



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

April 2, 2009

Mr. Preston D. Swafford
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 1 - SAFETY EVALUATION FOR
RELIEF REQUEST 1-ISI-18 ASSOCIATED WITH INSPECTION AND TESTING
OF SNUBBERS (TAC NO. MD8797)

Dear Mr. Swafford:

By a letter dated May 27, 2008, as supplemented by a letter dated October 22, 2008, the Tennessee Valley Authority submitted relief request (RR) 1-ISI-18, requesting relief from American Society of Mechanical Engineers Code, Section XI, requirements related to selection, examination and testing of snubbers at Browns Ferry Unit 1. In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 55a(a)(3)(i), your request proposes an alternative to use the testing plan described in the Browns Ferry Nuclear Plant Technical Requirements Manual.

Based on our review of your submittals, we have concluded that the alternative proposed in RR 1-ISI-18 provides an acceptable level of quality and safety, and, therefore, it is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

This relief is authorized for the remainder of the second 10-year Inservice Inspection interval at Browns Ferry Unit 1, which began June 2, 2008, and ends June 1, 2017.

Sincerely,

A handwritten signature in black ink, appearing to read "T. H. Boyce", with a long horizontal line extending to the right.

Thomas H. Boyce, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-259

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

INSERVICE INSPECTION PROGRAM RELIEF REQUEST NO. 1-ISI-18

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-259

1.0 INTRODUCTION

By letter dated May 27, 2008, Tennessee Valley Authority (the licensee) submitted Relief Request 1-ISI-18 for the second 10-year inservice inspection (ISI) and testing program interval for snubbers at Browns Ferry Nuclear Plant, Unit 1 (BFN1). In a letter dated October 22, 2008, the licensee submitted its response to the staff's request for additional information (RAI) dated September 15, 2008. In these submittals, the licensee requested relief from certain ISI and examination requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code) Section XI, 2001 Edition with 2003 Addenda, Articles IWA-2000, IWA-6000, and IWF-5000. IWF-5000 references ASME/American Nuclear Standards Institute (ANSI) Standard for Operation and Maintenance of Nuclear Power Plants (OM), Part 4 (OM-4), 1987 Edition with OMA-1988 Addenda. The second 10-year ISI interval at BFN1 commenced on June 2, 2008.

2.0 REGULATORY EVALUATION

The ISI of ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the ASME Code and applicable addenda as required by Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the U.S. Nuclear Regulatory Commission (NRC), pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

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 preservice 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. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b), 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the BFN1 second 10-year ISI interval is the 2001 Edition through 2003 Addenda.

3.0 TECHNICAL EVALUATION

3.1 Licensee Relief Request 1-ISI-18

The licensee proposed an alternative to the following ASME Code, Section XI, requirements for inspection and testing of ASME Code Class 1, 2, and 3 snubbers at BFN1.

- (a) IWF-5200(a) and (b), "Preservice Examinations and Tests"
- (b) IWF-5300(a) and (b), "Inservice Examinations and Tests"
- (d) IWF-5400, "Repair/Replacement Activities"
- (e) IWA-6230, "Summary Report Preparation"
- (f) IWA-2110, "Duties of the Inspector"

3.2 Code Requirements

- (a) ASME Section XI, IWF-5200(a) and (b) require preservice examinations and tests be performed in accordance with ASME/ANSI OM Part 4, 1987 Edition, OMa-1988 Addenda, using the VT-3 visual examination method in accordance with IWA-2213.
- (b) ASME Section XI, IWF-5300(a) and (b) require inservice examinations and tests be performed in accordance with ASME/ANSI OM Part 4, 1987 Edition, OMa-1988 Addenda, using the VT-3 visual examination method in accordance with IWA-2213.
- (d) ASME Section XI, IWF-5400, references IWF-5200 for snubber examination and test requirements following repair/replacement activities.
- (e) ASME Section XI, IWA-6230, requires the preparation of an inservice inspection summary report after each refueling outage.
- (f) ASME Section XI, IWA-2110, requires Authorized Nuclear Inservice Inspector (ANII) involvement for snubber examination and testing.

