

POLICY ISSUE (Information)

January 5, 2006

SECY-06-0006

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations /RA/

SUBJECT: ISSUANCE OF NUCLEAR REGULATORY COMMISSION GENERIC LETTER 2006-XX, "STEAM GENERATOR TUBE INTEGRITY AND ASSOCIATED TECHNICAL SPECIFICATIONS"

PURPOSE:

This paper informs the Commission that the staff intends to issue the attached generic letter. In the generic letter, the staff asks operating pressurized-water reactor (PWR) licensees to commit to modify their technical specifications for steam generator (SG) tube integrity or to describe their program for ensuring SG tube integrity. No response to the generic letter is necessary from licensees that have already modified their technical specifications to address the issues discussed in the generic letter. This paper does not address any new commitments or resource implications.

BACKGROUND:

Steam generator tubes are an integral part of the reactor coolant pressure boundary and also serve to isolate radiological fission products in the primary coolant from the secondary coolant and the environment. Given the importance of SG tube integrity, all current PWR licensees have technical specifications governing the surveillance of SG tubes.

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The staff of the U.S. Nuclear Regulatory Commission (NRC) has informed the Commission of its actions related to ensuring SG tube integrity in several previous communications. Most recently, the staff issued SECY 03-0080, "Steam Generator Tube Integrity (SGTI) - Plans for Revising the Associated Regulatory Framework," dated May 16, 2003; and the staff briefed the Commission on SG issues in May 2003.

As reported to the Commission in SECY 03-0080, the staff continued to work with the industry and other stakeholders to improve the SG regulatory framework (i.e., the surveillance requirements in plant technical specifications). These efforts involved reviewing changes to the technical specifications both through a plant-specific (i.e., lead plant) and a generic licensing process.

After issuing SECY 03-0080, the staff reviewed and approved plant-specific changes to the technical specifications for several units and generically approved changes to the standard technical specifications. These new technical specifications are performance-based in that they focus on ensuring that the tubes satisfy performance criteria that are commensurate with assurance of adequate tube integrity. In addition, the technical specifications are consistent with the Nuclear Energy Institute's (NEI's) initiative referred to as NEI 97-06, "Steam Generator Program Guidelines" (ADAMS Accession Number ML052710007).

DISCUSSION:

Working with the industry and other stakeholders on the SG regulatory framework, the staff envisioned that all plants would adopt the new technical specifications because the surveillance requirements in the current technical specifications may not ensure the SG tubes will have adequate integrity for the intervals between tube inspections. Although the staff is aware that many plants plan to submit applications to adopt these new technical specifications, the staff does not know when the applications will be submitted or whether all plants plan to adopt these new technical specifications.

As a result, the staff is issuing this generic letter to licensees whose technical specification requirements may not ensure tube integrity during the intervals between inspections. The generic letter requests addressees to either submit a description of their program for ensuring steam generator tube integrity for the interval between inspections or to adopt alternative technical specification requirements for ensuring steam generator tube integrity. The purpose of the information request is to verify that plants are maintaining tube integrity in accordance with their design and licensing basis and applicable regulatory requirements.

A draft of this generic letter was placed in the *Federal Register*. The staff's responses to public comments on the draft and the revised generic letter are attached.

COORDINATION:

The staff briefed the Committee to Review Generic Requirements (CRGR) on the proposed generic letter during a meeting on September 27, 2005, and has addressed the Committee's comments. The CRGR has endorsed the proposed generic letter.

The Office of the General Counsel has reviewed the proposed generic letter and has no legal objections to its content.

The Office of the Chief Financial Officer has reviewed the proposed generic letter and has no objections to its content.

The staff intends to issue the attached generic letter on January 20, 2006.

/RA William Kane Acting for/

Luis A. Reyes
Executive Director
for Operations

Enclosures:

1. Proposed Generic Letter 2006-XX
2. Resolution of Public Comments

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

{date}

NRC GENERIC LETTER 2006-XX: STEAM GENERATOR TUBE INTEGRITY AND
ASSOCIATED TECHNICAL SPECIFICATIONS

ADDRESSEES

All holders of operating licenses for pressurized-water reactors (PWRs), except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel. A response to this generic letter (GL) is not needed for the following units since they have revised their technical specifications (TS) to be conceptually similar to the TS discussed in this GL: Arkansas Nuclear One Unit 1, Callaway, Catawba Units 1 and 2, Farley Units 1 and 2, Salem Unit 1, and South Texas Project Units 1 and 2.

