

February 20, 2007

MEMORANDUM TO: Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: Victor Nerses, Senior Project Manager */RAI/*
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: THREE MILE ISLAND UNIT NO. 1 - FACSIMILE TRANSMISSION,
DRAFT REQUEST FOR ADDITIONAL INFORMATION REGARDING
THE STEAM GENERATOR TUBE INTEGRITY TECHNICAL
SPECIFICATION AMENDMENT (TAC NO. MD1807)

The attached draft request for additional information (RAI) was transmitted by facsimile on February 20, 2007, to Mr. David Distel, at AmerGen Energy Company, LLC (AmerGen). This draft RAI was transmitted to facilitate the technical review being conducted by the Nuclear Regulatory Commission (NRC) staff and to support a conference call with AmerGen in order to clarify certain items in the licensee's submittal. The draft RAI is related to AmerGen's submittal dated May 15, 2006, regarding Three Mile Island, Unit 1 steam generator (SG) tube integrity Technical Specifications (TSs). Review of the draft RAI would allow AmerGen to determine and agree upon a schedule to respond to the RAI. This memorandum and the attachment do not represent an NRC staff position.

Docket No. 50-289

Enclosure:
As stated

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DRAFT
REQUEST FOR ADDITIONAL INFORMATION
THREE MILE ISLAND, UNIT NO. 1 STEAM GENERATOR TUBE INTEGRITY TECHNICAL
SPECIFICATION AMENDMENT
TAC NO. MD1807
DOCKET NO. 50-289

By letter dated May 15, 2006 (ML061420294), AmerGen Energy Company, LLC (the licensee) submitted a license amendment request (LAR) regarding Three Mile Island Unit 1 steam generator (SG) tube integrity technical specifications (TS). The proposed amendment would revise the SG tube integrity TSs to be consistent with the U.S. Nuclear Regulatory Commission approved Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-449, "Steam Generator Tube Integrity," Revision 4 (ML0510902003). The licensee provided additional information regarding their SG tube integrity TSs in letters dated October 6, 2006 (ML062830331) and December 12, 2006 (ML063480459). Based on the review of the information provided by the licensee, the staff has the following additional questions.

1. The cover page of the October 6, 2006, document indicates that the SG tube integrity TSs are going to be made consistent with Revision 1 of TSTF-449 and Page 1 of Enclosure 1 of the same document indicates that changes to the SG tube integrity TSs will be consistent with Revision 3 of the TSTF-449. Please clarify that the modifications being made are consistent with TSTF-449, Revision 4.
2. The Actions and Note in TS Section 3.1.1.2 should be rearranged to indicate that TS Section 3.1.1.2.a.(3) should only be entered if TS Section 3.1.1.2.a.(2) was not met. As a result, discuss your plans to remove the last sentence of the Note and relocate it as part of TS Section 3.1.1.2.a.(3). This sentence should also be modified to remove reference to TS Section 3.1.1.2.a.(1) since entry into TS Section 3.1.1.2.a.(3) is not permitted if TS Section 3.1.1.2.a.(1) is not satisfied. For example, "If the requirements of Section 3.1.1.2.a.(2) are not met for one or more tubes then perform the following."
3. In regards to the Bases for TS Section 3.1.6, discuss your plans to replace "Steam generator leakage" in the last sentence of the third paragraph with "Primary-to-secondary leakage" to be consistent with TSTF-449.
4. The reference to TS Section 6.19.c.2 in the Bases for TS Section 3.1.6 is not clear, and the sentence (containing this reference) does not appear complete (when compared to TSTF-449). With respect to the corresponding sentence in TSTF-449, it indicates that primary-to-secondary leakage has the potential to increase as a result of accident induced conditions. This point is removed from your proposal (with the exception of the leakage attributed to a steam line break accident). In addition, TS 6.19.c.2 does not contain a leakage rate rather it has a total leakage volume. Please discuss your plans to address the above comments.

ENCLOSURE

It was stated on Page 4-78 of Enclosure 2 (Bases for TS Section 4.19) that “In these analyses, the steam discharge to the atmosphere is based on the total primary to secondary leakage from all SGs of 1 gallon per minute or is assumed to increase to the leakage rates described in TS 6.19.c.2 as a result of accident-induced conditions.” With respect to the corresponding sentence in TSTF-449, it indicates that primary-to-secondary leakage has the potential to increase as a result of accident-induced conditions. This point is removed from your proposal (with the exception of the leakage attributed to a steam line break accident). Please discuss your plans to address the above comment.