3.3 Licensee's Proposed Alternative

The BFN1 Technical Requirements Manual (TRM) Section TR 3.7.4, "Snubbers," will be used to perform visual examination and functional testing of ASME Code Class 1, 2, and 3 snubbers in lieu of meeting ASME Code, Section XI requirements.

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

ASME Section XI Class 1, 2 and 3 equivalent snubbers are examined and tested in accordance with BFN1 TRM, 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 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. Examination and testing of the snubbers in accordance with both ASME Section XI and the plant TRM would

result in a duplication of effort utilizing different standards and require the preparation of a separate program and associated procedures. This would result in additional cost and unnecessary radiological exposure. In addition, the personnel performing snubber visual examinations would also be required to be certified in accordance with the American Society of Nondestructive Testing (ASNT) SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing," and ASME/ASNT-CP-189, which is an additional certification as compared to the task training qualification required to perform the TRM-required examinations and testing of snubbers.

The implementation of OM-4, 1987 Edition with OMa-1988 addenda would require BFN1 to initiate a snubber examination and testing program that is more complicated and expensive to perform, without a compensating increase in the level of quality and safety.

The BFN1 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:

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

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

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

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

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

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

This will include the pin-to-pin area inclusive of applicable snubbers. The areas inclusive of the pins back to the building structure and to the component/piping being supported will remain in the ASME Section XI examination boundary.

Visual examination of repaired and replaced snubbers will be performed in accordance with BFN1 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, and the implementing procedures (1-SI-4.6.H-1, 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, 0-SI-4.6.H-2C, MPI-0-000-SNB002, and MPI-0-000-SNB004).

Subarticle IWF-5400 provides the requirements for repair and replacement of snubbers to be in accordance with OM-4. The OM-4 paragraphs 1.5.6, "Snubber Maintenance or Repair," and 1.5.7, "Snubber Modification and Replacement," require repaired and replaced snubbers to meet the visual examination requirements of paragraph 2.3.1.2 and the operability test requirements of paragraph 3.2.11. Paragraph 1.5.6 also requires an evaluation of the maintenance or repair activity and paragraph 1.5.7 requires a suitability evaluation on the replacement/modified

snubber. TR 3.7.4 (TSR 3.7.4.6) requires replacement snubbers and repaired snubbers that might affect the functional test results to be tested to meet the functional test criteria prior to installation.

BFN1 maintenance instruction MPI-0-000-SNB004 provides visual examination criteria for installation of a snubber after repair or replacement. The ASME Section XI repair/replacement program at BFN1 documents the suitability of repairs/replacements, IWA-4160.

ASME Section XI VT-3 certification required by personnel performing snubber visual examinations is an additional certification as compared with the TRM program training qualifications. 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 currently includes a visual test associated with face-mask fit and specific training on the acceptance criteria associated with procedure MPI-0-000-SNB004. Additional "visual acuity" verification for personnel performing snubber visual examinations will include visual acuity requirements that meet ASME Section XI. The training and documentation of personnel to the visual acceptance criteria, specified in the TRM implementing procedures, provides an acceptable level of quality and safety. Because relief is sought from the ASME Section XI snubber examination and test requirements, there will be no ASME Section XI snubber examination and test activities to require ANII involvement. The BFN1 TRM snubber program does not require the use of an ANII for examination and test requirements.

The ANII will not be involved in the TRM required visual examination or testing activities performed in lieu of the ASME Code requirements. 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 an acceptable level of quality and safety without ANII involvement in those activities. ANII involvement in other inservice repair and replacement snubber activities, as required by IWA-2110(g) and (h) and implemented by BFN1's ASME Section XI repair and replacement program will be maintained.

Subarticle IWA-6230 and OM-4, paragraphs 2.3 and 3.3, provide requirements for ASME Section XI inservice examination and test documentation for snubbers and a summary report of examinations and testing. Under the alternate requirements for snubbers, there will be no ASME Section XI inservice examination and testing to document in a summary report TRM 3.7.4 is implemented by surveillance instructions 1-SI-4.6.H-1, 0-SI-4.6.H-2A, 0 SI 4.6.H-2B, and 0-SI-4.6.H-2C and maintenance instruction 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 BFN1 QA records program. 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 Section XI and OM-4 Edition 1987 with OMa-1988.