PURPOSE

The U.S. Nuclear Regulatory Commission (NRC) is concerned that current TS requirements may not be sufficient to ensure that steam generator (SG) tube integrity can be maintained in accordance with current licensing and design basis. The NRC is, therefore, issuing this GL to request that addressees either submit a description of their program for ensuring SG tube integrity for the interval between inspections or adopt alternative TS requirements for ensuring SG tube integrity. Alternative TS requirements that address the staff's concerns with the existing TS were developed by the industry and found acceptable by the staff.

DISCUSSION

Steam generator tubes are an integral part of the reactor coolant pressure boundary (RCPB) and also serve to isolate radiological fission products in the primary coolant from the secondary coolant and the environment. For the purposes of this GL, tube integrity means that the tubes are capable of performing these functions in accordance with the plant design and licensing basis, including applicable regulatory requirements.

During operation licensees are required to monitor and maintain the condition of the SG tubes to ensure their continued integrity. Specifically, licensees are required by 10 CFR 50.55a(b)(2)(iii) and 10 CFR 50.55a(g) or by the plant TS to perform periodic inservice inspections and to repair (e.g., sleeve) or remove from service (by plugging the tube ends) all tubes found to have flaws exceeding the plugging limit (i.e. tube repair criterion).

The current TS requirements for inspection and repair of SG tubes were developed in the 1970s. These requirements are prescriptive. The licensees must inspect the tubes at specified intervals, implement specified tube inspection sampling plans, and repair or remove from

ML052780204

service by plugging all tubes found by inspection to have flaws in excess of specified flaw repair criteria. However, as shown by operating experience, the prescriptive approach in the TS may not ensure tube integrity. For example, in cases of low to moderate levels of degradation, the TS only require that 3 to 21 percent of the tubes be inspected, irrespective of whether the inspection indicates that additional tubes need to be inspected to reasonably ensure that tubes with flaws which may exceed the tube repair criteria or impair tube integrity are detected. In addition, the TS (and Section XI of the American Society of Mechanical Engineers [ASME] Boiler and Pressure Vessel Code) do not prescribe the inspection methods to be used for various tube degradation mechanisms at specific tube locations or define the specific objectives to be achieved by the selected methods. Also, flaws grow between inspections and can exceed the flaw size allowed for in the tube repair criteria. In such cases, the specified inspection frequencies may not ensure reinspection of a tube before its integrity is impaired. In short, current TS surveillance requirements may not require licensees to actively manage their SG programs so as to provide reasonable assurance of tube integrity. As a result, licensees have often found it necessary to implement measures beyond the TS requirements to ensure tube integrity. Licensees often interact with the NRC staff in an oversight or review capacity to ensure that tube integrity is being maintained.

The NRC staff, with external stakeholder involvement, began efforts to improve the SG tube integrity regulatory framework, as discussed in SECY-03-0800, "Steam Generator Tube Integrity (SGTI) - Plans for Revising the Associated Regulatory Framework." As a result of these efforts, the NRC and industry developed modified generic TS for addressing SG tube integrity. The generic changes to the Standard Technical Specifications (STS) were submitted by the Technical Specification Task Force (TSTF) and are designated TSTF-449, "Steam Generator Tube Integrity." The NRC reviewed and approved Revision 4 to TSTF-449, and applied the consolidated line item improvement process (CLIIP)¹ to provide an example application for adoption of TSTF-449 into a licensee's TS.² Several facilities have recently incorporated TSTF-449, Revision 4 (or something similar) into their TS. (Proposals to change the plant-specific TS are reviewed in accordance with the license amendment review process to confirm the acceptability of the changes.) The approach taken in TSTF-449, Revision 4, is generally consistent with Nuclear Energy Institute (NEI) 97-06, "Steam Generator Program Guidelines." The revised generic TS are performance-based in that they focus on ensuring the tubes satisfy performance criteria that are commensurate with assurance of adequate tube integrity. This approach can be readily adapted to new or unexpected degradation mechanisms and advances in nondestructive examination technology. This approach includes programmatic elements to ensure that tubes are adequately monitored and maintained relative to the structural and leakage performance criteria.

