GE Nuclear Energy

PROCEDURE: ADM-BFN-1006V0 REVISION No.: 0

TITLE

PROCEDURE FOR COMPLIANCE WITH USNRC
REGULATORY GUIDE 1.150

THIS PROCEDURE IS APPROVED FOR USE AT BROWNS FERRY NUCLEAR AND IS CONTAINED IN GE NDE MANUAL 9.6 OF TVA'S DOCUMENT CONTROL SYSTEM

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1.0 SCOPE

1.1 The equipment certification methods described herein are applicable to both remote automatic and manual ultrasonic equipment used to perform inservice examinations of "Reactor Vessel Welds" in accordance with a TVA approved GE specific examination procedure. Quality Assurance requirements are specified in the TVA approved GE specific examiniation procedure which references this administrative document.

1.2 In this procedure, "Reactor Vessel Welds" are those assembly welds that are categorized as either B-A or B-D under the rules of ASME Section XI.

1.3 The purpose of this procedure is to assure that activities described herein are performed and that records specified by Reg. Guide 1.150 are generated, gathered, stored, and reported in a manner consistent with both Reg. Guide and the Owner's Quality Assurance requirements.

1.4 It is not the purpose of this procedure to provide definitive instructions to the operator of the analysis and recording equipment used to generate the required records. It is, however, a requirement of this procedure that the analysis and recording equipment used be operated in accordance with the manufacturer's recommendations.

2.0 REFERENCES

2.1 Codes and Standards. The following Codes and Standards form a part of this procedure to the extent specified herein.

2.1.1 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.

2.1.1.1 Section V "Nondestructive Examination" 1974 Edition, Summer 1975 Addenda, through the latest USNRC approved edition.

2.1.1.2 Section XI "Inservice Inspection of Nuclear Power Plant Components" 1974 Edition Summer 1975 Addenda through the latest USNRC approved edition.

2.1.2 United States Nuclear Regulatory Commission (USNRC).

2.1.2.1 Regulatory Guide 1.150, Revision 1, February 1983, "Ultrasonic Testing of Reactor Vessel Welds During Pre-service and Inservice Examination" * alternate method.

Note: In this procedure, * (asterisk) corresponds with the section numbers of the Revision 1 alternate method of Regulatory Guide 1.150.

3.0 METHOD(S) OF COMPLIANCE

Note: The method(s) of compliance with Reg. Guide 1.150 are delineated in the subparagraphs that follow. Each subparagraph corresponds with a section of Reg. Guide 1.150 alternate method. Note that Sections 4 and 5 of Reg. Guide 1.150 have been deleted from the Revision 1 alternate method.

3.1 Inspection System Performance Checks

3.1.1 Pre-Exam Performance Checks specified in Paragraph *1.1 will not be performed separately. These checks are identical to the checks required in 3.1.2 below.

3.1.2 Field Performance Checks specified in Paragraph *1.2 shall be performed before, during and after the examination of "Reactor Vessel Welds" as specified below.

3.1.2.1 RF Waveform and frequency amplitude information shall be recorded for each transducer or transducer/wedge combination involved with examination. These records may be photographic, computer generated, or a combination of both. The reflector used to generate the required RF return signal, as well as the electronic system used, shall be documented. This allows future RF Waveform data to be gathered from the same or a similar reflector.

3.1.2.2 Screen Height Linearity data shall be gathered in accordance with the requirements specified in the procedure being used. The record of screen height linearity shall be the Calibration Data Sheet.

3.1.2.3 Amplitude Control Linearity data shall be gatherd in accordance with the requirements specified in the procedure being used. The record of amplitude control linearity shall be the Calibration Data Sheet.

3.1.2.4 Angle Beam Profile Characterization shall be performed for each transducer/wedge combination used to examine "Reactor Vessel Welds". Beam profiling shall be performed both before the search unit is used to examine the first weld and after the search unit is used to examine the last weld during the examination. The data shall be gathered in accordance with requirements of the applicable examination procedure. The record of vertical beam profiles shall be per the requirements of the procedure(s) used during the examination.

3.1.2.5 Transducers and wedges used to examine reactor vessel welds are subject to failures such as connector damage, wedge cracking, and internal electrical malfunctions. When a failure renders a transducer or transducer/wedge combination inoperable, the post-exam performance checks required in 3.1.2.1 and 3.1.2.4 cannot be performed.

3.1.2.6 The intent of pre- and post-exam checks is to assure there was no gross degradation of performance during a period of use. When post-exam checks cannot be performed, a review of calibration and examination data gathered with the inoperable equipment is required. If the review shows that performance during the period of the failed equipment's use was satisfactory, the intent of post-exam checks has been satisfied.

3.1.2.7 Documentation that the review was performed fulfills the post-exam requirement for failed equipment.

3.2 Calibration

3.2.1 Calibration for Manual Examinations shall be performed in accordance with the applicable manual ultrasonic examination procedure. Calibration checks shall be

performed at the intervals specified in the procedure. The record of manual ultrasonic calibrations shall be the Calibration Data Sheet.

3.2.2 Calibration for Mechanized Scanning shall be performed in accordance with the applicable remote ultrasonic examination procedure. Calibration checks shall be performed at the intervals specified in the procedure. The record of remote ultrasonic calibrations shall be the Calibration Data Sheet.

3.2.3 Calibration Confirmation shall be as specified in the applicable ultrasonic examination procedure (Ref. 3.2.1 - 3.2.2).

3.2.4 Calibration Blocks used during examination of Reactor Vessel Welds shall be those furnished by the Owner. Where possible, the same calibration block(s) should be used to perform successive RPV examinations. Where use of the same block(s) is not possible, the provisions of Section *2.4 shall apply.

3.3 Examinations

3.3.1 The scope and extent of examinations shall be in accordance with Reference 2.1.1.2. The use of electronic gating is addressed in the applicable ultrasonic examination procedure(s).

3.3.2 Internal Surface examination requirements per Section *3.1 are demonstrated during each angle beam calibration. The demonstration documents the ability of the ultrasonic examination system to differentiate between an indication from "clad roll" and an indication from the ID notch in the calibration standard. The record of this demonstration shall be the Calibration Data Sheet.

3.3.3 Scanning Weld-Metal Interface The ultrasonic examination procedures developed by GE for inservice inspection of the RPV utilize the ASME Section V, Article 4, specified beaming angles of 0°, 45° and 60°. These search unit angles are not based on weld preparation geometry; therefore, the ability of these angles to detect a planar flaw at the clad/base metal interface was verified during procedure development. Documentation is to be included in the "Reporting of Results" required by Paragraph 3.5.

3.4 Recording and Sizing

Note: The capability of GE examination procedures to detect and size flaws during inservice inspections was verified during procedure development. Documentation is to be included in the "Reporting of Results" required by Paragraph 3.5.

The procedures developed by GE for inservice inspection of Reactor Vessel Welds require all data to be recorded to 20% DAC end points and, if applicable, 50% DAC, 100% DAC, and one-half maximum amplitude end points. All data is recorded at scanning intervals of 1/4" or less. Determination of the adequacy of the recorded data and data evaluation

must be made by a certified Level III individual other than the one performing the examination.

3.4.1 Geometric Indications: All indications will be evaluated by a certified Level III. If Level III analysis of the data shows that the indication is geometric in nature, the basis for the determination will be described in the report of the examination.

3.4.2 Indications With Changing Metal Path: All indications will be evaluated by a certified Level III individual. The Level III will determine the location, through-wall dimension, and proper DAC evaluation. No determinations are to be made by the examination teams since, by procedural requirements, all data shall be recorded if it equals or exceeds 20% DAC.

3.4.3 Indications Without Changing Metal Path: See explanation in 3.4.2 above. Also, see precautionary note in *6.3 C for consideration.

3.4.4 Evaluation of Indications: All indications without changing metal path and indications in the outer 75% of the RPV wall thickness shall be sized using 50% DAC end point data. All indications with changing metal path in the inner 25% of the RPV wall thickness shall be sized using both 20% DAC and 50% end point data. The size of the indications shall be the larger of:

a) Indication size determined using 50% DAC end point data,

- OR -

b) Indication size determined using 20% DAC end point data, corrected for the predetermined 20% DAC beam spread.

