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

March 31, 2011

Mr. R. M. Krich
Vice President, Nuclear Licensing
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 2 – RELIEF FROM THE REQUIREMENTS OF THE ASME CODE; 2-ISI-40 (TAC NO. ME3716)

Dear Mr. Krich:

By letter dated March 31, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100920542), as supplemented on February 3, 2011 (ADAMS Accession No. ML110380129) the Tennessee Valley Authority (the licensee) submitted a request to the Nuclear Regulatory Commission (NRC) for the use of alternatives to certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI requirements at Browns Ferry Nuclear Plant (BFN), Unit 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), the licensee requested to use proposed alternatives on the basis that the alternatives provide an acceptable level of quality and safety.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that TVA has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i), and is in compliance with the ASME Code's requirements. Therefore, the licensee's proposed alternative is authorized in accordance with 10 CFR 50.55a(a)(3)(i) for the fourth 10-Year inservice inspection program interval at BFN, Unit 2, which begins May 25, 2011, and ends May 24, 2021.

If you have any questions regarding this matter, please contact Christopher Gratton at (301) 415-1055.

Sincerely,

Douglas A. Broaddus, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-260

Enclosure: Safety Evaluation

cc w/enclosure: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOURTH 10-YEAR INTERVAL INSERVICE EXAMINATION PROGRAM FOR SNUBBERS

RELIEF REQUEST 2-ISI-40

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-260

1.0 INTRODUCTION

By letter dated March 31, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100920542), as supplemented on February 3, 2011 (ADAMS Accession No. ML110380129), Tennessee Valley Authority (TVA, the licensee), submitted Relief Request (RR) 2-ISI-40 for its fourth 10-year interval inservice inspection (ISI) pertaining to the examination and testing program for snubbers at Browns Ferry Nuclear Plant (BFN), Unit 2. The licensee's February 3, 2011, supplement superseded the original application for RR 2-ISI-40 in its entirety. The fourth 10-year ISI interval for BFN Unit 2 will begin on May 25, 2011, and will end on May 24, 2021.

The 2004 edition is the applicable edition of the American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," for the BFN Unit 2, fourth 10-year ISI interval. The licensee requested relief from certain ISI and testing requirements of Article IWF-5000 of the ASME Code, Section XI, 2004 Edition. Article IWF-5000 references the ASME/American Nuclear Standards Institute (ANSI) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), Part 4 (OM-4), 1987 Edition with OMa-1988 Addenda, pertaining to the ISI and testing of snubbers. The licensee proposed to perform the snubber ISI and testing activities using BFN Unit 2, Technical Requirements Manual (TRM), Section TR 3.7.4, "Snubbers," in lieu of ASME Section XI requirements. Specifically, pursuant to Title 10 of the *Code of Federal Regulation* (10 CFR), Section 50.55a(a)(3)(i), the licensee requested to use the proposed alternative, noted in RR 2-ISI-40, on the basis that the alternative provides an acceptable level of quality and safety.

2.0 REGULATORY EVALUATION

Section 50.55a(g) of 10 CFR, "Inservice Inspection Requirements," requires, in part, that the ISI of ASME Code Class 1, 2, and 3 components (including supports) shall be performed in accordance with Section XI of the ASME Code and applicable addenda incorporated by reference in the regulation. Exceptions to these requirements are allowed where specific written

relief has been granted by the Nuclear Regulatory Commission (NRC), pursuant to 10 CFR 50.55a(g)(6)(i), or alternatives have been authorized pursuant to paragraphs (a)(3)(i) or (a)(3)(ii) of the 10 CFR 50.55a.

In proposing an alternative or requesting relief, the licensee must demonstrate that: (1) the proposed alternative provides an acceptable level of quality and safety (10 CFR 50.55a(a)(3)(i)); (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety (10 CFR 50.55a(a)(3)(ii)); or (3) conformance is impractical for the facility (10 CFR 50.55a(g)(6)(i)). Section 50.55a allows the NRC to authorize alternatives and to grant relief from ASME Code requirements upon making the necessary findings.

The NRC's findings with respect to approving the alternative associated with the BFN Unit 2, RR 2-ISI-40, are given below:

3.0 TECHNICAL EVALUATION

3.1 Licensee's Alternative Request 2-ISI-40

3.1.1 Component for Which Relief is Requested

All BFN Unit 2, safety-related ASME Code Class 1, 2 and 3 snubbers.