The proposed alternative will be used for the entire second 10-year interval of the ISI Program for snubbers at BFN1.

3.5 NRC Staff Evaluation of Relief Request 1-ISI-18

The licensee requested authorization of an alternative to the requirements of the ASME Code, Section XI, paragraphs IWF-5200(a) and (b), IWF-5300(a) and (b), IWF-5400, IWF-6230 and IWA-2110. The licensee proposed that the visual examinations and functional testing of ASME Code Class 1, 2 and 3 snubbers be performed in accordance with the requirements of BFN1 TRM TR 3.7.4 and its implementing procedures in lieu of meeting the requirements in the ASME Code, Section XI, paragraphs IWF-5200(a) and (b), and IWF-5300(a) and (b). The licensee states that areas outside the snubber pins back to the building structure and to the component/piping being supported will remain in the ASME Section XI examination boundary.

The applicable edition of Section XI of the ASME Code for the BFN1 second 10-year ISI interval is the 2001 Edition through 2003 Addenda. The ASME Code, Section XI, paragraphs IWF-5200(a) and (b) and IWF-5300(a) and (b), references OM-4, 1987 Edition with OMa-1988 addenda.

ASME Code, Section XI, 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.

OM-4 specifies the requirements for visual examination (paragraph 2.3), and functional testing (paragraph 3.2) of snubbers. The licensee proposes to use BFN1 TRM TR 3.7.4 surveillance requirements for visual inspection and functional testing of all safety-related snubbers. A visual inspection is the observation of the condition of installed snubbers to identify those that are damaged, degraded, or inoperable as caused by physical means, leakage, corrosion, or environmental exposure. To verify that a snubber can operate within specific performance limits, the licensee performs functional testing that typically involves removing the snubber and testing it on a specially designed stand or bench. The performance of visual examinations is a separate process that complements the functional testing program and provides additional confidence in snubber operability.

BFN1 TRM TR 3.7.4 incorporates GL 90-09, "Alternative Requirements for Snubber Visual Inspection Intervals and Corrective Actions." GL 90-09 acknowledges that the visual inspection schedule (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 for visual inspection provides the same confidence level as that provided by OM-4.

BFN1 TRM TR 3.7.4 defines inservice examination requirements: (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: (1) inservice operability or functional test; (2) initial 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 are similar to those provided by OM-4. OM-4 requirements and TRM TR 3.7.4 criteria are compared and summarized in the following table and followed by a detailed review:

	Criteria	ASME/ANSI OM Part 4 -1988	Browns Ferry Nuclear Plant, Unit 1, TRM TR 3.7.4, Technical Surveillance Requirements (TSR)
Inservice Examination			
1.	Visual Examination	Paragraph 2.3.1.1, Visual Examination, states that snubber visual examinations shall identify impaired functional ability due to physical damage, leakage, corrosion, or degradation.	TRM TSR 3.7.4.1 requires that visual inspections verify that there are: (a) no visible indications of damage or impaired operability; (b) attachments to the foundation or supporting structure are functional; and (c) fasteners for the attachment of the snubber to the component or system and to the snubber anchorage are functional. The discovery of loose or missing attachment fasteners will be evaluated to determine whether the cause may be localized or generic.
2.	Visual Examination Interval Frequency	Paragraph 2.3.2 provides Examination Interval frequency requirements.	TRM Table 3.7.4-1 provides snubber visual inspection interval frequency. These visual inspection interval frequency requirements are similar to those contained in NRC GL 90-09.
3.	Method of Visual Examination	IWF-5200(a) and IWF-5300(a) require use of the VT-3 visual examination method described in IWA-2213.	<p>The licensee states that personnel performing the TRM required visual examinations are "process qualified" to perform the examinations and testing required by the TRM and implemented by BFN1 surveillance instructions. The licensee proposed alternative to the Code-required requirements, provides an acceptable level of quality and safety.</p> <p>(Detailed evaluation is provided in Item 3 of Inservice Examination Requirements.)</p>
4.	Subsequent Examination Intervals Frequency	Paragraph 2.3.2 provides guidance for inservice examination intervals based on the number of unacceptable snubbers discovered.	TRM Table 3.7.4-1 provides a snubber visual inspection interval based on the number of unacceptable snubbers discovered. These requirements are similar to NRC GL 90-09.

