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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RISK-INFORMED EXEMPTIONS FROM SPECIAL TREATMENT REQUIREMENTS

STP NUCLEAR OPERATING COMPANY

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-498 AND 50-499

1.0 INTRODUCTION

1.1 Background

As discussed in SECY-98-300, "Options for Risk-Informed Revisions to 10 CFR Part 50, 'Domestic Licensing of Production and Utilization Facilities'," and the Advanced Notice of Proposed Rulemaking on Risk-Informing Special Treatment Requirements (65 FR 11488, March 3, 2000), the regulations of the U.S. Nuclear Regulatory Commission (NRC) in 10 CFR Parts 21, 50, and 100 and others contain special treatment requirements that impose controls to ensure the quality of structures, systems, and components (SSCs) that are safety-related, important to safety, or otherwise within the scope of the regulations. These special treatment requirements go beyond normal commercial and industrial practices, and include quality assurance (QA) requirements, environmental and seismic qualification requirements, inspection and testing requirements, and performance monitoring requirements. The scope of these regulations applies to some SSCs that have little or no safety or risk significance.

The NRC has approved a risk-informed process for determining the safety significance of SSCs as part of the Graded Quality Assurance (GQA) Program for South Texas Project, Units 1 and 2 (STP). Using this process, STP Nuclear Operating Company (STPNOC) has categorized certain SSCs in the plant as low safety significant (LSS) or non-risk significant (NRS), and other SSCs as high safety significant (HSS) or medium safety significant (MSS). STPNOC has found that in practice, the GQA Program was limited in implementation by the special treatment requirements imposed by 10 CFR Parts 21, 50, and 100 and others for SSCs that are safety-related, important to safety, or otherwise within the scope of the regulations. Regardless of their risk significance, SSCs that have been classified as safety related are subject to requirements for QA in Appendix B to 10 CFR Part 50, environmental qualification under 10 CFR 50.49, inservice testing (IST) and inservice inspection (ISI) under 10 CFR 50.55a, and monitoring the effectiveness of maintenance under 10 CFR 50.65.

On July 13, 1999, as supplemented October 14 and 22, 1999, January 26 and August 31, 2000, and January 15, 18, and 23, March 19, May 8 and 21, 2001, STPNOC submitted risk-informed

exemption requests from the special treatment requirements of 10 CFR Parts 21, 50, and 100 (hereinafter, exemption requests or submittal). STPNOC's submittal sought approval of processes for categorizing the safety significance of SSCs and treatment of those SSCs consistent with their categorization as the principal basis for granting the exemptions. The scope of the exemption requests include those safety-related SSCs categorized as LSS or NRS using STPNOC's categorization process.

As part of this review process, the staff and the licensee have interacted extensively since the original submittal was provided. A number of meetings were held that included an initial meeting on the exemption requests (August 31 - September 1, 1999); a site visit (October 5-6, 1999); a meeting on the categorization process (April 10-11, 2000); a meeting on the proposed treatment processes (June 20-21, 2000); and a meeting on commercial practices (July 24-25, 2000). The staff issued its draft safety evaluation (SE) on November 15, 2000 (see ADAMS Accession No. ML003761558). The purpose of the draft SE was to focus the licensee and staff resources on the issues that remained to be resolved to complete the staff's review of the licensee's exemption requests. In the draft SE, the staff identified 16 open and 2 confirmatory items that required a licensee response. The staff met with the licensee on December 6 and 8, 2000, February 15 and 16, April 4 and 5, and April 24, 2001, to discuss the resolution of the open and confirmatory items identified in the draft SE. In addition, the staff issued a request for additional information (RAI) on January 18, 2000, (see ADAMS Accession No. ML003675685) and its draft review guidelines for the review of the STPNOC exemption requests on July 19, 2000 (see ADAMS Accession No. ML003733405).

The Commission, pursuant to 10 CFR 50.12(a)(1), may grant exemptions from the requirements of 10 CFR Part 50 that are authorized by law, will not present an undue risk to public health and safety, and are consistent with the common defense and security. The Commission, however, pursuant to 10 CFR 50.12(a)(2), will not consider granting an exemption unless special circumstances are present. For the purposes of its exemption request, the licensee identified three of the special circumstances of 10 CFR 50.12(a)(2) that it determined were applicable to its exemption requests. These included (1) the special circumstance pursuant to 10 CFR 50.12(a)(2)(ii) that is present when application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule; (2) the special circumstance pursuant to 10 CFR 50.12(a)(2)(iv) that is present whenever the exemption would result in benefit to the public health and safety that compensates for any decrease in safety that may result from the grant of the exemption; and (3) the special circumstance pursuant to 10 CFR 50.12(a)(2)(vi) that is present whenever there is any other material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption. If 10 CFR 50.12(a)(2)(vi) is relied on exclusively for satisfying the special circumstances provision of 10 CFR 50.12(a)(2), the exemption may not be granted until the Executive Director for Operations has consulted with the Commission.

1.2 Overview of the Staff's Review Process

In order to grant exemptions from special treatment requirements of 10 CFR Part 50, the exemption provisions of 10 CFR 50.12 would not require the staff specifically to address the question of whether the SSCs would be functional under design-basis conditions. However, the Commission has endorsed the staff's view that under Option 2, as described in SECY-98-300 (RIP50 Option 2), there needs to be confidence that low risk-significant, but safety-related,

SSCs remain functional under design-basis conditions. The latest guidance on Option 2 was provided in SECY-00-194, “Risk-Informing Special Treatment Requirements,” dated September 7, 2000, that stated “licensees will be required to maintain the functional capability of SSCs using existing or new programs. When functionality is not maintained, licensees will be required to take corrective actions to restore functionality.” The review of the STPNOC exemption request was conducted as a proof-of-concept for Option 2. As such, the staff included within the scope of its review of the STPNOC exemption request whether low risk-significant, but safety-related, SSCs remain functional under design-basis conditions. This created an additional consideration for the staff in determining whether to grant the requested exemptions.

In its submittal, the licensee requested approval of the requested exemptions primarily based on the categorization process that would allow the application of its proposed treatment used to provide confidence of functionality based on the risk significance of the SSCs. The categorization process proposed by the licensee is a risk-informed methodology that uses both a probabilistic risk assessment (PRA) component and a deterministic component relying on expert judgment to determine the risk significance of both functions and SSCs. The proposed treatment ranges from the current treatment required by the NRC's regulations for safety-related SSCs of high risk significance to the treatment described in the licensee proposed Final Safety Analysis Report (FSAR) Section 13.7.3.3 to be applied to safety-related, but low risk-significant SSCs.

The staff has defined an approach to analyzing and evaluating proposed changes to regulatory controls imposed on licensees. This approach supports the NRC's desire to base its decisions on the results of traditional engineering evaluations, supported by insights (derived from the use of PRA methods) about the risk significance of the proposed changes. Decisions concerning proposed changes are expected to be reached in an integrated fashion, considering traditional engineering and risk information, and may be based on qualitative factors as well as quantitative analyses and information.

In implementing risk-informed decisionmaking, changes are expected to meet a set of key principles. Some of these principles are written in terms typically used in traditional regulatory and engineering decisions (e.g., defense in depth). While written in these terms, it should be understood that risk analysis techniques can be, and are encouraged to be, used to help ensure and show that these principles are met. These principles are:

1. The proposed change meets the current regulations unless it is explicitly related to a requested exemption or rule change, i.e., a "specific exemption" under 10 CFR 50.12 or a "petition for rulemaking" under 10 CFR 2.802.

2. The proposed change is consistent with the defense-in-depth philosophy.

3. The proposed change maintains sufficient safety margins.

4. When proposed changes result in an increase in core damage frequency or risk, the increases should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.

5. The impact of the proposed change should be monitored using performance measurement strategies.

The staff's proposed evaluation approach and acceptance guidelines for this review follow from these principles. In implementing these principles, the staff expects that,

- All safety impacts of the proposed change are evaluated in an integrated manner as part of an overall risk management approach in which the licensee is using risk analysis to improve operational and engineering decisions broadly by identifying and taking advantage of opportunities to reduce risk, and not just to eliminate requirements the licensee sees as undesirable. For those cases when risk increases are proposed, the benefits should be described and should be commensurate with the proposed risk increases. The approach used to identify changes in requirements should be used to identify areas where requirements should be increased as well as where they can be reduced.

- The scope and quality of the engineering analyses (including traditional and probabilistic analyses) conducted to justify the proposed change should be appropriate for the nature and scope of the change, should be based on the as-built and as-operated and maintained plant, and should reflect operating experience at the plant.

- The plant-specific PRA supporting the licensee's proposals has been subjected to quality controls such as an independent peer review or certification, and

- Appropriate consideration of uncertainty is given in analyses and interpretation of findings, including using a program of monitoring, feedback, and corrective action to address significant uncertainties.

In the case of the STPNOC requests for exemption from the special treatment requirements of 10 CFR Parts 21, 50, and 100, the staff relied heavily on the licensee's categorization process in reaching its conclusions. Fundamentally, the categorization process needs to be a rigorous and robust methodology that has been determined to properly categorize SSCs to the correct level of risk significance. Consistent with this approach, the staff developed explicit guidance against which the staff would measure the proposed categorization process. This guidance is provided in the July 19, 2000, draft review guidelines. The staff's assessment of the licensee's proposed categorization process is provided in Section 3.0 of this SE.

The categorization process, provided it is sufficiently rigorous and robust, could be the basis for granting most of the exemptions requested in that it clearly identifies a set of safety-related SSCs that are of such low risk significance that it is not necessary to impose the specific special treatment requirement of the subject regulation to protect public health and safety. However, the functionality of SSCs, including low safety significant SSCs, must be maintained consistent with the RIP50 Option 2 approach and to support the staff’s finding on the categorization process by maintaining defense-in-depth and the implicit assumption that SSCs will remain capable of performing their safety functions under design-basis conditions. Considering the low risk significance of some SSCs, it is not necessary to maintain the same level of confidence provided by the special treatment requirements. In assessing functionality, the staff’s review focused on whether the programmatic elements of the licensee’s treatment processes could be sufficient for the exempted SSCs to remain capable of performing their safety functions under design-basis conditions. The staff determined that it was not necessary

to assess the details regarding how the licensee will implement its treatment processes on safety-related LSS and NRS SSCs because successful implementation of the licensee's categorization process will result in only those SSCs that have little or no effect on plant risk being categorized as LSS or NRS. The staff's assessment of the licensee's proposed treatment programs and processes is provided in Section 4.0 of this SE.

2.0 SUMMARY OF PROPOSED CHANGES AND STAFF EVALUATIONS

The extent of the exemptions being sought can be characterized in six basic groups. These groups are (1) qualification requirements, (2) maintenance rule requirements, (3) QA requirements, (4) inspection and testing requirements, (5) industry code requirements, and (6) 10 CFR 50.59. Similar to Option 2 for risk-informing the special treatment requirements of 10 CFR Part 50 (Option 2)[1], the exemptions do not include technical requirements (design or functional) for SSCs. These technical requirements specify design requirements or safety functions to be performed by an SSC, including features to prevent adverse impacts on the safety function of one SSC due to the failure of another SSC. The exemptions being sought by STPNOC will not require any changes to design or functional requirements in the STP FSAR or the STP Technical Specifications (TSs). STPNOC's purpose for seeking the exemptions is to allow it to relax the special treatment requirements imposed by 10 CFR Parts 21, 50, and 100, consistent with the safety significance of the SSCs.

2.1 Categorization Process

The staff has reviewed STPNOC's integrated SSC categorization process. The categorization process was found to use both a probabilistic and a deterministic based methodology that appropriately addressed the issues of defense-in-depth, safety margins, and aggregate risk impacts. The staff finds the proposed categorization process to be acceptable to categorize the risk significance of both functions and SSCs for use in reducing the scope of SSCs subject to special treatment. The categorization process provides an acceptable method for defining those SSCs for which exemptions from the special treatment requirements can be granted. Based primarily on its findings on the categorization process, as supported by the finding on the alternative treatment processes, the staff concluded that relaxing the special treatment requirements on LSS and NRS safety-related SSCs would pose no undue risk to public health and safety. Further, the staff determined that the licensee's proposed FSAR Section provides an acceptable description of the categorization process and is sufficient to support the staff's findings regarding the requested exemptions.

2.2 Treatment Processes

For HSS and MSS SSCs, the staff concluded that the elements of the proposed process for determining the treatment of both safety-related and nonsafety-related HSS and MSS SSCs are acceptable. The staff concluded that the elements of the licensee-proposed treatment processes, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions. This

[1]See SECY 98-300, "Options for Risk-Informed Revisions to 10 CFR Part 50 - 'Domestic Licensing of Production and Utilization Facilities'," dated December 23, 1998, for specifics regarding Option 2.

conclusion for safety-related LSS and NRS SSCs supports the implicit assumption of the categorization process that these SSCs will remain functional. Further, the staff determined that the licensee's proposed FSAR Section provides an acceptable description of the elements of its treatment processes and is sufficient to support the staff's findings regarding functionality.

2.3 Change Control Process for Exemption Bases

The staff determined that the processes that form the bases for granting any of the exemptions requested are to be described in the STP FSAR. In its May 21, 2001, submittal, the licensee provided a proposed FSAR Section 13.7 describing these processes that the staff found acceptable. In order to control changes to these processes such that the bases for the exemptions remain valid, each of the exemptions will require that the licensee document these processes in the FSAR. Changes to the FSAR are governed by the requirements of 10 CFR 50.59. However, the staff concluded that 10 CFR 50.59 alone is not sufficient to provide regulatory assurance that the bases for the exemptions remain valid. Therefore, the staff is requiring that the licensee implement a change control process, in addition to the requirements of 10 CFR 50.59. This change control process will also be a condition of each of the exemptions granted as described in Section 5.0 of this SE.

2.4 Qualification Requirements

In the area of qualification requirements, 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," and 10 CFR Part 100, Appendix A, Section VI, "Application to Engineering Design," impose environmental and seismic qualification requirements on certain classes of SSCs. In general, these regulations require analysis or testing, or a combination of both, to provide confidence that the SSCs can perform their safety functions under design conditions, and require that the SSCs be maintained in their qualified condition. Further, requirements of 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 2, "Design Bases for Protection Against Natural Phenomena," and GDC 4, "Environmental and Dynamic Effects Design Bases," impose environmental and seismic design requirements on SSCs.

For 10 CFR 50.49, STPNOC is seeking an exemption from the scope of electric components important to safety defined under 10 CFR 50.49(b) to eliminate the qualification requirements for LSS and NRS electric SSCs. STPNOC is seeking exemptions from GDC 2 to the extent that it requires tests and inspections to demonstrate that LSS and NRS SSCs are designed to withstand the effects of natural phenomena without loss of capability to perform their safety functions. For GDC 4, STPNOC is only seeking exemption to the extent that GDC 4 requires inspection and testing to demonstrate that LSS and NRS SSCs are able to withstand environmental effects. GDC 4 requirements related to dynamic effects would not be exempted. STPNOC is seeking exemption from 10 CFR Part 100, Appendix A, Section VI.(a)(1) and (2) to the extent that these sections require testing and specific types of analyses to demonstrate that LSS and NRS SSCs are designed to withstand the safe-shutdown earthquake (SSE) and operating-basis earthquake (OBE), respectively. Associated with the exemption request from 10 CFR Part 100, Appendix A, are supporting requests for exemption from 10 CFR 50.34(b)(10) and 10 CFR 50.34(b)(11) to the extent that this regulation imposes the testing and specific types of analyses requirements of 10 CFR Part 100, Appendix A, on LSS and NRS SSCs.

As discussed in Section 8.0 of this SE, the licensee requested an exemption to 10 CFR 50.49 and has described the attributes of its processes for the treatment of LSS and NRS SSCs. The staff found that the categorization process (see Section 3.0 of this SE) provided an acceptable method for refining the scope of SSCs subject to special treatment requirements. In support of this finding, the staff also found that, if effectively implemented, the licensee's treatment processes can result in safety-related LSS and NRS SSCs remaining capable of performing their safety function(s) under design-basis conditions (see Section 4.0 of this SE). On this basis, the staff has no technical objection to granting an exemption to the scope of electric equipment defined in 10 CFR 50.49(b). The staff determined that to the extent that the requirements of 10 CFR 50.49(e)(1) through (7) discuss design requirements, these design requirements continue to apply to LSS and NRS SSCs. Further, as discussed in Section 20.2 of this SE, the staff found that the licensee's categorization process was not considered when the rule was adopted and that it is in the public interest to grant the requested exemptions, satisfying the special circumstances of 10 CFR 50.12(a)(vi). Therefore, the staff concluded an exemption from the requirements of this regulation should be granted to the extent that it includes LSS and NRS SSCs within the scope of the rule.

As discussed in Section 14.0 of this SE, the staff concluded that an exemption from GDC 2 is not necessary because safety-related LSS and NRS SSCs will continue to be designed in accordance with the requirements of GDC 2. Therefore, the NRC should deny the licensee's exemption request from the requirements of GDC 2.

As discussed in Section 15.0 of this SE, the staff concluded that an exemption from GDC 4 is not necessary because safety-related LSS and NRS SSCs will continue to be designed in accordance with the requirements of GDC 4. On the basis that an exemption is not necessary, the NRC should deny the licensee's exemption request from the requirements of GDC 4.

As discussed in Section 18.0 of this SE, the licensee requested an exemption to Sections VI.(a)(1) and (2) of Appendix A to 10 CFR Part 100, and has described the attributes of its processes for the treatment of LSS and NRS SSCs. The staff found that the categorization process (see Section 3.0 of this SE) provided an acceptable method for refining the scope of SSCs subject to special treatment requirements. In support of this finding, the staff also found that, if effectively implemented, the licensee's treatment processes can result in safety-related LSS and NRS SSCs remaining capable of performing their safety function(s) under design-basis conditions (see Section 4.0 of this SE). On this basis, the staff has no technical objection to granting an exemption to Sections VI.(a)(1) and (2) of Appendix A to 10 CFR Part 100. Further, as discussed in Section 20.2 of this SE, the staff found that licensee's categorization process was not considered when the rule was adopted and that it is in the public interest to grant the requested exemptions, satisfying the special circumstances of 10 CFR 50.12(a)(vi). Therefore, the staff concluded exemptions from the requirements of these regulations should be granted to the extent that it includes LSS and NRS SSCs within the scope of the rules. Further, the staff concluded that the supporting exemptions from the requirements of 10 CFR 50.34(b)(10) and 10 CFR 50.34(b)(11) should also be granted on the same basis.

2.5 Maintenance Rule Requirements

The Maintenance Rule (10 CFR 50.65) imposes requirements for monitoring the performance of SSCs defined in 10 CFR 50.65(b), measured against licensee established goals, in a manner

sufficient to provide confidence that the SSCs are capable of fulfilling their intended functions. Included within the scope of 10 CFR 50.65(b) are SSCs such as safety-related and nonsafety-related SSCs that are relied upon to remain functional during design-basis events, relied upon in emergency operating procedures, or whose failure could result in the failure of a safety function. STPNOC is requesting an exemption to exclude LSS and NRS SSCs from the scope of the Maintenance Rule defined in 10 CFR 50.65(b) [except the requirements of 10 CFR 50.65(a)(4) still apply]. STPNOC will continue to conduct monitoring at the plant, system, or train level. However, failure of an LSS or NRS SSC would not count as a Maintenance Rule Functional Failure (MRFF) at the plant, system, or train level unless that failure caused a failure of a HSS or MSS function.

As discussed further in Section 13.0 of this SE, the staff has determined that the STPNOC proposal to exempt LSS and NRS SSCs from the requirements of 10 CFR 50.65(b) does not pose an undue risk to public health and safety. The staff found that the categorization process (see Section 3.0 of this SE) provided an acceptable method for refining the scope of SSCs subject to special treatment requirements. In support of this finding, the staff also found that, if effectively implemented, the licensee's treatment processes can result in safety-related LSS and NRS SSCs remaining capable of performing their safety function(s) under design-basis conditions (see Section 4.0 of this SE). Further, as discussed in Section 20.2 of this SE, the staff found that the licensee's categorization process was not considered when the rule was adopted and that it is in the public interest to grant the requested exemptions, satisfying the special circumstances of 10 CFR 50.12(a)(vi). Therefore, the STPNOC request for an exemption from the scope of the Maintenance Rule defined in 10 CFR 50.65(b) [the requirements of 10 CFR 50.65(a)(4) still apply] should be granted.

2.6 Quality Assurance Requirements

The requirements of 10 CFR Part 50, Appendix B, impose QA requirements on SSCs that are safety related. Under the GQA Program approved by the NRC, STPNOC is required to apply a basic level of oversight to LSS and NRS SSCs that are safety related. STPNOC is requesting an exemption to exclude LSS and NRS SSCs from the scope of the requirements of all of the Criteria of Appendix B to 10 CFR Part 50, with the exception of Criterion III, "Design Control," Criterion XV, "Nonconforming Materials, Parts, or Components," and Criterion XVI, "Corrective Action." These three criteria will continue to apply to all safety-related SSCs, including those categorized as LSS or NRS. Specifically, STPNOC is seeking an exemption for LSS and NRS SSCs from the scope of SSCs included under 10 CFR Part 50, Appendix B, as defined in the introduction. A supporting exemption is also being sought from the scope of SSCs important to safety under the requirements of GDC 1, "Quality Standards and Records," for LSS and NRS SSCs.

Further, STPNOC is seeking exemption from 10 CFR 50.34(b)(6)(ii) that requires that the licensee describe in the FSAR how 10 CFR Part 50, Appendix B, is being satisfied as it relates to LSS and NRS SSCs. A supporting exemption is also being sought from 10 CFR 50.54(a)(3) regarding NRC review and approval of changes to the QA Program that result in a reduction in commitments associated with LSS and NRS SSCs.

In addition to the QA requirements of 10 CFR Part 50, Appendix B, the licensee is seeking exemption from the procurement, dedication, and reporting requirements of 10 CFR Part 21.

Specifically, STPNOC is seeking an exemption from the definition of "basic component" in 10 CFR 21.3 for those SSCs categorized as LSS or NRS.

As discussed further in Section 6.0 of this SE, the staff concluded that the exemption requested from the definition of basic component in 10 CFR 21.3 should be granted in that the exemption provisions of 10 CFR 21.7 have been satisfied.

As discussed further in Section 7.0 of this SE, the staff has determined the requested exemptions from 10 CFR Part 50, Appendix B, requirements should be granted (the requirements of Criteria III, “Design Control,” XV, “Nonconforming Material, Parts, or Components,” and XVI, “Corrective Action,” are not within the scope of the requested exemption.) The staff found that the categorization process (see Section 3.0 of this SE) provided an acceptable method for refining the scope of SSCs subject to special treatment requirements. In support of this finding, the staff also found that, if effectively implemented, the licensee’s treatment processes can result in safety-related LSS and NRS SSCs remaining capable of performing their safety function(s) under design-basis conditions (see Section 4.0 of this SE). Further, as discussed in Section 20.2 of this SE, the staff found that licensee’s categorization process was not considered when the rule was adopted and that it is in the public interest to grant the requested exemptions, satisfying the special circumstances of 10 CFR 50.12(a)(vi). Therefore, the STPNOC request for an exemption should be granted.

However, as discussed in Section 7.0 of this SE, the exemption requested from 10 CFR 50.34(b)(6)(ii) and 10 CFR 50.54(a)(3) should be denied. The licensee has submitted its revised QA Program description reflecting the reduction in commitment that will occur as a result of granting the exemptions for LSS and NRS SSCs. The revised QA Program description provided in the submittal included a discussion of the scope of the SSCs exempted from 10 CFR Part 50, Appendix B, requirements, the basis for the exemption (e.g., the staff’s SE), and also referenced the document where the alternate treatment processes are described (i.e., FSAR, Section 13.7). Further, the revised QA Program description identified the portions of the QA Program that remain applicable to the exempted SSCs (i.e., those sections related to design control, corrective action, and nonconforming items). The alternative treatment and categorization processes proposed in the submittal were incorporated into the revised QA Program description satisfying the requirements of GDC 1 for LSS and NRS SSCs. Therefore, the staff determined that an exemption from GDC 1 is not necessary.

2.7 Inspection and Testing Requirements

Under GDC 18, "Inspection and Testing of Electric Power Systems," electric SSCs are required to be designed such that they can be periodically tested and inspected. STPNOC is seeking an exemption to exclude LSS and NRS SSCs from the scope of SSCs important to safety under GDC 18 to the extent that it requires that inspection and testing be performed for individual features, such as wiring, insulation, connections, switchboards, relays, switches, and busses. STPNOC will continue to perform system functional tests for systems designed to meet the requirements of GDC 18, including those SSCs categorized as LSS or NRS.

As discussed further in Section 16.0 of this SE, the staff concluded that an exemption from GDC 18 is not necessary because safety-related LSS and NRS SSCs will continue to be designed in accordance with the requirements of GDC 18. On the basis that an exemption is

not necessary, the NRC should deny the licensee's exemption request from the requirements of GDC 18.

STPNOC is also requesting an exemption to exclude safety-related LSS and NRS SSCs, subject to the additional limitations as described in Section 17.0 of this SE, from the scope of SSCs requiring Type C containment isolation valve leak rate tests (10 CFR Part 50, Appendix J, Option B, Section III.B, "Type B and C Tests"). Cumulative limits for containment leakage would be based upon the tested SSCs, with the assumption that the exempted SSCs contribute zero leakage.

As discussed further in Section 17.0, the staff has concluded that exempting containment isolation valves that meet the licensee's proposed criteria from Type C testing does not pose an undue risk to public health and safety. The staff found that the categorization process (see Section 3.0 of this SE) provided an acceptable method for refining the scope of SSCs subject to special treatment requirements. In support of this finding, the staff also found that, if effectively implemented, the licensee's treatment processes can result in safety-related LSS and NRS SSCs remaining capable of performing their safety function(s) under design-basis conditions (see Section 4.0 of this SE). Further, as discussed in Section 20.2, the staff found that the licensee's categorization process was not considered when the rule was adopted and that it is in the public interest to grant the requested exemptions, satisfying the special circumstances of 10 CFR 50.12(a)(vi). Therefore, the licensee's proposed exemption to 10 CFR Part 50, Appendix J, Option B, Section III.B, should be granted.

2.8 Industry Code Requirements

STPNOC is requesting exemptions from the requirements of Section XI of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code), for repair and replacement of ASME Code Class 2 and 3 safety-related LSS and NRS SSCs required under 10 CFR 50.55a(f) and (g). STPNOC is also requesting exemptions from the IST and ISI requirements of the Code for ASME Code Class 1, 2, and 3 safety-related LSS and NRS SSCs required under 10 CFR 50.55a(f) and (g), respectively. The technical requirements of replacement SSCs related to material specifications, loadings, design methodology, and stress allowables will remain consistent with the original SSC technical requirements.

For electric SSCs important to safety, STPNOC is requesting an exemption from 10 CFR 50.55a(h) to exclude LSS and NRS SSCs from the scope of SSCs required to meet Sections 4.3 and 4.4 of Institute of Electrical and Electronics Engineers (IEEE) 279, "Criteria for Protection Systems for Nuclear Power Generating Stations." This would allow STPNOC to exclude these SSCs from the scope of the quality and environmental qualification requirements described in those sections.

As discussed in Section 9.0 of this SE, the staff has determined that excluding LSS and NRS safety-related pumps and valves from the IST requirements of 10 CFR 50.55a(f) does not pose an undue risk to public health and safety. The staff determined that 10 CFR 50.55a(f) does not impose the repair and replacement requirements of Section XI of the Code on ASME Code Class 2 or 3 SSCs. The staff found that the categorization process (see Section 3.0 of this SE) provided an acceptable method for refining the scope of SSCs subject to special treatment requirements. In support of this finding, the staff also found that, if effectively implemented, the licensee's treatment processes can result in safety-related LSS and NRS SSCs remaining

capable of performing their safety function(s) under design-basis conditions (see Section 4.0 of this SE). Further, as discussed in Section 20.2, the staff found that the licensee's categorization process was not considered when the rule was adopted and that it is in the public interest to grant the requested exemptions, satisfying the special circumstances of 10 CFR 50.12(a)(vi). As such, the staff has determined that the requested exemption from 10 CFR 50.55a(f) should be granted to the extent that it imposes the IST requirements of ASME Section XI to ASME Code Class 1, 2, and 3 components.

As discussed in Section 10.0 of this SE, the staff has determined that excluding LSS and NRS safety-related ASME components from the ISI (for ASME Code Class 1, 2, and 3), and repair and replacement (for ASME Code Class 2 and 3) requirements of 10 CFR 50.55a(g) does not pose an undue risk to public health and safety. The staff found that the categorization process (see Section 3.0 of this SE) provided an acceptable method for refining the scope of SSCs subject to special treatment requirements. In support of this finding, the staff also found that, if effectively implemented, the licensee's treatment processes can result in safety-related LSS and NRS SSCs remaining capable of performing their safety function(s) under design-basis conditions (see Section 4.0 of this SE). Further, as discussed in Section 20.2, the staff found that the licensee's categorization process was not considered when the rule was adopted and that it is in the public interest to grant the requested exemptions, satisfying the special circumstances of 10 CFR 50.12(a)(vi). As such, the staff has determined that the requested exemption from 10 CFR 50.55a(g) should be granted to the extent that it imposes the ISI requirements of ASME Section XI to ASME Code Class 1, 2, and 3 components, and the repair and replacement requirements of the Code to ASME Code Class 2 and 3 components.

As discussed in Section 11.0 of this SE, the staff has determined that excluding LSS and NRS electrical components from the quality and qualification requirements of IEEE 279 required by 10 CFR 50.55a(h)(2) does not pose an undue risk to public health and safety. The staff found that the categorization process (see Section 3.0 of this SE) provided an acceptable method for refining the scope of SSCs subject to special treatment requirements. In support of this finding, the staff also found that, if effectively implemented, the licensee's treatment processes can result in safety-related LSS and NRS SSCs remaining capable of performing their safety function(s) under design-basis conditions (see Section 4.0 of this SE). Further, as discussed in Section 20.2, the staff found that the licensee's categorization process was not considered when the rule was adopted and that it is in the public interest to grant the requested exemptions, satisfying the special circumstances of 10 CFR 50.12(a)(vi). As such, the staff has determined that the requested exemption from 10 CFR 50.55a(h)(2) should be granted to the extent that it imposes the quality and qualification requirements of Sections 4.3 and 4.4 of IEEE 279.

2.9 10 CFR 50.59

In support of the change in special treatment requirements, STPNOC is seeking an exemption from 10 CFR 50.59(c)(1), (c)(2), and (d)(1) to the extent that these regulations require a written evaluation of changes in special treatment requirements for LSS and NRS SSCs. Included in this request is an exemption from the requirement to seek prior NRC approval for such changes. STPNOC relies on the categorization of the SSCs as an equivalent evaluation of the safety significance of the SSCs and as such the evaluation required by 10 CFR 50.59 would be redundant.

As discussed further in Section 12.0 of this SE, the staff has determined that the STPNOC exemption request from the evaluation and prior approval requirements of 10 CFR 50.59 does not pose an undue risk to public health and safety as it relates to changes in the special treatment requirements associated with any of the exemptions the NRC may grant for LSS and NRS SSCs. Further, the special circumstances of 10 CFR 50.12(a)(2)(ii) are satisfied in that the underlying purpose of the regulation has been met by the evaluation and review of the licensee's submittal related to the exemption requests from the special treatment requirements of 10 CFR Parts 21, 50, and 100. Therefore, the STPNOC request for an exemption from 10 CFR 50.59(c)(1), (c)(2), and (d)(1) should be granted to the extent that it applies to the regulations for which exemptions may be granted. However, the requested exemption does not extend to other special treatment provisions as committed to in the STP FSAR or other licensing bases documents.

2.10 Replacement of Class 1E Components

As discussed further in Section 19.0 of this SE, based on the staff's evaluation, the staff finds that the licensee's request to replace Class 1E LSS and NRS components with Non-Class 1E components, in cases where the replacement does not meet all design and functional requirements, is not consistent with the licensee's submittal and with the proposed rulemaking for the Risk-Informing Special Treatment Requirements and, therefore, is not acceptable. The licensee has the option to reclassify the Class 1E component to a Non-Class 1E component after performing a design change consistent with its design control program that includes a review per the requirement identified in 10 CFR 50.59 to determine that it does not require prior NRC approval.

3.0 SAFETY SIGNIFICANCE CATEGORIZATION

3.1 Introduction

In its submittal, STPNOC requested an exemption to exclude LSS and NRS safety-related SSCs from the scope of NRC's regulations that impose special treatment requirements. STPNOC proposed a process that determines the risk significance of SSCs using an integrated decisionmaking (categorization) process. This section of the SE contains the staff's review of this risk categorization process.

3.2 Evaluation

STPNOC determines the risk significance of plant equipment using an integrated decisionmaking process that uses importance measures derived from the STP PRA and a "deterministic" process that relies on the judgment of a panel of experts. This process is reviewed in detail in the following sections.

3.2.1 Capability and Quality of the PRA to Support the Categorization Process

STP's PRA is an internal and external initiating events, full power, level 2 PRA that calculates both core damage frequency (CDF) and large early release frequency (LERF). Contributions from all initiating events at full power are included in the importance measure calculations that are used in the risk categorization process. The external events addressed in the PRA include floods, tornado, seismic events, and internal fires. The licensee also considers shutdown and

mode changes in its deterministic categorization process. Therefore, the staff finds the scope of the PRA to be suitable for use in the categorization process.

Sandia National Laboratories (Sandia), contracted by the NRC, conducted an extensive review of the STP PRA with favorable findings, as documented in NUREG/CR 5606, "A Review of the South Texas Project Probabilistic Safety Assessment for Accident Frequency Estimates and Containment Binning," 1991. In addition, the STP PRA has undergone NRC reviews of varying scope in support of numerous license amendments. In support of approval of the GQA Program, dated November 6, 1997, the staff reviewed the changes made to the PRA between the conclusion of the Sandia review and the GQA submittal. The staff found the changes to be well documented and reasonable. The staff concluded that the PRA was of sufficient quality as used in the categorization process described in the GQA submittal for assigning SSCs into broad safety-significance categories for consideration by the Working Group and the Expert Panel to develop and support the GQA Program.

The STPNOC PRA configuration control program incorporates a feedback process to update the PRA model. The program requires that plant design and procedure changes that affect the PRA models or input parameters be incorporated into the model on a period not to exceed 36 months. A comprehensive input parameter update incorporates changes to plant-specific failure rate distributions and human reliability about every 60 months. All potential model changes are evaluated on a monthly basis with respect to the impact on CDF and LERF. If the change would result in a significant increase in the CDF or LERF, the PRA would be updated as needed. The results of the updated PRA and the associated risk categorizations based on the updated PRA information are furnished to the Working Group, which, as part of the feedback and corrective action process, recategorizes the risk significance of SSCs as needed.

The licensee performed an assessment of the configuration control process using the guidance from the Boiling Water Reactor Owners Group Peer Certification Process. The licensee reported that all findings from this assessment were documented in the corrective action program and have been corrected.

Based on the above, the staff finds the STP PRA to be of sufficient quality and that it is capable of supporting the proposed SSC risk categorization process.

3.2.2 Integrated SSC Categorization Process

STPNOC's risk-informed categorization process evaluates the risk significance of individual SSCs using a two-fold process: (1) a process using PRA information, and (2) a deterministic risk ranking process based on expert judgment. Under this dual process, an SSC's importance, if modeled in the PRA, is separately rated based on the two independent processes. The higher of the two ratings is then used as the SSC's final categorization. The staff reviewed each of these two processes. If an SSC is not modeled in the PRA, it is rated using the deterministic risk ranking process. The categorization process is performed using an Expert Panel and a Working Group. The roles and responsibilities of these groups are described below.