3.1.2 Code Requirements

The ASME Code, Section XI, Article IWF-5000, provides ISI requirements for snubbers.

Paragraphs IWF-5200(a) and IWF-5300(a) require that snubber preservice and inservice examinations be performed in accordance with OM-4, using the VT-3 visual examination method described in IWA-2213.

Paragraphs IWF-5200(b) and IWF-5300(b) require that snubber preservice and inservice tests be performed in accordance with OM-4.

Paragraph IWF-5400 requires that, "Repair/replacement activities performed on snubbers shall be in accordance with IWA-4000. Snubbers installed, corrected, or modified by repair/replacement activities shall be examined and tested in accordance with the applicable requirements of IWF-5200 prior to return to service."

Paragraphs IWA-6230 and IWA-6240 require inservice inspection summary report preparation (for snubbers) and submittal of these reports to the regulatory authority.

Paragraph IWA-2110 specifies the duties of the Inspector for ASME Code, Section XI examinations and inspections. This includes requirements for the Authorized Nuclear Inservice Inspector (ANII) involved in snubber examinations.

Paragraph IWA-2317 provides alternative qualification requirements of VT-3 visual examination personnel and paragraph IWA-2321 provides qualification examination requirements for "Vision Tests."

3.1.3 Licensee's Proposed Alternative

The licensee proposes to use BFN Unit 2, TRM Section TR 3.7.4, "Snubbers," to perform visual examinations and functional testing of ASME Code Class 1, 2, and 3 snubbers in lieu of meeting ASME Code, Section XI requirements.

3.1.4 Licensee's Basis for Requesting Relief (as stated)

ASME Code, Section XI, Class 1, 2 and 3 equivalent snubbers are examined and tested in accordance with BFN Unit 2, TRM Section TR 3.7.4. TR 3.7.4 is prepared in accordance with the guidance given by NRC in Generic Letter (GL) 90-09, "Alternative Requirements for Snubber Visual Inspection Intervals and Corrective Actions." The scope for the snubbers examined and tested in accordance with TR 3.7.4 is not limited by line size or other applicable code exemptions and includes a numerically greater population of snubbers than the Section XI program.

The BFN Unit 2 TRM, TR 3.7.4, requirements will be utilized for the examination and testing of snubbers for preservice, inservice, and repair/replacement activities. The procedures utilized for these examinations are:

Surveillance Instruction, 2-SI-4.6.H-1, "Visual Examination of Hydraulic and Mechanical Snubbers";

Surveillance Instruction, 0-SI-4.6.H-2A, "Functional Testing of Mechanical Snubbers";

Surveillance Instruction, 0-SI-4.6.H-2B, "Functional Testing of Bergen-Patterson, Anchor/Darling, or Fronek Snubbers";

Surveillance Instruction, 0-SI-4.6.H-2C, "Functional Testing of Bergen-Patterson Torus Dynamic Restraints";

Surveillance Instruction, 0-SI-4.6.H-2E, "Functional Testing of Lisega Large Bore Torus Dynamic Restraints";

Surveillance Instruction, 0-SI-4.6.H-2F, "Functional Testing of Lisega Type 30 Hydraulic Snubbers";

Mechanical Preventive Instruction, MPI-0-000-SNB002, "Hydraulic Shock and Sway Arrestor Bergen-Patterson, Anchor/Darling, and Fronek Unit Disassembly and Reassembly";

Mechanical Preventive Instruction, MPI-0-000-SNB004, "Instruction for Removing and Reinstalling Pacific Scientific Mechanical, Bergen-Patterson, Anchor/Darling, Fronek, and Grinnell Hydraulic, and Bergen Patterson, or Lisega Torus Dynamic Restraint Snubbers," and

Technical Instruction, 0-TI-398, "Snubber Program Procedure."

This will include the pin-to-pin area of the applicable snubbers. Testing of repaired and replaced snubbers will also be performed in accordance with TRM Section TR 3.7.4.

Visual examination of repaired and replaced snubbers will be performed in accordance with BFN Unit 2 procedure MPI-0-000-SNB004.

Snubber examination and testing data will be maintained in accordance with the requirements of TR 3.7.4, the site corrective action program, SSP-3.1, "Corrective Action Program," and the implementing procedures (2-SI-4.6.H-1, 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, 0-SI-4.6.H-2C, 0-SI-4.6.H-2E, 0-SI-4.6.H-2F, 0-TI-398, MPI-0-000-SNB002, and MPI-0-000-SNB004).

