Xcel Energy®

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10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant, Units 1 and 2
Dockets 50-282 and 50-306
Renewed License Nos. DPR-42 and DPR-60

Application to Revise Technical Specifications Associated with Unit 2 Steam Generator Replacement and Adopt TSTF-510, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection"

Pursuant to 10 CFR 50.90, the Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy, hereby requests an amendment to the renewed operating licenses for Prairie Island Nuclear Generating Plant (PINGP) Units 1 and 2. Specifically, NSPM proposes to revise Technical Specifications (TS) 3.4.19 - "Steam Generator (SG) Tube Integrity," 5.5.8 - "Steam Generator (SG) Program," and 5.6.7 - "Steam Generator Tube Inspection Report" to apply the appropriate program attributes to the Unit 2 replacement steam generators that are planned for installation in fall 2013. Also, NSPM proposes to revise the same TS described above to adopt for Unit 1 and Unit 2 the program improvements in Technical Specifications Task Force Traveler (TSTF) 510, Revision 2, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection." The availability of this TS improvement was announced in the Federal Register (FR) on October 27, 2011 (76 FR 66763).

Enclosure 1 to this letter provides the evaluation of the proposed TS changes and the supporting justification, including a no significant hazards determination. Enclosure 2 provides the existing TS pages marked-up to show the proposed changes. Enclosure 3 provides the revised TS pages incorporating the proposed changes. Enclosure 4 provides, for information only, the existing TS Bases pages marked-up to show the associated proposed Bases changes. Final TS Bases changes will be implemented pursuant to TS 5.5.12, "Technical Specifications (TS) Bases Control Program," at the time the amendment is implemented.

NSPM has determined that the information for the proposed amendment does not involve a significant hazards consideration, authorize a significant change in the types or total amounts of effluent release, or result in any significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment meets the categorical exclusion requirements of 10 CFR 51.22(c)(9) and an environmental impact assessment need not be prepared.

A copy of this submittal, including the Determination of No Significant Hazards Consideration is being forwarded to the designated State of Minnesota official pursuant to 10 CFR 50.91(b)(1).

NSPM is requesting that this proposed amendment be approved by August 1, 2013 to support the steam generator replacement currently scheduled for the fall of 2013. Once approved, the amendment shall be implemented within 60 days after reactor startup following Unit 2 steam generator replacements.

If there are any questions or if additional information is needed, please contact Glenn Adams at 612-330-6777.

Summary of Commitments

This letter contains no new commitments or revisions to existing commitments.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on JUL 25 2012

James E. Molden
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosures (4)

cc: Regional Administrator, Region III, USNRC
Project Manager, Prairie Island Nuclear Generating Plant, USNRC
Resident Inspector, Prairie Island Nuclear Generating Plant, USNRC
State of Minnesota

ENCLOSURE 1

Evaluation of the Proposed Change

Application to Revise Technical Specifications Associated with Unit 2 Steam Generator Replacement and Adopt TSTF-510, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection"

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, the Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy, hereby requests an amendment to the renewed operating licenses for Prairie Island Nuclear Generating Plant (PINGP) Units 1 and 2. Specifically, NSPM proposes to revise Technical Specifications (TS) 3.4.19 - "Steam Generator (SG) Tube Integrity," 5.5.8 - "Steam Generator (SG) Program," and 5.6.7 - "Steam Generator Tube Inspection Report" to apply the appropriate program attributes to the Unit 2 replacement steam generators that are planned for installation in fall 2013. Also, NSPM proposes to revise the same TS described above to adopt the program improvements in Technical Specifications Task Force Traveler (TSTF) 510, Revision 2, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection."

NSPM is requesting that this license amendment request (LAR) be approved prior to the Unit 2 steam generator replacement currently scheduled for the fall of 2013.

2.0 DETAILED DESCRIPTION

A brief description of the proposed change is provided below. The specific wording changes to the Technical Specifications (TS) are provided in Enclosures 2 and 3.

- Revise TS 3.4.19 for Steam Generator Replacement (SGR) and TSTF-510

  The proposed change to TS 3.4.19 would remove any reference to steam generator tube "repair" to align with the planned removal of the Unit 2 original steam generators (OSGs), which do have approved repair methods. After installation of the Unit 2 replacement steam generators (RSGs), none of the PINGP Unit 1 or Unit 2 SGs will have approved repair criteria, so the proposed revision to TS 3.4.19 will only provide for steam generator tube plugging. The proposed change to TS 3.4.19 will also make editorial changes in accordance with TSTF-510.

- Revise TS 5.5.8 for SGR and TSTF-510

  The proposed change to TS 5.5.8 would remove any reference to steam generator tube "repair" to align with the planned removal of the Unit 2 OSGs, which do have approved repair methods. After installation of the Unit 2 RSGs, none of the PINGP SGs will have approved repair criteria, so the proposed revision to TS 5.5.8 will only provide for steam generator tube plugging. The proposed change to TS 5.5.8 will change the steam generator tube inservice inspection frequencies and make editorial changes in accordance with TSTF-510.

The proposed change to TS 5.5.8 would eliminate those repair and inspection provisions associated with the Unit 2 OSGs including voltage-based repair criteria, specific depth-based repair/plugging criteria, alternate repair criteria, and sleeving repairs. The proposed change subjects the Unit 2 RSG tubes to the same inspection and testing requirements that are applied to the Unit 1 RSGs.

- Revise TS 5.6.7 for SGR and TSTF-510

  The proposed change to TS 5.6.7 would remove any reference to steam generator tube "repair" to align with the planned removal of the Unit 2 OSGs, which do have approved repair methods. After installation of the Unit 2 RSGs, none of the PINGP SGs will have approved repair criteria, so the proposed revision to TS 5.6.7 will only provide for steam generator tube plugging. The proposed change to TS 5.6.7 will change the steam generator tube reporting requirements and make editorial changes in accordance with TSTF-510.

  The proposed change to TS 5.6.7 would eliminate those reporting provisions associated with the Unit 2 OSGs, particularly those associated with reporting flawed and unplugged tubes and special conditions associated with the use of alternate repair criteria. The proposed change subjects the Unit 2 RSGs to the same reporting requirements that are applied to the Unit 1 RSGs.

