November 15, 2000

Mr. William T. Cottle
President and Chief Executive Officer
STP Nuclear Operating Company
South Texas Project Electric
Generating Station
P. O. Box 289
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT, UNITS 1 AND 2 - DRAFT SAFETY EVALUATION ON EXEMPTION REQUESTS FROM SPECIAL TREATMENT REQUIREMENTS OF 10 CFR PARTS 21, 50, AND 100 (TAC NOS. MA6057 AND MA6058)

Dear Mr. Cottle:

The purpose of this letter is to provide you with the staff's preliminary assessment of your application, dated July 13, 1999, as supplemented October 14 and 22, 1999, and January 26 and August 31, 2000, for exemptions from certain requirements of 10 CFR Parts 21, 50, and 100 (hereinafter, exemption requests or submittal). The enclosure provides a draft safety evaluation that addresses each of the regulations for which you are seeking exemption. As you will note in the draft safety evaluation, we have identified a number of open items that require your attention in order for us to complete our review of your requests. We are providing you with this draft safety evaluation to express the extent to which we have found your request reasonable and to clearly identify those areas where additional information and interaction is necessary.

In the draft safety evaluation, we discuss current conclusions we derived regarding the exemptions that you requested. You need to be aware that none of these conclusions represent the final position of the NRC. There are instances where we have concluded that (1) the NRC should grant the requested exemption, (2) an exemption does not appear necessary to enable implementation of your alternative processes as requested, and (3) the NRC would not consider granting an exemption based on the current submittal. The preliminary conclusions in the draft safety evaluation are contingent upon resolution of the open items identified in the draft safety evaluation.

Your categorization process is the most significant feature of your proposal and received the greatest emphasis in our assessment of your exemption requests. With consideration of the July 19, 2000, draft review guidelines, we have reviewed the attributes of this process extensively and determined that it is generally a robust methodology for determining the risk significance of structures, systems, and components (SSCs). However, we have identified a number of issues that you must address before we can conclude that the categorization process is acceptable as a basis for your exemption requests. The issues are described in detail as open items in Section 3.0 of the enclosed draft safety evaluation.

Your exemption requests focused on seeking relief from a number of special treatment requirements in our regulations. One of the conditions we are working under in evaluating your exemption requests is that there is appropriate confidence that safety-related SSCs removed from the scope of these special treatment requirements remain functional under design-basis conditions. In your submittal you provide us with a description of the treatment that you use as the basis for concluding that the exempted SSCs will remain functional. With consideration of the July 19, 2000, draft review guidelines, we have reviewed the attributes of your proposed treatment processes and found that they are generally sufficient and meet our expectations for the process attributes necessary to provide sufficient confidence that the exempted SSCs will remain functional. However, we have identified a number of concerns that must be addressed before we can conclude that the attributes of the proposed treatment processes are acceptable. These issues are described in detail as open or confirmatory items in Section 4.0, and elsewhere, in the enclosed draft safety evaluation.

In your submittal, you indicate that the categorization process is ongoing, and that this process will be conducted for the remaining life of the units. As this process is implemented, you will change the treatment for those low risk, but safety-related, SSCs from the current treatment required by our regulations to the proposed treatment described in your submittal. We will need to have appropriate controls established to ensure that the bases of our findings for those exemptions we grant remain valid. As we have discussed with your staff, we concluded that the South Texas Project, Units 1 and 2 (STP) Final Safety Analysis Report (FSAR) is the appropriate place to describe the attributes of the processes upon which we will base our findings. In your submittal you provided a proposal for a new section of the STP FSAR. We have determined that in order for our findings to remain valid, the exemptions we grant must be conditioned such that descriptions of the attributes of these processes are required to be in the STP FSAR and that there are controls placed over changes to those descriptions. Section 5.0 of the enclosed draft safety evaluation describes our basis for this conclusion and provides a draft exemption condition that the NRC should include in any of the exemptions we may grant.

One of the regulations you sought exemption from was 10 CFR 50.59 as it relates to the requirement to seek prior NRC review and approval of changes to the treatment of SSCs included within the scope of your exemption request. You further stated your intention to extend the requested exemption to other special treatment provisions described in the STP FSAR. We have determined that the extent of any exemption we may grant to 10 CFR 50.59 should be limited to only those specific regulations identified in your submittal and would not include any other special treatment provisions that may be described elsewhere in the STP FSAR. Also, we believe the Nuclear Energy Institute commitment management process offers a structured approach for you to process contemplated changes to those other special treatment provisions. The basis for our position is provided in Section 12.4 of the enclosed draft safety evaluation.

Finally, you requested an exemption from the requirements to submit a change to your quality assurance program description that would result from the implementation of the categorization and proposed treatment processes. We determined that it is not appropriate to grant such an exemption. Specifically, we expect that you will submit revisions to your quality assurance program description consistent with the requirements of 10 CFR 50.54(a)(3).

I would like to emphasize that we remain committed to work with you and your staff to resolve the remaining open and confirmatory items. Our next milestone in this effort is the resolution of the open and confirmatory items from the draft safety evaluation that is targeted for completion by February 15, 2001. In support of this milestone, your response to the open and confirmatory items in the draft safety evaluation is needed by January 15, 2001. As discussed with your staff, as appropriate, we are willing to meet with you after you have had the opportunity to review our draft safety evaluation. Further, as discussed with your staff, if you find it necessary, multiple supplements to your submittal may be used as you develop your position in response to individual open items to allow us to work towards closure in an efficient and effective manner. Should you have questions regarding the information provided on any of the stated positions in this letter or on the draft safety evaluation, please contact Mr. John A. Nakoski of my staff at (301) 415-1278.

Sincerely,

/RA by Suzanne C. Black for/

John A. Zwolinski, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure: Draft Safety Evaluation

cc w/encl: See next page

South Texas, Units 1 & 2

cc:

Mr. Cornelius F. O'Keefe
Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 910
Bay City, TX 77414

A. Ramirez/C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

Mr. M. T. Hardt
Mr. W. C. Gunst
City Public Service Board
P. O. Box 1771
San Antonio, TX 78296

Mr. G. E. Vaughn/C. A. Johnson
Central Power and Light Company
P. O. Box 289
Mail Code: N5012
Wadsworth, TX 74483

INPO
Records Center
700 Galleria Parkway
Atlanta, GA 30339-3064

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011

D. G. Tees/R. L. Balcom
Houston Lighting & Power Co.
P. O. Box 1700
Houston, TX 77251

Judge, Matagorda County
Matagorda County Courthouse
1700 Seventh Street
Bay City, TX 77414

A. H. Gutterman, Esq.
Morgan, Lewis & Bockius
1800 M Street, N.W.
Washington, DC 20036-5869

Mr. J. J. Sheppard, Vice President
Engineering & Technical Services
STP Nuclear Operating Company
P. O. Box 289
Wadsworth, TX 77483

S. M. Head, Supervisor, Licensing
Quality & Licensing Department
STP Nuclear Operating Company
P. O. Box 289
Wadsworth, TX 77483

Office of the Governor
ATTN: John Howard, Director
Environmental and Natural
Resources Policy
P. O. Box 12428
Austin, TX 78711

Jon C. Wood
Matthews & Branscomb
112 East Pecan, Suite 1100
San Antonio, TX 78205

Arthur C. Tate, Director
Division of Compliance & Inspection
Bureau of Radiation Control
Texas Department of Health
1100 West 49th Street
Austin, TX 78756

Jim Calloway
Public Utility Commission of Texas
Electric Industry Analysis
P. O. Box 13326
Austin, TX 78711-3326

I would like to emphasize that we remain committed to work with you and your staff to resolve the remaining open and confirmatory items. Our next milestone in this effort is the resolution of the open and confirmatory items from the draft safety evaluation that is targeted for completion by February 15, 2001. In support of this milestone, your response to the open and confirmatory items in the draft safety evaluation is needed by January 15, 2001. As discussed with your staff, as appropriate, we are willing to meet with you after you have had the opportunity to review our draft safety evaluation. Further, as discussed with your staff, if you find it necessary, multiple supplements to your submittal may be used as you develop your position in response to individual open items to allow us to work towards closure in an efficient and effective manner. Should you have questions regarding the information provided on any of the stated positions in this letter or on the draft safety evaluation, please contact Mr. John A. Nakoski of my staff at (301) 415-1278.

Sincerely,
/RA by Suzanne C. Black for/
John A. Zwolinski, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure: Draft Safety Evaluation

cc w/encl: See next page

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ACCESSION NO: ML003761558 *See previous concurrence

OFFICE	PDIV-1/PM	PDIV-1/LA	PDIV-1/SC	PDIV-1/D	DIPM/D	DSSA/D	DRIP/D
NAME	JNakoski	CJamerson*	RGramm*	SRichards*	BBoger*	GHolahan*	DMatthews*
DATE	11/15/00	11/15/00	11/14/00	11/15/00	11/14/00	11/14/00	11/15/00

OFFICE	DE/D	OGC (NLO)	DLPM/D
NAME	JStrosnider*	JMoore*	SBlack for: JZwolinski
DATE	11/15/00	11/15/00	11/15/00

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OPEN ITEMS LIST

Open item 3.1: The appropriate equation for combining the random and common cause failure modes into a single importance value needs to be addressed by STPNOC.

Open item 3.2: STPNOC is required to provide the NRC with clarification on the FV criteria used in the categorization process for determining HSS SSCs.

Open item 3.3: STPNOC needs to incorporate the qualification criteria for members of the IDP provided in the July 19, 2000, draft review guidelines into its categorization process and a description of the qualification criteria into the proposed FSAR section.

Open item 3.4: STPNOC needs to clarify how it addresses the significance of SSCs that function to protect the integrity of the containment for consequence mitigation in its categorization process.

Open item 3.5: STPNOC needs to provide sufficient risk-informed justification for application of the categorization process to passive functions (i.e., structural integrity, pressure boundary) of safety-related SSCs. For example, the staff has determined that the categorization process is not sufficiently robust to support the requested exemption from ASME Section XI Inservice Inspection requirements.

Open item 3.6: STPNOC needs to finalize its process for the development and implementation of general notes in the categorization of SSCs and provide it to the NRC for review. Further issues may be developed related to this area after receipt of the finalized process.

Open item 4.1: STPNOC needs to describe in the FSAR the process attributes for determining the appropriate treatment to be applied to risk-significant functions of both safety-related and non-safety-related HSS and MSS SSCs not currently covered by programs established in response to the NRC regulations.

Open item 4.2: STPNOC must revise the proposed FSAR section that provides the description of attributes of its proposed treatment processes that form the basis for its exemption requests to incorporate the additional attributes needed as identified in this draft safety evaluation. See Sections 4.3.3.2, 4.3.3.3, 4.3.3.4, 4.3.3.5, 4.3.3.7, and 8.4 of this draft safety evaluation. The level of detail in the revisions to the FSAR should be consistent with the level of detail in the July 19, 2000, draft review guidelines for each of the alternative treatment processes.

Open item 5.1: As a condition of the exemptions the NRC may grant, the change control exemption conditions described in Section 5.0 of this draft safety evaluation will be imposed.

Open item 7.1: STPNOC should propose, for implementation concurrent with any approved exemptions, a revision to the Operations QA Program description, which includes a discussion of the scope of the SSCs exempted from 10 CFR Part 50, Appendix B, requirements, the basis for the

exemptions (e.g., by referencing the staff's safety evaluation), and also references the document(s) where the alternative treatment processes are described (i.e., STP FSAR, proposed Section 13.7). The QA Program description should identify any portions of the QA Program that remain applicable to the exempted SSCs (i.e., those sections related to design control, corrective actions, and nonconforming items). All changes to the QA Program that supplement and complete the exemption request should be submitted to the staff pursuant to the requirements of 10 CFR 50.54(a)(3). The revised QA Program should be implemented concurrently with implementation of any exemptions granted.

Open item 8.1: STPNOC needs to provide additional information on its need for the requested exemption from 10 CFR 50.49(b).

Open item 10.1: STPNOC needs to provide a valid basis to justify expansion of the 1 inch Section XI exemption to over 1 inch components.

Open item 10.2: STPNOC needs to provide an adequate engineering basis for mixing the requirements of ASME Code requirements with other code requirements. For example, STPNOC proposes to do leak tests permitted by Section XI in lieu of the construction code hydrostatic tests. Further, STPNOC proposes to use ASME allowable stress limits with commercial design and construction codes, and to eliminate impact testing and nondestructive examination.

Open item 11.1: STPNOC needs to provide the NRC with 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.

Open item 13.1: STPNOC needs to clarify in its exemption request that its requested exemption does not extend to the requirements of 10 CFR 50.65(a)(4).

Open item 18.1: STPNOC needs to describe to the staff 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.

CONFIRMATORY ITEMS LIST

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 (ANPR) 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 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 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 (EQ) 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, and January 26 and August 31, 2000, STPNOC submitted risk-informed exemption requests from the special treatment requirements of 10 CFR Parts 21, 50, and 100 (hereinafter, exemption requests or submittal). Unless specifically identified otherwise, references in this draft safety evaluation to the submittal or exemption requests refer primarily to the licensee's August 31, 2000, 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). In addition, the staff issued a request for additional information (RAI) on January 18, 2000, (see ADAMS Accession No. ML003675675) 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 that staff specifically 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, there needs to be confidence that low risk-significant, but safety-related, SSCs remain functional under design-basis conditions. The review of the STPNOC exemption request is being conducted as a proof-of-concept for Option 2. As such, the need for the confidence that low risk-significant, but safety-related, SSCs remain functional under design-basis conditions applies to the review of the licensee's submittal. This creates an additional condition that the staff must consider 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 judgement to determine the risk significance of functions, systems, structures, and components. 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 the licensee currently uses on its balance-of-plant SSCs that the licensee proposes to apply 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 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 preliminary 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 draft safety evaluation.

The categorization process, provided it is sufficiently rigorous and robust, could be used as the essential foundation 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 achieve the underlying purpose of the rule. However, consistent with the Option 2 approach, the staff must also have confidence at a level commensurate with their risk significance that the low risk-significant, but safety-related, SSCs remain functional under design-basis conditions. The staff developed a set of guidelines that represent the attributes of the treatment programs and processes that should be in place to achieve confidence of SSC functionality under design-basis conditions commensurate with the risk significance. These attributes are provided in the July 19, 2000, draft review guidelines. The staff's assessment of the licensee's proposed treatment programs and processes is provided in Section 4.0 of this draft safety evaluation.

2.0 SUMMARY OF PROPOSED CHANGES AND STAFF EVALUATIONS

The extent of the exemptions being sought can be broken down into 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 Final Safety Analysis Report (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.

[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.

2.1 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, 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, VI, (a)(1) and (2) to the extent that these sections require testing and inspection to demonstrate that LSS and NRS SSCs are designed to withstand the safe-shutdown earthquake and operating-basis earthquake, respectively. Associated with the exemption request from 10 CFR Part 100, Appendix A is a supporting request for exemption from 10 CFR 50.34(b)(11) to the extent that this regulation imposes the testing and inspection requirements of 10 CFR Part 100, Appendix A on LSS and NRS SSCs.

As discussed in Section 8.0 of this draft safety evaluation, 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. However, the staff has determined that the attributes in the licensee's design control and procurement processes (maintaining original design inputs and performance of an engineering evaluation) appear to satisfy the intent of the regulation. As such, it is not clear to the staff why the licensee believes an exemption for 10 CFR 50.49 is necessary. The licensee needs to provide the staff with additional information regarding why it requested an exemption from the requirements of 10 CFR 50.49.

As discussed in Section 14.0 of this draft safety evaluation, 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.

As discussed in Section 15.0 of this draft safety evaluation, the staff concludes 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 draft safety evaluation, the licensee has stated that it will use the current design-basis seismic inputs in the evaluation of LSS and NRS SSCs. The regulations at 10 CFR Part 100, Appendix A, Section VI(a)(1) and (2) require that SSCs be designed using a suitable dynamic analysis, suitable testing or equivalent static analysis to ensure that safety-related functions

are maintained during and after the vibratory motions associated with SSE and OBE events. In addition, the regulation provides adequate flexibility to allow the licensee to perform simplified analysis of components when a simplified analysis is technically justified. Based on the staff's understanding of the licensee's proposal, the staff has concluded that the submittal does not describe how the proposal to conduct an engineering evaluation for design changes related to LSS and NRS SSCs provides confidence of functionality absent the application of any of the methods described in Appendix A to 10 CFR Part 100. The staff requires this information to determine whether an exemption from the requirements of Sections VI(a) (1) and (2) to Appendix A of 10 CFR Part 100 describing the engineering methods to provide confidence of functionality is appropriate, or whether such an exemption should be granted. As such, the staff cannot determine whether the related exemption from 10 CFR 50.34(b)(11) that imposes the requirements of Appendix A to 10 CFR Part 100 is appropriate or should be granted.

2.2 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 non-safety-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). STPNOC would still 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 an HSS or MSS function.

As discussed further in Section 13.0 of this draft safety evaluation, the staff has determined that subject to closure of open items identified related to this exemption request, 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. Further, should the open items in this safety evaluation be resolved, the special circumstances of 10 CFR 50.12(a)(ii) are satisfied in that the STPNOC categorization process satisfies the underlying purpose of the rule for determining the scope of SSCs covered by the rule. Therefore, the STPNOC request for an exemption should be granted.

2.3 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 draft safety evaluation, the staff concluded that the exemption requested from the definition of basic component in 10 CFR 21.3 should be granted, subject to the resolution of the open items identified in this safety evaluation, in that the exemption provisions of 10 CFR 21.7 have been satisfied.

