ENCLOSURE

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 3
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI, INSERVIE INSPECTION (ISI) PROGRAM

SUBMITTAL OF THIRD TEN-YEAR INSPECTION INTERVAL PROGRAM

(SEE ATTACHED)

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

SURVEILLANCE INSTRUCTION

3-SI-4.6.G

INSERVICE INSPECTION AND RISK - INFORMED INSERVICE INSPECTION PROGRAM UNIT 3

REVISION 021A

PREPARED BY: .

RESPONSIBLE ORGANIZATION: COMPONENT ENGINEERING

APPROVED BY: DATE:

EFFECTIVE DATE:

LEVEL OF USE: CONTINUOUS USE

QUALITY-RELATED

REVISION LOG

Procedure Number: 3-SI-4.6.G Revision Number: 021A

Pages Affected: All

Description of Change: IC-23: Revised to reflect 10 year update for Third Interval

TABLE OF CONTENTS

OWNER'S STATEMENT

Owner:	Tennessee Valley Authority
Address of Corporate Office:	Chattanooga Office Complex 1101 Market St. Chattanooga, TN 37402-2801
Name & Address of Power Plant:	Browns Ferry Nuclear Plant P. O. Box 2000 Decatur, AL 35609
Applicable Nuclear Power Unit:	BFN, Unit 3
Construction Permit Date:	July 31, 1968
Commercial Operation Date:	March 1, 1977
First 10 Year ISI Interval:	March 1, 1977 through November 18, 1996
Second 10 Year ISI Interval	November 19, 1996 through November 18, 2005
Third 10 Year ISI Interval	November 19, 2005 through November 18, 2015 (projected)

1.0 INTRODUCTION

1.1 Purpose

This Inservice Inspection (ISI) Program is an administrative surveillance instruction (SI) utilized to obtain data through nondestructive examinations (NDE) required by ASME Section XI. This procedure satisfies portions of Technical Requirement 3.4.3 (TR 3.4.3) and to fulfill the requirements of SPP-9.1, related to NDE of code class 1, 2, and 3 equivalent components in accordance with applicable ASME Section XI requirements. NDE results are used to verify continued structural integrity of the subject components and their acceptability for continued service, and to determine if a flaw is an isolated case or of a generic nature.

This program shall serve as TVA's ISI/NDE plan and schedule for ASME Code Class 1, 2, and 3 (equivalent) components, in accordance with the requirements of ASME Section XI, IWA-1400 for the third ten year ISI interval.

1.2 Scope

The Inservice Inspection Program (ISI) is designed to comply with the 2001 Edition with the 2003 Addenda of American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME) Section XI, Division 1, with the exception of piping welds. For piping welds, an alternative inspection program the BFN Risk-Informed Inservice Inspection Program (RI-ISI) shall be utilized as outlined in Section 7.12. This program describes an acceptable alternative approach to the existing Section XI requirements for scope and frequency of piping weld inspections, and satisfies the criteria of 10 CFR 50.55a(a)(3)(i) providing an acceptable level of quality and safety.

Relief requests are issued for regulatory review and approval when implementation of ASME Section XI requirements is determined to be impractical in accordance with 10 CFR 50.55a(g)(4). This program provides for implementation in accordance with the Program B scheduling requirements of ASME Section XI, IWA-2432.

The ASME Section XI Code of record for the BFN Unit 3 third ten-year inservice inspection interval is the 2001 Edition with the 2003 Addenda. Subarticle IWA-2430 of the Code describes the inservice inspection interval inspection schedule and provides options for extending or decreasing the inspection interval for up to one year.

1.0 INTRODUCTION (continued)

ASME Section XI Code Class (equivalent) boundaries are depicted on the color-coded drawings listed in section 2.5.1. These drawings are prepared and maintained by Component Engineering and are issued and controlled through BFN Records Management (RM).

The ASME Section XI Code Class (equivalent) Boundary Drawings, ISI Drawings, and the RI-ISI Drawings identify the components and systems to be examined. The Unit 3 ISI Component and Component Support Drawings are listed in section 2.5.2.

Certain elements of ASME Section XI (repairs and replacements, system pressure tests, pump and valve inservice testing, snubber examination and inservice testing, and containment inservice inspection) are implemented by other site procedures. Refer to sections 7.7 and 7.8.

1.3 Frequency

1.3.1 Inspection Interval and Inspection Periods

This inspection interval is from November 19, 2005 to November 18, 2015. The inspection interval is divided into three periods in accordance with ASME Section XI, IWA-2432, Inspection Program B. Reference Section 1.2.

The associated inspection period dates are listed below:

Inspection Period	Minimum Exams	Maximum Exams
First (11/19/2005-11/18/2008)	16%	50%
Second (11/19/2008-11/18/2012)	50%	75%
Third (11/19/2012-11/18/2015)	100%	100%

If the first period completion percentage for any examination category exceeds 34%, at least 16% of the required examinations shall be performed in the second period.

The minimum and maximum examination percentages are applicable to those examination categories where deferral is not permissible.

The inspection interval may be extended in accordance with IWA-2430(e) if unit 3 is out of service continuously for six months or more.