The Expert Panel is composed of a group of senior-level personnel with diverse backgrounds. Their responsibilities include approving and issuing documents communicating risk-informed decisions, appointing the Working Group, assessing the overall station risk impact due to SSC

performance and implemented risk-informed programs after each plant-specific data update of the PRA, and retaining appropriate documented decisions and supporting documents as quality records.

The Working Group is composed of experienced personnel who possess diverse knowledge and insights into the plant and uses deterministic knowledge and risk insights in making SSC classifications. Their responsibilities include analyzing performance data and risk information when developing recommendations, documenting recommendations, including the rationale that forms the bases for the recommendations, providing recommendations to the Expert Panel for approval, and taking appropriate action to facilitate implementation of the Expert Panel's decisions.

3.2.2.1 Risk Categorization Process Based on PRA Information

The categorization process that uses PRA information relies on the use of PRA importance measures as a screening method to categorize SSCs and then an evaluation of overall impact on plant risk from a postulated reduction in the availability and reliability of LSS SSCs.

3.2.2.1.1 Uses of PRA Importance Measures

The relative importance of SSCs modeled in the PRA is determined using two PRA importance measures, namely Fussell-Vesely (FV) and Risk Achievement Worth (RAW). The FV importance provides a measure of how much of the total sequence frequency is due to minimal cutsets that contain the specific event or SSC for which the FV importance measure is to be calculated. The RAW importance measure is an indicator of how much the sequence frequency would increase if it were assumed that an SSC would fail.

To account for the importance of common cause failures (CCFs), STPNOC proposed a method in which the SSC importance value was calculated as the sum of the basic event importance value and associated common cause term importance values. The licensee's methodology addresses CCFs by combining all the random and CCF modes into a single FV and RAW importance measure for each SSC. The NRC had approved equations combining the common cause and random failure RAW and FV during the GQA review. STPNOC had proposed alternative methods of calculating RAW and FV in its submittal, but has opted to continue using the methods approved by the NRC under GQA. The staff determined that the GQA equations overestimate the importance of an SSC and is therefore conservative with respect to categorizing SSCs. Based on this, the staff concluded that the calculational method for determining FV and RAW importance measures approved under GQA is acceptable for use in the categorization process used as a basis for the exemption requests. The use of the FV and RAW importance measure equations approved under GQA resolved Open Item 3.1 identified in the staff's November 15, 2000, draft SE.

Under STPNOC's categorization process, the risk significance of a modeled SSC is determined by its FV and RAW importance measures. The importance measures are compared to guideline values and the safety-significance category for each SSC determined. The staff recognizes that these guideline values are only applicable to STP, consistent with the provision of NRC Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," that application of risk-informed decisionmaking should reflect the actual design, construction, and operational

practices of the plant. The guideline values used in STPNOC's categorization process (see Section 13.7.2.3 of the May 21, 2001, proposed FSAR Section) are contained in the following table where HSS and LSS designation is used for the groupings relative to the exemption request. Only SSCs not modeled in the PRA can be placed in the NRS category.

Risk Significance Ranking	Criteria based on FV and/or RAW
High (HSS)	RAW $\geq$ 100.0 OR FV $\geq$ 0.01 OR FV $\geq$ 0.005 and RAW $\geq$ 2.0
Medium (further evaluation required)	FV < 0.005 and 100.0> RAW $\geq$ 10.0
Medium (MSS)	FV $\geq$0.005 and RAW < 2.0 OR FV < 0.005 and 10.0 > RAW $\geq$ 2.0
Low (LSS)	FV < 0.005 and RAW < 2.0

These importance measures are calculated using the STP PRA, which is an integrated model of plant risk from all categories of initiators, both internal and external. Thus, all initiating events are included in all model quantifications and the resulting risk importance measures are determined from sequences that are representative of all the initiating events. In reviewing the licensee's submittal, the staff found an error in the licensee's FV criteria for HSS SSCs. Specifically, STPNOC's GQA submittal and our GQA SE state that when the FV is greater than 0.01, the SSC will be assigned as HSS. Although a draft response to staff Question #9 also used 0.01, one of STPNOC's procedures, the final response to staff Question #9 in Attachment 4 of the August 31, 2000, submittal, and the August 31, 2000, revised submittal used 0.10 as the criteria. The licensee corrected this error in its submittal, its procedure, and has affirmed that the correct value for the FV criteria is 0.01. This resolved Open Item 3.2 from the November 15, 2000, draft SE.

The staff requested in its January 18, 2000, RAI (staff Question #32) that STPNOC determine the importance of SSCs for seismic, fire, and other external events based on the specific analysis alone. For example, the staff requested that the importance of SSCs for seismic events be determined by using only the seismic analysis. The basis of the request was to reduce any potential effect between analyses of different uncertainty.

In response to staff Question #32, STPNOC provided estimates of SSC importance for different categories of external events. The estimates were developed for fires, floods, and seismic initiating events. A full quantification of the PRA model was performed for each calculation of the external event importance measures. The same PRA ranking methodology used to calculate the composite SSC importance was used for these studies.

STPNOC reported that for each case, the SSC's risk rank resulting from the external event calculations was never higher than the composite PRA risk rank. In other words, no SSC increased in risk rank category when only the external event categories were analyzed. In general, fires, floods, and seismic events guarantee failure of affected SSCs. SSCs, failed by external events, do not influence the mitigation of accident/transient events and have no calculated importance measures. Based on its evaluation, STPNOC concluded that its PRA risk ranking process is not sensitive to the influence of external events and that it appropriately

factors in the impacts of external events. The staff found the licensee's conclusion reasonable and considers the proposed process used to categorize the SSCs using PRA importance measures to be acceptable.

3.2.2.1.2 Evaluation of Impact on Overall Plant Risk

RG 1.174 states that when proposed changes in the licensing basis result in an increase in overall plant risk, the increase should be small. STPNOC performed an evaluation to assess the overall impact of the proposed exemptions from special treatment requirements on the plant risk.

The NRS and LSS SSCs are the two SSC risk categorization groups for which the licensee has requested reduced treatment. STPNOC reported that none of the NRS SSCs and only a small fraction of the LSS SSCs are modeled in the STP PRA. The reasons that many of these SSCs are not modeled in the STP PRA are that they are either implicitly modeled or that they have negligible or no contribution to the cause or mitigation of accidents modeled in the PRA. Thus, all NRS SSCs and the vast majority (approximately 90 percent) of the LSS SSCs were categorized based solely on the deterministic risk-ranking process. Only the LSS SSCs that are modeled in the STP PRA were included in the evaluation to estimate the overall impact on plant risk.

Since the impact of the proposed reduction in special treatment requirements on SSCs' failure rates is unknown at this time, the licensee performed a sensitivity study to determine the impact on the overall plant CDF and LERF from postulating a simultaneous factor of 10 increase in the failure rates of all LSS SSCs modeled in the STP PRA. In all cases, increasing the failure rates of LSS SSCs by a factor of 10 resulted in a failure rate that was greater than the 95^{th} percentile for each of the LSS SSC failure rate distributions.

In response to staff Question #20(e) on how the sensitivity study accounts for potential common cause failure (CCF) in diverse and redundant systems under postulated accident conditions, the licensee responded that any change in underlying basic event probability of failure is automatically carried through the quantification of the system function, including intrasystem CCF, in the plant risk model. This response indicates that the results of the analysis reflect a concomitant increase in CCF rates associated with the modeled LSS SSCs and their postulated increase in failure rates.

The results of the licensee's sensitivity study showed that the overall plant CDF increased from the current CDF of 9.087E-6/year to about 9.323E-6/year, an increase of about 2.45E-7/year or about 2.7 percent. The LERF increased from 1.374E-7/year to 1.391E-7/year, an increase of about 1.7E-9/year or about 1.2 percent. Even though the licensee's sensitivity study is based on the small percentage of the total safety-related LSS SSCs that are explicitly modeled in the PRA (the other safety-related LSS or NRS SSCs are either implicitly modeled by modeling its associated system, or the safety-related LSS or NRS SSCs do not play any role in the scenarios determined to be risk significant in the PRA), the staff finds this sensitivity study to be an acceptable method of ensuring that the potential aggregate risk impact of the LSS SSCs is only slightly impacted by significant changes in the SSC failure rates. In addition, the estimated aggregate increases in CDF and LERF are within the RG 1.174 guidelines; therefore, the staff finds that the postulated change in the failure rates of LSS SSCs that are modeled in the PRA would be expected to have a low overall impact on plant risk.

The licensee's submittal with regard to categorization does not specifically address how the reduced special treatment requirements would impact the effect of environmental and spatial effects on the NRS and LSS SSCs and how this in turn would impact the STP PRA, in particular, the sensitivity analysis. However, the staff has found that the results of sensitivity analysis, under the presumption that the functionality of the NRS and LSS SSCs would be maintained to withstand the environmental and spatial effects, is acceptable. As discussed in Section 4.0 of this SE, the staff found that the licensee's treatment processes, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions.

The following discussion illustrates the sensitivity of the categorization process on continued functionality of SSCs exposed to harsh environments. There are two issues of concern. The first is that reductions in environmental qualifications for LSS and NRS SSCs could cause otherwise nominally independent and reliable SSCs to fail in harsh environments in which they need to operate. The second is that LSS and NRS SSCs could fail more often and cause a harsh environment that could fail HSS SSCs. The second issue is primarily related to seismic events and pressure boundary failures.

In response to staff Question #32 related to this issue, STPNOC explained how the current PRA takes into account the environmental effects on SSCs. For example, the licensee states that in order to prevent a pump from failing due to environmental concerns (i.e., increasing pump room temperature), the PRA models the air handling units (AHU) for the pump room. If the AHU fails, then it is assumed in the PRA that the pump will fail due to temperatures above pump equipment qualification. This example illustrates the staff's concerns regarding environmental effects. The licensee's response indicated that the pump in question was qualified for a given ambient temperature, and it was determined that with the AHU operating, the temperature would remain below the qualified temperature. Further, the licensee indicated that if the AHU did not operate, the ambient temperature would exceed the pump's qualified temperature, and it was assumed in the STPNOC PRA that the pump would fail. Therefore, the licensee concluded that the STPNOC PRA model includes full credit for the qualification of the equipment. Assuming that the pump is placed in the LSS category, and replaced with a pump of indeterminate temperature sensitivity (an unrecognized design change), the replacement pump could fail at elevated temperatures (design-basis temperature or less) even if the AHU were operating. If the operating temperature in this room was always elevated when the pumps are demanded, the pump (and potentially other redundant pumps) may fail under the accident conditions under which they are expected to operate.

The staff believes that environmental conditions should be considered for radiation monitors. Many, if not all, radiation monitors are classified as LSS, even though radiation levels are often used to determine conditions and associated operator actions and, for example, would need to operate in loss-of-coolant accident (LOCA) environments. STPNOC also provided an example of containment isolation valves that may eventually be exposed to a harsh environment but that isolate early in an accident. These valves would not be exposed to severe conditions for any length of time before they would close and thus fulfill their safety-function. These examples illustrate the sensitivity of the categorization process on continued confidence in the functionality of SSCs exposed to harsh environments. However, the staff concluded that the licensee's PRA model adequately addresses environmental impacts in assessing the risk significance of SSCs given that the treatment processes for LSS and NRS SSCs, if effectively

implemented, can result in safety-related LSS and NRS SSCs remaining functional under design-basis conditions (see Section 4.0).

3.2.2.2 Deterministic Risk-Ranking Process

Regardless of whether an SSC is subject to the risk-ranking process using PRA insights, under STPNOC's categorization process all SSCs are subject to a deterministic risk-ranking process. An SSC's final categorization is based on the higher of the two risk rankings (if there is any difference). Thus, in comparison to the results of the risk-ranking process using PRA insights, STPNOC's deterministic risk-ranking process can result in an increase, but not a decrease, in an SSC's categorization.

The first step in STPNOC's deterministic categorization process consists of the Working Group identifying the system functions performed by the selected plant system. Next, each component in the system is evaluated to identify the system function(s) supported by that component. This is documented in a Risk Significance Basis Document (RSBD). Then, the component is initially assigned the same risk as the most limiting system function that it supports. If the Working Group reaches consensus that the initial risk ranking of the component is satisfactory, no additional documentation is required since the justification has already been provided within the function categorization. Only in the case where SSC redundancy or other insight is used to rank the SSC category lower than the category of its most limiting supported system function is additional documentation required. These steps are described below in more detail.

In STPNOC's categorization process, an SSC's deterministic importance is directly attributable to the importance of the function supported by the SSC. In cases where an SSC supports more than one system function, STPNOC categorizes the SSC based on the highest categorization of the functions supported. In categorizing the functions of a system, the Working Group considers five critical questions regarding the function, each of which can be answered by a score ranging from zero to five. A score from each critical question is then multiplied by a weighting factor for each question. Section 13.7.2.4 of the May 21, 2001, proposed FSAR Section provides a description of this process. These questions and their weight are as follows:

Critical Questions	Weight
1. Is the function used to mitigate accidents or transients?	5
2. Is the function specifically called out in the emergency operating procedures or Emergency Response Procedures (that provides beyond design-basis configuration)?	5
3. Does the loss of the function directly fail another risk-significant system?	4
4. Is the loss of the function safety significant for shutdown or mode changes?	3
5. Does the loss of the function, in and of itself, directly cause an initiating event?	3

Based on the impact on safety if the function is unavailable and the frequency of loss of the function, STPNOC responds to each of the five questions by giving it a numerical score ranging from zero to five. The scores and their definitions are as follows:

Score for Each Critical Question	Score Explanation / Definition
0	Negative response - “No”.
1	Positive response having an insignificant impact and/or occurring very rarely. Occurring Very Rarely – demanded once per lifetime. Insignificant Impact – a system function has been challenged, but there is no core damage or negative impact on the health and safety of the public.
2	Positive response having a minor impact and/or occurring infrequently. Occurring Infrequently – demanded < once per cycle. Minor Impact – a system function has been moderately degraded, but there is no core damage or negative impact on the health and safety of the public.
3	Positive response having a low impact and/or occurring occasionally. Occurring Occasionally – demanded 1-2 times per cycle. Low Impact – a system function is significantly degraded, with very low likelihood of core damage, and no negative impact on the health and safety of the public is expected.
4	Positive response having a medium impact and/or occurring regularly. Occurring Regularly – demanded > 5 times per year. Medium Impact – a system function is lost which may, but is not likely to, result in core damage and/or is unlikely to have a negative impact on the health and safety of the public.
5	Positive response having a high impact and/or occurring frequently. Occurring Frequently – continuously or routinely demanded. High Impact – a system function is lost which likely could result in core damage and/or may have a negative impact on the health and safety of the public.

Although some of these definitions are quantitative, both of these sets of definitions are applied based on the collective judgment and experience of the Working Group.

The scores for all critical questions, after being multiplied by weighting factors for each question, are then summed. The maximum possible score is 100. Based on this final score, STPNOC categorizes the functions as follows:

Final Score Range	Risk Category
0 – 20	Non-Risk Significant (NRS)
21 – 40	Low Safety Significant (LSS)
41 – 70	Medium Safety Significant (MSS)
71 – 100	High Safety Significant (HSS)

There are exceptions to the above function categorization using these scores. For a function with a low categorization due to a low sum (final score) STPNOC could still classify it with a

higher risk-significant category if one of the five critical questions received a high numerical answer. Specifically, a weighted score of 25 on any one question would result in an HSS categorization; a weighted score of 15-20 on any one question would result in a minimum categorization of MSS; and a weighted score of 9-12 on any one question would result in a minimum categorization of LSS. The purpose of these exceptions is to ensure that an SSC with a significant contribution to risk in one area is not masked by other areas that are low contributors to risk significance.

In general, STPNOC assigns an SSC the same risk category as that of the most limiting (highest category) system function that the SSC supports. However, STPNOC may rank an SSC lower than the associated system function(s) when there are redundant or diverse means of satisfying the system function. However, merely having multiple trains of components available in a system does not automatically result in that component being assigned to a lower category. In addition, the final category of an SSC cannot be NRS if the system function is LSS (or higher), and generally cannot be more than one category level lower than the category of the most limiting system function.

The Working Group considers system operating configuration, reliability history, recovery time available, and other factors when an SSC's redundancy or diversity is evaluated for categorization. STPNOC's primary consideration is whether the failure of an SSC will fail or severely degrade the function. If the answer is no, then STPNOC may factor into the categorization the SSC's redundancy, as long as the SSC's reliability assumed in the categorization process and that of its redundant counterpart(s) have been satisfied. STPNOC can consider an SSC reliable when (1) the SSC demonstrates strong operating performance with few deficiencies as defined, in part, by the table above that explains the intrinsic meaning of a numerical response to each critical question; (2) when the SSC has no open concerns that are applicable to STP based on industry operating experience; and (3) when site operating experience reflects no negative reliability trends or concerns. In all cases under STPNOC's categorization process, the SSC's final categorization cannot be lower than the risk categorization based on PRA information if the SSC is explicitly modeled in the PRA.

The STPNOC categorization process is an iterative process based upon the Working Group's expert judgment. The Working Group members' insights and varied experience are relied on to ensure that the final result reflects a comprehensive and justifiable deterministic judgment.

In Section 3.2.3.2 of Attachment 1 of its August 31, 2000, submittal, the licensee states that procedures identify training requirements for the Expert Panel and GQA Working Group that include training on PRA, risk ranking, and the GQA process (see Section 3.2.2.5 of this SE for a description of the Expert Panel and GQA Working Group compositions and responsibilities). In its July 19, 2000, draft review guidelines, the staff outlined specific training and qualification criteria for the Independent Decisionmaking Panel (IDP) process. The STPNOC Expert Panel and GQA Working Group are equivalent to the IDP for the purposes of the staff's review of the STPNOC submittal. The criteria in the draft review guidelines were developed from the criteria on IDP member qualifications provided in the proposed Appendix T to 10 CFR Part 50 to be used for categorization under Option 2 for risk-informing the special treatment requirements. Because the NRC places significant reliance on the capability of a licensee to implement a robust categorization process, a process that relies heavily on the skills, knowledge, and experience of the people that implement the process, the staff has determined the criteria it finds acceptable for the qualification of members of the IDP to be those described in its July 19,

2000, draft review guidelines. In its November 15, 2000, draft SE, the staff concluded that the licensee needed to incorporate those criteria into its categorization process and provide a description of the qualification criteria in the proposed section of the STP FSAR. In response to Open Item 3.3 of the draft SE, the licensee revised its proposed FSAR Section to include additional qualification requirements for the GQA Working Group and Expert Panel. The staff reviewed the applicable section of the proposed FSAR Section submittal and determined that it was acceptable. This closes Open Item 3.3 from the draft SE.

In the PRA-based categorization methodology, the staff considers the proposed RAW and FV importance criteria to provide confidence that plant equipment will be appropriately categorized according to their risk significance; and in general, the staff finds the proposed deterministic risk-ranking process, described above, to be a reasonably sound method to categorize the active functions of components. However, the staff identified in its review of risk significance basis documents for certain systems that the initially proposed categorization process was not sufficiently comprehensive as discussed in the following section.

3.2.2.3 Applicability of the SSC Categorization Process

To assess the applicability and adequacy of STPNOC's categorization process, the staff selected a sample of systems for review. The staff found the RSBDs used to categorize components in a system to be comprehensive, well organized, and capable of providing a scrutable record of the functional relationships linking system functions to individual component attributes for proper categorization of components.

For the auxiliary feedwater (AFW) system, the staff determined that the categorization process adequately accounted for certain AFW system design modifications. The design modifications included the replacement of steam condensate traps with orifices as a result of AFW system operational problems (i.e., overspeed of the AFW system pump turbine, resulting from steam condensate buildup in the steam supply line of the pump turbine when the steam condensate traps overfilled). The design modifications rectified the AFW system operational problems. The condensate removal function was risk-ranked HSS because the automatic start function of the pump turbine (a high risk component) is dependent on effective moisture removal from the steam supply system. The components installed for detecting and alarming excessive moisture buildup in the steam lines were risk-ranked medium. This was based on the installation of multiple and independent means to detect and alarm moisture buildup. The orifices were risk-ranked low based on the fact that an orifice is inherently a very reliable device, as it has no moving parts. The staff concluded that the results of the categorization process in risk-ranking the above components are acceptable.

In the November 15, 2000, draft SE, the staff identified a concern on how the categorization process addressed the significance of SSCs that function to protect the integrity of the containment for consequence mitigation. This concern was identified as Open item 3.4. In response to Open item 3.4, to assess the categorization of SSCs that function to protect the integrity of the containment for consequence mitigation, the licensee stated it conducted a sensitivity study that postulates a simultaneous factor of 10 increase in the failure rates for all modeled LSS SSCs to estimate the increase in the late containment failure frequency. The objective of this analysis is to assure that the estimated increase is small. The results of the licensee's sensitivity analysis showed that the increase in the late containment failure frequency was estimated to be about 2.8E-8/year, an increase of about 3.4 percent from the nominal late

containment failure frequency of about 8.3E-7/year. The staff considers this increase to be sufficiently small and the use of this sensitivity analysis to adequately address the defense-in-depth concerns discussed in RG 1.174. This satisfactorily resolves Open Item 3.4.

In addition to the above, the staff has reviewed the licensee's proposal to include the ISI program as a part of the proposed exemptions. Piping performs a passive pressure boundary function and its failure is not fully or explicitly modeled in PRAs. When pipes fail, however, there can be diversion of flows that may simultaneously fail several functions, and there can be wide ranging and severe environmental (flooding and steam) and spatial (pipe whip, jets and sprays) effects that can simultaneously fail multiple other SSCs. In the November 15, 2000, draft SE, the staff identified a concern with the categorization of the passive pressure boundary function of safety-related SSCs and requested that STPNOC provide a risk-informed justification for categorizing this passive function. This concern was identified as Open Item 3.5.

In response to Open Item 3.5, the licensee proposed to apply the higher categorization of the results from two methodologies for determining the final pressure boundary risk of ASME components for the purpose of exemption from 10 CFR 50.55a(g): (1) the risk ranking methodology approved for use at STP in support of its relief request to use a risk-informed inservice inspection (RI ISI) program (see ADAMS Accession No. ML003749167) or; (2) the categorization process proposed by the licensee in the exemption requests.

STPNOC used the RI ISI methodology developed by the Electric Power Research Institute (EPRI) in its request to implement a RI ISI program as an alternative to the ASME Section XI inspection program. The requested exemption from 10 CFR 50.55a(g) would, in part, remove requirements that ASME Code pre-service inspections be performed after repairing or replacing LSS and NRS components. The staff finds these pre-service inspections fully analogous to inspections performed within the inspection program. Therefore, the staff finds it acceptable to use the EPRI categorization methodology to support the exemption from ISI requirements of 10 CFR 50.55a(g) for LSS and NRS components. However, as discussed in Section 10.0 of this SE, in addition to relief for ASME Code Class 1, 2, and 3 components from the ISI requirements of the ASME Code, the STPNOC exemption request will also allow repair and replacement activities on ASME Code Class 2 and 3 LSS and NRS piping, components, and supports to be conducted according to alternative repair and replacement processes (see Section 10.0 of this SE) instead of ASME Code requirements. The staff reviewed the EPRI RI ISI methodology for applicability of this methodology to relief from the ASME Code repair and replacement requirements.

Since the EPRI RI ISI categorization process applies only to piping, the licensee would use one of the following methods for determining the risk for components other than piping: (1) assign such components the same pressure boundary risk as the associated section of piping. Where the associated piping has more than one risk (e.g., upstream and downstream of a valve), the higher risk will be used; or, (2) perform a technical evaluation that supports a lower pressure boundary risk, based on such factors as differences in design features and/or degradation mechanisms that are less severe for these components than for the associated piping. Supports are assigned the same category as the final pressure boundary category of the highest ranked piping or component within the piping analytical model in which the support is included.

Unlike inspection activities, repair and replacement activities may change the material and structural properties of the pressure boundary and thereby the reliability of the pressure boundary. The EPRI methodology determines the safety significance of pipe segments by assessing the failure consequence and failure potential for each piping segment, then directly combining the two into an HSS, MSS, or LSS category. The EPRI methodology is structured such that a segment with a high consequence following a failure (i.e., a high conditional core damage or conditional large early release probability), is never placed in the LSS category. A segment with medium consequences may be placed in the LSS category when there are no degradation mechanisms acting within the segment. This categorization process removes the very large uncertainty in the failure potential, and change in failure potential, from the safety significance determination process. Assigning each segment to the higher category of either the EPRI RI ISI or the licensee's categorization process provides additional assurance that segments assigned an LSS category are appropriately categorized. Therefore, the staff finds the overall process STPNOC uses for categorizing the passive pressure boundary function of ASME components results in the categorization of pipe segments that can be used as a basis for relaxing the ASME Code repair and replacement requirements for LSS and NRS, ASME Code Class 2 and 3 components.

The staff determined that the overall STPNOC categorization process, including the use of the EPRI RI ISI methodology, is sufficiently robust for risk ranking the passive pressure boundary function of ASME components. Further, assigning supports to the highest categorized segment of piping in the analytical model in which the support is included provides an acceptable method for categorizing the risk significance of ASME supports. Therefore, the staff concluded that the licensee's proposal to risk rank the ASME Code Class 1, 2, and 3 components and supports using the above methodology to be acceptable. Based on the use of the EPRI RI ISI methodology as described above, the staff determined that Open Item 3.5 was adequately addressed and considers the item closed.

3.2.2.4 Maintaining Defense-in-Depth and Safety Margin

STPNOC's categorization process considers an SSC's contribution to defense-in-depth. To ensure that reasonable balance is preserved among prevention of core damage, prevention of containment failure or bypass, and mitigation of consequences of an accident, the licensee reported that the deterministic categorization process requires a consideration of the contribution of an SSC to prevention of initiating events, to mitigation of accidents, and to emergency actions under the emergency operating procedures. The staff finds that the deterministic risk categorization accomplishes this balance.

Other means to maintain defense-in-depth include the preservation of system redundancy, independence, and diversity, no over-reliance on programmatic or operator actions to compensate for weaknesses in the plant design, and consideration of CCFs in the categorization process. The staff had concluded in its review of the SSC categorization process for the STPNOC GQA Program that these elements are preserved. Similarly, based on its review of the proposed categorization process, the staff finds that these elements of defense-in-depth are appropriately addressed and that the defense-in-depth philosophy is maintained in the categorization process to be applied under the exemption requests.

With respect to maintaining safety margins when plant SSCs are categorized, the licensee reported that the categorization process does not allow for changes in the design or function of

SSCs (i.e., setpoints, procedures). In addition, STPNOC determined that since the results of the sensitivity analysis demonstrate that there is only a small impact on CDF and LERF with a ten-fold postulated increase in LSS SSC failure rates (for those modeled in the STPNOC PRA), that sufficient safety margin is maintained. Implied in this statement is that a ten-fold increase in failure rates bounds any reasonable estimate of the increase that may be expected as a result of the proposed exemptions. The staff finds that this assertion is reasonable if the licensee maintains the functionality of the SSCs, following implementation of the exemptions. Section 4.0 of this SE provides additional discussion on the proposed treatment processes the licensee will implement that, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions. Based on this information, the staff finds that the proposed categorization includes appropriate level of consideration of a SSC's contribution to maintaining sufficient safety margins.

3.2.2.5 Documentation of the Integrated Decisionmaking Process and the Decision Criteria Used

The integrated decisionmaking process used by STPNOC for the categorization of SSCs is documented by procedure. The procedure requires the use of the Expert Panel and the Working Group. The licensee's procedures control the composition of and processes used by the Expert Panel and the Working Group. In particular, procedures designate the managers who are to act as the chairman, members, and alternates for the Expert Panel, and the procedures also identify the groups to be represented on the Working Group. The Expert Panel and the Working Group have expertise in the areas of risk assessment, QA, licensing, engineering, operations, and maintenance. Additionally, the cognizant system engineer participates in the Working Group discussions for his/her responsible system(s). The procedures also identify training requirements for members of the Expert Panel and Working Group, including training on PRA, risk-ranking, and the GQA process. Finally, the procedures specify the requirements for a quorum of the Expert Panel and the Working Group, meeting frequencies, the decisionmaking process for determining the categorization of SSCs, the process for resolving differing opinions among the Expert Panel and the Working Group, and periodic reviews of the appropriateness of the programmatic control and oversight provided to categorized SSCs.

The STPNOC deterministic categorization process is an iterative process based on the Working Group's professional judgment. In the Working Group meetings, the members' insights and varied experience are used to ensure that the final result reflects a comprehensive and justifiable deterministic judgment. If during this iterative process a consensus agreement cannot be reached by the Working Group members, a dissenting opinion is documented and forwarded to the Expert Panel for resolution prior to documenting a final categorization. Similarly, if there is a dissenting opinion among the Expert Panel members, it is forwarded to senior licensee management for resolution.

The PRA is updated on a defined periodic basis and may be updated more frequently in response to other factors. The results of the updated PRA are furnished to the Working Group which, as part of the categorization feedback process and corrective action process, recategorizes the risk significance of SSCs as needed.

The documentation of the integrated decisionmaking process includes (1) the results of the relative risk importance of SSCs modeled in the PRA, (2) the results of the sensitivity analyses, (3) the RSBD, which include system functions, the identification of the risk significance of SSCs, the categorization of SSCs, and the bases for determinations (including PRA inputs, performance analysis results, and deterministic inputs), (4) the procedures for the Expert Panel and the Working Group, and (5) the STP PRA.

As discussed previously, an SSC is initially assigned the same category as the most limiting system function that it supports. If the Working Group reaches consensus that the initial category is satisfactory, the RSBD simply records that determination and no additional documentation is required since the justification has already been provided within the function categorization. Only in the case where SSC redundancy or other insights are used to rank the SSC category lower than the category of its most limiting supported system function is additional documentation required. As mentioned previously, the staff found the RSBD used to categorize the components of the systems to be comprehensive, well organized, and capable of providing a scrutable record of the functional relationships linking system functions to individual component attributes for proper categorization.

In the November 15, 2000, draft SE, the staff identified an open item related to the development, control, and use of "notes" in the categorization process (see Open Item 3.6 from the draft SE). The staff's concern was essentially that it appeared the licensee was using general notes as a method to categorize large numbers of similar SSCs. For example, note number 9 in the table attached to the response to staff Question #22 in Attachment 4 of the August 31, 2000, submittal, stated that a "[l]ow pressure and/or high volume system pressure boundary" would normally be LSS. This would appear to allow the pressure boundary function of these types of systems to be categorized as LSS. In response to Open Item 3.6, the licensee indicated that "notes" are not a method for categorizing SSCs, but are a method to facilitate the documentation of the basis for SSC categorization. Further, the licensee indicated that "notes" would not be used to categorize system functions (consequently, the licensee has removed note number 9 from its list of notes). The licensee revised its proposed FSAR Section on categorization to include a description of the use and limitation of "notes." The staff reviewed the revision to the proposed FSAR Section and determined it was sufficient to address the staff's concerns regarding the use of "notes" in the categorization process. Based on its review, the staff considers Open Item 3.6 closed.

Based on the above, the staff finds the documentation of the integrated decisionmaking process and the decision criteria used to be acceptable.

3.3 Conclusion

The staff has reviewed STPNOC's integrated SSC categorization process. The staff finds the proposed categorization process to be acceptable to categorize the risk significance of plant SSCs for use in defining the scope of the exemptions granted. The staff has found that (1) the defense-in-depth philosophy is maintained in the categorization process to be applied under the exemption requests; (2) provided the licensee maintains the functionality of the SSCs following implementation of the exemptions, the staff found that the proposed categorization process includes an appropriate level of consideration of an SSC's contribution to maintaining sufficient safety margins; and (3) the licensee's sensitivity study, where failure rates of LSS SSCs modeled in the PRA were increased, to be an acceptable method of ensuring that the potential

aggregate risk impact is only slightly impacted by significant changes in the SSC failure rates that could potentially occur with relaxation of the special treatment requirements. Based on these findings the staff concluded that removing SSCs categorized as LSS or NRS from the scope of the special treatment requirements of 10 CFR Parts 21, 50, and 100, would pose no undue risk to public health and safety.

4.0 ALTERNATIVE TREATMENT PROCESSES

4.1 Introduction

In its submittal STPNOC requested an exemption to exclude safety-related SSCs classified as LSS or NRS from the scope of the NRC's regulations that impose special treatment requirements. STPNOC states that it will apply alternative treatment processes that will provide reasonable confidence that the safety-related LSS and NRS SSCs will be able to perform their safety functions, commensurate with their significance to safety. STPNOC states that safety-related SSCs classified as HSS or MSS will continue to receive treatment required by the NRC regulations and will be evaluated for risk-significant functions to identify any functions not being treated under its current programs. STPNOC also states that it will evaluate nonsafety-related HSS and MSS SSCs to determine whether enhanced treatment is warranted for their safety-significant functions. STPNOC did not request an exemption from the provisions of 10 CFR Parts 50 and 100 that specify design or functional requirements for SSCs; i.e., the requirements that specify that safety functions be performed by a system or component (including features to prevent adverse impacts upon the safety function of one SSC due to the failure of another SSC). STPNOC also will not use the exemptions to change any design or functional requirements contained in the STP FSAR or the STP TSs. In its submittal dated May 21, 2001, STPNOC provides a proposed revision to the FSAR to incorporate Section 13.7, "Risk-Informed Special Treatment Requirements," in support of its exemption.

4.2 Licensee's Alternative Treatment Processes

In Section 13.7 of its proposed FSAR revision, STPNOC states that SSCs with no or low safety significance that are exempted from the scope of the NRC regulations that impose special treatment requirements will instead be subject to alternative treatment practices described in the FSAR. STPNOC states that SSCs with medium or high safety significance will be evaluated for enhanced treatment. The description of the treatment for component categories as indicated in the licensee's proposed FSAR Section is provided below.

4.2.1 Safety-Related HSS and MSS SSC Treatment

In proposed FSAR Section 13.7.3.1, STPNOC describes the treatment of safety-related HSS and MSS SSCs as follows:

> The purpose of treatment applied to safety-related HSS and MSS SSCs is to maintain compliance with NRC regulations and the ability of these SSCs to perform risk-significant functions consistent with the categorization process. These components continue to receive the treatment required by NRC regulations and STP's associated implementing programs.

Some safety-related components may be called upon to perform functions that are beyond the design basis or perform safety-related functions under conditions that are beyond the design basis. STP's PRA does not take credit for such functions unless there is a basis for confidence that the component will be able to perform the functions (e.g., demonstrated ability of the component to perform the functions under the specified conditions). If STP takes credit for such functions beyond that described above, STP would use the process described in Section 13.7.3.2 to evaluate these risk-significant functions that are not being treated under STP's current programs.

4.2.2 Nonsafety-Related HSS and MSS SSC Treatment

In proposed FSAR Section 13.7.3.1, STPNOC describes the treatment of nonsafety-related HSS and MSS SSCs as follows:

The purpose of treatment applied to non-safety-related HSS and MSS SSCs is to maintain their ability to perform risk-significant functions consistent with the categorization process. These components will continue to receive any existing special treatment required by NRC regulations and STP's associated implementing programs. Additionally, the risk-significant functions of these components will receive consideration for enhanced treatment. This consideration is described in Section 13.7.3.2.

In proposed FSAR Section 13.7.3.2, STPNOC provides the following description of its consideration for enhanced treatment of HSS and MSS SSCs as follows:

Nonsafety-related HSS and MSS components may perform risk-significant functions that are not addressed by the special treatment requirements in NRC regulations or STP's current treatment programs.

