



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

March 21, 2016

Mr. Joseph W. Shea
Vice President, Nuclear Licensing
Tennessee Valley Authority
1101 Market Street, LP 3R-C
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 3 – CORRECTION TO
AMENDMENT NO. 278 REGARDING MODIFICATION OF TECHNICAL
SPECIFICATION 3.4.9, “RCS PRESSURE AND TEMPERATURE (P/T) LIMITS”
(CAC NO. MF5659)

Dear Sir or Madam:

By letter dated January 7, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15344A321), the U.S. Nuclear Regulatory Commission (NRC) approved a license amendment request (LAR) to revise the BFN, Unit 3, Technical Specification (TS) 3.4.9, “RCS [reactor coolant system] Pressure and Temperature (P/T) Limits,” Figures 3.4.9-1 and 3.4.9-2 that currently provide the P/T limits for up to 20 Effective Full Power Years (EFPYs), and greater than 20 EFPYs to less than or equal to 28 EFPYs, respectively. The proposed P/T limits for Figures 3.4.9-1 and 3.4.9-2 are applicable to 38 EFPYs, and greater than 38 EFPYs to less than or equal to 54 EFPYs, respectively. The amendment also revised Note 1 of TS Surveillance Requirement 3.4.9.1 to change the vessel pressure from greater than 312 pounds per square inch gauge (psig) to greater than 313 psig to conform to the modified P/T limit curves. The approval was in response to the Tennessee Valley Authority (TVA) LAR dated January 27, 2015 (ADAMS Accession No. ML15040A698), as supplemented by letters dated August 12 and October 23, 2015 (ADAMS Accession Nos. ML15226A324 and ML15296A527, respectively).

Subsequent to issuing the amendment, the TVA staff identified an error in the cover letter and pages 1 and 8 of the safety evaluation (SE). The cover letter and page 1 of the SE state:

The amendment also revises Note 1 of TS Surveillance Requirement 3.4.9.1 to change the vessel pressure from less than 312 pounds per square inch gauge (psig) to less than 313 psig to conform to the modified P/T limit curves.

The cover letter and page 1 of the SE should have read:

The amendment also revises Note 1 of TS Surveillance Requirement 3.4.9.1 to change the vessel pressure from greater than 312 pounds per square inch gauge (psig) to greater than 313 psig to conform to the modified P/T limit curves.

This error was also found on page 8 of the SE. Page 8 of the SE states:

... change the vessel pressure from less than 312 pounds per square inch gauge (psig) to less than 313 psig is acceptable because it applies a plant-specific value in place of the generic value used in NEDC-33178P-A, Revision 1.

Page 8 of the SE should have stated:

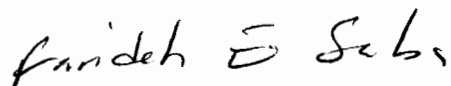
... change the vessel pressure from greater than 312 pounds per square inch gauge (psig) to greater than 313 psig is acceptable because it applies a plant-specific value in place of the generic value used in NEDC-33178P-A, Revision 1.

This letter corrects the cover letter and pages 1 and 8 of the SE for the errors where the word "less" should be "greater." The proposed TS 3.4.9 correctly used "greater" than 313 psig, and page 4 of the SE correctly identified the change as "greater" than 312 psig to "greater" than 313 psig.

The errors contained in the issued cover letter and pages 1 and 8 of the SE have no impact on the SE or the SE conclusion that the licensee has adequately developed the new P/T limits. The NRC staff continues to find that the new P/T limits and revised Note 1 of TS Surveillance Requirement 3.4.9.1 satisfies the requirements of Appendix G to Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code and Appendix G of Title 10 of the *Code of Federal Regulations*, Part 50.

If you have any questions, please contact me at 301-415-1447 or Farideh.Saba@nrc.gov.