As discussed further in Section 7.0 of this draft safety evaluation, the staff has determined 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 and the QA Program description required 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 safety evaluation), and also reference the document where the alternate treatment processes are described (i.e., FSAR, Section 13.7). The QA Program description should identify any portion of the QA Program description that remains applicable to the exempted SSCs (i.e., those sections related to design control, corrective action, and nonconforming items). Also, the staff determined that the requested exemption from 10 CFR 50.54(a)(3) should be denied and the licensee should submit its revised QA Program description that reflects the reduction in commitment that would occur as a result of granting the exemptions for LSS and NRS SSCs. Further, the staff determined that an exemption from GDC 1 is not necessary. The alternative treatment and categorization processes proposed in the submittal (once the open items identified in this draft safety evaluation are resolved) can be incorporated into a OQAP framework that satisfies the requirements of GDC 1 for LSS and NRS SSCs.

2.4 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 draft safety evaluation, the staff concludes 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 below, from the scope of SSCs requiring Type C containment isolation valve leak rate tests (10 CFR Part 50, Appendix J, Option B, 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 the public health and safety, provided the open items related to categorization identified in Section 3.0 of this safety evaluation are resolved. Further, the special circumstances of 10 CFR 50.12 are satisfied in that it is not necessary to include LSS and NRS safety-related containment isolation valves within the scope of Type C testing to satisfy the underlying purpose of the regulation (10 CFR 50.12(a)(2)(ii)). Therefore, the licensee's proposed exemption to 10 CFR Part 50, Appendix J, Option B, III.B, should be granted.

2.5 Industry Code Requirements

STPNOC is requesting an exemption from the requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (the Code), for repair and replacement of safety-related LSS and NRS SSCs required under 10 CFR 50.55a(f) and (g). 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. Replacement safety-related LSS and NRS SSCs will be procured that were fabricated or manufactured to the requirements of an alternative nationally recognized code, standard, or specification appropriate for that type of SSC. Included within the scope are exemptions from 10 CFR 50.55a(f) and 10 CFR 50.55a(g) on the IST and ISI requirements of ASME Section XI for safety-related LSS and NRS SSCs. Installation and examination of LSS and NRS replacement SSCs would be performed in accordance with American National Standards Institute (ANSI) B31.1, "Power Piping." Post-installation testing would be performed in accordance with Section XI of the Code and the requirements of the work package.

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 draft safety evaluation, based on the staff's review of the licensee's categorization process and the inspection, test, and surveillance processes described in Sections 3.0, 4.3.3.5, and 7.4.1 of this draft safety evaluation, respectively, the staff concluded that the special circumstances of 10 CFR 50.12(a)(2)(ii) have been met, contingent on the resolution of the open items identified in Sections 3.0 and 4.0 of this safety evaluation, in that it is not necessary to satisfy the underlying purpose of 10 CFR 50.55a(f) by including LSS and NRS safety-related pumps and valves within its scope. Further, the staff has determined that excluding LSS and NRS safety-related pumps and valves from the IST requirements of the regulation does not pose an undue risk to public health and safety. As such, the staff has determined that the requested exemption from 10 CFR 50.55a(f) should be granted, provided the open items in Section 3.0 and 4.0 of this safety evaluation are resolved.

As discussed in Section 10.0 of this draft safety evaluation, the staff determined that STPNOC has not provided an adequate engineering basis for mixing the requirements of ASME Code requirements with other code requirements. For example, STPNOC has proposed to do leak tests permitted by ASME Section XI in lieu of the construction code hydrostatic tests without a sufficient technical basis to support the use of the less demanding ASME Section XI test. Further, STPNOC proposes to use ASME allowable stress limits with commercial design and construction codes, again without a sufficient technical basis. Also, the staff determined that the ASME Section III requirements related to impact testing are not included within the scope of any of the exemptions requested by STPNOC and that to maintain the technical design requirements of SSCs, fracture toughness provisions (as demonstrated by impact testing) are to be specified for replacement SSCs consistent with ASME Section III as appropriate. Based on these determinations, the staff concluded that STPNOC has not provided sufficient justification to support a finding that the conditions of 10 CFR 50.12 have been satisfied for the granting of an exemption to the 10 CFR 50.55a(g) requirements for repair and replacement, and ISI of LSS and NRS SSCs. Also, the staff determined that the categorization process proposed by the licensee is not sufficiently robust to support the requested exemption from ASME Section XI ISI requirements. As such, absent additional information, the NRC should deny the requested exemption.

As discussed in Section 11.0 of this draft safety evaluation, the staff determined that it does not have sufficient information from the licensee on the basis for the requested exemption to determine whether an exemption from the requirements of 10 CFR 50.55a(h)(2) should be granted or if it is even necessary. STPNOC is requested to provide the staff with additional information on the basis for 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.

2.6 10 CFR 50.59

In support of the change in special treatment requirements, STPNOC is seeking an exemption from 10 CFR 50.59(a)(1), (a)(2) and (b)(1) (pre-1999 version) and 10 CFR 50.59(c)(1), (c)(2), and (d)(1) (2000 version) 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 draft safety evaluation, 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 requested 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(a)(1), (a)(2) and (b)(1) (pre-1999 version) and 10 CFR 50.59(c)(1), (c)(2), and (d)(1) (2000 version) should be granted to the extent that it relates to the specific special treatment requirements from which STPNOC requested exemption in its August 31, 2000, submittal. However, the requested exemption does not

extend to other special treatment provisions as committed to in the STP FSAR or other licensing bases documents.

2.7 Replacement of Class 1E Components

As discussed further in Section 19.0 of this safety evaluation, 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 case 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.

3.0 STAFF EVALUATION OF SSC 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 draft safety evaluation contains the staff's review of this risk categorization process. The staff's January 18, 2000, RAI, and the licensee's response to this RAI in Attachment 4 of its submittal are also referenced in this section of the draft safety evaluation.

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 judgement 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 the assigning of 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 judgement. Under this dual process, an SSC's importance 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.

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 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, but STPNOC has since modified these equations. STPNOC stated that the original equations overestimated the SSCs' importance while the new equations more realistically represent the importance. STPNOC provided no evaluation of the new equations, only arguments as to why the original method was conservative. The staff determined that as asserted by the licensee, the original equations overestimate the importance of an SSC, but our review, supported by the Office of Nuclear Regulatory Research, indicates that the new equations may underestimate the importance in that they do not appropriately consider the CCF contribution in the combined importance measures. **[Open item 3.1: The appropriate equation for combining the random and common cause failure modes into a single importance value needs to be addressed by STPNOC.]**

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 guideline values 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 $\geq$ 0.1 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

STPNOC's GQA submittal and our GQA safety evaluation 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 submittal, and the revised submittal use 0.10 as the criteria (as shown in the above table). Thus, the appropriate FV criteria to use (for HSS) in the categorization process is an open item. **[Open item 3.2: STPNOC is required to provide the NRC with clarification on the FV criteria used in the categorization process for determining HSS SSCs.]**

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.

However, 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 the RAI (see response to staff Question #32 in Attachment 4 of the licensee's submittal), 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 acceptable.

Contingent upon the resolution of the open items related to using an appropriate equation to account for CCF in a single importance value and the FV criteria for HSS SSCs, the staff 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

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," 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 these SSCs may not be modeled in the STP PRA may be 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 so 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 95th percentile for each of the LSS SSC failure rate distributions.

In response to staff Question #20(e) in Attachment 4 of the submittal on how the sensitivity study accounts for potential common mode failure 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 CCF in the plant risk model. The staff understands this response to indicate 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 sensitivity analysis 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 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 safety evaluation, the staff found that generally the attributes of the licensee's alternative treatment processes provided confidence of SSC functionality provided the open items identified in this safety evaluation are resolved.

The following discussion illustrates the sensitivity of the categorization process on continued confidence in the 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, in Attachment 4 of the submittal, 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. The staff believes that 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 that they are needed to operate under.

Another example where the staff believes that environmental conditions should be considered is for radiation monitors. As the staff understands it, 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 for LSS and NRS SSCs would provide confidence that these SSCs would remain functional under design basis conditions, subject to resolution of the open items identified in this safety evaluation (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, 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, the deterministic risk-ranking process can result in an increase, but not a decrease, in an SSC's categorization.

The first step in the 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.

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, the SSC is categorized based on the highest categorization for 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. 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, each of the five questions is given a numerical score ranging from zero to five. The scores and their definitions are as follows:

Score for Each Critical Question	Scale 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 judgement 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, the functions are categorized 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. A function with a low categorization due to a low sum (final score) could still be classified in 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, an SSC is assigned the same risk category as that of the most limiting (highest category) system function that the SSC supports. However, an SSC may be ranked 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. The primary consideration is whether the failure of an SSC will fail or severely degrade the function. If the answer is no, then the SSC redundancy may be factored into the SSC's categorization, as long as the SSC's reliability assumed in the categorization process and that of its redundant counterpart have been satisfied. An SSC can be considered 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, 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 categorization process is an iterative process based upon the Working Group's expert judgement. The Working Group members' insights and varied experience are relied on to ensure that the final result reflects a comprehensive and justifiable deterministic judgement.

In Section 3.2.3.2 of Attachment 1 of its 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 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. Based on that determination, the staff concluded that the licensee needs to incorporate those criteria into its categorization process and provide a description of the qualification criteria in the proposed section of the STP FSAR. **[Open item 3.3: STPNOC needs to incorporate the qualification criteria for members of the IDP provided in the July 19, 2000, draft review guidelines into its categorization process and a description of the qualification criteria into the proposed FSAR section.]**

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. However, the staff has identified in its review of risk significance basis documents for certain systems that the proposed categorization process may not be 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. In general, 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 reviewing several other systems, the staff identified a weakness in the deterministic categorization process. The staff determined that the licensee's categorization process does not give proper credit for SSCs that mitigate the consequences of an accident (e.g., safety-related ventilation system filters and fans, containment sprays and containment fan coolers to prevent late containment failure). The risk measures used in STPNOC's categorization process relying on PRA information are CDF and LERF, and "risk" that is referred to in the deterministic categorization process is implied to impact CDF and LERF. The staff notes that these risk measures, however, are not sensitive to the status of SSCs that limit onsite and offsite dose consequences (those that protect containment integrity). Consequence mitigation equipment is primarily relevant to latent fatality risk; therefore, an estimate of the population dose (person-rem) would be a more appropriate measure of risk for evaluating such equipment. However, the staff would consider alternative approaches that would capture the importance of the type of SSCs that function to protect the integrity of the containment. **[Open item 3.4: STPNOC needs to clarify how it addresses the significance of SSCs that function to protect the integrity of the containment for consequence mitigation in its categorization process.]**

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.

During the review of the Electric Power Research Institute (EPRI) report, EPRI TR-112657, "Revised Risk-Informed In-service Inspection Evaluation Procedure," Rev. B-A, December 1999, and Westinghouse Topical Report, WHAP-14572, "Westinghouse Owners Group Application of Risk-Informed Methods to Piping In-service Inspection," Rev. 1-NP-A, February 1999, (both of which are risk-informed (RI) ISI methodologies that have been accepted by the staff), the Individual Plant Examination (IPE) flooding analyses were found to be of insufficient scope and precision to support RI-ISI relief requests. STPNOC discusses its sensitivity study to support the claim that compliance with ASME Section XI ISI requirements for LSS and NRS SSCs is not necessary to provide adequate protection. Because the piping segment failure likelihood and the consequential spatial effects are modeled for essentially no piping segments, the quantitative results of the sensitivity study do not reflect the potential change in risk from changing the ASME Section XI special treatment, even as a sensitivity analysis.

The results from the staff review of RI-ISI relief requests in general indicates that, with due consideration for uncertainty, a reduction in the number of inspections alone can exceed the change in risk guidelines in RG 1.174. STPNOC is requesting exemption to ASME Section XI that is a greater change than the reduction in the number of inspections already approved at STP based on a submittal using the EPRI method (see NRC RI-ISI approval letter dated September 11, 2000, ADAMS Accession No. ML003749167). Therefore, the categorization and change in risk evaluations consistent with RG 1.178, "An Approach for Plant-Specific Risk-Informed Decisionmaking: Inservice Inspection of Piping," and the previously approved methods is needed. The staff finds that STPNOC has not provided sufficient justification for an exemption from ASME Section XI ISI requirements and considers this an open item. **[Open item 3.5: STPNOC needs to provide sufficient risk-informed justification for application of the categorization process to passive functions (i.e., structural integrity, pressure boundary) of safety-related SSCs. For example, the staff has determined**

that the categorization process is not sufficiently robust to support the requested exemption from ASME Section XI Inservice Inspection requirements.] Section 10.0 of this draft safety evaluation provides further discussion on the staff's evaluation of STPNOC's exemption request from the ISI and repair/replacement requirements of ASME Section XI.

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, with two exceptions. As discussed in Section 3.2.2.3, the staff finds that the deterministic categorization process does not adequately capture the importance of SSCs that mitigate the consequences of an accident by maintaining containment integrity or addresses the categorization of passive functions. As already stated in Section 3.2.2.3, these issues remain open items.

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, with the exception of the open items mentioned above, 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 functionality of the SSCs, as a result of the proposed exemptions, is maintained. Section 4.0 of this draft safety evaluation provides additional discussion on the proposed treatment to provide confidence in SSC functionality. Based on this information, the staff finds that the proposed categorization includes appropriate level of consideration of a SSC's contribution to maintaining 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 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.

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. (See Open item 3.3 on Expert Panel and Working Group qualifications.)

The deterministic categorization process is an iterative process based on the Working Group's professional judgement. 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 judgement. 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.

However, evaluation of several RSBDs submitted by STPNOC during the review of this exemption request determined that STPNOC was using so called "notes" to categorize classes of components. In response to staff concerns about the appropriateness of some of these notes, STPNOC provided a more detailed description of general notes in response to staff Question #22 (see Attachment 4 of the submittal). The response implies that all general notes are included in the RAI response. However, not all notes in the sample RSBD are provided in the table included in the response to staff Question #22. Furthermore, note number 9 in the table attached to the response to staff Question #22 states that a "[l]ow pressure and/or high volume system pressure boundary" would normally be LSS. This apparently allows most pressure boundaries in the plant, including the high volume reactor coolant system, to be categorized as LSS. STPNOC response states that STPNOC will perform a broader review of the general notes and will add procedural guidance. General notes assign whole classes of SSCs to specific safety significance categories and may categorize more SSCs than the PRA importance measures. The staff intends to review the general notes and the process surrounding their development and use after STPNOC has finalized its review. Therefore, the acceptability of the notes developed by STPNOC is an open item. **[Open item 3.6: STPNOC needs to finalize its process for the development and implementation of general notes in the categorization of SSCs and provide it to the NRC for review. Further issues may be developed related to this area after receipt of the finalized process.]**

Based on the above, the staff finds the documentation of the integrated decisionmaking process and the decision criteria used to be acceptable, with an exception of the open items already discussed.

3.3 Conclusion

The staff has reviewed STPNOC's integrated SSC categorization process. The staff finds the proposed categorization process to be generally acceptable to categorize the risk significance of plant SSCs. However, the staff has identified six issues that remain as open items: (1) the equations used to account for CCF in a single importance value underestimate the value, (2) different values were used for FV criteria for HSS SSCs in different parts of the submittal, (3) qualification requirements for the Expert Panel and Working Group, (4) an acceptable approach is needed to assess the risk significance of certain plant SSCs whose purpose is to mitigate the consequences of an accident by maintaining containment integrity, (5) STPNOC has not provided sufficient justification for

categorization to support exemption for ASME Section XI ISI requirements, and (6) the use of "general notes" to recategorize an SSC to a lower risk category. Conditioned on the successful resolution of these open items, the staff considers the proposed SSC risk categorization process to be acceptable.

4.0 STAFF EVALUATION OF ALTERNATIVE TREATMENT PROCESSES

4.1 Introduction

In its submittal, STPNOC requests 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 "normal industrial and commercial practices" to these SSCs that will provide reasonable assurance that they 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 non-safety-related HSS and MSS SSCs to determine whether enhanced treatment is warranted for their safety-significant functions. STPNOC indicates that the exemption will result in an overall risk benefit, or will be risk neutral. STPNOC states that it is not requesting 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 does not propose to use the exemption to change any design or functional requirements in the STP FSAR or the STP TSs.

4.2 Licensee's Proposed Alternative Treatment Processes

4.2.1 Safety-Related HSS and MSS SSC Treatment

In its submittal, STPNOC states that safety-related HSS and MSS SSCs will continue to receive treatment required by the NRC regulations and the associated implementing programs at STP. STPNOC will also evaluate the risk-significant functions performed by these SSCs to determine whether there are any functions that are not being treated under its current programs. If STPNOC does identify any risk-significant function that is not currently being treated as safety related, the licensee will evaluate the function for enhanced treatment, perform an engineering evaluation to ensure that the SSC can perform the function, and subject the function to its design control program and corrective action program.

4.2.2 Non-Safety-Related HSS and MSS SSC Treatment

In its submittal, STPNOC states that non-safety-related HSS and MSS SSCs will continue to receive any existing special treatment required by the NRC regulations and the implementing programs at STP. The licensee will also consider the risk-significant functions of these SSCs for enhanced treatment. STPNOC states that these SSCs will remain non-safety-related and will be procured commercially, but enhanced special treatment will be appropriately applied to give additional assurance that the SSCs will be able to perform their functions when demanded. STPNOC states that these SSCs will be placed under the Maintenance Rule monitoring program and subject to the TARGETED QA Program as provided in the NRC-approved GQA Program. STPNOC provides examples of process enhancements that might be applied to non-safety related HSS and MSS SSCs including performing routine preventive maintenance tasks more frequently, ensuring the SSC's critical attributes

are functionally validated following maintenance activities, ensuring that controls for replacement parts are enhanced, and increasing quality oversight of work activities and work documentation.

