NEXTera® ENERGY
SEABROOK

July 20, 2015

10 CFR 50.90

SBK-L-15151
Docket No. 50-443

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Seabrook Station

Supplemental Information for License Amendment Request 14-04
Revised Reactor Coolant System Pressure - Temperature Limits Applicable for 55 Effective Full Power Years

References:

1. Seabrook Station License Amendment Request 14-04, "Revised Reactor Coolant System Pressure - Temperature Limits Applicable for 55 Effective Full Power Years," SBK-L-14102, July 24, 2014 (ML14216A404).
2. NRC letter to Seabrook Station, "Seabrook Station, Unit No. 1 – Request for Additional Information Regarding License Amendment Request to Revise the Technical Specification Pressure-Temperature Limits and Request for Exemption from 10 CFR Part 50, Appendix G Minimum Temperature requirements (TAC Nos. MF4576 and MF4577)," dated January 9, 2015 (ML14363A367).
3. Seabrook Station letter SBK-L-15040, "Response to Request for Additional Information for License Amendment Request 14-04 Revised Reactor Coolant System Pressure - Temperature Limits Applicable for 55 Effective Full Power Years," dated March 9, 2015 (ML15072A036).
4. Seabrook Station letter SBK-L-15129, "Response to Request for Additional Information for License Amendment Request 14-04 Revised Reactor Coolant System Pressure - Temperature Limits Applicable for 55 Effective Full Power Years," dated June 23, 2015.
5. Seabrook Station letter SBK-L-15132, "Response to Request for Additional Information for License Amendment Request 14-04 Revised Reactor Coolant System Pressure - Temperature Limits Applicable for 55 Effective Full Power Years," dated July 9, 2015.

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In Reference 5, NextEra Energy Seabrook, LLC (NextEra) submitted the response to Request for Additional Information (RAI) 2.2.1 in support of the License Amendment Request 14-04 Revised Reactor Coolant System Pressure - Temperature Limits Applicable for 55 Effective Full Power Years.

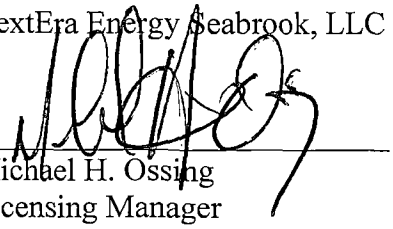
The purpose of this letter is to supplement the RAI response to clarify how the 20 degrees Fahrenheit temperature uncertainty identified in the proposed TS Figures 3.4-2 and 3.4-3 applied to the bolt up limit of 60 degrees Fahrenheit. The supplemental information is provided in the enclosure to this letter.

This letter contains no regulatory commitments.

Should you have any questions regarding this letter, please contact me at (603) 773-7512.

Sincerely,

NextEra Energy Seabrook, LLC



Michael H. Ossing
Licensing Manager

Enclosure

cc: D. Dorman, NRC Region I Administrator
J. Lamb, NRC Project Manager, Project Directorate I-2
P. Cataldo, NRC Senior Resident Inspector

Mr. Perry Plummer
Director Homeland Security and Emergency Management
New Hampshire Department of Safety
Division of Homeland Security and Emergency Management
Bureau of Emergency Management
33 Hazen Drive
Concord, NH 03305

John Giarrusso, Jr., Nuclear Preparedness Manager
The Commonwealth of Massachusetts
Emergency Management Agency
400 Worcester Road
Framingham, MA 01702-5399

ENCLOSURE to SBK-L-15151

Supplemental Information for License Amendment Request 14-04
Revised Reactor Coolant System Pressure - Temperature Limits Applicable for 55 Effective Full Power Years

Supplemental Information:

Describe how the 20°F temperature uncertainty identified on the proposed TS Figures 3.4-2 & 3.4-3 is applied to the bolt up limit of 60°F.

Discussion:

The proposed 55 EFPY pressure-temperature (P-T) limit curves (TS Figures 3.4-2 & 3.4-3) in LAR-14-04 and revised by SBK-L-15132 provide 55 EFPY P-T limit curves and also includes an exemption to the 10CFR50 Appendix G flange requirements based on WCAP-17444-P as an alternative. The minimum bolt up temperature is identified on the P-T limit curves as 60°F. The WCAP-17444-P justifies an alternative bolt up requirement using the K_{Ic} fracture toughness curve with a factor of safety of two (2) applied for Seabrook Unit 1 which occurs at T-RT_{NDT} = 16°F. For the limiting RT_{NDT} of the reactor vessel flange material of +30°F, the minimum bolt up temperature (T) would be +46°F. Applying the 20°F instrument uncertainty associated with the control room temperature indication used for the P-T curves to the limiting materials in the stressed flange region, the bolt up temperature is restricted to 66°F. To eliminate the 20°F temperature uncertainty associated with the control room indication, and to account for the temperature of the reactor vessel head, which has been resting on the stand during refueling, not in contact with the RCS, the stud tensioning procedure is being enhanced to identify the reactor vessel flange and reactor vessel head flange will be measured with a contact pyrometer, thereby eliminating the 20°F instrument uncertainty associated with the control room indication and only considering approximately ±1°F calibration uncertainty associated with the direct contact measurement equipment during the stud tensioning operation. Using a contact pyrometer uncertainty of ± 1°F and the alternative K_{Ic} based minimum bolt up temperature of 46°F will provide adequate margin to the TS required 60°F minimum bolt up temperature. Therefore, the 60°F bolt up temperature limitation identified on the TS Figures 3.4-2 & 3.4-3 will be met including appropriate instrument uncertainty.

Seabrook also has a more restricting/bounding requirement of 68°F associated with shut down margin during refueling including stud tensioning and detensioning of the vessel, which is incorporated in both the operating and maintenance procedures. This higher 68°F limit bounds the 46°F with greater than 20°F of margin for instrument uncertainty while the studs are tensioned prior to the start of heat up, such that margins are maintained for the entire range of the P-T curves.

A review of the Seabrook RCS temperature during the spring 2014 refueling outage identified that the actual RCS temperature during reactor vessel stud tensioning operations was greater than 78°F due to fuel decay heat such that there is additional margin to the P-T bolt up limit.

Conclusions

The reactor vessel minimum bolt up requirement for the flange exemption of 46°F will be met including appropriate temperature measurement uncertainty by the P-T limit curves and by enhancement of the Seabrook reactor vessel stud tensioning procedure. In addition, the operating procedure for refueling operations to maintain the RCS between 68°F and 140°F will assure that the temperature limitations of the reactor vessel flange material stressed region, including appropriate temperature uncertainty, will be met.