Sincerely,



Farideh E. Saba, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-296

Enclosure:
Correction to Cover Letter
and Safety Evaluation

cc w/enclosure: Distribution via Listserv

ENCLOSURE
CORRECTED PAGES FOR
BROWNS FERRY NUCLEAR PLANT, UNIT 3
AMENDMENT NO. 278

(Cover Letter page 1 and Safety Evaluation pages 1 and 8)



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

January 7, 2016

Mr. Joseph W. Shea
Vice President, Nuclear Licensing
Tennessee Valley Authority
1101 Market Street, LP 3R-C
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 3 - ISSUANCE OF AMENDMENT
REGARDING MODIFICATION OF TECHNICAL SPECIFICATION 3.4.9,
"RCS PRESSURE AND TEMPERATURE (P/T) LIMITS" (CAC NO. MF5659)

Dear Mr. Shea:

The U.S. Nuclear Regulatory Commission (NRC or the Commission) has issued the enclosed Amendment No. 278 to Renewed Facility Operating License No. DPR-68, for the Browns Ferry Nuclear Plant (BFN), Unit 3. This amendment is in response to Tennessee Valley Authority's (TVA, or the licensee) application dated January 27, 2015, as supplemented by letters dated August 13 and October 23, 2015.

The amendment revises BFN, Unit 3, Technical Specification (TS) 3.4.9, "RCS [reactor coolant system] Pressure and Temperature (P/T) Limits," Figures 3.4.9-1 and 3.4.9-2 that currently provide the P/T limits for up to 20 Effective Full Power Years (EFPYs), and greater than 20 EFPYs to less than or equal to 28 EFPYs, respectively. The proposed P/T limits for Figures 3.4.9-1 and 3.4.9-2 are applicable to 38 EFPYs, and greater than 38 EFPYs to less than or equal to 54 EFPYs, respectively. The amendment also revises Note 1 of TS Surveillance Requirement 3.4.9.1 to change the vessel pressure from greater than 312 pounds per square inch gauge (psig) to greater than 313 psig to conform to the modified P/T limit curves. The revision satisfies the requirements of NUREG-1843, "Safety Evaluation Report Related to the License Renewal of the Browns Ferry Nuclear Plant, Units 1, 2, and 3," dated April 2006, Commitment 39, that required the development and submittal of revised P/T limit curves for NRC approval prior to the period of extended operation.

The NRC staff has completed its review of the information provided by the licensee. The licensee's submittal contained proprietary information withheld from the public pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 2.390, "Public inspections, exemptions, requests for withholding." However, the enclosed NRC safety evaluation (SE) does not contain any proprietary information withheld under 10 CFR 2.390. The NRC will delay placing the enclosed (SE) in the public document room for a period of 10 working days from the date of this letter to provide TVA the opportunity to comment on any proprietary aspects of the SE. If you believe that Enclosure 2 contains proprietary information. Please identify such information line by-line and define the basis for withholding pursuant to the criteria of 10 CFR 2.390. After 10 working days, the enclosed SE will be made publicly available, if the NRC is not notified of any existing proprietary information.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 278

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-68

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT 3

DOCKET NO. 50-296

1.0 INTRODUCTION

By application dated January 27, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML 15040A698), as supplemented by letters dated August 13 and October 23, 2015 (ADAMS Accession Nos. ML15226A324 and ML15296A527, respectively), the Tennessee Valley Authority (TVA, or the licensee), requested changes to the Technical Specifications (TSs) for Browns Ferry Nuclear Plant (BFN), Unit 3. The supplements dated August 13 and October 23, 2015, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on May 5, 2015 (80 FR 25720).

The amendment revises BFN, Unit 3, Technical Specification (TS) 3.4.9, "RCS [Reactor Coolant System] Pressure and Temperature (P/T) Limits," Figures 3.4.9-1 and 3.4.9-2 that currently provide the P/T limits for up to 20 Effective Full Power Years (EFPYs), and greater than 20 EFPYs to less than or equal to 28 EFPYs, respectively. The amendment also revises Note 1 of TS Surveillance Requirement 3.4.9.1 to change the vessel pressure from greater than 312 pounds per square inch gauge (psig) to greater than 313 psig to conform to the modified P/T limit curves. The proposed P/T limits for Figures 3.4.9-1 and 3.4.9-2 are applicable to 38 EFPYs, and greater than 38 EFPYs to less than or equal to 54 EFPYs, respectively. The revision satisfies the requirements of NUREG-1843, "Safety Evaluation Report Related to the License Renewal of the Browns Ferry Nuclear Plant, Units 1, 2, and 3," dated April 2006 (ADAMS Accession No. ML061030032), Commitment 39, that required the development and submittal of revised P/T limit curves for U.S. Nuclear Regulatory Commission (NRC) approval prior to the period of extended operation.

change the vessel pressure from greater than 312 pounds per square inch gauge (psig) to greater than 313 psig is acceptable because it applies a plant-specific value in place of the generic value used in NEDC-33178P-A, Revision 1.