3.5 Reporting of Results

Note: The records detailed in Section *7 become a part of the report of the examination. Retention of these records is the responsibility of the Owner. Any flaw that exceeds the allowable limits detailed in Section XI, will be reported to the Owner in accordance with contractual requirements. The reporting of any flaw(s) indicative of "Abnormal Degradation of Reactor Pressure Boundary" is the responsibility of the Owner.

3.5.1 The best estimate of the tolerances (error band) in sizing flaws has been determined using standards developed by GE for this purpose. The standards for manual equipment and automated equipment represent the range of thicknesses to be examined on the RPV. The data and engineering analysis used to develop these error bands is retained by GE. The determined error band is a part of the report documenting the requirements of Section *7.

3.5.2 The effectiveness of the ultrasonic examination procedures was demonstrated on the standards used for error band determinations (3.5.1 above). Documentation of these demonstrations is a part of the Section *7 report.

3.5.3 The actual volumes that have not been examined due to vessel configuration, such as nozzle interferences or volumes that are shadowed by vessel flaws, must be documented in the report of the examination. Volumes not effectively examined due to near field effects, cladding to base material interface, electronic gating, or opposite surface interferences was determined using the standards discussed in Paragraph 3.5.1. The determined effects are a part of the Section *7 report. The calculated effect of these items is applied to the results of inservice examinations. Areas not examined (configuration) or not effectively examined (near field, etc.) will be reported to the Owner in accordance with contractual requirements. Any "Relief Requests" necessitated by these items are the Owner's responsibility.

3.5.4 Sketches and calculations documenting the effect of vessel configuration on inservice examinations of the RPV must be included in the report of the examination.

3.5.5 Sketches of mechanized scanning equipment with necessary reference points and dimensions are a part of the Section *7 report. These sketches allow reviewers to follow the mechanized scanning equipment's indication location method.

3.5.6 Alternative examination techniques, if used, will be documented and the results of such examination will be included in the report of the examination.

4.0 PERSONNEL

4.1 Ail calculations and reporting required by Reg. Guide 1.150 will be performed by a certified Level III individual. Data required to perform these calculations and evaluations may be gathered by either a certified Level II or Level III individual.

ATTACHMENT E

BFN Unit 3 Inservice Inspection Calibration Standards For the Second Ten-Year Inservice Inspection Interval

BROWN FERRY NUCLEAR PLANT INSERVICE INSPECTION CALIBRATION STANDARDS FOR UNIT 3 SECOND TEN YEAR ISI INSPECTION INTERVAL

CALIBRATION BLOCK NO.	GENERAL DESCRIPTION	WALL THICKNESS	MATERIAL TYPE/ DESCRIPTION	COMMENTS
BF-1	4" SCH 80	0.326"	A-106 GRADE B CS	PIPING
BF-2	4" SCH 80	0.326"	A-358 TP-304 SS	PIPING
BF-3	10" SCH 40	0.375"	A-106 GRADE B CS	PIPING
BF-4	6" SCH 140	0.752"	A-358 TP-304 SS	PIPING
BF-5	10" SCH 100	0.730"	A-106 GRADE B CS	PIPING
BF-18	24"X 6"X 6" FLAT BLOCK	6.125"	A-533 GRADE B CS	RPV NOZZLE AND SHELL WELDS
BF-19	24" X 6" X 4" FLAT BLOCK	4 1/64"	SQ-533 GRADE B CS	RPV HEAD & NOZZLE WELDS
BF-26	12" X 4" FLAT BLOCK	0.75"	ASME SA-106 GRADE B CS	PIPING
BF-29	4" SCH 160	0.506"	A-106 GRADE B CS	PIPING
BF-30	6" SCH 160	0.754"	A-106 GRADE B CS	PIPING
BF-31	6" SCH 80	0.422"	316L SS	PIPING
BF-33	20" X 4" X 1" FLAT BLOCK	1.272"	304L SS	PIPING
BF-34	6" SCH 80	0.399"	ASTM A-53 GRADE B CS	PIPING
BF-35	8" SCH 100	0.520"	A-106 CS	PIPING
BF-37	14" SCH 30	0.364"	SA-106 GRADE B CS	PIPING
BF-41	4' SCH 159	0.452"	SA-376 TP-304 SS	PIPING
BF-42	10" SCH 100	0.697"	SA-376 TP-304 SS	PIPING
BF-46	10" SCH 80	0.623"	A-312 TP-304 SS	PIPING
BF-56	14" SCH 100	0.938"	A-106 GRADE B CS	PIPING
BF-57	20" X 5" X 1" FLAT BLOCK	1.269"	304L SS	PIPING
BF-59	5" DIA. PIPE SEGMENT	0.923"	SA-182 F-316 SS	PIPING
BF-60	5" SCH XXS	0.758"	SA-312 T-316L SS	PIPING
BF-65	12" SCH 160	1.345"	SA-312 T-304 SS	PIPING
BF-70	13.75" PIPE SEGMENT	1.3"	SA-376 TP-316 SS	PIPING
BF-72	CLAD BLOCK FOR RPV NOZZLES	1.320"	ASTM A-508 CLASS 2 CS	RPV NOZZLES
BF-73	RPV STUD BLOCK	6" DIA.	ASTM A-540	RPV HEAD STUDS
BF-75	12" SCH 80	0.688"	SA-106 GRADE B CS	PIPING
BF-76	5.38" OD X 12" CLAD BLOCK	0.846"	SA-508 CL 2 CS	PIPING/NOZZLE
BF-77	16" SCH 30	0.375"	SA-106 GRADE B CS	PIPING
BF-79	12" SCH 80	0.691"	SA-358 GRADE 304 SS	PIPING
BF-81	RPV HEAD NOZZLE INNER RAD	VARIES	SA-508 CL 2 CS	RPV HEAD NOZZLE INNER RADIUS
BF-82	28" DIA. PIPE SEGMENT	1.250"	ASTM A-358 GRADE 304 SS	PIPING
BF-83	28" DIA. PIPE SEGMENT	1.750"	A-358 GRADE 304 SS/308L	PIPING
BF-84	N1, N2, & N3, NOZZLE IR	VARIES	SA-508 CL 2 CS	RPV NOZZLE IR"S
BF-85	N2, N5, & N9 NOZZLE IR	VARIES	SA-508 CL 2 CS	RPV NOZZLE IR"S

