

March 31, 2006

Mr. Joseph E. Venable
Vice President Operations
Entergy Operations, Inc.
17265 River Road
Killona, LA 70066-0751

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 (WATERFORD 3) -
REQUEST FOR ADDITIONAL INFORMATION RELATED TO PROPOSED
TECHNICAL SPECIFICATION CHANGE TO STEAM GENERATOR TUBE
INSERVICE INSPECTION PROGRAM USING CONSOLIDATED LINE ITEM
IMPROVEMENT PROCESS (TAC NO. MC7973)

Dear Mr. Venable:

By letter dated July 21, 2005, Entergy Operations, Inc. proposed revisions to the Waterford 3 Technical Specifications which would allow replacement of the existing steam generator tube surveillance program with that being proposed by the Technical Specification Task Force (TSTF) in TSTF 449, Revision 4. By letter dated February 15, 2006, Entergy Operations, Inc. responded to Nuclear Regulatory Commission (NRC) staff requests for additional information.

After reviewing the information contained in your February 15 letter, the NRC staff has determined that additional information is required to complete the review. As discussed with members of your staff, the NRC staff is requesting a response within 30 days of the date of this letter.

If you have any questions, please call me at (301) 415-3062.

Sincerely,

/RA/

Mel B. Fields, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure: Request for Additional Information

cc w/encl: See next page

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DATE	3/28/06	3/31/06	3/28/06	3/31/06

REQUEST FOR ADDITIONAL INFORMATION

TECHNICAL SPECIFICATION CHANGE TO STEAM GENERATOR TUBE INSERVICE

INSPECTION USING CONSOLIDATED LINE ITEM IMPROVEMENT PROCESS

ENERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1. Currently, no sleeves are installed in the Waterford Steam Electric Station, Unit 3 (Waterford-3) steam generators (SGs); however, proposed Technical Specification (TS) 6.5.9.f allows the use of sleeving (CENS Report CEN-605-P, "Steam Generator Tube Repair Using Leak Tight Sleeves"). It is the staff's understanding that the tubesheet sleeves, as described in CEN-605-P, have a nickel band in the area of the rolled joint. Based on interactions with other plants, it is not clear whether techniques currently exist to inspect the parent tube located behind (adjacent to) the nickel band for crack-like indications. If this is the case, it is not clear how you will implement proposed TS 6.5.9.d, which requires that the method of inspection should be capable of detecting flaws of any type that may be present along the length of the tube and that may satisfy the applicable tube repair criteria. In light of the above, either (a) discuss your plans for removing this sleeving method for your TSs, (b) provide information supporting the ability of an inspection technique to detect the forms of degradation that could occur in the parent tube adjacent to the nickel band and that may satisfy the applicable tube repair criteria, or c) provide analysis and/or testing results which indicate that inspection of this region (i.e., behind the nickel band) is not needed.
2. Proposed TS 6.5.9.d excludes from inspection the portion of each tube from the top support of the cold leg to the cold-leg tube end. This is inconsistent with the corresponding section of Technical Specification Task Force (TSTF)-449 (TS 5.5.9.d), which states the objective of tube inspection is to detect flaws of any type, "from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet." Please discuss your plans to modify the proposed TSs to make them consistent with TSTF-449.
3. Proposed TS 6.5.9.d, states, "In addition to meeting the requirements of d.1 and d.2 below,...." To be consistent with TSTF-449, this should read "...requirements of d.1, d.2, **and d.3** below,...." since your February 15, 2006, response to Request for Additional Information (RAI) question 3 added a paragraph that was missing from the original submittal. Please discuss your plans to modify the proposed TSs to make them consistent with TSTF-449. (Emphasis added by the staff.)
4. Proposed TS 6.5.9.c addresses SG tube repair criteria. Since a tube is defined as the entire length of the tube, including the tube wall and any repairs to it, it could be construed that the 40% plugging limit is applicable to the sleeves. Please discuss your

plans to incorporate the repair criteria for the sleeves into the specification. For example,

In the region of a tube repaired in accordance with TS 6.5.9.f, the tube shall be plugged upon detection of any service-induced flaw in (a) the sleeve or (b) the pressure boundary portion of the original tube wall in the sleeve-to-tube joint.

5. Proposed TS Bases Insert B-2 includes only the first sentence of a paragraph from the corresponding TSTF-449 insert (B 3.4.13B). Missing from the proposed Waterford-3 insert is the following:

The Steam Generator Program operational LEAKAGE performance criterion in NEI [Nuclear Energy Institute] 97-06 states, "The RCS [Reactor Coolant System] operational primary to secondary leakage through any one SG shall be limited to 150 gallons per day." The limit is based on operating experience with SG tube degradation mechanisms that result in tube leakage. The operational leakage rate criterion in conjunction with the implementation of the Steam Generator Program is an effective measure for minimizing the frequency of steam generator tube ruptures.