The support areas beyond the pins of the snubbers and back to the building structure, and to the component/piping being supported will remain in the ASME Code, Section XI examination boundary (ISI Program); therefore, IWF-5200(c) and IWF-5300(c) requirements will be met by the ASME Code, Section XI Program.

The provision of ASME Code, Section XI, Paragraph IWF-5400, referencing IWA-4000 will be met for the repair/replacement activities on snubbers by the current Repair and Replacement Program.

ASME Code Section XI, VT-3 certification, required by personnel performing snubber visual examinations is an additional certification as compared with the TRM program training qualifications at BFN Unit 2. The BFN Unit 2 TRM snubber program does not require the use of an ANII for examination and test requirements. Therefore, the ANII will not be involved in the TRM required visual examination or testing activities. However, a snubber program manager provides oversight of the TRM snubber program implementation for both visual examination and functional testing. This oversight includes both review and evaluation of visual examination and functional testing data to ensure TRM requirements are met. The snubber program manager provides oversight without ANII involvement in these activities. ANII involvement in other inservice repair and replacement snubber activities, as required by IWA-2110(g) and (h) and implemented by BFN Unit 2's ASME Code, Section XI repair and replacement program will be maintained.

Additionally, personnel performing the TRM required visual examinations are "process qualified" to perform the examinations and testing required by the TRM and implemented by the referenced procedures. This training includes visual acuity and specific training on the requirements and acceptance criteria associated with procedure 2-SI-4.6.H-1. Technical Instruction 0-TI-398 states that personnel performing the visual inspections of 2-SI-4.6.H-1 must meet the visual acuity requirements of ASME Code, Section XI, paragraph IWA-2321.

Paragraph IWA-6230 provides requirements for ISI documentation preparation for snubbers in the framework of a summary report. Under the alternate requirements for snubbers, there will be no ASME Code, Section XI inservice examination and testing documentation to include in a summary report. TRM 3.7.4 is implemented by surveillance instructions 2-SI-4.6.H-1, 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, 0-SI-4.6.H-2C, 0-SI-4.6.H-2E, and 0-SI-4.6.H-2F and maintenance instructions MPI-0-000-SNB002, and MPI-0-000-SNB004. These instructions are written and approved in accordance with the licensee's Nuclear Quality Assurance (QA) Program, include data sheets for documenting the visual examination and functional test data and results, and provide for documentation of nonconforming results and evaluation of those

results. The completed data sheets are QA records and are controlled and maintained in accordance with the BFN Unit 2 QA records program. Completed QA records from 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, 0-SI-4.6.H-2C, 0-SI-4.6.H-2E, and 0-SI-4.6.H-2F are permanent plant records prepared and stored in accordance with the TVA Nuclear QA Program requirements. These records are available onsite for review and inspection. The QA records documenting snubber visual examinations and functional tests provide an acceptable level of quality and safety when compared to the requirements of ASME Code, Section XI, and OM-4 Edition 1987 with OMa-1988 addenda.

3.2 NRC Staff's Evaluation

The licensee proposed that the inservice visual examinations and functional testing of ASME Code Class 1, 2, and 3 snubbers be performed in accordance with the requirements of the BFN Unit 2 TRM, Section TR 3.7.4, "Snubbers." The licensee requested relief from meeting the requirements in the ASME Code, Section XI, paragraphs IWF-5200(a) and (b), and IWF-5300(a) and (b). Additionally, the licensee requested relief from the IWA-2110, IWF-5400, and IWA-6230 and IWA-6240 requirements, which are discussed and evaluated later.

Paragraphs IWF-5200(a) and (b), and IWF-5300(a) and (b), reference OM-4, 1987 Edition with OMa-1988 Addenda. OM-4 specifies the requirements for visual examination and functional testing of snubbers. BFN Unit 2 TRM, Section TR 3.7.4 incorporates GL 90-09 for the snubber visual inspection schedule. GL 90-09 acknowledges that the visual inspection schedule (as noted in OM-4) is excessively restrictive. The GL 90-09 alternative schedule for visual inspections provides the same confidence level as that provided by OM-4.

The licensee states that all the requirements paragraphs IWF-5200(c) and IWF-5300(c) at Browns Ferry Unit 2 will be met by the ASME Code, Section XI ISI program and its site procedures and processes.