When a nonsafety-related component is categorized as HSS or MSS, STP documents the condition under the corrective action program and determines whether enhanced treatment is warranted to enhance the reliability and availability of the function. In particular, STP evaluates the treatment applied to the component to ensure that the existing controls are sufficient to maintain the reliability and availability of the component in a manner that is consistent with its categorization. This process evaluates the reliability of the component, the adequacy of the existing controls, and the need for any changes. If changes are needed, additional controls are applied to the component. In addition, the component is placed under the Maintenance Rule monitoring program, if not already scoped in the program (i.e., failures of the component are evaluated and Maintenance Rule Functional Failures (MRFF) involving the component are counted against the performance criteria at the plant/system/ train level, as applicable). Additionally, as provided in the approved Graded Quality Assurance (GQA) program, nonsafety-related HSS and MSS components are subject to the TARGETED QA program. These controls will be specifically 'targeted' to the critical attributes that resulted in the component being categorized as HSS or MSS. Components under these controls will remain nonsafety-related, but the enhanced treatments will be appropriately applied to give additional confidence that the component will be able to perform its HSS/MSS function when demanded.

These identified processes provide reasonable confidence that HSS and MSS components will be able to perform their risk-significant functions. The validation of functionality of HSS and MSS SSCs (safety-related SSCs for which existing special treatment does not provide the applicable level of confidence and nonsafety-related SSCs) will consist of a documented technical evaluation under the corrective action program to determine what enhanced treatment, if any, is warranted for these SSCs to provide reasonable confidence that the applicable risk-significant functions will be satisfied. The performance of these SSCs will be monitored to provide reasonable confidence of their ongoing capability to perform their risk-significant functions. The design control process will be applied to facility changes affecting the risk-significant functions of these SSCs.

4.2.3 Safety-Related LSS and NRS SSC Treatment

In proposed FSAR Section 13.7.3.3, STPNOC states:

A description of STP's commercial practices is provided below. The purpose of applying these practices to safety-related LSS and NRS SSCs is to provide STP with reasonable confidence that these SSCs will maintain their functionality under design-basis conditions.

STPNOC describes the treatment practices that will be applied to safety-related LSS and NRS SSCs as follows:

13.7.3.3.1 Design Control Process. The Station's Design Control Program is used for safety-related SSCs, including safety-related LSS and NRS SSCs. The Design Control Program complies with 10 CFR Part 50, Appendix B, and is described in the Operations Quality Assurance Plan (OQAP). Changes in the design functions of safety-related LSS and NRS SSCs or the conditions under which the intended functions are required to be performed, as described in the FSAR, will be controlled by following the design control process satisfying 10 CFR Part 50, Appendix B, and other regulatory requirements that may be applicable, such as 10 CFR 50.59.

13.7.3.3.2 Procurement Process. The purpose of the procurement process for safety-related LSS and NRS SSCs is to procure replacement SSCs that satisfy the design inputs and assumptions to support STP's determination that these SSCs will be capable of performing their safety-related functions under design-basis conditions. Technical requirements (including applicable design-basis environmental and seismic conditions) for items to be procured include the design inputs and assumptions for the item. As described below, one or more of the following methods will provide a sufficient basis to determine that the procured item can perform its safety-related function under design-basis conditions, including applicable design-basis environmental (temperature and pressure, humidity, chemical effects, radiation, aging, submergence, and synergistic effects) and seismic (earthquake motion, as described in the design bases, including seismic inputs and design load combinations) conditions:

- Vendor Documentation - Vendor documentation could be used when the performance characteristics for the item, as specified in vendor documentation (e.g., catalog information, certificate of conformance), satisfy the SSC's design

requirements. If the vendor documentation does not contain this level of detail, then the design requirements could be provided in the procurement specifications. The vendor's acceptance of the stated design specifications provides sufficient confidence that the replacement safety-related LSS or NRS SSC would be capable of performing its safety-related functions under design-basis conditions. Differences constituting a design change will be documented and processed under the STP design control process.

- Equivalency Evaluation - An equivalency evaluation could be used when it is sufficient to determine that the procured item is equivalent to the item being replaced (e.g., a like-for-like replacement).

- Technical Evaluation - For minor differences, a technical evaluation could be performed to compare the differences between the procured item and the design requirements of the item being replaced and determines that differences in areas such as material, size, shape, stressors, aging mechanisms, and functional capabilities would not adversely affect the ability to perform the safety-related functions of the SSC under design-basis conditions. Differences constituting a design change will be documented and processed under the STP design control process.

- Technical Analysis - In cases involving substantial differences between the procured item and the design requirements of the item being replaced, a technical analysis could be performed to determine that the procured item can perform its safety-related function under design-basis conditions. The technical analysis would be based on one or more engineering methods that include, as necessary, calculations, analyses and evaluations by multiple disciplines, test data, or operating experience to support functionality of the SSC over its expected life. Where the differences are determined to require a design change, STP will follow the design control process for safety-related SSCs.

- Testing - Testing under simulated design-basis conditions could be performed on the component. Margins and documentation specified in NRC regulations would not be required in these tests, since the components are LSS/NRS and do not warrant this additional confidence.

Documentation of the implementation of these methods is maintained. Additionally, documentation is maintained to identify the preventive maintenance needed to preserve the capability of the procured item to perform its safety-related function under applicable design-basis environmental and seismic conditions for its expected life.

In the procurement process, STP uses standards required by the State of Texas and national consensus commercial standards used at STP for the procurement of SSCs consistent with STP's normal commercial and industrial practices. STP does not need to itemize the standards in use at STP or to perform an evaluation of all national consensus standards.

The procurement program provides for the identification and implementation of special handling and storage requirements to ensure that the item is not damaged or degraded

during shipment to the site or during storage on site. These handling and storage requirements consider available recommendations from the vendor. STP may use an alternative to these recommendations if there is a technical basis that supports the functionality of the safety-related LSS and NRS SSCs. The basis does not need to be documented.

At the time of receipt, the received item is inspected to ensure that the item was not damaged in the process of shipping, and that the item received is the item ordered.

13.7.3.3.3 Installation Process. The purpose of the installation process for safety-related LSS and NRS SSCs is to achieve proper installation and testing of replacement SSCs to support STP's determination that these SSCs will be capable of performing their safety-related functions under design-basis conditions.

In the installation process, STP uses standards required by the State of Texas and national consensus commercial standards used at STP for the installation of SSCs consistent with STP's normal commercial and industrial practices. STP does not need to itemize the standards in use at STP or to perform an evaluation of all national consensus standards.

Post-installation testing will be performed to the extent necessary to provide STP with reasonable confidence that the installed SSC will perform its safety function. The test verifies that the SSC is operating within expected parameters and is functional. The testing may necessitate that the SSC be placed in service to validate the acceptance of its performance. Testing is not necessarily performed under design-basis conditions.

13.7.3.3.4 Maintenance Process. The purpose of the maintenance process for safety-related LSS and NRS SSCs is to establish the scope, frequency, and detail of maintenance activities necessary to support STP's determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions. Preventive maintenance tasks are developed for active structures, systems, or components factoring in vendor recommendations. STP may use an alternative to these recommendations if there is a technical basis that supports the functionality of the safety-related LSS and NRS SSCs. For an SSC in service beyond its designed life, STP will have a technical basis to determine that the SSC will remain capable of performing its safety-related function(s). These bases, while documented, do not need to be retained as quality records.

The frequency and scope of predictive maintenance actions are established and documented considering vendor recommendations, environmental operating conditions, safety significance, and operating performance history. STP may deviate from vendor recommendations where a technical basis supports the functionality of the safety-related LSS and NRS SSCs. Such deviations are not required to be documented.

When an SSC deficiency is identified, it is documented and tracked through the Corrective Action Program. The deficiency is evaluated to determine the corrective maintenance to be performed. Following maintenance activities that affect the capability of a component to perform its safety-related function, post maintenance testing is

performed to the extent necessary to provide reasonable confidence that the SSC is performing within expected parameters.

In the maintenance process, STP uses standards required by the State of Texas and national consensus commercial standards used at STP for the maintenance of SSCs consistent with STP's normal commercial and industrial practices. STP does not need to itemize the standards in use at STP or to perform an evaluation of all national consensus standards.

13.7.3.3.5 Inspection, Test, and Surveillance Process. The purpose of the inspection, test, and surveillance process for safety-related LSS and NRS SSCs is to obtain data or information that allows evaluation of operating characteristics to support STP's determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions throughout the service life of the SSC. The Station's inspection and test process is primarily addressed and implemented through the Maintenance process. When measuring and test equipment is found to be in error or defective, a determination is made of the functionality of the safety-related SSCs that were checked using that equipment. As stated above, the Maintenance process addresses inspections and tests through corrective, preventive, and predictive maintenance activities. These activities factor in vendor recommendations into the selected approach. STP may use an alternative to these recommendations if there is a technical basis that supports the functionality of the safety-related LSS and NRS SSCs. The basis does not need to be documented.

In the inspection, test, and surveillance process, STP uses standards required by the State of Texas and national consensus commercial standards used at STP for the inspection and testing of SSCs consistent with STP's normal commercial and industrial practices. STP does not need to itemize the standards in use at STP or to perform an evaluation of all national consensus standards.

13.7.3.3.6 Corrective Action Program. The Station's Corrective Action Program is used for safety-related (LSS and NRS as well as HSS and MSS SSCs) applications. The Corrective Action Program complies with 10 CFR Part 50 Appendix B, and is described in the OQAP.

13.7.3.3.7 Management and Oversight Process. The purpose of the management and oversight process for safety-related LSS and NRS SSCs is to control the implementation and to assess the effectiveness of the commercial practices to support STP's determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions. The Station's management and oversight process is accomplished through approved procedures and guidelines.

Procedures provide for the qualification, training, and certification of personnel. STP considers vendor recommendations in the training, qualification, and certification of personnel. STP may use an alternative to these recommendations if there is a basis for continued effective training of personnel. The basis does not need to be documented.

For qualification, training, and certification of personnel, STP uses standards required by the State of Texas and national consensus commercial standards used at STP

consistent with STP's normal commercial and industrial practices. STP does not need to itemize the standards in use at STP or to perform an evaluation of all national consensus standards.

Documentation, reviews, and record retention requirements for completed work activities are governed by Station procedures.

Planned changes to, or elimination of, commitments described in the UFSAR or other licensing bases documentation that address issues identified in NRC generic communications (e.g., generic letters or bulletins), NRC orders, notices of violation, etc. related to safety-related LSS and NRS SSCs will be evaluated in accordance with an NRC-endorsed commitment change process.

13.7.3.3.8 Configuration Control Process. The Station's configuration control process is controlled through approved procedures and policies. The design control process ensures that the configuration of the Station is properly reflected in design documents and drawings.

4.2.4 Nonsafety-Related LSS and NRS SSC Treatment

STPNOC states that the treatment of nonsafety-related LSS and NRS SSCs is not subject to regulatory control.

4.3 Evaluation

STPNOC's exemption submittal requested the staff to approve a set of treatment processes for various categories of safety-related SSCs at STP based on their risk significance. Specifically, the licensee will apply (1) the current special treatment requirements to safety-related HSS and MSS SSCs and evaluate their risk-significant functions to identify any functions not being adequately treated under its current programs; (2) any existing special treatment required by the NRC regulations to nonsafety-related HSS and MSS SSCs (such as equipment relied on to meet regulatory requirements associated with an anticipated transient without scram) and consider the risk-significant functions of these SSCs for enhanced treatment; and (3) alternative treatment processes to safety-related LSS and NRS SSCs in lieu of the NRC special treatment requirements. The licensee has not provided the categorization of specific SSCs and treatment to be applied to those SSCs because, under its proposal, the licensee intends to implement its alternative treatment processes in parallel with the implementation of the categorization process over the remaining licensed period of the facility. Nevertheless, the staff recognizes the significance of the exemption from the NRC regulations in terms of the potential impact on the treatment applied to SSCs performing safety functions at STP. For example, the licensee indicated that approximately 77 percent of its safety-related SSCs might be categorized as LSS or NRS.

In this section of the SE, the staff discusses its assessment of the performance-based aspects of STPNOC's proposal, and its evaluation of the elements and high-level objectives of STPNOC's treatment for SSCs at STP as described in the licensee's proposed FSAR Section. The scope of this evaluation does not include an assessment of the licensee's procedures for implementing the treatment processes. Review of the details on how the program will be implemented was not considered necessary given the conclusion that SSCs identified as LSS

or NRS by the categorization process do not contribute significantly to plant risk as described in Section 3.0 of this SE. Effective implementation of the treatment processes, such that the design bases and functionality of LSS and NRS SSCs are maintained, remains the responsibility of the licensee. This staff evaluation relies on the use of sound engineering judgment by the licensee in implementing the treatment processes.

4.3.1 Assessment of Performance-Based Aspects of Treatment Program

The staff has not characterized the treatment processes established by STPNOC as a performance-based alternative to the special treatment requirements of the NRC regulations. STPNOC's request for a risk-informed alternative to the special treatment requirements was based on the results of the categorization process (see Section 3.0 of this SE) and on the licensee's enhanced treatment of safety-related and nonsafety-related HSS and MSS SSCs, and implementation of alternative treatment processes (including for example, design control, procurement, maintenance, and corrective action processes) for safety-related LSS and NRS SSCs.

Performance-based processes monitor specified attributes indicative of operational performance of SSCs, evaluate the operational performance against specified acceptance criteria, and require corrective actions, if the specified acceptance criteria for the SSC are not achieved. Typically, special treatment requirements (such as those contained in 10 CFR 50.49 and 10 CFR Part 100, Appendix A, Section VI) are not performance-based because they only require a one-time qualification test or analysis, prior to placing the SSC in service, to verify that the SSC can perform its safety functions at design conditions. Also, with the exception of ISI and IST processes described below, STPNOC's treatment processes are not performance-based, because SSCs typically are not operated under design-basis conditions.

The special treatment requirements related to IST and ISI contained in 10 CFR 50.55a(f) and (g) do monitor operational performance on a periodic, ongoing basis with criteria for initiation of corrective actions. When properly implemented, IST and ISI processes can be performance-based in that they monitor specified attributes of operational performance and provide data and information that can be used to determine an SSC's ability to perform its safety function at design-basis conditions. Therefore, IST and ISI processes are unique among the special treatment requirements in that, even at reduced levels of implementation, applying risk insights, they can provide information useful to the licensee on the ability of SSCs to perform their design functions. This information will allow STPNOC to draw conclusions regarding the effectiveness of the licensee's implementation of other site-wide processes and practices that, in conjunction with the categorization process, form the basis for the staff's granting exemptions to special treatment requirements.

4.3.2 Treatment of Safety-Related HSS and MSS SSCs

The special treatment requirements of the NRC regulations will continue to be applied to safety-related HSS and MSS SSCs at STP. In addition, the staff has reviewed STPNOC's high-level description in proposed FSAR Section 13.7.3 of the treatment process to validate assumptions credited in the risk assessment for these SSCs that support or perform risk-significant functions beyond the design basis of the plant. The staff's review focused on whether the treatment for safety-related HSS and MSS SSCs can provide an acceptable approach to maintain their functionality. Proposed FSAR Section 13.7.3.1 provides a clear

statement that the purpose of treatment applied to safety-related HSS and MSS SSCs is to maintain compliance with NRC regulations and the ability of these SSCs to perform risk-significant functions consistent with the categorization process. Further, proposed FSAR Section 13.7.3.2 states that the licensee will evaluate enhanced treatment for safety-related HSS and MSS SSCs where credit is taken for risk-significant beyond-design basis functions of those SSCs using a process similar to that described for nonsafety-related HSS and MSS SSCs. STPNOC's validation of functionality of safety-related HSS and MSS SSCs will consist of a documented technical evaluation to determine what enhanced treatment, if any, is warranted for these SSCs to provide reasonable confidence that the applicable risk-significant functions will be satisfied. STPNOC will monitor the performance of these SSCs and apply corrective actions where conditions are identified that could adversely impact functionality. STPNOC will apply its design control process to facility changes affecting the risk-significant functions of these SSCs. The staff finds the process described in proposed FSAR Section 13.7.3 contains high-level elements and objectives that, if applied with sound engineering judgment, will allow STPNOC to evaluate the treatment applied to the safety-related HSS and MSS SSCs to ensure that the existing controls are sufficient to maintain the reliability and availability of these SSCs in a manner that is consistent with their categorization.

4.3.3 Treatment of Nonsafety-related HSS and MSS SSCs

Applicable special treatment requirements (e.g., Station Blackout and Anticipated Transient Without Scram) of the NRC regulations will continue to be applied to nonsafety-related HSS and MSS SSCs at STP. In addition, the staff has reviewed STPNOC's high-level description in proposed FSAR Sections 13.7.3.1 and 13.7.3.2 of the treatment process to validate assumptions credited in the risk assessment for nonsafety-related HSS and MSS SSCs that support or perform risk-significant functions. The staff's review has focused on whether the treatment process for nonsafety-related HSS and MSS SSCs can provide an acceptable approach to maintain their functionality.

Proposed FSAR Section 13.7.3.1 provides a clear statement that the purpose of treatment applied to nonsafety-related HSS and MSS SSCs is to maintain their ability to perform risk-significant functions consistent with the categorization process. These components will continue to receive any existing special treatment required by NRC regulations and STPNOC's implementing programs. Proposed FSAR Section 13.7.3.2 states that, when a nonsafety-related SSC is categorized as HSS or MSS, STPNOC will document the condition and determine whether enhanced treatment is warranted to increase the reliability and availability of the function. In particular, STPNOC will evaluate the treatment applied to the SSC to ensure that the existing controls are sufficient to maintain the reliability and availability of the component in a manner that is consistent with its categorization. This process will evaluate the reliability of the SSC, the adequacy of the existing controls, and the need for any changes. In addition, STPNOC will place the SSC under the Maintenance Rule monitoring program, if not already in the program. Additionally, as provided in the approved GQA program, nonsafety-related HSS and MSS SSCs will be subject to the Targeted QA program at STP. STPNOC's validation of the functionality of nonsafety-related HSS and MSS SSCs will consist of a documented technical evaluation to determine what enhanced treatment, if any, is warranted for these SSCs to provide reasonable confidence that the applicable risk-significant functions will be satisfied. STPNOC will monitor the performance of these SSCs and apply corrective actions where conditions are identified that could adversely impact functionality. STPNOC will apply its design control process to facility changes affecting the risk-significant functions of these SSCs.

The staff finds the process described in proposed FSAR Section 13.7.3 contains the elements and high-level objectives that, if effectively implemented, will allow STPNOC to evaluate the treatment applied to nonsafety-related HSS and MSS SSCs to ensure that the existing controls are sufficient to maintain the reliability and availability of these SSCs in a manner that is consistent with its categorization.

As discussed in Open Item 4.1 of the November 15, 2000, draft SE, the staff noted that STPNOC needed to describe in the FSAR the process attributes for determining the appropriate treatment to be applied to the risk-significant functions of both safety-related and nonsafety-related HSS and MSS SSCs. On May 21, 2001, STPNOC provided a revision to the proposed FSAR Section that discussed the high-level objectives of the treatment to be applied to safety-related and nonsafety-related HSS and MSS SSCs sufficient to support the staff's finding in this SE. For example, STPNOC stated that validation of functionality of HSS and LSS SSCs will consist of a documented technical evaluation to determine what enhanced treatment, if any, is warranted for these SSCs to provide reasonable confidence that the applicable risk significant functions will be satisfied. Based on the May 21, 2001, proposed FSAR Section, the staff considers Open Item 4.1 closed.

4.3.4 Treatment of Safety-Related LSS and NRS SSCs

The licensee requested an exemption from the special treatment requirements of 10 CFR Parts 21, 50, and 100 of the NRC regulations for safety-related LSS and NRS SSCs at STP. The licensee did not request an exemption from the provisions of 10 CFR Parts 21, 50, and 100 that specify design or functional requirements for safety-related LSS and NRS SSCs to perform their safety functions. Further, the licensee stated that it will not change any design or functional requirements in the STP FSAR or TSs. Based on the STPNOC's robust categorization process, the staff finds that treatment for safety-related SSCs determined to have a low impact on plant risk may be reduced from the level provided by the special treatment requirements of the NRC regulations. However, all safety-related LSS and NRS SSCs will continue to be required to be capable of performing their safety functions under design-basis conditions (albeit at a lower level of confidence than for SSCs categorized as HSS/MSS).

The special treatment requirements for safety-related SSCs at nuclear power plants are specified in the NRC regulations, and are described in numerous regulatory guides, standard review plans, and other regulatory documents. In lieu of the detailed guidance for implementation of the NRC special treatment requirements, STPNOC describes in its proposed FSAR Section 13.7.3.3 the elements and high-level objectives of its alternative treatment processes that will be applied to safety-related LSS and NRS SSCs at STP. The staff's evaluation of the treatment for safety-related LSS and NRS SSCs focused on these elements and high-level objectives of STPNOC's treatment processes to determine whether STPNOC can maintain the design bases and functionality of safety-related LSS and NRS SSCs under design-basis conditions. The scope of this evaluation does not include an assessment of the licensee's procedures for implementing the alternative treatment processes. Review of the details on how the processes will be implemented was not considered necessary given the staff's conclusion that SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk as described in this SE (see Section 3.0 of this SE). Effective implementation of the alternative treatment processes such that the design bases and functionality of safety-related LSS and NRS SSCs are maintained remains the responsibility of

the licensee. This staff evaluation relies on the use of sound engineering judgment by the licensee in implementing the treatment processes. The following discussion presents the staff's evaluation of whether the licensee's treatment processes have the appropriate elements and high-level objectives to maintain the design bases and functionality of safety-related LSS and NRS SSCs.

An NRC-sponsored study by Idaho National Engineering and Environmental Laboratory revealed that normal commercial and industrial practices at nuclear power plants not only vary widely between plants, but apply to a wide range of activities regarding the functionality of balance-of-plant SSCs. For example, licensees might apply specific controls for design, installation, and monitoring of a balance-of-plant SSC that directly supports the generation of electric power, but might allow a balance-of-plant SSC that does not directly support power generation to degrade with repairs performed when the SSC is found to not be functional. As a result, the staff has determined that reliance only on industrial and commercial practices may not provide an adequate basis for reaching a finding that the functionality of safety-related LSS and NRS SSCs will be maintained. Although STPNOC continues to note in its proposed FSAR Section that normal industrial and commercial practices will be applied to its safety-related LSS and NRS SSCs, STPNOC did not request an exemption from the design or functional requirements of those SSCs. Further, in its submittal dated January 23, 2001, STPNOC confirmed that its treatment processes for safety-related LSS and NRS SSCs are designed to provide assurance of the functionality of these SSCs under design-basis conditions. STPNOC will need to effectively implement the treatment practices specified in proposed FSAR Section 13.7.3.3 for safety-related LSS and NRS SSC (on an individual basis or by grouping of similar SSCs) such that these SSCs remain capable of performing their safety functions under design-basis conditions.

As noted in Open Item 4.2 of the November 15, 2000, draft SE, the staff requested that the proposed FSAR Section provide the description of attributes of STPNOC's proposed treatment processes that form the basis for its exemption requests. The staff sought to have STPNOC incorporate the additional attributes identified in the draft SE in Sections 4.3.3.2, 4.3.3.3, 4.3.3.4, 4.3.3.5, 4.3.3.7, and 8.4. At the time the draft SE was issued the staff was working towards establishing a level of detail in the proposed FSAR Section that would have been consistent with the level of detail in the July 19, 2000, draft review guidelines. Since the issuance of the draft SE, the staff has focused on identifying the elements and expected outcomes of the alternative treatment process in the FSAR that can result in safety-related LSS and NRS remaining capable of performing their safety functions under design-basis conditions. STPNOC has submitted a proposed FSAR Section that provides the level of detail sufficient to support the staff's focus on the elements and expected outcomes of the alternative treatment practices. These actions resolve Open Item 4.2 and this item is closed.

In its review of the STPNOC exemption request, the staff identified certain approaches that had been contemplated by STPNOC (as noted in the draft SE dated November 15, 2000) that could result in ineffective implementation of the treatment processes for safety-related LSS and NRS SSCs such that multiple SSCs might be incapable of performing their safety functions under design-basis conditions. The staff discusses several examples of effective and ineffective approaches later in this section of the SE. STPNOC is responsible for effective implementation of the treatment processes for safety-related LSS and NRS SSCs that can result in these SSCs remaining capable of performing their safety functions under design-basis conditions.

In its August 31, 2000, submittal, STPNOC states that common-cause failure in multiple train systems (intrasystem effects) is explicitly modeled in the PRA system analyses for all active components within a system. However, STPNOC explicitly modeled potential common-mode failures in diverse systems in its PRA for only certain basic events. STPNOC states that, for other types of equipment (such as motor-operated valves), potential changes in the basic event failure data were not carried across diverse systems (intersystem effects) because STPNOC believes that the unique operating condition for diverse systems affects the failure rates for their applicable components. The staff considers that the treatment processes could affect SSC reliability across multiple plant systems within the scope of the exemption. In Section 3.0 of this SE, the staff discusses the sensitivity study performed by STPNOC that increased the failure rates of modeled LSS SSCs and their common-cause relationship by a factor of 10. As noted in Section 3.0 of this SE, the staff considers STPNOC's assertion that the assumed increase in failure rate in the sensitivity study bounds the failure rate that might result from the reduction in treatment to be reasonable only if treatment processes for safety-related LSS and NRS SSCs described in the proposed FSAR Section are effectively implemented such that the functionality of these SSCs is maintained. NUREG/CR-5485, "Guidelines on Modeling Common-Cause Failures in Probabilistic Risk Assessment," indicates that defense strategies for common-cause failures typically include design control; use of qualified equipment; testing and preventive maintenance programs; procedure review; personnel training; quality control; barriers; diversity (functional, staff, equipment); and staggered testing and maintenance. Effective implementation of the treatment processes for safety-related LSS and NRS SSCs is necessary to ensure that common cause failures are minimized.

In Sections 4.3.3.2 and 8.4 of the November 15, 2000, draft SE, the staff identified areas of inconsistency for STPNOC to resolve. This issue was identified as Confirmatory Item 4.1 in the draft SE. In its January 23, 2001, submittal, and its May 21, 2001, proposed FSAR Section, STPNOC resolved specific areas of inconsistency in the planned treatment of safety-related LSS and NRS SSCs identified in the draft SE. In the sections that follow, the staff has addressed the areas of inconsistency identified in STPNOC's submittal. Resolution of these issues closes Confirmatory item 4.1.

4.3.4.1 Design Control Process

In proposed FSAR Section 13.7.3.3.1, STPNOC states that its Design Control Program used for safety-related SSCs, including safety-related LSS and NRS SSCs, will continue to comply with 10 CFR Part 50, Appendix B. STPNOC also states that changes in the design functions of safety-related LSS and NRS SSCs or the conditions under which the intended functions are required to be performed, as described in the FSAR, will be controlled by following the design control process satisfying 10 CFR Part 50, Appendix B, and other regulatory requirements that may be applicable, such as 10 CFR 50.59. Review of the details on how the process will be implemented was not considered necessary given STPNOC's commitment in the proposed FSAR Section to continue to comply with 10 CFR Part 50, Appendix B. The staff considers STPNOC's commitment to continue to implement the design control process in accordance with 10 CFR Part 50, Appendix B, to include maintaining and applying the design inputs and assumptions for safety-related LSS and NRS SSCs to provide reasonable confidence in the ability of these SSCs to perform their safety functions under design-basis conditions throughout their service life. The staff finds that STPNOC's commitment to implement the design control process in accordance with 10 CFR Part 50, Appendix B, provides confidence that STPNOC will follow approaches that lead to effective implementation of the design control process for

safety-related LSS and NRS SCCs. For example, as discussed in Section 10.0 of this SE, STPNOC has confirmed that fracture toughness or impact test data will be obtained if required under the ASME *Boiler and Pressure Vessel Code* edition to which the original item was designed.

4.3.4.2 Procurement Process

The staff reviewed the high-level description of STPNOC's procurement process in proposed FSAR Section 13.7.3.3.2 for safety-related LSS and NRS SSCs. The scope of the staff's evaluation did not include an assessment of the licensee's procedures for implementing the procurement process for safety-related LSS and NRS SSCs. Review of the details on how the program will be implemented was not considered necessary given the conclusion that SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk as described in this SE. Effective implementation of the procurement process using sound engineering judgment, such that the design bases and functionality of safety-related LSS and NRS SSCs are maintained, remains the responsibility of the licensee.

The procurement process is an acceptable element of the alternative treatment process that can maintain the design bases and functionality of safety-related LSS and NRS SSCs. In Sections 8.0 and 18.0 of this SE, respectively, the staff presents its review of the procurement methods specified by STPNOC to determine that safety-related LSS and NRS SSCs can perform their safety functions under design-basis conditions for harsh environments and seismic loadings. In Section 10.0 of this SE, the staff presents its review of the activities specified by STPNOC relating to repair and replacement of components within the scope of the ASME *Boiler and Pressure Vessel Code*.

In proposed FSAR Section 13.7.3.3.2, STPNOC states that the purpose of the procurement process for safety-related LSS and NRS SSCs is to procure replacement SSCs that satisfy the design inputs and assumptions to support STP's determination that these SSCs will be capable of performing their safety functions under design-basis conditions. STPNOC specifies that technical requirements (including applicable design-basis environmental and seismic conditions) for items to be procured include the design inputs and assumptions for the item. STPNOC states that one or more of five described methods (vendor documentation, equivalency evaluation, technical evaluation, technical analysis, and testing) will provide a sufficient basis to determine that the procured item can perform its safety-related function under design-basis conditions, including applicable design-basis environmental (temperature and pressure, humidity, chemical effects, radiation, aging, submergence, and synergistic effects) and seismic (earthquake motion, as described in the design bases, including seismic inputs and design load combinations) conditions. STPNOC specifies that standards required by the State of Texas and national consensus commercial standards will be used at STP for the procurement process for safety-related LSS and NRS SSCs. STPNOC will identify and implement special handling and storage requirements of procured SSCs to ensure that the item is not damaged or degraded during shipment to the site or during storage on site. STPNOC will consider available recommendations from the applicable vendor for handling and storage of procured items, or might use an alternative to these recommendations if there is a technical basis that supports the functionality of the safety-related LSS and NRS SSCs. STPNOC will provide for inspection of received items to ensure that the item was not damaged during shipping, and that the item received is the item ordered.

The staff finds that the proposed FSAR Section addresses concerns regarding approaches previously considered by STPNOC in its submittals that could have lead to ineffective implementation of the procurement process for safety-related LSS and NRS SSCs. For example, a previous approach suggested by STPNOC in its August 31, 2000, submittal indicated that it was unnecessary to perform engineering analysis, qualification testing, or other specialized efforts to provide empirical evidence or other justifications of an SSC's ability to function in adverse environments. However, Section 13.7.3.3.2 of the May 21, 2001, proposed FSAR Section specifies methods that will provide a sufficient basis to determine that the procured item can perform its safety function under design-basis conditions, including applicable design-basis environmental and seismic conditions.

The staff finds that the procurement process described in proposed FSAR Section 13.7.3.3 contains high-level objectives that, if effectively implemented, can result in the application of design inputs and assumptions to demonstrate that a procured SSC is capable of performing its safety-related function under design-basis conditions, including environmental and seismic conditions.

4.3.4.3 Installation Process

The staff reviewed the high-level description of STPNOC's installation process in proposed FSAR Section 13.7.3.3.3 for safety-related LSS and NRS SSCs. The scope of the staff's evaluation did not include an assessment of the licensee's procedures for implementing the installation process for safety-related LSS and NRS SSCs. Review of the details on how the program will be implemented was not considered necessary given the conclusion that SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk as described in Section 3.0 of this SE. Effective implementation of the installation process using sound engineering judgment, such that the design bases and functionality of safety-related LSS and NRS SSCs are maintained, remains the responsibility of the licensee.

The installation process is an acceptable element of the alternative treatment process that can maintain the design bases and functionality of safety-related LSS and NRS SSCs. Proposed FSAR Section 13.7.3.3.3 states that the purpose of the installation process for safety-related LSS and NRS SSCs is to achieve proper installation and testing of replacement SSCs to support STPNOC's determination that these SSCs will be capable of performing their safety-related functions under design-basis conditions. STPNOC specifies that standards required by the State of Texas and national consensus commercial standards will be used at STP for the installation process for safety-related LSS and NRS SSCs. STPNOC will perform post-installation testing to the extent necessary to provide reasonable confidence that the installed SSC will perform its safety function.

The staff finds that the proposed FSAR Section addresses concerns regarding approaches previously considered by STPNOC in its submittals that could have lead to ineffective implementation of the installation process for safety-related LSS and NRS SSCs. For example, a previous approach suggested by STPNOC in its August 31, 2000, submittal, might have resulted in inappropriate combination of installation provisions associated with the ASME Code with less rigorous provisions associated with non-Code standards. To resolve this concern, STPNOC modified its planned approaches for achieving proper installation and testing of safety-related LSS and NRS SSCs as reflected in proposed FSAR Section 13.7.3.3 and discussed in Section 10.0 of this SE.

The staff finds that the installation process described in proposed FSAR Section 13.7.3.3 contains high-level objectives that, if effectively implemented, can result in proper installation such that a procured SSC is capable of performing its safety function under design-basis conditions, including environmental and seismic conditions.

4.3.4.4 Maintenance Process

The staff reviewed the high-level description of STPNOC's maintenance process in proposed FSAR Section 13.7.3.3.4 for safety-related LSS and NRS SSCs. The scope of the staff's evaluation did not include an assessment of the licensee's procedures for implementing the maintenance process for safety-related LSS and NRS SSCs. Review of the details on how the program will be implemented was not considered necessary given the conclusion that SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk as described in this SE. Effective implementation of the maintenance process using sound engineering judgment, such that the design bases and functionality of safety-related LSS and NRS SSCs are maintained, remains the responsibility of the licensee.

The maintenance process is an acceptable element of the alternative treatment process that can maintain the design bases and functionality of safety-related LSS and NRS SSCs. Proposed FSAR Section 13.7.3.3.4 states that the purpose of the maintenance process for safety-related LSS and NRS SSCs is to establish the scope, frequency, and detail of maintenance activities necessary to support STP's determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions. STPNOC specifies that standards required by the State of Texas and national consensus commercial standards will be used at STP for the maintenance of safety-related LSS and NRS SSCs. STPNOC will also consider available recommendations from the applicable vendor or might use an alternative to these recommendations if there is a technical basis that supports the functionality of the safety-related LSS and NRS SSCs. For an SSC in service beyond its designed life, STPNOC will have a technical basis to determine that the SSC will remain capable of performing its safety-related function. STPNOC will document and track identified SSC deficiencies through its Corrective Action Program. Following maintenance activities that affect the capability of a component to perform its safety-related function, STPNOC will perform post-maintenance testing to the extent necessary to provide reasonable confidence that the SSC is performing within expected parameters.

The staff finds that the proposed FSAR Section addresses concerns regarding approaches previously considered by STPNOC in its submittals that could have lead to ineffective implementation of the maintenance process for safety-related LSS and NRS SSCs. For example, a previous approach suggested by STPNOC in its August 31, 2000, submittal would have allowed the assumption of the functionality of safety-related LSS and NRS SSCs that had exceeded their qualified life for environmental qualification without replacement, unless necessary for a separate reason. To resolve this concern, proposed FSAR Section 13.7.3.3.4 specifies that, for an SSC in service beyond its designed life, STPNOC will have a technical basis to determine that the SSC will remain capable of performing its safety-related functions. Further, proposed FSAR Section 13.7.3.3.2 specifies that documentation will be maintained to identify the preventive maintenance needed to preserve the capability of a procured item to perform its safety-related function under applicable design-basis environmental and seismic conditions for its expected life.