BROWN FERRY NUCLEAR PLANT INSERVICE INSPECTION CALIBRATION STANDARDS FOR UNIT 3 SECOND TEN YEAR ISI INSPECTION INTERVAL

CALIBRATION BLOCK NO.	GENERAL DESCRIPTION	WALL THICKNESS	MATERIAL TYPE/ DESCRIPTION	COMMENTS
BF-86	N8 NOZZLE IR CLAD	VARIES	SA-508 CL 2 CS	RPV NOZZLE IR
BF-87	20" SCH 80	1.031"	SA-376 TP-316 SS	PIPING
BF-88	22" PIPE	1.031"	SA-376 TP-316 SS	PIPING
BF-89	24" PIPE	1.285"	SA-376 TP-316 SS	PIPING
BF-90	28" PIPE	1.44"	SA-376 TP-316 SS	PIPING
BF-91	6" SCH 120	0.562"	SA-106 GRADE B CS	PIPING
BF-92	8" SCH 40	0.322"	SA-106 GRADE B CS	PIPING
BF-93	12" SCH 100	0.843"	SA-106 GRADE B CS	PIPING
BF-94	16" SCH 100	1.031"	SA-106 GRADE B CS	PIPING
BF-95	18" PIPE	0.312"	SA-106 GRADE B CS	PIPING
BF-96	18" PIPE	0.500"	SA-106 GRADE B CS	PIPING
BF-97	18" SCH 80	0.938"	SA-106 GRADE B CS	PIPING
BF-98	20" PIPE	0.500"	SA-106 GRADE B CS	PIPING
BF-99	20" SCH 100	1.281"	SA-106 GRADE B CS	PIPING
BF-100	24" PIPE	0.375	SA-106 GRADE B CS	PIPING
BF-101	24" PIPE	0.500"	SA-106 GRADE B CS	PIPING
BF-102	24" SCH 100	1.531"	SA-106 GRADE B CS	PIPING
BF-103	24" PIPE	2.50"	SA-106 GRADE B CS	PIPING
BF-104	26" PIPE	0.950"	SA-106 GRADE B CS	PIPING
BF-105	30" PIPE	0.375	SA-106 GRADE B CS	PIPING
BF-106	10" SPRAY NOZZLE	1.358	SA-508 CL 2 CS	SAFE END TO RPV NOZZLE
BF-107	RECIRC. OUTLET NOZZLE	1.737"	SA-508 CL 2 CS	SAFE END TO RPV NOZZLE
BF-108	24" PIPE	1.218"	SA-106 GRADE B CS	PIPING
BF-109	6.6" VESSEL BLOCK	6.6"	SA-533 GRADE B CS	REACTOR PRESSURE VESSEL
BF-119	3" DIA. RECIRC. PUMP STUD	3" DIA.	A-540	RECIRC. PUMP STUDS
BF-126	RPV STUD BLOCK	6.75" DIA.	SA-540 GRADE B23	RPV HEAD STUDS
BF-127	12" STD SCH	0.390"	SA-106 GRADE B CS	PIPING
BF-128	20" STD SCH	0.375"	SA-106 GRADE B CS	PIPING
BF-129	RPV INST. NOZ. TO FLANGE 7-1/2" OD	1.0"	ASTM A-105 GRADE B CS	RPV HEAD NOZZLES
BF-130	RPV INST. NOZ. TO FLANGE 5-1/2" OD	1.0"	ASTM A-105 GRADE B CS	RPV HEAD NOZZLES
BNP-17	12" SCH 40	0.380"	A-312 TP-304 SS	PIPING
SQ-37	12" X 4" X 5" FLAT BLOCK	0.502"	A-36 CS	PIPING
SQ-85	2" SCH 80	0.218"	SA-376 TP 304 SS	RPV INTSTR. SAFE ENDS

ATTACHMENT F

Statement Verifying the Personnel Certification Program Complies With the Requirements of ASME Code Section XI, 1989 Edition, Paragraph IWA 2300, Including Appendix VII

To: H. E. Hodges

Subject: Browns Ferry Unit 3 ISI Second Ten Year Interval- NRC RAI Item F

TVA procedure IEP- 200, "Qualification and Certification Requirements for TVA Nuclear (TVAN) Nondestructive Examination (NDE) Personnel" was revised to meet the requirements of ASME Code Section XI, 1989 Edition, paragraph IWA 2300, including Appendix VII requirements for ultrasonic personnel. Revision 1 was approved on May 16,1995, and implemented on August 16, 1995. TVA Inspection Services Organization's (ISO) NDE certification program was audited by the Hartford Steam Boiler Inspection and Insurance Company on August 11, 1995, for compliance to SNT- TC- 1A, 1984 Edition, ASME Code Section XI, 1989 Edition, paragraph IWA 2300 including Appendix VII. The program was acceptable as meeting the requirements listed above with comments which were included in subsequent revisions or answered satisfactorily.

Contractors on TVA's Approved Suppliers List (ASL) approved for performing ISI NDE examinations also have revised their programs accordingly to meet these requirements.

I trust this will satisfy the concerns about the NDE qualification program utilized for the Browns Ferry Unit 3 ISI program. Should you have any further questions or need additional information, please contact me at 423-843-4138.

T. L. Stocklem
NDE Specialist

ATTACHMENT G

1. Relief Request 3-ISI-3, Revision 1, Longitudinal Welds in Class 1 Piping, with ASME Code Case N-524, "Alternative Examination Requirements for Longitudinal Welds in Class 1 and 2 Piping Section XI, Division 1"

2. Relief Request 3-ISI-6, Revision 1, "Alternative Requirements to Repair and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000; Section XI, Division 1," ASME Code Case N-532

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT
UNIT 3
ASME SECTION XI, INSERVICE INSPECTION PROGRAM,
SECOND TEN-YEAR INSPECTION INTERVAL

REQUEST FOR RELIEF 3-ISI-3, Revision 1

Executive Summary: Pursuant to 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from the ASME Section XI requirements regarding the inspection of longitudinal welds in Class 1 and 2 piping. TVA proposes to use the alternative examination requirements provided by ASME Code Case N-524, "Alternative Examination Requirements for Longitudinal Welds in Class 1 and Class 2 Piping Section XI, Division 1." Code Case N-524 allows examination of longitudinal piping welds at intersecting circumferential welds within the examination boundary of the circumferential weld, rather than examination of one pipe diameter or up to twelve inches of each longitudinal piping weld that intersects a circumferential weld.

Request for relief 3-ISI-3 is consistent with one previously accepted by NRC letter dated September 28, 1994, for use by BFN Unit 3 during its First Ten-Year Inservice Inspection Interval.

Unit: BFN Unit 3

ISI Interval: Second ASME Section XI ISI Inspection Interval, (Start Date: November 19, 1996)

Systems: Various ASME Section XI Systems

Components: Longitudinal Welds in Class 1 and 2 Piping

Code Class: Class 1 and 2

Examination Category: B-J, C-F-1, and C-F-2

Item Number: B9.12, B9.22, C5.12, C5.22, C5.42, C5.52, C5.62, and C5.82

Code Requirement: 1989 Edition of ASME Section XI (no addenda), Table IWB-2500-1 requires a volumetric and/or surface examination of at least one pipe diameter length, but no more than 12 inches of each longitudinal weld that intersects a circumferential weld required to be examined in accordance with Examination Category B-J.

The 1989 Edition of ASME Section XI (no addenda), Table IWC-2500-1 requires a volumetric and/or surface examination to be performed of at least 2.5t, where "t" is the thickness of each longitudinal weld that intersects a circumferential weld required to be examined under Examination Categories C-F-1 and C-F-2.

Code Requirement From Which Relief is Requested: In accordance with 10 CFR 50.55a(a)(3)(i), relief is requested to use ASME Code Case N-524, "Alternative Examination Requirements for Longitudinal Welds in Class 1 and 2 Piping Section XI, Division 1," in lieu of the 1989 ASME Section XI requirements listed above.

Basis For Relief: The alternative examination requirements of Code Case N-524 include examination of the subject longitudinal piping welds at intersecting circumferential welds within the examination boundary of the circumferential weld. The following items summarize the basis for the revised longitudinal piping weld examination boundary:

- Longitudinal piping welds are fabricated during the manufacturing process under controlled shop conditions, which produce higher quality welds and more uniform residual stress patterns.

- Longitudinal piping welds undergo heat treatment during the manufacturing process which enhances the material properties of the weld and reduces the residual stress created by welding.

- Results of previous weld inspections throughout the industry indicate that longitudinal welds have not been a safety concern, and there has been no evidence of longitudinal weld defects compromising safety at nuclear power plants.

- Longitudinal welds have not been shown to be susceptible to any particular degradation mechanism.

- The areas of a longitudinal weld that would be the most susceptible to a potential failure mechanism would be at the intersection of a field fabricated circumferential weld.

- Locating longitudinal piping welds can require acid etching, eddy current examination, or a combination of methods. This increases radiological exposure, radwaste generation, and overall cost for performance of ASME Section XI examinations.

Alternative Requirements: As an alternative to the requirements stated in the 1989 Edition (no addenda) of ASME Section XI, Browns Ferry Nuclear Plant will adopt the provisions of ASME Code Case N-524 for the examination of Class 1 and 2 longitudinal piping welds.