4.2.3 Safety-Related LSS and NRS SSC Treatment

In its submittal, STPNOC states that safety-related LSS and NRS SSCs will receive "normal commercial and industrial practices" rather than meeting the special treatment requirements in the NRC regulations. STPNOC reports that a specific procedure or program labeled as a "Commercial Treatment Program" does not exist at STP. STPNOC states that the "commercial treatment" elements are contained in numerous plant programs and procedures. STPNOC summarizes the elements of treatment currently in place at STP as they will be applied to safety-related LSS and NRS SSCs. Key points of the STPNOC treatment elements intended for safety-related LSS and NRS SSCs are provided below.

4.2.3.1 Accountability, Responsibility, and Organization

The general authorities, responsibilities, and accountabilities for STPNOC personnel engaged in power plant activities are defined and described in approved station procedures and policies. Organizational responsibilities are established to assure the accomplishment of corporate, site, and performance goals. Plant activities are conducted in a manner that is consistent with a conservative, technically sound approach to plant operations that properly values nuclear safety and public protection. Personnel are responsible for assuring that goals and performance criteria are met and are responsible for recommending changes that support the accomplishment of company and site goals and performance criteria. STPNOC lists examples of subjects addressed by policies and procedures including conduct of operations, qualification of plant staff personnel, system performance monitoring, and quality surveillance/performance monitoring.

4.2.3.2 Performance Expectations for Personnel

Performance expectations and standards for personnel are specified in approved procedures, policies, and guidelines. Personnel are responsible for performing their activities consistent with these expectations, as well as established company standards. STPNOC lists examples of subjects covered by procedures, policies, and guidelines including performing/verifying station activities, minor maintenance guidelines, design change implementation, and work direction.

4.2.3.3 Design Control Process

The Design Control Program complies with 10 CFR Part 50, Appendix B, and is used for maintaining design inputs and functional requirements for repair, replacement, or modification of pressure-retaining capability of ASME systems, and for the accomplishment of design activities. Under the exemption, STPNOC could replace LSS and NRS ASME components with non-ASME components by ensuring that the material specifications and the design (design loadings, design methodology, and stress allowables) are consistent with the original requirements. For LSS and NRS ASME items that are replaced with non-ASME items, STPNOC will manufacture or procure, install, and perform examinations of the replacement items in accordance with the technical requirements of a nationally recognized non-nuclear code, standard, or specification suitable for that item. However, consistency with the original material specification and design will be maintained by using the original ASME Section II material or equivalent standard material applying the original ASME Section III Design Specification loadings and load combinations, and using the ASME Section III calculation methodology

and allowables. STPNOC states that it is not the intent of its request to require manufacturing and quality requirements of ASME Section III such as impact testing and nondestructive examination. STPNOC proposes to conduct post-installation pressure tests in accordance with ASME Section XI. As an alternative, STPNOC could design, manufacture, and test a replacement component in accordance with the technical requirements of the applicable nationally recognized non-nuclear code, standard or specification, including design methodology and allowables, except that the design loadings of the original design specification will apply. STPNOC provides examples of subjects addressed in procedures including design change implementation, plant modifications, design change packages, control of configuration changes, and 10 CFR 50.59 evaluations.

4.2.3.4 Procurement Process

STPNOC procurement activities, including the identification, procurement, and receipt of replacement components or parts, are performed in accordance with approved procedures and processes. These processes include identification, procurement evaluation, engineering evaluation, purchase order, receipt inspection, and special handling and storage. Upon determination of a need for replacement components, parts, or material, STPNOC prepares and evaluates a procurement request to ensure that technical requirements and quality requirements have been adequately described and specified. Whenever conditions exist such that the proposed replacement components or parts deviate from the design specifications of the original item, STPNOC performs a documented engineering evaluation to assess the design adequacy of the proposed replacement. The evaluation compares the form, fit, and function of the replacement component to the original component including the capability of the replacement component to perform its function under design-basis conditions, considering applicable seismic and environmental conditions. STPNOC specifies procurement requirements on a purchase order that includes design specifications, quality requirements, conformance with nationally recognized consensus standards (if required by the design specifications), and shipping requirements. At the time of receipt, STPNOC inspects the received items to ensure that the item was not damaged in the process of shipping and that the item received is the item ordered. The procurement program provides for the identification and implementation of special handling and storage requirements (if required) to ensure that the item is not damaged or degraded during shipment to the site or during storage on site. STPNOC states that it could deviate from vendor recommendations based on specific circumstances and sound business practices without documentation. STPNOC provides examples of subjects addressed in approved procedures including procurement of materials; replacement item equivalency evaluation; purchase order/control management; receiving material; and marking, handling, storage, and maintenance of materials.

4.2.3.5 Installation Process

STPNOC's component and part installation activities are accomplished through the design change programs and through the maintenance processes. STPNOC could install components procured under the commercial treatment program in plant systems governed by special treatment requirements, including but not limited to ASME Code, Class 1E, and seismic requirements. STPNOC states that proceduralized measures would be taken to ensure that the most limiting requirements are applied at the interface between the commercial component and the rest of the system (including design, installation, welding, nondestructive examination, inspection, and testing requirements). STPNOC states that post-maintenance testing is performed to provide an appropriate level of assurance that the SSC is performing within expected parameters and SSC functionality is verified prior to being returned to service. STPNOC provides examples of post-maintenance attributes that may be checked such as no visible leaks of process fluid, smooth and expected operation of stroked

valves, and expected fluid pressure and flow from pumps. STPNOC provided examples of subjects addressed by approved procedures including work process, post-maintenance testing program, minor maintenance guidelines, Tool Pouch Maintenance, condition reporting process, design change implementation, and control of configuration changes.

4.2.3.6 Maintenance Process

STPNOC's maintenance process activities include corrective, preventive, and predictive maintenance that are performed in accordance with approved procedures, processes, and guidelines. Upon identification of an SSC deficiency through the Corrective Action Program, STPNOC states that the deficiency is evaluated and that troubleshooting actions and engineering support may be required. STPNOC states that factors considered in the evaluation include complexity of the work, impact on SSC critical attributes, potential impact on operation of the equipment, and testing requirements. The deficiency is determined to be acceptable as-is, or corrective maintenance activities are scheduled, based on the results of the evaluation. Some corrective maintenance can be performed under an approach known as Tool Pouch Maintenance if the work activity is within the scope of the skill of the craft.

STPNOC develops preventive maintenance tasks and work packages for active SSCs factoring in vendor recommendations and technical insights. STPNOC establishes predictive maintenance activities to anticipate, monitor, and/or include degradation mechanisms that could result in component failure. STPNOC states that the frequency and scope of predictive maintenance activities are based on various considerations such as vendor recommendations, environmental operating conditions, safety significance, and operation performance history. STPNOC states that it could deviate from vendor recommendations for preventive and predictive maintenance based on specific circumstances and sound business practices without documentation. STPNOC provides examples of predictive maintenance activities, including periodic lube oil analyses on large motors and pumps, and motor potential diagnostic testing. STPNOC states that identified deficiencies are either immediately corrected or identified for correction under the Corrective Action Program. STPNOC provided examples of subjects addressed by approved procedures and guidelines including work process, work direction, minor maintenance guidelines, Tool Pouch Maintenance Guidelines, post-maintenance testing, and troubleshoot/rework process.

4.2.3.7 Inspection, Test, and Surveillance Process

STPNOC's inspection and test process is primarily addressed and implemented through the maintenance process at STP. STPNOC factors vendor recommendations into the selected approach. However, STPNOC states that it could deviate from vendor recommendations based on specific circumstances and sound business practices without documentation. STPNOC's surveillance process is governed by approved test procedures to ensure that TS requirements are met and satisfied. STPNOC provides examples of additional programs used to monitor SSC performance including the Maintenance Rule, operator rounds, system engineer reviews, management observations, and GQA Working Group evaluations. STPNOC states that, under the Maintenance Rule, monitoring will be performed at the system, train, or plant level. LSS and NRS components are not explicitly monitored, but STPNOC states that degrading performance in these components, if significant, would be observed at the system or train level. STPNOC provides examples of subjects addressed by approved procedures and guidelines used to support this process including work process, preventive maintenance program, plant surveillances, post-maintenance testing, and the Maintenance Rule Program.

4.2.3.8 Corrective Action Program

STPNOC has stated that its Corrective Action Program complies with 10 CFR Part 50, Appendix B. STPNOC states that this program is used to identify and correct equipment deficiencies and nonconformances, to determine the cause of significant conditions adverse to quality, and to initiate actions to prevent recurrence. STPNOC provides examples of subjects addressed by approved procedures and policies that implement the Corrective Action Program including the Condition Reporting Program and control of conditions adverse to quality.

4.2.3.9 Management and Oversight Process

STPNOC's management and oversight process is accomplished through approved procedures and guidelines. STPNOC states that the management and oversight process includes independent oversight assessments and line self-assessments, Maintenance Rule monitoring, GQA Working Group assessments, and PRA model updates with a 36-month plant operating update and a 60-month comprehensive data update.

STPNOC documents actions and findings identified during assessment activities in a condition report in accordance with its Corrective Action Program. As part of the management and oversight process, STPNOC establishes and implements technical and administrative procedures. STPNOC procedures provide for the qualification, training, and certification of personnel. Administrative procedures and work instructions govern documentation, review, and retention requirements for completed work activities. STPNOC provides examples of documentation, including design drawings and specifications, procurement documents, documentation of completed installations, maintenance, and TS surveillances, condition reports on conditions adverse to quality, and actions and findings resulting from assessments. STPNOC procedures identify the types of inspection, test, and surveillance equipment requiring control and calibration, and the interval of calibration. STPNOC provides examples of subjects addressed in approved procedures and guidelines used to support the management and oversight process including plant audits, oversight planning and scheduling process, quality surveillance/monitoring, Maintenance Rule Program, independent plant assessments, and the Self-Assessment Process.

4.2.3.10 Configuration Control Process

STPNOC's configuration control process is controlled through approved procedures and policies. The design control process ensures that the configuration of the plant is properly reflected in design documents and drawings. Plant changes are controlled through design change packages that require controlled drawings and documents be updated prior to closeout of the modification package. This process also addresses the day-to-day status of plant SSCs. SSCs are tagged and manipulated by qualified Operations personnel per procedure. Non-ASME components installed in ASME Code systems are identified and tracked. STPNOC provides examples of subjects addressed in approved procedures and policies that implement the configuration control process, including design change implementation, operations configuration management, control of configuration changes, and plant modifications.

4.2.4 Non-Safety-Related LSS and NRS SSC Treatment

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

4.3 Evaluation

By the licensee's exemption request, the NRC staff is requested to approve the replacement of the special treatment requirements specified in the NRC regulations for all safety-related SSCs at STP with a set of treatment processes for various categories of SSCs based on their risk significance. Specifically, the licensee proposes (1) to apply the current special treatment requirements to safety-related HSS and MSS SSCs and evaluate their risk-significant functions to identify any functions not being treated under its current programs, (2) to apply any existing special treatment required by the NRC regulations to non-safety-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) to apply its "normal industrial and commercial practices" to safety-related LSS and NRS SSCs that the licensee states will provide reasonable assurance that these SSCs will be able to perform their safety functions, commensurate with their significance to safety. The licensee has not provided the categorization of specific SSCs and treatment planned for 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. Accordingly, the staff's review has focused on determining that the attributes of the treatment processes are sufficiently well defined and controlled to result in effective implementation.

The staff recognizes the significance of the proposed exemption from the NRC regulations requested by the licensee in terms of the potential impact on the treatment applied to SSCs performing safety functions at STP. For example, although the categorization and treatment is not specified for each SSC, the licensee indicated that approximately 77 percent of its safety-related SSCs might be categorized as LSS or NRS. In performing its review, the staff has applied insights and utilized guidance from RG 1.174, and its associated regulatory guides, such as the ability to monitor the impact of changes to licensee programs and the need to maintain defense in depth and safety margins.

The staff has reviewed the acceptability of the attributes described in the licensee's proposed treatment for safety-related and non-safety-related HSS and MSS SSCs, and reduced treatment for safety-related LSS and NRS SSCs. In the following paragraphs, describing the staff's evaluation of the attributes of the licensee's proposed treatment for the various SSC categories and individual processes, the staff established criteria that were used in evaluating the licensee's exemption request that provide the treatment attributes necessary to meet functional requirements to be applied to various SSCs at STP. The staff also discusses certain expectations to which the licensee has not specifically committed but that are needed by the staff to reach its safety finding.

4.3.1 Proposed 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 expects the licensee 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. In this regard, the licensee's risk assessment may assume that the SSC performs (1) an entirely different function (for example, a valve assumed to be capable of closing when its design function is to open); (2) the same design function, but beyond the design-basis limits of the plant (for example, expecting a component to maintain integrity to its ultimate failure point); or (3) its design function or beyond design-basis function in an environment outside the design-basis envelope (for example, without room coolers). The validation is expected to consist of a documented engineering evaluation to determine whether enhanced treatment is warranted for safety-related HSS

and MSS SSCs to provide confidence that the beyond design-basis safety significance functions are satisfied. The staff expects the performance of these SSCs to be monitored at the train or component level and all failures need to be evaluated. If the provisions of 10 CFR 50.65 are used to meet this condition, those provisions need to be supplemented to monitor all functional failures of those SSCs (not just maintenance preventable failures). Following facility changes that affect risk-significant beyond design-basis functions, the staff expects an evaluation to be performed and documented that determines whether there continues to be confidence that the risk-significant beyond design-basis functions will be satisfied and that the credit assumed in the categorization process remains valid.

In Section 3.3.1 of Attachment 1 to its submittal, the licensee states that safety-related HSS and MSS SSCs will continue to receive special treatment required by the NRC regulations and the associated implementing programs at STP. The licensee indicates that it will evaluate the risk-significant functions performed by these SSCs to determine whether there are any functions that are not being treated under its current programs. If it identifies any risk-significant function that is not currently being treated adequately by the current special treatment requirements, the licensee proposes to evaluate the function for enhanced treatment, perform an engineering evaluation to ensure that the component can perform the function, and subject the function to its Design Control Program and Corrective Action Program.

The staff finds that the proposed process attributes for determining the appropriate treatment for the risk-significant functions of safety-related HSS and MSS SSCs are not adequately described in the proposed FSAR section (Attachment 7 of the submittal). The licensee's submittal simply states that the licensee will determine when and to what extent additional actions are necessary for risk-significant functions of safety-related HSS and MSS SSCs. The licensee needs to specify the attributes for determining appropriate treatment for these SSCs such that the staff can make a finding that these attributes are acceptable. Further, the licensee states that the risk-significant functions of safety-related HSS and MSS components will only be subject to monitoring under the Maintenance Rule at the system/train level. The licensee also needs to address the monitoring of the risk-significant functions of safety-related HSS and MSS SSCs at the component level. The licensee references Section 3.3.6 of Attachment 1 of its submittal for details on its evaluation for enhanced treatment of these SSCs, but that section suggests that the licensee has determined that the existing special treatment requirements are adequate and that no enhanced treatment will applied. This overall concern is considered part of Open item 4.1 that is discussed in Section 4.3.2 of this draft safety evaluation.

4.3.2 Proposed Treatment of Non-Safety-Related HSS and MSS SSCs

Any applicable special treatment requirements of the NRC regulations will continue to be applied to non-safety-related HSS and MSS SSCs at STP. In addition, the staff expects the licensee to validate the assumptions credited in the risk assessment for these SSCs. The validation is expected to consist of a documented engineering evaluation to determine whether enhanced treatment is warranted for non-safety-related HSS and MSS SSCs to provide confidence that the risk-significant functions are satisfied. The staff expects the performance of these SSCs to be monitored at the train or component level and that all failures will be evaluated. If the provisions of 10 CFR 50.65 are used to meet this condition, those provisions need to be supplemented to monitor all failures associated with HSS and MSS functions (not just maintenance preventable failures). Following facility changes that affect risk-significant functions, the staff expects an evaluation to be performed and documented that determines whether there continues to be confidence that the risk-significant functions will be satisfied and that the credit assumed in the categorization process remains valid.

In Section 3.3.2 of Attachment 1 to its submittal, the licensee states that non-safety-related HSS and MSS SSCs will continue to receive any existing special treatment required by the NRC regulations and the implementing programs at STP. The licensee proposes to consider the risk-significant functions of these SSCs for enhanced treatment. The staff expects that the treatment to be applied to non-safety-related HSS and MSS SSCs to be sufficient to ensure that these SSCs can perform their risk-significant functions.

The staff finds that the proposed process attributes for determining the treatment of non-safety-related HSS and MSS SSCs is not adequately described in the proposed FSAR section (Attachment 7 of the submittal). The licensee needs to integrate the process attributes described in the submittal into the proposed FSAR section such that the staff can make a finding that the process attributes are acceptable. **[Open item 4.1: STPNOC needs to describe in the FSAR the process attributes for determining the appropriate treatment to be applied to risk-significant functions of both safety-related and non-safety-related HSS and MSS SSCs not currently covered by programs established in response to the NRC regulations.]**

4.3.3 Proposed Treatment of Safety-Related LSS and NRS SSCs

The licensee requests 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 does 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 does not propose to change any design or functional requirements in the STP FSAR or TSs.

The NRC 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, but the requirement remains for the licensee to have confidence that safety-related LSS and NRS SSCs are capable of performing their safety functions. For example, in SECY-99-256, "Rulemaking Plan for Risk-Informing Special Treatment Requirements," under Option 2 of the NRC project to risk-inform 10 CFR Part 50, the NRC staff states that low-risk safety-related SSCs "will need to receive sufficient regulatory treatment [emphasis added] such that these SSCs are still expected to meet functional requirements, albeit at a reduced level of assurance." The NRC staff reviewed the attributes of the treatment processes to be applied to the safety-related LSS and NRS SSCs proposed by the licensee to determine whether the proposal will provide confidence in the capability of those SSCs to perform their safety functions with recognition that the level of confidence may be lower for low-risk SSCs than that provided by implementation of the special treatment requirements of the NRC regulations.

