

NRR-PMDAPEm Resource

From: Galvin, Dennis
Sent: Wednesday, March 02, 2016 11:08 AM
To: Scott Connelly (Scott.Connelly@duke-energy.com)
Cc: Dijamco, David; Patel, Amrit; Grover, Ravinder
Subject: Robinson Draft RAIs – LAR to Change the Technical Specification Reactor Coolant System Pressure and Temperature Limits (MF7048)
Attachments: Robinson 50 EFPY PTL Draft RAIs 2016-03-02.pdf

Scott,

By letter dated November 2, 2015, (Agencywide Documents Access and Management System (ADAMS) Accession Number ML15307A069), Duke Energy Progress, Inc., the licensee for H. B. Robinson Steam Electric Plant, Unit 2 (Robinson), submitted to the U.S. Nuclear Regulatory Commission (NRC) a license amendment request (LAR) to revise the reactor coolant system pressure and temperature (P-T) limits in the Technical Specifications. The proposed revision would extend the Robinson P-T limits applicability up to 50 effective full power years (EFPY) from the current 35 EFPY.

To complete its review, the NRC staff has the prepared requests for additional information (RAIs). Please see the attached RAIs in DRAFT form.

A Sensitive Unclassified Non-Safeguards Information (SUNSI) review was completed by the staff on the draft RAIs and the staff concluded the RAIs do not contain SUNSI. If you find any information needs to be withheld from the public, please notify me within 5 days of receipt of this email.

Please submit your response to these RAIs within 30 days of this email. If you need a clarification call for the attached draft RAIs, or you need to change the RAI response due date, please contact me at (301) 415-6256.

Respectfully,

Dennis Galvin
Project Manager
NRR/DORL/Licensing Branch II-2
US Nuclear Regulatory Commission
301-415-6256

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REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST

REVISION OF REACTOR COOLANT SYSTEM PRESSURE AND TEMPERATURE LIMITS

DUKE ENERGY PROGRESS, INC.

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT 2

DOCKET NO. 50-261

By letter dated November 2, 2015, (Agencywide Documents Access and Management System (ADAMS) Accession Number ML15307A069), Duke Energy Progress, Inc., the licensee, submitted to the U.S. Nuclear Regulatory Commission (NRC) a license amendment request to revise the reactor coolant system (RCS) pressure and temperature (P-T) limits in the Technical Specifications (TSs) of the H. B. Robinson Steam Electric Plant, Unit 2 (Robinson). The proposed revision would extend the Robinson 2 P-T limits applicability from the current 35 effective full power years (EFPY) up to 50 EFPY. The 50 EFPY P-T limits are based on the P-T limit curves developed in Westinghouse report WCAP-15827, Revision 0, "H. B. Robinson Unit 2, Heatup and Cooldown Limit Curves for Normal Operation," March 2003, which was included as Attachment 4 to the submittal. The P-T limit curves determined in WCAP-15827 are based on the methodology in the NRC-approved topical report WCAP-14040-NP-A, Revision 2, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," dated January 1996 (ADAMS Accession No. ML15324A233). The fluence values used to determine the P-T curves were updated and documented in WCAP-15805, "Analysis of Capsule X from the Carolina Power and Light Company H. B. Robinson Unit 2 Reactor Vessel Radiation Surveillance Program," dated April 25, 2002 (ADAMS Accession No. ML021190366).

The staff needs responses to the following requests for additional information (RAI) in order to complete its review.

RAI-1

With respect to low temperature overpressure protection (LTOP) settings, the licensee stated the following in Attachment 1, Section 1.2 of the submittal: "Review of the low temperature overpressure protection limits confirmed that no changes are required as a result of the revised reactor pressure vessel analyses and limits." To verify this statement, the staff requests the licensee to describe the review performed that confirmed no changes to the LTOP settings are required. In addition to the description of the review, the response should include: (1) the enable temperature LTOP setting value and an explanation of its determination based on Section 3.4 "Enable Temperature for COMS" of WCAP-14040-NP-A, Revision 2, and (2) the pressurizer power-operated relief valve LTOP setting value (or range of values) and an explanation of its determination based on Section 3.2.2 "Pressure Limits Selections," Section 3.2.5 "Final Setpoint Selection," and Section 3.3 "Application of ASME Code Case N-514" of WCAP-14040-NP-A, Revision 2.