Justification For Granting Relief: TVA's proposed alternative, Code Case N-524, limits the volumetric and surface examination requirements of the longitudinal weld to the volume or area contained within the examination requirements of the intersecting circumferential weld. If any degradation associated with a longitudinal weld were to occur, it is expected that it would be located at the intersection with a circumferential weld. These intersections would be inspected in accordance with the provisions of Code Case N-524.

Code Case N-524 was developed by the ASME Code Committee as an alternative to the requirements specified in ASME Section XI for the examination of longitudinal piping welds. The alternate examinations specified in the Code case maintain an acceptable level of quality and safety and are sufficient to verify the continued structural integrity of longitudinal piping welds.

Implementation Schedule: Code Case N-524 will be implemented during the Second Ten-Year ISI Inspection Interval for Browns Ferry Unit 3.

Attachment: ASME Code Case N-524, "Alternative Examination Requirements For Longitudinal Welds in Class 1 and 2 Piping, Section XI Division 1"

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: August 9, 1988

See Numerical Index for expiration and any reaffirmation dates.

Case N-524
Alternative Examination Requirements for Longitudinal Welds in Class 1 and 2 Piping Section XI, Division 1

Inquiry: What alternative requirements may be applied to the surface and volumetric examination of longitudinal piping welds specified in Table IWB-2500-1, Examination Category B-J, Table IWC-2500-1, Examination Categories C-F-1 and C-F-2 (Examination Category C-F prior to Winter 1983 Addenda), and Table IWC-2520, Examination Category C-G (1974 Edition, Summer 1975 Addenda)?

Reply: It is the opinion of the Committee that the following shall apply:

(a) When only a surface examination is required, examination of longitudinal piping welds is not required beyond those portions of the welds within the examination boundaries of intersecting circumferential welds.

(b) When both surface and volumetric examinations are required, examination of longitudinal piping welds is not required beyond those portions of the welds within the examination boundaries of intersecting circumferential welds provided the following requirements are met.

(1) Where longitudinal welds are specified and locations are known, examination requirements shall be met for both transverse and parallel flaws at the intersection of the welds and for that length of longitudinal weld within the circumferential weld examination volume;

(2) Where longitudinal welds are specified but locations are unknown, or the existence of longitudinal welds is uncertain, the examination requirements shall be met for both transverse and parallel flaws within the entire examination volume of intersecting circumferential welds.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT
UNIT 3
ASME SECTION XI, INSERVICE INSPECTION PROGRAM,
SECOND TEN-YEAR INSPECTION INTERVAL

REQUEST FOR RELIEF 3-ISI-6, REVISION 1

Executive Summary: Pursuant to 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from the ASME Section XI requirements regarding the preparation and submittal of NIS-1 and NIS-2 Summary Reports for inservice inspection and repair and replacement activities for each operating cycle. TVA proposes to use the alternative reporting documentation described in ASME Code Case N-532 which makes similar information available for review at the plant site and requires submission of an Owners Activity Report at the end of the ISI inspection period (approximately every 3.3 years). The current requirement is for submission of the NIS-1 and NIS-2 Summary Reports to the NRC within 90 days following each refueling outage

Unit: BFN Unit 3

ISI Interval: Second ASME Section XI ISI Inspection Interval, (Start Date: November 19, 1996)

Systems: Various ASME Section XI Systems

Components: NIS-1 and NIS-2 Summary Reports

Code Class: 1, 2, and 3

Examination Category: N/A

Item Number: N/A

Code Requirement: 1989 Edition, no addenda, of ASME Section XI, IWA-4800, IWA-6210(c), IWA-6220(c),(d), and (e), IWA-6230, and IWA-7520(a)(8) requirements for NIS-1 and NIS-2 summary report preparation and submittal. [The references to IWA-4000, -6000, and -7000 are the equivalent references from the 1989 Edition of ASME Section XI to the references in Code Case N-532 from the 1992 Edition of ASME Section XI]

Code Requirement From Which Relief is Requested: In accordance with 10 CFR 50.55a(a)(3)(i), relief is requested to use Code Case N-532, "Alternative Requirements to Repair

and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000, Section XI, Division 1," in lieu of the 1989 ASME Section XI requirements listed above.

Basis For Relief: The 1989 Edition of ASME Section XI requires the preparation and submittal of NIS-1 and NIS-2 Summary Reports within 90 days following the completion of each refueling outage. This requires resources to be diverted from restart of the applicable unit to preparation of the NIS-1 and NIS-2 Summary Reports within the prescribed time limit. It also presents an unnecessary time constraint on the licensee for submittal of the Summary Reports to NRC.

Code Case N-532 allows an alternate method for the certification of repairs and replacements in conjunction with the preparation and submittal of an Owner's Activity Report (OAR). Code Case N-532 requires submittal of the OAR to NRC at the end of each inspection period, which allows flexibility of resources at the end of a refueling outage. The information required for the OAR-1, "Owner's Activity Report" and Form NIS-2A, "Repair/Replacement Certification Record," provide the same level of assurance and third party certification as the corresponding," NIS-1, "Owner's Report for Inservice Inspections" and NIS-2, "Owner's Report for Repairs and Replacements from the 1989 Edition of ASME Section XI. Code Case N-532 requires that additional information be provided at the end of each inspection period regarding the percentage of examinations completed, which assures both the Owner and NRC that ASME Section XI Code compliance has been achieved.

TVA has concluded that Code Case N-532 provides an equal or superior degree of information related to repairs/replacements and ISI examinations completed when compared to the NIS-1 and NIS-2 required by the 1989 Edition of ASME Section XI.

Alternate Examinations: For BFN Unit 3 TVA will invoke the requirements of ASME Code Case N-532, "Alternative Requirements To Repair and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000; Section XI, Division 1," as an alternative to the ASME Section XI requirements listed above.

REQUEST FOR RELIEF 3-ISI-6 (cont.)

Justification For The Granting Of Relief: Code Case N-532 was developed by the ASME Code Committee as an alternative to the provisions in ASME Section XI regarding repair/ replacement documentation and inservice inspection summary report preparation. The requirements currently prescribed by the 1989 Edition, no addenda, of ASME Section XI result in preparation of the NIS-1 and NIS-2 Summary Reports for submittal to NRC within 90 days following each refueling outage. Code Case N-532 makes similar information available for review at the plant site and requires submittal of an Owner's Activity Report at the end of the ISI inspection period. The information presented in the OAR is more concise than that currently required by the NIS-1 and NIS-2.

The use of Code Case N-532 will not affect the margin of safety achieved through implementation of ASME Section XI for verification of system/structural integrity.

Implementation Schedule: Code Case N-532 will be implemented during the Second Ten-Year ISI Inspection Interval for Browns Ferry Unit 3.

Attachment: ASME Code Case N-532, "Alternative Requirements to Repair and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000, Section XI, Division 1"

Approval Date: December 12, 1994

See Numeric Index for expiration and any reaffirmation dates.

Case N-532
Alternative Requirements to Repair and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000[1]
Section XI, Division 1

Inquiry: What alternatives may be used to the requirements of IWA-4910(d) and IWA-6210(e) for completion of Form NIS-2 following repair or replacement, and IWA-6210(c) and (d), IWA-6220, IWA-6230(b), (c), and (d), and IWA-6240(b) for preparation and submittal of the inservice summary report and Form NIS-1?

Reply: It is the opinion of the Committee that as an alternative to the requirements of IWA-4910(d), IWA-6210(c), (d), and (e), IWA-6220, IWA-6230(b), (c), and (d), and IWA-6240(b), the following provisions may be used. This Case shall be utilized at least until the end of the inspection period in which it was invoked.

1.0 CERTIFICATION OF THE REPAIR OR REPLACEMENT

(a) The Owner's Repair/Replacement Program shall identify use of this Case.

(b) A Repair/Replacement Plan shall be prepared in accordance with IWA-4140[1], and shall be given a unique identification number.

(c) Upon completion of all required activities associated with the Repair/Replacement Plan, the Owner shall prepare a REPAIR/REPLACEMENT CERTIFICATION RECORD, FORM NIS-2A.