	Criteria	ASME/ANSI OM Part 4 -1988	Browns Ferry Nuclear Plant, Unit 1, TRM TR 3.7.4, Technical Surveillance Requirements (TSR)
5.	Inservice Examination Failure Evaluation	Paragraph 2.3.4 states that snubbers not meeting examination and acceptance criteria shall be evaluated to determine the cause of unacceptability.	TRM TSR 3.7.4.1 states that snubbers which 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.
Inservice Operability Test			
1.	Inservice Operability Test Requirements	Paragraph 3.2.1.1 states that snubber operational readiness tests shall verify activation, release rate, and breakaway force or drag force by either an in-place or bench test.	TSR 3.7.4.2, states that snubbers shall be functionally tested either in-place or in a bench test. The functional test is to verify (a) activation (restraining action) is achieved in both tension and compression within the specified range; (b) 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.
2.	Snubber Sample size	Paragraph 3.2.3 states that each defined test plan group shall use either a 10-percent sampling plan; a "37 testing sample plan"; or a "55 testing sample plan" during each refueling outage.	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 meets the requirements as specified in OM-4.

	Criteria	ASME/ANSI OM Part 4 -1988	Browns Ferry Nuclear Plant, Unit 1, TRM TR 3.7.4, Technical Surveillance Requirements (TSR)
3.	Additional Sampling	Paragraph 3.2.3.1(b) states that for any snubber(s) determined to be unacceptable as a result of testing, an additional sample of at least one-half the size of the initial sample lot shall be tested.	TSR 3.7.4.3 requires that for each failed snubber that does not meet the functional test acceptance criteria of TSR 3.7.4.2, an additional 10 percent of that type of snubber shall be tested. The Code requires that for a 10-percent sample program, an additional 5 percent of the same type of snubber in the overall population would need to be tested. Therefore, the NRC staff finds that the TRM TSR 3.7.4.3 requirement to sample an additional 10 percent is acceptable and provides an acceptable level of quality and safety.
4.	Inservice Operability Failure Evaluation	Paragraph 3.2.4.1 states that snubbers not meeting the operability testing acceptance criteria in paragraph 3.2.1 shall be evaluated to determine the cause of the failure.	TSR 3.7.4.3 states that a failure analysis shall be made of each failure to meet the functional test acceptance criteria of TSR 3.7.4.2 to determine the cause of the failure.
5.	Test Failure Mode Groups	Paragraph 3.2.4.2 states that unacceptable snubber(s) shall be categorized into failure mode group(s). A test failure mode group(s) shall include all unacceptable snubbers that have a given failure mode, and all other snubbers subject to the same failure mode.	TSR 3.7.4.4 states that for any snubber that fails to lockup or fails to move (i.e., frozen in place), evaluate the cause. If the failure is caused by the manufacturer or design deficiency, all snubbers of the same design, subject to the same defect, shall be functionally tested. TSR 3.7.4.4 is independent of the requirements of TSR 3.7.4.3. (Detailed evaluation is provided later in Item 5, Test Failure Mode Groups.)

	Criteria	ASME/ANSI OM Part 4 -1988	Browns Ferry Nuclear Plant, Unit 1, TRM TR 3.7.4, Technical Surveillance Requirements (TSR)
6.	Corrective Actions for 10 percent Testing Sample Plan	Paragraph 3.2.5.1 states that unacceptable snubbers shall be repaired, modified, or replaced.	The licensee states that for each unacceptable or failed snubber, a problem event report is initiated, failure analysis performed and work order initiated to replace the snubber, if necessary. Therefore, the TRM corrective actions associated with unacceptable snubbers at BFN1 are considered to be equivalent to the OM-4 requirements.