In summary, this LAR eliminates any reference to SG repair methods and adopts the NRC-approved inservice inspection frequencies, reporting requirements, and editorial changes in accordance with TSTF-510.

3.0 TECHNICAL EVALUATION

3.1 Background:

PINGP is a dual unit site. Each unit is a two-loop Westinghouse design, licensed to an uprated power of 1677 megawatts-thermal (MWt). The units were originally provided with Westinghouse Model 51 steam generators having Inconel 600 mill annealed (MA) tube material. In 2004, the licensee replaced the OSGs in Unit 1 with steam generators fabricated by Framatome ANP having Inconel 690 thermally treated (TT) tube material. Presently, NSPM is preparing to replace the Unit 2 Westinghouse steam generators with AREVA (formerly Framatome ANP) models designed and fabricated to the same standards as the Unit 1 replacement steam generators having Inconel 690TT tube material. NSPM plans to install these replacement steam generators in fall 2013.

The following information concerning the RSGs is provided to support the NRC review of this LAR:

	Unit 1	Unit 2
SG Manufacturer	AREVA (Framatome-ANP)	
SG Model	56/19	
Year of Installation	2004	2013
Tubing Material	690TT	
No. Tubes / SG	4868	
Approved Alternate Repair Criteria	None	
Approved SG Tube Repair Methods	None	

NSPM's preliminary design review recognizes the similarity of the Unit 2 RSGs to the Unit 1 RSGs (as shown in the table above). Further, this preliminary design review indicates that the Unit 2 RSGs comport with the form, fit, and function of the OSGs that they replace and may be installed in accordance with 10 CFR 50.59.

3.2 Current Licensing Basis

In 2007, NRC issued PINGP license amendments 177 (Unit 1) and 167 (Unit 2) to revise TS 3.4.19, 5.5.8, and 5.6.7 in accordance with TSTF-449 (Reference 6.4). These amendments provided a Steam Generator Program that prescribed inspection criteria, inspection frequency, and reporting rules for Unit 1 based on the replacement steam generator design (Inconel 690TT tubes) and a Unit 2 program based on the original steam generator design (Inconel 600MA tubes). The Unit 2 program provides for steam generator repair, alternate repair criteria, and associated reporting requirements that are approved and applicable only to the Westinghouse OSGs that are currently installed in Unit 2. As described in Reference 6.3, the RSG design does not have any such repair criteria approved. Therefore, the TS provide no alternate repair criteria and no associated reporting requirements for the RSG design.

3.3 Justification for the Proposed Changes

This LAR adopts TSTF-510 and revises the Steam Generator Program to recognize the Unit 2 replacement steam generator design. These changes are consistent with the intent of TSTF-449, which was to establish Steam Generator Program inspection and reporting criteria that are applicable to the respective steam generator design. Following the Unit 2 steam generator replacement, all four PINGP SGs will be of AREVA/Framatome ANP design having Inconel 690TT tube material. Such SGs do not have approved methods for "repair" (as described in TSTF-449). Therefore, the proposed changes are appropriate and justified in that they eliminate all inspection and repair criteria associated with the OSGs. Following implementation of the Unit 2 SGR, none of the PINGP SGs will have approved repair criteria.

Justifications for specific TS changes are described below:

- Revise TS 3.4.19 for SGR and TSTF-510

The removal of all reference to tube repair is appropriate because the only PINGP SGs with approved repair criteria are being replaced with steam generators without approved repair criteria.

The TSTF-510 editorial changes (to Improved Standard Technical Specification – ISTS Section 3.4.20) are justified as generic changes applicable to PINGP, and are adopted for PINGP TS Section 3.4.19 without alteration.

- Revise TS 5.5.8 for SGR and TSTF-510

  The removal of all reference to tube repair is appropriate because the only PINGP SGs with approved repair criteria are being replaced with steam generators without approved repair criteria.

  The TSTF-510 changes to inservice testing methods, testing frequency, and editorial changes (per ISTS Section 5.5.9) are justified as generic changes applicable to PINGP, and are adopted for PINGP TS Section 5.5.8 without alteration.

- Revise TS 5.6.7 for SGR and TSTF-510

  The removal of all reference to reporting tube repair is appropriate because the only PINGP SGs with approved repair criteria are being replaced with steam generators without approved repair criteria.

  The TSTF-510 changes to reporting requirements, and the associated editorial changes (per ISTS Section 5.6.7) are justified as generic changes applicable to PINGP, and are adopted for PINGP TS Section 5.6.7 without alteration.

3.4 TSTF-510 Assessment

Applicability of Published Safety Evaluation: NSPM has reviewed TSTF-510, Revision 2, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection," and the model safety evaluation dated June 20, 2011 as part of the Federal Register Notice for Comment. As described in Section 3.3, NSPM has concluded that the justifications presented in TSTF-510 and the model safety evaluation prepared by the NRC staff are applicable to Prairie Island Units 1 and 2, and justify this amendment for the incorporation of the changes to the PINGP TS.

The Traveler and model Safety Evaluation discuss the applicable regulatory requirements and guidance, including the 10 CFR 50, Appendix A General Design Criteria (GDC). PINGP was not licensed to the 10 CFR 50, Appendix A GDC. The PINGP equivalent of the referenced GDC are PINGP GDCs 1, 9, 16, and 36 described in USAR Sections 4.1.1, 4.1.2.1, 4.1.2.2, and 4.7 respectively. This

difference does not alter the conclusion that the proposed change is applicable to PINGP.

Optional Changes and Variations: The PINGP TS utilize different numbering than the Standard Technical Specifications on which TSTF-510 was based. Specifically, the PINGP TS 3.4.19 embodies Steam Generator (SG) Tube Integrity, whereas the Standard Technical Specification is numbered 3.4.20. Also, the PINGP TS 5.5.8 embodies the Steam Generator (SG) Program, whereas the Standard Technical Specification is numbered 5.5.9. These differences are administrative and do not affect the applicability of TSTF-510 to the PINGP TS.