(d) Form NIS-2A shall be presented to the Inspector for certification.

(e) The completed Form NIS-2A shall be maintained by the Owner.

(f) The Owner shall maintain an index of Repair/Replacement Plans in accordance with IWA-6340. The index shall identify the identification number required by (b) above and the inspection interval and period during which each repair or replacement was completed.

2.0 OWNER'S ACTIVITY REPORT PREPARATION AND SUBMITTAL

An OWNER'S ACTIVITY REPORT FORM OAR-1 shall be prepared and certified upon completion of each refueling outage. Each Form OAR-1 prepared during an inspection period shall be submitted following the end of the inspection period. Each Form OAR-1 shall contain the following:

(a) Abstract of applicable examinations and tests with the information and format of Table 1.

(b) A listing of item(s) with flaws or relevant conditions that required evaluation to determine acceptability for continued service, whether or not the flaw or relevant condition was discovered during a scheduled examination or test. The listing shall provide the information in the format of Table 2.

(c) Abstract for repairs, replacements and corrective measures performed, which were required due to an item containing a flaw or relevant condition that exceeded IWB-3000, IWC-3000, IWD-3000, IWE-3000, IWF-3000, or IWL-3000 acceptance criteria; even though the discovery of the flaw or relevant condition that necessitated the repair, replacement or corrective measure, may not have resulted from an examination or test required by this Division. If acceptance criteria for a particular item is not specified in this Division, the provisions of IWA-3100(b) shall be used to determine which repairs, replacements, and corrective measures are required to be included in the abstract. The abstract shall provide the information in the format of Table 3.

[1] All references to IWA-4000 and IWA-6000 used in this Case refer to the 1992 Edition.

FORM NIS-2A REPAIR/REPLACEMENT CERTIFICATION RECORD

OWNER'S CERTIFICATE OF CONFORMANCE

I certify that the _____ represent by Repair/Replacement
(repair or replacement)

Plan number _____ conforms to the requirements of Section XI.

Type Code Symbol Stamp _____

Certificate of Authorization No. _____ Expiration Date _____

Signed _____ Date _____
(Owner or Owner's Designee, Title)

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of _____ and employed by _____ of _____ have inspected the items described in Repair/Replacement Plan number _____ during the period _____ to _____ and state that to the best of my knowledge and belief, the Owner has performed all the activities described in the Repair/Replacement Plan in accordance with the requirements of Section XI.

By signing this certificate neither the inspector nor his employer makes any warranty, expressed or implied, concerning the activities described in the Repair/Replacement Plan. Furthermore, neither the inspector nor his employer shall be liable in any manner for any personal injury or property damage or loss of any kind arising from or connected with this inspection.

_____ Commissions _____
(Inspector's Signature) (National Board, State, Province, and Endorsements)

Date _____

This form (E00126) may be obtained from the Order Dept., ASME, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300.

E

FORM OAR-1 OWNER'S ACTIVITY REPORT

Report Number _____

Owner _____
Name and Address of Owner

Plant _____
Name and Address of Plant

Unit No _____ Commercial service date _____ Refueling outage no. _____
(if applicable)

Current inspection interval _____
(1st, 2nd, 3rd, 4th, other)

Current inspection period _____
(1st, 2nd, 3rd)

Edition and Addenda of Section XI applicable to the inspection plan _____

Date and revision of inspection plan _____

Edition and Addenda of Section XI applicable to repairs and replacements, if different than the inspection plan _____

CERTIFICATE OF CONFORMANCE

I certify that the statements made on this Owner's Activity Report are correct, and that the examinations, tests, repairs, replacements, evaluations, and corrective measures described on the report conform to the requirements of Section XI

Certificate of Authorization No. _____ Expiration Date _____

Signed _____ Date _____
(Owner or Owner's Designee, Title)

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of _____ and employed by _____ of _____ have inspected the items described on this Owner's Activity Report, during the period _____ to _____ and state that to the best of my knowledge and belief, the Owner has performed all activities represented by this report in accordance with the requirements of Section XI.

By signing this certificate neither the inspector nor his employer makes any warranty, expressed or implied, concerning the examinations, tests, repairs, replacements, evaluations and corrective measures described this report. Furthermore, neither the inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

_____ Commissions _____
Inspector's Signature National Board, State, Province, and Endorsements

Date _____

This form (E00127) may be obtained from the Order Dept. ASME, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300

SAMPLE

TABLE 1
ABSTRACT OF EXAMINATIONS AND TESTS

Examination Category	Total Examinations Required for The Interval	Total Examinations Credited for This Period	Total Examinations Credited (%) For The Period	Total Examinations Credited (%) To Date for The Interval	Remarks

TABLE 2
ITEMS WITH FLAWS OR RELEVANT CONDITIONS THAT REQUIRED EVALUATION FOR CONTINUED SERVICE

Examination Category	Item Number	Item Description	Flaw Characterization (IWA-3300)	Flaw or Relevant Condition Found During Scheduled Section XI Examination or Test (Yes or No)

TABLE 3
ABSTRACT OF REPAIRS, REPLACEMENTS, OR CORRECTIVE MEASURES REQUIRED FOR CONTINUED SERVICE

Code Class	Repair, Replacement, or Corrective Measure	Item Description	Description of Work	Flaw or Relevant Condition Found During Scheduled Section XI Examination or Test (Yes/No)	Date Complete	Repair/ Replacement Plan Number

ATTACHMENT K

1. Relief Request 3-ISI-2, Revision 1, Examination and Testing of Component/Piping Snubbers

2. BFN Unit 3 Technical Requirements Manual, Section TR 3.7.4, Snubbers, and the Associated Bases

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT
UNIT 3
ASME SECTION XI, INSERVICE INSPECTION PROGRAM,
SECOND TEN-YEAR INSPECTION INTERVAL

REQUEST FOR RELIEF 3-ISI-2, REVISION 1

Executive Summary: Pursuant to 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from the identified ASME Section XI requirements related to examination and testing of snubbers. TVA proposes to use the examination and testing plans currently defined in the BFN Technical Requirements Manual (TRM) 3.7.4. The current TRM requirements are consistent with the guidance given in Generic Letter 90-09, "Alternate Requirements For Snubber Visual Inspection Intervals and Corrective Actions," which has been promulgated and approved by NRC. The ASME Section XI criteria imposes overlapping requirements which do not enhance the quality or safety of the subject snubber examination and testing.

Unit: BFN Unit 3

ISI Interval: Second ASME Section XI ISI Inspection Interval, (Start Date: November 19, 1996)

Systems: Various ASME Section XI Systems

Components: Component/Piping Snubbers

Code Class: 1, 2, and 3

Examination Category: N/A

Item Number: N/A

Code Requirement: 1989 Edition of ASME Section XI (no addenda) IWF-5300(a) and (b) inservice examination and testing in accordance with the first Addenda to ASME/ANSI OM-1987, Part 4.

IWF-5400 Repairs and Replacements of snubbers shall be in accordance with the first Addenda to ASME/ANSI OM-1987, Part 4.

IWA-6230 requires inservice inspection summary reports for snubbers be filed with the regulatory authority.

REQUEST FOR RELIEF 3-ISI-2 (cont.)

IWA-2110 requires Authorized Nuclear Inservice Inspector (ANII) involvement for snubber examination and testing

Code Requirement From Which Relief is Requested: In accordance with 10 CFR 50.55a(a)(3)(i), relief is requested from the ASME Section XI, 1989 Edition (no addenda), requirement for inservice examinations and tests for snubbers, and repair/replacement examinations and tests of snubbers:

a) IWF-5300(a) and (b) inservice examination and testing, and implied OM-1987, Part 4, Sections 2.3, Inservice Examination, 2.4, Examination Documentation, and 3.2, Inservice Operability Testing, and 3.3, Testing Documentation.

b) IWF-5400 Repairs and Replacements of snubbers shall be in accordance with the first Addenda to ASME/ANSI OM-1987, Part 4, Sections 1.5.6, Snubber Maintenance or Repair, and 1.5.7, Snubber Modification and Replacement

c) IWA-6230, summary reports (for snubbers)

d) IWA-2110(a)(5) and (c), Duties of the Inspector (for involvement for snubber examination and testing)

Basis For Relief: ASME Section XI Class 1, 2 and 3 equivalent snubbers are examined and tested in accordance with Browns Ferry Nuclear (BFN) Plant Technical Requirements Manual (TRM), TR 3.7.4. BFN TR 3.7.4 is prepared in accordance with the guidance given by NRC in Generic Letter 90-09. 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," which is an additional certification as compared

to the task training qualification required to perform the TRM 3.7.4 required examinations and testing of snubbers. The existing TRM program for examination and testing of snubbers was promulgated and accepted by NRC.