Inservice Examination Requirements

(1) Visual Examination

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 discovery of loose or missing attachment fasteners will be evaluated to determine whether the cause may be localized or generic. 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. The licensee states that visual examination verifies visible indication of damage due to leakage, corrosion, degradation, and bending. OM-4, paragraph 2.3.1.1, requires snubber visual examinations to identify impaired functional ability due to physical damage, leakage, corrosion, or degradation. Therefore, TRM TR 3.7.4 snubber visual examination requirements are considered to be equivalent to the snubber visual examination requirements of OM-4 paragraph 2.3.1.1 and provide an acceptable level of quality and safety.

(2) Visual Examination Interval Frequency

TRM Table 3.7.4-1 provides snubber visual inspection interval frequency requirements that are different than the OM-4 visual inspection interval requirements. Table 3.7.4-1 incorporates 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 that provided by OM-4. Therefore, TRM TR 3.7.4 provides an acceptable level of quality and safety.

(3) Method of Visual Examination

IWF-5200(a) and IWF-5300(a) require 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.

As an alternative to IWF-5200(a) and IWF-5300(a), which require VT-3 certification for personnel performing snubber visual examination, the licensee proposes to use 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 procedures. This training includes a visual test associated with face-mask fit, and "visual acuity" requirements of ASME Section XI. The licensee stated in its RAI response letter dated October 22, 2008, that the visual examination training qualification and documentation is provided by BFN1 Surveillance Instruction 0-SI-4.6.H-1, "Visual Examination of Hydraulic and Mechanical Snubbers," Steps 7.1.1 [A] through [F] and the visual acuity requirements of IWA-2320 are satisfied. BFN1 Surveillance Instruction 0-SI-4.6.H-1 will be used to verify visible indication of damage or impaired operability of snubbers. The areas adjacent to the snubbers (i.e., between the snubbers and building structure and between the snubbers and the component/piping being supported, including the pins) will remain in the ASME Section XI examination boundary (ISI program). This proposed alternative to the Code-required certification including the "visual acuity" requirements provides an acceptable level of quality and safety.

(4) Subsequent Examination Intervals

TRM Table 3.7.4-1 establishes subsequent snubber visual inspection intervals based on the number of unacceptable snubbers discovered, in lieu of OM-4, paragraph 2.3.2 requirements. These requirements are equivalent to the guidance provided in GL 90-09, which has been approved for use by the NRC. Therefore, the NRC staff finds that the subsequent examination intervals contained in TRM Table 3.7.4-1 provide 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 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. Therefore, the NRC staff finds that the TRM's inservice examination failure evaluation requirements provide an acceptable level of quality and safety.

Inservice Operability Testing Requirements

(1) Inservice Operability Test

TSR 3.7.4.2 states that snubbers shall be functionally tested either in-place or in a bench test. 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. OM-4, paragraph 3.2.1.1, Operability Test, states that snubber operational readiness tests verify activation, release rate, and breakaway force or drag force by either an in-place or bench test. The staff finds that the TRM requirements are equivalent to the snubber operability test requirements of OM-4, paragraph 3.2.1. Therefore, the TRM operability test requirements provide an acceptable level of quality and safety.

(2) Snubber Sample Size

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. 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." BFN1 is using a 10-percent sample criteria, which is equivalent to the 10-percent sample testing requirements of OM-4. As a result, the number of snubbers tested during outages is considered to be equivalent to the OM-4 requirements. Therefore, the NRC staff finds that the TRM snubber sample size provides an acceptable level of quality and safety.

(3) Additional Sampling

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. OM-4, paragraph 3.2.3.1(b) states that the additional sample must be at least one-half the size of the initial sample lot 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 snubber in the overall population would need to be tested. Therefore, the NRC staff finds that the TRM TSR 3.7.4.3 requirement to sample an additional 10 percent is acceptable and 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. The cause of failure evaluation requires review of other unacceptable snubbers and determination whether other snubbers of similar design would require further examination. TSR 3.7.4.3 states that a failure analysis shall be made of each failure to meet the functional test acceptance criteria of 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, and 0-SI-4.6.H-2C 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 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 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. TSR 3.7.4.4 requires an evaluation of the cause for any snubber that fails to lockup or fails to move (i.e., frozen in place).