The staff finds that the maintenance process described in proposed FSAR Section 13.7.3.3 contains high-level objectives that, if effectively implemented, can result in predictive, preventive, and corrective maintenance such that safety-related LSS and NRS SSCs will be capable of performing their safety functions under design-basis conditions.

4.3.4.5 Inspection, Test, and Surveillance Process

The staff reviewed the high-level description of STPNOC's inspection, test, and surveillance process in proposed FSAR Section 13.7.3.3.5 for safety-related LSS and NRS SSCs. The scope of the staff's evaluation did not include an assessment of the licensee's procedures for implementing the inspection, test, and surveillance process of the alternative treatment program for safety-related LSS and NRS SSCs. Review of the details on how the program will be implemented was not considered necessary given the conclusion that SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk as described in this SE. Effective implementation of the inspection, test, and surveillance process of the alternative treatment program using sound engineering judgment, such that the design bases and functionality of safety-related LSS and NRS SSCs are maintained, remains the responsibility of the licensee.

The inspection, test, and surveillance process is an acceptable element of the alternative treatment process that can maintain the design bases and functionality of safety-related LSS and NRS SSCs (including such SSCs as pumps, valves, and snubbers). Proposed FSAR Section 13.7.3.3.5 states that the purpose of the inspection, test, and surveillance process for safety-related LSS and NRS SSCs is to obtain data or information that allows evaluation of operating characteristics to support STP's determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions throughout the service life of the SSC. STPNOC specifies that standards required by the State of Texas and national consensus commercial standards will be used at STP for the inspection, test, and surveillance of safety-related LSS and NRS SSCs. STPNOC will also consider available recommendations from the applicable vendor or might use an alternative to these recommendations if there is a technical basis that supports the functionality of the safety-related LSS and NRS SSCs. In Sections 9.0 and 10.0 of this SE, the staff presents its review of the portion of STPNOC's inspection, test, and surveillance process related to activities to be performed in lieu of the IST requirements of 10 CFR 50.55a(f) and the ISI requirements of 10 CFR 50.55a(g), respectively.

The staff finds that the proposed FSAR Section addresses concerns regarding approaches previously considered by STPNOC in its submittals that could have lead to ineffective implementation of the inspection, test, and surveillance process for safety-related LSS and NRS SSCs. For example, the approach suggested by STPNOC in its January 23, 2001, submittal to address measuring and test equipment found to be in error or out of calibration might have resulted in extensive common-cause problems where the licensee failed to address the capability of affected safety-related LSS and NRS SSCs to perform their safety functions. To resolve this concern, proposed FSAR Section 13.7.3.3.5 specifies that, when measuring and test equipment is found to be in error or defective, a determination be made on the functionality of the safety-related SSCs that were checked using that equipment.

The staff finds that the inspection, test, and surveillance process described in proposed FSAR Section 13.7.3.3 contains elements and high-level objectives that, if effectively implemented, can result in the performance of inspection, test, and surveillance activities such that

safety-related LSS and NRS SSCs will be capable of performing their safety functions under design-basis conditions throughout their service life.

4.3.4.6 Corrective Action Process

In proposed FSAR Section 13.7.3.3.6, STPNOC states that the Corrective Action Program for safety-related LSS and NRS SSCs will comply with 10 CFR Part 50, Appendix B. The staff accepts STPNOC's application of the requirements of 10 CFR Part 50, Appendix B (including requirements for quality of review and timeliness of corrective action) as the corrective action process for safety-related LSS and NRS SSCs.

4.3.4.7 Management and Oversight Process

The staff reviewed the high-level description of STPNOC's management and oversight process in proposed FSAR Section 13.7.3.3.7 for safety-related LSS and NRS SSCs. The scope of the staff's evaluation did not include an assessment of the licensee's procedures for implementing the management and oversight process for safety-related LSS and NRS SSCs. Review of the details on how the program will be implemented was not considered necessary given the conclusion that SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk as described in this SE. Effective implementation of the management and oversight process using sound engineering judgment, such that the design bases and functionality of safety-related LSS and NRS SSCs are maintained, remains the responsibility of the licensee.

The management and oversight process is an acceptable element of the alternative treatment process that can maintain the design bases and functionality of safety-related LSS and NRS SSCs. Proposed FSAR Section 13.7.3.3.7 states that the purpose of the management and oversight process for safety-related LSS and NRS SSCs is to control the implementation, and to assess the effectiveness, of the treatment processes to support STP's determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions. STPNOC accomplishes its management and oversight process through approved procedures and guidelines, including qualification, training, and certification of personnel. STPNOC specifies that standards required by the State of Texas and national consensus commercial standards will be used at STP for the qualification, training, or certification of personnel. STPNOC will also consider available recommendations from the applicable vendor or might use an alternative to these recommendations if there is a basis for continued effective training. STP procedures also specify requirements for documentation, reviews, and record retention related to completed work activities.

The staff finds that the proposed FSAR Section addresses concerns regarding approaches previously considered by STPNOC in its submittals that could have lead to ineffective implementation of the management and oversight process for safety-related LSS and NRS SSCs. For example, a previous approach presented by STPNOC in its submittal dated January 23, 2001, would have allowed the elimination of commitments applicable to safety-related LSS and NRS SSCs without using the guidelines endorsed by the staff even though some commitments might involve safety concerns related to the functionality of safety-related SSCs that would not be adequately addressed by normal industrial and commercial practices (such as those related to the performance of motor-operated valves). This concern was initially identified in the November 15, 2000, draft SE as Confirmatory Item 4.2. To resolve this

concern, proposed FSAR Section 13.7.3.3.7 specifies that planned changes to, or elimination of, commitments described in the FSAR or other licensing bases documentation that address issues identified in NRC generic communications, NRC orders, notices of violation, and other documents related to safety-related LSS and NRS SSCs will be evaluated in accordance with an NRC-endorsed commitment change process. The current staff endorsed guidelines, prepared by the Nuclear Energy Institute (NEI), state that documentation (such as NRC generic communications) pertinent to the change in commitment, should be reviewed to understand the safety basis of the commitments and to determine if the SSC would remain capable of performing its safety function(s). The commitment in the proposed FSAR Section resolves Confirmatory Item 4.2 and the staff considers this item closed.

The staff finds that the management and oversight process described in proposed FSAR Section 13.7.3.3 contains elements and high-level objectives that, if effectively implemented, can provide adequate management and oversight such that safety-related LSS and NRS SSCs will be capable of performing their safety functions under design-basis conditions.

4.3.4.8 Configuration Control Process

The staff reviewed the high-level description of STPNOC's configuration control process in proposed FSAR Section 13.7.3.3.8 for safety-related LSS and NRS SSCs. STPNOC states that its design control process ensures that the configuration of the Station is properly reflected in design documents and drawings, and that the configuration control process is controlled through approved procedures and policies. The scope of the staff's evaluation did not include an assessment of the licensee's procedures for implementing the configuration control process for safety-related LSS and NRS SSCs. Review of the details on how the program will be implemented was not considered necessary given the conclusion that SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk as described in this SE. Effective implementation of the configuration control process using sound engineering judgment, such that the design bases and functionality of are maintained, remains the responsibility of the licensee.

The configuration control process is an acceptable element of the alternative treatment process that, if effectively implemented by the licensee, can maintain the design bases and functionality of safety-related LSS and NRS SSCs. In proposed FSAR Section 13.7.3.3.1, STPNOC states that its Design Control Program used for safety-related SSCs, including safety-related LSS and NRS SSCs, will continue to comply with 10 CFR Part 50, Appendix B. Based on STPNOC's commitment in proposed FSAR Section 13.7.3.3.8 that station configuration will be ensured by the design control process and will be properly reflected in design documents and drawings, the staff finds the configuration control process for safety-related LSS and NRS SSCs to be acceptable.

4.4 Conclusion

The staff reviewed proposed FSAR Section 13.7.3 to determine if it is consistent with the technical bases for the exemptions. The staff's review focused on whether the proposed FSAR Section provides an understanding of the purpose of the treatment processes for SSCs at STP to maintain the design bases and functionality of these SSCs under all design-basis conditions. The staff also considered whether the treatment process would be able to maintain the

capability of the SSCs to perform risk-significant functions beyond the design basis where credited in the categorization process.

The staff reviewed the treatment specified for safety-related and nonsafety-related HSS and MSS SSCs in proposed FSAR Sections 13.7.3.1 and 13.7.3.2. These proposed FSAR Sections specify the purpose of the treatment process for safety-related and nonsafety-related HSS and MSS SSCs, and address elements and high-level objectives of the process with respect to engineering evaluation, monitoring, and facility changes. The staff concludes that the process described in proposed FSAR Sections 13.7.3.1 and 13.7.3.2 contains elements and high-level objectives that, if applied with sound engineering judgment, will allow STPNOC to evaluate the treatment applied to the safety-related and nonsafety-related HSS and MSS SSCs to ensure that the existing controls are sufficient to maintain the reliability and availability of these SSCs in a manner that is consistent with their categorization.

The staff reviewed the elements and high-level objectives of the treatment processes for safety-related LSS and NRS SSCs as described in proposed FSAR Section 13.7.3.3. The proposed FSAR Section provides a high-level description of eight treatment processes (design control; procurement; installation; maintenance; inspection, test, and surveillance; corrective action; management and oversight; and configuration control) that will provide STPNOC with reasonable confidence that safety-related LSS and NRS SSCs will maintain their functionality under design-basis conditions. As noted above, the scope of this SE did not include the licensee's procedures for the treatment processes to be implemented. Review of the specifics of the licensee's implementation of the treatment processes was not considered necessary based on the staff's finding that safety-related SSCs identified as LSS or NRS by the licensee's PRA/categorization process do not contribute significantly to risk as described in Section 3.0 of this SE. Effective implementation of the treatment processes for safety-related LSS and NRS SSCs to maintain their design bases and functionality under all design-basis conditions is the responsibility of the licensee. This staff evaluation relies on the use of sound engineering judgment by the licensee in implementing the treatment processes. The staff concludes that the treatment processes described in proposed FSAR Section 13.7.3.3 contain elements and high-level objectives that, if effectively implemented, can result in safety-related LSS and NRS SSCs being capable of performing their safety functions under design-basis conditions, including environmental and seismic conditions, throughout their service life. STPNOC is responsible for effective implementation of the treatment processes for safety-related LSS and NRS SSCs that can result in these SSCs remaining capable of performing their safety functions under design-basis conditions.

5.0 CHANGE CONTROL PROCESS

5.1 Introduction

During the GQA review, STPNOC indicated its desire to have extensive flexibility to make changes to the categorization process as it gained experience with implementation. For the exemption request, STPNOC indicated similar flexibility was necessary and proposed placing a description of the categorization process (and other processes that form the basis for its exemption request) in the STP FSAR. STPNOC stated that changes to the descriptions of these processes would be made in accordance with the requirements of 10 CFR 50.59. Considering that changes in the categorization process could move SSCs out of the scope of special treatment requirements under the STPNOC exemption requests, and considering some

of the changes that have been made to the categorization procedures under GQA, the staff determined that the processes that are used as the basis for STPNOC's exemption requests should be subject to stricter controls than those currently in place for the GQA categorization process. The staff determined that these controls are necessary to ensure the underlying basis for granting any of the exemptions requested remains valid, or the NRC is provided with prior review and approval before changes are implemented. In the submittal, the licensee proposed additional change control conditions for the processes that form the basis for its exemption request.

5.2 Licensee's Proposed Change Control Process

As stated in its submittal, STPNOC proposed to control its commitments regarding the categorization process and the treatment to be provided to SSCs by adding a new Section 13.7 to the STP FSAR. STPNOC stated that its proposed processes represents the first-of-a-kind program. This first-of-a-kind effort may require that changes will be needed or desirable as experience with implementation of the process is accumulated. STPNOC proposed controlling these changes in accordance with 10 CFR 50.59 and a number of additional criteria. STPNOC indicated that these controls will provide flexibility for it to make changes in the processes based upon implementation experience, while ensuring that significant changes will be subject to prior NRC approval. As described in more detail in Attachment 6 of its August 31, 2000, submittal, STPNOC stated that the STP FSAR is the appropriate location for this information [rather than the Operations Quality Assurance Program (OQAP)], because the risk-informed process applies to more subjects than just QA and the change control process for the OQAP would be unduly restrictive if applied to Section 13.7. Additionally, STPNOC stated that it would be inappropriate (and inconsistent with NRC's policy toward the TSs and other license conditions) to incorporate Section 13.7 as a license condition. Such a condition would create an undue burden on both STPNOC and the NRC, because it would require STPNOC to apply for, and the NRC to review and approve, relatively minor changes in the process.

STPNOC's proposed Section 13.7 for the FSAR is provided in its May 21, 2001, submittal. STPNOC states that this new section in the STP FSAR will be controlled in accordance with the requirements in 10 CFR 50.59. Further, in response to Open Item 5.1 of the November 15, 2000, draft SE, STPNOC also proposed to use the following additional criteria contained in proposed FSAR Section 13.7.5.2 for controlling changes to the proposed Section 13.7 of the STP FSAR:

> 13.7.5.2 Regulatory Process for Controlling Changes. Changes affecting Section 13.7 will be controlled in accordance with the following provisions:
>
> a. Changes to Section 13.7.2, "Component Categorization Process" may be made without prior NRC approval, unless the change would decrease the effectiveness of the process in identifying HSS and MSS components.
>
> b. Changes to Section 13.7.3, "Treatment of Component Categories" may be made without prior NRC approval, unless the change would result in a reduction in the confidence of component functionality.

c. Changes to Section 13.7.4, “Continuing Evaluations and Assessments” may be made without prior NRC approval, unless the change would result in a decrease in effectiveness of the evaluations and assessments.

d. A report shall be submitted, as specified in 10 CFR 50.4, of changes made without prior NRC approval pursuant to these provisions. The report shall identify each change and describe the basis for the conclusion that the change does not involve a decrease in effectiveness or confidence as described above. The report shall be submitted within 60 days of the date of the change.

e. Changes to Sections 13.7.2, 13.7.3, and 13.7.4 that do not meet the criteria of Sections 13.7.5.2.a through c shall be submitted to the NRC for prior review and approval.

5.3 Evaluation

In its submittal, STPNOC has requested exemptions from the special treatment requirements of 10 CFR Parts 21, 50, and 100 primarily based on the implementation of processes for the categorization, treatment, and oversight (evaluation and assessments) of SSCs. From a practical standpoint, what this means is that as STPNOC implements these exemptions, it will define the scope of SSCs (safety-related or important to safety LSS and NRS SSCs) using the categorization process that will be subject to the proposed treatment and oversight processes. In the staff's evaluation of the exemption requests, it has based its conclusions primarily on the attributes of the processes described in STPNOC's proposed FSAR Section 13.7. Therefore, changes to the attributes of these processes must be controlled such that the staff's findings remain valid, or the NRC is provided with the opportunity for prior review and approval of changes to the basis of its findings.

To provide the appropriate licensing basis upon which to base the change control process, the staff evaluated several options. These included describing the processes in the licensee's QA Program description, incorporating descriptions of the process in the license or TSs, incorporating the process descriptions in a separate topical report that is tied to the license as a license condition, or incorporating the process descriptions in the STP FSAR. In order to provide the licensee with the flexibility to make changes to the implementing procedures as it gains experience during implementation, while still providing the NRC with confidence that significant changes to the processes will receive prior NRC review and approval, the staff determined that the processes shall be described in the STP FSAR. This is consistent with the licensee's proposal for the appropriate location for the descriptions.

The staff has reviewed the licensee’s proposed Section 13.7 to the STP FSAR submitted on May 21, 2001. This proposed STP FSAR section provides the description of the categorization, treatment, and continuing evaluation and assessment processes that support STPNOC exemption requests. The staff found that the proposed Section 13.7.2 of the STP FSAR provided the necessary detail to describe the PRA based and deterministic based methodologies of the overall categorization process. Further, this section adequately describes the sensitivity studies performed to assess the aggregate impact on risk. The information in Section 13.7.2 is sufficient to support the staff’s determination that the overall categorization process is robust and that it can be used as the basis for defining the scope of SSCs that can

be excluded from the special treatment requirements. Section 3.0 of this SE provides the staff's evaluation of the categorization process.

The staff found that proposed Section 13.7.3 of the STP FSAR provided the necessary detail to describe the elements of the treatment practices to be applied to the various categories of SSCs. The information in Section 13.7.3 is sufficient to support the staff's finding that the alternative treatment practices proposed for LSS and NRS safety-related SSCs, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions. Section 4.0 of this SE provides the staff's evaluation of the alternative treatment practices.

The staff found that proposed Section 13.7.4 of the STP FSAR provided the necessary detail to describe licensee continuing evaluation and assessment activities to ensure the proper implementation of the categorization and treatment processes described in proposed Sections 13.7.2 and 13.7.3 of the STP FSAR. Proposed Section 13.7.4 describes the processes for performance monitoring, feedback and corrective action, and assessing aggregate risk. The staff's evaluation of these processes are provided in Section 3.0 (performance monitoring, feedback, and aggregate risk), Section 4.0 (corrective action), and Section 7.0 (performance monitoring, and feedback and corrective action) of this SE.

Based on the staff's findings on the May 21, 2001, submittal, the staff concluded that proposed Section 13.7 to the STP FSAR provided the descriptions of the categorization, treatment, and continuing evaluations and assessments necessary to support the requested exemptions from the special treatment requirements.

With this information described in the STP FSAR, the regulation that would govern changes to these descriptions is 10 CFR 50.59. However, the staff determined that the requirements of 10 CFR 50.59 alone, are not sufficient to provide for prior review and approval of significant changes to the processes that form the basis for granting exemptions from the special treatment requirements. As such, the staff determined that additional controls are necessary to ensure that the NRC reviews and approves changes to these processes. With this in mind, and based on concerns identified with changes made to the categorization procedures under GQA, the staff determined that the appropriate location for controls governing changes to the processes that form the basis for the NRC's findings as described in the proposed STP FSAR section in the licensee's submittal, is in each of the exemptions granted by the NRC.

The staff evaluated the licensee's proposed change control criteria described in its submittal for each of the processes it proposes to describe in the STP FSAR. The staff determined that the STPNOC proposed change control criteria provided sufficient confidence that changes that could affect the underlying basis for the staff's findings would remain valid. This satisfactorily resolved Open Item 5.1 from the November 15, 2000, draft SE. The staff determined that changes that could result in any decrease in the assurance or effectiveness of the processes to the extent described in the proposed FSAR Section would require prior staff review and approval. The staff determined that this level of control is necessary to ensure that the regulatory basis for granting the exemptions remains unchanged as the licensee proceeds with implementation. The staff recognizes that this could potentially have an impact on both STPNOC and NRC resources during the implementation of any of the exemptions it grants. However, the staff has determined that this approach provides sufficient flexibility for STPNOC to change its implementing procedures while providing the level of regulatory control required to

ensure the NRC's basis for granting the exemptions remains valid. To ensure that the bases for any of the exemptions the NRC may grant remains valid, the NRC should impose the following exemption conditions to any exemption it may grant:

1. The licensee shall follow the categorization, treatment, and oversight (evaluation and assessment) processes described in its submittal dated July 13, 1999, as supplemented October 14 and 22, 1999, January 26 and August 31, 2000, and January 15, 18, 23, March 19, May 8 and 21, 2001, and relied upon by the staff in approving this exemption as discussed in the NRC's SE dated **[to be determined]**. The licensee has documented these processes in a proposed FSAR submittal dated May 21, 2001, found acceptable by the staff as the regulatory basis for granting this exemption. The licensee shall incorporate this proposed FSAR submittal into the STP FSAR.

2. The licensee shall implement a change control process that incorporates the following requirements:

    a. Changes to FSAR Section 13.7.2, "Component Categorization Process," dated May 21, 2001, and found acceptable by the NRC as described in the NRC's SE dated **[to be determined]**, may be made without prior NRC approval, unless the change would decrease the effectiveness of the process in identifying HSS and MSS components.

    b. Changes to FSAR Section 13.7.3, "Treatment of Component Categories," dated May 21, 2001, and found acceptable by the NRC as described in the NRC's SE dated **[to be determined]**, may be made without prior NRC approval, unless the change would result in a reduction in the assurance of component functionality.

    c. Changes to FSAR Section 13.7.4, "Continuing Evaluations and Assessments," dated May 21, 2001, and found acceptable by the NRC as described in the NRC's SE dated **[to be determined]**, may be made without prior NRC approval, unless the change would result in a decrease in effectiveness of the evaluations and assessments.

    d. The licensee shall submit a report, as specified in 10 CFR 50.4, of changes made without prior NRC approval pursuant to these provisions. The report shall identify each change and describe the basis for the conclusion that the change does not involve a decrease in effectiveness or assurance as described above. The report shall be submitted within 60 days of the date of the change.

    e. Changes to FSAR Sections 13.7.2, 13.7.3, and 13.7.4 that do not meet the criteria of a through c above shall be submitted to the NRC for prior review and approval.

5.4 Conclusion

The staff concluded that the description of the categorization, treatment, and continuing evaluations and assessments provided in the proposed STP FSAR Section 13.7, as submitted on May 21, 2001, is sufficient to support the staff's findings regarding the requested exemptions. The staff concluded that the change control process described by the licensee provided sufficient confidence that the staff's findings would remain valid as the licensee changed the processes during implementation of any of the exemptions granted. The staff concluded that 10 CFR 50.59 alone was not sufficient to control changes to the processes

described in the STP FSAR. Therefore, in order to allow changes to the processes described in the proposed STP FSAR Section 13.7, the staff determined change control conditions shall be imposed on the exemptions granted.

6.0 EXEMPTION TO 10 CFR 21.3 - DEFINITION OF BASIC COMPONENT

6.1 Introduction

The regulation at 10 CFR Part 21 requires directors and responsible officers of certain organizations building, operating or owning NRC-licensed facilities, or conducting NRC-licensed activities, to report any defects in SSCs and failures to comply with NRC requirements that could result in a substantial safety hazard. This reporting requirement is intended to provide confidence that the NRC receives prompt notification concerning defects or failures to comply with NRC requirements for facilities or activities licensed by the Commission that could present a substantial safety hazard.

6.2 Exemption Requested

Provisions for granting exemptions from the requirements of the regulations of 10 CFR Part 21 are established in 10 CFR 21.7, “Exemptions.” The Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations of 10 CFR Part 21 as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

The licensee requests exemption from the requirements of 10 CFR Part 21 to exclude LSS and NRS SSCs from the scope of the definition of “basic component,” as defined in 10 CFR 21.3. This exemption would effectively remove LSS and NRS SSCs from the scope of 10 CFR Part 21 and, for the exempted SSCs, would eliminate the requirement for the licensee to invoke 10 CFR Part 21 through procurement documents (10 CFR 21.31), the requirement for dedication of commercial-grade items (10 CFR 21.3), and the requirement for reportability evaluations of deviations in component critical characteristics or other reportable defects (10 CFR 21.21).

6.3 Discussion

The licensee’s technical justification, provided in Attachment 1, Section 5.1 of the August 31, 2000, submittal, addresses the exemption provisions of 10 CFR 21.7 in that the exemption would not endanger life or property and would otherwise be in the public interest.

The licensee states that the exempted SSCs do not significantly affect the performance of any significant safety function. The licensee states that the exempted SSCs would not be exempted from design and functional requirements, and that defense-in-depth and safety margins would be maintained. The licensee further states that exemption from 10 CFR Part 21 requirements would focus attention on more risk-significant SSCs.

6.4 Evaluation

The intent of 10 CFR Part 21 is to ensure that the NRC receives prompt notification of possible substantial safety hazards in facilities or activities licensed by the NRC. A substantial safety

hazard is defined in 10 CFR 21.3 as meaning a loss of safety function to the extent that there is a major reduction in the degree of protection provided to public health and safety. The staff reviews 10 CFR Part 21 notifications related to nuclear power reactors to determine the need for regulatory action and issuance of appropriate generic communications related to reported defects.

An exemption from the definition of basic component in 10 CFR 21.3 was requested to allow the licensee to exclude safety-related LSS and NRS SSCs from the scope of the requirements of 10 CFR Part 21 because the definition includes all safety-related SSCs. As it relates to nuclear power plants licensed pursuant to 10 CFR Part 50, a basic component is defined as an SSC, or part thereof, that affects its safety function necessary to assure (1) the integrity of the reactor coolant pressure boundary, (2) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (3) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1) or 10 CFR 100.11. Further, a basic component is defined as items designed and manufactured under a quality assurance program complying with 10 CFR Part 50, Appendix B, or commercial-grade items which have successfully completed the dedication process. Finally, the definition of basic component includes the safety-related design, analysis, inspection, testing, fabrication, replacement of parts, or consulting services that are associated with the SSC hardware.

In Section 4.0 of this SE, the staff describes its assessment of the attributes of the proposed treatment processes for LSS and NRS SSCs. The staff determined that, if effectively implemented, the licensee's treatment processes can result in safety-related LSS and NRS SSCs remaining capable of performing their design-basis functions. Also, as discussed in Section 3.0 of this SE, the staff determined that the licensee's categorization process provides a reasonable method for determining that safety-related LSS and NRS SSCs have a small contribution to overall safety. Further, the PRA sensitivity study conducted by the licensee demonstrates that for relatively large changes in availability of all of the safety-related LSS SSCs modeled in the PRA, there is only a small change in the overall plant risk. Therefore, the staff determined that it is acceptable to exclude LSS and NRS SSCs from the scope of the definition of basic component in 10 CFR 21.3 because the staff concluded that defects in these components would not cause a substantial safety hazard and so no notification pursuant to 10 CFR Part 21 is required.

The staff also finds the proposed exemption is authorized by law. Based on the above, the staff finds that the exemption would not endanger life or property, and that the common defense and security are unaffected by the exemption. The exemption is in the public interest, since it focuses NRC and licensee attention on the most safety- and risk-significant SSCs. The staff finds that the proposed exemption satisfies the criteria given in 10 CFR 21.7. Therefore, the proposed exemption may be granted.

6.5 Conclusion

Based on the staff's review of the categorization process, the staff concluded that the exemption requested from the definition of basic component in 10 CFR 21.3 should be granted in that the exemption provisions of 10 CFR 21.7 have been satisfied.

7.0 EXEMPTION TO QUALITY ASSURANCE (QA) REQUIREMENTS

7.1 Introduction

7.1.1 Appendix B to 10 CFR Part 50 – Quality Assurance Criteria for Nuclear Power Plants And Fuel Reprocessing Plants

Appendix B to 10 CFR Part 50 provides QA requirements for the design, construction, and operation of SSCs that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. These requirements apply to all activities that affect SSC safety-related functions. The general requirements contained in 10 CFR Part 50, Appendix B, are supplemented by industry standards and NRC regulatory guides that describe specific practices that have been found acceptable by the industry and the staff.

7.1.2 GDC 1 - Quality Standards and Records

The GDC of Appendix A to 10 CFR Part 50 establish minimum requirements for the principal design criteria for water-cooled nuclear power reactors for which construction permits have been issued by the Commission. GDC 1 establishes the requirement that SSCs important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. GDC 1 further requires that where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency and shall be supplemented or modified as necessary to assure a quality product in keeping with the required safety function. A QA Program shall be established and implemented in order to provide adequate assurance that these SSCs would satisfactorily perform their safety functions. Appropriate records of the design, fabrication, erection, and testing of SSCs important to safety shall be maintained by and under control of the nuclear power unit licensee throughout the life of the unit.

7.1.3 10 CFR 50.34(b)(6)(ii) – Managerial and Administrative Controls

The regulation at 10 CFR 50.34(b) specifies the information to be included in the FSAR. Specifically, 10 CFR 50.34(b)(6)(ii) requires that information on the managerial and administrative controls used to assure safe operation should be included in the FSAR. This information is normally included in the licensee's QA Program description that is incorporated into the FSAR by reference. The QA Program description must include a discussion of how the applicable requirements of 10 CFR Part 50, Appendix B, are satisfied.

7.1.4 10 CFR 50.54(a)(3) - Changes to QA Program Descriptions

The regulation at 10 CFR 50.54(a)(3) requires licensees to submit changes that reduce commitments in a QA Program description for NRC review prior to implementation. Changes that do not reduce commitments are submitted in accordance with the requirements of 10 CFR 50.71(e).

7.2 Exemptions Requested

For SSCs that have been categorized as LSS or NRS, the licensee requests exemptions from (1) 10 CFR Part 50, Appendix B, except for Criteria III, XV, and XVI; (2) GDC 1 of 10 CFR Part 50, (except to the extent that they incorporate Criteria III, XV, and XVI of Appendix B); (3) 10 CFR 50.34(b)(6)(ii) with respect to the extent that this regulation incorporates provisions from 10 CFR Part 50, Appendix B, except for Criteria III, XV, and XVI; and (4) 10 CFR 50.54(a)(3) on the requirement for NRC approval prior to implementation of changes that would reduce commitments in the QA Program description.

7.3 Discussion

The NRC's policy statement on PRA ["Use of Probabilistic Risk Assessment in Nuclear Activities: Final Policy Statement," (60 FR 42622), August 6, 1995] encourages greater use of this analysis technique to improve safety decisionmaking and improve regulatory efficiency. Consistent with this policy, RG 1.176, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Graded Quality Assurance," August 1998, describes an acceptable approach for identifying the safety significance of SSCs and assigning QA requirements in a manner commensurate with safety significance. The NRC has approved STPNOC's risk-informed process for determining the safety/risk significance of SSCs. STPNOC's GQA Program was made effective for implementation on February 1, 1998, as part of Revision 13 of the licensee's OQAP ["Graded Quality Assurance, Operations Quality Assurance Plan (Revision 13)," Letter USNRC to STPNOC, November 6, 1997]. STPNOC's risk-informed process for implementing its GQA Program is described in SECY-97-329, "Graded Quality Assurance/Probabilistic Risk Assessment Implementation Plan for the South Texas Project Electric Generating Station," dated October 6, 1997.

STPNOC's risk-informed categorization process is described in its proposed FSAR Section. The categorization process for determining the safety/risk significance of SSCs places a SSC into one of four categories (HSS, MSS, LSS, or NRS). The exemption would apply only to safety-related LSS and NRS SSCs that the licensee defines as having little or no safety significance with respect to mitigating the consequences of an accident or protecting the health and safety of the public during a design-basis event or any credible event.

Although 10 CFR Part 50, Appendix B, provides flexibility to apply QA controls in a graded manner that is commensurate with the safety importance of SSCs, other regulations require that the explicit criteria of 10 CFR Part 50, Appendix B, still apply. STPNOC considers these requirements to be unduly burdensome and that its commercial practices, currently applied only to non-safety, balance-of-plant equipment, are adequate to provide reasonable confidence that the exempted SSCs would perform satisfactorily in service.

7.3.1 STPNOC Alternative Treatment Program

The elements of STPNOC's alternative treatment program for LSS and NRS SSCs are described in Section 13.7.3 of its proposed FSAR Section. The licensee commits to continue to satisfy the QA requirements of 10 CFR Part 50, Appendix B, for the elements of the design control program (Criterion III), corrective action program (Criterion XVI) and nonconforming materials, parts, or components (Criterion XV). The licensee's OQAP describes how these program elements satisfy 10 CFR Part 50, Appendix B. Also, the licensee has established

monitoring and feedback programs as part of its GQA Program. These programs include the SSCs within the scope of the exemption requests. Under the exemptions, the licensee would continue to assess equipment performance through monitoring at the plant, system, and train level. Although the exempted SSCs are not explicitly monitored, degraded SSC performance would be observed at the plant/system/train level.

The licensee further commits to maintain the design functions for the exempted SSCs. Based on a comparative analysis of failure rates for both safety-related and nonsafety-related SSCs in the nuclear industry's Nuclear Plant Reliability Data System for the period from 1977 through 1996, the licensee indicates that the failure rate of SSCs controlled by commercial treatment processes does not differ appreciably from the failure rate of those controlled by processes meeting NRC's special treatment requirements. Using this information, STPNOC indicated that the reliability of the exempted SSCs would not be affected by application of its alternative treatment program, although it is not clear to the staff to what extent these data reflect reliability of SSCs under design-basis conditions.

The elements of STPNOC's alternative treatment program, applicable to the exempted SSCs, are as follows:

1. Design Control Process (Appendix B program)
2. Procurement Process
3. Installation Process
4. Maintenance Process
5. Inspection, Test, and Surveillance Process
6. Corrective Action Program (Appendix B program)
7. Management and Oversight Process
8. Configuration Control Process

These alternative treatment program elements are described in Section 4.2.3 and evaluated in Section 4.3.4 of this SE.

7.3.2 Comparison of STPNOC Alternative Treatment Program with Appendix B Criteria

Section 4.2.3 of this SE describes the alternative treatment program that would be applied to activities associated with the exempted SSCs. The licensee has requested exemptions from 15 of the 18 10 CFR Part 50, Appendix B, Criteria. The licensee has compared the elements of its proposed alternative treatment program with the exempted 10 CFR Part 50, Appendix B, Criteria in its response to staff Question #13 provided in Attachment 4 to the August 31, 2000, submittal.

7.3.2.1 Criterion I – Organization

The Quality organization will focus on HSS/MSS components, including nonsafety-related HSS/MSS components and will not be required to provide oversight for LSS/NRS components or activities. The Comprehensive Risk Management Expert Panel provides organizational oversight for the categorization of SSCs and for the implementation of risk-informed activities at STP. The GQA Working Group provides oversight for the categorization of SSCs and monitors the implementation feedback for potential adjustments in controls or categorization.

7.3.2.2 Criterion II – Quality Assurance Program

The Operations Quality Assurance Program (OQAP) will be modified to focus on HSS/MSS SSCs. Commercial programs, procedures, and practices (i.e., Balance of Plant) are in place to provide appropriate controls over activities affecting LSS and NRS components. These processes have been proven to provide satisfactory controls to provide an appropriate level of assurance that Balance-of-Plant equipment operates safely and reliably. Likewise, these processes will provide reasonable assurance that LSS/NRS SSCs can perform their design-basis functions. The implementation of these activities will be under the oversight of the Expert Panel, who will receive input from the GQA Working Group, other Working Groups, and plant staff.

7.3.2.3 Criterion III – Design Control

No exemption from this 10 CFR Part 50, Appendix B, criterion is requested. The licensee's program for control of design and modification activities is described in Chapter 4 of the Operations Quality Assurance Plan.

7.3.2.4 Criterion IV – Procurement Document Control

Measures shall be established to assure that applicable regulatory requirements, design bases, and other requirements which are necessary to assure adequate quality are suitably included or referenced in the documents for procurement of material, equipment, and services, whether purchased by the applicant or by its contractors or subcontractors. To the extent necessary, procurement documents shall require contractors or subcontractors to provide a quality assurance program consistent with the pertinent provisions of this appendix.

7.3.2.5 Criterion V – Instructions, Procedures, and Drawings

Appropriate procedures, instructions, and drawings are in place, and will be used, as appropriate, in support of activities affecting LSS/NRS components. The use of these instructions, procedures, and drawings will follow good business practices to provide reasonable assurance that LSS/NRS components will operate reliably and can satisfy their design functional requirements.

7.3.2.6 Criterion VI – Document Control

Appropriate commercial practices will be followed to properly control documents affecting LSS/NRS components and activities. These practices will be governed by administrative procedures which will provide reasonable oversight over the LSS/NRS activities.