1.0 INTRODUCTION (continued)

1.4 SECTION XI REQUIREMENTS

1.4.1 Section XI Code of Record and Risk Informed ISI Program

This program is in effect for BFN Unit 3 during the third inspection interval which will begin November 19, 2005. The unit 1 and 2 ISI programs are contained in 1-, and 2-SI.4.6.G, respectively.
The code of record for the unit 3 third inspection interval is the 2001 Edition with the 2003 Addenda of ASME Section XI. The effective code edition and addenda are determined in accordance with 10 CFR 50.55a(g)(4).

A Risk-Informed Inservice Inspection Program (RI-ISI) provides an alternative to the requirements of Subsections IWB and IWC for inservice inspection of Class 1 and 2 piping. A RI-ISI Program in accordance with 10 CFR 50.55a(a)(3)(i) and Code Case N-577, with the more detailed provisions provided in WCAP-14572, Revision 1-NP-A, "Westinghouse Owners Group Application Of Risk - Informed Methods To Piping Inservice Inspection Topical Report" shall be utilized. This code case provides risk-informed requirements for inservice inspection of Class 1 and Class 2 piping. These requirements are an alternative to the requirements of examination categories B-F, B-J, C-F-1, and C-F-2. Refer to section 7.3.1.E and section 7.12.

ASME Section XI Technical Interpretation #IN04-009 is utilized with respect to Section XI, Table IWB-2500-1, Examination Category B-G-1, Item No. B6.50.

Certification of NDE personnel shall be in accordance with ANSI/ASNT CP-189, 1995, Standard for Qualification and Certification of Nondestructive Testing Personnel, per the requirements of ASME Section XI, Division 1, 2001 Edition, with the 2003 Addenda.

1.4.1.1 10 CFR 50.55a Limitations and Modifications

Optional 10 CFR 50.55a Limitations and Modifications were published in a Final Rule dated October 1 2004 (69FR58804) and became effective on November 1, 2004. These Limitations and Modifications were reviewed for inclusion in the ISI Program and none of the optional modifications will be utilized.

1.0 INTRODUCTION (continued)

1.4.2 Section XI Code Cases

The following code cases have been approved for use by the NRC in Regulatory Guide 1.147 Revision 14 and have been adopted by TVA for use at BFN Unit 3:

Code Case N-526, Alternative requirements for Successive Inspections of Class 1, 2, and 3 Vessels Section XI, Division 1.

Code Case N-586, Alternate Additional Examination requirements for Class 1, 2, and 3 Piping, Components, and Supports Section XI, Division 1, subject to the following conditions:

The engineering evaluations addressed under item (a) and the additional examinations addressed under Item (b) shall be performed during this outage.

If the additional examinations performed under (b) reveal indications exceeding the applicable acceptance criteria of Section XI, the engineering evaluations and the examinations shall be further extended to include additional evacuations and examinations at this outage.

Code Case N-624, Successive Inspections, Section XI, Division 1.

Code Case N-648-1, Alternative Requirements for Inner Radius Examination of Class 1 Reactor Vessel Nozzles, Section XI Division 1, subject to the following conditions:

In place of a UT examination, a visual examination with enhanced magnification that has a resolution sensitivity to detect a 1-mil width wire or crack, utilizing the allowable flaw length criteria of Table IWB-3512-1 with limiting assumptions on the flaw aspect ration will be performed. The provisions of Table IWB-2500-1, Examination Category B-D, continue to apply except that, in place of examination volumes, the surfaces to be examined are the external surfaces shown in the figures applicable to this table.

1.0 INTRODUCTION (continued)

1.4.3 Preservice Inspection (PSI) History

A PSI program was not required for Unit 3 based on its construction permit date of July 31, 1968. TVA performed a voluntary PSI for Class 1 components to the 1971 Edition, Summer 1971 Addenda of ASME Section XI.

1.4.4 First Inspection Interval History

The first inspection interval began March 1, 1977 and ended November 18, 1996 and was prepared to comply with the 1974 Edition, Summer 1975 Addenda of ASME Section XI. Ultrasonic examination and evaluation of piping welds was upgraded to the 1977 Edition, Summer 1978 Addenda of ASME Section XI beginning July 1, 1991.

Commencing January 1, 1992, the PSI of piping welds, including the extent of examination (Examination Categories B-F, B-J, and C-F), was upgraded to the 1977 Edition, Summer 1978 Addenda of ASME Section XI. From June 12, 1992 to December 15, 1995, NDE methods, qualification, of personnel, weld reference system, and standards for examination evaluation were in accordance with the 1986 Edition of ASME Section XI. From December 15, 1995 to September 30, 1996.

NDE methods, qualification of personnel, weld reference system, and standards for examination evaluation were in accordance with the 1989 Edition of ASME Section XI.

1.4.5 Second Inspection Interval History

The second inspection interval began November 19, 1996 and ended November 18, 2005 and was prepared to comply with the 1989 Edition (no addenda) of ASME Section XI. In the second and third inspection periods as an alternative inspection program for piping welds the BFN Risk-Informed Inservice Inspection Program (RI-ISI) was utilized.

For the first period and the first cycle of the second period, certification of NDE personnel was in accordance with the 1984 Edition of ASNT SNT-TC-1A. Effective May 25, 2001, certification f NDE personnel was in accordance with ANSI/ASNT CP-189, 1991, Standard for Qualification and Certification of Nondestructive Testing Personnel, as amended by the requirements of Division 1, ASME Section XI, Division 1, including editions through 1995 Edition, 1996 Addenda.

