



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

September 1, 2009

Mr. Gene F. St. Pierre  
Site Vice President  
Seabrook Station  
NextEra Energy Seabrook, LLC  
P.O. Box 300  
Seabrook, NH 03874

SUBJECT: SEABROOK STATION, UNIT NO. 1 – SECOND REQUEST FOR ADDITIONAL  
INFORMATION (RAI) REGARDING STEAM GENERATOR PROGRAM  
(TAC NO. ME1386)

Dear Mr. St. Pierre:

By letter dated May 28, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML091530539) the licensee (NextEra Energy Seabrook, LLC) submitted a license amendment request to revise the technical specifications (TS) of Seabrook Station Unit No. 1. The request proposed changes to the inspection scope and repair requirements of TS Section 6.7.6.k, "Steam Generator (SG) Programs," and to the reporting requirements of TS Section 6.8.1.7, "Steam Generator Tube Inspection Report." The proposed changes would establish permanent alternate repair criteria for portions of the SG tubes within the tubesheet.

By letter dated August 13, 2009, (ADAMS Accession No. ML092100324) the NRC staff issued a set of RAI questions. The NRC staff is continuing its review of your application and finds that additional information is needed, as discussed in the enclosure.

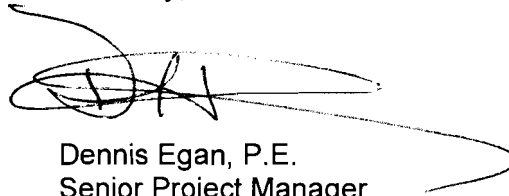
A draft of these questions was previously sent to Mr. O'Keefe, of your staff with an opportunity to have a teleconference to ensure that the licensee understood the questions and their regulatory basis; as well as, to verify that the information was not on the docket. On August 26, 2009, Mr. Kilby, of your staff, declined the opportunity for a teleconference and requested that the final RAIs be issued.

G. F. St. Pierre

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If you have any questions please feel free to contact me at (301) 415-2443.

Sincerely,

A handwritten signature in black ink, appearing to read "Dennis Egan", with a long horizontal flourish extending to the right.

Dennis Egan, P.E.  
Senior Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure: RAIs

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REQUEST FOR ADDITIONAL INFORMATION (RAI)  
REGARDING PERMANENT H\* ALTERNATE REPAIR CRITERIA  
FOR STEAM GENERATOR INSPECTIONS  
SEABROOK STATION UNIT NO. 1  
DOCKET NO. 50-443

By letter dated May 28, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML091530539) the licensee (NextEra Energy Seabrook, LLC) submitted a license amendment request to revise the technical specifications (TS) of Seabrook Station Unit No.1. The request proposed changes to the inspection scope and repair requirements of TS Section 6.7.6.k, "Steam Generator (SG) Programs," and to the reporting requirements of TS Section 6.8.1.7, "Steam Generator Tube Inspection Report." The proposed changes would establish permanent alternate repair criteria for portions of the SG tubes within the tubesheet.

By letter dated August 13, 2009, (ADAMS Accession No. ML092100324) the NRC staff issued a set of RAI questions. The NRC staff is continuing its review of your application and finds that additional information is needed, as discussed below.

The Westinghouse document, WCAP-17071-P, Rev. 0, "H\*: Alternate Repair Criteria for the Tubesheet Expansion Region in Steam Generators with Hydraulically Expanded Tubes (Model F)" (Reference 1) was submitted with the May 28, 2009, letter, in support of the requested license amendment.

All RAI numbers identified in the following questions refer to the previously-transmitted RAIs.