If caused by manufacturer or design deficiency, perform in-place or bench functional test of all snubbers of same design, subject to same defect. The functional test criteria shall be as specified in TSR 3.7.4.2. The TRM states that the testing requirements of TSR 3.7.4.4 are independent of TSR 3.7.4.3.

In addition, the applicable BFN1 surveillance instructions 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, and 0-SI-4.6.H-2C 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 licensee states that establishment of specific groupings based on failure is not performed. TRM TR 3.7.4 does not specifically address "Failure Mode Groups." However, TSR 3.7.4.4 accomplishes the same intent as Failure Mode Grouping. Therefore, the TRM requirements are considered to be equivalent to the OM-4 requirements and provide 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. In its RAI response letter dated October 22, 2008, the licensee states that for each unacceptable or failed snubber, a problem event report is initiated, failure analysis performed and work order initiated to replace the snubber, if necessary. Therefore, the NRC staff finds that the TRM corrective actions associated with unacceptable snubbers at BFN1 are equivalent to the OM-4 requirements.

Repair and Replacement Activities

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 its RAI response letter dated October 22, 2008, the licensee states that the provisions of IWA-4000 will be met for repair/replacement activities on snubbers by the current BFN1 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 performed above. Therefore, the NRC staff finds that the TRM requirements related to repair and replacement activities associated with snubbers at BFN1 are equivalent to IWF-5400 requirements.

Record of snubber examinations and testing

ASME Section XI, IWA-6230, provides the requirements for snubber examination and test summary report preparation for snubber inservice examination and test documentation; and OM-4, paragraphs 2.4 and 3.4, provide requirements for examination and test documentation. The licensee proposes the alternative to use TRM TR 3.7.4 in lieu of these requirements. The licensee states that BFN1 TRM 3.7.4 is implemented by surveillance instructions 1-SI-4.6.H-1, 0-SI-4.6.H-2A, 0-SI-4.6.H-2B, and 0-SI-4.6.H-2C and maintenance instruction MPI-0-000-SNB004. The procedures and instructions are written and approved in accordance with the BFN1 QA Program. The licensee 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 to this, the NRC has endorsed the use of the ASME 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 are similar to the TRM requirements. Therefore, the licensee proposed method of preparing and maintaining records of snubber examinations and tests provides an acceptable level of quality and safety and is acceptable.

Authorized Inspection Agency

ASME, Section XI, IWA-2110 specifies various inspector duties related to examination and testing activities. IWA-9000 states that an ANII is a person who is employed and has been qualified by an Authorized Inspection Agency to verify examination, tests and repair/replacement activities. The BFN1 TRM snubber program does not require the use of an ANII for examination and test requirements, and the ANII will not be involved in the TRM required visual examination or testing activities performed in lieu of the ASME Code requirements. The TRM snubber program is directed by a designated snubber program manager who will provide oversight of the snubber program implementation for both visual examination and functional testing. The snubber program manager's responsibilities include both review and evaluation of visual examination and functional test data to ensure that TRM requirements are met. ANII involvement in other inservice repair and replacement snubber activities, as required by IWA-2110(g) and (h) and implemented by BFN1's Repair and Replacement Program, will be maintained. In addition to this, the NRC has endorsed the use of the ASME 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 staff finds that the BFN1 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 discussions, the staff finds that snubber visual examinations and functional testing, conducted in accordance with BFN1 TRM TR 3.7.4 and its implementing instructions and procedures, provide reasonable assurance of snubber operability and provide a level of quality and safety equivalent to that of the ASME Code, Section XI, subarticles IWF-5200(a) and (b), IWF-5300(a) and (b), IWA-5400, IWA-6230 and IWA-2110. Therefore, the staff finds the licensee's proposed alternative provides an acceptable level of quality and safety with respect to snubber visual inspection and functional testing. It should be noted that in authorizing Relief Request 1-ISI-18, BFN1 TRM TR 3.7.4 becomes a regulatory requirement that may be used in lieu of ASME Code, Section XI requirements for performing ISI and testing of snubbers. Changes to these requirements must be reviewed and approved by the NRC staff for authorization pursuant to 10 CFR 50.55a(a)(3) or as an exemption pursuant to 10 CFR 50.12.