¹See 70 FR 24126 or ADAMS Accession No. ML051160106 for the availability of the CLIIPed TSTF-449 Revision 4.

²See <http://www.nrc.gov/reactors/operating/licensing/techspecs.html>. Follow the CLIIP links to the table of CLIIP STS Changes Issued for Adoption.

The requirements for SG tube integrity are given in Title 10 of the Code of Federal Regulations (10 CFR). Specifically, the general design criteria (GDC)¹ in Appendix A to 10 CFR Part 50 contain requirements related to the RCPB (GDC 2, GDC 14, GDC 30, and GDC 32), and 10 CFR 50.55a states that components that are part of the RCPB must meet the requirements for Class 1 components in Sections III and XI of the ASME Boiler and Pressure Vessel Code. If the TS of a nuclear power plant include surveillance requirements for SGs different from those in Section XI of the ASME Boiler and Pressure Vessel Code, the inservice inspection program for SG tubing is governed by the requirements in the TS (10 CFR 50.55a(b)(2)(iii)).

The requirements for the content of a plant's TS are given in 10 CFR 50.36, "Technical specifications." All currently operating PWR licensees have TS for SG tube surveillance. These TS include operational leakage limits so that if significant leakage develops, the plant is shut down. The plugging limits in the TS were developed to ensure that degraded tubes maintain factors of safety against gross rupture consistent with the plant design basis (i.e., consistent with the stress limits of Section III of the ASME Code), and maintain leakage integrity consistent with the plant licensing basis while allowing for potential flaw size measurement error and flaw growth between inservice inspections.

As part of the plant licensing basis, applicants for PWR licenses are also required to analyze the consequences of postulated design basis accidents. Typical accidents analyzed are SG tube rupture, locked rotor, control rod ejection, and a main steamline break. These analyses consider the potential primary-to-secondary leakage through the tubes during these events and must show that the offsite radiological doses do not exceed 10 CFR Part 100 limits (or some fraction thereof) and GDC 19 of 10 CFR Part 50, Appendix A.

In addition to inspecting and repairing SG tubes, licensees are required by 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," to ensure that conditions adverse to quality are promptly identified and corrected. If the conditions are significantly adverse to quality, the licensee must assure that the cause of the condition is determined and corrective action taken to preclude repetition.

The staff is requesting information about (1) actions licensees are taking or will take to ensure tube integrity is being maintained and (2) contemplated changes to the TS to reflect these actions. The staff requests this information because the surveillance requirements in the current TS may not ensure that the SG tubes are within safety limits. The staff will use the information to verify that the surveillance requirements implemented at the plant provide reasonable assurance that the safety limits will be satisfied for the operating interval between inspections and that the safety limits are consistent with the plant's design and licensing basis.

APPLICABLE REGULATORY REQUIREMENTS

The applicable 10 CFR Part 50 and plant TS requirements are discussed in the Discussion section.

¹Or similar requirements in the plant-specific principal design criteria for PWR facilities licensed before the issuance of 10 CFR Part 50, Appendix A.

REQUESTED ACTION

This GL asks addressees to submit information.

REQUESTED INFORMATION

All addressees are requested to provide a response to this GL that contains either the information requested in Option 1 or Option 2:

Option 1: Within 30 days of the date of this GL, either confirm that you have submitted a request to modify the SG portion of your TS that is consistent with TSTF-449, Revision 4, or provide a regulatory commitment detailing your plans and schedule for submitting such a request (refer to Regulatory Issue Summary 2000-17, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff"). If you modify your commitment so that the request will not be submitted by May 31, 2006, provide the information requested in Option 2 within 60 days of changing your commitment.

If your commitment is to submit a request after May 31, 2006, provide the information requested in Option 2. If you or the NRC staff determine that your submittal is not consistent with TSTF-449, Revision 4, provide the information requested in Option 2 within 60 days of this determination.

Option 2: Within 60 days of the date of this GL, provide a description of the actions being taken or that will be taken to ensure tube integrity is being maintained (i.e., provide a detailed description of your tube integrity program).

