



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

March 7, 2011

Mr. Paul Freeman  
Site Vice President  
c/o Mr. Michael O'Keefe  
NextEra Energy Seabrook, LLC  
P.O. Box 300  
Seabrook, NH 03874

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RELATED TO THE REVIEW OF  
THE SEABROOK STATION LICENSE RENEWAL APPLICATION (TAC  
NUMBER ME4028)

Dear Mr. Freeman:

By letter dated May 25, 2010, NextEra Energy Seabrook, LLC submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to renew Operating License NPF-86 for Seabrook Station, Unit 1, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

The request for additional information was discussed with Mr. Rick Cliche, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-1427 or by e-mail at [richard.plasse@nrc.gov](mailto:richard.plasse@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Richard A. Plasse".

Richard A. Plasse, Project Manager  
Projects Branch 2  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure:  
As stated

cc w/encl: Distribution via Listserv

SEABROOK STATION  
LICENSE RENEWAL APPLICATION  
REQUEST FOR ADDITIONAL INFORMATION SET 11

**RAI 3.2.2.2.6-02**

**Background:**

By letter dated January 5, 2011, the staff issued request for additional information (RAI) 3.2.2.2.6-01 concerning aging management of stainless steel miniflow orifices in the chemical and volume control system. In its response dated February 3, 2011, NextEra Energy Seabrook, LLC (the applicant) modified its approach by proposing to credit only the Water Chemistry Program for aging management of the subject components. The applicant stated that the Water Chemistry Program is expected to mitigate the potential for erosion in the miniflow orifices by controlling the buildup of corrosion products and particulates that could contribute to erosion. The applicant also included a discussion of quarterly inservice testing required by its technical specifications and trending of the test data by a system engineer. Based on the information provided, the applicant changed Table 3.3.2-3, for the applicable orifice, to state that the Water Chemistry Program will be used to manage this aging effect, and the applicant added plant-specific note 8 with the comparable information.

**Issue:**

Standard Review Plan – License Renewal (SRP-LR) Section 3.2.2.2.6 states that loss of material due to erosion could occur in the stainless steel high pressure safety injection (HPSI) pump miniflow recirculation orifice exposed to treated borated water and recommends a plant-specific aging management program (AMP) be evaluated for erosion of the orifice due to extended use of the centrifugal HPSI pump for normal charging. The staff noted that the stainless steel miniflow orifices in the applicant's chemical and volume control system are functionally equivalent to, and in the same environment as the miniflow orifices described in SRP-LR Section 3.2.2.2.6; and they would be subject to the same aging effect.

SRP-LR, Appendix A, Section A.1.2.3.4, states that in a plant-specific AMP, the detection of aging effects should occur before there is a loss of intended function(s). The staff noted that the Water Chemistry Program does not include an inspection or testing activity to detect loss of material due to erosion in the stainless steel miniflow orifices in the chemical and volume control system. The staff also noted that the Generic Aging Lessons Learned (GALL) Report typically recommends using the One-Time Inspection Program to confirm effectiveness of the Water Chemistry Program to mitigate loss of material. Because the applicant has not credited any activity to confirm the Water Chemistry Program's effectiveness to mitigate erosion, the staff does not have sufficient information to conclude that the Water Chemistry Program will provide adequate aging management for the subject miniflow orifices.

**Request:**

Describe how the existing Water Chemistry Program is capable of detecting the loss of material due to erosion in the stainless steel miniflow orifices, or include in the AMP(s) for these components an inspection or testing activity that is capable of detecting the loss of material due to erosion before the loss of the components' intended function occurs.

ENCLOSURE

### **RAI B.2.1.12-8**

#### **Background:**

The closed-cycle water chemistry guidelines in Electric Power Research Institute (EPRI) topical report (TR) TR-107396 state that higher levels of hydrazine can increase ammonia levels. Elevated concentrations of ammonia can cause higher levels of corrosion or cracking of copper alloys. The EPRI guideline also states that higher sulfate levels can lead to stress-corrosion cracking of stainless steel alloys. By letter dated January 13, 2011, the staff issued RAI B.2.1.12-1, in which the staff requested additional information on the effect of hydrazine and sulfate excursions in the thermal barrier system for aging during the period of extended operation. The response to RAI B.2.1.12-1 stated that the applicant evaluated the significance of allowing operation of the thermal barrier system at the elevated hydrazine and sulfate levels, and determined it to be acceptable. The response also stated that routine monitoring during operation at the elevated ranges showed no indication of system or component degradation.