1.0 INTRODUCTION (continued)

Effective May 25, 2001 the Nondestructive Examination Program (NDE techniques, qualification of personnel, weld reference system, and standards for examination evaluation) were in accordance with ASME Section XI, Division 1, including editions through the 1995 Edition, 1996 Addenda as stated below. Reference Letter of Intent (RIMS # L44010810800) sent to NRC on August 10, 2001.

For VT-2 (visual examinations) for system leakage and hydrostatic tests TVA utilized portions of the 1998 Edition of ASME Section XI Code, Paragraph IWA-2316, associated with alternate qualification of VT-2 examination personnel for observation of leakage during system leakage and hydrostatic tests.

For the remainder of the second inservice inspection interval for Unit 3, paragraph, IWA-2316 of the 1998 ASME Code was only used to qualify alternate VT-2 examiners who observe system leakage tests or fluid hydrostatic tests conducted in accordance with the IWA-5211 (a) and (b), 1998 Edition through the later edition and addenda incorporated by reference in 10 CFR 50.55a (b) (2). TVA requested by letter to the NRC dated September 26, 2003. This was approved by the NRC by letter dated January 14, 2004.

2.0 REFERENCES

2.1 Technical Specifications

BFN Unit 3 Technical Requirement 3.4.3.

2.2 Final Safety Analysis Report

Browns Ferry Nuclear Plant Updated Final Safety Analysis Report, Volume 2, Section 4.12.

2.3 NRC Documents

10 CFR 50.55a(g), Code of Federal Regulations, *Codes and Standards*

10 CFR 50.2, Code of Federal Regulations, *Definitions*

BWR (Boiling Water Reactor) Vessel and Internals Project, Technical Basis for Revisions to Generic Letter (GL) 88-01 Inspection Schedules (BWRVIP-75). Reference Safety Evaluation Report (SER), RIMS # L44 020320 001 from NRC dated March 15, 2002.

Regulatory Guide 1.26, Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants

Regulatory Guide 1.147, Inservice Inspection Code Case Acceptability ASME Section XI Division I

Regulatory Guide 1.174, An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions of Plant-Specific Changes to the Licensing Basis

Regulatory Guide 1.178, An Approach for Plant-Specific Risk-Informed Decisionmaking: Inservice Inspection of Piping

IE Bulletin 80-13, Core Spray Spargers

Generic Letter 88-01, NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping

NUREG-0313, Rev. 2, Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping, Final Report

NUREG-0619, BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking.

2.0 REFERENCES (Continued)

2.4 Plant Procedures and Instructions

SDP-NADP-1, Conduct of Quality Assurance

SDP-NEDP-3, Drawing Control

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

1-SI-4.6.G, Inservice Inspection Program for Unit 1

2-SI-4.6.G, Inservice Inspection Program for Unit 2

3-SI-4.6.G-A, Analysis For Risk - Informed Inservice Inspection Program Unit 3

3-TI-140, Monitoring Program For Flow Accelerated Corrosion

0-TI-376, ASME Section XI Containment Inservice Inspection Program Units 2 and 3

0-TI-365, Reactor Vessel Internals Inspection Units 1, 2, and 3

0-TI-400, ASME Section XI Inservice Inspection Program Responsibilities And Interface Document.

MSI-0-001-VSL001, Reactor Vessel Disassembly and Reassembly

MCI-2-068-PMP001, Maintenance of Reactor Water Recirculation Pumps, Unit 2

MCI-3-068-PMP001, Maintenance of Reactor Water Recirculation Pumps, Unit 3

IEP-100, Nondestructive Examination Procedures Approved for use on CSSC Items at all Nuclear Plants

IEP-200, Qualification and Certification Requirements for NQA NDE Personnel

IEP-300, Qualification and Certification of Ultrasonic TVA Nuclear (TVAN) Personnel for Preservice and Inservice ASME Section XI Examinations.

MCI-0-001-VLV001, Main Steam Isolation Valves Atwood Morrill Co. Disassembly, Inspection, Rework, and Reassembly.

MCI-0-001-VLV002, Main Steam Relief Valves Target Rock Model 7567 Disassembly, Inspection, Rework, and Reassembly

