



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

June 3, 2019

Mr. Joseph W. Shea, Vice President
Nuclear Regulatory Affairs
and Support Services
Tennessee Valley Authority
1101 Market Street, LP 4A
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 1 – REQUEST FOR ADDITIONAL
INFORMATION REGARDING RESUBMITTAL OF PROPOSED ALTERNATIVE
REQUEST NO. 1-ISI-27 FOR THE PERIOD OF EXTENDED OPERATION
(EPID NO. L-2018-LLR-0389)

Dear Mr. Shea:

By letter dated December 27, 2018 (Agencywide Documents Access and Management System Accession No. ML18361A812), Tennessee Valley Authority (TVA, the licensee), resubmitted proposed alternative Request No. 1-ISI-27 to certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code for the second 10-year inservice inspection program for the Browns Ferry Nuclear Plant, Unit 1. Specifically, pursuant to Title 10 of the *Code of Federal Regulations* 50.55a(z)(1), the licensee requested permanent relief from reactor vessel circumferential shell weld examinations for the period of extended operation that expires on December 20, 2033.

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the licensee's submittal and determined that additional information, as described in the attached request for additional information (RAI), is needed for the staff to complete its review of Relief Request 1-ISI-27. The NRC staff forwarded a draft RAI to TVA by e-mail on April 1, 2019. On April 15, 2019, the NRC staff held a conference call to provide the licensee with an opportunity to clarify any portion of the draft RAIs and discuss the timeframe for which TVA would provide the requested information. Subsequently, the NRC staff forwarded its revised draft RAI to TVA on April 22, 2019. The finalized RAI is provided in the enclosure to this letter.

By an e-mail dated April 25, 2019, Mr. Russel Wells of your staff proposed to submit TVA's response to the NRC staff RAI by July 1, 2019. Mr. Wells explained that TVA needs 60 days to respond because its response to part b of the RAI will require TVA to run a complex analysis. TVA does not have the internal resources to perform this. Accordingly, TVA has to contract with external resources to perform these analyses. The NRC staff agreed with the proposed response date.

J. Shea

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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. 50-259

Enclosure:
Request for Additional Information

cc: Listserv

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 1 – REQUEST FOR ADDITIONAL INFORMATION REGARDING RESUBMITTAL OF PROPOSED ALTERNATIVE REQUEST NO. 1-ISI-27 FOR THE PERIOD OF EXTENDED OPERATION (EPID NO. L-2018-LLR-0389) DATED JUNE 3, 2019

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ADAMS Accession No.: ML19116A071

*by e-mail

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REQUEST FOR ADDITIONAL INFORMATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REGARDING TENNESSEE VALLEY AUTHORITY
RESUBMITTAL OF PROPOSED ALTERNATIVE REQUEST NO. 1-ISI-27
FOR THE PERIOD OF EXTENDED OPERATION
BROWNS FERRY NUCLEAR PLANT, UNIT 1
DOCKET NO. 50-259

By letter dated December 27, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18361A812), Tennessee Valley Authority (the licensee) resubmitted proposed alternative Relief Request No. 1-ISI-27 to certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) for the second 10-year inservice inspection program for the Browns Ferry Nuclear Plant, Unit 1. Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee requested permanent relief from reactor vessel (RV) circumferential shell weld examinations for the period of extended operation that expires December 20, 2033.

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the licensee's submittal and determined that additional information, as described in the following request for additional information (RAI), is needed for the staff to complete its review of the Relief Request 1-ISI-27.

RAI 1

Section 50.55a(g)(4) of 10 CFR requires inservice inspection of ASME Code Class 1 components to be performed in accordance with Section XI of the ASME Code. In the July 28, 1998, Safety Evaluation Report (SER) for BWRVIP-05 (ADAMS Accession No. ML9808040037), the NRC approved a methodology that would allow a licensee to request relief from the ASME Code inservice inspection requirements for RV circumferential shell welds. Also, in the BWRVIP-05 SER, the NRC staff described an integrated probabilistic assessment of reactor vessel integrity based on the product of the frequency of the limiting event that would challenge the integrity of the RV and the conditional probability of the crack penetrating the reactor vessel. The limiting event that would challenge the integrity of the RV was further described in the BWRVIP-05 SER as a cold over-pressurization event with an estimated frequency of 1×10^{-3} per year.

The licensee's submittal describes an integrated probabilistic assessment of the RV integrity based on BWRVIP-05 methodology. As inputs to the integrated probabilistic assessment, the licensee specifies a conditional probability of failure of 1.366×10^{-2} and an event frequency of 2.38×10^{-5} per year.

- a. Since the BWRVIP-05 SER describes the limiting event frequency as a cold over-pressurization event with an estimated frequency of 1×10^{-3} per year, either justify the event frequency of 2.38×10^{-5} per year or provide a corrected event frequency for this relief request.

- b. The licensee stated that the conditional probability of failure value of 1.366×10^{-2} was based on a Monte Carlo simulation based on the VIPER Code. However, the plant-specific analysis performed by the staff in the BWRVIP-05 SER was based on the FAVOR Code. Since the BWRVIP-05 analysis results suggest that the combination of different input and different probabilistic codes can result in an order of magnitude difference in the failure frequencies, the staff requests that the licensee either:
- (1) re-perform the relief request analysis using the most recent version of the FAVOR Code; or
 - (2) justify the use of the VIPER Code for this relief request analysis considering the differences in inputs between the FAVOR and VIPER Codes.