The proposed change corrects an administrative inconsistency in TSTF-510, Paragraph d.2 of the Steam Generator Tube Inspection Program. In Section 2.0, "Proposed Change," TSTF-510 states that references to "tube repair criteria" in Paragraph d are revised to "tube plugging [or repair] criteria." However, in the following sentence in Paragraph d.2, this change was inadvertently omitted, "If a degradation assessment indicates the potential for a type of degradation to occur at a location not previously inspected with a technique capable of detecting this type of degradation at this location and that may satisfy the applicable tube repair criteria, the minimum number of locations inspected with such a capable inspection technique during the remainder of the inspection period may be prorated" (emphasis added).

After installation of the Unit 2 RSGs, the PINGP SGs do not have approved tube repair criteria. Therefore, the sentence is revised to state "tube plugging" criteria.

3.5 Conclusion

As discussed in the preceding paragraphs, the proposed changes to the SG Program Technical Specifications are justified because they align the SG Program requirements with the planned steam generator configuration, and because they adopt the TSTF-510 SG Program improvements in accordance with the TSTF model safety evaluation with minor administrative changes.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

PINGP TS 3.4.19, 5.5.8, and 5.6.7 establish Steam Generator Program requirements that differentiate between the OSGs (Inconel 600MA tubes) and RSGs (Inconel 690TT tubes).

Technical Specifications Task Force Traveler (TSTF) 510, Revision 2, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection" has been approved and the NRC has announced the availability of this TS improvement in the Federal Register (FR) on October 27, 2011 (76 FR 66763).

Subsequently, the Technical Specifications Task Force has notified NRC of a correction to TSTF-510 and proposed an explanation to be provided in license amendment requests (Reference 6.11). This explanation is provided in Section 3.4 above.

Further, the TSTF has recently recommended that LARs include a discussion similar to the example provided in Reference 6.13 when the 10 CFR 50 Appendix A GDCs in a Traveler's model Safety Evaluation (SE) are not consistent with the plant's licensing basis.

4.2 Precedent

Similar changes to remove alternate repair criteria were approved for PINGP Unit 1 (Reference 6.4), and as part of other SG replacements that have been previously sought and approved. One recent example was performed for Progress Energy's Crystal River Nuclear Plant, which the NRC approved on May 29, 2009 (Reference 6.7).

NSPM is not aware of any amendments approved pursuant to TSTF-510, Revision 2; however, NSPM does recognize that Entergy has submitted and NRC accepted a license amendment request for Waterford requesting adoption of TSTF-510 improvements as a plant-specific change as opposed to a Consolidated Line Item Improvement Process (CLIIP) change (because the TSTF had not been approved at the time of submittal). See Reference 6.8.

Additionally, amendment requests applying CLIIP were recently submitted for Wolf Creek (Reference 6.9), Byron-Braidwood (Reference 6.10), and Three Mile Island (Reference 6.12).

4.3 Significant Hazards Consideration

Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy, proposes to amend the facility operating license of Prairie Island Nuclear Generating Plant (PINGP) Units 1 and 2. The purpose of this amendment is to modify the PINGP Technical Specifications (TS) to maintain the intent of the steam generator program following the Unit 2 steam generator replacement. Further, for the benefit of PINGP Units 1 and 2, NSPM requests adoption of an approved change to the standard technical specifications (STS) into the plant specific technical specifications (TS), to revise the Specification 5.5.8, "Steam Generator (SG) Program," 5.6.7, "Steam Generator Tube Inspection Report," and Limiting Condition for Operation (LCO) 3.4.19, "Steam Generator Tube Integrity," to address inspection periods and other administrative changes and clarifications.

NSPM has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92(c) as discussed below:

1. **Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   Response: No

   The proposed changes associated with Technical Specification Task Force Traveler (TSTF) 510 revise the Steam Generator (SG) Program to modify the frequency of verification of SG tube integrity and SG tube sample selection. A steam generator tube rupture (SGTR) event is one of the design basis accidents that are analyzed as part of a plant's licensing basis. The proposed SG tube inspection frequency and sample selection criteria will continue to ensure that the SG tubes are inspected such that the probability of a SGTR is not increased. The consequences of a SGTR are bounded by the conservative assumptions in the design basis accident analysis. The proposed change will not cause the consequences of a SGTR to exceed those assumptions.

   The proposed changes associated with Unit 2 SG replacement preserve the intent of the PINGP TS for the new plant configuration following Unit 2 steam generator replacement. In effect, these changes will eliminate the SG tube repair criteria that were only applicable to the original SGs that will be replaced. These changes will ensure that the Unit 2 replacement SGs are subject to the inservice inspection, testing, and reporting criteria that are applicable to their design as approved for use with TSTF-510.

   Therefore, it is concluded that this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?**

   Response: No

   The proposed changes to the Steam Generator Program associated with TSTF-510 will not introduce any adverse changes to the plant design basis or postulated accidents resulting from potential tube degradation. The proposed change does not affect the design of the SGs or their method of operation. In addition, the proposed change does not impact any other plant system or component.

   The proposed changes associated with Unit 2 SG replacement preserve the intent of the PINGP TS for the new plant configuration following Unit 2 steam

generator replacement. In effect, these changes will eliminate the SG tube repair criteria that were only applicable to the original SGs that will be replaced. Such programmatic changes do not affect the design of the SGs or their method of operation. In addition, these programmatic changes do not impact any other plant system or component.

Therefore, it is concluded that this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Do the proposed changes involve a significant reduction in a margin of safety?**

   Response: No

   The SG tubes in pressurized water reactors are an integral part of the reactor coolant pressure boundary and, as such, are relied upon to maintain the primary system's pressure and inventory. As part of the reactor coolant pressure boundary, the SG tubes are unique in that they are also relied upon as a heat transfer surface between the primary and secondary systems such that residual heat can be removed from the primary system. In addition, the SG tubes also isolate the radioactive fission products in the primary coolant from the secondary system. In summary, the safety function of a SG is maintained by ensuring the integrity of its tubes.

   Steam generator tube integrity is a function of the design, environment, and the physical condition of the tube. The proposed changes do not affect tube design or operating environment. The proposed changes will continue to require monitoring of the physical condition of the SG tubes such that there will not be a reduction in the margin of safety compared to the current requirements.