2.0 REFERENCES (continued)

2.5 Drawings

2.5.1 Unit 3 Section XI Code Class Boundary Drawings

3-47E600-57A-ISI, RCS Instrumentation

3-47E3600-301-ISI, Mechanical Instruments and Controls

3-47E3600-302-ISI, Mechanical Instruments and Controls

3-47E610-43-1-ISI, Sampling and Water Quality System

3-47E610-43-6-ISI, Sampling and Water Quality System

3-47E801-1-ISI, Main Steam

3-47E801-2-ISI, Main Steam

3-47E803-1-ISI, Feedwater System

3-47E803-5-ISI, Reactor Pressure Vessel Sensing Lines

3-47E805-3-ISI, Heater Drains and Vents and Miscellaneous Piping

3-47E807-1-ISI, Turbine Drains & Misc. Piping

3-47E807-2-ISI, Turbine Drains & Misc. Piping

3-47E810-1-ISI, Reactor Water Clean-up System

3-47E811-1-ISI, Residual Heat Removal System

3-47E812-1-ISI, High Pressure Coolant Injection System

3-47E813-1-ISI, Reactor Core Isolation Cooling System

3-47E814-1-ISI, Core Spray System

3-47E817-1-ISI, Nuclear Boiler

3-47E820-2-ISI, Control Rod Drive Hydraulic System

3-47E820-6-ISI, Control Rod Drive Hydraulic System

2.0 REFERENCES (continued)

3-47E822-1-ISI, Reactor Building Closed Cooling Water System

0-47E839-5-ISI, Raw Water Chemical Treatment System

3-47E852-1-ISI, Floor & Dirty Radwaste Drainage System

3-47E852-2-ISI, Clean Radwaste & Decon. Drainage System

3-47E854-1-ISI, Standby Liquid Control System

3-47E855-1-ISI, Fuel Pool Cooling System

3-47E856-2-ISI, Demineralized Water System

3-47E858-1-ISI, RHR Service Water System

3-47E859-1-ISI, Emergency Equipment Cooling Water System

3-47E859-2-ISI, Emergency Equipment Cooling Water System

3-47E866-5-ISI, Air Conditioning Chilled Water

3-47E866-7-ISI, Air Conditioning Chilled Water

3-47E867-3-ISI, Sampling and Water Quality System

0-117C2556-4-ISI, Rack 25-18

0-117C2556-5-ISI, Rack 25-18

3-117C2563-4-ISI, Rack 25-51

3-117C2563-5-ISI, Rack 25-51

3-117C2564-4-ISI, Rack 25-52

3-117C2564-5-ISI, Rack 25-52

2.5.2 Unit 3 ISI Component and Component Support Drawings

3-ISI-0220-C, RPV Shell Course Weld/Nozzle Locations

2.0 REFERENCES (continued)

3-ISI-0267-C, Vessel Stud Locations

3-ISI-0295-A, Closure Head Assembly Weld Locations

3-ISI-0293-C, Control Rod Drive RPV Penetrations

ISI-0445-C, Bottom Head Assembly Weld Locations

3-ISI-0422-C, RHR Heat Exchanger Weld Locations

3-ISI-0033-C, RBCCW System Class 2 Weld Locations

3-ISI-0102-C, Core Spray System Class 2 Weld Locations

3-ISI-0143-C, CRD System Class 2 Weld Locations

3-ISI-0327-C, Feedwater System Class 1 Weld Locations

3-ISI-0328-C, Recirculation System Class 1 Weld Locations

3-ISI-0329-C, Main Steam System Class 1 Weld Locations

3-ISI-0330-C, RHR System Class 1 Weld Locations

3-ISI-0331-C, Core Spray System Class 1 Weld Locations

3-ISI-0332-C, CRD, RCIC, and RWCU System Class 1 Weld Locations

3-ISI-0333-C, HPCI and RWCU Systems Class 1 Weld Locations

3-ISI-0354-C, Main Steam System Class 2 Weld Locations

3-ISI-0393-C, RHR System Class 2 Weld Locations

3-ISI-0411-C, Jet Pump Instr. Nozzle Class 1 Weld Locations

3-CHM-2407-C, HPCI System Class 2 Weld Locations

3-CHM-2408-C, RCIC System Class 2 Weld Location

3-ISI-0034-C, RBCCW System Class 2 Support Locations

3-ISI-0104-C, Core Spray System Class 2 Support Locations

2.0 REFERENCES (continued)

3-ISI-0144-C, CRD Scram Discharge System Class 2 Support Locations

3-ISI-0334-C, RWCU and RCIC Support Locations

3-ISI-0335-C, HPCI and RWCU Systems Class 1 Support Locations

3-ISI-0336-C, Feedwater System Class 1 Support Locations

3-ISI-0337-C, Recirculation System Class 1 Support Locations

3-ISI-0338-C, Main Steam System Class 1 Support Locations

3-ISI-0339-C, Core Spray System Class 1 Support Locations

3-ISI-0340-C, RHR System Class 1 Support Locations

3-ISI-0355-C, Main Steam System Class 2 Support Locations

3-ISI-0390-C, EECW System Class 3 Support Locations

3-ISI-0395-C, RHR System Class 2 Support Locations

3-ISI-0453-C, MSRV System Vent Piping Class 3 Support Locations

3-CHM-2412-C, RCIC System Class 2 Support Locations

3-CHM-2413-C, HPCI System Class 2 Support Locations

3-CHM-2416-C, RHRSW Class 3 Support Locations

3-CHM-2429-C, FPCS Class 3 Support Locations

3-ISI-0313-B, Main Steam Class 1 Bolted Connections

3-ISI-0413-C, Recirculation Pump Class 1 Bolting Locations

3-ISI-0311-B, RHR Class 2 Pump Support

3-ISI-0416-C, Reactor Vessel Supports

ISI-0317-A, Reactor Vessel Clad Patches

2.0 REFERENCES (continued)

ISI-0344-A, Reactor Vessel Core Differential Pressure and Liquid Control Nozzle Weld Locations

