

**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.