



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

August 6, 2015

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

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3 – RELIEF FROM THE REQUIREMENTS OF AMERICAN ASSOCIATION OF MECHANICAL ENGINEERS CODE SECTION XI INSERVICE INSPECTION PROGRAM, REQUEST FOR AN ALTERNATIVE ISI-45 (TAC NOS. MF4854, MF4855, AND MF4856)

Dear Mr. Shea:

By letter dated September 12, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14260A365), as supplemented on January 27, 2015 (ADAMS Accession No. ML15028A404), the Tennessee Valley Authority (the licensee) submitted Relief Request (RR) ISI-45 to the Nuclear Regulatory Commission (NRC) for an alternative to the inservice inspection (ISI) interval requirements described in Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) for Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3. The requested alternative would align the separate ISI interval dates for the three BFN units to a single interval date starting February 1, 2016.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 55a, Paragraph (a)(3)(i), the licensee requested to use the proposed alternative on the basis that the alternative provides an acceptable level of quality and safety. By *Federal Register* Notice 79 FR 65776, dated November 5, 2014, which became effective on December 5, 2014, the paragraph headings in 10 CFR 50.55a were revised. Accordingly, relief requests that had been previously covered under 10 CFR 50.55a(a)(3)(i) are now covered under the equivalent 10 CFR 50.55a(z)(1).

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that the proposed alternative for RR ISI-45 provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes RR ISI-45 to allow the BFN Units 1, 2, and 3 to use the proposed alternative date of February 1, 2016, for the beginning of BFN Units 1, 2, and 3 next 10-year inspection interval.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

J. W. Shea

- 2 -

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

Sincerely,

A handwritten signature in cursive script that reads "Shana R. Helton".

Shana R. Helton, Branch Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260, and 50-296

Enclosure: Safety Evaluation

cc w/encl: Distribution via Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NO. ISI-45 REGARDING

ALIGNMENT OF INSERVICE INSPECTION INTERVALS

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3

DOCKET NOS. 50-259, 50-260, AND 50-296

1.0 INTRODUCTION

By letter dated September 12, 2014, as supplemented by letter dated January 27, 2015 (Agencywide Documents Access and Management System Accession Numbers ML14260A365 and ML15028A404, respectively), the Tennessee Valley Authority (the licensee) submitted Relief Request (RR) ISI-45 for Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3. The licensee is requesting an alternative from inservice inspection (ISI) interval scheduling requirements described in Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), to align the three separate ISI 10-year interval dates of the three BFN Units, 1, 2, and 3.

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Section 55a, Paragraph (a)(3)(i), the licensee requested to use the proposed alternative on the basis that the alternative provides an acceptable level of quality and safety.

2.0 REGULATORY EVALUATION

Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee proposed an alternative to the 2001 and 2004 ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," paragraph IWA-2432 that states that successive 10-year inspection intervals should start 10 years after the previous inspection interval.

By *Federal Register* Notice 79 FR 65776, dated November 5, 2014, paragraph headings in 10 CFR 50.55a were revised and made effective December 5, 2014, such that material previously contained in 10 CFR 50.55a(a)(3) is now contained in 10 CFR 50.55a(z)(1). Therefore, relief requests that had been previously covered under 10 CFR 50.55a(a)(3)(i) are now covered under the equivalent 10 CFR 50.55a(z)(1).

Enclosure

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. Paragraph 50.55a(g)(4)(ii) states that inservice examination of components and system pressure tests conducted during successive 120-month inspection intervals must comply with the requirements in the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, and is subject to the limitations and modifications listed therein.

It states, in part, in 10 CFR 50.55a(z)(1), that alternatives to the requirements of 10 CFR 50.55a(g) may be used, when authorized by the U.S. Nuclear Regulatory Commission (NRC), if the licensee demonstrates that the proposed alternatives would provide an acceptable level of quality and safety.

Based on the above and subject to the following technical evaluation the NRC staff finds that the regulatory authority exists for the licensee to propose and the NRC to authorize the proposed alternative.

3.0 TECHNICAL EVALUATION

3.1 The Licensee's Requested Relief

ASME Codes of Record

BFN Unit 1 is currently in its second 10-year ISI interval. The code of record for this interval is ASME Section XI, 2001 Edition with 2003 Addenda. The Unit 1 second 10-year ISI interval is currently scheduled to end on June 1, 2017.