REQUIRED RESPONSE

In accordance with 10 CFR 50.54(f), addressees are required to submit written responses to this GL. There are two options:

- (a) Addressees may submit written responses providing the information requested above within the requested time period.
- (b) Addressees who cannot meet the requested completion date or who choose an alternate course of action are required to so notify the NRC in writing as soon as possible but no later than 30 days from the date of this GL. The response must address any alternative course of action proposed, including the basis for the acceptability of the proposed alternative course of action, and the schedule for completing the alternative course of action.

The required written response should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, Maryland 20852, under oath or affirmation under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, a copy of the response should be sent to the appropriate regional administrator.

REASONS FOR REQUESTED INFORMATION

This GL asks addressees to submit information. The requested information will enable the NRC staff to determine whether addressees' SG tube integrity programs provide reasonable assurance of tube integrity consistent with the design and licensing basis and applicable regulatory requirements (e.g., 10 CFR Part 50, Appendix A Criteria 2, 14, 15, 19, 30, 31, and 32; 10 CFR Part 50, Appendix B, Criterion XVI).

The NRC staff will review the responses to this GL to determine whether additional actions are necessary.

RELATED GENERIC COMMUNICATIONS

The related generic communications are listed below:

NRC Information Notice 2005-09, "Indications in Thermally Treated Alloy 600 Steam Generator Tubes and Tube-to-Tubesheet Welds," April 7, 2005 (ML050530400).

NRC Information Notice 2004-17, "Loose Part Detection and Computerized Eddy Current Data Analysis in Steam Generators," August 25, 2004 (ML042180094).

NRC Information Notice 2004-16, "Tube Leakage due to a Fabrication Flaw in a Replacement Steam Generator," August 3, 2004 (ML041460357).

NRC Information Notice 2004-10, "Loose Parts in Steam Generators," May 4, 2004 (ML041170480).

NRC Generic Letter 2004-01, "Requirements for Steam Generator Tube Inspections," August 30, 2004 (ML042370766).

BACKFIT DISCUSSION

Under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f), this GL transmits an information request for the purpose of verifying compliance with applicable existing requirements. The information will enable the NRC staff to determine whether the applicable requirements discussed above are being met. No backfit is either intended or approved in issuing this GL. Therefore, the staff has not performed a backfit analysis.

FEDERAL REGISTER NOTIFICATION

A notice of opportunity for public comment was published in the *Federal Register* on October 7, 2004 (69 FR 60193). Five sets of comments were received, all from the nuclear industry. The staff considered all the comments received. The staff's evaluation of the comments is publicly available through the NRC's Agencywide Document Access and Management System (ADAMS) under Accession No. ML053110454.

SMALL BUSINESS REGULATORY ENFORCEMENT FAIRNESS ACT

The NRC has determined that this action is not subject to the Small Business Regulatory Enforcement Fairness Act of 1996.

PAPERWORK REDUCTION ACT STATEMENT

This GL contains information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget (in approval no. 3150-0011, which expires on February 28, 2007).

The burden to the public for these mandatory information collections is estimated to average 200 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collected. Send comments regarding this burden estimate or any other aspect of these information collections, including suggestions for reducing the burden, to the Records and FOIA/Privacy Services Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail to INFOCOLLECTS@NRC.GOV; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0011), Office of Management and Budget, Washington, DC 20503.

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

CONTACT

Please direct any questions about this matter to the contacts listed below or to the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

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Note: NRC generic communications may be found on the NRC public Web site, <http://www.nrc.gov>, under Electronic Reading Room/Document Collections.

**RESOLUTION OF PUBLIC COMMENTS ON
NRC DRAFT GENERIC LETTER 2005-XX:
STEAM GENERATOR TUBE INTEGRITY AND
ASSOCIATED TECHNICAL SPECIFICATIONS**

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A. The following letters provided comments on draft generic letter (GL) 2004-XX, "Steam Generator Tube Integrity and Associated Technical Specifications":