TRM TR 3.7.4 defines inservice examination requirements as follows: (1) visual examination; (2) visual examination interval frequency; (3) method of visual examination; (4) subsequent examination intervals; and (5) inservice examination failure evaluation. Inservice operability testing requirements are also defined through the: (1) inservice operability or functional test; (2) snubber sample size; (3) additional sampling; (4) failure evaluation; (5) test failure mode groups; and (6) corrective actions for the 10 percent sample plan that is similar to the one provided by OM-4. The criteria for the OM-4 requirements and TRM TR 3.7.4 are compared in the following table:

	Criteria	ASME/ANSI OM Part 4 -1987 through OMa-1988 Addenda	Browns Ferry Nuclear Plant Unit 2 TRM TR 3.7.4, Technical Surveillance Requirements (TSR)
Inservice Examination			
1.	Visual Examination	Paragraph 2.3.1.1, Visual Examination, provides visual examination acceptance criteria.	TRM, TSR 3.7.4.1 provides visual inspection (examination) acceptance criteria.
2.	Visual Examination Interval Frequency	Paragraph 2.3.2.2 provides visual examination interval frequency.	TRM Table 3.7.4-1 provides snubber visual inspection (examination) interval frequency.
3.	Method of Visual Examination	IWF-5200(a) and IWF-5300(a) requires use of the VT-3 visual examination method described in IWA-2213.	The licensee states that personnel performing the TRM required visual examinations are "process qualified" to perform the examinations and testing.
4.	Subsequent Examination Intervals	Paragraph 2.3.2 provides guidance for subsequent inservice examination intervals.	TRM Table 3.7.4-1 provides subsequent visual inspection intervals.
5.	Inservice Examination Failure Evaluation	Paragraph 2.3.4 provides details about the snubber inservice examination failure evaluation.	TRM, TSR 3.7.4.1 provides details related to inservice examination failure evaluation.
Inservice Operability Test			
1.	Inservice Operability Test Requirements	Paragraph 3.2.1.1, Operability Test, provides details about snubber operability test requirements either with an in-place or bench test.	TRM, TSR 3.7.4.2, provides details about snubber inservice operability test requirements. The licensee states in their relief request that snubbers will be tested either with an in-place or a bench test.
2.	Snubber Sample size	Paragraph 3.2.3 states that each defined test plan group shall use either a "10% sampling plan," a "37 testing sample plan," or a "55 testing sample plan" during each refueling outage.	TRM, TSR 3.7.4.2, provides for a 10 percent snubber sample plan, similar to the OM-4, 10 percent sampling option.
3.	Additional Sampling	(a) Paragraph 3.2.3.1(b) requires an additional sampling size of 50 percent of the initial sample size in the event of an acceptance criteria failure.	(a) TRM, TSR 3.7.4.3 requires an additional sampling size of 10 percent of the remaining lot in the event of an acceptance criteria failure.

	Criteria	ASME/ANSI OM Part 4 -1987 through OMa-1988 Addenda	Browns Ferry Nuclear Plant Unit 2 TRM TR 3.7.4, Technical Surveillance Requirements (TSR)
		(b) & (c) Paragraph 3.2.3.2(b) provides additional sampling requirements for a "37 testing sample plan," and "55 testing sample plans.	(b) & (c) BFN 2 is not using "37 testing sample plan," or "55 testing sample plan."
4.	Inservice Operability Failure Evaluation	Paragraph 3.2.4.1 provides snubber inservice operability failure evaluation.	TRM, TSR 3.7.4.3 provides details about inservice operability failure evaluations.
5.	Test Failure Mode Groups	Paragraph 3.2.4.2 requires that unacceptable snubber(s) shall be categorized into failure mode group(s).	The licensee states in their relief request that failure mode grouping is not incorporated into the TRM. However, TRM, TSR 3.7.4.4 states that for any snubber, which fails to lockup or fails to move, an engineering evaluation shall be performed.
6.	Corrective Actions for 10% Testing Sample Plan	Paragraphs 3.2.5.1 requires that unacceptable snubbers during functional tests shall be repaired, modified, or replaced.	The licensee states in their relief request that for each unacceptable or failed snubber, a corrective action report will be initiated, to repair or replace snubber, if necessary.

The following paragraphs contain detailed reviews of the comparison between OM-4 and the TRM Section TR 3.7.4 requirements as summarized in the table above.