ISI-0346-A, Reactor Vessel Instrumentation Nozzles Weld Locations

ISI-0348-B, Reactor Vessel Recirculation Inlet Nozzles

ISI-0368-C, EECW S Support Locations

2.5.3 Unit 3 Risk-Informed ISI Segment Boundary Drawings

3-001-RIISI-01, Main Steam Risk Informed Segment Boundary

3-001-RIISI-02, Main Steam Risk Informed Segment Boundary

3-001-RIISI-03, Main Steam Risk Informed Segment Boundary

3-001-RIISI-04, Main Steam Risk Informed Segment Boundary

3-003-RIISI-01, Reactor Feedwater Risk Informed Segment Boundary

3-003-RIISI-01, Reactor Feedwater Risk Informed Segment Boundary

3-003-RIISI-02, Reactor Feedwater Risk Informed Segment Boundary

3-003-RIISI-03, Reactor Feedwater Risk Informed Segment Boundary

3-063-RIISI-001, Unit 3 Standby Liquid Control Risk Informed Segment Boundary

3-068-RIISI-01, Unit 3 Reactor Water Reciculation, Drains, Vents and Blowdown System Risk Informed Segment Boundary

3-069-RIISI-01, Unit 3 Reactor Water Cleanup Demineralizer Risk Informed Segment Boundary

3-069-RIISI-02, Unit 3 Reactor Water Cleanup Risk Informed Segment Boundary

3-070-RIISI-01, Unit 3 Reactor Building Closed Cooling Water Risk Informed Segment Boundary

3-070-RIISI-02, Unit 3 Reactor Building Closed Cooling Water Risk Informed Segment Boundary

2.0 REFERENCES (continued)

3-070-RIISI-03, Unit 3 Reactor Building Closed Cooling Water Risk Informed Segment Boundary

3-070-RIISI-04, Unit 3 Reactor Building Closed Cooling Water Risk Informed Segment Boundary

3-071-RIISI-01, Unit 3 Reactor Core Isolation Cooling Risk Informed Segment Boundary

3-071-RIISI-02, Unit 3 Reactor Core Isolation Cooling Risk Informed Segment Boundary

3-071-RIISI-03, Unit 3 Reactor Core Isolation Cooling Risk Informed Segment Boundary

3-073-RIISI-01, Unit 3 High Pressure Coolant Injection Risk Informed Segment Boundary

3-073-RIISI-02, Unit 3 High Pressure Coolant Injection Risk Informed Segment Boundary

3-074-RIISI-01, Unit 3 Residual Heat Removal Risk Informed Segment Boundary

3-074-RIISI-02, Unit 3 Residual Heat Removal Risk Informed Segment Boundary

3-074-RIISI-03, Unit 3 Residual Heat Removal Risk Informed Segment Boundary

3-074-RIISI-04, Unit 3 Residual Heat Removal Risk Informed Segment Boundary

3-074-RIISI-05, Unit 3 Residual Heat Removal Risk Informed Segment Boundary

3-075-RIISI-01, Unit 3 Core Spray System Risk Informed Segment Boundary

3-075-RIISI-02, Unit 3 Core Spray System Risk Informed Segment Boundary

3-078-RIISI-01, Unit 3 Fuel Pool Cooling Risk Informed Segment Boundary

2.0 REFERENCES (continued)

3-085-RIISI-01, Unit 3 Control Rod Drive Risk Informed Segment Boundary

3-085-RIISI-02, Unit 3 Control Rod Drive Risk Informed Segment Boundary

3-085-RIISI-03, Unit 3 Control Rod Drive Risk Informed Segment Boundary

3-085-RIISI-04, Unit 3 Control Rod Drive Risk Informed Segment Boundary

2.6 Vendor Manuals

2.6.1 BFN-VTM-B014-0010, B&W Reactor Pressure Vessel Manual, Contract 66C60-90744

2.6.2 BFN-VTM-B580-0010, B&J Recirculation Pump Manual, Contract 67C60-91750

2.6.3 BFN-VTM-B260-0030, Bingham Pump Co. RHR Pump Manual, Contract 66C60-90744

2.6.4 BFN-VTM-P160-0010, VTM-P160-0010, Vendor Technical Manual for Perfex Corp. Heat Exchangers, Types NEN, CEU, CES, and CEN

2.7 Reference Documents

2.7.1 ASME Boiler and Pressure Vessel Code, Section XI, Division 1, 2001 Edition with 2003 Addenda.

2.7.2 ASME Section XI Code Cases as listed in Section 1.4.

2.7.3 GE SIL No. 571, Instrument Nozzle Safe End Inspection

2.7.4 Boiling Water Reactor Vessel and Internals Project (BWRVIP) BWRVIP-27, “BWR Vessel and Internals Project, BWR Standby Liquid Control System/Core Plate delta/P Inspection and Flaw Evaluation Guidelines.”

2.7.5 Boiling Water Reactor Vessel and Internals Project (BWRVIP) BWRVIP-49, “BWR Vessel and Internals Project, Instrument Penetration Inspection and Flaw Evaluation Guidelines.”