#### **Issue:**

The applicant did not provide details of its evaluation that determined the operation at the elevated levels of hydrazine and sulfate would not cause any accelerated aging that could affect components during the period of extended operation. In addition, the applicant did not describe the routine monitoring it had performed during operation at the elevated ranges that could be credited for showing that no system or component degradation had occurred.

#### **Request:**

Provide the technical information that describes why the elevated levels of hydrazine and sulfate will not have caused accelerated aging of the components in the thermal barrier system that could affect component functions during the period of extended operation. If it is determined that the elevated levels of hydrazine and sulfate may have caused some accelerated aging, provide information on the AMP that will be used to manage the accelerated aging.

### **RAI 4.7.12-2**

#### **Background:**

By letter dated January 5, 2011, the staff issued RAI 4.7.12-1 concerning license renewal application (LRA) Section 4.7.12, which discussed the absence of a time-limited aging analysis (TLAA) for metal corrosion allowances. In its response dated February 3, 2011, the applicant revised LRA Section 4.7.12 to include steam generator tube metal corrosion allowance as a TLAA and revised Tables 4.1-1 and 4.1-2 for the disposition method and applicability of the TLAA. However, LRA Section 4.7.12 now states that the TLAA disposition for this issue is in accordance with 10 CFR 54.21(c)(1)(iii), whereas the revision to Table 4.1-1 states that the TLAA disposition is in accordance with 10 CFR 54.21(c)(1)(i). In addition, the staff noted that the final safety analysis report (FSAR) supplement in LRA Section A.2.4.5, "Other Plant-Specific TLAAs," had not been revised as a result of this new determination.

Issue:

SRP-LR Section 4.7.3.1.1, "10 CFR 54.21(c)(1)(i)," states that the justification provided by the applicant is reviewed to verify that the existing analyses are valid for the period of extended operation. In contrast, SRP-LR Section 4.7.3.1.3, "10 CFR 54.21(c)(1)(iii)," states that the applicant's proposal to manage the aging effects associated with the TLAA by an AMP is reviewed to verify that the effects of aging will be adequately managed. The staff is unclear which method was used by the applicant. In addition, 10 CFR 54.21(d) states that the FSAR supplement must contain a summary description of the evaluation of TLAA's for the period of extended operation as part of the LRA.

Request:

- a) Clarify which method was used to disposition the TLAA associated with the steam generator tube metal corrosion allowance.
- b) Provide a revised FSAR supplement for the evaluation of the TLAA associated with the steam generator tube metal corrosion allowance, in accordance with 10 CFR 54.21(d).

**RAI 3.4.1-37-2**

Background:

By letter dated January 5, 2011, the staff issued RAI 3.4.1-37-1. This RAI requested information as follows: a) propose to manage aging of these components using water chemistry and an appropriate verification AMP as indicated by the GALL Report for the management of aging in a secondary feedwater/steam environment or justify why the use of a verification AMP is either inconsistent with the GALL Report or technically unnecessary; b) justify why is it unnecessary to consider both the aging effects "loss of material" and "cracking" for each of the components under consideration; c) classify the steam generator feedwater inlet ring (J tube) and the steam generator tubes as steam generator components (making the appropriate verification AMP the Steam Generator Tube Integrity Program) or justify why these components should be considered piping, piping components, or piping elements as proposed by item 3.4.1-37. The applicant responded to this RAI by letter dated February 3, 2011. With one potential exception, the staff found these responses acceptable.

Issue:

In its response to the previous RAI, the applicant reclassified the steam generator feedwater nozzle (thermal sleeve) and the orifice from being consistent with SRP-LR Table 3.4.1-34 (generic note A) to being inconsistent with the GALL Report (generic note H). The applicant also proposed to manage the aging of these components through the use of its Water Chemistry Program. Based on its review, it appears to the staff that the components, materials, environments, and aging effects under consideration are described by SRP-LR Table 3.4-1 ID 84. The staff notes that SRP-LR Table 3.4-1 ID 84, recommends that aging be managed through the use of GALL Report AMP XI.M2, Water Chemistry and either AMP XI.M32, One-Time Inspection, or AMP XI.M1, ASME Section XI, Inservice Inspection.