Inservice Examination Requirements

(1) Visual Examination

OM-4, paragraph 2.3.1.1, requires snubber visual examinations to identify impaired functional ability due to physical damage, leakage, corrosion, or degradation. TRM, TSR 3.7.4.1 states that visual inspections shall verify that there are: (a) no indications of damage or impaired operability; (b) attachments to the foundation or supporting structure are secure; and (c) fasteners for attachment of the snubber to the component or system and to the snubber anchorage are functional. The visual examination per TRM, TSR 3.7.4.1 verifies visible indication of damage or impaired operability of snubbers as well as their attachments and support. TRM, TSR 3.7.4.1 snubber visual examination requirements are equivalent to snubber visual examination requirements of OM-4, paragraph 2.3.1.1. Therefore, this alternative provides an acceptable level of quality and safety.

(2) Visual Examination Interval Frequency

OM-4, paragraph 2.3.2.2 provides visual examination interval frequency. TRM Table 3.7.4-1, "Snubber Visual Inspection Interval," provides snubber visual inspection interval frequency requirements that are different than the OM-4 visual inspection interval requirements, but similar to the visual inspection interval frequency as specified in GL 90-09. GL 90-09 acknowledges that the visual inspection interval frequency (as contained in OM-4) is excessively restrictive and that licensees with large snubber populations have spent a significant amount of resources and have subjected plant personnel to unnecessary radiological exposure to comply with the visual examination requirements. GL 90-09 states that its alternative schedule (interval frequency) for visual inspection provides the same confidence level as provided by OM-4. Therefore, this alternative provides an acceptable level of quality and safety.

(3) Method of Visual Examination

IWF-5200(a) and IWF-5300(a) requires that preservice and inservice examinations be performed in accordance with OM-4, using the VT-3 visual examination method described in IWA-2213. IWA-2213 states that, "VT-3 examinations are conducted to determine the general mechanical and structural condition of components and their supports by verifying parameters such as clearance, settings, and physical displacements; and to detect discontinuities and imperfections, such as loss of integrity at bolts and welded connections, loose or missing parts, debris, corrosion, wear, or erosion. VT-3 includes examinations for conditions that could affect operability or functional adequacy of snubbers and constant load and spring type supports."

The licensee proposes, as an alternative to IWF-5200(a) and IWF-5300(a), which require VT-3 certification for personnel performing snubber visual examination, to use the TRM program qualifications. Personnel performing the TRM visual examinations are "process qualified" to perform the examinations and testing in accordance with the TRM implementing instructions and maintenance procedures. In response to a request for additional information from the NRC staff, dated February 3, 2011, the licensee stated that the qualification to perform visual examinations of snubbers in accordance with the TRM Program requires examination personnel to meet Task Qualification MMY-501, "Perform Visual Examination of Mechanical and Hydraulic Snubbers." Task Qualification MMY-501 requires the following prerequisites for qualification: Snubber Visual Examination Training (per MTM150.000), documented on-the-job training, and a satisfactory visual acuity examination. The personnel selected to perform visual examinations of snubbers are required to have sufficient plant experience and visual acuity to meet the requirements of IWA-2317. IWA-2317 provides alternative qualifications of VT-3 visual examination for personnel. This proposed alternative to the Code-required certification, including the "visual acuity" requirements, provides an acceptable level of quality and safety.

The intent and scope of the visual inspection requirements for BNF2 are equivalent to the OM-4, VT-3 examination requirements. Therefore, this alternative is acceptable.

(4) Subsequent Examination Intervals

OM-4, paragraph 2.3.2 provides the subsequent examination interval based on the number of unaccepted snubbers discovered. TRM Table 3.7.4-1 establishes subsequent snubber visual inspection intervals based on the number of unacceptable snubbers discovered using the guidance in GL 90-09, in lieu of OM-4 paragraph 2.3.2 requirements. The TRM requirements

are equivalent to the guidance provided in GL 90-09, and provide the same confidence level as OM-4. Therefore, this alternative provides an acceptable level of quality and safety.

(5) Inservice Examination Failure Evaluation

OM-4, paragraph 2.3.4.1 requires that snubbers not meeting examination criteria be evaluated to determine the cause of unacceptability. OM-4, paragraph 2.3.4.2, states that snubbers found unacceptable, may be tested in accordance with the requirements of OM-4, paragraph 3.2. TRM TSR 3.7.4.1 states that snubbers that appear inoperable as a result of visual inspections shall be classified unacceptable and may be reclassified acceptable for the purpose of establishing the next visual inspection interval, provided that (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers, irrespective of type, that may be generically susceptible; and (2) the affected snubber is functionally tested in the as-found condition and determined operable per the criteria of TSR 3.7.4.2. The NRC staff considers the TRM requirements to be equivalent to the requirements of OM-4. Therefore, this alternative provides an acceptable level of quality and safety.