The NRC staff reviewed how the nozzles are accounted for in the heatup and cooldown analysis and confirmed that only the N16 water level instrument nozzles were in the extended beltline region where the fluence is estimated to exceed 1×10^{17} n/cm² (E > 1 MeV). The licensee used Appendix J of the NEDC-33178P-A, Revision 1, methodology to calculate the P/T limits for the water level instrument nozzle. The NRC staff previously determined in the safety evaluation for BWR Owners Group Topical Report BWROG-TP-11-023, Revision 0, "Linear Elastic Fracture Mechanics Evaluation of General Electric Boiling Water Reactor Water Level Instrument Nozzles for Pressure-Temperature Curve Evaluations" (ADAMS Accession No. ML13183A017), that the thermal stress value from Appendix J of the NEDC-33178P-A, Revision 1, methodology is acceptable because it is derived from a bounding transient. The bounding transient is a more severe transient than is required to be addressed by the ASME BPV Code, Section XI, Appendix G. Using the emergency transient, the resulting applied stress intensity factor for the water level instrument nozzle in the P/T limit curves would be higher than would be calculated according to the ASME BPV Code; therefore, the NRC staff finds the analysis acceptable.

The NRC staff also evaluated the analysis of non-beltline components and materials by comparing the application and the BFN, Unit 3, Updated Final Safety Analysis Report (UFSAR). The NRC staff confirmed that the material properties conveyed in the UFSAR are consistent with the material properties stated in the application.

Attachment 5 to Enclosure 1 of the application provides proposed changes to Section 4.2.4 of the UFSAR to reflect implementation of the new P/T limit curves. The NRC staff notes that the proposed changes to the UFSAR are consistent with the new P/T limit curves and supporting technical information. The NRC staff did not review the UFSAR changes for approval. Based on the evaluation described above, the NRC staff finds that the proposed P/T limits follow the same approved methodology as the current P/T limits, and that the UFSAR material properties are consistent with the application.

3.4 Summary

Based on the review of the application, the NRC staff has determined that the licensee appropriately followed NRG-approved guidance for calculating neutron fluence and developing new P/T limits. The NRC staff finds that the proposed BFN, Unit 3, P/T limits satisfy the requirements of Appendix G to Section XI of the ASME BPV Code and Appendix G of 10 CFR Part 50, and concludes that they are acceptable for use in TS 3.4.9, Figures 3.4.9-1 and 3.4.9-2.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Alabama State official was notified of the proposed issuance of the amendment on December 10, 2015. The State official had no comments.

This error was also found on page 8 of the SE. Page 8 of the SE states:

... change the vessel pressure from less than 312 pounds per square inch gauge (psig) to less than 313 psig is acceptable because it applies a plant-specific value in place of the generic value used in NEDC-33178P-A, Revision 1.

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If you have any questions, please contact me at 301-415-1447 or Farideh.Saba@nrc.gov.

Sincerely,

/RA/

Farideh E. Saba, Senior Project Manager
 Plant Licensing Branch II-2
 Division of Operating Reactor Licensing
 Office of Nuclear Reactor Regulation

Docket No. 50-296

Enclosure:

Correction to Cover Letter
 and Safety Evaluation

cc w/enclosure: Distribution via Listserv

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ADAMS Accession No.: ML16075A067

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| OFFICE | NRR/DORL/LPL4-2/PM | NRR/DORL/LPL2-2/LA | NRR/DORL/LPL2-2/BC | NRR/DORL/LPL2-2/PM |
| NAME | MOrenak | BClayton | BBeasley | FSaba |
| DATE | 03/21/16 | 03/18/16 | 03/21/16 | 03/21/16 |