Overall, the staff found that the licensee's proposal provides confidence in the capability of LSS and NRS SSCs to perform their safety functions provided the open items identified in this safety evaluation are resolved. However, the staff did identify several areas that warrant either clarification by the licensee on its stated practices or adjustments to the attributes of the processes to be consistent with the staff's expectations for attributes of minimally acceptable treatment processes as described in the July 19, 2000, draft review guidelines. The areas of concern basically fall into (1) examples of where sufficient commitments are not provided in the licensee's submittal, and (2) examples of where the stated attributes of the treatment processes in the licensee's description (provided in Attachment 1 of

the submittal) differs from discussions of how the processes will be implemented in response to staff questions in requests for additional information or other parts of the submittal.

With respect to the concern regarding insufficient commitments, the licensee provides a description of the treatment attributes proposed for safety-related LSS and NRS SSCs in Section 3.3.7 of Attachment 1 to its submittal. The licensee provides examples of the treatment to be applied to safety-related LSS and NRS SSCs and various considerations in establishing the treatment for those SSCs. Overall, the staff has found that the proposed treatment attributes provide sufficient confidence that LSS and NRS SSCs will remain functional provided the open items identified in this safety evaluation are resolved. In Attachment 7 of the submittal, the licensee provides a proposed FSAR section that provides a general description of the attributes of its treatment processes (and other processes) that form the basis for its exemption requests. However, the staff has determined that in some areas the proposed FSAR section does not provide a sufficient description of the attributes of the alternative treatment processes. The staff has identified, in this and other sections of this draft safety evaluation, areas where additional description of the process attributes is necessary in the proposed FSAR section to provide a sound regulatory basis for the staff to have confidence that the change controls (described in Section 5.0 of this draft safety evaluation) are sufficiently robust to ensure the staff's findings remain valid as the licensee implements any of the exemptions the NRC grants. The additional level of detail that is expected is generally consistent with the NRC's draft review guidelines provided to STPNOC under cover of a letter dated July 19, 2000. In those cases where the staff has identified the need for additional information to be provided in the proposed FSAR section, the staff has determined that the licensee must revise the proposed FSAR section to include the additional information requested. **[Open item 4.2: STPNOC must revise the proposed FSAR section that provides the description of attributes of its proposed treatment processes that form the basis for its exemption requests to incorporate the additional attributes needed as identified in this draft safety evaluation. See Sections 4.3.3.2, 4.3.3.3, 4.3.3.4, 4.3.3.5, 4.3.3.7, and 8.4 of this draft safety evaluation. The level of detail in the revisions to the FSAR should be consistent with the level of detail in the July 19, 2000, draft review guidelines for each of the alternative treatment processes.]**

The staff based its conclusions on the attributes of the treatment processes described in the proposed FSAR section and Attachment 1 of the licensee's submittal. The staff identified areas where the licensee's submittal in the other attachments (or within Attachment 1) differed from the treatment processes described in Attachment 1. The staff expects the licensee to implement the treatment processes as described in Attachment 1 of its submittal. Where the staff has identified areas of inconsistency between attachments of the submittal, it is the staff's expectation that the treatment processes described in Attachment 1 of the submittal are correct. **[Confirmatory item 4.1: STPNOC must confirm to the staff that it will resolve the areas of inconsistency identified by the staff in this safety evaluation. See Sections 4.3.3.2 and 8.4 of this safety evaluation. (To the extent that other sections of this safety evaluation identify inconsistencies, this Confirmatory item applies).]**

The staff concluded that in the areas of "Accountability, Responsibility, and Organization" and "Performance Expectations for Personnel," in Sections 3.3.7.1 and 3.3.7.2, respectively, of Attachment 1 to its submittal, the licensee's description was acceptable without exception and no further discussion of the staff review was needed. For the other alternative treatment areas, the staff determined a more detailed description of its review and areas where differences or technical concerns were identified during its review was required. The following sections provide the staff's assessment of the attributes of the remaining alternative treatment areas.

4.3.3.1 Design Control Process

The staff considers that the design control process for safety-related LSS and NRS SSCs must ensure the maintenance of design inputs and functional requirements for currently installed and replacement SSCs. This includes (1) the capability of electrical, instrumentation and control system components and mechanical components to withstand a seismic event using the appropriate structural design response spectra including component-level seismic and other applicable loads in combination; and (2) the capability of electrical and instrumentation and control system components to withstand a harsh environment based on the design environmental envelope. The staff expects the accomplishment of design activities to be achieved in accordance with national consensus standards as applicable and to the extent that national consensus standards exist for a subject, including repair, replacement, or modification of pressure-retaining capability of ASME Class 2 and Class 3 systems.

The licensee states in Section 3.3.7.3 of Attachment 1 to its submittal that its design control process as applied to safety-related LSS and NRS SSCs at STP will continue to comply with the requirements of 10 CFR Part 50, Appendix B. Further, the licensee states that it could replace LSS and NRS ASME components with non-ASME components where the material specifications and the design (design loadings, design methodology, and stress allowables) are consistent with the original requirements.

Because the licensee states that its Design Control Program will continue to meet the requirements of 10 CFR Part 50, Appendix B, the staff accepts the licensee's proposed treatment for design control process of safety-related LSS and NRS SSCs. However, as described in detail in Section 10.0 of this draft safety evaluation, the licensee's description of its planned implementation of the design control process contains certain statements that are outside the scope of this exemption request as changes to technical requirements are proposed by the licensee. For example, the licensee would (1) do leak tests permitted by Section XI in lieu of the construction code hydrostatic tests, (2) allow the higher stress allowable limits associated with the ASME Code to be applied with the less rigorous methodologies associated with non-Code standards, and (3) eliminate impact testing and nondestructive examination (see Section 10.0 and Open item 10.2 of this draft safety evaluation).

4.3.3.2 Procurement Process

The staff considers that the set of procurement attributes that would be acceptable to ensure that current design requirements are maintained for safety-related LSS and NRS SSCs are that the procurement process (1) needs to provide sufficient engineering basis for acceptance of the SSC based on design specifications including the original design inputs and assumptions, (2) replacement SSCs are procured in accordance with national consensus standards as applicable and to the extent that national consensus standards exist for a subject meeting the requirements of the design standard, (3) considers vendor recommendations for shipping, storage, and handling requirements for these SSCs or basis for alternative, and (4) includes receipt inspection to ensure that the procured SSC matches the design specifications.

With respect to procurement, the licensee's proposed FSAR section states that:

> Station procurement activities, including the identification, procurement, and receipt of replacement components or parts, are performed in accordance with approved procedures and processes. These processes include requirements for appropriate material and performance specifications, inspection, and special handling.

A summary description of the licensee's procurement process is provided in Section 4.2.3.4 of this draft safety evaluation. In Section 3.3.7.4 of Attachment 1 to its submittal, the licensee states that, when purchasing a replacement safety-related LSS and NRS SSC, a procurement request is prepared to ensure that technical requirements and quality requirements for the SSC have been adequately described and specified. Whenever conditions exist such that the proposed replacement SSC deviates from the technical requirements of the original item, the licensee performs an engineering evaluation to assess the design adequacy of the proposed replacement and compares the form, fit, and function of the replacement SSC to the original SSC. The licensee states that this comparison includes the capability of the replacement SSC to perform its function under design-basis conditions, including applicable seismic and environmental conditions.

However, the licensee's response to staff Question #4 in Attachment 3 to the submittal contains the following statement regarding environmental qualification:

> Therefore, STP[NOC] believes that 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 is overly burdensome and not necessary for LSS and NRS components (i.e., not commensurate with their safety significance).

The staff found the above statement by the licensee to be inconsistent with its statement to perform an engineering evaluation for replacement SSCs and to contradict its statements regarding its Design Control Program. The staff concluded that the above statement would eliminate the requirement to perform any engineering evaluation or analysis that provides an assessment under accident conditions. The staff determined that under these circumstances, there would be no sound technical basis that provides confidence that LSS and NRS SSCs would meet their specified performance requirements under the conditions predicted to be present should they be required to perform their safety function. The licensee must provide confidence, commensurate with their risk significance, that the LSS and NRS SSCs will function under design-basis conditions. In order to provide this confidence, the staff considers an engineering evaluation as the minimum standard that provides evidence that the LSS and NRS SSCs will function under the specified environmental conditions. Further, the program description in the proposed FSAR section does not provide the attributes that (1) the item received is the item ordered, (2) consider vendor recommendations, or (3) national consensus standards are used to the extent they are available. The procurement process described in the proposed FSAR section must be revised to include the additional attributes discussed above and the attribute that an engineering evaluation will be performed to provide confidence that replacement LSS and NRS SSCs will continue to meet design inputs (environmental, seismic, or other design specifications) under design-basis conditions up to the end of their qualified life (see Open item 4.2).

The staff generally accepts the attributes of the licensee's proposed treatment for procurement of safety-related LSS and NRS SSCs provided the open items identified in this safety evaluation are resolved. Staff acceptance is based on the determination that the procurement process provides attributes to ensure that (1) purchase orders specify procurement requirements that includes design specifications, quality requirements, conformance with nationally recognized consensus standards (if required by the design specifications), and shipping requirements; (2) received items are inspected to ensure that the item was not damaged in the process of shipping, and that the item received is the item ordered; and (3) vendor recommendations are considered. However, as described in detail later in Section 10.0 of this draft safety evaluation, the licensee's description of the implementation of the procurement process appears inconsistent with the staff's expectation that technical requirements would be maintained. In Attachment 1, the licensee states that equivalent design and materials

requirements would be maintained when procuring components to nationally recognized consensus commercial standards. However, the licensee further states in Attachment 1 that "[i]t is not the intent of this request to require manufacturing and quality requirements of ASME Section III such as impact testing and NDE [nondestructive examination]." This is inconsistent with the staff's expectations with regard to technical requirements for SSCs and the staff has determined, as discussed further in Section 10.0 of this draft safety evaluation, that to maintain the technical design requirements of SSCs, fracture toughness provisions are to be specified in procurement documents for replacement SSCs consistent with ASME Section III (see Open item 10.2).

The staff also identified several areas where the licensee's description of how this process would be implemented raises concern that the implementation would not be consistent with the program described in Attachment 1 of the submittal to provide confidence of functionality under design basis conditions. For example, the licensee states on pages 48 and 49 of Attachment 4 of the submittal, in response to staff Question #12, that if a Class 1E component is not fully qualified it would be isolated from Class 1E circuitry without discussing the functional capability of the replaced component. Also, although relating to maintenance, in response to staff Question #39(d) on page 148 of Attachment 4 of the submittal, the licensee states that when safety-related LSS and NRS SSCs exceed their qualified life for environmental qualification, the SSCs would be assumed to be capable of functioning and would not be replaced unless necessary for a separate reason. In addition, the licensee states on page 157 of Attachment 3 that "Replacement LSS components are procured to be capable of meeting their design functional requirements (including environmental conditions). These functional requirements will envelope the credible design basis conditions [emphasis added] that the component can be expected to see." In these instances, the staff expects that the licensee will implement its programs as described in Attachment 1 of the submittal and will initiate appropriate corrective actions to address the issues identified by the staff (see Confirmatory item 4.1).

4.3.3.3 Installation Process

The attributes the staff considers necessary to provide confidence in the functionality of LSS and NRS SSCs for the installation process for safety-related LSS and NRS SSCs are that the process must (1) provide preoperational and preservice testing and evaluation to provide reasonable confidence of its proper installation and operation, and (2) be accomplished in accordance with national consensus standards as applicable and to the extent that such standards exist for a subject meeting the requirements of the design standard.

With respect to installation, the licensee's proposed FSAR section states that:

> The Station's component and part installation activities are accomplished through the Design Change Programs and/or through the Maintenance processes. Components procured under the commercial treatment program may be installed in plant systems that are governed by special treatment requirements, including but not limited to ASME Code, Class 1E, and seismic requirements. In such instances, proceduralized measures are taken to ensure that the most limiting requirements are applied at the interface between the commercial component and the rest of the system. Appropriate post-maintenance testing is performed.

In its general description of its installation process in Section 3.3.7.5 of Attachment 1 to its submittal, the licensee states:

Upon completion of installation activities, a post-maintenance test (PMT) (or other tests as specified by the Work Planner, Work Supervisor, System Engineer, or Plant Operations) is performed, if the installation could affect an SSC's design function. Post-maintenance testing is performed to provide an appropriate level of assurance that the SSC is performing within expected parameters and component functionality is verified prior to being returned to service. The post-maintenance testing may necessitate that the SSC be placed in service to validate the acceptance of its performance. Post-maintenance testing is not necessarily performed under design-basis conditions. Examples of post-maintenance attributes which may be checked include:

- no visible leaks of process fluid
- smooth and expected operation of stroked valves
- expected fluid pressure and flow from pumps
- rotating equipment operating with no abnormal noises
- expected circuit continuity and indication
- expected vibration responses on rotating equipment

The component is only returned to service after Operations accepts the results of the maintenance activities and/or the post-maintenance operability tests. If expected performance is not achieved, the work order document remains open to continue replacement/repair/rework until the activity is satisfactorily completed.

The licensee's installation process is generally acceptable to the staff because it provides attributes to (1) perform PMT when the installation could affect an SSC's design function, and (2) verify expected SSC performance before being returned to service. However, the licensee's FSAR section does not include the attributes to provide preoperational and preservice testing and evaluation to provide confidence of its proper installation and operation or to conduct installation in accordance with nationally recognized consensus standards. Incorporation of these attributes into the proposed FSAR description related to the installation process would satisfy the staff's expectations, commensurate with risk significance, for preoperational and preservice testing necessary to provide confidence that LSS and NRS SSCs will remain functional following installation activities. The licensee needs to revise its proposed FSAR section to include the attributes described above to the description of the installation process for safety-related LSS and NRS SSCs (see Open item 4.2).

4.3.3.4 Maintenance Process

To provide confidence in the functionality of LSS and NRS SSCs as related to maintenance, the staff considers that the attributes of the maintenance process for safety-related LSS and NRS SSCs needs to (1) establish preventive maintenance that considers vendor recommendations or a basis for alternatives, (2) establish corrective maintenance that implements the results of the corrective action process, (3) provide for post-maintenance testing and evaluation (including examination and testing of repaired items) demonstrating the proper performance of maintenance and subsequent operation, and (4) accomplish maintenance in accordance with national consensus standards, as applicable, and to the extent that national consensus standards exist for a subject.

With respect to maintenance, the licensee’s proposed FSAR section states that:

> The Station’s maintenance process activities include corrective, preventive, and predictive maintenance. These maintenance activities are performed in accordance with approved procedures, processes, and guidelines.

In its general description of its maintenance process for safety-related LSS and NRS SSCs, the licensee proposes in Section 3.3.7.6 of Attachment 1 of its submittal to perform corrective, preventive, and predictive maintenance in accordance with approved procedures, processes, and guidelines. As discussed in the summary of the licensee's proposal in Section 4.2.3.6 of this draft safety evaluation, the licensee's maintenance processes include attributes that considers vendor recommendations, are tied to the STPNOC Corrective Action Program to initiate corrective maintenance, and includes predictive and preventive maintenance requirements. The process for post-maintenance testing is described in Section 3.3.7.5 of Attachment 1 of the submittal under installation processes (see Section 4.2.3.5 of this draft safety evaluation for a summary of this process). The staff's evaluation of the licensee's installation processes is provided in Section 4.3.3.3 of this draft safety evaluation. Based on the description of the maintenance and installation processes at STP, the staff determined that commensurate with their risk significance, the attributes of these processes would be sufficient to provide confidence that safety-related LSS and NRS SSCs would remain functional as a result of maintenance activities. However, the licensee’s proposed FSAR section does not include the attributes that (1) preventive maintenance considers vendor recommendations or a basis for alternatives, (2) corrective maintenance implements the outcome of the corrective action process, (3) provide for post-maintenance testing and evaluation (including examination and testing of repaired items) demonstrating the proper performance of maintenance and subsequent operation, and (4) maintenance is accomplished in accordance with national consensus standards. The licensee needs to revise the proposed FSAR section to include these additional attributes for maintenance processes (see Open item 4.2).

4.3.3.5 Inspection, Test, and Surveillance Process

To provide confidence in the functionality of LSS and NRS SSCs on an ongoing basis, the staff considers, commensurate with the risk significance of the SSC, that the inspection, test, and surveillance process needs to include the following attributes: (1) consider vendor recommendations or basis for alternative to provide reasonable confidence that SSCs are capable of performing their safety functions under design-basis conditions, including the potential for service-induced aging; and (2) is conducted in accordance with nationally recognized consensus standards as applicable and to the extent that these standards exist for a subject.

In Section 13.7.3.3.7 of Attachment 7 of the submittal, the licensee-proposed FSAR section on the inspection, test, and surveillance process states:

> The Station’s inspection and test process is primarily addressed and implemented through the Maintenance process. As stated above, the Maintenance process addresses inspections and tests through corrective, preventive, and predictive maintenance activities.
>
> The Station’s surveillance process is governed by approved test procedures to ensure that Technical Specification requirements are met and satisfied. These Technical Specification requirements apply to some safety-related and non-safety-related SSCs, including some components that are categorized as LSS. These surveillances will continue to be performed.

> In addition to the surveillances required by Technical Specifications, additional monitoring is performed to validate the acceptable performance of SSCs. Examples of programs used to monitor SSC performance include Maintenance Rule, Operator Rounds, System Engineer reviews, and management assessments.

In Section 3.3.7.5 of Attachment 1 of the submittal, the licensee states:

> Upon completion of installation activities, a post-maintenance test (PMT) (or other tests as specified by the Work Planner, Work Supervisor, System Engineer, or Plant Operations) is performed, if the installation could affect an SSC's design function. Post-maintenance testing is performed to provide an appropriate level of assurance that the SSC is performing within expected parameters and component functionality is verified prior to being returned to service.