BFN Unit 2 is currently in its fourth 10-year ISI interval. The code of record for this interval is ASME Section XI, 2004 Edition. The Unit 2 fourth 10-year ISI interval is currently scheduled to end on May 25, 2021.

BFN Unit 3 is currently in its third 10-year ISI interval. The code of record for this interval is ASME Section XI, 2001 Edition with 2003 Addenda. The Unit 3 third 10-year ISI interval is currently scheduled to end on November 18, 2015.

The proposed start of the forthcoming aligned 10-year ISI interval for all BFN units is February 1, 2016, with an ending date of February 1, 2026. Therefore, BFN Units 1 and 2 will begin their next interval (third and fifth, respectively) prior to that originally scheduled and BFN Unit 3 will begin its next interval (fourth) 2 months and 14 days after that currently scheduled. The code of record for the proposed forthcoming aligned third (BFN Unit 1), fifth (BFN Unit 2), and fourth (BFN Unit 3) 10-year ISI intervals, will be ASME Section XI, 2007 Edition with 2008 Addenda.

ASME Code Requirements

The scheduling of successive inspection intervals is described in ASME Code Section XI. The 2001 and 2004 editions of ASME Code Section XI, paragraph IWA-2432 state that successive 10-year inspection intervals should start 10 years after the previous inspection interval.

The Licensee's Proposed Alternative

The licensee is requesting authorization to allow use of an alternative to the interval timetable currently required by ASME Section XI and the 10 CFR 50.55a for updating the ISI programs. The licensee is proposing to start the next inspection interval for all three units on February 1, 2016. The licensee also requests the start date for the remaining subsequent 120 month interval ISI programs be the same for all three units.

The licensee states that this alternative will apply to the ISI, Pressure Test, and Repair Replacement Activity Programs and that examinations performed under Subsection IWE (Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Plants), will not be affected by this request for an alternative. BFN Units 1, 2, and 3 employ a General Electric Company Mark 1 steel containment design consisting of a drywell and pressure suppression chamber. The requirements of Subsection IWL (Requirements for Class CC Concrete Components of Light-Water Cooled Plants) are not applicable to the steel containment (Class MC) vessels.

The Licensee's Basis for Proposed Alternative

BFN Units 1, 2, and 3 entered commercial service on August 1, 1974, March 1, 1975, and March 1, 1977, respectively. These commercial service start dates established the initial inspection intervals for ISI of the units. Due to extended shutdowns of all three BFN units in the years since entering commercial service, these ISI interval dates were altered in accordance with ASME Code, Subsection IWA-2430(e) of the 2001 Edition with 2003 Addenda of Section XI. Every ten (10) years, an update to the ISI Program is required, in accordance with 10 CFR 50.55a(g)(4)(ii).

Currently, BFN's three units have different inspection interval schedules. There are three different ISI Programs using two different Code Editions and Addenda. When the next interval update occurs, which will be for BFN Unit 3 in November 2015, the three units will be using three different Editions and Addenda of ASME Section XI. The licensee is proposing to start the next inservice inspection interval for all three units on February 1, 2016. The Edition and Addenda of ASME Code Section XI chosen for the interval updates will be in accordance with 10 CFR 50.55(g)(4)(ii).

The licensee stated that there are distinct advantages for the BFN units to be on the same ISI schedule and Edition of the ASME Section XI. There are fewer procedures to maintain and procedures will be meeting the requirements of one Edition/Addenda of the Code instead of several versions. The ISI program documents can be combined into one document covering all three units, which reduces the chance of applying incorrect ISI requirements. Use of one set of procedures and documents will not result in a reduction in the quality of the ISI program or the safety of the plant.

The licensee, in its letter dated January 27, 2015, clarified that non-destructive type examinations on piping and components that have not been completed for the existing interval will be performed as required prior to the planned synchronization of the inspection interval dates.

The licensee states that all examinations required by both the current ASME Code and the later ASME Code edition/addenda will be performed during the overlap period of the intervals. Subsequent 10-year intervals will be in accordance with the applicable rules in force at that time.

Duration of Proposed Alternative

The proposed alternative is a one-time modification of the ends of the current 10-year ISI intervals at each unit. The proposed date for the new 10-year ISI Inspection intervals is February 1, 2016. Therefore, BFN Unit 1 and 2 will begin their next interval (third and fifth, respectively) prior to that originally scheduled and BFN Unit 3 will begin its next interval (fourth) 2 months and 14 days after that originally scheduled.