Enclosure

RAI-2

The licensee in Attachment 1, Section 1.2 of the submittal identifies that the fluence values used in the analyses of the heatup and cooldown limits were updated and documented in WCAP-15805. WCAP-15805 describes how data from 4 capsules, with Capsule X being the most recently removed from the reactor pressure vessel at 20.39 EFPY, were used to provide projections of the neutron exposure of the reactor pressure vessel for operating periods extending to 50 EFPY.

Demonstrate that the greater than 1 MeV neutron fluence at the reactor vessel inner surface at 50 EFPY (projected in the WCAP-15805 Capsule X analysis using the average of Cycles 16 through 21) remains bounding based on core and operational design changes that occurred between 20.39 EFPY (when Capsule X was pulled) and 35 EFPY (end of the current licensing basis).

RAI-3

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix G, requires that P-T limits be developed to bound all ferritic materials in the reactor pressure vessel (RPV). Regulatory Issue Summary 2014-11, "Information on Licensing Applications for Fracture Toughness Requirements for Ferritic Reactor Coolant Pressure Boundary Components," dated October 14, 2014 (ADAMS Accession No. ML14149A165) clarifies that P-T limit calculations for ferritic RPV materials other than those materials with the highest reference temperature may define P-T curves that are more limiting because the consideration of stress levels from structural discontinuities (such as RPV inlet and outlet nozzles) may produce a lower allowable pressure. The staff noted that the licensee addressed the fluence levels of the RPV inlet and outlet nozzles for the 50 EFPY in WCAP-15827, Table 6, "Summary of the Vessel Surface, 1/4T and 3/4T Fluence Values used for the Generation of the 30, 35, 40, 45 and 50 EFPY Heatup/Cooldown Curves," and reported the adjusted reference temperatures (ART) for the RPV inlet and outlet nozzles in Table 16, "Calculation of the ART Values for the 1/4T Location @ 50 EFPY" and Table 17, "Calculation of the ART Values for the 3/4T Location @ 50 EFPY." However, WCAP-15827 does not have P-T limit calculations for the RPV inlet and outlet nozzles, and therefore, does not demonstrate how the P-T limit curves developed for 50 EFPY bound all ferritic pressure boundary components of the RPV.

Therefore, the staff requests the licensee to provide P-T limit calculations for the Robinson RPV inlet and outlet nozzles or otherwise demonstrate how the P-T limit curves developed for 50 EFPY in WCAP-15827 bound all ferritic pressure boundary components of the RPV. In the P-T limit calculations for the Robinson RPV inlet and outlet nozzles, the staff requests the following to be used: 1) the ART values of the Robinson RPV inlet nozzle, outlet nozzle, and "Nozzle Welds" in Tables 16 and 17 of WCAP-15827, and 2) consideration of the stress levels in the welds that attach the Robinson RPV inlet and outlet nozzles to the RPV. Lastly, the staff requests the licensee to confirm that there are no other ferritic pressure boundary components of the Robinson RPV that need to be considered for P-T limit evaluation for the period of extended operation.

RAI-4

According to the licensee, TS Figures 3.4.3-1, "Reactor Coolant System Heatup Limits Applicable Up to 35 EFPY," and 3.4.3-2, "Reactor Coolant System Cooldown Limits Applicable Up to 35 EFPY," would be revised to indicate that the curves are applicable up to 50 EFPY.

The staff's review of the application, especially, the proposed changes to P-T limit curves, finds that the limits in these Figures only contain values for RCS pressure greater than 0 pounds per square inch gauge. However, based on a review of similar changes for other licensee's applications, it is also the staff's understanding that it is a common practice for a licensee to perform a vacuum-fill operation for a short period of time during startup, i.e., a vacuum is drawn in the RCS while filling with water. The staff finds that the licensee does not mention a vacuum fill operation explicitly in its application.

If the licensee plans to perform an RCS vacuum-fill operation at its Robinson facility, the staff requests the licensee to confirm that such operation is below and to the right of the proposed limit lines, which represent pressure-temperature limits for a normal heatup and cooldown of the primary RCS.

Regulatory Basis

The regulations under 10 CFR 50.36 (c)(2)(i) state that limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.