7.3.2.7 Criterion VII – Control of Purchased Material, Equipment, and Services

Appropriate commercial practices will be followed to provide reasonable assurance that purchased material and equipment for LSS/NRS components conform to the procurement documentation. STP will continue to procure LSS/NRS components from reputable vendors. These practices will be governed by administrative procedures.

7.3.2.8 Criterion VIII – Identification and Control of Materials, Parts, and Components

Appropriate commercial practices will be followed to provide reasonable assurance that incorrect or defective material, parts, and components are not used in LSS/NRS component applications. These practices will be governed by administrative procedures.

7.3.2.9 Criterion IX – Control of Special Processes

Special processes will follow good commercial practices, and will be administratively controlled using existing processes and programs. Appropriate measures will be followed to ensure the reliability of LSS/NRS components, and to provide reasonable assurance that these components can perform their design functional requirements.

7.3.2.10 Criterion X – Inspection

Commercial practices will be followed to ensure the reliability of LSS/NRS components, and to provide reasonable assurance that these components can perform their design functional requirements. Supervisor oversight or peer observations may be used to provide additional assurance that activities are completed in a safe and effective manner.

7.3.2.11 Criterion XI – Test Control

Commercial practices will be followed to provide reasonable assurance that LSS/NRS components can satisfy their design functional requirements. Appropriate post-maintenance testing will be performed as well as operational checks to provide reasonable assurance that components will function.

7.3.2.12 Criterion XII – Control of Measuring and Test Equipment (M&TE)

Commercial maintenance procedures, work instructions, and practices will be followed to use tools, gauges, instruments, and other M&TE. It is expected that this equipment will continue to be controlled and calibrated as it is currently. As discussed in Section 13.7.3.3.5 of the proposed FSAR Section, if a post-calibration check of the M&TE fails, a determination is made of the functionality of the safety-related SSCs that were checked using that equipment.

7.3.2.13 Criterion XIII – Handling, Storage, and Shipping

Appropriate commercial practices will be used to ensure that LSS/NRS components are properly handled, stored, shipped, cleaned, and preserved to ensure that replacement components retain their design functional requirements.

7.3.2.14 Criterion XIV – Inspection, Test, and Operating Status

LSS and NRS components will continue to remain within the existing configuration control program at STP. This includes the appropriate tagging to identify operational or maintenance status. Commercial practices will be used to identify the status of inspections or tests (normally contained within procedural guidance).

7.3.2.15 Criterion XV – Nonconforming Materials, Parts, or Components

No exemption from this 10 CFR Part 50, Appendix B, criterion has been requested. The licensee's program for nonconforming materials, parts, or components is within the scope of the corrective action program, described in Chapter 13 of the QA Program description.

7.3.2.16 Criterion XVI – Corrective Action

No exemption from this 10 CFR Part 50, Appendix B, criterion has been requested. The licensee's corrective action program is described in Chapter 13 of the QA Program description.

7.3.2.17 Criterion XVII – Quality Assurance Records

Administrative controls will specify appropriate records and documentation for LSS and NRS components. Records that are administratively required to be retained will be controlled through the existing document control process.

7.3.2.18 Criterion XVIII – Audits

LSS and NRS components will be monitored under the Maintenance Rule program at the system/train/plant level if their failure affects an HSS or MSS function. In addition, periodic reviews performed by the GQA Working Group will assess the appropriateness of the controls placed on LSS/NRS components and the risk categorization for these components. Furthermore, the Quality Organization has and will continue to assess the overall GQA program and provide findings/recommendations to STP Management. Other assessments may be pursued based on good business practices or as directed by the Comprehensive Risk Management Expert Panel.

7.4 Evaluation

The intent of 10 CFR Part 50, Appendix B, and the complementary regulations addressed by this section of the SE is to provide a regulatory basis for activities associated with SSCs that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public.

Every applicant for an operating license is required to include information in the FSAR on the processes to assure safe operation. Under 10 CFR 50.34(b)(6)(ii) requirements are established for information related to managerial and administrative controls. This information is normally provided by a licensee in a OQAP description; 10 CFR 50.34(b)(6)(ii) requires that the information include a discussion of how the applicable 10 CFR Part 50, Appendix B, requirements are satisfied.

GDC of Appendix A to 10 CFR Part 50 establish minimum requirements for the principal design criteria for water-cooled nuclear reactors. GDC 1 incorporates the quality requirements of 10 CFR Part 50, Appendix B, as criteria for the design, fabrication, erection, and testing of SSCs within the scope of 10 CFR Part 50, Appendix A.

7.4.1 Appendix B to 10 CFR Part 50

The general statements contained in 10 CFR Part 50, Appendix B, are supplemented by industry standards and NRC regulatory guides that describe QA practices that have been found acceptable by the industry and the staff. Both 10 CFR Part 50, Appendix B, and the industry standards include provisions for the flexible application of these QA practices commensurate with the importance to safety of the SSCs to which these practices are applied. STPNOC's approved OQAP applies graded controls that are consistent with the guidance provided by RG 1.174 and RG 1.176. RG 1.174 provides general guidance concerning an approach that the NRC has determined to be acceptable for analyzing issues associated with proposed changes to a plant's licensing basis and for assessing the impact of such proposed changes on the risk associated with plant design and operation. RG 1.176 provides guidance on modifying current OQAP controls based on the safety categorization of SSCs.

STPNOC's categorization process determines the risk significance of SSCs in a manner consistent with the categorization process described in RG 1.176. The SSCs for which exemptions are requested are classified as LSS or NRS. LSS and NRS SSCs would cause little, if any, impact on mitigating the consequences of an accident or protecting the health and safety of the public during a design-basis event or any other credible event.

STPNOC's proposed treatment processes, described in the submittal (see Section 4.2.3 of this SE) are implemented by procedures. STPNOC's response to staff Question #13 in Attachment 4 of the August 31, 2000, submittal specifically addresses how the 15 exempted criteria of 10 CFR Part 50, Appendix B, are covered by its commercial program. Controls for design control, corrective action, and nonconforming items will continue to be implemented by processes conforming to the requirements of 10 CFR Part 50, Appendix B, as described in the licensee's OQAP description.

The submittal provides a methodology by which the licensee could determine that the functionality and reliability of the SSCs would not be adversely affected by the exemptions. In addition, performance monitoring, observation by operations and engineering personnel, and periodic evaluations by the GQA Working Group provide adequate oversight of the process in the unlikely event that SSC performance degrades. In the event of degraded performance, the process provides for appropriate adjustment in the alternative treatment program. Even if exemption from the special treatment requirements were to adversely affect the function or reliability of an exempted SSC, the categorization process provides confidence that there would be no significant increase in risk to the health and safety of the public.

The staff found that the licensee's application of a risk-informed categorization process has identified a class of SSCs that have little or no safety significance with respect to protecting the health and safety of the public. The staff also found that the proposed treatment processes to be applied to activities associated with LSS and NRS SSCs, as described by the licensee, if effectively implemented, can result in these SSCs remaining capable of performing their safety functions under design-basis conditions. Based on these findings, the staff concluded that granting of the requested exemptions from 10 CFR Part 50, Appendix B, for LSS and NRS SSCs would pose no undue risk to public health and safety. As discussed in Section 20.2 of this SE, the staff found that the categorization process was not considered when the requirements of 10 CFR Part 50, Appendix B were adopted and that it is in the public interest to grant an exemption from the special treatment requirements. This satisfies the special

circumstance of 10 CFR 50.12(a)(2)(vi). Therefore, the staff determined that the exemptions should be granted from the criteria of 10 CFR Part 50, Appendix B, as requested by STPNOC.

7.4.2 GDC 1

The requirements of 10 CFR Part 50, Appendix A, GDC 1 states, in part, that plant equipment shall be designed, fabricated, erected, and tested to quality standards that are commensurate with the importance of the safety function performed. GDC 1 additionally requires that a OQAP shall be established and implemented to provide adequate assurance that plant equipment is functional, and that appropriate records be maintained for various activities. STPNOC has proposed an exemption to GDC 1 for LSS and NRS SSCs except to the extent that it imposes the requirements of 10 CFR Part 50, Appendix B, criteria for design, nonconforming conditions, and corrective action.

With respect to the requirements of GDC 1, STPNOC has a structured process to determine the safety significance of SSCs as evaluated by the staff within Section 3.0 of this SE. Further, STPNOC has proposed treatment processes in the quality area for those SSCs that have been determined not to be safety significant (LSS and NRS). The staff has evaluated the adequacy of the alternative QA controls in Section 7.4.1 of this SE and found them acceptable. The staff additionally concluded that the alternate controls can be used by the licensee as the basis for confidence in the continued functionality of LSS and NRS SSCs. STPNOC submitted a revised OQAP description that describes QA controls that will be implemented for the LSS and NRS safety-related SSCs consistent with the staff's determination that such a submittal was necessary (see Section 7.4.4 of this SE). With respect to the GDC 1 requirement for records, the STPNOC alternative program specifies that administrative controls will specify records that will be maintained for LSS and NRS SSCs and this is acceptable to the staff.

The staff concludes that an exemption from GDC 1 is not necessary. The alternative treatment and categorization processes proposed in the submittal have been incorporated into a OQAP framework that satisfies the requirements of GDC 1 for LSS and NRS SSCs. Further, to grant the exemption would be inconsistent with the staff's expectations that even for LSS and NRS SSCs it remains necessary (1) to use appropriate standards (as available and applicable) commensurate with the risk significance, (2) to establish and implement a OQAP, (3) to maintain plant records as determined by the licensee, and (4) for the licensee to have sufficient confidence that LSS and NRS SSCs will be capable of functioning under design-basis conditions. On this basis, the NRC should deny the licensee's exemption request from the requirements of GDC 1.

7.4.3 10 CFR 50.34(b)(6)(ii)

The licensee requests exemption to the extent that this regulation incorporates provisions from 10 CFR Part 50, Appendix B, except for Criteria III, XV, and XVI. For the remaining fifteen 10 CFR Part 50, Appendix B, criteria for which an exemption is requested, the licensee proposes to control its commitments regarding the categorization and treatment processes to be applied to the exempted SSCs by adding a new Section 13.7 to the STP FSAR. The exempted 10 CFR Part 50, Appendix B, requirements would not be subject to the provisions of 10 CFR 50.34(b)(6)(ii).

The underlying purpose of the requirement is for the licensee to document how the QA requirements of 10 CFR Part 50, Appendix B, will be satisfied for safety-related SSCs. The application of a risk-informed categorization process or changes to special treatment requirements applied to safety-related SSCs does not affect the underlying purpose of the requirement of 10 CFR 50.34(b)(6)(ii) related to the documentation describing the licensee's OQAP. Should the licensee be granted exemptions from any of the requirements of 10 CFR Part 50, Appendix B, for LSS and NRS SSCs, the documentation describing its OQAP should note that exemptions have been granted for LSS and NRS SSCs from those requirements.

Further, the NRC has found that none of the special circumstances described under 10 CFR 50.12(a)(2) that are necessary for the Commission to grant the exemption are satisfied with regard to the specific requirements of 10 CFR 50.34(b)(6)(ii). There are no conflicts with other rules or requirements of the Commission, the underlying purpose of the rule would not be met by granting the exemption, compliance with the rule would not result in undue hardship or excessive costs, granting the exemption would not result in either a benefit to the public health and safety or a decrease in safety, STPNOC is not seeking temporary relief from the regulation, and there are no other material circumstances not previously considered for which it would be in the public interest to grant an exemption.

Based on the above findings, the staff has determined that the OQAP description should include a discussion of the scope of the SSCs exempted from 10 CFR Part 50, Appendix B, requirements, the basis for this exemption (e.g., by referencing the staff's SE), and also reference the document where the alternate treatment processes are described (i.e., proposed FSAR, Section 13.7). Further, the staff determined that the OQAP description should identify any portion of the OQAP that remains applicable to the exempted SSCs (i.e., those sections related to design control, corrective action, and nonconforming items). As such, the staff determined that it is not appropriate to grant the requested exemption.

7.4.4 10 CFR 50.54(a)(3)

The licensee requests exemption from the provisions of this regulation. As justification, the licensee indicates that it would be extremely burdensome and prohibitively costly to seek staff approval prior to each change.

Exemption of LSS and NRS SSCs from regulatory QA requirements constitutes a significant reduction in commitments in the OQAP description as accepted by the NRC. The staff determined that the licensee's OQAP should be revised to incorporate the information specified in Section 7.4.3 above. All changes to the OQAP that supplement and complete this exemption request should be submitted to the staff pursuant to the requirements of 10 CFR 50.54(a)(3). The revised OQAP should be implemented concurrently with implementation of the requested exemptions.

The underlying purpose of the requirement is for the licensee to notify, and where appropriate seek prior review and approval from, the NRC of changes to the application of the requirements of 10 CFR Part 50, Appendix B, to safety-related SSCs. The application of a risk-informed categorization process or changes to special treatment requirements applied to safety-related SSCs does not affect the underlying purpose of the requirement of 10 CFR 50.54(a)(3) related to the changes in commitments described in the licensee's OQAP. Changes to the OQAP that supplement and complete any exemptions from the requirements of 10 CFR Part 50,

Appendix B should be reviewed and approved pursuant to the requirements of 10 CFR 50.54(a)(3).

Further, the NRC has found that none of the special circumstances described under 10 CFR 50.12(a)(2) that are necessary for the Commission to grant the exemption are satisfied with regard to the specific requirements of 10 CFR 50.54(a)(3). There are no conflicts with other rules or requirements of the Commission, the underlying purpose of the rule would not be met by granting the exemption, compliance with the rule would not result in undue hardship or excessive costs, granting the exemption would not result in either a benefit to the public health and safety or a decrease in safety, STPNOC is not seeking temporary relief from the regulation, and there are no other material circumstances not previously considered for which it would be in the public interest to grant an exemption.

On the basis of the above findings, the staff concluded that an exemption from 10 CFR 50.54(a)(3) should not be granted. This position was discussed with the licensee during the staff's review (see Open Item 7.1 of the November 15, 2000, draft SE) and the licensee has submitted a revision to its OQAP. Subsequent changes to the OQAP description will continue to be subject to the provisions of 10 CFR 50.54(a)(3). Commitments relocated to other documents, such as the proposed Section 13.7 of the STP FSAR would be subject to change control provisions other than 10 CFR 50.54(a)(3). The staff has reviewed the licensee's proposed revision to the OQAP (see Section 7.4.5 of this SE) and on the basis of its review, closes Open Item 7.1 of the November 15, 2000, draft SE.

7.4.5 Revisions to the STP OQAP

The staff has reviewed the proposed changes to the licensee's OQAP, submitted by letter dated January 18, 2001. The proposed changes are consistent with the conditions of the exemption request, as referenced in the staff's SE, and would be implemented concurrently with any approved exemptions.

The licensee's QA program applies a graded approach to structures, systems, and components to an extent consistent with their importance to safety. The licensee has defined a new class of "limited" program controls to be applied to safety-related SSCs categorized as either LSS or NRS. For SSCs subject to limited program controls, special treatment requirements are applied to the extent granted by the approved exemption. QA program controls, conforming to the requirements of 10 CFR Part 50, Appendix B, will continue to be applied as described in OQAP Chapter 6, "Design and Modification Control," and Chapter 13, "Control of Conditions Adverse to Quality." These chapters describe how the licensee's QA program meets the Appendix B requirements for design control, nonconforming materials, parts, or components, and corrective action (Appendix B Criteria III, XV, and XVI). Other processes for treatment of these SSCs are described in the proposed FSAR Section 13.7.3.3 and implementing procedures.

The proposed changes to the OQAP are consistent with the licensee's exemption request and appropriately reference proposed FSAR Section 13.7.3.3 for the alternate controls to be applied to the exempted SSCs and to the staff's SE, which describes the scope of the exemptions.

7.5 Conclusions

The staff has determined that the requested exemptions from 10 CFR Part 50, Appendix B, requirements should be granted. However, the exemption requested from 10 CFR 50.34(b)(6)(ii) should be denied. Also, the staff determined that the requested exemption from 10 CFR 50.54(a)(3) should be denied. Further, the staff determined that an exemption from GDC 1 is not necessary. The alternative treatment and categorization processes proposed in the submittal have been incorporated into a OQAP framework that satisfies the requirements of GDC 1 for LSS and NRS SSCs.

8.0 EXEMPTION TO 10 CFR 50.49(b) - ELECTRICAL EQUIPMENT IMPORTANT TO SAFETY

8.1 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) nonsafety-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.

The regulation at 10 CFR 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.

8.2 Exemption Requested

In its submittal, STPNOC requested an exemption to exclude safety-related 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 letters dated January 23, and May 21, 2001, (FSAR), STPNOC 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).

Technical Evaluation - A technical 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 conditions.

Technical Analysis - In cases involving design changes or substantial differences between the procured item and replacement item, a technical analysis may be performed to determine that the procured item can perform its safety-related function under design-basis conditions. The technical analysis may be based upon a computer calculation, evaluations by multiple disciplines, test data, or operating experience related to the procured item over its expected life.

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.

8.3 Discussion

In its submittal, STPNOC 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. Additionally, STPNOC states that the functional requirements for the safety-related LSS and NRS SSCs will not be affected and these SSCs will be subjected to the same design controls as those used for HSS and MSS safety-related SSCs. STPNOC proposed that should the exemption be granted, (1) the qualification documentation and files specified in 10 CFR 50.49 would not be applicable to safety-related LSS and NRS components, (2) safety-related LSS and NRS electric equipment would not be required to be maintained in a qualified condition pursuant to 10 CFR 50.49, (3) safety-related LSS and NRS electric equipment could be replaced with equipment that is not qualified pursuant to 10 CFR 50.49, (4) safety-related 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.

STPNOC 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. STPNOC indicates that the application of 10 CFR 50.49 equipment qualification requirements to safety-related LSS and NRS components is not necessary to achieve the underlying purpose of 10 CFR Part 50. Thus, STPNOC concluded it is not necessary to apply 10 CFR 50.49 qualification requirements to safety-related LSS or NRS components to achieve the underlying purpose of the rule.

The electric equipment qualification program in 10 CFR 50.49 states that the electrical equipment qualification program must include and be based on the following: (1) temperature and pressure, (2) humidity, (3) chemical effects, (4) radiation, (5) aging, (6) submergence, (7) synergistic effects, and (8) margins. The regulation at 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. Items (1) through (7) above, are design-basis conditions that must be addressed by the licensee treatment process in order to maintain the design bases and functionality of safety-related LSS and NRS SSCs. The regulation at 10 CFR 50.49 also sets forth requirements for documentation and margin. The staff has evaluated the need to maintain margin and documentation to determine if relaxation may be possible without compromising functionality albeit with a level of confidence less than that of HSS and MSS SSCs.

In the November 15, 2000, draft SE, the staff identified the need for STPNOC to provide additional information to support its need for the exemption requested from 10 CFR 50.49(b) as Open item 8.1. In its response to this open item, STPNOC indicated that in general, the methods proposed to procure replacement SSCs do not constitute one of the four qualification methods described in 10 CFR 50.49(f). Based on this additional information, the staff determined an exemption from 10 CFR 50.49(b) was necessary for the licensee to implement its proposed processes and considers Open Item 8.1 closed.

8.4 Evaluation

The alternate treatment program proposed by the licensee to be applied to safety-related LSS and NRS SSCs includes eight elements: Design Control Process; Procurement Process; Installation Process; Maintenance Process; Inspection, Test and Surveillance Process; Corrective Action Program; Management and Oversight Process; and Configuration Process. The staff's overall evaluation of the alternate treatment program and each of its elements is presented in Section 4.0 of this SE. Section 4.0 of the SE identifies the elements of the program acceptable to the staff that, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions.

The staff's evaluation focused on the methods of the licensee's proposed procurement process element of the alternate treatment program for safety-related LSS and NRS SSCs as described in Section 13.7.3.3 of the licensee's proposed FSAR Section dated May 21, 2001, as augmented by licensee's information contained in a letter dated January 23, 2001. Specifically, the staff reviewed the procurement process to determine if it contained appropriate methods for the licensee to maintain functionality of replacement safety-related LSS and NRS SSCs under design-basis conditions. The scope of this evaluation did not include an assessment of the

licensee's plans for implementing the procurement process. Review of the details of how the licensee will implement the procurement of safety-related LSS and NRS SSCs was not considered necessary given the conclusion that safety-related SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk. Effective implementation of the procurement process such that the design bases and functionality of replacement safety-related LSS and NRS SSCs are maintained remains the responsibility of the licensee.

As discussed below, the staff determined that each of the five methods described in Section 13.7.3.3 of the licensee's proposed FSAR Section dated May 21, 2001, could be used by the licensee to maintain the functionality of replacement safety-related LSS and NRS SSCs under design-basis conditions. In its review of the methods of the overall procurement process, the staff found that the licensee would apply these methods based on the degree of similarity between the original SSC and the replacement SSC. In each method, the design requirements associated with environmental qualification (temperature and pressure, humidity, chemical effects, radiation, aging, submergence, and synergistic effects) must be addressed by the licensee to ensure functionality of the SSCs. Proposed FSAR Section 13.7.3.3 addresses this aspect of the licensee's proposed treatment program.

As noted above, the scope of the staff's evaluation does not include an assessment of how the licensee would implement these methods. The staff's evaluation of each method is provided below:

Vendor Documentation

Vendor documentation such as catalog information or certificate of conformance could be used to obtain the performance characteristics of the item. The staff concluded that the licensee could use vendor documentation as the basis for reasonable confidence that the replacement safety-related LSS or NRS SSC would remain functional provided that the vendor documentation specifies that the item can perform its function subject to design-basis conditions, including environmental design requirements. If the vendor documentation does not contain this level of detail, then the design requirements could be provided in the procurement specifications. The staff concluded that the vendor's acceptance of the procurement specifications could be used by the licensee to maintain the capability of the replacement safety-related LSS or NRS SSC to perform their safety functions under design-basis conditions.

Equivalency Evaluation

The staff determined that an equivalency evaluation could be used to demonstrate component functionality under design-basis harsh environmental conditions for identical components; however, where the components are not identical, a technical evaluation or other method included in the licensee's program as described in this SE would be necessary. The staff's experience with similarity analysis demonstrates that this type of evaluation is difficult to perform when the component is not 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 qualification testing has shown 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.

STPNOC proposes an equivalency evaluation that it calls a like-for-like replacement. The licensee referenced EPRI report NP-6406 "Technical Evaluation of Replacement Items Guideline," in its August 31, 2000, submittal. The staff determined that the definition contained in EPRI Report NP-6406 for like-for-like replacement is acceptable to demonstrate component functionality under design-basis harsh environmental conditions for identical components. Where the components are not identical, a technical evaluation or other method included in the licensee's program as described in this SE would be necessary.

Technical Evaluation

STPNOC proposes to use a technical evaluation to compare differences between the procured item and the design requirements. STPNOC described the types of evaluations in its letter of January 23, 2001, that could be performed for each environmental design requirement to ensure that the functionality of SSCs is maintained. The staff determined that a technical evaluation that systematically demonstrates that the differences between the original SSC and the replacement SSC in material, size, shape, stressors, aging mechanisms, and functional capabilities does not adversely affect the ability to perform the safety functions of the SSC could be used by the licensee to maintain the capability of the replacement safety-related LSS or NRS SSC to perform their safety functions under design-basis conditions.

Technical Analysis

STPNOC proposes to perform a technical analysis of an SSC where there is a substantial difference between the replacement component and the original component. The type or rigor of the analysis will be determined by engineering judgment to support reasonable confidence of functionality. The staff determined that 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 (EPRI TR-100516, Nuclear Power Plant Equipment Qualification Reference Manual) that electrical equipment often responds and sometimes fails in unexpected ways due to small design changes or material changes. However, technical analysis in combination with necessary supporting test data and other relevant information as described in Section 13.7.3.3 of the licensee's proposed FSAR Section dated May 21, 2001, can be used to demonstrate that the differences in design or materials would not impact the component's functionality when subjected to a design-basis event. To be effective, the technical analysis usually needs to rely on necessary test data and other relevant information as described above to account for substantial differences between the procured item and replacement item to demonstrate functionality under design-basis conditions.

Testing

STPNOC proposes to use a "commercial test" of the component under simulated design-basis conditions for cases where technical analysis is not feasible. While the licensee has not defined how it would implement a "commercial test," the staff determined that component testing that simulates the applicable design-bases environmental conditions could be used by the licensee to maintain the capability of the replacement safety-related LSS or NRS SSC to perform their safety functions under design-basis conditions.

Margins and Documentation

Margins during testing of components are required in 10 CFR 50.49(e)(8) to account for unquantified uncertainty, such as the effects of production variations and inaccuracies in test instruments. The staff determined that these margins, which are in addition to conservatisms that exist in establishing the LOCA profile and assumed normal service conditions such as temperature, radiation, and humidity at the component's installed location, are not necessary for LSS and NRS SSCs. Elimination of margins in the performance of testing for safety-related LSS or NRS SSCs is acceptable to the staff since the test would show that the component is capable of performing its required function, with reasonable confidence when the uncertainty margins are applied. These reduced margins and level of confidence are considered acceptable based on the conclusion that SSCs defined as safety-related LSS or NRS by the licensee's PRA and categorization process do not contribute significantly to risk.

Based on information presented in Attachment 4 of the January 23, 2001, letter, and proposed FSAR Section 13.7.3.3.2, "Procurement Process," dated May 21, 2001, the staff determined that the documentation of the implementation of the above five STP proposed methods for qualification of components is maintained through implementation of the licensee's design and procurement processes. Documentation is also maintained to identify the preventive maintenance needed to preserve the capability of the procured component to perform its safety function under design-basis environmental and seismic conditions for its expected life through implementation of the licensee's maintenance process. The maintenance process also includes the technical basis that will be used for an SSC prior to exceeding its expected life such that the SSC will remain capable of performing its safety function beyond its expected life.

8.5 Conclusion

The staff's evaluation was based on information submitted by STPNOC in a letter dated January 23, 2001, and Section 13.7.3.3 of the proposed FSAR Section dated May 21, 2001.

STPNOC's alternate treatment program requires that the design bases and functionality of these safety-related LSS and NRS SSCs be maintained. The staff reviewed the five methods in the procurement process element to determine if, when effectively implemented, the licensee could maintain functionality of procured safety-related LSS and NRS SSCs to perform their safety function(s) under design-basis environmental conditions. As noted above, the scope of the staff's review did not include how the licensee will implement these methods.

The staff concludes that one, or more, of these methods supported by the relevant elements of the alternate treatment program (such as the procurement process) would provide the licensee with a framework that, if effectively implemented, could result in safety-related LSS and NRS SSCs remaining functional under design-basis environmental conditions. On this basis, the staff has no technical objection to granting an exemption to 10 CFR 50.49(b).

The staff found, as discussed in Section 3.0 of this SE, that the licensee's application of a risk-informed categorization process has identified with a high level of confidence a class of SSCs that have little or no safety significance with respect to protecting the health and safety of the public. The staff also found, as discussed in Section 4.0 of this SE, that the treatment processes described in proposed FSAR Section 13.7.3.3 contain elements and high-level objectives which, if effectively implemented, can result in safety-related LSS and NRS SSCs

being capable of performing their safety functions under design-basis conditions throughout their service life. Further, as stated above, the staff has reviewed the licensee's high-level objective related to the environmental qualification of safety-related LSS and NRS SSCs and concludes that the elements of the treatment process, if effectively implemented, can be sufficient for the licensee to make a technical determination that safety-related SSCs categorized as LSS/NRS will be capable of performing their safety functions under design-basis environmental conditions.

Based on the above findings, primarily on the robust categorization process, the staff concludes that granting the requested exemption from 10 CFR 50.49(b) for LSS and NRS SSCs would pose no undue risk to public health and safety. The categorization process relies, in part, on the ability of these SSCs to perform their safety functions during design-basis events. The elements of the treatment process, if effectively implemented, can result in continued functionality of the LSS and NRS SSCs. As discussed in Section 20.2 of this SE, the staff found that the categorization process was not considered when the requirements of 10 CFR 50.49(b) were adopted and that it is in the public interest to grant an exemption from the special treatment requirements. This satisfies the special circumstance of 10 CFR 50.12(a)(2)(vi). Therefore, the staff has determined that the requested exemption should be granted from 10 CFR 50.49(b).

9.0 EXEMPTION TO 10 CFR 50.55a(f) - ASME SECTION XI FOR INSERVICE TESTING

9.1 Introduction

The regulation at 10 CFR 50.55a(f) requires the performance of IST to assess the operational readiness of the pumps and valves within the scope of the ASME Code. The ASME Code provides specific test provisions and acceptance criteria that are applied to determine operational readiness and demonstrate functional capability. In its submittal, the licensee requests exemption from this regulatory requirement.

The staff's evaluation focused on the elements of the licensee's proposed alternative treatment program for safety-related LSS and NRS SSCs (in this case safety-related pumps and valves) as described in Section 13.7.3.3.5 of the licensee's proposed FSAR Section. Specifically, the staff reviewed the proposed program to determine if it contained necessary programmatic elements that could maintain the capability of LSS and NRS SSCs to perform their safety function under design-basis conditions. The scope of this evaluation does not include an assessment of the licensee's procedures for implementing the program. The staff did not consider review of the details of how the program will be implemented to be necessary based on the staff's finding that safety-related SSCs identified as LSS or NRS by the licensee's categorization process do not contribute significantly to risk as described in Section 3.0 of this SE. Effective implementation of the program such that the design-basis functional capability of LSS and NRS SSCs are maintained is the responsibility of the licensee.

9.2 Exemption Requested

STPNOC requested an exemption from 10 CFR 50.55a(f) to the extent that it imposes the requirements of Section XI of the ASME *Boiler and Pressure Vessel Code* for IST of safety-related LSS and NRS SSCs.

9.3 Discussion

Under the licensee's exemption request, safety-related LSS and NRS pumps and valves would not be subject to the IST requirements of the ASME Code. The licensee would continue to apply system-level testing requirements in accordance with the STP TSs. Sections 13.7.3.3 and 13.7.4.1 of STPNOC's May 21, 2001, proposed FSAR Section provide a general description of the alternate treatment practices that are intended to provide reasonable assurance (albeit lower than safety-related HSS and MSS SSCs) of the functionality of safety-related LSS and NRS SSCs at the design conditions specified in the FSAR.

Specifically, Section 13.7.3.3.5 of STPNOC's May 21, 2001, proposed FSAR Section states:

> The purpose of the inspection, test, and surveillance process for safety-related LSS and NRS SSCs is to obtain data or information that allows evaluation of operating characteristics to support STP's determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions throughout the service life of the SSC. The Station's inspection and test process is primarily addressed and implemented through the Maintenance process. When measuring and test equipment is found to be in error or defective, a determination is made of the functionality of the safety-related SSCs that were checked using that equipment. As stated above, the Maintenance process addresses inspections and tests through corrective, preventive, and predictive maintenance activities. These activities factor in vendor recommendations into the selected approach. STP may use an alternative to these recommendations if there is a technical basis that supports the functionality of the safety-related LSS and NRS SSCs. The basis does not need to be documented.
>
> In the inspection, test, and surveillance process, STP uses standards required by the State of Texas and national consensus commercial standards used at STP for the inspection and testing of SSCs consistent with STP's normal commercial and industrial practices. STP does not need to itemize the standards in use at STP or to perform an evaluation of all national consensus standards.

Section 13.7.4.1 of STPNOC's May 21, 2001, proposed FSAR Section lists examples of other programs used to monitor SSC performance (e.g., Maintenance Rule monitoring, operator rounds, and system engineer reviews as input to the licensee's corrective action program).

9.4 Evaluation

The NRC regulations in 10 CFR 50.55a(f) require that the operational readiness of ASME Code Class 1, 2, or 3 (safety-related) pumps and valves in nuclear power plants to perform their safety function be verified by meeting the IST provisions of the ASME Code. STPNOC has proposed to exclude safety-related pumps and valves categorized as LSS and NRS from the scope of IST required by 10 CFR 50.55a(f).

The staff has reviewed the information contained in the May 21, 2001, revision to the proposed FSAR Section and, for the reasons indicated below, concludes that the licensee's inspection, test and surveillance process, if effectively implemented, can be sufficient for the licensee to make a technical judgment that safety-related pumps and valves categorized as LSS/NRS will be capable of performing their safety functions under design-basis conditions when called upon.

The licensee stated that it would continue to apply system-level testing requirements in accordance with the STP TSs. TS surveillance tests typically assess system functional capability. For example, TS testing during normal plant operation verifies that a particular pump can deliver a flow rate greater than that assumed in the accident analysis but it does not verify this capability under design-basis conditions. In addition, TS surveillance tests do not necessarily provide information regarding age-related degradation of pumps and valves. In contrast, inservice testing assesses the operational readiness of the pump itself through hydraulic performance and vibration levels to detect service-induced degradation. Thus, the pump inservice test, unlike the system TS test, gathers data/information sufficient to conclude that the pump (and system) will perform its safety function under design-basis conditions when it is called upon.

In Section 13.7.3.3.5 of its May 21, 2001, proposed FSAR Section, STPNOC committed to implement an inspection, test, and surveillance process for safety-related LSS and NRS SSCs that would obtain data or information that allows evaluation of operating characteristics to support STPNOC's determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions throughout the service life of the SSC. Inspection, test, and surveillance activities aimed at collecting such data or information can provide an indication that safety-related LSS/NRS pumps and valves will be capable of performing their safety functions under design-basis conditions, because such activities will detect service-induced aging and degradation of safety-related pumps and valves. Therefore, the licensee's proposed inspection, test, and surveillance process, in conjunction with other processes (such as the licensee's corrective action process) can be sufficient for the licensee to make a technical determination that safety-related pumps and valves categorized as LSS/NRS will be capable of performing their safety functions under design-basis conditions when called upon.

The staff notes that performance data obtained for safety-related pumps and valves operating under normal conditions may not be capable of predicting their capability to perform their safety function under design-basis conditions without additional evaluation or analysis. Although the normal operating and design-basis accident conditions may be the same for some components, many pumps and valves perform their safety functions under conditions more severe than normal operating conditions. For example, some power-operated valves must operate in the event of an accident under significantly more severe conditions than typically experienced during normal operation or a surveillance test. In addition, the frequency of testing and the data evaluated during testing must be established such that it can be reasonably concluded that functionality of the component will be maintained throughout the service life of the SSC. This does not mean that components must be tested under design-basis conditions. Testing at design-basis conditions is not practical for many components. However, methods exist for collecting test/performance data at conditions different than design-basis conditions that can be used to reach conclusions regarding component ability to perform their functions under design-basis conditions. Some examples of such methods are described in Regulatory Guide 1.175, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Inservice Testing," and ASME Code Cases (e.g., OMN-1, OMN-4). Thus, the process for ensuring that these safety-related pumps and valves will remain capable of performing their safety function under design-basis conditions on an ongoing basis must include elements such as periodic testing and evaluation of test/performance data sufficient to allow STPNOC to conclude that the pumps and valves will perform their safety function under design-basis conditions throughout the service life of the SSC. Testing may be less rigorous and less frequent than tests performed on similar pumps

and valves categorized as HSS/MSS. The licensee may also group and stagger testing of similar safety-related LSS/NRS pumps and valves in order to share test data and performance trends. To be effective, the licensee would develop the type and frequency of the testing or monitoring of safety-related LSS/NRS pumps and valves to obtain data/information sufficient to conclude that the pump or valve will perform its safety function under design-basis conditions throughout the service life of the SSC.