Inservice Operability Testing Requirements

(1) Inservice Operability Test

OM-4, paragraph 3.2.1.1, requires that snubber operational readiness tests verify the activation, release rate, and breakaway force or drag force of the tested snubbers by either an in-place or bench test. TRM, TSR 3.7.4.2 states that snubbers shall be functionally tested either in-place or in a bench test, and the functional test is to verify (a) activation is achieved in both tension and compression within the specified range, (b) snubber bleed or release, where required, is within the specified range in both compression and tension; (c) for mechanical snubbers, the force required to initiate or maintain motion of the snubber; and (d) for snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement is maintained. The NRC staff finds that the TRM requirements are equivalent to the snubber operability test requirements of OM-4, paragraph 3.2.1.1. Therefore, this alternative provides an acceptable level of quality and safety.

(2) Snubber Sample Size

OM-4, Paragraph 3.2.3 requires either a 10 percent testing sampling plan, a "37 testing sample plan," or a "55 testing sample plan." TRM, TSR 3.7.4.2 states that functional tests will be performed on a representative sample of 10 percent of each type of safety-related snubber. The licensee's 10 percent testing sample is similar to the one in the 10 percent testing sample plan, as specified in OM-4. As a result, the numbers of snubbers tested during outages are equivalent to the OM-4 requirements. Therefore, the TRM requirements for snubber sample size provide an acceptable level of quality and safety.

(3) Additional Sampling (for 10 percent testing sample plan)

OM-4, paragraph 3.2.3.1(b), requires that an additional sample size must be at least one-half the size of the initial sample size of the "defined test plan group" of snubbers. That is, for a 10 percent sample program, an additional 5 percent of the same type of snubbers in the overall population would need to be tested. TRM, TSR 3.7.4.3 requires that for each failed snubber, an additional lot equal to 10 percent of the remainder of that type of snubber be functionally tested. Therefore, the NRC staff finds that the TRM, TSR 3.7.4.3 requirement to sample an additional 10 percent provides an acceptable level of quality and safety.

(4) Inservice Operability Failure evaluation

OM-4 paragraph 3.2.4.1 requires that snubbers not meeting operability testing acceptance criteria in paragraph 3.2.1 be evaluated to determine the cause of the failure. TRM, TSR 3.7.4.3 states that a failure analysis shall be made of each failure to meet the functional test acceptance criteria of TRM, TSR 3.7.4.2 to determine the cause of the failure. Surveillance instructions 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, 0-SI-4.6.H-2C, 0-SI-4.6.H-2E, and 0-SI-4.6.H-2F provide the requirements for performing failure evaluations of failed snubbers, and an engineering failure analysis for inoperable snubbers must be performed using the appropriate data sheets of applicable surveillance instructions to determine the cause of failure. The NRC staff finds that the TRM requirements and surveillance instructions related to inservice operability failure evaluation are equivalent to the OM-4 requirements and provide an acceptable level of quality and safety.

(5) Test Failure Mode Groups

OM-4, paragraph 3.2.4.2 requires that unacceptable snubber(s) be categorized into test failure mode group(s). A test failure mode group shall include all unacceptable snubbers that have a given failure mode, and all other snubbers subject to the same failure mode. TRM, TSR 3.7.4.4 states that for any snubber which fails to lockup as expected or fails to move (i.e., is frozen in place), the cause must be evaluated. If the failure is caused by a manufacturer or design deficiency, the licensee must perform an in-place or bench functional test of all snubbers of same design, subject to the same defect. The functional test criteria shall be as specified in TRM, TSR 3.7.4.2.

In addition, the applicable BFN Unit 2 surveillance instructions 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, and 0-SI-4.6.H-2C, 0-SI-4.6.H-2E, and 0-SI-4.6.H-2F require an engineering evaluation of failed snubbers and an engineering failure analysis for inoperable snubbers. The engineering evaluation includes a determination of subsequent testing required, based on the failure mode, which may involve testing of snubbers susceptible to the same failure mode.

The BFN Unit 2 TRM does not specifically address "Failure Mode Groups." However, the TRM and plant surveillance instructions, that address extent of condition and failure grouping for sample expansion, accomplish the same intent as "Failure Mode Grouping," in OM-4. The TRM requirements, along with surveillance instructions, are considered to be equivalent to the OM-4 requirements. Therefore, this alternative provides an acceptable level of quality and safety.