1. Tennessee Valley Authority (TVA) letter dated December 6, 2004, "Tennessee Valley Authority (TVA) - Comments on Proposed Draft Generic Communication - Steam Generator Tube Integrity and Associated Technical Specifications (Vol. 69, *Federal Register* 60193, Dated October 7, 2004)," ML043480273
2. Nuclear Energy Institute letter dated December 6, 2004, "Transmittal of NEI Comments on Draft Generic Communication; Steam Generator Tube Integrity and Associated Technical Specifications (69 Fed. Reg. 60193, October 7, 2004), Request for Comments," ML043620077
3. Progress Energy letter dated December 6, 2004, "Comments on Proposed Generic Communication; Steam Generator Tube Integrity and Associated Technical Specifications (69 FR 60193)," ML043620079
4. Duke Power letter dated December 6, 2004, "Duke Energy Corporation; Comments on Draft Generic Communication; Steam Generator Tube Integrity and Associated Technical Specifications (69 Fed. Reg. 60193, October 7, 2004)," ML043620081
5. Kenneth R. Worthington (of American Electric Power) e-mail dated December 3, 2004, "NRC Draft Generic Letter 2004-XXX, Steam Generator Tube Integrity and Associated Technical Specifications," ML050040470

B. Comment Resolution

Below are abbreviated descriptions of the comments or sets of comments (when several comments are closely related) followed by the NRC staff's response. In some cases, the NRC staff paraphrased the comments, while in others the language is taken verbatim from the comments. It should be noted that the abbreviated descriptions are not intended to simplify or narrow the issues raised by those who commented on the draft GL. The staff carefully considered each comment in its entirety. Following each comment is an identifier (i.e., a number) that enables the reader to refer back to the letters referenced in Section A.

1. **Draft generic letter (GL) should reference approved version of Technical Specification Task Force (TSTF) 449.**

Comments:

The draft generic communication includes sample technical specifications. The technical specifications attached to the final version of the generic communication should be the approved version of Technical Specification Task Force (TSTF) 449, "Steam Generator Tube Integrity." To avoid confusion, it would be better to reference the TSTF than attach the technical specifications. (1, 2, 4)

The need for comments on the sample technical specifications would be reduced if the final generic letter included TSTF-449 in its final form. (3)

Response:

The technical specifications attached to the draft generic letter were intended only as an example of the type of information to be included in the specifications. The final generic letter indicates that the steam generator technical specifications were recently modified at several units, instead of giving an example of the technical specifications in an attachment to the generic letter. The units whose technical specifications were modified (as of October 31, 2005) to be consistent with the industry's generically developed technical specifications are Farley Units 1 and 2 (ML042570427), South Texas Units 1 and 2 (ML043370354), Catawba Units 1 and 2 (ML050110258), Arkansas Nuclear One - Unit 1 (ML052240384), Callaway (ML052570086), and Salem Unit 1 (ML052720233). All of these plants' technical specifications are conceptually similar. In addition, the generic letter references TSTF-449, Revision 4, which the staff approved on May 2, 2005 (ML051160106).

2. GL should not be addressed to plants that have applied to amend their technical specifications.

Comments:

The draft generic communication is addressed to PWRs that have not already "modified their technical specifications to be consistent with those in the Attachment." We understand that the technical specifications that will be included in the attachment when the generic communication is issued will be the approved version of TSTF-449. The industry submitted TSTF-449 with the intention of applying it to the Consolidated Line Item Improvement Process (CLIIP). Since the intention of the CLIIP is to facilitate licensee adoption of essentially identical technical specification changes, licensees who have requested the TSTF-449 CLIIP should be treated the same as licensees who have already been granted the associated technical specification amendment and should not be addressed by the generic communication. This would save the licensee and NRC the effort of processing responses to the generic communication for plants that either intend to adopt the new technical specifications or have already received the associated license amendment. (1, 2, 4)

Response:

The draft generic letter is not addressed to units that have already modified their technical specifications. The NRC staff is confident that, for licensees that have adopted the new technical specifications, plant programs are in place for ensuring tube integrity since tube integrity is a condition of steam generator operability in the new technical specifications. If the staff did not address the generic letter to licensees of units that planned to adopt the new technical specifications, the staff would be assuming that the unit's submittal would be acceptable. Since it is possible that the submittal could be found unacceptable, the staff recommends the following approach to disposition this comment. The staff will still address the generic letter to licensees of units that have not modified their technical specifications; however, it will not require licensees that provide an amendment request by May 31, 2006 to describe their tube integrity program. In the event that the proposal is not consistent with TSTF-449, Revision 4, the staff will request licensees to provide a description of their tube integrity program within 60 days of being notified that their request is not consistent with TSTF-449.