In Section 3.3.7.6 of Attachment 1 of the submittal, the licensee states under the discussion of predictive maintenance that:

> Predictive maintenance activities are intended to anticipate, monitor, and/or include degradation mechanisms which, if left unattended, would result in component failure. The frequency and scope of these maintenance actions are established and documented based on various considerations such as vendor recommendations, environmental operating conditions, safety significance, and operating performance history. STP[NOC] may deviate from vendor recommendations based on specific circumstances and sound business practices. Such deviations are not required to be documented.
>
> Examples of predictive maintenance activities include:
>
> - periodic lube oil analyses on large motors and pumps
> - vibration analyses of rotating equipment
> - thermographic analysis of both mechanical and electrical SSCs to identify improper temperature conditions or electrical hot-spots
> - motor potential diagnostic testing
>
> Deficiencies that are discovered during the performance of predictive maintenance activities are either immediately corrected or identified for correction under the Corrective Action Program.
>
> Post maintenance testing, if required by the work instructions, is performed to provide an appropriate level of assurance that the SSC is performing within expected parameters prior to being returned to service.

In Section 3.3.7.7 of Attachment 1 to its submittal, the licensee states that the surveillance process at STP is governed by approved test procedures to ensure that TS requirements are met and satisfied. Additional programs referenced by the licensee that monitor SSC performance include the Maintenance Rule program, operator rounds, system engineer reviews, management observations, and GQA Working Group evaluations. The licensee states that, under the Maintenance Rule, monitoring will be performed at the system, train, or plant level. Although LSS and NRS components

are not explicitly monitored, the licensee states that degrading performance in these components, if significant, would be observed at the system or train level.

The staff has determined that the attributes of the licensee's processes to conduct inspections, tests, and surveillances are generally acceptable, but deficient in some areas. STPNOC does state that testing will be conducted to provide assurance that the SSCs are performing within expected parameters. However, none of the testing proposed by the licensee is conducted, or compared to performance, at design-basis conditions, including the potential for service-induced aging. Further, the proposed FSAR section does not include the attribute that inspections, tests, and surveillances will be conducted in accordance with national consensus standards or considering vendor recommendations. To provide the staff with confidence that the licensee will implement an inspection, test, and surveillance process that appropriately addresses the functionality of LSS and NRS safety-related SSCs under design-basis conditions, the licensee's proposed FSAR section must be updated to include the additional attributes that inspections, tests, and surveillances will be conducted in accordance with national consensus standards to the extent they exist, and that testing will be conducted, or compared to performance, at design-basis conditions including the potential for service-induced aging, and considering vendor recommendations (see Open item 4.2).

4.3.3.6 Corrective Action Program

The staff considers that the corrective action program for safety-related LSS and NRS SSCs must determine the cause of conditions adverse to quality identified in the various plant processes, resolve the adverse condition, and feed back the results of the evaluation into applicable plant programs. Corrective action activities must be planned and accomplished in accordance with written, approved, and controlled procedures. In Section 3.3.7.8 of Attachment 1 to its submittal, the licensee states that the corrective action program as applied to safety-related LSS and NRS SSCs will comply with the requirements of 10 CFR Part 50, Appendix B. The staff finds that the licensee’s commitment to apply the corrective action program requirements of 10 CFR Part 50, Appendix B, to safety-related LSS and NRS SSCs, including requirements for quality of review and timeliness of corrective action, provides confidence in the continued capability of safety-related LSS and NRS SSCs.

4.3.3.7 Management and Oversight Process

The staff considers that the licensee’s management and oversight process for safety-related LSS and NRS SSCs should include the attribute that assessment and follow-up activities are planned and accomplished in accordance with written, approved, and controlled procedures. The management and oversight process needs to include the attribute that training and qualification of plant personnel in accordance with vendor recommendations and national consensus standards, as applicable, and to the extent that national consensus standards exist for a subject will be provided. Documentation provided needs to be sufficient to support the treatment processes for safety-related LSS and NRS SSCs. The management and oversight process needs to include an attribute for the control of inspection, test, and surveillance equipment.

The staff finds that the licensee’s description of the attributes of its proposed management and oversight process for safety-related LSS and NRS SSCs generally acceptable. However, the licensee’s proposed FSAR section needs to include the additional attributes that training and qualification of plant personnel will be conducted in accordance with vendor recommendations and national consensus standards, as applicable, and that inspection, test, and surveillance equipment will be controlled. Further, the licensee states in response to staff Question #13 in

Attachment 4 under Criterion XII of its submittal that "if a post-calibration check of M&TE [measuring and test equipment] fails, evaluation of impact on LSS and NRS components will not be required, nor will any rework be required on LSS/NRS components." The proposed FSAR section that discusses the process attributes for control of inspection, test, and surveillance equipment (i.e., M&TE) needs to include the attribute that confidence of SSC functionality will be provided upon failure of post-calibration checks of M&TE. The licensee must revise its proposed FSAR section to include the additional attributes described above (see Open item 4.2). Further, the staff identified one exception to its acceptance of the proposed management and oversight process. As discussed in Section 4.2.1 of Attachment 1 of the submittal, the licensee proposes to extend the exemption from the requirements of 10 CFR 50.59 to other special treatment provisions described in the FSAR that are not related to regulations. 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. The licensee states on page 21 of Attachment 4 to its submittal that the generic assessment provided in its exemption request envelops the impacts of changes in particular commitments and, therefore, assumes that there is no reason to evaluate the impact of each individual change in a commitment to the special treatment requirements for LSS and NRS SSCs. The staff determined that the process used by the licensee to reduce or eliminate commitments needs to explicitly address the effect of these relaxations on component functionality. For example, the staff issued Generic Letter (GL) 89-10 and GL 96-05 because of identified weaknesses in the design, sizing, and setup of motor-operated valves (MOVs) using past practices by vendors and licensees. Elimination of the safety-related MOVs categorized as LSS and NRS from the licensee's programs in response to GL 89-10 and GL 96-05 could result in the loss of the functionality of those MOVs. Therefore, the licensee's proposal to eliminate its commitments to generic letters and other regulatory documents based solely on its exemption request is not acceptable (see Section 12.0 of this draft safety evaluation for further discussion of the staff's position on changes to other special treatment provisions of the FSAR). Changes to commitments need to be addressed in accordance with the guidance prepared by the Nuclear Energy Institute (NEI) for managing commitments and, if necessary, found acceptable to the NRC staff. **[Confirmatory item 4.2: STPNOC must confirm its commitment to adhere to the NRC-endorsed NEI guidance on commitment management.]**

4.3.3.8 Configuration Control Process

The staff expects the licensee to establish a process that provides configuration control for safety-related LSS and NRS SSCs and plant documents (for example, procedures and drawings) associated with those SSCs to reflect current plant status and design changes. The staff finds that the licensee's description of the attributes of its proposed configuration control process to be applied to safety-related LSS and NRS SSCs acceptable.

4.4 Conclusion

For HSS and MSS SSCs, the staff concluded that the attributes of the proposed process for determining the treatment of both safety-related and non-safety-related HSS and MSS SSCs is not adequately described in the proposed FSAR section (Attachment 7 of the submittal).

Overall, the staff concludes that the attributes of the licensee-proposed treatment processes provide a reasonable alternative to provide confidence that safety-related LSS and NRS SSCs would remain functional under design-basis conditions. However, the staff did identify several

areas that warrant either clarification by the licensee on its stated practices or adjustments to the processes to be consistent with the staff expectations on the attributes of minimally acceptable treatment. Further, the staff determined that the licensee must revise the proposed FSAR section that provides the description of attributes of its proposed treatment processes that form the basis for its exemption requests to incorporate the additional attributes needed as identified in this draft safety evaluation.

5.0 STAFF EVALUATION OF CHANGE CONTROL PROCESSES

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 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 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 technical specifications 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 contained in Attachment 7 of its submittal. STPNOC states that this new section in the STP FSAR will be controlled in accordance with the requirements in 10 CFR 50.59. STPNOC also proposed to use the following additional criteria for controlling changes to the proposed Section 13.7 of the STP FSAR:

1. STPNOC may make changes in the categorization process described in Section 13.7 of the FSAR, without prior NRC approval, provided that the revised process:

    a. has both PRA and deterministic categorization processes;

    b. designates the category of a component based upon the higher of the PRA risk categorization and deterministic categorization;

    c. provides a risk categorization of a component as LSS or NRS only if the component has little or no impact on CDF or LERF (using commonly accepted assessment techniques such as Fussell-Vesely (FV) and RAW); and

    d. provides a deterministic categorization of a component as LSS or NRS only if the component has no more than a minor impact on the ability of the plant to prevent or mitigate accidents.

2. STPNOC may make changes in the treatment described in Section 13.7 of the FSAR, without prior NRC approval, provided that the revised treatment provides reasonable assurance that components:

    a. can perform their HSS and MSS functions, and

    b. can perform their safety-related functions under design-basis conditions.

3. STPNOC may make changes in the evaluations and assessments described in Section 13.7 of the FSAR, without prior NRC approval, provided that the revised evaluations and assessments include the following elements:

    a. Processes to monitor the effect of changes in special treatment on the reliability/availability of safety-significant and safety-related functions;

    b. Processes to ensure that significant changes in reliability/availability of safety-significant and safety-related functions are evaluated for impact on component risk categorization, application of special treatment, and corrective action; and

    c. Periodic assessments to update the PRA and to reassess the risk categorization of components.

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 preliminary conclusions primarily on the attributes of the processes described in STPNOC's submittal. 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.

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 recognizes 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 did not provide sufficient confidence that changes that could affect the underlying basis for the staff's findings would remain valid. The staff determined that in order for the NRC to be able to grant any of the exemptions requested in the licensee's submittal that the exemptions would require a condition that the description of the processes in the STP FSAR that form the basis for the staff's findings with regard to LSS and NRS SSCs cannot be changed without prior NRC review and approval. How the licensee chooses to implement these processes, as described in its procedures, may be changed as the licensee determines appropriate, provided there is no change necessary to the description in the STP FSAR. Should the licensee determine that the description of the processes in the STP FSAR with regard to LSS and NRS components require change, the licensee would be required to submit the proposed change to the FSAR description to the NRC for prior 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 believes 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. Therefore, to ensure that the bases for any of the exemptions the NRC may grant remains valid, the NRC should impose the following exemption condition to any exemption it may grant:

> As a condition of this exemption, the licensee will follow the categorization, treatment, and oversight (evaluation and assessment) processes for LSS and NRS structures, systems, and components described in its submittal dated July 13, 1999, as supplemented October 14 and 22, 1999, and January 26, August 31, and [other supplement date(s) as appropriate] 2000, and relied upon by the NRC staff in approving this exemption. The licensee has documented these processes in a proposed FSAR submittal dated [appropriate date] found acceptable by the NRC staff. The licensee shall incorporate this proposed FSAR submittal into the STP FSAR. No changes to these processes that would affect the description in the FSAR will be implemented by the licensee without prior NRC staff review and approval to provide confidence that the bases of this exemption remain valid. If the bases for this exemption do not remain valid, a subsequent exemption will be required to implement the proposed changes.

The staff has identified a number of open items in this safety evaluation regarding the proposed FSAR section provided in the submittal. These open items must be resolved before the staff can determine that the proposed FSAR section is acceptable as the regulatory bases for those exemptions that the NRC may grant as requested in the licensee's submittal.

The staff considers the criteria for controlling changes to the processes described in the STP FSAR as an open item pending further discussions on the NRC proposed exemption conditions with the licensee. **[Open item 5.1: As a condition of the exemptions the NRC may grant, the change control exemption conditions described in Section 5.0 of this draft safety evaluation will be imposed.]**

5.4 Conclusion

The staff concluded that the change control process described by the licensee did not provide sufficient confidence that the staff's findings would remain valid as the licensee changed the processes during implementation of any of the exemptions granted.

6.0 STAFF EVALUATION OF PROPOSED 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 submittal, addresses the remaining 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 or 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 NRC 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 is necessary for 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 draft safety evaluation, the staff describes its assessment of the attributes of the proposed treatment processes for LSS and NRS SSCs. The staff determined, subject to resolution of the related open items, that the proposed treatment processes provide confidence of functionality. Also, as discussed in Section 3.0 of this draft safety evaluation, the staff determined, subject to resolution of the related open items, 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 endanger life or property.

The staff also finds the licensee's legal evaluation is valid, so that the proposed exemption is authorized by law. The common defense and security are unaffected by the exemption, since there is no effect upon security and safeguards protection. 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, subject to the resolution of the open items identified in Section 3.0 of this safety evaluation, in that the exemption provisions of 10 CFR 21.7 have been satisfied.

7.0 STAFF EVALUATION OF PROPOSED 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 NRC 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) of 10 CFR Part 50 – Managerial and Administrative Controls

The regulation at 10 CFR 50.34(b) specifies the information to be included in the FSAR. 10 CFR 50.34(b)(6)(ii) specifies 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 probabilistic risk assessment (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 Attachment 1, Section 3 of the submittal. 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, 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 assurance that the exempted SSCs would perform satisfactorily in service.

7.3.1 STPNOC Commercial Treatment Program

The elements of STPNOC's commercial treatment program are described in Section 3.3.7 of the submittal. The licensee commits to continue to satisfy the QA requirements of 10 CFR Part 50, Appendix B, for the elements of 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 would not be 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 non-safety-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. This suggests that the reliability of the

exempted SSCs would not be affected by application of its commercial treatment program, although it is not clear to what extent these data reflect reliability of SSCs under design-basis conditions.

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

- Accountability, Responsibility, and Organization
- Performance Expectations for Personnel
- Design Control Process (Appendix B program)
- Procurement Process
- Installation Process
- Maintenance Process
- Inspection, Test, and Surveillance Process
- Corrective Action Program (Appendix B program)
- Management and Oversight Process
- Configuration Control Process

These commercial program elements are described in Section 4.2.3 and evaluated in Section 4.3 of this draft safety evaluation.

7.3.2 Comparison of STPNOC Commercial Practices with Appendix B Criteria

Section 4.2.3 describes the commercial practices 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 commercial practices with the exempted 10 CFR Part 50, Appendix B, criteria in its response to staff Question #13 provided in Attachment 4 to the submittal.

7.3.2.1 Criterion I – Organization

The Quality organization will focus on HSS/MSS components, including non-safety 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 measuring and testing equipment (M&TE). It is expected that this equipment will continue to be controlled and calibrated as it is currently, however, if a post-calibration check of the M&TE fails, evaluation of impact on LSS and NRS components will not be required, nor will any rework be required on LSS/NRS components.

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, Part 50, 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 regulation at 10 CFR 50.12(a)(2)(ii) provides for exemption from an NRC regulation when application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The intent of 10 CFR Part 50, Appendix B, and the complementary regulations addressed by this section of the draft safety evaluation 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. 10 CFR 50.34(b)(6)(ii) establishes requirements for information related to managerial and administrative controls. This information is normally provided by a licensee in a QA Program 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 NRC 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 QA Program 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 QA Program 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 (summarized in Section 4.2.3 of this draft safety evaluation) are implemented by procedures, many of which are explicitly referenced in the submittal. STPNOC's response to staff Question #13 in Attachment 4 of the submittal specifically addresses how the 15 exempted QA criteria are covered by its commercial program. Controls for design control, corrective action, and nonconforming items would continue to be implemented by processes conforming to the requirements of 10 CFR Part 50, Appendix B, as described in the licensee's QA Program description.

Subject to the resolution of the open items identified in Sections 3.0 and 4.0 of this safety evaluation, the submittal provides a credible basis for assuming 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 commercial processes. Even if exemption from the special process 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 licensee's application of risk-informed categorization techniques has identified a class of SSCs that have little or no safety significance with respect to protecting the health and safety of the public. 10 CFR Part 50, Appendix B, provides for a graded approach to QA in that controls may be applied to SSCs to an extent consistent with their importance to safety. Subject to resolution of the open items identified in Section 3.0 and 4.0 of this safety evaluation, the proposed treatment processes to be applied to these activities, as described by the licensee, specifies planned and systematic actions that provides adequate confidence, commensurate with importance to safety, that the exempted SSCs would perform satisfactorily in service. Therefore, the "special circumstance" of 10 CFR 50.12(a)(2)(ii) is satisfied because application of the regulation is not necessary to achieve the underlying purpose of the rule, subject to resolution of the open items in Sections 3.0 and 4.0 of this safety evaluation, in that STPNOC's categorization and proposed treatment processes provide confidence that the exempted SSCs would perform satisfactorily and therefore, 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 QA program 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 safety evaluation. 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 and found them acceptable. The staff additionally believes that the alternate controls will provide confidence in the continued functionality of LSS and NRS SSCs. The staff has determined that it is necessary, as described in Section 7.4.4 of this safety evaluation, to have the licensee submit a revised OQAP description that describes QA controls that will be implemented for the LSS and NRS safety-related SSCs. With respect to records, the STPNOC alternative program specifies that administrative controls will specify records that will be maintained for LSS and NRS SSCs.

The staff concludes that an exemption from GDC 1 is not necessary. The alternative treatment and categorization processes proposed in the submittal (once the Open items identified in this draft safety evaluation are resolved) can be incorporated into a OQAP framework that appears to satisfy 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 QA program, (3) to maintain plant records as determined by the licensee, and (4) to have confidence, commensurate with their risk significance, 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).

However, the staff has determined that the QA Program 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 safety evaluation), 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 QA Program description should identify any portion of the QA Program 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 based on the fact that the underlying purpose of the rule would not be satisfied by the licensee's proposal.

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 NRC staff approval prior to each change.

Exemption of LSS and NRS SSCs from regulatory QA requirements constitutes a significant reduction in commitments in the QA Program 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 QA Program 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 QA Program should be implemented concurrently with implementation of the requested exemptions.

Subsequent changes to the QA Program 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 licensee has not requested exemptions from Criteria III, XV, or XVI of Appendix B. The licensee should propose, for implementation concurrent with the approved exemptions, a revision to the OQAP that addresses the exempted SSCs, as described in Section 7.4.3 above. The staff does not consider that these requirements constitute an extremely or prohibitively costly regulatory process, and on this basis, the staff determined that the requested exemption should be denied.