If properly implemented, the licensee's inspection, test, and surveillance process will be performance-based, in that it will monitor specified attributes of performance and provide data/information that can be used to determine an SSC's ability to perform its safety function at design conditions. Even at reduced levels of implementation, it can provide insights useful to the licensee regarding the effectiveness of the licensee's implementation of other site-wide processes and practices that, in conjunction with the categorization process, form the basis for the staff's granting exemptions to special treatment requirements.

Common-cause problems could result if the licensee failed to address the capability of safety-related LSS and NRS SSCs to perform their safety functions in the event that inspection, test, and surveillance equipment used on those SSCs is found to be defective or out of calibration. The commitment in Section 13.7.3.3.5 of the licensee's May 21, 2001, proposed FSAR Section which states: "When measuring and test equipment is found to be in error or defective, a determination is made of the functionality of the safety-related SSCs that were checked using that equipment," adequately addresses this concern and is acceptable to the staff.

In Section 13.7.4.1 of the May 21, 2001, proposed FSAR Section, STPNOC identifies several other methods that it will use to monitor the performance of LSS/NRS SSCs currently within the scope of their IST program to provide insights in the SSCs performance at design-basis conditions. These methods include Maintenance Rule Program; Corrective Action Program; and feedback from such activities as corrective maintenance, installation of modifications, and conduct of testing. Under the licensee's Maintenance Rule Program, components that affect MSS or HSS functions will be monitored and assessed in accordance with plant, system and/or train performance criteria. The licensee's Corrective Action Program will be used to identify degraded equipment performance or conditions, including conditions identified as a result of operator rounds, system engineer walk-downs, and corrective maintenance activities. Additional indicators of LSS and NRS SSC performance will be obtained from plant activities, such as corrective maintenance, installation of modifications, and conduct of testing. The staff bases its conclusion on the adequacy of the licensee's inspection, testing and surveillance process, in part, on these additional monitoring activities.

9.5 Conclusion

The staff's evaluation was based on information submitted by STPNOC in a letter dated January 23, 2001, and Section 13.7.3.3 of the proposed STP FSAR dated May 21, 2001.

The stated high-level objective of STPNOC's inspection, test, and surveillance process is to obtain data or information that allows evaluation of operating characteristics to support STPNOC's determination that these SSCs will remain capable of performing their safety-related functions under design-basis conditions throughout the service life of the SSC. The scope of this SE did not include an assessment of the licensee's procedures for implementing the stated high-level objective. Review of the details of how this objective will be satisfied to assure that

design-basis functionality of the SSCs will be maintained was not considered necessary based on the staff's finding that safety-related SSCs identified as LSS or NRS by the licensee's categorization process do not contribute significantly to risk as described in Section 3.0 of this SE. Effective implementation of the program, using sound engineering judgment, such that the design-basis functional capability of LSS and NRS SSCs are maintained is the responsibility of the licensee.

The staff found, as discussed in Section 3.0 of this SE, that the licensee's application of a risk-informed categorization process has identified with a high level of confidence a class of SSCs that have little or no safety significance with respect to protecting the health and safety of the public. The staff also found, as discussed in Section 4.0 of this SE, that the treatment processes described in proposed FSAR Section 13.7.3.3 contain elements and high-level objectives that, if effectively implemented, can result in safety-related LSS and NRS SSCs being capable of performing their safety functions under design-basis conditions throughout their service life. Further, as stated above, the staff has reviewed the licensee's high-level objective related to the inspection, test, and surveillance of safety-related LSS and NRS pumps and valves and concludes that the licensee's test activities, in conjunction with the remaining elements of the treatment process, if effectively implemented, can be sufficient for the licensee to make a technical determination that safety-related pumps and valves categorized as LSS/NRS will be capable of performing their safety functions under design-basis conditions when called upon.

Based on the above findings, primarily on the robust categorization process, the staff concludes that granting the requested exemption from 10 CFR 50.55a(f) for LSS and NRS SSCs would pose no undue risk to public health and safety. The categorization process relies, in part, on the ability of these SSCs to perform their safety functions during design-basis events. The inspection, test, and surveillance process, in conjunction with the remaining elements of the treatment process, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions. As discussed in Section 20.2 of this SE, the staff found that the categorization process was not considered when the requirements of 10 CFR 50.55a(f) were adopted and that it is in the public interest to grant an exemption from the special treatment requirements. This satisfies the special circumstance of 10 CFR 50.12(a)(2)(vi). Therefore, the staff has determined that the requested exemption should be granted from 10 CFR 50.55a(f).

10.0 EXEMPTION TO 10 CFR 50.55a(g) - ASME SECTION XI FOR INSERVICE INSPECTION AND REPLACEMENT AND REPAIRS

10.1 Introduction

This section of the SE assesses the licensee's submittal regarding repair and replacement activities and inservice inspection (including preservice, baseline inspections) of ASME Code Class 1, 2, and 3 items of the ASME *Boiler and Pressure Vessel Code* (BPV Code). The review in these areas was primarily based on the licensee's August 31, 2000, submittal that provided a complete revision to its exemption requests and information submitted by the licensee in response to Open Items 10.1 and 10.2 from the staff's draft SE, dated November 15, 2000. Information addressing these Open Items was submitted by STPNOC by letter dated May 8, 2001. Further, the staff used the guidance provided in RG 1.174 in its review. The staff followed the Commission expectation in the portion of the NRC policy statement included in

RG 1.174 that "the use of PRA technology should be increased in all regulatory matters...in a manner that complements the NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy."

In response to Open Items 10.1 and 10.2 from the draft SE, STPNOC revised its requested exemption with respect to the requirements for repair and replacement of LSS and NRS components and associated supports under Section XI of the ASME Code. The staff's evaluation of the revised exemption request is provided below. Based on its review of the revised request, the staff considers Open Items 10.1 and 10.2 closed.

10.2 Exemption Requested

In Section 4.1 of Attachment 1 to its August 31, 2000, submittal, the licensee requested an exemption for safety-related LSS and NRS components from requirements for repair and replacement and inservice inspection (ISI) in ASME BPV Code, Section XI that is incorporated by reference in 10 CFR 50.55a. The licensee explained that:

> [f]or repair and replacement activities, LSS and NRS components would be exempt from ASME Code, Section XI, except that material specifications and the design (design loadings, design methodology, and stress allowables) would be consistent with the original requirements....Post-installation testing would be performed in accordance with ASME Section XI and the requirements of the work package. For inservice inspection...activities, LSS and NRS components would be exempt from the requirements of ASME Section XI.

The licensee provided two clarifications regarding its exemption request in the May 8, 2001, submittal. The first clarification applied to the repair and replacement activities for components (defined to include piping as well as such items as valve, pumps, vessels, etc.) and supports categorized as ASME Code Class 1. The licensee noted that ASME Code Class 1 components are not included within the scope of this exemption request as it concerns repair and replacement activities since such components are also covered by GDC 31, "Fracture Prevention of Reactor Coolant Pressure Boundary," of Appendix A, to 10 CFR Part 50, and no exemption from this GDC is being sought. Therefore, ASME Code Section XI requirements concerning repair and replacement of all ASME Code Class 1 components would still apply.

The second clarification provided by the licensee applied to ASME Code Class 1, 2, and 3 components of nominal pipe size 1 inch (NPS 1) or less. Although such components are included within the licensee's categorization process, the licensee has determined that it will continue to apply the requirements, to the extent that any exist, currently incorporated within the ASME Code for the repair and replacement and ISI of NPS 1 and smaller components. Specifically, STPNOC will continue to take advantage of the current provisions in ASME Section XI that provide relief for ASME Code Class 1, 2, and 3 piping, valves, and fittings of size NPS 1 or smaller, and associated supports.

Section 13.7.2.5 of the proposed STP FSAR describes considerations in the process for categorizing the pressure boundary function of ASME components. In its submittal dated May 21, 2001, the licensee states that pipe supports are assigned the same category as the final pressure boundary category of the highest ranked piping or component within the piping

analytical model in which the support is included. The licensee's categorization process is described in Section 3.0 of this SE.

10.3 Discussion

The NRC regulations in 10 CFR 50.55a provide an acceptable basis for the design, fabrication, inspection, testing, and flaw evaluation of safety-related components (including pipe supports) through the incorporation by reference of the ASME BPV Code and the ASME *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code). The provisions of the ASME Codes were the principal standards included in the Standard Review Plan for judging whether a licensee's design, fabrication, quality standards, inspection and testing of components were adequate. The components were classified in accordance with the function of the system contained in RG 1.26, "Quality Group Classification and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components at Nuclear Power Plants." The safety classifications were consistent with an ASME designation of Code Class 1, 2, and 3. These classifications are used both in the construction and operating phases for a nuclear power plant. Paragraph (g) of 10 CFR 50.55a incorporates by reference ASME Section XI for requirements related to ISI, flaw evaluation, pressure testing, and repair and replacement activities for these components in an operating nuclear power plant. As discussed in the *Federal Register* (64 FR 51370, 51388-89, September 22, 1999), Section XI of the ASME BPV Code requires examinations and tests of active pipe supports (i.e., snubbers) as part of the licensee's ISI program with additional guidance provided in the ASME OM Code for snubber examination and testing.

This section of the SE addresses the STPNOC request for an exemption from the ASME Code requirements incorporated in 10 CFR 50.55a(g) with respect to the repair and replacement of ASME Code Class 2 and 3 components and supports; and ISI of ASME Code Class 1, 2, and 3 components and supports attached to these components. STPNOC's request for an exemption from the requirements of 10 CFR 50.55a related to verification of the active functional capability of snubbers is addressed in Section 4.3.4.5 of this SE as part of the treatment processes to be applied to safety-related LSS and NRS SSCs.

10.3.1 Repair and Replacement Activities

The requested exemption from the requirements of 10 CFR 50.55a(g) would enable STPNOC to replace LSS and NRS ASME Class 2 and 3 components or supports with non-ASME components or supports, subject to ensuring that the material specifications and the design (design loadings, design methodology, and stress allowables) are consistent with the original requirements. In its submittal of May 8, 2001, the licensee also clarified that ASME Code Class 2 and 3 items will also meet the fracture toughness requirements specified in the original design Code.

The licensee explained in Section 4.1.2.2 of Attachment 1 to its August 31, 2000, submittal:

> STP's compliance with the ASME Code was originally established on a system level basis. Therefore, most LSS and NRS components in ASME systems are currently subjected to ASME Code requirements. For LSS and NRS components, STP seeks to re-establish ASME Code class boundaries on a subsystem level basis rather than on a system level basis without prior NRC approval. If this exemption is granted, LSS and

> NRS ASME components may be repaired in accordance with or replaced with non-Code components that meet the technical requirements of a nationally recognized Code, Standard or Specification suitable for that item (e.g., B31.1 series for piping, B16.34 for valves, API 620 for 0-15 psi atmospheric storage tanks or API 650 for other tanks) without prior NRC approval, as the need arises....In addition, STP will conduct post-installation pressure tests in accordance with ASME Section XI. Other additional requirements of ASME Section III, including Subsection NCA*, General Requirements*, would not apply.

The licensee further clarified its position regarding acceptable alternatives for the repair and replacement of LSS or NRS ASME Code Class 2 and 3 components or supports in its submittal dated May 8, 2001. The licensee's submittal included two alternatives similar to those considered in a draft ASME Code Case entitled, "Alternative Repair/Replacement Requirements for Structures, Systems, and Components Classified in Accordance with Risk-Informed Processes." The licensee's proposed alternatives are:

1. The repair or replacement item will meet the technical (but not the administrative) requirements of the ASME Section XI Code and of the ASME Construction Code, as incorporated in Section XI. Administrative requirements of the ASME Section XI Code include QA program, ANI contracts, repair program, replacement program stamping, suitability evaluation, code data reports, records, and documentation. Administrative requirements of the ASME Section III Code are called out in Subsection NCA 'General Requirements' and include Code specific responsibilities, QA programs, authorizations, ANI contracts, and stamping.

2. The repair or replacement item will meet the technical and administrative requirements of other nationally-recognized Codes, Standards, or Specifications suitable for the item. Examples of other nationally-recognized Codes, Standards, and Specifications are: ASME Section VIII for vessels, B31 series for piping, B16.34 for valves, API 620 for 0-15 psi storage tanks, and API 650 for atmospheric storage tanks.

If the affected piping to which a replacement component is connected is categorized as LSS or NRS, the welds will also be subject to the above alternatives. Regardless of which alternative is selected, the boundary (e.g., welds) between HSS/MSS ASME and the LSS/NRS portion of the system will continue to comply with the most limiting applicable code requirements for the associated boundary.

10.3.2 Inservice Inspection Activities

The requested exemption from the requirements of 10 CFR 50.55a(g) would enable STPNOC to remove LSS and NRS ASME Code Class 1, 2, and 3 components and supports from the scope of ISI requirements (including preservice, baseline inspections). This is similar to, but broader than, what has been previously requested under risk-informed inservice inspection (RI-ISI) relief requests consistent with RG 1.178 and ASME Code Case N-577-1 and N-578-1.

10.4 Evaluation

The licensee has stated in its exemption request that the scope of the requested exemption includes the special treatment requirements of 10 CFR 50.55a(g) for the purposes of repair and

replacement and ISI. The staff has separately evaluated the requested exemption as it applies to repair and replacement and ISI activities. The staff's evaluation of the licensee's categorization process is provided in Section 3.0 of this SE.

10.4.1 Repair and Replacement Activities

Regarding ASME Code Section XI repair and replacement requirements, the scope of the licensee's requested exemption includes only ASME Code Class 2 and 3 components and supports categorized as LSS or NRS under the pressure-boundary categorization process discussed in Section 3.5 of this SE. ASME Code Class 1 components and supports categorized as LSS or NRS are not included within the scope of the repair and replacement portion of the exemption request. Based on the pressure-boundary categorization process discussed in Section 3.5 for identifying LSS and NRS components, the staff finds the scope of the exemption requested by STPNOC from the repair and replacement requirements of 10 CFR 50.55(a)(g) to be acceptable.

Regarding the repair and replacement of LSS and NRS ASME Code Class 2 and 3 components and supports, the licensee stated that the design and material requirements for replacement components and supports would be consistent with the original design requirements (see Section 3.3.7.3 of Attachment 1 of the August 31, 2000, submittal). As clarified in the licensee's May 8, 2001, letter, this would include retaining a requirement to obtain fracture toughness or impact test data if, under the ASME Code edition to which the original item was designed, such data were required. Obtaining such data is necessary to provide an appropriate degree of confidence regarding the functionality of the subject replacement components and does not constitute a special treatment requirement. The staff finds that the requirement to obtain fracture toughness or impact test data, as incorporated in the design requirements of the component being replaced, is appropriate.

Further, the licensee intends to procure and replace LSS and NRS ASME Code Class 2 and 3 components and supports to nationally-recognized Codes, Standards, and Specifications, as addressed by alternatives (1) and (2) discussed in Section 10.3 above. As part of the procurement process, the licensee will require the vendor to pressure test a replacement component consistent with the standard to which it is procured. Post-installation testing of the pressure boundary (i.e., installation welds) will be performed consistent with all requirements of the ASME Code if the piping to which the component is attached is HSS or MSS. If the installation welds are categorized as LSS or NRS under the pressure-boundary categorization process discussed in Section 3.5 of this SE, the welds would also be subject to the two repair and replacement alternatives discussed in Section 10.3 above.

The staff finds that, if the treatment processes discussed in Section 4.0 of this SE are effectively implemented (including the use of alternatives 1 or 2, with the fracture toughness/impact testing requirements discussed above), the licensee can determine that the repaired or replaced component or support will remain capable of performing its safety functions under design-basis conditions.

10.4.2 Inservice Inspection

The revised exemption request, provided in the licensee's submittal of August 31, 2000, clarifies that STPNOC proposes to remove LSS and NRS ASME Code Class 1, 2, or 3

components and supports attached to these components from the scope of ISI (including pre-service, baseline inspections) required by 10 CFR 50.55a(g). The staff evaluated this request for exemption against relief previously granted under the RI-ISI programs. The staff considers that the basis for the granting of such inspection relief must rely on the ability of the categorization process to appropriately risk rank the subject components. The staff compared the categorization process proposed by STPNOC for the pressure boundary function of ASME Code Class 1, 2, and 3 components as discussed in Section 3.5 of this SE and the EPRI RI-ISI categorization process that has served as the basis for previous staff approval of RI-ISI relief requests at STP. In this comparison, the staff determined the proposal by STPNOC to assign a risk ranking for attached pipe supports to the same category as the final pressure boundary category of the highest ranked piping or component within the piping analytical model in which the support is included to be acceptable. The staff finds the STPNOC categorization process to be acceptable to reduce the scope of ISI required by 10 CFR 50.55a(g). As noted above, the active functional capability of snubbers categorized as safety-related LSS or NRS components is addressed under the inspection, test, and surveillance process discussed in Section 4.3.4.5 of this SE.

10.5 Conclusion

The staff found that the licensee's application of a risk-informed categorization process has identified a class of SSCs that have little or no safety significance with respect to protecting the health and safety of the public. The staff also found that the proposed treatment processes to be applied to activities associated with LSS and NRS SSCs, as described by the licensee, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions. Given the limited scope of the requested exemptions, the proposed use of alternative repair and replacement processes based on national-consensus Codes, Standards, and Specifications for LSS or NRS, ASME Code Class 2 and 3 components and supports, and on a sufficiently robust categorization process, the staff found that STPNOC will be able to maintain the functionality of these SSCs when performing repair or replacement activities and that LSS and NRS, ASME Code Class 1, 2, and 3 components could be removed from the scope of ISI activities required by 10 CFR 50.55a(g).

Based on these findings, primarily on the robust categorization process, the staff concluded that granting of the requested exemptions from 10 CFR 50.55a(g) for the repair and replacement, and ISI requirements of the ASME Code for LSS and NRS SSCs would pose no undue risk to public health and safety. As discussed in Section 20.2 of this SE, the staff found that the categorization process was not considered when the requirements of 10 CFR 50.55a(g) were adopted and that it is in the public interest to grant an exemption from the special treatment requirements. This satisfies the special circumstance of 10 CFR 50.12(a)(2)(vi). Therefore, the staff determined that the exemptions should be granted from the requirements of 10 CFR 50.55a(g) for LSS and NRS ASME Code Class 1, 2, or 3 SSCs to the extent that the rule defines the scope of SSCs subject to the ASME Code ISI requirements and for LSS and NRS ASME Code Class 2 or 3 SSCs to the extent that the rule defines the scope of SSCs subject to the ASME Code repair and replacement requirements.

11.0 EXEMPTION TO 10 CFR 50.55a(h) - IEEE 279

11.1 Introduction

The regulation at 10 CFR 50.55a discusses the industry codes and standards that are conditions of the licenses for power reactors. The requirements for protection and safety systems in a nuclear power plant are defined in 10 CFR 50.55a(h). For plants with construction permits issued after January 1, 1971, but before May 13, 1999, protection systems must meet the requirements stated in either IEEE Std. 279, "Criteria for Protection Systems for Nuclear Power Generating Stations," (IEEE 279) or IEEE Std. 603-1991, "Criteria for Safety Systems for Nuclear Power Generation Stations," and the correction sheet dated January 30, 1995. In its FSAR, STPNOC is committed to meet IEEE 279-1971. The scope of IEEE 279 states that this standard establishes the minimum safety-related functional performance and reliability requirements for protection systems in a nuclear power plant. Furthermore, the scope states that fulfillment of these requirements does not necessarily establish the adequacy of protective system functional performance and reliability, but failure to fulfill any of these requirements usually indicates system inadequacy.

11.2 Exemption Requested

In its submittal, the licensee requested an exemption from 10 CFR 50.55a(h)(2) to exclude safety-related LSS and NRS SSCs from having to meet the requirements identified in Sections 4.3 and 4.4 of IEEE 279. Section 4.3 of IEEE 279 discusses the quality expected of components and modules and Section 4.4 discusses the equipment qualification expected. The other requirements of IEEE 279, including functional and design requirements, will continue to be applied.

11.3 Discussion

In its submittal, the licensee states that "the quality assurance requirements and environmental qualification requirements in Sections 4.3 and 4.4 of IEEE 279 are not necessary for safety-related LSS and NRS SSCs." The licensee bases this statement on its position that "components that are categorized as LSS and NRS do not significantly contribute to mitigating or preventing accidents." Therefore, STPNOC concludes that "it is not necessary to apply these requirements to satisfy the purpose of these provisions [10 CFR 50.55a(h) as it imposes Sections 4.3 and 4.4 of IEEE 279]."

In its submittal, the licensee states that "in lieu of these requirements [special treatment requirements], STPNOC would apply normal commercial and industrial practices for these components [LSS and NRS], similar to the type of practices applied to the power production side of the plant." Section 13.7.3.3 of the proposed FSAR Section describes the methods of the procurement process element that are used to provide reasonable confidence that safety-related LSS and NRS SSCs can perform their functions under design-basis environmental and seismic conditions. Although not specifically stated by the licensee in relation to 10 CFR 50.55a(h), the licensee has stated that safety-related LSS and NRS SSCs would be designed to satisfy original design requirements (see Sections 2.0 and 3.3.7.3 of Attachment 1 of the August 31, 2000, submittal).

As discussed in Open Item 11.1 of the November 15, 2000, draft SE, the staff requested that STPNOC provide additional information regarding its exemption request from the requirements of 10 CFR 50.55a(h)(2) to the extent that it imposes Section 4.4 qualification requirements of IEEE 279. In response, STPNOC's indicated that the basis for the exemption from the qualification requirements in IEEE 279, as incorporated in 10 CFR 50.55a(h), is the same as the basis for the exemption from the environmental qualification requirements in 10 CFR 50.49. The regulations at 10 CFR 50.55a(h) imposes qualification requirements through Section 4.4 of IEEE 279 independent of the requirements of 10 CFR 50.49. Based on the additional information provided by STPNOC, the staff concluded an exemption from 10 CFR 50.55a(h) was required to the extent that it imposes the requirements of Sections 4.3 and 4.4 of IEEE 279. This closes Open Item 11.1.

11.4 Evaluation

The alternate treatment processes proposed by the licensee to be applied to safety-related LSS and NRS SSCs includes eight elements: Design Control Process; Procurement Process; Installation Process; Maintenance Process; Inspection, Test and Surveillance Process; Corrective Action Program; Management and Oversight Process; and Configuration Process. The staff's overall evaluation of the alternate treatment processes and each of its elements is presented in Section 4.0 of this SE. Other staff evaluations that are relevant to the licensee's requested exemption from 10 CFR 50.55a(h)(2) are contained in Section 7.0 "Exemption to Quality Assurance (QA) Requirements," Section 8.0 "Exemption to 10 CFR 50.49(b) - Environmental Qualification of Electrical Equipment Important to Safety," and Section 18.0 "Exemption to 10 CFR 50.34(b)(10), 10 CFR 50.34(b)(11), and 10 CFR Part 100, Appendix A, Section VI.(a)(1) and (2) - Application to Engineering Design (For Safe Shutdown Earthquake and Operating Basis Earthquake)." Sections 4.0, 7.0, 8.0 and 18.0 identify those elements of the alternate treatment program and QA that, if effectively implemented by the licensee, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety function under design-basis conditions.

The staff's evaluation concerning the requested exemption to 10 CFR 50.55a(h)(2) focused on assessing the requirements set forth in IEEE 279 to determine whether a technical finding could be made that the licensee's proposed alternate treatment program would maintain the design basis and functionality of safety-related LSS and NRS SSCs.

In the introduction of IEEE 279, protection systems are defined as those systems that "encompasses all electric and mechanical devices and circuitry (from sensors to actuation device input terminals) involved in generating those signals associated with the protective function." The signals include "those that actuate reactor trip and that, in the event of a serious reactor accident, actuate engineered safeguards such as containment isolation, core spray, safety injection, pressure reduction, and air cleaning." From the discussion in the introduction of IEEE 279, the underlying purpose of the standard is to impose requirements on those protection systems that protect the reactor or that must function to prevent or mitigate the consequences of reactor accidents.

Section 4.3 of IEEE 279 discusses the quality expected of components and modules and states that: "Components and Modules shall be of a quality that is consistent with minimum maintenance requirements and low failure rates. Quality levels shall be achieved through the specification of requirements known to promote high quality, such as requirements for design,

for the derating of components, for manufacturing, quality control, inspection, calibration and test." Section 4.4 of IEEE 279 discusses the equipment qualification expected and 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." Neither of these sections of IEEE 279 prescriptively describe how the expected quality or qualification are to be achieved. Prescriptive requirements to achieve the expected quality are discussed in 10 CFR Part 50, Appendix B, and environmental and seismic qualification requirements are discussed in 10 CFR 50.49 and 10 CFR Part 100, Appendix A, respectively.

The safety-related electric components currently installed in both STP units were designed, procured, and installed in accordance with the IEEE 279 requirements. Current safety-related electric system design requirements specify environmental and seismic conditions under which the components are required to function. The licensee plans to continue controlling its design change process for all safety-related SSCs (HSS, MSS, LSS and NRS) in accordance with its program found to satisfy the requirements of 10 CFR Part 50, Appendix B, Criterion III, "Design Control" and the requirements of 10 CFR 50.59 (for changes to design requirements).

The regulations at 10 CFR 50.55a(h)(2) imposes quality and qualification requirements independent of any other regulation by imposing the controls of Section 4.3 and 4.4 of IEEE 279. The licensee has stated that safety-related LSS and NRS SSCs will remain functional under design-basis conditions using its proposed alternate treatment processes. In considering whether the licensee's alternate treatment processes maintain the design basis and functionality of safety-related LSS and NRS SSCs, the staff relied upon its review of the requested exemptions from Appendix B to 10 CFR Part 50, 10 CFR 50.49, and Appendix A to 10 CFR Part 100.

The staff determined that, while Section 4.3 of IEEE 279 does not specify how the licensee should achieve the expected quality of safety-related components, the staff's evaluation relative to Appendix B to 10 CFR Part 50 (see Section 7.0 of this SE) determined that, if effectively implemented, the licensee's alternative treatment practices provide a level of quality that can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions. Similarly, while Section 4.4 of IEEE 279 does not specify how the licensee should qualify safety-related components, the staff's evaluation relative to 10 CFR 50.49 and Appendix A to 10 CFR Part 100 (see Sections 8.0 and 18.0 of this SE, respectively) determined that the alternative treatment process, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis seismic and environmental conditions.

11.5 Conclusion

The staff evaluation of the alternate treatment program as related to this exemption is based on information submitted by the licensee in its letter dated January 23, 2001, and Section 13.7.3.3 of the proposed FSAR Section dated May 21, 2001. In considering whether the licensee's alternate treatment program maintains the design basis and functionality of safety-related LSS and NRS SSCs, as it applies to the exemption requested from Section 4.3 of IEEE 279 as imposed by 10 CFR 50.55a(h)(2), the staff relied upon its review of the request for exemption from 10 CFR Part 50, Appendix B, to determine whether the quality of components (Section 4.3 of IEEE 279) would be maintained for safety-related LSS and NRS components. Similarly, the

staff relied on its review of the requests for exemptions from 10 CFR 50.49 and Appendix A to 10 CFR Part 100 to determine whether the environmental and seismic qualification of components required by Section 4.4 of IEEE 279 would be maintained for safety-related LSS and NRS components. In addition, the staff relied upon its review of the alternate treatment program, such as the design control process and procurement process, to make similar determinations.

The licensee's alternate treatment program requires that the design bases and functionality of safety-related LSS and NRS components be maintained. The scope of the staff's review did not include how the licensee will implement the various aspects of the program. Review of the details of how the program will be implemented to assure that design-basis functionality of the SSCs will be maintained was not considered necessary given the conclusion that SSCs identified as LSS and NRS by the categorization process do not contribute significantly to plant risk. Effective implementation of the program such that the design-basis functional capability of LSS and NRS SSCs are maintained is the responsibility of the licensee.

The staff found, as discussed in Section 3.0 of this SE, that the licensee's application of a risk-informed categorization process has identified a class of SSCs that have little or no safety significance with respect to protecting the health and safety of the public. The staff also found, as discussed in Section 4.0 of this SE, that the treatment processes described in proposed FSAR Section 13.7.3.3 contain elements and high-level objectives that, if effectively implemented, can result in safety-related LSS and NRS SSCs being capable of performing their safety functions under design-basis conditions throughout their service life. Further, as discussed in Section 7.0 of this SE, the staff found that sufficient controls for the quality of components (applicable to Section 4.3 of IEEE 279) would be maintained and the staff found, as discussed in Sections 8.0 and 18.0, respectively, that the environmental and seismic qualification of components (Section 4.4 of IEEE 279) would be maintained for safety-related LSS and NRS components.

Based on the above findings, primarily on the robust categorization process, the staff concludes that granting the requested exemption from 10 CFR 50.55a(h)(2) for LSS and NRS SSCs would pose no undue risk to public health and safety. The categorization process relies, in part, on the ability of these SSCs to perform their safety functions during design-basis events. The elements of the treatment process, if effectively implemented, can result in continued functionality of the LSS and NRS SSCs. As discussed in Section 20.2 of this SE, the staff found that the categorization process was not considered when the requirements of 10 CFR 50.55a(h)(2) were adopted and that it is in the public interest to grant an exemption from the special treatment requirements. This satisfies the special circumstance of 10 CFR 50.12(a)(2)(vi). Therefore, the staff has determined that the requested exemption should be granted from 10 CFR 50.55a(h)(2) to the extent that the rule imposes the quality and qualification requirements of Sections 4.3 and 4.4 of IEEE 279.

12.0 EXEMPTION TO 10 CFR 50.59 - CHANGES, TESTS, AND EXPERIMENTS

12.1 Introduction

Under 10 CFR 50.59, requirements were established by which licensees could make changes to their facilities without prior NRC approval. For changes to the facility as described in the FSAR (or to procedures as described in the FSAR), the licensee is to perform an evaluation of

the change to determine whether certain conditions are met – if so, prior NRC approval for the change is required. The purpose of the rule is to ensure that the NRC has the opportunity to review changes of potential significance to the basis for licensing of the facility, before they are implemented. The rule requires licensees to review proposed changes, and if they meet particular criteria (which relate to accident probability or consequences and related aspects), to seek NRC approval prior to implementing the particular change.

As discussed in a rulemaking that revised the 10 CFR 50.59 requirements published on October 4, 1999, (64 FR 53582) the rule was originally established to allow licensees the ability to make certain changes to their facilities, but to preserve the functional requirements and information included in the FSAR of how the facilities, including its SSCs, conform with NRC requirements for design, construction, and operation of the plant. The rule revision was intended to clarify which changes require evaluation (and which changes require prior NRC approval).

12.2 Exemption Requested

STPNOC requested an exemption from the requirements of 10 CFR 50.59 [Paragraphs 50.59(c)(1), 50.59(c)(2) and 50.59(d)(1)] to perform a written evaluation for changes in special treatment requirements for LSS and NRS SSCs. STPNOC further requested an exemption from the requirement to seek prior NRC approval for such changes to the extent that they fall within listed criteria in 10 CFR 50.59.

12.3 Discussion

STPNOC has requested an exemption from 10 CFR 50.59 to the extent that changes to the FSAR, resulting from the revised application of special treatment requirements consistent with the risk-significance categorization process, would not require evaluation in accordance with 10 CFR 50.59 (and, as applicable, receive NRC approval). Section 4.2.1 of Attachment 1 of the August 31, 2000, submittal provides a discussion of the requested exemption from 10 CFR 50.59. Since the FSAR for STP includes descriptions of many of the “special treatment” requirements as presently applied to SSCs, the proposed approach to revise special treatment requirements (included in the licensee's submittal) will result in changes to the FSAR that would fall within the scope of applicability of 10 CFR 50.59. The exemption request does not extend to changes to functional requirements for SSCs that are described in the FSAR. However, the licensee proposed to apply the exemption to 10 CFR 50.59 to other FSAR special treatment provisions that are not directly required by a regulation and therefore for which no exemption request was included within the scope of the staff’s review.

As discussed in the submittal, the licensee indicates that application of the regulation in the particular circumstances would not serve, or is not necessary to achieve, the underlying purpose of the rule. In evaluating the licensee's submittal, the staff reviewed the licensee’s categorization process and the application of the alternative treatment requirements. Through the process of reviewing the requested exemptions from special treatment requirements for LSS or NRS SSCs, the staff has reviewed the basis for the changes to the FSAR that discuss these requirements. Therefore, requiring the licensee to conduct a further evaluation of these changes for the purpose of determining if staff approval is necessary would provide no safety benefit, and is not necessary to achieve the underlying purpose of the rule.

The current requirements for STPNOC are to apply the provisions of 10 CFR 50.59 to changes to the facilities or procedures as described in the FSAR, and to the extent that the criteria for requesting prior NRC approval are met, to obtain prior NRC approval before implementation. The regulation at 10 CFR 50.59 also establishes recordkeeping and reporting requirements for the basis as to why changes did not require prior NRC approval.

12.4 Evaluation

In the licensee's submittal, it requested exemption from several requirements in 10 CFR Parts 21, 50, and 100. These exemption requests are being made to enable STPNOC to apply certain requirements in a graded manner based upon the safety/risk significance of SSCs. The regulations for which exemptions are being sought include “special treatment” requirements, such as qualification, inspection, testing, monitoring and QA requirements, as well as process requirements such as 10 CFR 50.59. The extent of the other exemptions being sought are discussed in other sections of this SE.

The basis for these exemption requests is STPNOC’s proposal to apply a risk categorization approach to determining the level of “treatment” instead of the existing approach outlined in the regulations that focuses upon “safety-related” SSCs (as defined in 10 CFR 50.2) or other defined scopes within the regulations. As part of this overall exemption request, the staff has reviewed the categorization process as well as how treatment requirements will be applied to the different categories of SSC (HSS, MSS, LSS, and NRS) to make its findings regarding the other exemptions being sought.

As noted, the purpose of the requirements in 10 CFR 50.59 is for licensees to assess proposed changes in order to identify when NRC review is needed. As part of the overall exemption review, the staff has reviewed the categorization methodologies used to determine the risk significance of SSCs. Further, the staff has reviewed the elements of the treatment processes proposed by the licensee that would be applicable to the various categories of SSCs. The specific changes to FSAR requirements resulting from use of these processes is part of the implementation process following the granting of the exemptions to the special treatment requirements of 10 CFR Parts 21, 50, and 100. Therefore, requiring an additional review of individual changes to the FSAR with respect to the exemptions from the special treatment requirements, for the purposes of deciding on the need for prior staff approval, is unnecessary in that staff review of the licensee’s processes that will lead to those detailed FSAR changes has been performed through the staff's reviews of the exemption requests. As previously noted, the scope of the exemption requested from 10 CFR 50.59 is only for changes concerning special treatment requirements for SSCs categorized as LSS or NRS. Any other changes to the facility (or procedures) as described in the FSAR, even if they relate to LSS or NRS SSCs, are not exempted from the requirements of 10 CFR 50.59.