(6) Inservice Operability Testing Corrective Actions (for 10 percent testing sample plan)

OM-4, paragraph 3.2.5.1 requires that unacceptable snubbers be adjusted, repaired, modified, or replaced. TRM, Section TR 3.7.4.4 and 3.7.4.5 state that for any snubber which fails to lockup or fails to move (i.e., is frozen in place), an engineering evaluation will be performed. TRM, TSR 3.7.4.6 states that verification will be performed that repaired and replaced snubbers meet the functional test criteria of TRM, TSR 3.7.4.2. Snubber examination and testing data will be maintained in accordance with the requirements of TRM, Section TR 3.7.4, the site corrective action program, SSP-3.1, "Corrective Action Program," and the implementing procedures (2-SI-4.6.H-1, 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, 0-SI-4.6.H-2C, 0-SI-4.6.H-2E, 0-SI-4.6.H-2F, 0-SI-398, MPI-0-000-SNB002, and MPI-0-000-SNB004). Therefore, the NRC staff finds that the corrective actions associated with unacceptable snubbers at BFN Unit 2 are equivalent to the OM-4 requirements. The TRM requirements, along with the surveillance instructions that address corrective actions for snubbers, provide an acceptable level of quality and safety.

Based on the above reviews of the comparison of the OM-4 and TRM, Section TR 3.7.4 requirements, the NRC staff finds that snubber inservice visual examinations and functional testing, conducted in accordance with the BFN Unit 2 TRM, Section TR 3.7.4, provides reasonable assurance of snubber operability equivalent to that of the ASME Code, Section XI, paragraphs IWF-5200(a) and (b), and IWF-5300(a) and (b). Therefore, the NRC staff finds that the licensee's proposed alternative provides an acceptable level of quality and safety.

Repair and Replacement Activities

ASME Code, Section XI, paragraph IWF-5400 states that repair/replacement activities performed on snubbers shall be in accordance with IWA-4000, and snubbers installed, corrected, or modified by repair/replacement activities shall be examined and tested in accordance with the applicable requirements of IWF-5200 prior to return to service. In this relief request, the licensee states that the provisions of IWA-4000 will be met for the repair/replacement activities on snubbers by the current BFN Unit 2 Repair and Replacement Program. The examination and testing of snubbers [IWF-5200(a) and (b)] will be in accordance with the licensee's alternative TRM Snubber Program. The detailed comparison and evaluation of the licensee's alternative with respect to IWF-5200 is noted above. Therefore, the NRC staff finds that the TRM requirements related to repair and replacement activities associated with snubbers at BFN Unit 2 are considered to be equivalent to the IWF-5400 requirements, and are acceptable.

Record of snubber examinations and testing

ASME Code Section XI, IWA-6230 and IWA-6240, provides the requirements for snubber examination and test summary report preparation for snubber inservice examination and test documentation. The licensee proposes the alternative to use TRM, Section TR 3.7.4 in lieu of these requirements. The licensee states that TRM, Section TR 3.7.4 is implemented by surveillance instructions, 2-SI-4.6.H-1, 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, 0-SI-4.6.H-2C, 0-SI-4.6.H-2E, 0-SI-4.6.H-2F, and maintenance preventive instructions, MPI-0-000-SNB0024, and MPI-0-000-SNB004. The procedures and instructions are written and approved in accordance with the BFN Unit 2 Nuclear QA Program. The licensee's proposed alternative to maintain and control documentation as QA records, available onsite for review and inspection,

provides an acceptable level of quality and safety. In addition, the NRC has endorsed the use of the OM Code, Subsection ISTD, for snubber inservice examination and testing. The OM Code requirements for snubber examination and test summary report preparation, for snubber inservice examination and test documentation, as specified by the Owner (in this instance, the licensee), are similar to the TRM requirements. Therefore, the licensee's proposed method of preparing and maintaining records of snubber examinations and tests provides an acceptable level of quality and safety.