2.7.6 NRC Information Notice 98-42: Implementation of 10 CFR 50.55a (g) Inservice Inspection Requirements.

2.0 REFERENCES (continued)

2.8 Miscellaneous Documents

2.8.1 BFPER951466, Inservice Inspection Program Problem Evaluation Report Units 1& 3.

2.8.2 DNE Calculation, Exclusion Criteria for ISI Scope. RIMS R14950829109, R14010222101, and R14020405108. (MD-Q0999-950033) This reference refers to Section XI activities not covered under the Risk-Informed Program. The Risk - Informed Program was implemented in the Interval 2.

2.8.3 GE Letter Nos.: BFSE 93-143, BFSE 94-001, BFSE 94-002, BFSE 94-005, and BFSE 94-007.

2.8.4 Memorandum from K. L. Groom to F. W. Froscello, dated August 22, 1996, NRC IEB 88-01 IGSCC for Unit 2 and 3 Core Spray Safe-End Replacement Weld, RIMS R92960821851

2.9 TVAN Standard Programs and Processes

2.9.1 SPP-2.2, Administration of Site Technical Procedures

2.9.2 SPP-3.1, Corrective Action Program

2.9.3 SPP-3.5, Regulatory Reporting Requirements

2.9.4 SPP-9.1, ASME Section XI

2.9.5 SPP-9.3, Plant Modifications and Design Change Control

2.9.6 SPP-2.4, Records Management

3.0 PRECAUTIONS AND LIMITATIONS

3.1 RADCON shall be contacted prior to any work in a radiologically controlled area (RCA). RADCON shall determine the requirements for a radiological work permit (RWP) and any other radiological requirements.

3.2 Standard safety practices as outlined in the TVA Health and Safety Manual shall be followed.

3.3 Efforts should be made to ensure proper planning to reduce delays and radiation exposure during performance of examinations.

3.4 Any revisions to this instruction initiated by other groups shall be submitted to Components Engineering for concurrence prior to incorporation.

4.0 PREREQUISITES

4.1 Personnel responsible for performance of examinations should familiarize themselves with the requirements of this program prior to performing the examinations. Specifics concerning performance of NDE are not a part of this program, but are included in Inspection Services Organization (ISO) Program Manuals, Section 2, Engineering NDE Procedures.

5.0 SPECIAL TOOLS AND EQUIPMENT

Equipment is specified in the applicable NDE procedure utilized for performance of the examination.

6.0 ACCEPTANCE STANDARDS

Acceptance criteria are specified in the applicable NDE procedures of Inspection Services Organization (ISO) Programs Manual, Section 2, Engineering NDE Procedures., which are in compliance with ASME Section XI, Articles IWA-3000, IWB-3000, IWC-3000, IWD-3000, and IWF-3000.

Evaluation of examinations is performed in accordance with IWB-3132.3, IWB-3142.4, IWC-3122.3, IWC-3132.3, IWF-3112.3, or IWF-3122.3 and shall be submitted to the regulatory authority having jurisdiction at the plant site. This information may be submitted with the Inservice Inspection Summary Report including Form NIS-1 or, if deemed necessary, a separate report shall be submitted.

7.0 INSTRUCTION STEPS/ELEMENTS

7.1 Responsibilities

7.1.1 Materials Technology and Codes

A. Providing ASME Section XI interpretations as requested by various site organizations or as required in program development and implementation.

B. Providing assessment and oversight of ISI programs and activities, including review of ISI Program reports and submittals prior to issuance.

C. Review of relief requests prior to issuance.

7.1.2 Component Engineering

A. Defining ASME Section XI Code Class 1, 2, and 3 equivalent boundaries in accordance with applicable guidelines (e.g.: 10 CFR 50.2, 10 CFR 50.55a, ASME Section XI, Regulatory Guide 1.26, and others).

B. Preparing/revising ASME Section XI Code Class boundary drawings to identify the ASME Section XI Class 1, 2, and 3 equivalent boundaries within each plant system as defined in 7.1.2.A. Reference procedure 0-TI-400. See Section 2.5 for drawing list.

C. Preparing/revising ASME Section XI ISI and RI-ISI drawings that identify the Class 1, 2, and 3 equivalent components (including supports) that require NDE to comply with ASME Section XI requirements. See Section 2.5 for drawing list.

D. Preparing/revising this instruction (ISI Program) in accordance with SPP-2.2, and submitting it to:

(1) Site Procedures for approval and issue as a controlled document.

(2) RM for subsequent submittal to the ANII for a detailed review per IWA-2110(a)(1) and (a)(2).

(3) Site Licensing for subsequent submittal to the NRC, as required.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

E. Ensuring this program includes the following information as a minimum:

(1) The ASME Section XI Code of Record for ISI

(2) Inspection interval number and begin/end dates

(3) List of ASME Section XI code class boundary drawings

(4) List of ASME Section XI ISI drawings

(5) ASME Section XI Examination Category and Item Number for components.

(6) Examination schedule providing quantities for each applicable code item number distributed over each period of the inspection interval

(7) NDE method required for each code item number

(8) Applicable relief requests

(9) Name and address of Owner

(10) Name and address of generating plant

(11) Name or number designation of the unit

(12) Commercial operation date of the unit

(13) Description of the system utilized for maintaining record of completed examinations

(14) Description of scan plan contents and control

(15) Applicable augmented examination requirements and their basis.

(16) Code Cases proposed for use and the extent of their application.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

(17) Ensuring the RI-ISI Program is maintained as a Living Program. Review the RI-ISI Program on a basis of periods that coincide with the inspection program requirements contained in Section XI Inspection Program B.