The implementation of OM-1987, Part 4 would require BFN 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.

Alternate Examinations: The BFN TRM 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: 3-SI-4.6.H-1, "Visual Examination of Hydraulic and Mechanical Snubbers;" 3-SI-4.6.H-2A, "Functional Testing of Mechanical Snubbers;" 3-SI-4.6.H-2B, "Functional Testing of Bergen-Patterson Hydraulic Snubbers;" 3-SI-4.6.H-2C, "Functional Testing of Bergen-Patterson Torus Dynamic Restraints;" MPI-0-000-SNB002, "Hydraulic Shock and Sway Arrestor Bergen-Patterson Unit Disassembly and Reassembly;" and MPI-0-000-SNB004, "Instructions for Removing and Reinstalling Pacific Scientific Mechanical, Bergen-Patterson Grinnell Hydraulic, and Torus Dynamic Restraints." This will include the pin-to-pin area inclusive of applicable snubbers.

Testing of repaired and replaced snubbers to establish a new preservice examination will also be performed in accordance with TR 3.7.4.

Visual examination of repaired and replaced snubbers will be performed in accordance with MPI-0-000-SNB-004, "Instruction for Removing and Reinstalling Pacific Scientific Mechanical, Bergen-Patterson Grinnell Hydraulic, and Torus Dynamic Restraints."

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 (3-SI-4.6.H-1, 3-SI-4.6.H-2A, 3-SI-4.6.H-2B, 3-SI-4.6.H-2C, MPI-0-000-SNB002, and MPI-0-000-SNB004).

The areas, inclusive of the pins back to building structure and to the component/piping being supported, will remain in the ASME Section XI examination boundary.

Justification For The Granting Of Relief: The current program, as defined by TR 3.7.4, provides for a level of quality and safety equal to or greater than that provided by OM Code 1987, Part 4, and utilizes NRC guidance not incorporated into the OM Code referenced by the 1989 Edition of ASME Section XI.

Examination, testing, repair and replacement of snubbers is currently performed in accordance with TR 3.7.4, which utilizes the guidance provided by NRC in Generic Letter 90-09. The OM Code referenced by ASME Section XI has a different basis for examination (i.e., failure mode groups) and testing plans (10, 37, or 55 percent). It is impractical to implement both plans because of the resulting duplication of examination and testing efforts and different requirements for snubber quantities subject to examination or test, actually examined and/or tested, and sample expansion requirements. This would result in additional cost and unnecessary radiological exposure. The existing TRM program (based on GL 90-09) for examination and testing of snubbers has been promulgated and accepted by NRC. The differences in the two programs could create confusion when selecting test samples, applying acceptance criteria, corrective actions, and examination schedules for failed snubbers. This situation could increase the possibility of applying the wrong action, thus creating a nonconformance, an inoperability, or a violation of TRM requirements.

To eliminate any misinterpretation or confusion in administering overlapping requirements for snubbers, and to remove the possibility of applying contradicting requirements to the same snubber(s), BFN proposes to examine and test snubbers in accordance with BFN TR 3.7.4.

Subarticle IWF-5400 provides the requirements for repair and replacement of snubbers to be in accordance with OM-1987, Part 4. OM-1987, Part 4, Sections 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. Section 1.5.6 also requires an evaluation of the maintenance or repair activity and Section 1.5.7 requires a suitability evaluation of the replacement/modified snubber. TR 3.7.4 (TSR 3.7.4.6) requires replacement snubbers and snubbers

which have repairs which might affect the functional test results to be tested to meet the functional test criteria prior to installation.

Maintenance procedure 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 BFN documents the suitability of repairs, IWA-4130(a)(4), and replacements, IWA-7220.

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 BFN 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 BFN's ASME Section XI repair and replacement program, will be maintained.

REQUEST FOR RELIEF 3-ISI-2 (cont.)

Subarticle IWA-6230 and OM-1987, Part 4, Sections 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. TR 3.7.4 is implemented by surveillance instructions 3-SI-4.6.H-1, 3-SI-4.6.H-2A, 3-SI-4.6.H-2B, and 3-SI-4.6.H-2C and maintenance instruction MPI-0-000-SNB004. These instructions are written and approved in accordance with the TVA Nuclear Quality Assurance 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 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-1987, Part 4.

Based on the justification provided above, BFN's alternative program for examination and testing of snubbers in accordance with TR 3.7.4 will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), TVA requests that relief be granted from the 1989 Edition of ASME Section XI Code requirements related to inservice examination and testing for snubbers.

Implementation Schedule: TR 3.7.4 will be implemented during the Second Ten-Year ASME Section XI Inservice Inspection Interval for snubber examination and testing in lieu of the ASME Code requirements listed above.

Attachment: Browns Ferry Nuclear Plant, Unit 3 Technical Requirements Manual, Section TR 3.7.4, "Snubbers," and the associated bases.

TR 3.7 PLANT SYSTEMS

TR 3.7.4 Snubbers

LCO 3.7.4 During all MODES of operation, all snubbers shall be OPERABLE. All safety-related snubbers are listed in plant procedures.

APPLICABILITY: MODES 1, 2, 3, 4, 5

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more snubber(s) inoperable on a system that is required to be OPERABLE in the current plant Condition.	----------NOTE---------- An engineering evaluation of the components which are restrained by the inoperable snubber(s) shall be completed if this Condition is entered. ----------	
	A.1 Replace or restore the inoperable snubber(s) to OPERABLE status and perform an engineering evaluation on the attached component.	72 hours
	OR	
	A.2 Declare the attached system inoperable. (Refer to applicable TS and TRM LCOs).	72 hours

NOTES

1. Each safety-related snubber shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program and the requirements of this Technical Requirement. These snubbers are listed in plant procedures.
2. As used in this Technical Requirement, "type of snubber" shall mean snubbers of the same design and manufacturer, irrespective of capacity.

TECHNICAL SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
TSR 3.7.4.1	NOTE Snubbers are categorized as inaccessible or accessible during reactor operations. Each of these categories (inaccessible and accessible) may be inspected independently according to the schedule determined by Table 3.7.4-1. The visual inspection interval for each type of snubber shall be determined based upon the criteria provided by Table 3.7.4-1. The first inspection interval determined using Table 3.7.4-1 criteria shall be based on the previous inspection interval established by the requirements in effect before Technical Specification Amendment 183 was issued.	
	Perform visual inspection of required snubber based on the criteria for each category in Table 3.7.4-1 to verify: 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 and to the snubber anchorage are functional.	In accordance with Table 3.7.4-1

(continued)

TECHNICAL SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
TSR 3.7.4.1 (continued)	Additionally, snubbers attached to sections of safety-related systems that have experienced unexpected potentially damaging transients since the last inspection period shall be evaluated for the possibility of concealed damage and functionally tested, if applicable, to confirm OPERABILITY. Snubbers which appear inoperable as a result of visual inspection shall be classified unacceptable. A review and evaluation shall be performed and documented to justify continued operation with an unacceptable snubber. If continued operation cannot be justified, the snubber shall be declared inoperable.	
TSR 3.7.4.2	Perform an in-place or bench functional test of a representative sample of 10% of the total of each type of safety-related snubber. a. The representative sample selected for functional testing shall include the various configurations, operating environments, and the range of size and capacity of snubbers within the types; b. The representative sample should be weighed to include more snubbers from severe service areas such as near heavy equipment; c. The stroke setting and the security of fasteners for attachment of the snubbers to the component and to the snubber anchorage shall be verified.	During each REFUELING OUTAGE