Authorized Nuclear Inservice Inspector

ASME Code, Section XI, IWA-2110 specifies, in part, various inspector duties related to examination and testing activities. IWA-9000 defines an ANII, in part, as "a person who is employed and has been qualified by an Authorized Inspection Agency (AIA) to verify examination, tests and repair/replacement activities." The BFN Unit 2 TRM snubber program does not require the use of an ANII for examination and testing requirements, and the ANII will not be involved in the TRM required visual examination or testing activities. The TRM snubber program is directed by a designated snubber program manager who provides oversight of the snubber program implementation for both visual examination and functional testing. The responsibilities of the snubber program manager include both the review and evaluation of visual examination and functional test data to ensure that the TRM requirements are met. The ANII is involved in other inservice repair and replacement snubber activities, as required by IWA-2110(g) and (h) and implemented by the BFN Unit 2 "Repair and Replacement Program." In addition, the NRC has endorsed the use of the OM Code, Subsection ISTD for snubber inservice examination and testing. The OM Code states that the Owner's responsibility includes qualification of personnel who perform and evaluate examinations and tests in accordance with the Owner's QA program. These requirements are similar to the TRM requirements. The NRC staff finds that the BFN Unit 2 proposed alternative to use the TRM for snubber visual examination and functional testing, without involving the ANII in these activities, provides an acceptable level of quality and safety.

Based on the above, the NRC staff finds that snubber visual examinations and functional testing, conducted in accordance with BFN Unit 2 TRM, Section TR 3.7.4 and its implementing instructions and procedures, provides reasonable assurance of snubber operability. Additionally, the NRC staff determined that performance of snubber visual examinations and functional testing per TRM Section TR 3.7.4, along with BFN Unit 2 surveillance, maintenance and other plant instructions and procedures, are equivalent to meeting the ASME Code Section XI, Paragraphs IWF-5200(a) and (b), IWF-5300(a) and (b), IWA-5400, IWA-6230, IWA-6240, and IWA-2110. Therefore, the NRC staff finds that the licensee's proposed alternative provides an acceptable level of quality and safety.

It should be noted that in authorizing RR 2-ISI-40, BFN Unit 2 TRM, Section TR 3.7.4 becomes an alternative that may be used in lieu of ASME Code, Section XI requirements for performing ISI and testing of snubbers. Changes to BFN Unit 2 TRM, Section TR 3.7.4 that modify the alternative must be reviewed and authorized by the NRC staff, pursuant to 10 CFR 50.55a(a)(3).

4.0 CONCLUSION

As set forth above, the NRC staff determines that the proposed alternative in RR 2-ISI-40 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(a)(3)(i), and is in compliance with the ASME Code's requirements. All other ASME Code Section XI requirements for which relief was not specifically requested and approved remain applicable, including third-party review by the ANII.

Therefore, the NRC staff authorizes the alternatives noted above, at BNF Unit 2, for all safety-related ASME Code Class 1, 2, and 3 snubbers, for the fourth 10-year ISI and testing interval, which will begin on May 25, 2011, and will end on May 24, 2021.

5.0 REFERENCES

U.S. Code of Federal Regulations, Domestic Licensing of Production and Utilization Facilities, Title 10, "Energy," Chapter I – Nuclear Regulatory Commission, Part 50, Section 50.55a, Codes and standards.

Generic Letter (GL) 90-09, "Alternative Requirements for Snubber Visual Inspection Intervals and Corrective Actions," dated December 11, 1990.

American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components.

American Society of Mechanical Engineers Operation and Maintenance Code, Operation and Maintenance of Nuclear Power Plants, Part 4 (OM-4) 1987 Edition with 1988 Addenda.

American Society of Mechanical Engineers Operation and Maintenance Code, Rules for Inservice Testing of Light-Water Reactor Power Plants.

Browns Ferry Nuclear Plant, Unit 2, Technical Requirements Manual, Section TR 3.7.4, "Snubbers"

Letter from R. M. Krich, of Tennessee Valley Authority, to NRC, "Browns Ferry Nuclear Plant (BFN) -Unit 2 - American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Inservice Inspection Program for the Fourth Ten-Year Inspection Interval," dated March 31, 2010.

Letter from R. M. Krich, of Tennessee Valley Authority, to NRC, "Browns Ferry Nuclear Plant (BFN) -Unit 2 – Response to NRC Request for Additional Information Regarding American Society of Mechanical Engineers (ASME) Section XI, Inservice Inspection Program for the Fourth Ten-Year Inspection Interval - Request for Relief 2-ISI-40, (TAC No. ME3716)," dated February 3, 2011.

Principle Contributor: G. Bedi

Date: March 31, 2011

If you have any questions regarding this matter, please contact Christopher Gratton at (301) 415-1055.

Sincerely,

/RA/

Douglas A. Broaddus, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-260

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