F. Providing a list of components scheduled for examination during each refueling outage to Inspection Services Organization (ISO) for scan plan development. This list shall include the component identifier, ASME Section XI examination category and item number, ISI drawing number and sheet number, and examination requirement source.

G. Component Engineering will request prior to each refueling outage, a list of Flow Accelerated Corrosion (FAC) examinations to be taken credit for in the RI-ISI Program from Mechanical Nuclear Design to be included in the scan plan. Agreement of the FAC examinations required for the RI-ISI Program will be documented by a signature from Mechanical Nuclear Design on the scan plan.

H. Approving scan plan and revisions and submitting copies of the approved scan plan to site management and the ANII.

I. Determining scope of additional samples and notification of site engineering when an indication(s) results from inservice inspection examinations.

J. Notifying site engineering of indications found during the final additional sample examination to allow evaluation for further actions to be taken.

K. Preparing a Request for Relief (RFR) as required when conformance with Code requirements is impractical (see section 7.6). ISO responsibilities related to identification of limited examinations are listed in section 7.1.5.

L. Submitting RFRs to Site Licensing in a timely manner to support ISI activities.

M. Performing NDE in accordance with this instruction.

N. Ensuring that ISI/PSI examinations are performed in accordance with approved TVA or contractor NDE procedures authorized by ISO.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

O. Administering the AIA contract and ensuring that services of AIA are utilized when performing Code required activities. TVA's interface with the Authorized Inspector for ISI, repairs, and replacements is defined in SPP-9.1.

P. Providing AIA representative with access to plant facilities and documentation in accordance with IWA-2130 of ASME Section XI.

Q. Notifying ANII prior to performing ASME Section XI examinations.

R. Preparing a Notification of Indication (NOI) to document rejectable indications detected during the performance of ASME Section XI examinations. The NOI process is defined in SPP-9.1.

S. Preparing examination reports and recording them (report number, date, examiner's initials, and comments/NOI number) in the scan plan. When inservice examinations are implemented by instructions other than this program, copies of the examination data sheets shall be submitted to Component Engineering by the performing organization. These data sheets shall be used as examination reports and incorporated into the scan plan.

T. Ensuring that scan plan examinations are complete prior to completion of an outage.

U. Preparing (or ensuring preparation of) the ISI Summary Report including Form NIS-1. Ensuring that Form NIS-1 is signed by the ANII. Submitting the ISI Summary Report to Site Licensing in accordance with site schedules, preparing augmented examination summary reports, coordinationg summary report review with ISO, and submitting augmented examination summary reports to Site Licensing..

V. Preparing and submitting the Site Final Report to RM as a QA record.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

W. Ensuring records used as PSI records from manufacturers or construction organizations comply with SPP-9.1.

X. Ensuring the calculation of component support acceptance ranges, if required, are prepared in accordance with IEP-100, N-GP-7 and N-VT-1.

Y. Maintaining calibration blocks stored at the plant site.

Z. Initiating a pre-outage meeting to identify augmented examinations in accordance with section 7.11.

AA. Ownership of the ISI Program, and assignment of an ISI Program Engineer with primary responsibility for ISI activities.

7.1.3 Site Engineering

A. Including provisions for inservice inspection access in designs in accordance with ASME Section XI, IWA-1400(b) and IWA-1500.

B. Performing engineering evaluations in support of examination indications related to operability and corrective measures.

C. Performing evaluations of rejectable indications found during final additional sample examinations to determine if further action is required.

D. Determining those component supports that could be affected by observed failure modes and could affect nonexempt components.

E. Providing specific written details for augmented requirements they are responsible for, refer to Section 7.11, and determining if a post examination meeting is required.

7.1.4 Site Licensing

A. Filing this instruction and 3-SI-4.6.G-A, including revisions, with the NRC in accordance with IWA-1400(c).

B. Submitting RFRs, the ISI Summary Report including Form NIS-1, and IW(X)-3600 analytical reports to the NRC.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.1.5 Inspection Services Organization (ISO)

A. Developing and maintaining a computerized data base, at the direction of Component Engineering, to include components identified on the ISI weld and support drawings.

B. Preparing/revising scan plans for each refueling outage of the inspection interval , as directed by Component Engineering, utilizing the computerized data base. This includes providing additional information provided by NDE Level III personnel to complete the scan plan, such as NDE procedure references, and calibration standard references.

C. Providing NDE Level III approval of scan plan revisions that affect the additional information of section 7.1.5.B. and maintaining a scan plan revision history log.

D. Providing NDE Level III determination if a Request for Relief (RFR) is required because of areas that are inaccessible or partially inaccessible for examination or because it is determined that conformance with Code requirements is impractical and notifying Component Engineering. Reference paragraph 7.2.3 (E).

E. Approving contractor NDE procedures (using IEP-200 as a guideline), contractor written practices for qualification and certification of NDE personnel, and certifications of contractor's NDE personnel performing ISI/PSI.

F. Providing NDE Level III evaluation of successive examination results.

G. Packaging radiographs for storage and providing them with reader sheets as a life of plant record to RM.

H. Providing copies of IEP-100 NDE procedure revisions and evidence of personnel qualifications to RM as permanent records for the service lifetime of the plant in accordance with IWA-1400(k).