   Therefore, it is concluded that the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, NSPM has concluded that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c) and, accordingly a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATIONS

The proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

6.0 REFERENCES

6.1 Federal Register Notice, Notice of Availability published on October 27, 2011 (76 FR 66763), Models for Plant-Specific Adoption of Technical Specifications Task Force Traveler TSTF-510, Revision 2, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection"

6.2 Technical Specifications Task Force Traveler TSTF-510, Revision 2, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection" (ADAMS Accession No. ML110610350)

6.3 NMC letter to NRC, L-HU-06-001, Application for Technical Specification Improvement Regarding Steam Generator Tube Integrity, dated February 16, 2006 (ADAMS Accession No. ML060480440)

6.4 NRC letter and safety evaluation for PINGP License Amendments 177/167 dated March 20, 2007 (ADAMS Accession No. ML070330455)

6.5 Federal Register Notice, Notice for Comment published on June 20, 2011 (76 FR 35923), Notice of Opportunity for Public Comment on the Proposed Model Safety Evaluation for Plant-Specific Adoption of Technical Specifications, Task Force Traveler TSTF–510, Revision 2, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection"

6.6 Technical Specifications Task Force Traveler TSTF-449, Revision 4, "Steam Generator Tube Integrity" (ADAMS Accession No. ML051090200)

6.7 NRC Amendment 234 issued to Progress Energy on May 29, 2009, Crystal River Unit 3, Issuance of Amendment Regarding the Revision of the Steam Generator Portion of the Technical Specifications to Reflect the Replacement of the Steam Generators (TAC No. MD9547). (ADAMS Accession No. ML091100056)

6.8 Entergy letter to NRC, License Amendment Request Technical Specification Change Regarding Steam Generator Tube Integrity Waterford Steam Electric Station, Unit 3, dated July 20, 2011. (ADAMS Accession No. ML11224A010)

6.9 Wolf Creek Nuclear Operating Corporation letter to NRC, Application to Revise Technical Specifications to Adopt TSTF-510, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection," Using the Consolidated Line Item Improvement Process, dated April 26, 2012. (ADAMS Accession No. ML12124A339)

6.10 Exelon letter to NRC, Application to Revise Technical Specifications to Adopt TSTF-510, Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection, dated March 22, 2012 (ADAMS Accession No. ML12082A135)

6.11 TSTF letter to NRC, Correction to TSTF-510A, Revision 2, Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection, dated March 28, 2012 (ADAMS Accession No. ML12088A082)

6.12 Exelon letter to NRC, License Amendment Request to Revise Steam Generator Program Inspection Frequencies and Tube Sample Selection, dated March 26, 2012 (ADAMS Accession No. ML12086A037)

6.13 TSTF letter to NRC, TSTF-12-13, Response to NRC Request to Revise TSTF Traveler Model Applications, dated July 4, 2012 (ADAMS Accession No. ML12187A184)

Enclosure 2

Marked-Up Technical Specification Pages

14 pages follow

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.19 Steam Generator (SG) Tube Integrity

LCO 3.4.19 SG tube integrity shall be maintained.

AND

All SG tubes satisfying the tube pluggingrepair criteria shall be plugged ~~or repaired~~ in accordance with the Steam Generator Program

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each SG tube.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more SG tubes satisfying the tube pluggingrepair criteria and not plugged ~~or repaired~~ in accordance with the Steam Generator Program.	A.1 Verify tube integrity of the affected tube(s) is maintained until the next refueling outage or SG inspection. AND A.2 Plug ~~or repair~~ the affected tube(s) in accordance with the Steam Generator Program.	7 days Prior to entering MODE 4 following the next refueling outage or SG tube inspection

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR SG tube integrity not maintained.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.19.1	Verify SG tube integrity in accordance with the Steam Generator Program.	In accordance with the Steam Generator Program
SR 3.4.19.2	Verify that each inspected SG tube that satisfies the tube pluggingrepair criteria is plugged ~~or repaired~~ in accordance with the Steam Generator Program.	Prior to entering MODE 4 following an SG tube inspection

5.5 Programs and Manuals (continued)

5.5.8 Steam Generator (SG) Program

A Steam Generator Program shall be established and implemented to ensure that SG tube integrity is maintained. In addition, the Steam Generator Program shall include the following ~~provisions~~:

a. Provisions for condition monitoring assessments. Condition monitoring assessment means an evaluation of the "as found" condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. The "as found" condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging ~~or repair~~ of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected~~,~~ or plugged~~, or repaired~~ to confirm that the performance criteria are being met.

b. Performance criteria for SG tube integrity. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity, accident induced leakage, and operational LEAKAGE.

1. Structural integrity performance criterion: All in-service steam generator tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down), ~~and~~ all anticipated transients included in the design specification~~,~~) and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary-to-secondary pressure differential and~~, except for flaws addressed through application of the alternate repair criteria discussed in Specification 5.5.8.c.2(c),~~ a safety factor of 1.4 against burst applied to the design basis accident primary-to-secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse.

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads. ~~For Unit 2, when alternate repair criteria discussed in Specification 5.5.8.c.2(c) are applied to axially oriented outside diameter stress corrosion cracking indications at the tube support plate locations, the probability that one or more of these indications in an SG will burst under postulated main steam line break conditions shall be less than 1E-02.~~

2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. ~~For Unit 1,~~ Lleakage is not to exceed 1 gpm per SG. ~~For Unit 2, leakage from all sources, excluding the leakage attributed to the degradation associated with implementation of the voltage-based repair criteria discussed in Specification 5.5.8.c.2(c), is not to exceed 1 gpm per SG.~~

3. The operational LEAKAGE performance criterion is specified in LCO 3.4.14, "RCS Operational LEAKAGE."

c. Provisions for SG tube plugging~~repair~~ criteria.~~:~~

~~1. Unit 1 steam generator.~~ Ttubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.