The licensee proposed to extend the exemption from the requirements of 10 CFR 50.59 to other special treatment provisions described in the FSAR that are not directly related to those regulations for which an exemption is sought in the submittal. STPNOC goes on further to state that these changes could include changing special treatment as it relates to testing of motor or air operated valves, and inspections of snubbers. Changes to such special treatment provisions in the FSAR reflect changes to commitments to the NRC. As discussed in Section 4.3.3.7 of this SE, the staff concluded that STPNOC should follow the guidance prepared by NEI for managing commitments that was found acceptable to the staff. The staff

has determined that extending the exemption from 10 CFR 50.59 to special treatment provisions of the STP FSAR beyond the special treatment requirements for which the staff may grant exemptions is not appropriate. This limitation is based on the fact that the NEI commitment management process ["Guidelines for Managing NRC Commitments" (NEI-99-04), see ADAMS Accession No. ML003680088, as endorsed by SECY-00-0045, "Acceptance of NEI 99-04, 'Guidelines for Managing NRC Commitments'," see ADAMS ML003679799] provides a structured approach for handling changes to commitments. The process screens out contemplated changes where prior staff review is necessary. The NEI process states that documentation (such as NRC generic communications) pertinent to the change in commitment, should be reviewed to understand the safety basis of the commitments and to determine if the SSC would remain capable of performing its safety function(s). The NEI process also would direct the licensee to pursue regulatory relief from obligations in accordance with existing mechanisms (such as 10 CFR 50.90, 10 CFR 50.12, 10 CFR 2.202, etc.). The staff cannot support an open ended exemption from 10 CFR 50.59 for all special treatment provisions as committed to in the FSAR.

As noted above, the staff concludes that the intent of the underlying regulation (10 CFR 50.59) for prior staff approval of particular changes contained in the submittal is satisfied by the review process being applied to the review of the other exemption requests and the technical basis (i.e., the categorization process and treatment requirements). Thus, application of the rule to the particular instances of changes to specific special treatment as described in the FSAR is not necessary.

On this basis, the staff should approve the requested exemption from the 10 CFR 50.59 requirements for evaluation of proposed changes to the facility or procedures as described in the FSAR with respect to changes to scope of special treatment requirements granted by the exemptions. To the extent that such changes, if they were evaluated under 10 CFR 50.59 would satisfy the criteria in 10 CFR 50.59(c)(2), the licensee should be exempted from the requirement to seek prior NRC approval of such changes. However, as discussed previously, the extent of this exemption should be limited to only those special treatment requirements for which exemptions are granted, and not other special treatment provisions in the STP FSAR.

The staff does not envision, nor has STPNOC suggested, that the changes to special treatment requirements would require any revision to the STP TS. However, to the extent that this is found to be necessary, the licensee is still required to seek NRC approval for any such changes to the TS, notwithstanding the above-mentioned exemption from other aspects of 10 CFR 50.59.

12.5 Conclusion

On the basis of its evaluation, the staff concludes that the STPNOC proposal to exempt changes to the facility or procedures as described in the FSAR from the review requirements established in 10 CFR 50.59, limited to special treatment requirements for which exemptions are granted, does not pose an undue risk to public health and safety. Further, the special circumstances of 10 CFR 50.12(a)(2)(ii) are satisfied in that the underlying purpose of the regulation has been met by the evaluation and review of the licensee's submittal related to the exemption requests from the special treatment requirements of 10 CFR Parts 21, 50, and 100. Therefore, the STPNOC request for such an exemption should be granted in a limited manner. The staff has concluded that extending the exemption from 10 CFR 50.59 to other special

treatment provisions of the STP FSAR is not appropriate and that the staff should place a limit in the 10 CFR 50.59 exemption that the exemption applies only to those changes to the STP FSAR that result from the granting of any other exemption requested from the special treatment requirements of 10 CFR Parts 21, 50, and 100 in the licensee's submittal.

13.0 EXEMPTION TO 10 CFR 50.65(b) - MAINTENANCE RULE SCOPE

13.1 Introduction

In its submittal, STPNOC requested an exemption from 10 CFR 50.65(b). The staff used information provided in the submittal along with information contained in the following documents as a basis for evaluating the exemption request: RG 1.160 Rev. 2, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants;" NUMARC 93-01, Rev. 2, "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants;" and 10 CFR 50.65 - Statements of Consideration.

13.2 Exemption Requested

STPNOC requested an exemption from the requirements of 10 CFR 50.65(b) to exclude LSS and NRS SSCs from the scope of the Maintenance Rule, with the exception that the requirements of 10 CFR 50.65(a)(4) would continue to apply. STPNOC specified in this request that performance would be monitored on a plant/system/train level and it would evaluate failures of LSS and NRS SSCs that caused a Maintenance Rule Functional Failure (MRFF) at the applicable plant/system/train level if the failure results in loss of a HSS or MSS function (refer to the licensee's August 31, 2000, submittal in Attachment 2 and staff Question #14.b response in Attachment 4) (note: MRFF is an STPNOC plant-specific term)

13.3 Discussion

13.3.1 General Description

STPNOC would not apply Maintenance Rule monitoring, goal setting, corrective action, alternate demonstration, or periodic evaluation treatments required by 10 CFR 50.65(a)(1), (a)(2), and (a)(3) to LSS and NRS SSCs. This exemption will apply only to categorized SSCs. STPNOC indicated in response to staff Question #14.c (see Attachment 4 of its August 31, 2000, submittal) that it is not seeking an exemption to the provisions of 10 CFR 50.65(a)(4). STPNOC further clarified that it is not seeking an exemption to the requirements of 10 CFR 50.65(a)(4) for assessing and managing the risk that may result from proposed maintenance activities. This satisfied the staff's concern expressed in Open Item 13.1 in the November 15, 2000, draft SE and the staff considers this item closed.

STPNOC indicated that it would continue to require HSS and MSS SSCs that are currently within the scope of 10 CFR 50.65(b) to remain subject to existing Maintenance Rule requirements. STPNOC also indicated that they would add a requirement that HSS and MSS functions not currently within the scope of 10 CFR 50.65(b) would be added to the scope of the Maintenance Rule.

STPNOC stated it will adopt an alternative treatment program for safety-related LSS and NRS SSCs categorized using the plant specific categorization process as described in Section 3.0 of

this SE. The alternative treatment program includes requirements for monitoring, feedback, and corrective action. This alternative treatment has many similarities to existing Maintenance Rule treatment requirements and utilizes similar performance-based monitoring concepts. The alternative treatment implemented by STPNOC is separate and distinct from the treatment currently required by 10 CFR 50.65.

13.3.2 Characterization of STPNOC Request and Justification

The NRC stated in a question to STPNOC contained in Attachment 3, of STPNOC's August 31, 2000, submittal, that with respect to the Maintenance Rule, there are no requirements to monitor at the component level. STPNOC responded with its reasons for seeking exemption to the Maintenance Rule as stated in its revised response to this NRC question. In its revised response, STPNOC acknowledged that monitoring at the component level is not a requirement for all components. However, STPNOC pointed out that NRC guidance contained in RG 1.160 states that some component level monitoring may be necessary and that a similar NRC statement is contained in the statement of considerations for the Maintenance Rule.

Given these NRC statements, STPNOC believes, as stated in its revised response, that an exemption to 10 CFR 50.65 is necessary to clarify that the Maintenance Rule is not applicable to individual NRS and LSS components. STPNOC clarified, in its revised response, that LSS and NRS SSCs will be monitored at the plant/system/train level, as appropriate, and monitoring of LSS and NRS SSCs consists of tracking MRFF whose failure results in loss of an HSS or MSS function. STPNOC further clarified, in its revised response, that when performance criteria are not satisfied, STPNOC will perform evaluations to determine the cause and corrective action. This will include, as necessary, corrective action for LSS and NRS SSCs.

13.3.3 Discussion about the intent of 50.65(b)

As discussed in its statement of considerations, the Commission developed the Maintenance Rule to require commercial nuclear power plant licensees to monitor the effectiveness of maintenance activities for safety significant plant equipment in order to minimize the likelihood of failures and events caused by the lack of effective maintenance. In developing this rule, the Commission concluded that to maintain safety it is necessary to monitor the effectiveness of maintenance, and take timely and appropriate corrective action, where necessary, to ensure the continuing effectiveness of maintenance for the lifetime of nuclear power plants, particularly as plants age.

When the Maintenance Rule was first proposed in 1988, the matter of scope addressed in this proposed rule suggested that all (safety-related and nonsafety-related) SSCs in a nuclear power plant would be subject to the proposed rule's maintenance requirements. In response to public comment, the Commission subsequently narrowed the scope for nonsafety-related SSCs covered by the final Maintenance Rule because not all of these SSCs had the same safety significance. Accordingly, the scope of the final rule described in 50.65(b)(2) was modified to include only those nonsafety-related SSCs whose failure could most directly threaten public safety. The Commission concluded that it was well within its statutory jurisdiction in requiring that all SSCs that can significantly affect safety, including nonsafety-related SSCs, be properly maintained. The Commission retained the requirement to include all safety-related SSCs within the scope of the rule.

The Commission provided additional guidance in the statement of consideration that the extent of monitoring may vary from system to system depending on the system's importance to plant risk. Some monitoring at the component level may be necessary; however, it is envisioned that most of the monitoring could be done at the plant, system, or train level.

13.3.4 Other relevant facts or factors

13.3.4.1 Selection of Plant SSCs

As stated, in RG 1.160, the staff endorsed the methods described in Revision 2 of NUMARC 93-01 as acceptable for complying with the provisions of 10 CFR 50.65. Section 8.2.1 of NUMARC 93-01 provides screening criteria to determine which SSCs are within the scope of the Maintenance Rule. The guideline recognizes that safety systems may perform not only safety functions but also other functions that have no safety significance. The guideline states that it is necessary to document the functions for both safety and nonsafety SSCs that cause the SSCs to be within the scope of the Maintenance Rule. The guideline explains that this information is needed because (identification of) the function(s) that the system or structure provides is needed so all failures can be evaluated against those functional aspects. This information is also needed because not all failures that cause a loss of some function are functional failures under the Maintenance Rule, because the function lost may not be within the scope of the Maintenance Rule.

13.3.4.2 Function Versus System

RG 1.160 states that licensees may use a functional basis to determine which SSCs must be monitored within the scope of the rule. That is, the licensee may determine all the functions performed by the SSCs and include within the scope of the rule only those functions, and the associated SSCs that fulfill those functions, that meet the scoping criteria of the rule. The STPNOC response to staff Question #14.b (see Attachment 4 of the August 31, 2000, submittal) indicates that it currently uses a functional basis for Maintenance Rule scope determinations and that STPNOC will add HSS and MSS functions to the scope of the Maintenance Rule.

13.3.4.3 Comparison of 10 CFR 50.65(b) Scope and STPNOC Risk Determination Process Scope

In response to staff Question #28 (see Attachment 4 of the August 31, 2000, submittal), STPNOC stated that its categorization process (plant specific risk significance determination process) encompasses all SSCs covered by the Maintenance Rule scope as described in 10 CFR 50.65(b) and the associated industry guidance.

13.3.4.4 Evaluating SSCs Against Risk Significance and Performance Criteria

Guidance contained in Section 9.3.3 of NUMARC 93-01 describes a method for complying with 10 CFR 50.65(a)(2) by demonstrating that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance such that the SSC remains capable of performing its intended function. A method referred to as "run-to-failure" allows licensees to perform corrective maintenance rather than preventive maintenance if SSCs (can be shown to) provide little or no contribution to system safety function.

13.3.4.5 SSCs Outside the Scope of the Maintenance Rule

Section 8.2.1.6 of NUMARC 93-01, states, in part, that SSCs that are outside the scope of the Maintenance Rule will continue to have appropriate maintenance activities performed on them. For these SSCs, the degree of maintenance attention will be dependent upon factors such as the consequence of SSC failure on power production and economic performance.

13.4 Evaluation

The provisions in 10 CFR 50.65 were intended, in part, to require that licensees establish a monitoring regime that is sufficient in scope to provide reasonable confidence that intended safety, accident mitigation, and transient mitigation functions within the scope of the rule can be performed. The rule was intended to allow flexibility in developing monitoring activities and allowed that monitoring would vary depending on safety significance. Industry guidelines endorsed by the staff contain provisions to allow for the reduction of preventive maintenance activities for SSCs that can be shown to provide little or no contribution to safety.

The staff evaluated the consequence of excluding LSS and NRS SSCs from scope of the Maintenance Rule. Information provided by the licensee in the submittal sufficiently describes a risk-informed categorization process that can identify a class of SSCs (LSS and NRS) that have little or no safety significance (refer to Section 3.0 of this SE). The staff determined that the elements considered in this process are comparable to the elements described in 10 CFR 50.65(b). The overall STPNOC process provides for adequate oversight to validate and recognize changes in safety significance and degradation in SSCs in the LSS and NRS class of SSCs. Provisions are contained in the STPNOC's process to require corrective action according to 10 CFR 50.65 when LSS or NRS SSCs cause the loss of HSS or MSS functions. STPNOC will implement corrective action and monitoring programs for LSS and NRS SSCs (refer to Section 7.0 of this SE). While the Commission retained within the scope of the Maintenance Rule all safety-related SSCs, the underlying purpose of the rule is to require the monitoring of the effectiveness of maintenance for those SSCs that are risk significant (important to the protection of public health and safety). The Commission, in implementing the rule, provided for flexibility in establishing and modifying licensee monitoring activities. As such, alternative approaches to identifying the scope of SSCs under the rule should be considered. The licensee has proposed an alternative for defining the scope of SSCs subject to the Maintenance Rule through the application of its categorization process. As discussed in Section 3.0 of this SE, the staff has concluded the licensee categorization process is an acceptable method for refining the scope of SSCs subject to special treatment requirements.

13.5 Conclusion

The staff found that the licensee's application of a risk-informed categorization process has identified a class of SSCs that have little or no safety significance with respect to protecting the health and safety of the public. The staff also found that the proposed treatment processes to be applied to activities associated with LSS and NRS SSCs, as described by the licensee, specifies planned and systematic actions that if effectively implemented provide a basis for sufficient confidence that the exempted SSCs would perform satisfactorily in service. Further, the staff found that STPNOC's categorization process considered elements comparable to the elements described in 10 CFR 50.65(b). Also, the staff found that the licensee was not seeking to include within the scope of its exemption request the requirements of 10 CFR 50.65(a)(4).

Based on these findings, the staff concluded that granting of the requested exemptions from 10 CFR 50.65(b) to the extent it defines the scope of SSCs subject to the requirements of 10 CFR 50.65 [except 10 CFR 50.65(a)(4) continues to apply], for LSS and NRS SSCs would pose no undue risk to public health and safety. As discussed in Section 20.2 of this SE, the staff found that the categorization process was not considered when the requirements of 10 CFR 50.65(b) were adopted and that it is in the public interest to grant an exemption from the special treatment requirements. This satisfies the special circumstance of 10 CFR 50.12(a)(2)(vi). Therefore, the staff determined that the exemptions should be granted from 10 CFR 50.65(b) to the extent it defines the scope of SSCs subject to the requirements of 10 CFR 50.65 [except 10 CFR 50.65(a)(4) continues to apply], as requested by STPNOC.

14.0 EXEMPTION TO 10 CFR PART 50, APPENDIX A, GDC 2 - DESIGN BASES FOR PROTECTION AGAINST NATURAL PHENOMENA

14.1 Introduction

Appendix A to 10 CFR Part 50 discusses the principal design criteria that establish the necessary design, fabrication, construction, testing, and performance requirements for SSCs important to safety. GDC 2 of 10 CFR Part 50, Appendix A, discusses the design bases for protection against natural phenomena. In its submittal, the licensee requests an exemption to exclude safety-related SSCs classified as LSS and NRS from the requirements of GDC 2.

14.2 Exemption Requested

STPNOC requests an exemption to exclude safety-related LSS and NRS SSCs from the scope of SSCs important to safety under GDC 2, to the extent that GDC 2 requires tests and inspections to demonstrate that SSCs are designed to withstand the effects of natural phenomena without loss of capability to perform their safety functions.

14.3 Discussion

In Attachment 2 to its August 31, 2000, submittal, the licensee proposes that safety-related LSS and NRS SSCs not be required to be maintained in a qualified condition under GDC 2 and that these SSCs be allowed to be replaced with SSCs that are not qualified under GDC 2. The licensee indicates that these SSCs, as applicable under GDC 2, would be designed to withstand the effects of natural phenomena without loss of capability to perform their safety function. The licensee states that its design and procurement processes proposed for these SSCs would achieve the requirement. The licensee's design and procurement processes are discussed in Section 4.0 of this SE.

In its technical justification for the proposed exemption, the licensee indicates that its proposed design requirements ensure that SSCs important to safety can perform their safety function during and following a design-basis event. The licensee then indicates that SSCs classified as LSS and NRS do not involve the performance of any risk-significant function and that it is unnecessary to maintain the qualification of such components or to replace them with qualified components to meet the intent of the regulations.

14.4 Evaluation

On page 6 in Attachment 2 to its August 31, 2000, submittal, the licensee requests an exemption to the requirements of GDC 2 for maintaining safety-related LSS and NRS SSCs in a qualified condition. The licensee further indicates that these SSCs will be designed to withstand the effects of natural phenomena without loss of capability to perform their safety function. GDC 2 states:

> Structures, systems, and components important to safety shall be designed [emphasis added] to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. The design bases for these structures, systems, and components shall reflect: (1) Appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena and (3) the importance of the safety functions to be performed.

In its exemption request, the licensee has not proposed any change to the design basis for natural phenomena. The licensee's statement in Attachment 2 of its August 31, 2000, submittal that safety-related LSS and NRS SSCs will be designed to withstand the effects of natural phenomena without loss of capability to perform their safety function appears to be consistent with the requirements of GDC 2. The licensee's statement indicates that current design inputs (e.g., the same seismic input used in the evaluation of HSS and MSS SSCs) will be used for the evaluation of safety-related LSS and NRS SSCs and would continue to be designed to remain functional under design-basis natural phenomena conditions. This satisfies the requirements of GDC 2 in that the regulation requires components to be designed to withstand natural phenomena and is not prescriptive in how it must be satisfied.

14.5 Conclusion

The staff concludes that an exemption from GDC 2 is not necessary because safety-related LSS and NRS SSCs will continue to be designed in accordance with the requirements of GDC 2. Therefore, the NRC should deny the licensee's exemption request from the requirements of GDC 2.

15.0 EXEMPTION TO 10 CFR PART 50, APPENDIX A, GDC 4 - ENVIRONMENTAL AND DYNAMIC EFFECTS DESIGN BASES

15.1 Introduction

GDC 4 of 10 CFR Part 50, Appendix A, requires SSCs important to safety to be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including LOCAs. GDC 4 also requires that these SSCs be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit.

15.2 Exemption Requested

In its submittal, the licensee requested an exemption from GDC 4 of 10 CFR Part 50, Appendix A, for important to safety components that have been categorized as LSS or NRS in accordance with the licensee's categorization process to the extent that GDC 4 requires inspection and testing to demonstrate that SSCs are able to withstand environmental effects.

15.3 Discussion

In Attachment 2 of its August 31, 2000, submittal, the licensee proposed that should the exemption to GDC 4 be granted (1) important to safety LSS and NRS components would not be required to be maintained in a qualified condition pursuant to GDC 4, (2) important to safety LSS and NRS components could be replaced with components that are not qualified pursuant to GDC 4, (3) important to safety LSS and NRS components, as applicable pursuant to GDC 4, would be designed to withstand applicable environmental effects, (4) normal commercial and industrial design and procurement controls would be applied to achieve the GDC 4 requirement that important to safety LSS and NRS components are designed to withstand environmental effects, and (5) GDC 4 requirements with respect to dynamic effects would continue to be applicable.

Although not specifically stated by the licensee in relation to GDC 4, the licensee has stated that safety-related LSS and NRS SSCs would be designed to satisfy original design requirements (see Sections 2.0 and 3.3.7.3 of Attachment 1 of the August 31, 2000, submittal). Included within the original design is the requirement that SSCs shall be designed in accordance with GDC 4 to withstand environmental effects. Further, in Section 3.3.7.4 of Attachment 1 of its August 31, 2000, submittal, the licensee states that procurement evaluations “ensures that the original design inputs and assumptions for the SSC have been properly factored in.” The staff's evaluation of the licensee’s design and procurement processes are discussed in Section 4.0 of this SE.

In the technical justification for the exemption to GDC 4 in Attachment 2 of its August 31, 2000, submittal, the licensee indicates that SSCs classified as LSS and NRS do not involve the performance of any risk-significant function and that “it is not necessary to maintain such equipment in a qualified condition or to replace such components with qualified components in order to meet the intent of GDC 4.”

15.4 Evaluation

The staff evaluated the licensee’s request for an exemption from the requirements of 10 CFR Part 50, Appendix A, GDC 4, for important to safety LSS or NRS SSCs. As described below, the staff concludes that the requirements for which an exemption has been requested are not within the scope of GDC 4. There is no apparent need for an exemption. Therefore, the STPNOC request for an exemption should not be granted.

The licensee requested an exemption from GDC 4 to the extent that GDC 4 requires inspection and testing to demonstrate that SSCs are able to withstand environmental effects. GDC 4 specifies only that SSCs shall be designed [emphasis added] to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including LOCAs. GDC 4 does not specify that

SSCs shall be subject to inspection and testing to ensure SSCs are able to withstand environmental effects. The STPNOC exemption request, consistent with the conditions of GDC 4, states that important to safety LSS and NRS SSCs would be designed to withstand applicable environmental effects. The licensee's statement indicates that current design inputs (e.g., the same environmental condition used in the evaluation of HSS and MSS SSCs located in the same or similar environments) will be used for the design of safety-related LSS and NRS SSCs. This satisfies the requirements of GDC 4 in that the regulation requires components to be designed to withstand environmental effects and is not prescriptive in how it must be satisfied.

15.5 Conclusion

The staff concludes that an exemption from GDC 4 is not necessary because LSS and NRS safety-related SSCs will continue to be designed in accordance with the requirements of GDC 4. Therefore, the NRC should deny the licensee's exemption request from the requirements of GDC 4.

16.0 EXEMPTION TO 10 CFR PART 50, APPENDIX A, GDC 18 - INSPECTION AND TESTING OF ELECTRICAL POWER SYSTEMS

16.1 Introduction

GDC 18 of 10 CFR Part 50, Appendix A, requires that electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards, to assess the continuity of the systems and the condition of their components. GDC 18 also requires that the systems shall be designed with a capability to test periodically (1) the operability and functional performance of the components of the systems, such as onsite power sources, relays, switches, and buses, and (2) the operability of the systems as a whole and, under conditions as close to design as practical, the full operation sequence that brings the systems into operation, including operation of applicable portions of the protection system, and the transfer of power among the nuclear power unit, the offsite power system, and the onsite power system.

16.2 Exemption Requested

In its submittal, the licensee requested an exemption from GDC 18 for important to safety electric components that have been categorized as LSS or NRS in accordance with the licensee's categorization process to the extent that GDC 18 requires that inspection and testing be performed for individual features, such as wiring, insulation, connections, switchboards, relays, switches, and buses. The licensee proposed that should the exemption be granted: (1) the individual LSS and NRS components within the electrical power systems would not be required to be inspected or tested; (2) system functional tests would still be required in accordance with GDC 18; and (3) normal commercial and industrial practices would be applied to ensure functionality of important to safety LSS and NRS SSCs.

16.3 Discussion

In Attachment 2 of its August 31, 2000, submittal, the licensee states that should the exemption to GDC 18 be granted, "[i]ndividual LSS and NRS components within the electrical power

systems would not be required to be inspected or tested [based on GDC 18 requirements]; [s]ystem functional tests would still be required in accordance with GDC 18; and [a]dditionally, Section 3.3.7 of Attachment 1 [of its August 31, 2000, submittal] identifies other controls that would be applied to ensure the functionality of LSS and NRS components."

Although not specifically stated by the licensee in relation to GDC 18, the licensee has stated that safety-related LSS and NRS SSCs would be designed to satisfy original design requirements (see Sections 2.0 and 3.3.7.3 of Attachment 1 of the August 31, 2000, submittal). Included within the original design is the requirement that SSCs shall be designed to provide for periodic inspection and testing in accordance with GDC 18.

In the technical justification for the exemption to GDC 18 in Attachment 2 of its August 31, 2000, submittal, the licensee indicates that the provisions described in its submittal "ensure that Electric Power Systems and important components within these systems can perform their safety function." The licensee then indicates that SSCs classified as LSS and NRS do not involve the performance of any risk-significant function and that "it is not necessary to inspect or test these components to satisfy the purpose of these provisions [GDC 18]."

16.4 Evaluation

The staff evaluated the licensee's request for an exemption from the requirements of 10 CFR Part 50, Appendix A, GDC 18, for important to safety LSS or NRS SSCs. As described below, the staff concludes that the requirements to which an exemption has been requested are not within the scope of GDC 18. There is no apparent need for an exemption. Therefore, the STPNOC request for an exemption should not be granted.

The licensee requested an exemption from GDC 18 to the extent that GDC 18 requires that inspection and testing be performed for individual features, such as wiring, insulation, connections, switchboards, relays, switches, and buses. GDC 18 specifies that electric power systems important to safety shall be designed [emphasis added] to permit appropriate periodic inspections and testing of important areas and features, such as wiring, insulation, connections, and switchboards to assess the continuity of the systems and the condition of their components. GDC 18 further specifies that the systems shall be designed [emphasis added] with a capability to test periodically the operability and functional performance of the components of the systems, such as onsite power sources, relays, switches, and buses. GDC 18 does not specify that inspection and testing shall be performed for individual features. GDC 18 limits itself to the requirement that the individual features shall be designed [emphasis added] to permit appropriate periodic inspections and testing to ensure their operability.

The licensee has stated that safety-related LSS and NRS SSCs would be designed to satisfy original design requirements. The licensee's statement indicates that current design inputs (e.g., the capability to perform periodic inspections and testing) will be used for the design of safety-related LSS and NRS SSCs. This satisfies the requirements of GDC 18 in that the regulation requires components to be designed to be capable of periodic inspections and testing, but is not prescriptive in how it must be satisfied.

16.5 Conclusion

The staff concludes that an exemption from GDC 18 is not necessary because LSS and NRS safety-related SSCs will continue to be designed in accordance with the requirements of GDC 18. Therefore, the staff should deny the licensee's exemption request from the requirements of GDC 18.

17.0 EXEMPTION TO 10 CFR PART 50, APPENDIX J, OPTION B, SECTION III.B - TYPE C TESTING

17.1 Introduction

Under 10 CFR 50.54(o) primary reactor containments for water cooled power reactors shall be subject to the requirements set forth in 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." The purpose of 10 CFR Part 50, Appendix J, is to ensure that the containment is and remains "an essentially leak tight barrier" as set forth in 10 CFR Part 50 Appendix A, GDC 16, "Containment Design."

On September 26, 1995, the NRC issued Option B, "Performance-Based Requirements," to 10 CFR Part 50, Appendix J. Option B is a performance-based approach to containment leak rate testing. By letter dated August 13, 1996, the NRC approved the implementation of a primary reactor containment leakage rate testing program in compliance with 10 CFR Part 50, Appendix J, Option B for STP.

In its exemption request, STPNOC submitted for staff review an exemption from 10 CFR Part 50, Appendix J, Option B, Section III.B. This request would exempt certain containment isolation valves from the Type C leakage rate test. The licensee states that these containment isolation valves meet certain criteria, given in the response to staff Question #16 (see Attachment 4 of the licensee's August 31, 2000, submittal), that qualify them for an exemption. Examples of these containment isolation valves are provided in the table accompanying the licensee's response to staff Question #16.

Type C tests are defined in 10 CFR Part 50, Appendix J, as "tests intended to measure containment isolation valve leakage rates." The containment isolation valves specified in 10 CFR Part 50, Appendix J, as subject to a Type C test that are applicable to pressurized-water reactors (PWRs) such as STP are those that either,

1. provide a direct connection between the inside and outside atmospheres of the primary reactor containment under normal operation, such as purge and ventilation, vacuum relief, and instrument valves;

2. are required to close automatically upon receipt of a containment isolation signal in response to controls intended to effect containment isolation, or

3. are required to operate intermittently under post-accident conditions.

In addition to the licensee's submittal, the staff used the following additional sources in reviewing the licensee's exemption request:

1. 10 CFR 50.12, "Specific Exemptions"

2. 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors"

3. M. Dey, et al., "Performance Based Containment Leak-Test Program," NUREG-1493, September 1995

4. Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants LWR Edition Section 6.2.4, "Containment Isolation System," NUREG-0800 dated July 1981

5. "Risk Impact Assessment of Revised Containment Leak Rate Testing Intervals," EPRI TR-104285 Electric Power Research Institute, dated August 1994

6. NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants; Final Summary Report," dated December 1990

7. Regulatory Guide 1.163, "Performance-Based Containment Leak Testing Program," dated September 1995

The staff's evaluation of the licensee's proposed exemption is given below.

17.2 Exemption Requested

As stated above, the licensee's request would exempt from Type C testing those containment isolation valves that satisfy a set of proposed criteria. Examples of containment isolation valves that are included within the scope of the exemption request are identified in the table accompanying the licensee's response to staff Question #16 in Attachment 4 of the August 31, 2000, submittal. Type C testing is required by 10 CFR Part 50, Appendix J, Option B, Section III.B.

Also required by 10 CFR Part 50, Appendix J, Option B, Section III.B, is that "the sum of the leakage rates at accident pressure of Type B tests[2] and pathway leakage rates from Type C tests, must be less than the performance criterion (L_a[3]) with margin, as specified in the Technical Specifications." The licensee, in response to a staff question, has stated that "STP does not plan to revise the allowable leakage values contained in the Technical Specifications ... Those penetrations which have been removed from 10 CFR Part 50, Appendix J, scope by this exemption request will be assumed to contribute zero leakage..." Since the cumulative total applies only to leakage from those leak tests that are performed and not the leakage rate from each penetration, there is no need for an exemption from this requirement.

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[2] A Type B test is a test intended to detect local leaks and to measure leakage across each pressure containing or leakage limiting boundary for penetrations other than containment isolation valves, e.g., air locks, electrical penetrations, piping fitted with expansion bellows, etc.

[3] L_a is defined in 10 CFR Part 50, Appendix J, as the maximum allowable leakage rate at the calculated peak containment internal pressure related to the design-basis LOCA as specified in the TSs.

The STP TS 6.j, "Containment Leakage Rate Testing Program," requires that the total Type B and Type C leakage rate be less than $0.6L_a$ for the first startup following testing. Since the total applies only to leakage from those leak tests that are performed and not the leakage rate from every penetration, no TS change is required.

Section 6.0 of Attachment 1 of the licensee's August 31, 2000, submittal addresses special circumstances that must be present in order for the NRC to grant an exemption from the regulations. The licensee has not specified a particular special circumstance as applicable to this exemption from 10 CFR Part 50, Appendix J, Option B, Section III.B. Rather, the licensee has identified several special circumstances applicable to the entire proposal that includes exemptions from other sections of 10 CFR Parts 21, 50, and 100. In order to grant exemptions pursuant to 10 CFR 50.12, special circumstances must be present. The staff, as discussed in Section 17.4 of this SE, finds that the leakage is low enough (essentially leak tight) so that there is not a significant risk to the public. Further, in Section 20.2 of this SE, the staff concluded that the licensee has provide a material circumstance (the categorization process) that was not considered when 10 CFR Part 50, Appendix J, was adopted, and that it is in the public interest to grant exemptions from the special treatment requirements. This satisfies the special circumstance provision of 10 CFR 50.12(a)(2)(vi).

17.3 Discussion

The attributes of the containment leakage testing program for STP are determined by the requirements of TS 6.8.3.j, "Containment Leakage Rate Testing Program," that requires a program to leak test the primary containment as required by 10 CFR 50.54(o) and 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions. The STP TS further require that this program be in accordance with the guidelines of RG 1.163, "Performance-Based Containment Leak Testing Program," dated September 1995.

The licensee's proposed exemptions will revise the licensing basis only by exempting certain identified containment isolation valves from Type C testing. As stated in Attachment 2 of the August 31, 2000, submittal under "Scope of Exemption," for 10 CFR Part 50, Appendix J, Option B, Section III.B, the licensee states, in part, that "[c]umulative limits for containment leakage would be based upon the tested components, with the assumption that the exempted components contribute zero leakage."

The licensee has not proposed an alternative to the leakage rate testing required by 10 CFR Part 50, Appendix J. In response to staff Question #34 (see Attachment 4 of the August 31, 2000, submittal), the licensee stated that "[f]or LSS and NRS components [which includes the containment isolation valves for which the licensee is requesting an exemption]...leak testing is not required...The reliability strategy is to monitor and restore component functions once they are identified through the corrective action program or the periodic feedback process."

The licensee is proposing that those valves that satisfy the following criteria should be exempt from Type C testing:

1. The valve has been categorized as LSS or NRS.

2. The valve meets one or more of the following criteria:

a. The valve is required to be open under accident conditions to prevent or mitigate core damage events.

b. The valve is normally closed and in a physically closed, water filled system.

c. The valve is in a physically closed system whose piping pressure rating exceeds the containment design pressure rating and that is not connected to the reactor coolant pressure boundary.

d. The valve is in a closed system whose piping pressure rating exceeds the containment design pressure rating, and is connected to the reactor coolant pressure boundary. The process line between the containment isolation valve and the reactor coolant pressure boundary is non-nuclear safety (i.e., the valve itself would have been classified as non-nuclear safety were it not for that fact that it penetrates the containment building).

e. The valve size is 1-inch NPS or less (i.e., by definition the valve failure does not contribute to large early release).

17.4 Evaluation

The primary reactor containment is considered an important barrier to the release of radioactivity from the reactor to the environment. The leakage rate limit, L_a, of 10 CFR Part 50, Appendix J, is used in safety analyses to ensure that the dose guidelines of 10 CFR Part 100 (for offsite releases) and GDC 19 (for the control room dose) are met for the design-basis accidents. The leak rate testing required by 10 CFR Part 50, Appendix J, provides reasonable confidence that these leak rate limits of the STP TSs will not be exceeded for the design-basis accidents.

The licensee is proposing an exemption from 10 CFR Part 50, Appendix J, Option B, Section III.B, so that certain containment isolation valves will not be Type C leak rate tested. The licensee states that these valves meet criteria 1 and one or more of the criteria 2.a through 2.e listed above and in the licensee's response to staff Question #16. Examples of the valves to be included within the scope of the exemption are identified in a table in the same response.

The staff has reviewed these criteria and finds that they are reasonable in that even without Type C testing, the probability of significant leakage during an accident (that is, leakage to the extent that public health and safety is affected) is small, even though some of the valves being exempted are fairly large (e.g., the 12-inch and 16-inch valves carrying component cooling water into and out of the containment). The staff has also reviewed the licensee's application of the proposed criteria to a sample of various containment isolation valves and concludes that the licensee has applied the criteria correctly.

Appendix J of 10 CFR Part 50 deals only with leakage rate testing of the primary reactor containment and its penetrations. It assumes that containment isolation valves are in their safe position. No failure is assumed that would cause the containment isolation valves to be open when they are supposed to be closed. The valve would be open if needed to transmit fluid into or out of containment to mitigate an accident or closed if not needed for this purpose. If open to mitigate an accident, it is assumed for the purposes of this evaluation to be capable of being closed, if necessary, to perform its containment isolation safety function, when not required to

be in the open position to mitigate the accident. Testing to ensure the capability of containment isolation valves to reach their safe position is not within the scope of 10 CFR Part 50, Appendix J, and as such is not within the scope of this review. Therefore, the valves addressed by this exemption are considered to be closed, but may be leaking.

The licensee indicates that it is not credible for the set of penetrations that meet the licensee's criteria for an exemption from Type C leak rate testing to have leakage paths that "would threaten public health and safety" (response to staff Question #16 in Attachment 4 of the August 31, 2000, submittal). The staff finds that the increase in risk due to granting this exemption is negligible. Our reasons are discussed below.

Past studies, e.g., NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants; Final Summary Report," dated December 1990, show that the overall reactor accident risks are not sensitive to variations in containment leakage rate. This is because reactor accident risk is dominated by accident scenarios in which the containment either fails or is bypassed. Such very low probability scenarios dominate predicted accident risks due to their high consequences.