4.0 CONCLUSION

Based on the information provided, the staff concludes that the proposed alternative to use BFN1 TRM TR 3.7.4 for snubber visual inspection and functional testing provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's alternative is authorized for the second 10-year ISI interval at BFN1, which began June 2, 2008, and ends June 1, 2017.

5.0 REFERENCES

1. 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.
2. Generic Letter 90-09, "Alternative Requirements for Snubber Visual Inspection Intervals and Corrective Actions," dated December 11, 1990.
3. *American Society of Mechanical Engineers Boiler and Pressure Vessel Code*, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components.
4. *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.
5. *American Society of Mechanical Engineers Operation and Maintenance Code*, Rules for Inservice Testing of Light-Water Reactor Power Plants.
6. Browns Ferry Nuclear Plant, Unit 1, Technical Requirements Manual, Section TR 3.7.4, Snubbers
7. Letter from D. T. Langley, of Tennessee Valley Authority, to NRC, "Browns Ferry Nuclear Plant (BFN) -Unit 1 - American Society of Mechanical Engineers (ASME) Section XI, Inservice Inspection Program for the Second Ten-Year Inspection Interval," dated May 27, 2008.
8. Letter from D. T. Langley, of Tennessee Valley Authority, to NRC, "Browns Ferry Nuclear Plant (BFN) -Unit 1 - American Society of Mechanical Engineers (ASME) Section XI, Inservice Inspection Program for the Second Ten-Year Inspection Interval - Request for Relief 1-ISI-18, Response to NRC Request for Additional Information (RAI) (TAC NO. MD8797)," dated October 22, 2008.

Principal Contributor: Gurjendra S. Bedi

Date: April 2, 2009

April 2, 2009

Mr. Preston D. Swafford
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 1 - SAFETY EVALUATION FOR
RELIEF REQUEST 1-ISI-18 ASSOCIATED WITH INSPECTION AND TESTING
OF SNUBBERS (TAC NO. MD8797)

Dear Mr. Swafford:

By a letter dated May 27, 2008, as supplemented by a letter dated October 22, 2008, the Tennessee Valley Authority submitted relief request (RR) 1-ISI-18, requesting relief from American Society of Mechanical Engineers Code, Section XI, requirements related to selection, examination and testing of snubbers at Browns Ferry Unit 1. In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 55a(a)(3)(i), your request proposes an alternative to use the testing plan described in the Browns Ferry Nuclear Plant Technical Requirements Manual.

Based on our review of your submittals, we have concluded that the alternative proposed in RR 1-ISI-18 provides an acceptable level of quality and safety, and, therefore, it is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

This relief is authorized for the remainder of the second 10-year Inservice Inspection interval at Browns Ferry Unit 1, which began June 2, 2008, and ends June 1, 2017.

Sincerely,

/RA/

Thomas H. Boyce, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-259

Enclosure: Safety Evaluation

cc w/encl: Distribution via Listserv

Distribution:

PUBLIC
RidsRgn2MailCenter Resource
RidsAcrsAcnw_MailCenter Resource
RidsNrrDorLpl2-2 Resource

LPL2-2 R/F
RidsOgcRp Resource
RidsNrrDciCptb Resource
JAdams, EDO R-II

RidsNrrLABClayton
RidsNrrPMBMoroney
RidsNrrPMEBrown

ADAMS ACCESSION NUMBER: ML090711077

NRR-028

OFFICE	LPL2-2/PM	LPL2-2/PM	PDII-2/LA	CPTB/BC	OGC	LPL2-2/BC
NAME	BMoroney	EBrown	BClayton	JMcHale By memo	AJones	TBoyce
DATE	3/18/09	3/18/09	3/17/09	2/26/09	3/26/09	4/2/09

OFFICIAL RECORD COPY