~~2. Unit 2 steam generator tubes found by inservice inspection to contain flaws shall be dispositioned as follows:~~

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

~~(a) Depth Based Criteria:~~

~~(1) Tubes found by inservice inspection containing a flaw in a non-sleeved region with a depth equal to or exceeding 50% of the nominal tube wall thickness shall be plugged or repaired except if permitted to remain in service through application of the alternate tube repair criteria discussed in Specification 5.5.8.c.2(b) or in Specification 5.5.8.c.2(c). If significant general tube thinning occurs, this criterion is reduced to 40% wall penetration.~~

~~(2) Tubes found by inservice inspection containing a flaw in the pressure boundary region of any sleeve exceeding 25% of the nominal sleeve wall thickness shall be plugged.~~

~~(3) Tubes with a flaw in a sleeve to tube joint that occurs in the original tube wall of the joint shall be plugged.~~

~~(b) The following F* or EF* Alternate Repair Criteria may be applied to the hot leg of the tubesheet as an alternative to the depth based criteria in Specification 5.5.8.c.2(a)(1):~~

~~(1)F* Criterion: If the bottom of the uppermost hardroll transition in the tubesheet is below the midplane of the tubesheet, then all flaws located below 1.07 inches from the bottom of this uppermost hardroll transition (not including eddy current uncertainty) may be allowed to remain in service provided the tube does not contain any flaws within this 1.07 inch span (not including eddy current uncertainty). This 1.07 inch span (increased for measurement uncertainty) is referred to as the F* region. If flaws are contained within the F* region, the tube shall be plugged or repaired.~~

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

~~(2) EF* Criterion: If the bottom of the uppermost hardroll transition in the tubesheet is above the midplane of the tubesheet but at least 2.0 inches below the top of the secondary face of the tubesheet, then all flaws located below 1.67 inches from the bottom of the uppermost hardroll transition (not including eddy current uncertainty) may be allowed to remain in service provided the tube does not contain any flaws within this 1.67 inch span (not including eddy current uncertainty). This 1.67 inch span (increased for measurement uncertainty) is referred to as the EF* region. If flaws are contained within the EF* region, the tube shall be plugged or repaired.~~

~~(c) The following Alternate Tube Support Plate Voltage Based Repair Criteria may be applied as an alternative to the depth based criteria in Specification 5.5.8.c.2(a)(1): For regions of the tube affected by predominately axially oriented outside diameter stress corrosion cracking confined within the thickness of tube support plates the plugging or repair limit is as follows:~~

~~(1) If the bobbin voltage associated with the indication is less than or equal to 2.0 Volts, the indication is allowed to remain in service.~~

~~(2) If the bobbin voltage associated with the indication is greater than 2.0 Volts, the tube shall be plugged or repaired unless the voltage is less than or equal to the upper voltage repair limit (calculated according to the methodology in GL 95-05 as supplemented) and a rotating pancake coil (or comparable examination technique) does not detect a flaw. In this latter case, the indication may remain in service.~~

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

~~3 If an unscheduled mid-cycle inspection is performed, the following mid-cycle repair limits apply instead of the limits in Specifications 5.5.8.c.2(c)(1) and 5.5.8.c.2(c)(2) above. The mid-cycle repair limits are determined from the following equations:~~

$$V_{MURL} = \frac{V_{SL}}{1.0 + NDE + Gr\left(\frac{CL - \Delta t}{CL}\right)}$$

$$V_{MLRL} = V_{MURL} - (V_{URL} - 2.0)\left(\frac{CL - \Delta t}{CL}\right)$$

~~Where:~~

~~V_{URL} = upper voltage repair limit~~

~~V_{LRL} = lower voltage repair limit~~

~~V_{MURL} = mid-cycle upper voltage repair limit based on time into cycle~~

~~V_{MLRL} = mid-cycle lower voltage repair limit based on V_{MURL} and time into cycle~~

~~Δt = length of time since last scheduled inspection during which V_{URL} and V_{LRL} were implemented~~

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

~~CL = cycle length (time between two scheduled steam generator inspections)~~

~~V_{SL} = structural limit voltage~~

~~Gr = average growth rate per cycle length~~

~~NDE = 95 percent cumulative probability allowance for nondestructive examination uncertainty (i.e., a value of 20 percent has been approved by the NRC)~~

~~Implementation of these mid-cycle repair limits should follow the same approach as described in Specifications 5.5.8.c.2(c)(1) and 5.5.8.c.2(c)(2) above.~~

~~Note: The upper voltage repair limit is calculated according to the methodology in GL 95-05 as supplemented.~~

d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube pluggingrepair criteria. ~~In tubes repaired by sleeving, the portion of the original tube wall between the sleeve's joints is not an area requiring re-inspection.~~ The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2~~,~~ and d.3 ~~and d.4~~ below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

next SG inspection. A~~n assessment of~~ degradationassessment shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.

1. Inspect 100% of the tubes in each SG during the first refueling outage following SG installation~~replacement~~.

2. After the first refueling outage following SG installation, inspect each SG at least every 72 effective full power months or at least every third refueling outage (whichever results in more frequent inspections). In addition, the minimum number of tubes inspected at each scheduled inspection shall be the number of tubes in all SGs divided by the number of SG inspection outages scheduled in each inspection period as defined in a, b, c and d below. If a degradation assessment indicates the potential for a type of degradation to occur at a location not previously inspected with a technique capable of detecting this type of degradation at this location and that may satisfy the applicable tube plugging criteria, the minimum number of locations inspected with such a capable inspection technique during the remainder of the inspection period may be prorated. The fraction of locations to be inspected for this potential type of degradation at this location at the end of the inspection period shall be no less than the ratio of the number of times the SG is scheduled to be inspected in the inspection period after the determination that a new form of degradation could potentially be occurring at this location divided by the total number of times the SG is scheduled to be inspected in the inspection period. Each inspection period defined below may be extended up to 3 effective full power months to include a SG inspection outage in an inspection period and the subsequent inspection period begins at the conclusion of the included SG inspection outage.

a) After the first refueling outage following SG installation, inspect 100% of the tubes during the next 144 effective full power months. This constitutes the first inspection period;

b) During the next 120 effective full power months, inspect 100% of the tubes. This constitutes the second inspection period;

c) During the next 96 effective full power months, inspect 100% of the tubes. This constitutes the third inspection period; and

d) During the remaining life of the SGs, inspect 100% of the tubes every 72 effective full power months. This constitutes the fourth and subsequent inspection periods.