The staff examined in more detail the effect of containment leakage on risk as part of the 10 CFR Part 50, Appendix J, Option B, rulemaking. The results of these studies are applicable to this exemption request.

NUREG-1493, "Performance-Based Containment Leak-Test Program," dated September 1995, calculated the containment leakage necessary to cause a significant increase in risk and found that the leakage rate must typically be approximately 100 times the TS leak rate L_a. However, in the NUREG-1150 risk study, on which the NUREG-1493 calculations are based, L_a is 1 weight-% per day. The STP TSs specify an L_a value of 0.3 weight-% per day so that the factor would be approximately 300 rather than 100. It is improbable that even the leakage of multiple valves included in the licensee's exemption request would exceed this amount. Operating experience shows that most measured leaks are much less than 100 times L_a.

A more direct estimate of the increase in risk for the licensee's proposed exemption to 10 CFR Part 50, Appendix J, can be obtained from the EPRI report TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing Intervals," dated August 1994. This report examined the change in the baseline risk [as determined by the plant's Independent Plant Examination (IPE) risk assessment] due to extending the leakage rate test intervals.

For the PWR large dry containment examined in the EPRI report (STP Units 1 and 2 both have large dry containments), the percent increase in baseline risk from extending the Type C test interval from 2 years to 10 years was less than 0.1 percent. While this result was for a test interval of 10 years vs. the licensee's proposal to do no more Type C testing of the exempted valves for the life of each unit, the analysis may reasonably apply to this situation since it contains several conservative assumptions which offset the 10-year time interval. These include,

1. The study used leakage rate data from operating plants. Any leakage over the plant's administrative leakage limit was considered a leakage failure. An administrative limit is the utility's internal limit and does not imply violation of any 10 CFR Part 50, Appendix J, limits. Therefore, the probability of a leakage failure is overestimated.

2. Also, failure of one valve to meet the administrative limit does not imply that the penetration would leak because containment penetrations have redundant isolation valves. While one valve may leak, the other may remain leak-tight. The study assumed that failure of one valve in series failed the penetration; however, the probability of failure was that for a single valve. (NUREG-1493, based on Type C testing data from the North Anna nuclear power plant, estimated the probability of failure of both valves in a penetration due to common mode failure as 5.5E-2.)

3. This analysis assumed possible leakage of all valves subject to Type C testing, not just those addressed in the licensee's exemption request.

According to this analysis, the licensee's proposed exemption does not have a significant effect on risk. The NUREG-1493 analysis shows that the amount of leakage necessary to significantly increase risk is three orders of magnitude greater than the STP TS leakage rate limit. These analyses were not obtained for STP, but even though the baseline risk would be different for different sites, the relative change in risk should be comparable. Therefore, the staff concludes that the risk to the public will not significantly increase due to granting this exemption and the licensee's request is acceptable.

17.5 Conclusion

The staff found that the licensee's application of a risk-informed categorization process has identified a class of SSCs that have little or no safety significance with respect to protecting the health and safety of the public. The staff also found that the proposed treatment processes to be applied to activities associated with LSS and NRS SSCs, as described by the licensee, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions. Further, the staff found that leakage through containment isolation valves meeting the licensee's criteria would have negligible impact on public health and safety. As such the staff found that is was reasonable for STPNOC to assert that the cumulative limits for containment leakage would be based upon the tested components, with the assumption that the exempted components contribute zero leakage. Based on this finding, the staff determined that an exemption from the 10 CFR Part 50, Appendix J, Option B, Section III.B requirement that "the sum of the leakage rates at accident pressure of Type B tests and pathway leakage rates from Type C tests, must be less than the performance criterion (L_a) with margin, as specified in the Technical Specifications," is not necessary.

Based on these findings, the staff concluded that granting of the requested exemption from the Type C testing requirements of 10 CFR Part 50, Appendix J, Option B, Section III.B, for LSS and NRS containment isolation valves that meet the licensee's proposed criteria discussed and evaluated above, would pose no undue risk to public health and safety. As discussed in Section 20.2 of this SE, the staff found that the categorization process was not considered when the requirements of 10 CFR Part 50, Appendix J, Option B, Section III.B, were adopted and that it is in the public interest to grant an exemption from the special treatment requirements. This satisfies the special circumstance of 10 CFR 50.12(a)(2)(vi). Therefore, the staff determined that the exemptions should be granted from the Type C testing requirements of 10 CFR Part 50, Appendix J, Option B, Section III.B, as requested by STPNOC.

18.0 EXEMPTION TO 10 CFR 50.34(b)(10), 10 CFR 50.34(b)(11), AND 10 CFR PART 100, APPENDIX A, VI, (a)(1) & (2) - APPLICATION TO ENGINEERING DESIGN (FOR SAFE SHUTDOWN EARTHQUAKE AND OPERATING BASIS EARTHQUAKE)

18.1 Introduction

The requirements of 10 CFR 50.34(b) pertain to the technical information in FSARs with 10 CFR 50.34(b)(10) addressing earthquake engineering criteria and 10 CFR 50.34(b)(11) addressing seismic and geologic siting criteria. In its submittal, the licensee requests an exemption to exclude safety-related SSCs classified as LSS and NRS from the requirements of 10 CFR 50.34(b)(10) and 10 CFR 50.34(b)(11).

The requirements of 10 CFR Part 100 pertain to reactor site criteria and its Appendix A addresses seismic and geologic siting criteria. Sections VI(a)(1) and (2) of 10 CFR Part 100, Appendix A, address the engineering design for the Safe Shutdown Earthquake (SSE) and Operating Basis Earthquake (OBE), respectively. In its submittal, the licensee requests an exemption to exclude safety-related SSCs classified as LSS and NRS from the requirements of Sections VI.(a)(1) and (2) of 10 CFR Part 100, Appendix A.

18.2 Exemptions Requested

In its May 21, 2000, submittal, the licensee requests an exemption from the requirements of 10 CFR 50.34(b)(10) to the extent that 10 CFR 50.34(b)(10) refers to the earthquake engineering criteria in Sections VI.(a)(1) and VI.(a)(2) of Appendix A to 10 CFR Part 100. Also, in its submittal, STPNOC requested an exemption from the requirements of 10 CFR 50.34(b)(11) to the extent that it refers to the seismic and geologic siting criteria of Sections VI.(a)(1) and (2) of 10 CFR Part 100, Appendix A.

In its submittal, STPNOC requests an exemption to exclude safety-related LSS and NRS SSCs from Sections VI.(a)(1) and (2) of 10 CFR Part 100, Appendix A, to the extent that these sections require testing and specific types of analyses to demonstrate that safety-related SSCs are designed to withstand the SSE and OBE.

18.3 Discussion

The licensee refers to the 10 CFR Part 100, Appendix A, exemption request to define the scope and provide the technical justification for its 10 CFR 50.34(b)(10) and 10 CFR 50.34(b)(11) exemption requests. As such, in reviewing the licensee's submittal, the staff has decided to treat the requested exemptions from 10 CFR Part 100, Appendix A, Sections VI(a)(1) and (2), 10 CFR 50.34(b)(10), and 10 CFR 50.34(b)(11) together.

The licensee requested the exemption for safety-related SSCs that are classified as LSS and NRS based on its risk categorization process. In its submittal, the licensee indicates that safety-related LSS and NRS SSCs would continue to be required to function under design-basis seismic conditions, but would not be required to be maintained in a qualified condition in accordance with the requirements stated in 10 CFR Part 100, Appendix A, and that these SSCs could be replaced with SSCs not qualified under 10 CFR Part 100, Appendix A.

The licensee has stated that safety-related LSS and NRS SSCs would be designed to satisfy design requirements (see Sections 2.0 and 3.3.7.3 of Attachment 1 of the August 31, 2000, submittal). Included within the design is the requirement that SSCs shall be designed to withstand the effects of seismic events without the loss of capability to perform their safety function. Further, in Section 3.3.7.4 of Attachment 1 of its August 31, 2000, submittal, the licensee states that procurement evaluations "ensures that the original design inputs and assumptions for the SSC have been properly factored in." The licensee's design and procurement processes are discussed in Section 4.0 of this SE.

In its technical justification for the exemption to 10 CFR Part 100, Appendix A, in Attachment 2 of its August 31, 2000, submittal, the licensee states that its proposed treatment process ensures that LSS and NRS SSCs "important to safety can perform their safety function during and following a design-basis event." The licensee then indicates that safety-related SSCs "categorized as LSS and NRS do not involve the performance of any safety significant function" and that "[i]t is unnecessary to maintain the qualification of such components or to replace them with qualified components to meet the intent of these regulations."

The licensee's request does not encompass all requirements of 10 CFR Part 100, Appendix A, Section VI.(a)(1) and (2), and the licensee has indicated that it is seeking an exemption from these requirements to the extent that they require testing and specific types of analyses to demonstrate that safety-related SSCs are designed to withstand the SSE and OBE. However, the licensee's submittal was unclear regarding how it proposed to evaluate LSS and NRS SSCs if the exemption is granted.

In Open Item 18.1 of the November 15, 2000, draft SE, the staff requested that the licensee describe the attributes of an engineering evaluation for design changes related to LSS and NRS SSCs that provides confidence of functionality absent the application of any of the engineering methods described in Appendix A to 10 CFR Part 100. In response to the open item, the licensee described five methods it proposes to use to demonstrate that SSCs can function under design-basis seismic conditions. These methods are included in proposed FSAR Section 13.7.3.3 that specifies the treatment processes that the licensee intends to apply to safety-related LSS and NRS SSCs. Incorporation of these methods into the proposed FSAR Section resolves Open Item 18.1 and the staff considers this item closed.

In Section 13.7.3.3.1 of its proposed FSAR Section the licensee stated:

> The Stations Design Control Program is used for safety-related SSCs, including safety related LSS and NRS SSCs. The Design Control Program complies with 10 CFR Part 50, Appendix B, and is described in the Operations Quality Assurance Plan (OQAP).

In Section 13.7.3.3.2 of the licensee proposed FSAR Section on the procurement process, the licensee stated:

> Technical requirements (including applicable design-basis environmental and seismic conditions) for items to be procured include the design inputs and assumptions for the item. As described below, one or more of the following methods will provide a sufficient basis to determine that the procured item can perform its safety-related function under design-basis conditions, including applicable design-basis environmental (temperature

and pressure, humidity, chemical effects, radiation, aging, submergence, and synergistic effects) and seismic (earthquake motion, as described in the design bases, including seismic inputs and design load combinations) conditions:

Vendor Documentation - Vendor documentation could be used when the performance characteristics for the item, as specified in vendor documentation (e.g., catalog information, certificate of conformance), satisfy the SSC's design requirements. If the vendor documentation does not contain this level of detail, then the design requirements could be provided in the procurement specifications. The vendor's acceptance of the stated design specifications provides sufficient confidence that the replacement safety-related LSS or NRS SSC would be capable of performing its safety-related functions under design-basis conditions. Differences constituting a design change will be documented and processed under the STP design control process.

Equivalency Evaluation - An equivalency evaluation could be used when it is sufficient to determine that the procured item is equivalent to the item being replaced (e.g., a like-for-like replacement).

Technical Evaluation - For minor differences, a technical evaluation could be performed to compare the differences between the procured item and the design requirements of the item being replaced and determines that differences in areas such as material, size, shape, stressors, aging mechanisms, and functional capabilities would not adversely affect the ability to perform the safety-related functions of the SSC under design-basis conditions. Differences constituting a design change will be documented and processed under the STP design control process.

Technical Analysis - In cases involving substantial differences between the procured item and the design requirements of the item being replaced, a technical analysis could be performed to determine that the procured item can perform its safety-related function under design-basis conditions. The technical analysis would be based on one or more engineering methods that include, as necessary, calculations, analyses and evaluations by multiple disciplines, test data, or operating experience to support functionality of the SSC over its expected life. Where the differences are determined to require a design change, STP will follow the design control process for safety-related SSCs.

Testing - Testing under simulated design-basis conditions could be performed on the component. Margins and documentation specified in NRC regulations would not be required in these tests, since the components are LSS/NRS and do not warrant this additional confidence.

18.4 Evaluation

The staff's evaluation focused on the licensee's treatment processes for LSS and NRS SSCs as described in Section 13.7.3.3 of the proposed FSAR Section. The treatment process consists of eight elements. The design control process and the procurement process are examples of elements in the treatment process. Section 4.0 of this SE provides the staff's

evaluation of each of the eight elements of the treatment processes. This section of the SE focuses on the design control and procurement control processes to determine if these processes, as described in proposed FSAR Section 13.7.3.3, provide appropriate process controls for the licensee to maintain functionality of LSS and NRS SSCs under design-basis seismic conditions. The scope of this evaluation does not include an assessment of the licensee's procedures for implementing the program. Review of the details on how the program will be implemented is not considered necessary given the conclusion that SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk. Effective implementation of the program such that the design bases and functionality of LSS and NRS SSCs are maintained remains the responsibility of the licensee.

The licensee requests an exemption to 10 CFR 50.34(b)(10) for maintaining safety-related LSS and NRS SSCs in a qualified condition under the provisions of 10 CFR Part 100, Appendix A. The relevant portion of 10 CFR 50.34(b)(10) states:

> However, for either an operating license applicant or holder whose construction permit was issued prior to January 10, 1997, the earthquake engineering criteria in section VI of Appendix A to part 100 of this chapter continues to apply.

Further, the licensee has requested an exemption to 10 CFR 50.34(b)(11) for maintaining safety-related LSS and NRS SSCs in a qualified condition under the provisions of 10 CFR Part 100, Appendix A. The relevant portion of 10 CFR 50.34(b)(11) states:

> However, for either an operating license applicant or holder whose construction permit was issued prior to January 10, 1997, the reactor site criteria in part 100 of this chapter and the seismic and geologic siting criteria in Appendix A to part 100 of this chapter continues to apply.

These regulations address earthquake engineering criteria, and seismic and geological siting criteria, and do not refer to component qualification requirements. The licensee indicates that safety-related LSS and NRS SSCs will be designed to withstand the effects of seismic events without loss of capability to perform their design function. The licensee has indicated that exemptions from 10 CFR 50.34(b)(10) and 10 CFR 50.34(b)(11) are necessary because it imposes the requirements of Appendix A to 10 CFR Part 100.

The licensee requests an exemption to 10 CFR Part 100, Appendix A, Sections VI.(a)(1) and (2), to the extent that these sections require testing and specific types of analyses to demonstrate that safety-related LSS and NRS SSCs are designed to withstand the SSE and OBE. The relevant portion of Section VI.(a)(1) requires:

> 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.

Section VI.(a)(2) contains identical wording for the Operating Basis Earthquake.

In its exemption request, the licensee has not proposed any change to the design-basis input for seismic loads. The licensee states that LSS and NRS SSCs, as applicable under 10 CFR Part 100, would be designed to withstand the effects of seismic events without loss of capability to perform their design function. This statement is consistent with the requirements of 10 CFR Part 100, Appendix A, Sections VI.(a)(1) and (2). The licensee further states that its proposed design and procurement criteria would be applied to LSS and NRS SSCs to achieve this requirement.

The staff reviewed the elements of the licensee's proposed design and procurement processes for safety-related LSS and NRS SSCs. As indicated above, the licensee's proposed treatment process for LSS and NRS SSCs consists of eight elements. The elements of the treatment process are discussed in Section 4.0 of this SE. The following discussion contains the staff's evaluation of the five procurement evaluation methods proposed by the licensee to demonstrate that SSCs meet design-basis requirements as these evaluation methods relate to the 10 CFR Part 100 exemption request.

Vendor Documentation

Vendor documentation such as catalog information or certificate of conformance could be used to obtain the performance characteristics of the item. If the catalog information specifies that the item can perform its function subject to earthquake motion, as described in the design bases including seismic inputs and design load combinations it could be used to assure functionality of the SSC during an earthquake. If the vendor catalog does not contain this level of detail, then the design seismic loads, including necessary design load combinations at the location of the SSC, could be provided in the procurement specification. The vendor's acceptance of the procurement specification without exceptions would provide assurance of functionality under the specified load combinations.

Equivalency Evaluation

STPNOC proposes an equivalency evaluation that it calls a like-for-like replacement. The licensee referenced EPRI report NP-6406 "Technical Evaluation of Replacement Items Guideline," in its August 31, 2000, submittal. EPRI report NP-6406 provides a definition for like-for-like replacement and this is one method to assure an equivalency evaluation that maintains functionality.

Technical Evaluation

STPNOC proposes to use a technical evaluation (referred to as an engineering evaluation in the STPNOC response to Open Item 18.1) to compare differences between the procured item and the original item. This evaluation is based on seismic experience data. STPNOC indicates that it will use various industry tools in evaluating the seismic adequacy of components such as the methodology contained in EPRI Report TR-7484, "Generic Seismic Technical Evaluations for Replacement Items for Nuclear Power Plants – Item Specific Evaluations," for the evaluation of seismically insensitive SSCs and EPRI Report TR-105489, "Generic Seismic Technical Evaluations for Replacement Items for Nuclear Power Plants – Item Specific Evaluations," but does not commit to any specific procedure. The staff has not reviewed these reports in detail. However, a cursory review indicates that they do not contain definitive criteria for determining seismic functionality but provide insights that may be used to determine functionality. The staff

notes that the use of seismic experience data relies on sound engineering judgment. The staff agrees that the use of seismic experience data is a tool that can be used to provide insights into a components ability to function during and after an earthquake. However, the STP FSAR (Section 3.10.1) contains a design requirement that seismic qualification of equipment by analysis or test is able to withstand seismic loads as a result of the SSE preceded by five OBEs without loss of function. The staff notes that STPNOC would not be able to satisfy the OBE design requirements by relying solely on seismic experience data without supplemental evaluation or analysis.

Technical Analysis

STPNOC proposes to perform a technical analysis (referred to as an engineering analysis in the STPNOC response to Open Item 18.1) of an SSC when there is a substantial difference between the replacement component and the original component. The type or rigor of the analysis will be determined by engineering judgment to support minimum assurance of seismic functionality. A number of analysis methods are available that could be used to assure functionality of SSCs is maintained.

Testing

STPNOC proposes to use a commercial test of the component under simulated seismic conditions for cases where seismic analysis is not feasible. STPNOC further states that margins, detailed documentation, and additional assurance specified in Appendix A of 10 CFR Part 100 would not be required in these tests. As pointed out above, 10 CFR 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). The licensee has not defined what is meant by commercial test; however, a test that simulates the applicable design bases conditions could be used to assure functionality of SSCs is maintained during and after a seismic event.

Each of the evaluation methods listed in proposed FSAR Section 13.7.3.3.2, in conjunction with the remaining elements of the treatment process, can be used to maintain SSC functionality during and after a seismic event. As noted previously, the scope of this SE does not include how the licensee will implement these methods. Although any combination of these methods can be used to evaluate seismic functionality, the staff recognizes that they rely heavily on sound engineering judgment. The staff also recognizes that it would be difficult to anticipate and specify guidance for each situation that arises.

However, the five evaluation methods discussed above, in conjunction with the remaining elements of the treatment process, can provide an acceptable approach to maintaining the design bases and functionality of LSS and NRS SSCs.

18.5 Conclusion

The staff has reviewed the elements of the licensee's proposed design control and procurement processes for LSS and NRS SSCs described in the proposed FSAR Section 13.7.3.3, as they apply to the seismic evaluation of SSCs. The licensee's procurement process indicates that the applicable design-bases seismic conditions including the design inputs and assumptions will be specified. The procurement process also indicates that appropriate methods will be used to determine that the procured item can perform its safety-related function under the applicable

design-basis seismic conditions. The proposed FSAR Section also lists five evaluation methods that can be used to achieve this objective. As noted above, the scope of this SE does not include how the licensee will implement these methods. Review of the details of how these methods will be implemented to assure that design-basis functionality of the SSCs will be maintained was not considered necessary given the conclusion that SSCs identified as LSS or NRS by the categorization process do not contribute significantly to plant risk.

Although any combination of these methods can be used to evaluate seismic functionality, the staff recognizes that they rely heavily on sound engineering judgment. The staff also recognizes that it would be difficult to anticipate and specify guidance for each situation that arises. However, as indicated by the above discussion, the five evaluation methods, if effectively implemented by the licensee in conjunction with the remaining elements of the treatment process, can provide an acceptable approach to maintaining the design bases and functionality of LSS and NRS SSCs. The elements of the treatment process are described in Section 13.7.3.3 of the proposed FSAR Section. The staff's evaluation of these elements is discussed in Section 4.0 of this SE.

Based on the above findings, primarily on the robust categorization process, the staff concluded that granting of the requested exemption to Sections VI.(a)(1) and (2) of 10 CFR Part 100, Appendix A, would pose no undue risk to public health and safety. Likewise, the requested exemptions from 10 CFR 50.34(b)(10) and 10 CFR 50.34(b)(11) would pose no undue risk. The categorization process relies, in part, on the ability of these SSCs to perform their safety functions during design-basis events. The elements of the licensee's treatment process can, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions. As discussed in Section 20.2 of this SE, the staff found that the categorization process was not considered when the requirements of 10 CFR 50.34(b)(10), 10 CFR 50.34(b)(11), and Sections VI.(a)(1) and (2) of 10 CFR Part 100, Appendix A, were adopted and that it is in the public interest to grant an exemption from the special treatment requirements. This satisfies the special circumstance of 10 CFR 50.12(a)(2)(vi). Therefore, the staff has determined that the requested exemption should be granted from 10 CFR 50.34(b)(10), 10 CFR 50.34(b)(11), and Sections VI.(a)(1) and (2) of 10 CFR Part 100, Appendix A.

19.0 REPLACEMENT OF CLASS 1E ELECTRICAL EQUIPMENT WITH NON-CLASS 1E EQUIPMENT

19.1 Introduction

STPNOC, in Section 4.1.2.1 of Attachment 1 of its August 31, 2000, submittal, stated, without further explanation, that for those LSS and NRS safety-related components that do not meet all design and functional requirements, it proposes to replace Class 1E LSS or NRS components with Non-Class 1E components or install a fully qualified Class 1E component. If a Non-Class 1E component is used, the component will be isolated from the Class 1E circuitry and proper separation would be maintained downstream of the isolation device(s).

19.2 Exemption Requested

STPNOC has not identified any specific regulation that is applicable for this change in treatment. However, since the licensee proposes to change the classification of a component

from safety-related to nonsafety-related or from Class 1E to Non-Class 1E, the staff believes that the licensee is required to perform a design change that includes a review per the requirement identified in 10 CFR 50.59 to determine that the proposed change(s) does not require prior NRC review and approval.

In Section 3.2.2.1.2 of Attachment 1 of its August 31, 2000, submittal, the licensee states that its categorization process ensures that the failures of safety-related LSS and NRS SSCs will not result in undue risk and functionality of such safety-related LSS and NRS SSCs will be maintained through commercial practices similar to those used for BOP SSCs. The licensee further states that commercial practices have been proven adequate in ensuring high reliability and availability of SSCs and by definition, safety-related SSCs that are categorized as LSS and NRS do not affect the performance of a risk-significant function. Additionally, the licensee in Section 3.3.7.3 of Attachment 1 of its August 31, 2000, submittal, states that the functional requirements for safety-related LSS and NRS SSCs will not be affected and these SSCs will be subject to the same design controls used for HSS and MSS safety-related SSCs. The staff evaluation of the licensee's risk categorization process and alternative treatment program are discussed in Sections 3.0 and 4.0 of this SE, respectively.

19.3 Discussion

STP FSAR Section 7.1.1 defines the safety-related instrumentation and control systems and their supporting systems as those systems that are required to function to achieve the system response assumed in the SE and to assure,

the integrity of the reactor coolant pressure boundary, or

the capability to shutdown the reactor and maintain it in a safe shutdown condition, or

the capability to prevent or mitigate the consequences of accidents which could result in potential offsite radiation exposures comparable to the guideline exposures stated in 10 CFR Part 100.

The Class 1E components used in the safety-related systems currently installed in both STP units were designed, procured, and maintained in accordance with NRC regulations. However, the licensee has requested staff approval to permit the replacement of an existing LSS or NRS Class 1E component with a commercial-grade component that meets the existing functional, design and environmental requirements. The licensee will procure replacement items consistent with one or more of the five methods described in its proposed FSAR Section (see Section 4.3.3.2 of this SE) to ensure that the replacement component will not degrade other Class 1E components and will satisfy the required form, fit, and functional requirements (including the ability to function under specified environmental conditions). However, the replacement component would not be specifically qualified or subject to all of the QA provisions associated with Class 1E components. According to the licensee, procuring replacement components that meet the design and functional requirements, from reputable vendors will provide reasonable assurance of receiving a quality product (that will meet the various challenges of service operation). Upon receipt, the licensee will perform an inspection to validate that the received component is the component that was ordered and that it was not damaged during shipment. According to the licensee, if the subject component were exposed to conditions for which the original Class 1E component was specifically qualified, there will be

reasonable assurance, commensurate with the risk significance, that the component would be able to perform satisfactorily and would not electrically degrade other components. Therefore, STPNOC intends to continue to identify the replacement component as Class 1E. However, if the licensee determines that a proposed replacement commercial-grade component does not satisfy all of the design and functional requirements applicable to a Class 1E component, STPNOC will either purchase and install a Class 1E component that is fully qualified and subject to the applicable special treatment requirements, or classify the replacement component as Non-Class 1E.

19.4 Evaluation

In Section 4.1.2.1 of Attachment 1 of its August 31, 2000, submittal the licensee stated that in case of a replacement of a Class 1E component with a Non-Class 1E component, it will properly isolate the replaced component from the Class 1E circuitry, and the circuit downstream of the isolation device will also be classified as Non-Class 1E and STPNOC will maintain proper separation. The licensee also stated that the functionality of safety-related LSS and NRS equipment will be maintained through practices similar to those used for BOP SSCs. The staff's evaluation of the licensee's treatment practices to be applied to safety-related LSS and NRS SSCs is discussed in Section 4.0 of this SE. However, in this specific request, the licensee is going one step further, in that it is requesting the ability to replace a Class 1E component with a Non-Class 1E component in case the replacement component does not satisfy all of the design and functional requirements applicable to this component. Thus, this request contradicts the assumption that all LSS and NRS components should satisfy all the current design and functional requirements. The licensee will make a determination that the affected design functional requirement is not needed. When this determination is done in accordance with the STPNOC Design Change Control Process, the licensee's proposal to isolate the replaced component from the Class 1E circuitry, and the classification of the circuit downstream as Non-Class 1E with proper isolation is acceptable.

19.5 Conclusion

Based on the staff's evaluation, the staff finds that the licensee's request to replace Class 1E LSS and NRS components with Non-Class 1E components, in cases where the replacement does not meet all design and functional requirements, is not consistent with the licensee's submittal and with the proposed rulemaking for the Risk-Informing Special Treatment Requirements and, therefore, is not acceptable. The licensee has the option to reclassify the Class 1E component to a Non-Class 1E component after performing a design change that includes a review per the requirement identified in 10 CFR 50.59 to determine that it does not require prior NRC approval.

20.0 APPLICATION OF EXEMPTION PROVISIONS

20.1 Use of 10 CFR 50.12 Provisions For 10 CFR Part 100 Exemptions

There are no specific provisions in 10 CFR Part 100 for granting exemptions. Therefore, in order for the staff to consider granting exemptions from the requirements of 10 CFR Part 100, a regulatory basis for implementing exemption provisions contained in other parts of NRC's regulations was investigated. The staff concluded that the most appropriate regulation that could be applied to exemptions from the requirements of 10 CFR Part 100 would be those

contained in 10 CFR Part 50, specifically, 10 CFR 50.12. The Commission has applied 10 CFR 50.12, in the past, to the granting of exemptions from the requirements of 10 CFR Part 100. Thus, our current action is consistent with past Commission practice. In addition, as it applies to STP Units 1 and 2, 10 CFR 50.34(b)(10) states that the earthquake engineering criteria in Section VI of Appendix A to 10 CFR Part 100 continue to apply. Also, as it applies to STP Units 1 and 2, 10 CFR 50.34(b)(11) states that the reactor site criteria in 10 CFR Part 100, and seismic and geological siting criteria in Appendix A to 10 CFR Part 100 continue to apply. These regulations refer to the seismic qualification requirements (earthquake engineering criteria) specified in Sections VI.(a)(1) and VI.(a)(2) of Appendix A, to 10 CFR Part 100, governing the continued operation of STP Units 1 and 2. Therefore, the staff concluded that exemptions from 10 CFR 50.34(b)(10) and 10 CFR 50.34(b)(11) are also appropriate.

20.2 Material Circumstance Not Considered

Under 10 CFR 50.12(a)(2)(vi), special circumstances are present whenever there is any other material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption. If 10 CFR 50.12(a)(2)(vi) is relied on exclusively for satisfying the special circumstances provision of 10 CFR 50.12(a)(2), the exemption may not be granted until the Executive Director for Operations (EDO) has consulted with the Commission.

The staff concluded that the special circumstance of 10 CFR 50.12(a)(2)(vi) can be applied to all of the special treatment regulations of 10 CFR Part 50 from which the licensee requested exemptions except for 10 CFR 50.59. For each of these regulations, the staff determined that the underlying purpose of the rule was not satisfied by the licensee's treatment processes and to meet the underlying purpose it would be necessary to impose the rule. As noted above, when the special circumstance of 10 CFR 50.12(a)(2)(vi) is relied on exclusively, the EDO is required to consult with the Commission before granting exemptions. The staff concluded that for the requested exemption from 10 CFR 50.59, the special circumstance of 10 CFR 50.12(a)(2)(vi) did not apply. However, the staff found that the special circumstance of 10 CFR 50.12(a)(2)(ii) applied as discussed in Section 12.0 of this SE.

The staff determined that in its submittal, the licensee had provided a basis for the application of the special circumstance under 10 CFR 50.12(a)(2)(vi). The staff's basis for applying this special circumstance is provided below.

As discussed in Section 3.0 of this SE, the staff determined that the licensee's categorization process provides a method for identifying safety-related SSCs that do not have a significant contribution to risk (LSS and NRS SSCs). The categorization process was found to use both a probabilistic and a deterministic (based on expert judgment) methodology that addressed the issues of defense-in-depth, safety margins, and aggregate risk impacts. In categorizing SSCs, the staff found that the licensee appropriately used the risk insights derived from the site specific PRA with the insights derived through the expert judgment of the GQA Working Group and Expert Panel. The probabilistic analysis included the plant's PRA-based sensitivity studies which showed that the increases in risk were small and were consistent with the guidelines of RG 1.174. Therefore, the staff concluded that the licensee's categorization process can be used as a method for reducing the scope of safety-related SSCs subject to special treatment.

As discussed in Section 4.0 of this SE, the staff found that the treatment processes included the programmatic elements for design control; procurement; installation; maintenance;

inspection, test, and surveillance; corrective action; management and oversight; and configuration control. The staff concluded that these programmatic elements, if properly implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing their safety functions under design-basis conditions.

The finding related to categorization, when combined with the finding on functionality, provides confidence that relaxing the special treatment requirements for safety-related LSS and NRS SSCs does not have a significant impact on public health and safety. Further, while risk insights may have been considered for some of the regulations from which the licensee is seeking exemption, the licensee's categorization process was not considered when these regulations were adopted. STPNOC's categorization process relies on the risk insights derived from the application of the licensee's PRA in determining the safety significance of SSCs along with insights derived from a deterministic methodology that incorporates the expert judgment of cognizant STPNOC technical management and staff. As such, the NRC determined that STPNOC's categorization process is a material circumstance not considered when the regulations were adopted.

In the application of this special circumstance, the staff evaluated whether it was in the public interest to grant the requested exemptions. The staff found that the exemptions to be granted that relax the treatment requirements for safety-related LSS and NRS SSCs do not pose undue risk to public health and safety. This is supported by the staff's finding on categorization and treatment. Therefore, the staff concluded that it could reduce unnecessary regulatory burden without compromising safety. This also enhances the effectiveness and efficiency of the NRC's oversight of the licensee's activities at STP by focusing its resources on those SSCs that are most significant to maintaining public health and safety. Likewise, the licensee's resources and attention can be focused on those SSCs that have the highest contribution to plant risk. Further, the reactor oversight process relies on the application of risk insights in determining the significance of issues or events identified at licensee facilities. The licensee's categorization process provides a method for establishing a licensing basis for STP that is consistent with the risk-informed approach in the NRC's reactor oversight process. This enhances the regulatory framework under which STPNOC operates its facility and by which the NRC oversees the licensee's activities. Therefore, the staff concluded that it is in the public interest to grant exemptions from the special treatment requirements based on a material circumstance not considered.

The staff has concluded that the special circumstance of 10 CFR 50.12(a)(2)(vi) is satisfied in that the licensee's approach represents a material circumstance that was not considered when the regulations were adopted that provides an acceptable method for refining the scope of SSCs to be included under the regulations and that it is in the public interest to grant such exemptions. The EDO has consulted with the Commission in the application of this special circumstance during the Commission meeting held on **[to be determined]**.

21.0 REVIEW CONCLUSIONS

The staff found that the licensee's categorization process is sufficient as a method for categorizing the risk significance of functions and SSCs for use in defining the scope of SSCs for which exemptions from the special treatment requirements can be granted. In support of this finding, the staff also found that the licensee's alternative treatment processes, if effectively implemented, can result in safety-related LSS and NRS SSCs remaining capable of performing

their safety functions under design-basis conditions. Also, the staff found that there are special circumstances as required by 10 CFR 50.12(a) sufficient to support granting certain exemptions. Further, the staff found that the description of the categorization, treatment, and oversight processes in the proposed FSAR Section dated May 21, 2001, were sufficient to document the licensing basis for the exemptions. With these findings, the staff concluded that the exemptions, to the extent described in this SE, from the requirements of 10 CFR 21.3, 10 CFR 50.34(b)(10), 10 CFR 50.34(b)(11), 10 CFR 50.49(b), 10 CFR 50.55a(f), 10 CFR 50.55a(g), 10 CFR 50.55a(h), 10 CFR 50.65(b), Appendix B to 10 CFR Part 50, Appendix J to 10 CFR Part 50, and Sections VI.(a)(1) and VI.(a)(2) of Appendix A to 10 CFR Part 100 should be granted. For the exemption requested to the requirements of 10 CFR 50.59, the staff concluded that it should be granted to the extent that changes to the special treatment requirements described in the FSAR that result from the exemptions granted would not require prior staff review and approval. The staff concluded that, contrary to the licensee's request, the exemption from 10 CFR 50.59 cannot be extended to other treatment requirements described in commitments made by the licensee in the FSAR or other licensing bases documents.

For the exemptions requested from the requirements of 10 CFR 50.34(b)(6)(ii) and 10 CFR 50.54(a)(3) the staff concluded that the underlying purpose of the regulations would not be met by the licensee request and that none of the other special circumstance provisions of 10 CFR 50.12(a) applied. Therefore, the staff determined that these exemptions should be denied. As a result of the staff and licensee interactions during the review of the licensee's submittal, the staff determined that the licensee's revised QAP satisfied the requirements of GDC 1 in Appendix A to 10 CFR Part 50. Therefore, the staff concluded that an exemption from GDC 1 is not necessary and should be denied.

The staff concluded that the licensee's request for exemption from the requirements of GDC 2, GDC 4, and GDC 18 of Appendix A to 10 CFR Part 50 were not necessary based on the fact that these regulations do not impose special treatment requirements but are design requirements that must be satisfied. The licensee will continue to maintain the design of LSS and NRS SSCs, including the design requirements associated with these regulations. As such, the staff concluded that exemptions from these requirements should not be granted.

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