The staff notes that the licensee's justification includes a statement that "multiple changes to the QA Program" may be required for implementation of the exemptions. The basis for this statement is not clear. Further dialogue is needed to resolve this issue. **[Open item 7.1: STPNOC should propose, for implementation concurrent with any approved exemptions, a revision to the Operations QA Program description, which includes a discussion of the scope of the SSCs exempted from 10 CFR Part 50, Appendix B, requirements, the basis for the exemptions (e.g., by referencing the staff's safety evaluation), and also references the document(s) where the alternative treatment processes are described (i.e., STP FSAR, proposed Section 13.7). The QA Program description should identify any portions of the QA Program that remain applicable to the exempted SSCs (i.e., those sections related to design control, corrective actions, and nonconforming items). All changes to the QA Program that supplement and complete the exemption request should be submitted to the staff pursuant to the requirements of 10 CFR 50.54(a)(3). The revised QA Program should be implemented concurrently with implementation of any exemptions granted.]**

7.5 Conclusions

The staff has determined that the requested exemptions from 10 CFR Part 50, Appendix B, requirements should be granted, subject to the resolution of the open items identified in Sections 3.0 and 4.0 of this safety evaluation. However, the exemption requested from 10 CFR 50.34(b)(6)(ii) should be denied and the QA Program 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 safety evaluation),

and also reference the document where the alternate treatment processes are described (i.e., FSAR, Section 13.7). The QA Program description should identify any portion of the QA Program description that remains applicable to the exempted SSCs (i.e., those sections related to design control, corrective action, and nonconforming items). Also, the staff determined that the requested exemption from 10 CFR 50.54(a)(3) should be denied and the licensee should submit its revised QA Program description that reflects the reduction in commitment that would occur as a result of granting the exemptions for LSS and NRS SSCs. Further, the staff determined that an exemption from GDC 1 is not necessary. The alternative treatment and categorization processes proposed in the submittal (once the Open items identified in this draft safety evaluation are resolved) can be incorporated into a OQAP framework that satisfies the requirements of GDC 1 for LSS and NRS SSCs.

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

8.2 Exemption Requested

In its submittal, the licensee requested an exemption to exclude LSS and NRS components from the scope of electric equipment important to safety under 10 CFR 50.49(b) for the purposes of environmental qualification of electrical components.

8.3 Discussion

In its 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. 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. The licensee further states

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

The licensee 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. The licensee indicates that the application of 10 CFR 50.49 equipment qualification requirements to LSS or NRS components is not necessary to achieve the underlying purpose of 10 CFR Part 50. Specifically, the 10 CFR 50.49 qualification requirements are currently applied to components (categorized LSS or NRS) that will not credibly cause loss of the safety-related system level function and will not have an adverse impact on plant risk. Thus, the licensee concluded it is not necessary to apply 10 CFR 50.49 qualification requirements to LSS or NRS components to achieve the underlying purpose of the rule.

8.4 Evaluation

The licensee indicates that qualification documentation and files specified in 10 CFR 50.49 would not be applicable to LSS and NRS electric components. Originally, important to safety LSS and NRS SSCs at STP were designed and procured under the 10 CFR 50.49 requirement for qualification documentation and files. The licensee states that these components would continue to be designed to function in the installed environment. The staff notes that the engineering evaluation performed in the procurement process, discussed in Section 4.3.3.2 of this safety evaluation, would document the capability of the replacement SSCs to function under design-basis environmental conditions. This appears to meet the intent of the requirement for qualification documentation and files in 10 CFR 50.49. This is consistent with the proposed rulemaking for Risk-Informing Special Treatment Requirements published in the *Federal Register* on March 3, 2000 (65 FR 11488). In this rulemaking, the staff stated that risk-informed safety class 3 (RISC-3) SSCs (equivalent to safety-related LSS and NRS SSCs) must receive sufficient regulatory treatment such that these SSCs still meet functional requirements, albeit at a reduced level of assurance.

The licensee requested an exemption from the requirements of 10 CFR 50.49 for maintaining LSS and NRS electric equipment in a qualified condition. However, the licensee indicated in Attachment 2 of its submittal under “Scope of Exemption” for 10 CFR 50.49(b), that these components will be designed to withstand the effects of design-basis event environmental conditions without loss of capability to perform their safety function. Also, the licensee states in Section 3.3.7.4 that “[w]henever conditions exist such that the proposed replacement

components or parts deviate from the design specifications (technical requirements) of the original item, an engineering evaluation is performed to assess the design adequacy of the proposed replacement." The staff concluded that the engineering evaluation is the minimum standard that provides confidence that LSS and NRS electric components would function under design-basis conditions. This appears to meet the intent of the regulation that would require maintaining the LSS and NRS electric equipment in a qualified condition. However, in the licensee's response to staff Question #4 in Attachment 3 to the submittal, the licensee made statements that the staff found to be inconsistent with the statement to perform an engineering evaluation for replacement SSCs (see Section 4.3.3.2 of this safety evaluation). The procurement process described in the proposed FSAR section must be revised to include the additional attribute that an engineering evaluation will be performed to provide confidence that replacement LSS and NRS SSCs will continue to meet design inputs (environmental, seismic, or other design specifications) under design-basis conditions up to the end of their qualified life (see Open item 4.2 and Section 4.3.3.2 of this safety evaluation).

In Attachment 2 of its submittal, the licensee states under the "Scope of Exemption" for 10 CFR 50.49(b) that "LSS and NRS components, as applicable under Section 50.49, would be designed to function in the installed environment. Section 3.3.7 of Attachment 1 [to the submittal] identifies the design and procurement controls that would be applied to LSS and NRS components to achieve this requirement." A similar statement is made in the proposed FSAR Table 13.7-1. However, included within the original design requirements of safety-related LSS and NRS SSCs, as applicable, are the environmental conditions of a design-basis event harsh environment at the end of qualified life. Therefore, the licensee's statement that "to achieve the requirement that they are designed to function in the installed environment," is inconsistent with attributes of the procurement process described in its submittal and inconsistent with condition that LSS and NRS SSCs will remain functional under design basis conditions. STPNOC must confirm to the staff that it will resolve this area of inconsistency (see Confirmatory item 4.1).

The licensee stated that LSS and NRS electric equipment could be replaced with equipment that is not qualified pursuant to 10 CFR 50.49. The staff reviewed Section 3.3.7 of Attachment 1 of the submittal that identifies the attributes of the STPNOC design and procurement processes that would be applied to LSS and NRS SSCs to achieve the requirement to remain functional under design-basis conditions. The staff assessment of design control and procurement processes are provided in Section 4.0 of this draft safety evaluation. The licensee states that the Station's Design Control Program is used for both safety-related (LSS and NRS as well as HSS and MSS SSCs) and non-safety-related applications that are in the Configuration Management Program. In addition, the licensee stated that commercial treatment practices will be adequate to provide an appropriate level of assurance that LSS and NRS safety-related SSCs can satisfy their design functional requirements. Further, the comparison of form, fit, and function, includes the capability of the replacement component to perform its function under design-basis event conditions, including applicable environmental conditions.

The licensee's statements indicate that current design inputs (the same environmental conditions used in the evaluation of HSS and MSS SSCs, as applicable) will be used for the evaluation of safety-related LSS and NRS SSCs located in the same spaces as HSS or MSS SSCs. The staff considers this position consistent with the requirements set forth in 10 CFR 50.49 and provides confidence that the LSS and NRS SSCs will function under design-basis environmental conditions. The licensee's submittal (page 41 of Attachment 1) states an

engineering evaluation will be performed to ensure that replacement components will not degrade other Class 1E components and will satisfy the required form, fit, and function (including the ability to function under specified environmental conditions). Under 10 CFR 50.49(f)(3) the licensee has the option to qualify important to safety electric equipment using "experience with identical or similar equipment under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable." Based on the facts that the licensee has stated it will maintain the original design inputs and plans to perform engineering evaluations for replacement components to assure the required form, fit, and function is maintained, it is not clear to the staff why STPNOC believes it needs an exemption from 10 CFR 50.49. **[Open item 8.1: STPNOC needs to provide additional information on its need for the requested exemption from 10 CFR 50.49(b).]**

8.5 Conclusion

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. However, the staff has determined that the attributes in the licensee's design control and procurement processes (maintaining original design inputs and performance of an engineering evaluation) appear to satisfy the intent of the regulation. As such, it is not clear to the staff why the licensee believes an exemption from 10 CFR 50.49 is necessary.

9.0 STAFF EVALUATION OF PROPOSED 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.

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 SSCs would not be subject to the component-specific IST requirements of the ASME Code. The licensee would continue to apply system-level testing requirements in accordance with the STP TSs. Additionally, Section 3.3.7 of Attachment 1 to the licensee's submittal (and Section 13.7.3.3 of Attachment 7 to the submittal) identifies other activities intended to provide reasonable assurance of the functionality of safety-related LSS and NRS SSCs (i.e., normal commercial and industrial practices).

In Section 3.3.7.5 of Attachment 1 of the submittal, the licensee states:

> Upon completion of installation activities, a post-maintenance test (PMT) (or other tests as specified by the Work Planner, Work Supervisor, System Engineer, or Plant Operations) is performed, if the installation could affect an SSC's design function. Post-maintenance testing is performed to provide an appropriate level of assurance that the SSC is performing within expected parameters and component functionality is verified prior to being returned to service.

In Section 3.3.7.6 of Attachment 1 of the submittal, the licensee states under the discussion of predictive maintenance that:

> Predictive maintenance activities are intended to anticipate, monitor, and/or include degradation mechanisms which, if left unattended, would result in component failure. The frequency and scope of these maintenance actions are established and documented based on various considerations such as vendor recommendations, environmental operating conditions, safety significance, and operating performance history. STP[NOC] may deviate from vendor recommendations based on specific circumstances and sound business practices. Such deviations are not required to be documented.
>
> Examples of predictive maintenance activities include:
>
> - periodic lube oil analyses on large motors and pumps
> - vibration analyses of rotating equipment
> - thermographic analysis of both mechanical and electrical SSCs to identify improper temperature conditions or electrical hot-spots
> - motor potential diagnostic testing
>
> Deficiencies that are discovered during the performance of predictive maintenance activities are either immediately corrected or identified for correction under the Corrective Action Program.
>
> Post maintenance testing, if required by the work instructions, is performed to provide an appropriate level of assurance that the SSC is performing within expected parameters prior to being returned to service.

Section 3.3.7.7 of Attachment 1 to the licensee's submittal states, in part:

> The Station's inspection and test process is primarily addressed and implemented through the Maintenance process. 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[NOC] may deviate from vendor recommendations based on specific circumstances and sound business practices. Such deviations are not required to be documented.

As stated in Attachment 2 to the licensee's submittal:

> These provisions [i.e., inservice testing requirements of 10 CFR 50.55a(f)] ensure that mechanical systems and important components within these systems can perform their safety function. By definition, components that are categorized as LSS and NRS do not significantly contribute to mitigating or preventing accidents. Therefore, it is not necessary to perform ASME inservice testing of these components to satisfy the purpose of these provisions [emphasis added].

Attachment 3 to the licensee's submittal (in response to staff Question #2 on Inservice Testing) states:

> As discussed in Section 5.2.5 of Attachment 1, the Operating Experience Group (OEG) collects and evaluates problems reported in the STP corrective action program database, which will include problems with individual safety-related LSS and NRS components. The OEG also supports identification of adverse equipment trends, possible common cause or common mode failures, and similarities to station and industry operating experience.
>
> Under the Maintenance Rule, STP[NOC] will continue to monitor performance on a plant, system, or train level, as appropriate. Monitoring LSS/NRS SSCs consists of tracking Maintenance Rule Functional Failures (MRFFs) whose failures result in loss of an HSS/MSS function. When performance criteria are not satisfied, STP[NOC] will perform evaluations to determine the cause and corrective action, including, as necessary, corrective action for LSS and NRS components.
>
> Therefore, the existing monitoring program approved by the NRC for the GQA Program will be sufficient to monitor the effects of the changes in the special treatment requirements for LSS and NRS components and to provide an appropriate level of assurance that SSCs will continue to satisfy their functional requirements.

Attachment 3 to the licensee's submittal also states (in response to staff Question #5 on Inservice Testing):

> As discussed in Section 5.2.5 of Attachment 1, STP[NOC]'s corrective action program will continue to be used to identify and correct nonconforming conditions and adverse trends for LSS and NRS components. Information from the corrective action program will be provided to the monitoring and feedback program to assess the impact of the changes in the special treatment requirements and the need for future adjustments to ensure the continued reliability and availability of the components. Whenever degraded performance is attributed to the reduction or relaxation of special treatment controls, the Working Group will recommend the appropriate remedial action, up to and including the reinstatement of the subject special treatment control(s) and the potential re-categorization of the component's risk significance to a higher level. As such, the corrective action and monitoring and feedback programs are significant barriers against allowing unacceptable levels of performance degradation to occur.

Attachment 3 to the licensee's submittal also states (in response to staff Question #7 on Inservice Testing), in part:

> The IST program is a special treatment process, and should be treated similarly to other special treatment requirements. In that regard, STP[NOC]'s risk significance evaluation process can be used to establish the importance of components within the IST program, and components with low safety significance do not need to be subject to the IST program to provide adequate protection of public health and safety.
>
> Compliance with ASME Code IST requirements for LSS and NRS components is not necessary to provide reasonable assurance that these components are capable of performing their intended function(s). Reasonable assurance for LSS components can be achieved through other programs currently in effect [Maintenance Rule and Corrective Action Program as discussed above]. Finally, industry accepted testing requirements may be applied as appropriate [emphasis added] for currently installed or replacement components in order to provide reasonable assurance of component functional capability.

9.4 Evaluation

The regulation at 10 CFR 50.55a(f) states that IST is conducted to verify the operational readiness of ASME Code Class 1, 2, or 3 (safety-related) pumps and valves in nuclear power plants. The underlying purpose of the rule is to verify the operational readiness of those pumps and valves whose function are required for safety. STPNOC has proposed to exclude pumps and valves categorized as LSS and NRS from the scope of IST required by 10 CFR 50.55a(f) based on a method different from that used in ASME Code classification of pumps and valves.

As noted above, STPNOC has stated that its "risk significance evaluation process [categorization process] can be used to establish the importance of components within the IST program, and components with low safety significance do not need to be subject to the IST program to provide adequate protection of public health and safety." The STPNOC categorization process was reviewed by the staff and the staff's assessment of that process is provided in Section 3.0 of this draft safety evaluation.

Generally, the staff determined that the categorization process provides a reasonable method for determining the safety significance of SSCs (subject to the resolution of the open items identified in this safety evaluation) and that those safety-related SSCs categorized as LSS and NRS do not have a significant impact on public health and safety. Further, as part of its categorization process, STPNOC conducted a sensitivity study for all modeled LSS components. The licensee's sensitivity study determined that relatively large decreases in the availability of all of the modeled LSS SSCs have a small effect on safety. As such, the staff determined it is reasonable to apply the licensee's categorization process to determine the scope of pumps and valves to be excluded from the IST requirements of 10 CFR 50.55a(f). Through its review of the categorization process, the staff has determined that it is not necessary to include within the scope of 10 CFR 50.55a(f) those safety-related pumps and valves categorized as LSS or NRS to satisfy the underlying purpose of the rule in that safety-related LSS and NRS pumps and valves do not have a significant contribution to safety and

significant degradation in LSS and NRS safety-related pumps and valves individually and collectively would have little change in overall safety.

However, the licensee is still required to provide confidence that even though the safety-related pumps and valves categorized as LSS and NRS are excluded from the specific IST requirements of the ASME Code, these pumps and valves will remain capable of performing their design-basis functions on an ongoing basis. Many SSCs perform their safety functions under conditions more severe than normal conditions or operations. 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. Confidence in the ongoing functionality of the LSS and NRS safety-related pumps and valves shall be provided by the treatment proposed by the licensee. As discussed in Section 4.3.3.5 of this draft safety evaluation, the staff has determined that the attributes of the licensee's processes to conduct inspections, tests, and surveillances generally provide an acceptable level of confidence that safety-related LSS and NRS SSCs remain functional on an ongoing basis subject to the resolution of the open items identified in Section 4.0 of this safety evaluation. Specifically. the licensee's proposed FSAR section must be updated to include the additional attributes that inspections, tests, and surveillances will be conducted in accordance with national consensus standards to the extent they exist, and that testing will be conducted, or compared to performance at design-basis conditions, including the potential for service-induced aging, and considering vendor recommendations (see Section 4.3.3.5 of this safety evaluation).

9.5 Conclusion

Based on the staff's review of the licensee's categorization process and the attributes of the inspection, test, and surveillance processes, described in Section 3.0 and 4.3.3.5 of this draft safety evaluation respectively, the staff concluded that the special circumstances of 10 CFR 50.12(a)(2)(ii) have been met, contingent on the resolution of the open items identified in Sections 3.0 and 4.0 of this safety evaluation, in that it is not necessary to satisfy the underlying purpose of 10 CFR 50.55a(f) by including LSS and NRS safety-related pumps and valves within its scope. Further, the staff has determined, subject to open item resolution, that excluding LSS and NRS safety-related pumps and valves from the IST requirements of the regulation does not pose an undue risk to public health and safety. As such, the staff has determined that the requested exemption from 10 CFR 50.55a(f) should be granted, provided the open items in Section 3.0 and 4.0 of this safety evaluation are resolved.

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

10.1 Introduction

This section of the draft safety evaluation assesses the licensee’s submittal regarding repair and replacement activities and ISI. 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. Further the staff used the guidance provided in RG 1.174. 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.”