~~For Unit 1 SGs, inspect 100% of the tubes at sequential periods of 144, 108, 72, and, thereafter, 60 effective full power months. The first sequential period shall be considered to begin after the first inservice inspection of the SGs. In addition, inspect 50% of the tubes by the refueling outage nearest the midpoint of the period and the remaining 50% by the refueling outage nearest the end of the period. No SG shall operate for more than 72 effective full power months or three refueling outages (whichever is less) without being inspected.~~

~~3. For Unit 2 SGs, inspect 100% of the tubes at sequential periods of 60 effective full power months. The first sequential period shall be considered to begin after the first inservice inspection of the SGs. No SG shall operate more than 24 effective full power months or one refueling outage (whichever is less) without being inspected.~~

~~(a)During each Unit 2 SG inspection (every 24 effective full power months (EFPM) or one refueling outage (whichever is less)), all tubes within that SG which have had the F* or EF* criteria applied will be inspected in the F* and EF* regions of the roll expanded region. The region of these tubes below the F* and EF* regions do not need to be inspected, unless there is a sleeve (or portion of a sleeve) that extends below the F* or EF* region.~~

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

~~(b)Implementation of the SG tube alternate repair criteria discussed in Specification 5.5.8.c.2(c) requires a 100 percent bobbin coil inspection for hot leg and cold leg tube support plate intersections down to the lowest cold leg tube support plate with known outside diameter stress corrosion cracking (ODSCC) indications. The determination of the lowest cold leg tube support plate intersections having ODSCC indications shall be based on the performance of at least a 20 percent random sampling of tubes inspected over their full length.~~

~~(c) SG tube indications left in service as a result of application of the alternate repair criteria discussed in Specification 5.5.8.c.2(c) shall be inspected by bobbin coil probe every 24 EFPM or one refueling outage (whichever is less).~~

43. If crack indications are found in any SG tube, then the next inspection for each affected and potentially affected SG for the degradation mechanism that caused the crack indication shall not exceed 24 effective full power months or one refueling outage (whichever results in more frequent inspections~~is less~~). If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.

e. Provisions for monitoring operational primary to secondary LEAKAGE.

~~f. Provisions for SG tube repair methods. Steam generator tube repair methods shall provide the means to reestablish the RCS pressure boundary integrity of SG tubes without removing the tube from service. For the purposes of these Specifications, tube plugging is not a repair. All acceptable tube repair methods are listed below.~~

~~1. There are no approved SG tube repair methods for the Unit 1 SGs.~~

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

~~2.For Unit 2, the following are approved repair methods:~~

~~(a) Alloy 690 tungsten inert gas welded sleeves in accordance with CEN-629-P, Revision 03-P, "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak-Tight Sleeves".~~

~~(b) Hardroll expanding non-sleeved portions of tubes in the tubesheet in order to apply the F* and EF* criteria.~~

5.6 Reporting Requirements (continued)

5.6.7 Steam Generator Tube Inspection Report

~~a.~~ A report shall be submitted within 180 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with the Specification 5.5.8, Steam Generator (SG) Program. The report shall include:

a~~1~~. The scope of inspections performed on each SG,

b~~2~~. ~~Active~~ D~~d~~egradation mechanisms found,

c~~3~~. Nondestructive examination techniques utilized for each degradation mechanism,

d~~4~~. Location, orientation (if linear), and measured sizes (if available) of service induced indications,

e~~5~~. Number of tubes plugged ~~or repaired~~ during the inspection outage for each ~~active~~ degradation mechanism,

f~~6~~. The number and percentage of tubes plugged to date, and the effective plugging percentage in each steam generator~~Total number and percentage of tubes plugged or repaired to date~~, and

g~~7~~. The results of condition monitoring, including the results of tube pulls and in-situ testing~~.~~,

~~8. The effective plugging percentage for all plugging and tube repairs in each SG,~~

~~9. Repair method utilized and the number of tubes repaired by each repair method, and~~

~~10. The results of inspections performed under Specification 5.5.8.d.3 for all tubes that have flaws below the F* or EF* distance, and were not plugged. The report shall include: a) identification of F* and EF* tubes; and b) location and extent of degradation.~~

5.6 Reporting Requirements

5.6.7 Steam Generator Tube Inspection Report (continued)

~~b. For implementation of the alternate repair criteria discussed in Specification 5.5.8.c.2(c), notify the NRC staff prior to returning the steam generators to service should any of the following conditions arise:~~

~~1. If circumferential crack-like indications are detected at the tube support plate intersections;~~

~~2. If indications are identified that extend beyond the confines of the tube support plate, or~~

~~3. If indications are identified at the tube support plate elevations that are attributable to primary water stress corrosion cracking.~~

5.6.8 EM Report

When a report is required by Condition C or I of LCO 3.3.3, "Event Monitoring (EM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

Enclosure 3

Retyped Technical Specification Pages

13 pages follow

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.19 Steam Generator (SG) Tube Integrity

LCO 3.4.19 SG tube integrity shall be maintained.

AND

All SG tubes satisfying the tube plugging criteria shall be plugged in accordance with the Steam Generator Program

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each SG tube.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more SG tubes satisfying the tube plugging criteria and not plugged in accordance with the Steam Generator Program.	A.1 Verify tube integrity of the affected tube(s) is maintained until the next refueling outage or SG inspection. AND	7 days
	A.2 Plug the affected tube(s) in accordance with the Steam Generator Program.	Prior to entering MODE 4 following the next refueling outage or SG tube inspection

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR SG tube integrity not maintained.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.19.1	Verify SG tube integrity in accordance with the Steam Generator Program.	In accordance with the Steam Generator Program
SR 3.4.19.2	Verify that each inspected SG tube that satisfies the tube plugging criteria is plugged in accordance with the Steam Generator Program.	Prior to entering MODE 4 following an SG tube inspection

5.5 Programs and Manuals (continued)

5.5.8 Steam Generator (SG) Program

A Steam Generator Program shall be established and implemented to ensure that SG tube integrity is maintained. In addition, the Steam Generator Program shall include the following:

a. Provisions for condition monitoring assessments. Condition monitoring assessment means an evaluation of the "as found" condition of the tubing with respect to the performance criteria for structural integrity and accident induced leakage. The "as found" condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging of tubes. Condition monitoring assessments shall be conducted during each outage during which the SG tubes are inspected or plugged to confirm that the performance criteria are being met.

b. Performance criteria for SG tube integrity. SG tube integrity shall be maintained by meeting the performance criteria for tube structural integrity, accident induced leakage, and operational LEAKAGE.