3. **Delay issuing GL until some time after TSTF-449 is available through the CLIP process.**

Comments:

To determine which licensees intend to adopt the new steam generator tube integrity technical specifications, the NRC should not issue the generic communication until an appropriate period of time after the TSTF-449 CLIP notice of availability is published in the *Federal Register*. This will give licensees time to make a license amendment request through the CLIP to adopt TSTF-449. (1, 2, 3, 4)

Response:

Since the staff's request focuses on units that have not adopted the new version of the technical specifications, the staff will provide addressees with two options. These options include providing a commitment to submit the new technical specifications, or describing their tube integrity program. For units providing a commitment to modify their technical specifications (or for units that have submitted a request which has not yet been approved), a detailed description of the tube integrity program will only be needed in the event that the submittal is made after May 31, 2006 or the submittal is not consistent with TSTF-449. This is responsive to the comment since it gives addressees one year after the CLIP notice of availability to submit a request to revise their technical specifications.

4. Licensees should be able to reference the industry impact study if it bounds plant-specific conditions.

Comments:

The industry recently completed a study of the impact of the structural integrity performance criterion (SIPC) on steam generator tube integrity assessments. This study was undertaken as a result of changes to the SIPC identified during the development of TSTF-449. The NRC is aware of the changes to the SIPC, has been briefed on the results of the impact study, and will be given a copy of the impact study before the generic communication is issued. The impact study shows that the revised SIPC is not a significant issue for most licensees. The results also show that many licensees may need to update their licensing basis analyses to determine their site-specific nonpressure-related loads. Since industry resources are finite, there may not be enough time to update the analyses necessary to define the site specific nonpressure-related loads before the final generic communication is issued. In responding to Requested Information item 2 in the generic communication (demonstrate that the SG tubes will have adequate structural and leakage integrity at the time of the next SG tube inspection, taking into account the effects of nonpressure related loads), if nonpressure-related loads are not clearly defined in the licensing basis to support calculation of site-specific structural limits, affected licensees should be able to cite the results of the SIPC industry impact study in lieu of a plant-specific analysis if the impact study bounds their plant-specific conditions. (1, 2, 4)

If the nonpressure-related loads are not clearly defined in the licensing basis to support calculation of site-specific structural limits, the results of the industry impact study should be accepted, as an interim measure, for use in the safety assessment to demonstrate that the steam generator tubes will have adequate structural and leakage integrity until the next steam generator tube inspection and until the necessary analyses can be updated. (3)

Response:

As a result of information provided by the industry on the effect of non-pressure related loads on tube integrity, the staff has determined that this request is no longer needed and has deleted it from the generic letter. As a result, this comment is no longer applicable.

5. Clarify that the 150-gallon-per-day limit applies to each steam generator.

Comments:

In the sample technical specification, Section b, item 3, there is a statement about operational primary-to-secondary leakage: "For limits currently greater than 150 gallons per day, the LCO limit should be lowered-to a value less than or equal to 150 gallons per day." The phrase "from any single steam generator" should be added to the end of the sentence. This would then be consistent with Nuclear Energy Institute (NEI) 97-06. (3)

Response:

In response to comment 1, the NRC staff stated that it referenced TSTF-449 and other recent examples of approved technical specifications. Thus, the sample technical specifications will be removed from the generic letter and the change requested in this comment is no longer applicable. As the comment points out, TSTF-449 and the other approved technical specifications make it clear that the operational leakage limit is the amount of leakage "from any single steam generator" (or "through any one steam generator").

6. **Add a provision that sequential periods can be extended until the next refueling outage if the plant is operating during a sequential period.**

Comments:

Sample technical specification Section d, item 2, provides the sequential periods over which 100 percent of the SG tubes of various materials are to be inspected. Although similar to the Electric Power Research Institute (EPRI) guidelines, the sample technical specification omits an important provision of the EPRI guidelines. The EPRI guidelines had an additional provision that "if the end of the sequential period occurs while the plant is not in a refueling outage, deferring examination until the next refueling outage is acceptable". This is an important provision for plants that operate on 24-month cycles, since the sequential periods are multipliers of 18 months. The EPRI guideline provision cited above should be maintained in the sample technical specifications since the deletion of the provision will significantly increase the required number of inspections at many plants on 24-month operating cycles. (3)

Response:

The suggested change to the sample technical specification is inconsistent with the generic industry proposal (TSTF-449) and other recently approved amendments. Although such a modification to the wording in the technical specification may be acceptable, a detailed technical basis (e.g., extensive laboratory testing on time to crack initiation and crack growth rates under various long-term water chemistry regimes) would need to be provided so the staff could evaluate the acceptability of such a modification. In addition, although all of the intervals listed in the industry's generic proposal may not be multiples of 24, the inspections can be performed at plants with 24-month fuel cycles (i.e., the inspections simply require prior planning). As a result, no changes are needed to the generic letter in response to this comment.