10.2 Exemption Requested

The licensee stated in Section 4.1 of Attachment 1 to its submittal:

> STP[NOC] seeks an exemption for LSS and NRS components from requirements for repair/replacement, inservice inspection, and inservice testing in ASME Code Section XI and/or the Operation and Maintenance (O&M) Code which is incorporated by reference in 10 CFR 50.55a. For 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. STP[NOC] would otherwise be able to purchase replacement 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). Installation and examination of LSS and NRS replacement components would be performed in accordance with ANSI B31.1. Post-installation testing would be performed in accordance with ASME Section XI and the requirements of the work package. For inservice inspection and inservice testing activities, LSS and NRS components would be exempt from the requirements of ASME Section XI.

10.3 Discussion

STPNOC is requesting an exemption from the ASME Code requirements incorporated in 10 CFR 50.55a with respect to the repair and replacement of ASME components. For example, the exemption would enable STPNOC to replace LSS and NRS ASME components with non-ASME components, subject to ensuring that the material specifications and the design (design loadings, design methodology, and stress allowables) are consistent with the original requirements.

The licensee stated in Section 4.1.2.2 of Attachment 1 to its submittal:

> STP[NOC]'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[NOC] 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. Thus, individual systems could contain both Code and non-Code components. Since the plant has already been designed and constructed in accordance with the ASME Code, STP[NOC]’s exemption request addresses only the portion of the Code that involves the repair and replacement of items, when the need arises. This activity is covered under Section XI of the Code. Section XI of the Code

generally requires that replacement items meet the requirements of the original Construction Code, i.e., ASME Section III. However, Section XI does provide relief for piping, valves, and fittings 1-inch nominal pipe size and less. These items are exempt from the requirements of Section XI and, by reference, from the requirements of Section III, as long as the materials and stress levels are consistent with the requirements of the applicable Construction Code. The Code provides this relief in consideration of the burden of the extensive controls required by Section III, especially subsection NCA, when compared to the likelihood and consequences of a failure. Under STP[NOC]'s exemption request, this relief would be expanded to include repair and replacement of safety-related LSS and NRS ASME items, regardless of size or product form. Thus, for LSS and NRS ASME items, STP[NOC] would be able to repair the items or fabricate or procure replacement items in accordance with the technical requirements of a nationally recognized Code, Standard or Specification suitable for that item as long as the material specifications and the design (design loadings, design methodology, and stress allowables) are consistent with the original requirements. Installation and examination of LSS and NRS replacement components would be performed in accordance with ANSI B31.1. In addition, STP[NOC] 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.

For example, the replacement of an LSS or NRS ASME valve with a non-ASME valve would consist of the following steps:

1. Initiate a design change package to implement the replacement of a code valve with a non-code valve.

2. Identify the proposed ANSI B16.34 valve.

3. Ensure and document that the material specifications of the replacement valve are consistent with the requirements of ASME Section II or equivalent standard material (e.g., ASTM).

4. Ensure that the wall thickness exceeds the original design minimum wall thickness. (Note: this step, along with step 3 above, will ensure that the stresses are within allowables).

5. Prepare a Work Package that identifies installation requirements required by ANSI B31.1 such as welding, NDE, etc.

6. Install the valve and conduct post-installation testing in accordance with ASME Section XI and the requirements of the work package.

7. Maintain associated records for the life of the plant.

These measures will be sufficient to provide reasonable assurance, commensurate with the LSS or NRS risk significance, that the technical requirements of the Code will be satisfied for LSS and NRS replacement items,

> and that the replacement items will remain functional under design-basis conditions.

The regulation at 10 CFR 50.55a provides an acceptable basis for the design, fabrication, inspection, testing, and flaw evaluation of safety-related components through the endorsement of the ASME Boiler and Pressure Vessel Codes including Section III, Section XI, and the O&M Code. The provisions of the ASME Codes were the principal standards included in the Standard Review Plan for judging if 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 Class 1, 2 and 3. These classifications are used both in the construction and operating phases for a nuclear power plant. In particular 10 CFR 50.55a(g) that endorse ASME Section XI, is the applicable portion of the regulations governing ISI, flaw evaluation, pressure testing and repair/replacement activities for these components in an operating nuclear power plant.

10.4 Evaluation

The licensee has stated in its exemption request that the design and material requirements would be consistent with the original design (see Section 3.3.7.3 of Attachment 1 of the submittal). The licensee intends to procure and replace components to recognized commercial standards and pressure test these components after installation to ASME Section XI requirements. The revised exemption request, provided in its submittal, clarifies that STPNOC does not intend to perform either preservice or ISIs of the LSS or NRS SSCs. The licensee also states that it only requests exemption from GDC 4 for environmental qualification purposes and that protection from dynamic effects will be maintained (see Section 15.0 for staff assessment of the GDC 4 exemption request).

The licensee states in Section 4.1.2.2 of Attachment 1 of its submittal:

> ...Section XI does provide relief for piping, valves, and fittings 1-inch nominal pipe size and less. These items are exempt from the requirements of Section XI and, by reference, from the requirements of Section III, as long as the materials and stress levels are consistent with the requirements of the applicable Construction Code. The Code provides this relief in consideration of the burden of the extensive controls required by Section III, especially subsection NCA, when compared to the likelihood and consequences of a failure. Under STP[NOC]'s exemption request, this relief would be expanded to include repair and replacement of safety-related LSS and NRS ASME items, regardless of size or product form.

The staff found the discussion provided by the licensee to justify expansion of the 1 inch ASME Section XI exemption technically unacceptable. Components 1 inch and under in ASME Section XI have been exempted from examination requirements because a break of this size is generally within coolant makeup capacity without the use of emergency core cooling systems. The expansion of the treatment given to 1 inch and under components to LSS and NRS components of larger sizes is without adequate basis. **[Open item 10.1: STPNOC needs to**

provide a valid basis to justify expansion of the 1 inch Section XI exemption to over 1 inch components.]

As a part of its exemption request, the licensee has requested the following:

> For inservice inspection and inservice testing activities, LSS and NRS components would be exempt from the requirements of ASME Section XI.

The staff found that complete removal of LSS and NRS SSCs from all the inspection of Section XI is not justified based on the information provided in the submittal. The licensee has stated that it intends to use the leak tests permitted by ASME Section XI in lieu of the construction code hydrostatic tests. The licensee has failed to present an adequate engineering basis as to why this should be acceptable (see Open item 10.2 below). The basis for elimination of hydrostatic pressure testing for ASME Section XI includes a recognition that volumetric or special surface examinations would be performed during installation and that adequate fracture toughness is contained in the item to preclude brittle failure. The purpose of the construction code hydrostatic pressure testing is to serve as a proof test to preclude an SSC manufactured with gross negligence or improper materials from being put in service.

Consistent with the licensee's request, the staff recognizes that LSS and NRS components would be manufactured to commercial standards with less stringent examination and QA requirements than an ASME component and would, therefore in the staff's view, require the more conservative test dictated by the construction code. Further the preservice examination, as may be required by ASME Section XI, is needed to verify that installation of the commercial component did not degrade the system with regard to its structural integrity. Section 3.2.2.3 of this draft safety evaluation provides additional staff evaluation of this area (see Open item 3.5).

The licensee, in Section 3.3.7.3, of Attachment 1, to its submittal states that it intends to meet the original design and materials requirements except that the LSS or NRS components would be procured to suitable commercial standards. Further the licensee has stated that it does not intend to reduce defense in depth through the reduction of barriers. In particular the licensee states in Section 3.3.7.3:

> For LSS and NRS ASME items that are replaced with non-ASME items, STP[NOC] will manufacture or procure, install, and perform examinations of the replacement items in accordance with the technical requirements of a nationally recognized non-nuclear 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). However, consistency with the original material specification and design will be maintained by using the original ASME Section II material or equivalent standard material (e.g., ASTM), applying the original ASME Section III Design Specification loadings and load combinations, and using the ASME Section III calculation methodology and allowables. (Note: The use of ASME Section III allowables is justified because it is consistent with the ASME Section III design methodology. Also, the use of identical or equivalent material and original design methodology will, in general, eliminate the need for reanalysis provided the wall thickness exceeds original design minimum wall requirement). It is not the intent of this request to require manufacturing and quality requirements of ASME Section III

such as impact testing and NDE. These are considered permissible reductions in special treatment requirements consistent with the low risk classification. In addition, STP[NOC] 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 staff has reviewed the proposed reduced special treatment requirements stated above and has identified three concerns as follows.

1. The use of the higher ASME III allowable stress limits in lieu of the commercial standards allowable stress limits without the equivalent design and fabrication controls and inspections.

2. The removal of fracture toughness requirements from the design and procurement requirements.

3. The use of post-installation pressure test provisions from Section XI in lieu of the hydrostatic pressure test provisions of the commercial standard for the item.

With regard to concern 1, the licensee states that this approach is acceptable since consistency with the original material specification and design will be maintained by using the original ASME Section II material or equivalent standard material (e.g., ASTM), applying the original ASME Section III design specification loadings and load combinations, and using the ASME Section III calculation methodology and allowable stress limits. The staff's concern is that the basis for the allowable stress limits in Section III is not only based on the design practices but also on the other controls imposed during fabrication and inspections that are required as part of the process. The preferred practice being requested by the licensee would result in a hybrid that appears would not meet a commercial national consensus standard that would be used in the BOP systems in a nuclear plant. This is an example of where STPNOC has proposed an alternative to a national consensus standards that mixes requirements between an ASME Code and a commercial code without providing an adequate engineering basis for why it is acceptable (see Open item 10.2 below).

With regard to concern 2, the licensee states that equivalent design and materials requirements would be maintained when procuring components to nationally recognized consensus commercial standards. Nonetheless, the licensee states “[i]t is not the intent of this request to require manufacturing and quality requirements of ASME Section III such as impact testing and NDE [nondestructive examination]”. This statement would result in fracture toughness requirements not being included in the procurement specifications of these LSS or NRS SSCs. Fracture toughness is a fundamental material property that is relied upon to preclude rapid propagating brittle failure and is a part of the component’s design. Sufficient fracture toughness in a material is necessary to preclude catastrophic failure modes that would result in loss of component functionality by loss of its ability to carry pressure or load or loss of its ability to perform its intended function (i.e., close a valve). Ferritic materials used in reactor applications may have ductile to brittle transition temperatures above system operating temperatures. Fracture toughness criteria are necessary to preclude such materials from being put into service.

The design of the reactor coolant system (RCS) (consistent with GDC 31, "Fracture Prevention of Reactor Coolant Pressure Boundary") and the containment (consistent with GDC 51, "Fracture Prevention of Containment Pressure Boundary") are required to be of such a manner that the likelihood of brittle failure is minimized. The licensee has neither requested exemption from GDC 31 or GDC 51, nor from the dynamic effects of pipe breaks pursuant to GDC 4. Further, elimination of the fracture toughness requirements for the RCS and the containment would change the technical design requirements for these SSCs. Changes to technical design requirements are not acceptable under Option 2 of risk-informing the special treatment requirements of 10 CFR Part 50 under which the STPNOC exemption request is being considered. As such, the staff concludes that the ASME Section III requirements related to impact testing are not included within the scope of any of the exemptions requested by STPNOC and that to maintain the technical design requirements of SSCs, fracture toughness provisions (as demonstrated by impact testing) are to be specified for replacement SSCs consistent with ASME Section III as appropriate.

With regard to concern 3, the licensee has also proposed to exclude the construction code hydrostatic pressure test requirements, as well as the Section XI preservice and inservice examination requirements, for LSS and NRS SSCs. The licensee has stated that it intends to use the leak tests permitted by Section XI in lieu of the construction code hydrostatic tests. The licensee has failed to present a basis as to why this should be acceptable. The basis for elimination of hydrostatic pressure testing for Section XI includes a recognition that volumetric or special surface examinations would be performed during installation and that adequate fracture toughness is contained in the component to preclude brittle failure. The purpose of the construction code hydrostatic pressure testing is to serve as a proof test to preclude a component manufactured with gross negligence or improper materials from being put in service. **[Open item 10.2: STPNOC needs to provide an adequate engineering basis for mixing the requirements of ASME Code requirements with other code requirements. For example, STPNOC proposes to do leak tests permitted by Section XI in lieu of the construction code hydrostatic tests. Further, STPNOC proposes to use ASME allowable stress limits with commercial design and construction codes, and to eliminate impact testing and nondestructive examination.]**

10.5 Conclusion

The staff determined that STPNOC has not provided an adequate engineering basis for mixing the requirements of ASME Code requirements with other code requirements. For example, STPNOC has proposed to do leak tests permitted by ASME Section XI in lieu of the construction code hydrostatic tests without a sufficient technical basis to support the use of the less demanding ASME Section XI test. Further, STPNOC proposes to use ASME allowable stress limits with commercial design and construction codes, again without a sufficient technical basis.

Further, the staff determined that the ASME Section III requirements related to impact testing are not included within the scope of any of the exemptions requested by STPNOC and that to maintain the technical design requirements of SSCs, fracture toughness provisions (as demonstrated by impact testing) are to be specified for replacement SSCs consistent with ASME Section III as appropriate.

Based on these determinations, the staff concluded that STPNOC has not provided sufficient justification to support a finding that the conditions of 10 CFR 50.12 have been satisfied for the granting of an exemption to the 10 CFR 50.55a(g) requirements for repair and replacement, and ISI of LSS and NRS SSCs. Further, as discussed in Section 3.2.2.3 of this safety evaluation, the staff determined that the categorization process proposed by the licensee is not sufficiently robust to support the requested exemption from ASME Section XI ISI requirements. As such, absent additional information from the licensee, the NRC cannot approve the requested exemption.

11.0 STAFF EVALUATION OF PROPOSED 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. 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. In its submittal, the licensee requests an exemption to exclude safety-related SSCs classified as LSS and NRS from the requirements of 10 CFR 50.55a(h).

11.2 Exemption Requested

In the 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 listed in IEEE 279, including functional and design requirements, will continue to be applied.

11.3 Discussion

In Attachment 2 of its submittal, the licensee states that “[t]he quality assurance requirements and environmental qualification requirements in Sections 4.3 and 4.4 of IEEE 279 are not necessary for these components [LSS and NRS safety-related SSCs].” The licensee bases this statement on its assertion 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 Section 4.1.1 of Attachment 1 of its submittal, the licensee states that “[i]n lieu of these requirements [special treatment requirements], STP[NOC] 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 3.3.7 of Attachment 1 of the submittal describes the practices to be applied to LSS and NRS safety-related SSCs. In addition, the proposed STP FSAR Section 13.7.3.3 provided in Attachment 7 of the submittal, describes the attributes for ensuring the functionality of safety-related LSS and NRS SSCs.

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 submittal). Further, in Section 3.3.7.4 of Attachment 1 of its 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 safety evaluation.

11.4 Evaluation

The staff has completed its evaluation of STPNOC's request for an exemption from the requirements of 10 CFR 50.55a(h)(2) for safety-related electric equipment categorized as LSS or NRS.

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 serious 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. How the qualification and quality requirements of IEEE 279 are achieved are to be determined by the licensee.

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 50, Appendix B, Criterion III, “Design Control” and the requirements of 10 CFR 50.59 (for changes to design requirements).

In the licensee's submittal treatment processes were described in Section 3.3.7 of Attachment 1 and the licensee asserted that they provide reasonable assurance, commensurate with the risk significance, that LSS and NRS safety-related SSCs will be functional under design-basis conditions. The staff’s review of the attributes of these practices are discussed in Section 4.0 of this safety evaluation. Further, Section 7.0 of this safety evaluation describes the staff’s evaluation of the attributes of the QA processes to be applied to LSS and NRS SSCs. As discussed in Sections 4.0 and 7.0 of this safety evaluation, the staff found (subject to the resolution of the open items in this safety evaluation) that the attributes of the licensee's Design Control Program and the QA controls for design and procurement were sufficient to provide confidence that original design requirements would be retained in replacement SSCs or a suitable justification established for changing an original design requirement. The staff also found, subject to open item resolution, that the attributes of the alternative treatment described by the licensee provide confidence that LSS and NRS SSCs will remain capable of fulfilling their safety-related functions under design-basis conditions.

The staff recognizes that 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. These sections of IEEE 279 are not prescriptive in how to meet the requirements. The licensee has stated that safety-related LSS and NRS SSCs will remain functional under design-basis conditions using its proposed alternative treatment. The proposed alternative treatment processes include attributes for a broad cross section of processes (Design Control Process; Procurement Process; Installation Process; Maintenance Process; Inspection, Test, and Surveillance Process; Corrective Action Program; Management and Oversight Process; and Configuration Control Process).

The staff has determined that the attributes of the alternative treatment process may be sufficient to satisfy the quality requirements imposed through 10 CFR 50.55a(h)(2), subject to the resolution of the open items identified in this safety evaluation (see Section 4.0 of this safety evaluation for a discussion of the alternative treatment processes). In that case, an exemption would not be required. If an exemption is required, it is unclear from the licensee’s submittal how the special circumstances of 10 CFR 50.12(a) would be met.

The submittal did not provide the information needed by the staff to determine whether the special circumstances of 10 CFR 50.12(a) were met, or whether the attributes of the alternative treatment processes satisfy the specific requirements of Section 4.4 of IEEE 279. Specifically, the staff needs to know what attributes of the proposed alternative treatment processes provide confidence that LSS and NRS protection system equipment shall meet, on a continuing basis, the performance requirements determined to be necessary for achieving the system requirements. The licensee needs to provide the staff with information that either shows the alternative treatment meets the special circumstances of 10 CFR 50.12(a) or meets the specific requirements of Section 4.4 of IEEE 279. Thus, the licensee is requested to provide additional information to the staff regarding the basis for 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. **[Open item 11.1: STPNOC needs to provide the NRC with 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.]

11.5 Conclusion

The staff determined that it does not have sufficient information from the licensee on the basis for the requested exemption to determine whether an exemption from the requirements of 10 CFR 50.55a(h)(2) should be granted or if it is even necessary. STPNOC is requested to provide the staff with additional information on the basis for 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.