1. Structural integrity performance criterion: All in-service steam generator tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down), all anticipated transients included in the design specification, and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary-to-secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary-to-secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse.

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.

2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Leakage is not to exceed 1 gpm per SG.

3. The operational LEAKAGE performance criterion is specified in LCO 3.4.14, "RCS Operational LEAKAGE."

c. Provisions for SG tube plugging criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.

d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube plugging criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2 and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. A degradation assessment shall be

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.

1. Inspect 100% of the tubes in each SG during the first refueling outage following SG installation.

2. After the first refueling outage following SG installation, inspect each SG at least every 72 effective full power months or at least every third refueling outage (whichever results in more frequent inspections). In addition, the minimum number of tubes inspected at each scheduled inspection shall be the number of tubes in all SGs divided by the number of SG inspection outages scheduled in each inspection period as defined in a, b, c and d below. If a degradation assessment indicates the potential for a type of degradation to occur at a location not previously inspected with a technique capable of detecting this type of degradation at this location and that may satisfy the applicable tube plugging criteria, the minimum number of locations inspected with such a capable inspection technique during the remainder of the inspection period may be prorated. The fraction of locations to be inspected for this potential type of degradation at this location at the end of the inspection period shall be no less than the ratio of the number of times the SG is scheduled to be inspected in the inspection period after the determination that a new form of degradation could potentially be occurring at this location divided by the total number of times the SG is scheduled to be inspected in the inspection period. Each inspection period defined below may be extended up to 3 effective full power months to include a SG inspection outage in an inspection period and the subsequent inspection period begins at the conclusion of the included SG inspection outage.

   a) After the first refueling outage following SG installation, inspect 100% of the tubes during the next 144 effective full power months. This constitutes the first inspection period;

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program (continued)

b) During the next 120 effective full power months, inspect 100% of the tubes. This constitutes the second inspection period;

c) During the next 96 effective full power months, inspect 100% of the tubes. This constitutes the third inspection period; and

d) During the remaining life of the SGs, inspect 100% of the tubes every 72 effective full power months. This constitutes the fourth and subsequent inspection periods.

3. If crack indications are found in any SG tube, then the next inspection for each affected and potentially affected SG for the degradation mechanism that caused the crack indication shall not exceed 24 effective full power months or one refueling outage (whichever results in more frequent inspections). If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.

e. Provisions for monitoring operational primary to secondary LEAKAGE.

5.5 Programs and Manuals (continued)

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5.5 Programs and Manuals (continued)

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5.6 Reporting Requirements (continued)

5.6.7 Steam Generator Tube Inspection Report

A report shall be submitted within 180 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with the Specification 5.5.8, Steam Generator (SG) Program. The report shall include:

a. The scope of inspections performed on each SG,

b. Degradation mechanisms found,

c. Nondestructive examination techniques utilized for each degradation mechanism,

d. Location, orientation (if linear), and measured sizes (if available) of service induced indications,

e. Number of tubes plugged during the inspection outage for each degradation mechanism,

f. The number and percentage of tubes plugged to date, and the effective plugging percentage in each steam generator, and

g. The results of condition monitoring, including the results of tube pulls and in-situ testing.

5.6 Reporting Requirements (continued)

5.6.8 EM Report

When a report is required by Condition C or I of LCO 3.3.3, "Event Monitoring (EM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

Enclosure 4

Marked-Up Technical Specification Bases Pages

For Information Only

6 pages follow

BASES

BACKGROUND (continued)

There are three SG performance criteria: structural integrity, accident induced leakage, and operational LEAKAGE. The SG performance criteria are described in Specification 5.5.8. Meeting the SG performance criteria provides reasonable assurance of maintaining tube integrity at normal and accident conditions.

The processes used to meet the SG performance criteria are defined by the Steam Generator Program Guidelines (Ref. 1).

APPLICABLE SAFETY ANALYSES

The steam generator tube rupture (SGTR) accident is the limiting design basis event for SG tubes and avoiding an SGTR is the basis for this Specification. The analysis of a SGTR event assumes a bounding primary to secondary LEAKAGE rate greater than the operational LEAKAGE rate limits in LCO 3.4.14, "RCS Operational LEAKAGE," plus the leakage rate associated with a double-ended rupture of a single tube. The accident analysis for a SGTR assumes the contaminated secondary fluid is released to the atmosphere via atmospheric steam dumps.

The analyses for design basis accidents and transients other than a SGTR assume the SG tubes retain their structural integrity (i.e., they are assumed not to rupture). In these analyses, the steam discharge to the atmosphere is based on the total primary to secondary LEAKAGE of 1 gallon per minute from the faulted SG or is assumed to increase to 1 gallon per minute as a result of accident induced conditions plus 150 gallons per day from the intact SG. ~~When the alternate repair criteria discussed in Specification 5.5.8.c.2(c) are implemented for Unit 2 (only), the safety analyses assume the leakage from the faulted SG is limited to 1.42 gallons per minute (based on a reactor coolant system temperature of 578 °F). When alternate repair criteria discussed in Specification 5.5.8.c.2(c) are applied to axially oriented outside diameter stress corrosion cracking indications, the probability that one or more of these indications in an SG will burst under postulated main steam line break conditions shall be less than 1E-02.~~

BASES

APPLICABLE SAFETY ANALYSES (continued)

For accidents that do not involve fuel damage, the primary coolant activity level of DOSE EQUIVALENT I-131 is assumed to be equal to or greater than the LCO 3.4.17, "RCS Specific Activity," limits. For accidents that assume fuel damage, the primary coolant activity is a function of the amount of activity released from the damaged fuel. The dose consequences of these events are within the limits of GDC 19 (Ref. 2), 10 CFR 100 (Ref. 3) or the NRC approved licensing basis (e.g., a small fraction of these limits).