(continued)

TECHNICAL SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
TSR 3.7.4.2 (continued)	The snubber functional test shall verify that: a. Activation (restraining action) is achieved in both tension and compression within the specified range, except that inertia dependent, acceleration limiting mechanical snubbers may be tested to verify only that activation takes place in both directions of travel. b. Snubber bleed, or release where required, is present in both compression and tension within the specified range. c. For mechanical snubbers, the force required to initiate or maintain motion of the snubber is not great enough to overstress the attached piping or component during thermal movement, or to indicate impending failure of the snubber. d. For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified. e. Testing methods may be used to measure parameters indirectly or parameters other than those specified if those results can be correlated to the specified parameters through established methods. An engineering evaluation shall be made of each failure to meet the test acceptance criteria to determine the cause of the failure. The result of this analysis shall be used, if applicable, in selecting snubbers to be tested in the subsequent lot in an effort to determine the OPERABILITY of other	

(continued)

TECHNICAL SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
TSR 3.7.4.2 (continued)	snubbers which may be subject to the same failure mode. Selection of snubbers for future testing may also be based on the failure analysis. The discovery of loose or missing attachment fasteners will be evaluated to determine whether the cause may be localized or generic. The result of the evaluation will be used to select other suspect snubbers for verifying the attachment fasteners, as applicable.	
TSR 3.7.4.3	For each failed snubber, perform in-place or bench functional test on an additional lot equal to 10% of the remainder of that type of snubber. Testing shall continue until no additional inoperable snubbers are found within subsequent lots or all snubbers of the original test type are tested or all suspect snubbers identified by the failure analysis have been tested, as applicable. The functional test criteria shall be as specified in TSR 3.7.4.2.	Once for each discovery of snubber failure to meet functional test acceptance criteria
TSR 3.7.4.4	——————NOTE—————— This testing is independent of the requirements of TSR 3.7.4.3. ———————————————— For any snubber which fails to lockup or fails to move (i.e., frozen in place), evaluate the cause.. If caused by manufacturer or design deficiency, perform in-place or bench functional test of all snubbers of the same design subject to the same defect. The functional test acceptance criteria shall be as specified in TSR 3.7.4.2.	Once for each discovery of snubber failure to lockup or failure to move

(continued)

TECHNICAL SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
TSR 3.7.4.5	Perform an engineering evaluation on the components which are restrained by the snubber(s) found inoperable.	Once for each discovery of an inoperable snubber
TSR 3.7.4.6	Verify replacement snubbers and snubbers which have repairs which might affect the functional test results meet the test criteria of TSR 3.7.4.2. a. These snubbers shall have met the acceptance criteria subsequent to their most recent service; and b. The functional test must have been performed within 12 months before being installed in the unit.	Once prior to installation in the unit for each replacement snubber and each snubber which has repairs which might affect functional test results

Table 3.7.4-1
Snubber Visual Inspection Interval

	NUMBER OF UNACCEPTABLE SNUBBERS		
Population or Category (Notes 1, 2 and 7)	Column A Extend Interval (Notes 3, 6 and 7)	Column B Repeat Interval (Notes 4, 6 and 7)	Column C Reduce Interval (Notes 5, 6 and 7)
1	0	0	1
80	0	0	2
100	0	1	4
150	0	3	8
200	2	5	13
300	5	12	25
400	8	18	36
500	12	24	48
750	20	40	78
1000 or more	29	56	109

Note 1: The next visual inspection interval for a snubber population or category size shall be determined based upon the previous inspection interval and the number of unacceptable snubbers found during that interval. Snubbers may be categorized, based upon their accessibility during power operation, as accessible or inaccessible. These categories may be examined separately or jointly. However, the licensee must make and document that decision before any inspection and shall use that decision as the basis upon which to determine the next inspection interval for that category.

Note 2: Interpolation between population or category sizes and the number of unacceptable snubbers is permissible. Use next lower integer for the value of the limit for Columns A, B, or C if that integer includes a fractional value of unacceptable snubbers as determined by interpolation.

Table 3.7.4-1 (Continued)
Snubber Visual Inspection Interval

Note 3: If the number of unacceptable snubbers is equal to or less than the number in Column A, the next inspection interval may be twice the previous interval but not greater than 48 months.

Note 4: If the number of unacceptable snubbers is equal to or less than the number in Column B but greater than the number in Column A, the next inspection interval shall be the same as the previous interval.

Note 5: If the number of unacceptable snubbers is equal to or greater than the number in Column C, the next inspection interval shall be two-thirds of the previous interval. However, if the number of unacceptable snubbers is less than the number in Column C, but greater than the number in Column B, the next interval shall be reduced proportionally by interpolation, that is, the previous interval shall be reduced by a factor that is one-third of the ratio of the difference between the number of unacceptable snubbers found during the previous interval and the number in Column B to the difference in the numbers in Columns B and C.

Note 6: The provisions of TSR 3.0.1, 3.0.2, and 3.0.3 are applicable for all inspection intervals up to and including 48 months.

Note 7: 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.

Snubbers which have been made inoperable as the result of unexpected transients, isolated damage, or other random events, when the provisions of TSR 3.7.4.5 and TSR 3.7.4.6 have been met and any other appropriate corrective action implemented, shall not be counted in determining the next visual inspection interval.

TR 3.7 PLANT SYSTEMS

TR 3.7.4 Snubbers

BASES

BACKGROUND

Snubbers are designed to prevent unrestrained pipe or component motion under dynamic loads as might occur during an earthquake or severe transient, while allowing normal thermal motion during startup and shutdown. The consequence of an inoperable snubber is an increase in the probability of structural damage to piping or components as a result of a seismic or other event initiating dynamic loads. It is therefore required that all snubbers required to protect the primary coolant system or any other safety system or component be OPERABLE during MODES 1, 2, 3, 4, and 5 when the component or system is required OPERABLE.

APPLICABLE SAFETY ANALYSIS

Once a snubber is found to be inoperable, an engineering evaluation shall be performed to determine the effects on the supported component and the OPERABILITY of the affected system(s). Additionally, only a limited amount of time is allowed for the attached system to be considered OPERABLE, since adequate protection during seismic or other events initiating dynamic loads may not be provided with the snubber inoperable.

LCO 3.7.4

The number of snubbers on each unit and shared systems at BFN are too numerous to list in this Technical Requirement. The surveillance 4.6.H series lists the components that are required.

APPLICABILITY

All MODES are applicable for this requirement since the snubbers affect a wide variety of systems, of which some of the systems are required in one or more MODES of operation. All MODES are covered since every MODE will be applicable for one or more of the supported systems.

However, if a component or system affected by the snubber is not required to be OPERABLE, then the snubber is not required to be OPERABLE. During the times the snubbers are not required to be OPERABLE for an inoperable system , the inoperable snubber(s) will be tracked to prevent declaring the system OPERABLE with unanalyzed inoperable snubbers.

BASES

ACTIONS

A.1 and A.2

Because the protection is required only during relatively low probability events, a period of 72 hours is allowed to replace or restore the inoperable snubber to OPERABLE status and perform an engineering evaluation on the supported component or declare the supported system inoperable. The engineering evaluation is performed to determine whether the mode of failure of the snubber has adversely affected any safety-related component or system.

TECHNICAL SURVEILLANCE REQUIREMENTS

A note is provided to indicate that in this Technical Requirement, "type of snubber" shall mean snubbers of the same design and manufacturer, irrespective of capacity.

An additional not is provided to indicate that each safety-related snubber (listed in plant procedures) shall be demonstrated OPERABLE by performance of the augmented inservice inspection program and requirements of this Technical Requirement. The augmented inservice inspection program includes the following.

To verify snubber OPERABILITY functional test shall be performed during the REFUELING OUTAGEs, at approximately 18-month intervals.