3.2 NRC Staff Evaluation

The licensee is proposing to synchronize the beginning of the next 10-year ISI inspection intervals for BFN Unit 1, 2, and 3, to February 1, 2016. The licensee is requesting this relief pursuant to the provisions of 10 CFR 50.55a(z)(1) on the basis that the alternative provides an acceptable level of quality and safety.

As described in letter dated September 12, 2014, and clarified in letter dated January 27, 2015, (ADAMS Accession Numbers ML14260A365 and ML15028A404, respectively), the schedule for ISIs will not be affected by use of the alternate start date for the of the 10-year inspection intervals. Adoption of the proposed alternate ISI interval start date would leave one outage for BFN Unit 1 and three outages for BFN Unit 2 left in the currently scheduled intervals. All examinations that would have been scheduled for the remaining outages will still be performed under the revised schedule. For BFN Units 1 and 2, when these examinations are completed, the scheduling of examinations will revert to the requirements of the applicable Edition and Addenda of ASME Section XI. For BFN Unit 3, the licensee's proposed change in the beginning of interval date from November 14, 2015, to February 1, 2016, will not affect the schedule of examinations.

As an example, weld inspections for intergranular stress corrosion cracking Category D welds at BFN Unit 2 that are currently scheduled to be conducted during the 20th refueling outage, currently the third period of the fourth 10-year inspection interval, will still be conducted in the 20th refueling outage, which would be the second period of the fifth inspection interval using the proposed alternate start date for the fifth inspection interval.

One effect of ending the BFN Unit 1 and 2 10-year ISI intervals early would be the earlier adoption of a later edition of an NRC-approved version of ASME Code Section XI for ISIs occurring before the end of the currently scheduled intervals. Later NRC-approved code editions include the most-recent NRC-approved changes and have fewer conditions in 10 CFR 50.55a. Adoption of a later NRC-approved code does not result in a reduction in inspection quality.

With the currently scheduled intervals when BFN Unit 3 begins a new interval on November 14, 2015, three different editions of ASME Code (2001 for Unit 1, 2004 for Unit 2, and 2007 for Unit 3) will be used at the BFN site. With the ISI program documents combined into one document covering all three units, there will be a reduced chance of the licensee applying the incorrect ISI requirements. The use of one set of procedures and documents will not reduce the quality of the ISI program or the safety of the plant.

As the alternative alignment for the next inspection intervals for BFN Units 1, 2, and 3, result in no changes in ISI schedule and the licensee will use an edition of ASME Code Section XI incorporated by reference in 10 CFR 50.55a for the inspections, the NRC staff has determined that the proposed synchronization of the 10-year inspection intervals for the three units provides an acceptable level of quality and safety.

4.0 CONCLUSION

As set forth above, the NRC staff determines that the proposed alternative described in RR ISI-45 provides an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes RR ISI-45 to allow the licensee to use the date of February 1, 2016, for the beginning of the BFN Units 1, 2, and 3 next 10-year inspection interval.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributors: Stephen Cumblidge
Candace Pfefferkorn

Date: August 6, 2015

J. W. Shea

-5-

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

Sincerely,

/RA/

Shana R. Helton, Branch Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260, and 50-296

Enclosure: Safety Evaluation

cc w/encl: Distribution via Listserv

DISTRIBUTION:

PUBLIC

LPL2-2 r/f

RidsNrrDorlLpl2-2 Resource

RidsACRS_MailCTR Resource

RidsNrrPMBrownsFerry Resource

RidsNrrLABClayton Resource

RidsRgn2MailCenter Resource

RidsNrrDeEpnB Resource

CRCooper, OEDO

SCumblidge, NRR

MFarnan, NRR

CPfefferkorn, NRR

ADAMS Accession No.: ML15191A372

OFFICE	NRR/DORL/LPL2-2/PM	NRR/DORL/LPL2-2/PM	NRR/DORL/LPL2-2/LA	NRR/DE/EPNB/BC
NAME	CPfefferkorn	FSaba	BClayton	DAiley
DATE	08/05/15	08/06/15	08/05/15	08/06/15
OFFICE	NRR/DORL/LPL2-2/BC			
NAME	SHelton			
DATE	08/06/15			

OFFICIAL RECORD COPY