Steam generator tube integrity satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requires that SG tube integrity be maintained. The LCO also requires that all SG tubes that satisfy the pluggingrepair criteria be plugged or repaired in accordance with the Steam Generator Program.

During an SG inspection, any inspected tube that satisfies the Steam Generator Program pluggingrepair criteria is repaired or removed from service by plugging. If a tube was determined to satisfy the pluggingrepair criteria but was not plugged or repaired, the tube may still have tube integrity.

In the context of this Specification, an SG tube is defined as the entire length of the tube, including the tube wall and any repairs made to it, between the tube-to-tubesheet weld at the tube inlet and the tube-to-tubesheet weld at the tube outlet. The tube-to-tubesheet weld is not considered part of the tube., nor is the region of tube below the F* and EF* region (except as noted below), nor the portion of the tube between sleeve joints. When an F* or EF* region is repaired by sleeving, the entire sleeve is considered part of the tube.

BASES (continued)

APPLICABILITY

Steam generator tube integrity is challenged when the pressure differential across the tubes is large. Large differential pressures across SG tubes can only be experienced in MODE 1, 2, 3, or 4. RCS conditions are far less challenging in MODES 5 and 6 than during MODES 1, 2, 3, and 4. In MODES 5 and 6, primary to secondary differential pressure is low, resulting in lower stresses and reduced potential for LEAKAGE.

ACTIONS

The ACTIONS are modified by a Note clarifying that the Conditions may be entered independently for each SG tube. This is acceptable because the Required Actions provide appropriate compensatory actions for each affected SG tube. Complying with the Required Actions may allow for continued operation, and subsequent affected SG tubes are governed by subsequent Condition entry and application of associated Required Actions.

A.1 and A.2

Condition A applies if it is discovered that one or more SG tubes examined in an inservice inspection satisfy the tube pluggingrepair criteria but were not plugged ~~or repaired~~ in accordance with the Steam Generator Program as required by SR 3.4.19.2. An evaluation of SG tube integrity of the affected tube(s) must be made. Steam generator tube integrity is based on meeting the SG performance criteria described in the Steam Generator Program. The SG pluggingrepair criteria define limits on SG tube degradation that allow for flaw growth between inspections while still providing assurance that the SG performance criteria will continue to be met. In order to determine if an SG tube that should have been plugged ~~or repaired~~ has tube integrity, an evaluation must be completed that demonstrates that the SG performance criteria will continue to be met until the next refueling outage or SG tube inspection. The tube integrity determination is based on the estimated condition of the tube at the time the situation is discovered and the estimated growth

BASES

ACTIONS

A.1 and A.2 (continued)

of the degradation prior to the next SG tube inspection. If it is determined that tube integrity is not being maintained, Condition B applies.

A Completion Time of 7 days is sufficient to complete the evaluation while minimizing the risk of plant operation with an SG tube that may not have tube integrity.

If the evaluation determines that the affected tube(s) have tube integrity, Required Action A.2 allows plant operation to continue until the next refueling outage or SG inspection provided the inspection interval continues to be supported by an operational assessment that reflects the affected tubes. However, the affected tube(s) must be plugged ~~or repaired~~ prior to entering MODE 4 following the next refueling outage or SG inspection. This Completion Time is acceptable since operation until the next inspection is supported by the operational assessment.

B.1 and B.2

If the Required Actions and associated Completion Times of Condition A are not met or if SG tube integrity is not being maintained, the reactor must be brought to MODE 3 within 6 hours and MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the desired plant conditions from full power conditions in an orderly manner and without challenging plant systems.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.19.1

During shutdown periods the SGs are inspected as required by this SR and the Steam Generator Program. NEI 97-06, Steam Generator Program Guidelines (Ref. 1), and its referenced EPRI Guidelines, establish the content of the Steam Generator Program. Use of the Steam Generator Program ensures that the inspection is appropriate and consistent with accepted industry practices.

During SG inspections a condition monitoring assessment of the SG tubes is performed. The condition monitoring assessment determines the "as found" condition of the SG tubes. The purpose of the condition monitoring assessment is to ensure that the SG performance criteria have been met for the previous operating period.

The Steam Generator Program determines the scope of the inspection and the methods used to determine whether the tubes contain flaws satisfying the tube plugging~~repair~~ criteria. Inspection scope (i.e., which tubes or areas of tubing within the SG are to be inspected) is a function of existing and potential degradation locations. The Steam Generator Program also specifies the inspection methods to be used to find potential degradation. Inspection methods are a function of degradation morphology, non-destructive examination (NDE) technique capabilities, and inspection locations.

The Steam Generator Program defines the Frequency of SR 3.4.19.1. The Frequency is determined by the operational assessment and other limits in the SG examination guidelines (Ref. 6). The Steam Generator Program uses information on existing degradations and growth rates to determine an inspection Frequency that provides reasonable assurance that the tubing will meet the SG performance criteria at the next scheduled inspection. In addition, Specification 5.5.8 contains prescriptive requirements concerning inspection intervals to provide added assurance that the SG performance criteria will be met between scheduled inspections. If crack indications are

found in any SG tube, the maximum inspection interval for all affected and potentially affected SGs is restricted by Specification 5.5.8 until subsequent inspections support extending the inspection interval.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.19.2

During an SG inspection, any inspected tube that satisfies the Steam Generator Program plugging~~repair~~ criteria is ~~repaired or~~ removed from service by plugging. The tube plugging~~repair~~ criteria delineated in Specification 5.5.8 are intended to ensure that tubes accepted for continued service satisfy the SG performance criteria with allowance for error in the flaw size measurement and for future flaw growth. In addition, the tube plugging~~repair~~ criteria, in conjunction with other elements of the Steam Generator Program, ensure that the SG performance criteria will continue to be met until the next inspection of the subject tube(s). Reference 1 provides guidance for performing operational assessments to verify that the tubes remaining in service will continue to meet the SG performance criteria.

~~Steam generator tube repairs are only performed using approved repair methods as described in the Steam Generator Program.~~

The Frequency of prior to entering MODE 4 following an SG inspection ensures that the Surveillance has been completed and all tubes meeting the plugging~~repair~~ criteria are plugged ~~or repaired~~ prior to subjecting the SG tubes to significant primary to secondary pressure differential.