A. Replace RAI 4 with:

4. Reference 1, Page 6-69. In Section 6.2.5.3, it is concluded that the tube outside diameter and the tubesheet tube bore inside diameter always maintain contact in the predicted range of tubesheet displacements. However, for tubes with through wall cracks at the H\* distance, there may be little or no net pressure acting on the tube for some distance above H\*. In Tables 6-18 and 6-19, the fourth increment in the step that occurs two steps prior to the last step suggests that there may be no contact between the tube and tubesheet, over a portion of the circumference, for a distance above H\*. Is the conclusion in 6.2.5.3 valid for the entire H\* distance, given the possibility that the tubes may contain through wall cracks at that location? Additionally, please address the following issues:
  - a. Clarify the nature of the finite element model ("slice" model versus axisymmetric SG assembly model) used to generate the specific information in Tables 6-1, 2,

Enclosure

and 3 (and accompanying graph entitled "Elliptical Hole Factors") of Reference 6-15. What loads were applied? How was the eccentricity produced in the model? (By modeling the eccentricity as part of the geometry? By applying an axisymmetric pressure the inside of the bore?) Explain why this model is not scalable to lower temperatures.

- b. Provide a table showing the maximum eccentricities (maximum diameter minus minimum diameter) from the 3 dimensional (3-D) finite element analysis for normal operating and steam line break (SLB), for model F.
- c. In Figure 2 of the White Paper, add plot for original relationship between reductions in contact pressure and eccentricity as given in Reference 6-15 in the graph accompanying Table 6-3. Explain why this original relationship remains conservative in light of the new relationship. Explain the reasons for the differences between the curves.
- d. When establishing whether contact pressure increases when going from normal operating to SLB conditions, how can a valid and conservative comparison be made if the normal operating case is based on the original delta contact pressure versus eccentricity curve and the SLB case is based on the new curve?

B. Replace RAI 21 with:

21. Section 8 of Reference 1. The variability of  $H^*$  with all relevant parameters is shown in Figure 8-3. The interaction between  $\alpha T$  and  $\alpha TS$  are shown in Figure 8-5. Please explain why the direct relationships shown in these two figures were not sampled directly in the Monte Carlo analysis, instead of the sampling method that was chosen. Also, please explain why the sampling method chosen led to a more conservative analysis than directly sampling the relationships in Figures 8-3 and 8-5. As part of the response, include discussion of main SLB and whether it continues to be less limiting, from maximum  $H^*$  perspective, than three times normal operating pressure.

C. Replace RAI 24 with:

24. Reference 1, Page 9-6, Section 9.2.3.1. The feedwater line break heat-up transient is part of the plant design and licensing basis. Thus, it is the staff's position that  $H^*$  and the "leakage factors," as discussed in Section 9.4, should include consideration of this transient. Explain why the proposed  $H^*$  and leakage factor values are conservative, even with consideration of the feedwater line break heat-up transient. As part of the response, address the feedwater line break heatup transient. Please provide a rationale to justify basing the leakage factor on SLB, or commit to a leakage factor based on the feedwater line break heatup transient.

D. New RAI 25:

During review of the Seabrook amendment request, it was noticed that wording, regarding use of the leakage factor, had been used in the body of the document (page 10 Attachment 1) but the licensee did not actually make a commitment to establish an administrative

operational leakage limit on page 10 of Attachment 1, in the list of regulatory commitments in the cover letter, or in Attachment 7. Since the final leakage factor may change based on the feedwater line break analysis (question C above), the proper factor will need to be used in the regulatory commitment. See below for an example of a complete commitment.

*For the Condition Monitoring assessment, the component of leakage from the prior cycle from below the H\* distance will be multiplied by a factor of X.XX and added to the total leakage from any other source and compared to the allowable accident induced leakage limit. For the Operational Assessment, the difference between the allowable accident induced leakage and the accident induced leakage from sources other than the tubesheet expansion region will be divided by X.XX and compared to the observed operational leakage. An administrative operational leakage limit will be established to not exceed the calculated value.*

Reference:

1. WCAP-17071-P, Rev. 0, "H\*: Alternate Repair Criteria for the Tubesheet Expansion Region in Steam Generators with Hydraulically Expanded Tubes (Model F)," dated April 2009.

G. F. St. Pierre

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If you have any questions please feel free to contact me at (301) 415-2443.

Sincerely,

*/ra/*

Dennis Egan, P.E.  
Senior Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure: RAIs

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**ADAMS Accession No.: ML092400135**

**\* concurrence via email**

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DATE	8/28/09	08/31/09	8/31/09	9/1/09

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