These tests will include stroking of the snubbers to verify proper movement, activation, and bleed or release. Ten percent represents an adequate sample for such tests. Observed failures on these samples will require an engineering analysis and testing of additional units. If the engineering analysis results in the determination that the failure of a snubber to activate or to stroke (i.e., seized components) is the result of manufacture or design deficiency, all snubbers subject to the same defect shall be functionally tested. A thorough visual inspection of the snubber threaded attachments to the pipe or components and the anchorage will be made in conjunction with all required functional tests. The stroke setting of the snubbers selected for functional testing also will be verified.

TECHNICAL SURVEILLANCE REQUIREMENTS (Continued)

All safety-related snubbers are also visually inspected for overall integrity and OPERABILITY. The inspection will include verification of proper orientation, adequate fluid level if applicable, and proper attachment of the snubber to piping and structures. The removal of insulation or the verification of torque values for threaded fasteners is not required for visual inspections.

The visual inspection frequency is based upon maintaining a constant level of snubber protection. The number of inoperable snubbers found during a required inspection determines the time interval for the next required inspection. Inspections performed before that interval has elapsed may be used as a new reference point to determine the next inspection. However, the results of such early inspections performed before the original required time interval has elapsed (nominal time less 25 percent) may not be used to lengthen the required inspection interval. Any inspection whose results require a shorter inspection interval will override the previous schedule.

When the cause of the rejection of a snubber in a visual inspection is clearly established and remedied for that snubber and for any other snubbers that may be generically susceptible and OPERABILITY verified by inservice functional testing, if applicable, that snubber may be reclassified as OPERABLE. Generically susceptible snubbers are those which are of a specific make or model and have the same design features directly related to rejection of the snubber, or are similarly located or exposed to the same environmental conditions such as temperature, radiation, and vibration. Inspection types may be established based on design features, and installed conditions which may be expected to be generic. Each of these inspection types is inspected and tested separately unless an engineering analysis indicates the inspection type is improperly constituted. All suspect snubbers are subject to inspection and testing regardless of inspection type.

Exemption from Visual Inspection or Functional Tests:

Permanent or other exemptions from visual inspections and/or functional testing for individual snubbers may be granted by the Commission if a justifiable basis for exemption is presented and if applicable snubber life destructive testing was performed to qualify snubber OPERABILITY for the applicable design conditions at either the completion of their fabrication or at a subsequent date. Snubbers so exempted shall continue to be listed in the plant instructions with footnotes indicating the extent of the exemptions.

TECHNICAL SURVEILLANCE REQUIREMENTS (continued)

Snubber Service Life Program:

The service life of snubbers may be extended based on an evaluation of the records of functional tests, maintenance history, and environmental conditions to which the snubbers have been exposed.

The following will be implemented by the augmented inservice inspection program:

TSR 3.7.4.1

Visual Inspections:

Snubbers are categorized as inaccessible or accessible during reactor operation. Each of these categories (inaccessible and accessible) may be inspected independently according to the schedule determined by Table 3.7.4-1. The visual inspection interval for each type of snubber shall be determined based upon the criteria provided in Table 3.7.4-1 and the first inspection interval determined using this criteria shall be based upon the previous inspection interval as established by the requirements in effect before Technical Specification amendment No. 183.

Visual Inspection Acceptance Criteria:

Visual inspections shall verify that (1) the snubber has no visible indications of damage or impaired OPERABILITY, (2) attachments to the foundation or supporting structure are functional, and (3) fasteners for the attachment of the snubber to the component and to the snubber anchorage are functional. 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.

A review and evaluation shall be performed and documented to justify continued operation with an unacceptable snubber. If continued operation cannot be justified, the snubber shall be declared inoperable.

TECHNICAL SURVEILLANCE REQUIREMENTS

TSR 3.7.4.1 (continued)

Additionally, snubbers attached to sections of safety-related systems that have experienced unexpected potentially damaging transients since the last inspection period shall be evaluated for the possibility of concealed damage and functionally tested, if applicable, to confirm OPERABILITY. Snubbers which have been made inoperable as the result of unexpected transients, isolated damage, or other random events, when the provisions of TSR 3.7.4.5 and 3.7.4.6 have been met and any other appropriate corrective action implemented, shall not be counted in determining the next visual inspection interval.

TSR 3.7.4.2, TSR 3.7.4.3, and TSR 3.7.4.4

Functional Test Schedule, Lot Size, and Composition:

During each REFUELING OUTAGE, a representative sample of 10% of the total of each type of safety-related snubbers in use in the plant shall be functionally tested either in place or in a bench test. The representative sample selected for functional testing shall include the various configurations, operating environments, and the range of size and capacity of snubbers within the types. The representative sample should be weighed to include more snubbers from severe service areas such as near heavy equipment. The stroke setting and the security of fasteners for attachment of the snubbers to the component and to the snubber anchorage shall be verified on snubbers selected for functional tests.

Functional Test Acceptance Criteria:

The snubber functional test shall verify that:

a. Activation (restraining action) is achieved in both tension and compression within the specified range, except that inertia dependent, acceleration limiting mechanical snubbers may be tested to verify only that activation takes place in both directions of travel.

b. Snubber bleed, or release where required, is present in both compression and tension within the specified range.

TECHNICAL SURVEILLANCE REQUIREMENTS

TSR 3.7.4.2, TSR 3.7.4.3, and TSR 3.7.4.4 (continued)

c. For mechanical snubbers, the force required to initiate or maintain motion of the snubber is not great enough to overstress the attached piping or component during thermal movement, or to indicate impending failure of the snubber.

d. For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified.

e. Testing methods may be used to measure parameters indirectly or parameters other than those specified if those results can be correlated to the specified parameters through established methods.

Functional Test Failure Analysis and Additional Test Lots:

An engineering evaluation shall be made of each failure to meet the functional test acceptance criteria to determine the cause of the failure. The result of this analysis shall be used, if applicable, in selecting snubbers to be tested in the subsequent lot in an effort to determine the OPERABILITY of other snubbers which may be subject to the same failure mode. Selection of snubbers for future testing may also be based on the failure analysis. The discovery of loose or missing attachment fasteners will be evaluated to determine whether the cause may be localized or generic. The result of the evaluation will be used to select other suspect snubbers for verifying the attachment fasteners, as applicable.

For each snubber that does not meet the functional test acceptance criteria, an additional lot equal to 10 percent of the remainder of that type of snubbers shall be functionally tested. Testing shall continue until no additional inoperable snubbers are found within subsequent lots or all snubbers of the original functional test type have been tested or all suspect snubbers identified by the failure analysis have been tested, as applicable. If any snubber selected for functional testing either fails to lockup or fails to move, i.e., frozen in place, the cause will be evaluated and if caused by manufacturer or design deficiency, all snubbers of the same design subject to the same defect shall be functionally tested. This testing requirement shall be independent of the requirements stated above for snubbers not meeting the functional test acceptance criteria.

TECHNICAL SURVEILLANCE REQUIREMENTS (continued)

TSR 3.7.4.5

Functional Test Failure - Attached Component Analysis:

For the snubber(s) found inoperable, an engineering evaluation shall be performed on the components which are restrained by the snubber(s). The purpose of this engineering evaluation shall be to determine if the components restrained by the snubber(s) were adversely affected by the inoperability of the snubber(s), and in order to ensure that the restrained component remains capable of meeting the designed service.

TSR 3.7.4.6

Functional Testing Of Repaired and Spare Snubbers:

Snubbers which fail the visual inspection or the functional test acceptance criteria shall be repaired or replaced. Replacement snubbers and snubbers which have repairs which might affect the functional test results shall meet the functional test criteria before installation in the unit. These snubbers shall have met the acceptance criteria subsequent to their most recent service, and the functional test must have been performed within 12 months before being installed in the unit.

REFERENCES

1. BFN Technical Specifications (version prior to standardized version)

ATTACHMENT A

BFN Unit 3 Inservice Inspection Classification Boundary Diagrams

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