In place of this paragraph, you have a plant-specific discussion of operational leakage limits. The staff recognizes that the 75 gallons per day (gpd) operational leakage limit at Waterford-3 ensures the radiological consequences will be limited to the appropriate regulatory limits. However, this limit also reflects operating experience with SG tube degradation mechanisms that result in tube leakage. The operational leakage rate criterion (since it is less than 150 gpd through any one SG) in conjunction with the implementation of the Steam Generator Program is an effective measure for minimizing the frequency of SG tube ruptures. Please discuss your plans for modifying your Bases to include the other reason for the operational leakage limit. The staff notes that, from the Bases as currently proposed, one may incorrectly conclude 540 gpd is an appropriate operational leakage limit for a "faulted steam generator."

6. In the Limiting Condition for Operation section of your BASES Section 3/4.4.4, "STEAM GENERATOR TUBE INTEGRITY", the reference to Regulatory Guide 1.121 is omitted from the bullet dealing with the structural integrity performance criterion (i.e., where Subsection NB of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code is referenced). Since Regulatory Guide 1.121 was used in the development of the structural integrity performance criterion, it is not clear why it is not referenced. Please discuss your plans to modify your proposal to address this comment.
7. You included a commitment in Attachment 4 indicating all loads that can significantly affect burst or collapse will be determined and assessed. In this commitment, there is a statement that indicates: "These loads, as well as the other analyses to support a 40% plugging limit, will be analyzed for the Waterford-3 SG licensing basis. These analyses will be performed and documented under the requirements of 10 CFR 50.59."

The NRC staff is aware of the industry's efforts to assess the effects of non-pressure loads on tube integrity (structural and leakage integrity). These efforts include an assessment of whether changes are needed to the industry guidelines to ensure these loads are appropriately accounted for in tube integrity evaluations (i.e., in the methods used to determine whether the performance criteria have been exceeded).

However, your statements seem to imply that the on-going industry efforts may affect the 40% tube plugging limit. The reason for this is not clear since the 40% plugging limit was developed with consideration of non-pressure loads (consistent with the guidance in Regulatory Guide 1.121). Please clarify the meaning of your commitment which should include a determination of whether it is needed.

8. A separate license amendment request to apply the C* inspection criterion at Waterford-3 was submitted on March 15, 2005, and is still under NRC staff review. This would require tube inspection to a depth of 10.4 inches below the top of the hot-leg tubesheet or hot-leg expansion transition, whichever is lower. If your C* amendment is approved before the TSTF amendment, it may be necessary to amend the specifications in your TSTF amendment. Similarly, if you desire approval of the TSTF amendment before approval of the C* amendment, it will be necessary to remove references to C* from the specifications.

The following question was included in RAI question 9 about your C* amendment proposal. The staff notes that this will need to be addressed before the C* criterion can be incorporated into your proposed TSs modeled after TSTF-449.

The Waterford[-3] technical specifications (4.4.4.4.b) currently allow installation of leak-tight sleeves according to CENS Report CEN-605-P. Since sleeves could extend into the tubesheet below the C* distance, the proposed technical specifications would not require an inspection of this portion of the sleeve (including the lower sleeve joint.) Sleeves were not addressed in the testing and analysis used to justify excluding part of the tube from inspection (WCAP-16208-P, Rev. 1). What plans do you have to modify the technical specifications to ensure the lower ends of sleeves (i.e., those within the tubesheet below the C* distance) will be inspected?

9. In your proposed TS 3.4.5.2.c under OPERATIONAL LEAKAGE for the RCS, the primary-to-secondary limit is 75 gpd per SG. The wording in TSTF-449 and in your proposed accident-induced leakage performance criterion (TS 6.5.9.b.2) is "**through any one**" SG. Please discuss your plans for modifying your proposed TS to make the wording of your leakage limits fully consistent with your performance criteria and the TSTF. (Emphasis added by the staff.)
10. Proposed TS 6.5.9.b.3, the operational leakage performance criterion, refers to Limiting Condition for Operation 3.4.5.2 as "Operational Leakage." The wording used in your proposed TS 3.4.5.2 is "Reactor Coolant System Operational Leakage," and the TSTF-449 wording is "RCS Operational Leakage." Please discuss how you will modify

your proposed TS to make them consistent with either your existing wording or the TSTF wording. (Emphasis added by the staff.)

11. In your February 15, 2006, response to RAI question 1, you proposed changes to the ACTION section of TS 3/4.4.4, "Steam Generator (SG) Tube Integrity." Paragraph a.1 of the proposed insert states :

Within 7 days verify tube integrity of the affected tube(s) is maintained until the next **inspection**, (Emphasis added by the staff.)

The corresponding section of the TSTF states:

Within 7 days verify tube integrity of the affected tube(s) is maintained until the next **refueling outage or SG tube inspection**. (Emphasis added by the staff.)

The TSTF wording could eliminate the need to shut down the facility in the event that tube integrity is only maintained until a refueling outage and not until the next SG tube inspection. Please discuss your plans to revise your proposed TS to make them consistent with the TSTF.

12. On page 6 of 8 of Attachment 4 in your February 15, 2006, RAI response, the final bullet under "Limiting Condition for Operation" discusses operational leakage. The staff notes there appears to be an unnecessary bracket in the next-to-last sentence between "SGTR" [steam generator tube rupture] and "under." Please delete this bracket, or provide the missing information and closing bracket you intended to include.

Waterford Steam Electric Station, Unit 3

cc:

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May 2005