12.0 STAFF EVALUATION OF PROPOSED 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 [in particular to Paragraph 50.59(a)(1), 50.59(a)(2) and 50.59(b)(1) under the current rule requirements, and for Paragraphs 50.59(c)(1), 50.59(c)(2) and 50.59(d)(1) under the revised rule] 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.

The reason for the STPNOC request with respect to two sets of specific requirements is that the rule revision resulted in changes to paragraph numbers as well as changes to specific provisions within the rule. The comparable sections from the old to the new rule are covered by the specific paragraph references. Further, this rule revision does not otherwise affect the

scope or applicability of the requested exemption. Because the revised rule requirements are not yet in effect, the exemption request refers to both the "existing" paragraphs and the corresponding "new" paragraphs that contain the comparable requirements.

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 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 is being reviewed.

As discussed in the submittal, the licensee argues 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 NRC 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 NRC 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 NRC 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. 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 draft safety evaluation.

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, NRC is reviewing the categorization process as well as how the special treatment requirements are to 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, NRC has reviewed the categorization methodologies used to determine the risk significance of SSCs. Further, NRC has reviewed 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 NRC prior approval, is unnecessary in that NRC review of the licensee's processes that will lead to those detailed FSAR changes has been performed through the NRC's exemption reviews. 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 draft safety evaluation, the staff concluded that STPNOC should follow the guidance prepared by NEI for managing commitments that was found acceptable to the NRC 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 NRC 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 (see Confirmatory item 4.2).

As noted above, the NRC concludes that the intent of the underlying regulation (10 CFR 50.59) for prior NRC approval of particular changes contained in the August 31, 2000, 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, NRC 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. To the extent that such changes, if they were evaluated under 10 CFR 50.59 would satisfy the criteria in 10 CFR 50.59(a)(2) [or the criteria in 10 CFR 50.59(c)(2) after the effective date of the revised rule], 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 as discussed below.

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 NRC should place a limit in the 10 CFR 50.59 exemption, should it be granted, 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 STAFF EVALUATION OF PROPOSED 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. 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 HSS and MSS function (refer to the licensee's 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 SSCs within the categorization boundary of categorized systems.

STPNOC indicated that they 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 regime for categorized systems as part of a plant specific safety significance determination process. The alternative treatment regime 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. STPNOC will apply this alternative treatment regime only to SSCs categorized using the plant specific categorization process as described in Section 3.0 of this draft safety evaluation. The alternative treatment implemented by the STPNOC plant specific categorization process is separate and distinct from the treatment currently required by 10 CFR 50.65. This alternative treatment serves two purposes: 1) to validate results of plant specific safety significance determinations; and 2) to recognize and adjust for changes in significance determinations in a timely manner.

13.3.2 Characterization of STPNOC Request and Justification

The NRC stated in a question to STPNOC contained in Attachment 3, of STPNOC’s 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 consideration 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 and 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.

STPNOC provided justification for this exemption request associated with the special circumstances, defined in 10 CFR 50.12(a), in Attachment 1 of its submittal. Under 10 CFR 50.12(a)(2)(ii) special circumstances are present when application of the regulation would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule. Based on its review of the categorization process provided in the licensee's submittal, the staff concluded that it was not necessary to include LSS and NRS SSCs within the scope of the Maintenance Rule to satisfy the underlying purpose of the regulation.

13.3.3 Discussion about the intent of 50.65(b)

As discussed in its statement of consideration, 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 non-safety-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 non-safety-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 non-safety-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 non-safety-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. The Commission further stated that consistent with the underlying purposes of the rule, maximum flexibility should be offered to licensees in establishing and modifying their monitoring activities. RG 1.160 also amplifies this guidance.

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 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 submittal), STPNOC stated that its 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. This 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.

13.3.4.6 10 CFR 50.65(a)(4)

STPNOC indicated in response to staff Question #14.c (see Attachment 4 of its submittal) that it is not seeking an exemption to the provisions of 10 CFR 50.65(a)(4). **[Open item 13.1: STPNOC needs to clarify in its exemption request that its requested exemption does not extend to the requirements of 10 CFR 50.65(a)(4).]**

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 LSS and NRS SSCs that have little or no safety significance (refer to Section 3.0 of this draft safety evaluation). 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 draft safety evaluation). 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. With respect to 10 CFR 50.65(b), the staff determined that the STPNOC categorization process achieves the underlying purpose of the requirements of the Maintenance Rule by providing a reasonable alternative for identifying those SSCs that should be within the scope of the rule. Therefore, special circumstances described in 10 CFR 50.12(a)(ii) are satisfied.

13.5 Conclusion

Subject to closure of the open items identified in this section, and related to categorization in Section 3.0, of this draft safety evaluation, the staff concluded 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. Further, should the open items in this section and Section 3.0 of this safety evaluation be resolved, the special circumstances of

10 CFR 50.12(a)(ii) are satisfied in that the STPNOC categorization process satisfies the underlying purpose of the rule for determining the scope of SSCs covered by the rule. Therefore, the STPNOC request for an exemption should be granted.

14.0 STAFF EVALUATION OF PROPOSED 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 exemption request, 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 draft safety evaluation.

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 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 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. See Section 18.4 of this safety evaluation for a discussion of the staff's concerns regarding an inconsistency in the use of engineering evaluations to maintain design inputs. 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 NRC 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 STAFF EVALUATION OF PROPOSED 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 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 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 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 draft safety evaluation.

In the technical justification for the exemption to GDC 4 in Attachment 2 of its 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 thus no apparent need for 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 loss-of-coolant accidents. 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. See Section 18.4 of this safety evaluation for a discussion of the staff's concerns regarding an inconsistency in the use of engineering evaluations to maintain design inputs. 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 NRC 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 STAFF EVALUATION OF PROPOSED 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 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 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 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 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 thus no apparent need for 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. See Section 18.4 of this safety evaluation for a discussion of the staff's concerns regarding an inconsistency in the use of engineering evaluations to maintain design inputs. 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 NRC 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 NRC should deny the licensee's exemption request from the requirements of GDC 18.

17.0 STAFF EVALUATION OF PROPOSED EXEMPTION TO 10 CFR PART 50, APPENDIX J, OPTION B, 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, 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 submittal), that qualify them for an exemption. These containment isolation valves are identified 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.

Our 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 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[NOC] 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.

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

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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.

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 exemption request 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, 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 regulation at 10 CFR 50.12(a)(2)(ii) identifies a special circumstance as one where the application of the rule (in this case Type C testing of the identified containment isolation valves) is not necessary to meet the underlying purpose of the rule. This special circumstance is applicable because the licensee states that the exemption applies to a "set of penetrations where leakage paths which would threaten public health and safety are not credible." Therefore, the licensee is asserting that leak testing these penetrations is not necessary to meet the intent of 10 CFR Part 50, Appendix J, which is, as stated in GDC 16, to ensure an essentially leak tight barrier against the uncontrolled release of radioactivity. The staff, as discussed in Section 17.4 of this draft safety evaluation report, finds that the leakage is low enough (essentially leak tight) so that there is not a significant risk to the public, and therefore special circumstance 10 CFR 50.12(a)(2)(ii) applies.

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 submittal under "Scope of Exemption," for 10 CFR Part 50, Appendix J, B.III, 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 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 operate (i.e. 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 (nominal pipe size) 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, 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 the 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 are 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 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

On the basis of its evaluation, the staff concludes that exempting containment isolation valves that meet the licensee's proposed criteria discussed and evaluated above, from Type C testing does not pose an undue risk to the public health and safety, provided the open items related to categorization identified in Section 3.0 of this safety evaluation are resolved. Further, the staff determined that STPNOC's assertion that the exempted containment isolation valves contribute zero leakage was reasonable. Based on this determination, the staff concluded that including these valves within the scope of the rule is not necessary to achieve the underlying purpose of 10 CFR Part 50, Appendix J. On this basis the staff concludes that the licensee's proposed exemption to 10 CFR Part 50, Appendix J, Option B, III.B should be granted.

18.0 STAFF EVALUATION OF PROPOSED EXEMPTION TO 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)(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)(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 Attachment 2 to its submittal, the licensee requests an exemption from the requirements of 10 CFR 50.34(b)(11) to the extent that 10 CFR 50.34(b)(11) incorporates the seismic qualification requirements in Sections VI.(a)(1) and VI.(a)(2) of Appendix A to 10 CFR Part 100.

In Attachment 2 to 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 inspection 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 exemption request to define the scope and provide the technical justification for its 10 CFR 50.34(b)(11) exemption request. As such, in reviewing the licensee's submittal, the staff has decided to treat the requested exemptions from Sections VI(a)(1) and (2) of 10 CFR Part 100, Appendix A 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 Attachment 2 of its submittal, the licensee indicates that safety-related LSS and NRS SSCs would not be required to be maintained in a qualified condition under 10 CFR Part 100 and that these SSCs could be replaced with those not qualified under 10 CFR Part 100.

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 submittal). Included within the original 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 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 safety evaluation.

In its technical justification for the exemption to 10 CFR Part 100, Appendix A in Attachment 2 of its 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."

Even though the licensee's request does not encompass all requirements of 10 CFR 100, Appendix A, VI(a)(1) and (2), the licensee has indicated that it is seeking an exemption from these requirements to the extent that they require testing and inspection to demonstrate that safety-related SSCs are designed to withstand the SSE and OBE.

18.4 Evaluation

The licensee requests 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. 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.

The regulation addresses seismic and geological siting criteria and does 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 an exemption from 10 CFR 50.34(b)(11) is necessary because it imposes the requirements of Appendix A to 10 CFR Part 100. As discussed below, the staff has concluded it does not have sufficient information to determine whether an exemption from the requirements of Appendix A to 10 CFR Part 100 is necessary. As such, the staff cannot conclude that it is necessary to grant an exemption from 10 CFR 50.34(b)(11).

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 inspection 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 components, 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 Sections VI(a)(1) and (2) of Appendix A to Part 100. The licensee further states that its

proposed design and procurement criteria would be applied to LSS and NRS components to achieve this requirement.

The staff reviewed the attributes of the licensee's proposed design and procurement processes for safety-related LSS and NRS SSCs. In Section 3.3.7.3 of Attachment 1 to its submittal, the licensee states:

> The Station's Design Control Program is used for both safety-related (LSS and NRS as well as HSS and MSS SSCs) and non-safety-related applications which are in the Configuration Management Program. The Design Control Program complies with 10 CFR Part 50, Appendix B, and is used for maintaining design inputs and functional requirements, for repair or modification of pressure-retaining capability of ASME systems, and for the accomplishment of design activities.

The licensee's statement above 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. Further, the licensee stated in Section 3.3.7.4 of Attachment 1 to its submittal that:

> Procurement Evaluation - A procurement request form is prepared and evaluated to ensure that technical requirements and quality requirements have been adequately described and specified. This evaluation ensures that the original design inputs and assumptions for the SSC have been properly factored in. Detailed procurement information, catalog identifications, and specifications, as applicable, are documented in a formal Purchase Order to the supplier. This documented information supports the procurement of the desired replacement component or part.

Also, the licensee states in Section 3.3.7.4 that "[w]henever conditions exist such that the proposed replacement components or parts deviate from the design specifications (technical requirements) of the original item, an engineering evaluation is performed to assess the design adequacy of the proposed replacement."

Sections VI(a)(1) and (2) of Appendix A to 10 CFR Part 100 do not specify testing as the only acceptable method to qualify SSCs for seismic capability. In addition, Sections VI(a)(1) and (2) of Appendix A to 10 CFR Part 100 do not address inspection of SSCs. 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 safety function. The regulation provides flexibility to allow the licensee to ensure that the required safety functions of SSCs are maintained during and after a seismic event using a suitable dynamic analysis, suitable qualification testing, or an equivalent static engineering evaluation method. It is the responsibility of the licensee to assure that the engineering method used in its evaluation is suitable.

Consistent with the licensee's commitment to maintain the design basis, the engineering evaluation must use the current design-basis seismic inputs. The engineering evaluation may require an analysis to demonstrate that the acceptance criteria from the design code have been satisfied. The staff finds that it is reasonable that the engineering evaluation could make use of

a previously performed qualification analysis for a component evaluated to be a like-for-like replacement of one previously qualified. The staff determined that this is an acceptable method for meeting Sections VI(a)(1) and (2) of Appendix A to 10 CFR Part 100. For those cases where the replacement item deviates from the original component design or is designed to a different standard, such as ASME B31.1 for pressure boundary components instead of ASME Section III, a suitable dynamic analysis, suitable component testing, or an equivalent static analysis to demonstrate that the acceptance criteria for the design standard have been satisfied is required by Appendix A to 10 CFR Part 100. Design codes, such as ASME B31.1, require that the component are designed to meet specified allowable stress limits for load combinations that include seismic inputs and these allowable stress limits are typically different from the allowable stress limits specified in ASME Section III.

In Attachment 1, Paragraph 4.1.2.3 of the licensee's submittal STP states that:

> Under STP's exemption request, safety-related LSS and NRS components will still be required to function in the event of a Safe Shutdown Earthquake (SSE), but will not be specifically qualified. As described in Section 3.3.7, STP will perform engineering evaluations to provide an appropriate level of assurance that procured LSS and NRS components will be able to perform their safety-related functions under design basis conditions.

The licensee's response to NRC Staff Question # 4 in Attachment 3 to its submittal contains the following statement regarding seismic and environmental qualification:

> Therefore, STP believes that engineering analyses, qualification testing, or other specialized efforts to provide empirical evidence or other justifications of an SSC's ability to function in adverse environments is overly burdensome and not necessary for LSS and NRS components (i.e., not commensurate with their safety significance).

The staff finds that this statement may be inconsistent with the licensee's commitment to perform engineering evaluations to provide an appropriate level of assurance that LSS and NRS components will be able to perform their safety-related functions under design basis conditions. Further, as discussed in Section 1.2 of this safety evaluation, one of the criteria under which the staff is reviewing the submittal is that the licensee must provide confidence, albeit at a level lower than that provided by the existing special treatment requirements, that safety-related LSS and NRS SSCs will function under design-basis conditions.

Appendix A to 10 CFR Part 100 provides three methods for determining whether an SSC will function during and after a seismic event (dynamic analysis, testing, or an equivalent static analysis) and this regulation allows the licensee to determine the analysis method used. Based on its review of the submittal, the staff understands that the licensee would conduct an engineering evaluation following the guidance of EPRI report NP-6406, "Technical Evaluation of Replacement Items Guideline," (see Section 3.3.7.4 of Attachment 1 of the submittal) for the like-for-like replacement of an SSC previously qualified to provide confidence of SSC functionality. The staff has concluded that for like-for-like replacements, an adequate engineering evaluation is a suitable analysis that satisfies the requirements of Appendix A to 10 CFR Part 100.

The staff understands that if a like-for-like replacement SSC could not be procured or was not available, the licensee would process a design change in accordance with its Design Control Program. Further, the licensee has stated that safety-related LSS and NRS components will still be required to function. However, as noted above, the licensee has stated that engineering analyses, qualification testing, or other specialized efforts are overly burdensome and not necessary for LSS and NRS SSCs. Based on the two statements by the licensee described above, it is the staff's understanding that the licensee is proposing that it would conduct an engineering evaluation for replacement LSS and NRS SSCs subject to design changes as well as for like-for-like replacement SSC. However, the licensee's submittal has not described the attributes of an engineering evaluation for design changes that provide confidence of SSC functionality absent the application of the three methods included within Appendix A to 10 CFR Part 100. Without this information the staff cannot determine whether an exemption from Sections VI(a) (1) and (2) of Appendix A to 10 CFR Part 100 describing the engineering methods used to insure functionality is appropriate, or whether such an exemption should be granted. **[Open item 18.1: STPNOC needs to describe to the staff the attribute 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.]**

18.5 Conclusion

The licensee has stated that it will use the current design-basis seismic inputs in the evaluation of LSS and NRS SSCs. The regulations at 10 CFR Part 100, Appendix A, Sections VI(a)(1) and (2) require that SSCs be designed using a suitable dynamic analysis, suitable testing or equivalent static analysis to ensure that safety-related functions are maintained during and after the vibratory motions associated with SSE and OBE events. In addition, the regulation provides adequate flexibility to allow the licensee to perform simplified analysis of components when a simplified analysis is technically justified. Based on the staff's understanding of the licensee's proposal, the staff has concluded that the submittal does not describe how the proposal to conduct an engineering evaluation for design changes related to LSS and NRS SSCs provides confidence of functionality absent the application of any of the methods described in Appendix A to 10 CFR Part 100. The staff requires this information to determine whether an exemption from the requirements of Sections VI(a) (1) and (2) to Appendix A of 10 CFR Part 100 describing the engineering methods to provide confidence of functionality is appropriate, or whether such an exemption should be granted. As such, the staff cannot determine whether the related exemption from 10 CFR 50.34(b)(11) that imposes the requirements of Appendix A to 10 CFR Part 100 is appropriate or should be granted.

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 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 non-safety-related or from Class 1E to Non-Class 1E, the NRC 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) involves no unreviewed safety question.

In Section 3.2.2.1.2 of Attachment 1 of its 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 and 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 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 commercial practices are discussed in Sections 3.0 and 4.0 of this draft safety evaluation, 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 safety evaluation and to assure,

the integrity of the reactor coolant pressure boundary (RCPB), 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 perform an engineering evaluation 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 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 commercial practices similar to those used for BOP SSCs. The staff's evaluation of the licensee's commercial practices is discussed in Section 4.0 of this draft safety evaluation. 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 staff assumes that the licensee will make a determination that the affected design functional requirement is not needed. However, the licensee has not stated how this determination will be made. If this determination is done in accordance with the STPNOC Design Change Control Process, then 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 case 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 STAFF REVIEW CONCLUSIONS

TO BE PROVIDED LATER