The staff notes that, in its response to the previous RAI, the applicant stated that these components were not available for inspection. The staff also notes that these components have been addressed in many recent license renewal Safety Evaluation Reports (SERs). While there have been differences in the approaches to the management of aging of these components from plant to plant, in each case the SER indicates that the accepted method of aging management involves the use of an AMP to manage water chemistry and an AMP to perform at least a one-time inspection to verify the efficacy of the water chemistry program. This indicates to the staff that water chemistry and inspection programs are necessary for adequate aging management and that these components are generally inspectable.

Request:

Please: a) demonstrate why the aging management guidance provided by SRP-LR Table 3.4-1 ID 84 need not be followed; or b) demonstrate why the components under consideration are not inspectable; or c) propose to manage aging of these components in a manner consistent with or equivalent to SRP-LR Table 3.4-1 ID 84.

**Followup RAI B.2.1.22-1**

Background:

The applicant's response to RAI B.2.1.22-1, by letter dated January 13, 2011, was not sufficient to resolve all of the staff's questions.

Issue:

- a) Although the applicant will be sampling for several different factors (e.g., soil resistivity, water samples) it is not clear to the staff that the stated parameters are sufficient, nor how the results will be combined to determine the level of soil corrosivity such as can be determined by using American Water Works Association C105/A2.15-10 Table A.1.
- b) The applicant's program only increases the number of planned inspections based on the quality of backfill in the vicinity of the buried pipe. Given that portions of buried in-scope steel piping are not provided with cathodic protection, the staff believes that the number of inspections of this piping should also be informed by localized soil conditions.
- c) Given that localized soil conditions can vary, the applicant's response was not clear enough for the staff to conclude that soil samples will be obtained in the vicinity of each buried in-scope steel piping system (excluding fire protection) that is not provided cathodic protection.
- d) It is not clear to the staff how often soil samples will be obtained during the period of extended operation.

Request:

- a) State what soil parameters will be utilized and how their aggregate impact will be evaluated to determine localized soil corrosivity.

- b) State whether localized soil conditions will be utilized to increase the number of inspections or state how there will be reasonable assurance that the piping system's current licensing basis function(s) will be maintained without increasing the number of samples in the absence of localized soil data or with results that indicate that the soil is corrosive.
- c) State if soil samples will be obtained in the local vicinity of all buried in-scope steel piping systems (excluding fire protection) that are not provided with cathodic protection.
- d) State how often soil sampling will be conducted during the period of extended operation, or if soil samples will not be collected during the period of extended operation, state how it is known that localized soil conditions will not vary with time.

### **Followup RAI B.2.1.22-3**

#### **Background:**

The applicant's response to RAI B.2.1.22-3, by letter dated January 13, 2011, was not sufficient to resolve all of the staff's questions.

#### **Issue:**

The applicant stated that it utilized a Keeler and Long 1000 Kolormastic system and Tapecoat 20 primer and wrap when installing flanges to allow access to the underground service water piping that is exposed to raw water. The applicant also stated that the painting system chosen for the piping is designed to protect the pipe from long term external corrosion when exposed to continuous immersion in brackish stagnant water. The staff does not have sufficient information related to this coating to independently determine that it will provide protection to the piping when exposed to long term immersion.

#### **Request:**

Provide copies of the vendor technical data that demonstrated that the coating system was acceptable for long term immersion in a brackish water environment. Alternatively, if the vendor information is proprietary, provide a copy of the applicable portions of the engineering evaluation of the coating system.

### **RAI B.2.1.22-5**

#### **Background:**

In LRA Supplement 2 dated November 15, 2010, the applicant revised LRA Table 3.3.2-37 to include copper-alloy (with > 15% zinc) valves and bolting exposed to raw water in the submerged underground vault for service water piping. The applicant stated that the components will be managed for aging by the Buried Piping and Tanks Inspection Program.

Issue:

The applicant did not revise LRA Section B.2.1.22 to reflect inclusion of this material nor to provide inspection frequencies.

Request:

Revise LRA Section B.2.1.22 to reflect inclusion of copper-alloy (>15% zinc) and state the number of planned inspections of these components.

March 7, 2011

Mr. Paul Freeman  
Site Vice President  
c/o Mr. Michael O'Keefe  
NextEra Energy Seabrook, LLC  
P.O. Box 300  
Seabrook, NH 03874

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Sincerely,

*/RA/*

Richard A. Plasse, Project Manager  
Projects Branch 2  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosure:  
As stated

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Letter to P. Freeman from R. Plasse dated March 07, 2011

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RELATED TO THE REVIEW OF  
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