5. Please discuss your plans to modify the following TS bases sections to be consistent with the wording in the associated proposed TS sections.
 - i. The last sentence in the first paragraph of the Bases for TS Section 3.1.6 is not clear since one could interpret it to mean that the leakage of 144 gallons per day (gpd) is permitted from each SG. As a result, discuss your plans to clarify this sentence. For example, “The TS requirement to limit the sum of the primary to secondary leakage from both SGs to less than or equal to 144 gallons per day is significantly less than the conditions assumed in the safety analysis.” In addition, discuss your plans to clarify the first sentence of the second paragraph of the same Bases for a similar reason. For example, “The limit on the sum of the primary to secondary leakage from both SGs of 144 gallons per day bounds the TSTF-449, Rev. 4 limit of 150 gallons per day per SG, which is based on the operational leakage performance criterion in NEI 97-06, Steam Generator Program Guidelines (Ref.1).”
 - ii. The first sentence of the first paragraph of the Bases for TS Section 4.1 is not clear since it could be interpreted to mean the leakage of 144 gpd is permitted from each SG. As a result, discuss your plans to clarify this sentence. For example, “The primary to secondary leakage surveillance in TS Table 4.1-2, Item 12, verifies that the sum of the primary to secondary leakage from both SGs is less than or equal to 144 gallons per day.” For a similar reason, discuss your plans to modify the last sentence of the first paragraph of the same Bases. For example, “The operational leakage rate limit applies to the sum of the leakage through both SGs.”
 - iii. In the first full paragraph on Page 4-80, discuss your plans to clarify that the leakage limit is the sum of the leakage from both SGs
6. In the Bases for TS Section 3.4, you indicated that the following sentence will be removed, “According to Specification 3.1.1.2a, both OTSGs shall be operable whenever the reactor coolant average temperature is above 250 degrees F.” Please provide justification for removing this information entirely rather than modifying the sentence. For example, the sentence could be modified to read, “According to Specification 3.1.1.2.a, both SGs shall have tube integrity whenever the reactor coolant average temperature is above 200 degrees F.
7. In TS Table 4.1.2, the “Test” for “primary to secondary leakage” is listed as “Evaluate”.

The meaning of this term is not clear. Isn't the "Test" for primary to secondary leakage, continuous monitoring of the effluent (steam and feedwater systems) for radioactive isotopes or performing radiochemical analyses of grab samples of the steam and feedwater systems? Similarly, isn't the "Test" for reactor coolant system leakage, a water inventory balance rather than "Evaluate?" Please discuss your plans to modify your proposal to more accurately reflect the "Test" for monitoring primary-to-secondary leakage.

In addition, discuss your plans to modify the Note in Table 4.1-2 to make it more consistent with the TSTF-449. For example, "Note: Not required to be performed until 12 hours after establishment of steady state operation." By removing reference to the "initial" leak rate, a corresponding change should be made to the second paragraph of the insert to TS Page 4-2b (Bases for TS Section 4.1).

8. Please discuss your plans to add the Note currently on Page 4-83a of your existing TSs to your associated proposed TSs bases.
9. TSTF-449 indicates, "The SG heat removal function is addressed by..." specific TS sections in the Bases for the SG tube integrity section. Please discuss your plans to include a similar sentence at the end of the first paragraph in your Bases for TS Section 4.19.
10. On Page 4-78 of Enclosure 2, you state "...a SG tube is defined as the entire length of the tube, including the tube wall and any repairs made to it,..." Please discuss your plans to include a discussion that would highlight that tubes have been sleeved and additional sleeves will not be installed without prior NRC approval.
11. Since "serviceability" is no longer defined in your TSs, please discuss your plans to modify the second paragraph under Surveillance Requirement (SR) 4.19.2 in your Bases to remove reference to it.
12. Even though TMI-1 will not have approved repair methods, please discuss your plans to describe the existing kinetic expansions and sleeves where the following note appears in the TSTF-449, "[Steam generator tube repairs are only performed using approved repair methods as described in the Steam Generator Program.]" In addition, please discuss your plans to incorporate the existing NOTE on Page 4-83a of your TSs in your new proposed Bases.
13. Please discuss your plans to modify TS Section 6.9.6.f to be consistent with TSTF-449 by reading, "Total number and percentage of tubes plugged or repaired to date."
14. Given that TMI-1 has tubes that are sleeved, please discuss your plans to modify TS Section 6.19.c to clearly indicate that repair criteria for the non-sleeved region of the tube and the repair criteria for the sleeved region of the tube. In addition, discuss your plans to clearly indicate that the alternative to the 40-percent depth based criteria can only be applied to non-sleeved tubes.
15. Please discuss your plans to include the definition of inside diameter inter-granular attack from TS Section 4.19.4.a.9 in TS Section 6.19.c.1 (current proposed numbering).