7. Specify that primary bending loads are the loads of concern.

Comments:

The second item under Purpose and the final paragraph of the Discussion section includes the phrase "nonpressure-related loads such as bending loads." The phrase should be revised to specify "*primary* bending loads" because bending loads may also be secondary, according to ASME Section III, Division 1, Subsection NB. (3)

Response:

As a result of information provided by the industry on the effect of non-pressure related loads on tube integrity, the staff has determined that this request is no longer needed and has deleted it from the generic letter. As a result, this comment is no longer applicable.

8. Calculating loads at tubesheet will be burdensome without contributing to safety.

Comments:

In recirculating steam generators, the largest tube loads occur in the upper bundle (U-bend) region. Wear marks from debris, which can have a strong circumferential character, are typically not found in the upper bundle. Since the primary bending moments acting on the tubes near the tubesheet are small, the assessment of such wear marks is not expected to be impacted by the new SIPC. However, if definite evidence is needed that an analysis based on pressure differential is in fact bounding, it may be necessary to calculate the plant-specific tube loads near the tubesheet. These loads are not available in the present tube stress evaluation conducted in accordance with Regulatory Guide 1.121 since this location does not see the highest loads. This will be expensive for utilities to backfit and most utilities will need the assistance of the original equipment manufacturer to do the calculations since appropriate tube loads to perform the calculations are not currently given in the plant-specific stress reports. Requiring each utility to provide a plant-specific analysis to show that the analysis based on pressure differential is bounding appears to be overly burdensome and does not significantly increase the health and safety of the public. (5)

Response:

As a result of information provided by the industry on the effect of non-pressure related loads on tube integrity, the staff has determined that this request is no longer needed and has deleted it from the generic letter. As a result, this comment is no longer applicable. Nonetheless, the staff's response to this comment is provided below.

The SIPC is an industry/NRC criterion which, if met, is intended to ensure that tube integrity is being maintained consistent with existing plant design and licensing bases. The industry's TSTF submittal includes this criterion together with a requirement to periodically demonstrate that this criterion is met. Industry guidelines (including NEI 97-06) are being revised consistent with the TSTF submittal. The SIPC requires the consideration of nonpressure loads which may affect burst pressure. For certain kinds of flaws of certain sizes and at certain locations, nonpressure loads can influence when burst occurs. For plants with such flaws, an assessment of the nonpressure loads is important to ensure tube integrity is maintained and thus does not constitute an unnecessary burden.

The GL does not request that plant-specific nonpressure loads be used or that the loads be calculated specifically for the location of interest. Loadings considered in available industry studies may be used if they can be shown to be conservative for the subject plant at the location of interest. In cases where a plant-specific Regulatory Guide 1.121 analysis has been performed, maximum bending moments may be known for certain critical locations. Such bending moments may be applied to other locations of interest if known to be conservative. However, if licensees cannot demonstrate adequate tube integrity with such a bounding approach, they have several options, including performing additional more detailed analysis, plugging tubes at an earlier stage of degradation, and doing midcycle inspections.

The industry has published interim guidelines on the effects of nonpressure loads. For flaws in the straight length portion of recirculating steam generators, the interim guidelines state that bending loads do not influence burst pressure for circumferential flaws extending 270 degrees around the tube circumference. If the licensee's tube integrity assessment must address flaws greater than 270 degrees (because such flaws have been found or are anticipated in the future), the interim guidelines state that the influence of nonpressure loads on burst pressure must be evaluated on a plant-specific basis or, alternatively, evaluated using the results of the SIPC impact study if the licensee can demonstrate that the plant conditions used in the impact study bound the plant-specific conditions.

On this basis, the NRC staff concludes that no changes to the generic letter are needed to address this comment. However, as discussed above, the staff has deleted this request from the generic letter.