In addition, please discuss your plans to remove "repaired or" from the fourth sentence of this TS since there will be no approved repair methods at TMI-1.

16. The reason for referencing the accident-induced leakage criteria in proposed TS Section 6.19.c.1 and 6.19.c.2 is not apparent. If it is consistent with your design and licensing basis it would seem that it is addressed by the first sentence under TS Section 6.19.b.2. In addition, please discuss your plans to clearly indicate that the only exception to the 1 gpm per SG limit is for leakage attributed to the kinetic expansions. For example, "Leakage from all sources excluding the leakage attributed to the degradation described in TS Section 6.19.c.2 is also not to exceed 1 gpm per SG."
17. Please discuss your plans to modify TS Section 6.19.d.4 to make it more consistent with your current TSs. For example, "...AmerGen Engineering Report, ECR No. TM 01-00328 during all subsequent SG inspections."
18. Please discuss your plans to modify TS Section 6.19.f to indicate that repairs were performed by kinetic expansion and sleeving but no new tube repairs can be made without prior NRC approval.
19. In TS Section 6.19.c.2, the proposal does not address the repair criteria for the parent tube behind the sleeve upper joint. Pending submittal of additional information (i.e., the additional qualification work referenced by the licensee), it would appear that the repair criteria for flaws in the parent tubing at the upper sleeve joint should be 20-percent through-wall since this appears to be consistent with the original sleeve qualification (please note that this is based on the licensee's submittal and not a review of the original qualification report).

In addition, it is not clear why the phrase "in accordance with ECR No. TM 02-01121, Rev. 2" is needed in the specification.

As a result, please discuss your plans to specify the acceptance criteria for any flaws in the parent tube behind (adjacent to) the sleeve's upper joint and the purpose for the last phrase in TS Section 6.19.c.2. If ECR No. TM 02-01121, Revision 2 does not clarify the repair criteria for sleeves, discuss your plans to delete it.

20. In your proposed TS (and TSTF-449) a 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. Given this definition, the proposed repair criteria in TS Section 6.19.c could be misinterpreted. Please discuss your plans to modify your TS to more clearly define the repair criteria for the sleeved portion of a tube. For example, this TS may be modified using the following,
 1. The non-sleeved region of a tube found by inservice inspection to contain flaws with a depth equal to or exceeding 40-percent of the nominal tube wall thickness shall be plugged or repaired except when alternate tube repair criteria permitted by technical specifications are satisfied.

Tubes shall be plugged if the sleeved region of a tube is found by in-service

inspection to contain flaws in the (a) sleeve or (b) pressure boundary portion of the original tube wall in the sleeve tube assembly (i.e., the sleeve-to-tube joint).

2. The following alternate repair criteria may be applied as an alternative to the 40-percent depth based criteria:
 - a. "Volumetric Inside Diameter (ID) Inter-Granular Attack (IGA) indications..."
 - b. "Upper tubesheet kinetic expansion indications..."
21. Given that TS Section 6.19.d provides the inspection requirements for the tube (which by definition includes the sleeve) and the inspections must be performed to ensure SG tube integrity, it is not clear that the proposed requirements in TS Section 6.19.d.6 are needed. As a result, please discuss your plans for removing these proposed requirements. If the proposed requirements are maintained, please discuss your plans to add TS Section 6.19.d.6 to the first paragraph of TS Section 6.19.d.
22. As currently written, proposed TS Section 6.19.f is unclear. Please discuss your plans to modify this proposed requirement. For example, "There are currently no approved repair methods; however, tubes repaired with sleeves and by kinetically expanding the tube in the upper tubesheet prior to 2006 may remain in service subject to the requirements of TS Sections 3.1.1.2, 4.19, and 6.19.
23. As currently proposed, any flaws in the parent tube between the sleeve lower end and the parent tube's kinetic expansion are required to be plugged on detection. Since several flaws were removed from service as a result of the sleeving campaigns (several imperfections and one inside diameter indication greater than 40-percent through-wall), it would appear that upon adoption of the new proposed TSs there will be several tubes that exceed (satisfy) the repair criteria. This will require a tube integrity assessment, possibly a forced shutdown, and will result in these tubes being plugged. Please clarify that this was your intent and provide the results of the tube integrity assessment.
24. Proposed TS Section 6.9.6.i implies that repairs are authorized at TMI-1. Given that tubes have been repaired in the past but that no new repairs will be permitted, please discuss your plans to modify TS Section 6.9.6.i to indicate that you will provide the number of tubes remaining in service using repair methods previously implemented. It would also appear that the Bases should reflect that repairs were previously used at TMI-1 but that no additional tubes may be repaired since there are currently no approved repair methods.