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

I. Maintaining as-built calibration standard drawings and the calibration standard material certifications.

7.1.6 Site Records Management (RM)

A. Issuing controlled copies of ASME Section XI Code Class Boundary Drawings and ISI drawings.

B. Issuing this instruction and providing controlled copies to Component Engineering, ANI/ANII, and other requesting organizations.

C. Maintaining the site final report as a life of plant QA document. Other records referenced in the final report (work plans, radiographs, etc.), NDE procedure revisions, and evidence of personnel qualifications shall be retained for the service lifetime of the plant.

7.1.7 Authorized Nuclear Inservice Inspector (ANII)

A. Performing the duties of IWA-2110, including a detailed review of this instruction and subsequent revisions. He shall submit a report of the review to the Owner in accordance with IWA-2110(a)(3).

B. Having the prerogative and authorization to require requalification of an operator or procedure when he has reason to believe code requirements are not being met.

7.1.8 Nuclear Assurance

A. Ensuring the adequacy of contractor's QA programs in accordance with the TVA Standard Programs and Processes.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.2 Implementation

7.2.1 System for Maintaining Status of Examinations

A. ISI Data Base

A computerized data base shall be utilized for identification of the components requiring examination and for maintaining the status of completed examinations for ASME Section XI and/or augmented credit. Maintenance and updating of this data base is detailed in section 7.9.

B. Scan Plan

(1) The scan plan is developed from the ISI data base and details the examinations scheduled for performance during an outage. A scan plan may also be used for examinations performed pre-outage or between outages. It should contain as a minimum: components to be examined; Code examination category; Code item number; methods of examination; NDE procedure reference; calibration standard reference; ISI drawing and sheet number.

(2) Prior to performing examinations, the scan plan shall be approved by Component Engineering.

(3) When inservice examinations are performed as a result of instructions other than this program (e.g., maintenance instructions, work plans, etc.), copies of the examination data sheets shall be submitted to Component Engineering by the performing organization for assignment of a report number and incorporation into the scan plan.

(4) During implementation, it may become necessary to revise the scan plan. Scan plan revisions may be initiated by Component Engineering, ISO, or by other personnel involved with implementation of the scan plan. All changes shall be coordinated with Component Engineering and, as needed, with the appropriate plant planning and scheduling personnel for facilitating the use of supporting craft personnel.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

Revisions to the scan plan shall be controlled in the same manner as the original. ISO shall maintain a scan plan revision history log. Interim working copies may be handwritten to allow examinations to be performed before a formal revision is issued. These changes shall be approved by Component Engineering and a NDE Level III, as required by Section 7.1.2.G or Section 7.1.5.C. Approving individuals shall initial and date such changes.

C. Configuration Changes

(1) When major portions of existing pipe or supports are replaced or new systems are added, a system walkdown should be performed under the direction of Component Engineering to identify the pipe configuration, welds, components, and supports that are required to be in the inspection program.

(2) If variations in configuration are discovered or modifications (including additions or deletions), repairs or replacements are made during the service lifetime of the unit, the changes shall be marked on field corrected copies of the appropriate drawing listed in Section 2.5 by a Component Engineering representative. The field corrected copies shall be used in the performance of examinations and as records until the drawing has been revised to reflect the change(s).

(3) Component Engineering shall be responsible for reviewing the proposed change, revising the drawings as necessary, and ensuring the revised drawings are issued prior to the next refueling outage. The scan plan shall be revised to reflect any PSI examinations performed due to the variations in configuration. The ISI Engineer (or his designee) shall track the ISI field drawing revisions by utilization of a log book. This log book will utilize the assigned RIMS (Record of Information Management System) number on the NEDP-3 Form, "Request For Administrative Change To Drawings," as the tracking number for the ISI field drawing revisions. Guidelines for preparation and control of ISI examination drawings are delineated in SPP-9.1, Part A, Appendix C and NEDP-3 Paragraph 3.9.2 and Appendix C.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.2.2 Notification of Indication (NOI)

A. NOI form, FORM SSP-9.1-2 of SPP-9.1, shall be used to document indication(s) exceeding the acceptance criteria of Article 3000 of ASME Section XI. If engineering evaluation determines that the condition is unacceptable for continued service, corrective action shall be initiated Component Engineering shall provide/coordinate dispositions for NOI's in accordance with SPP-9.1 and SPP-3.1. Any Problem Evaluation Reports (PERs) or Work Orders (WOs) generated to support the NOI disposition should be referenced on the NOI.

B. Additional Examinations

(1) Additional examinations for Class 1 equivalent components (IWB) shall be in accordance with the requirements of IWB-2430.

NOTE: Class 1 Piping Welds shall be in accordance with the RI-ISI additional examination requirements of Code Case N-577, as outlined in Section 7.12 of this program.

The additional examination samples are defined as those items (welds, areas, or parts) in a particular examination category and item number. Engineering judgment should be documented concerning expansion (or no expansion) into additional systems. The initial sample is the sample scheduled for examination at a particular outage for ASME Section XI credit.

(a) Examinations of the initial sample that reveal indications exceeding the acceptance standards of Table IWB-3410-1 shall be extended to include additional examinations in the same outage as the initial examinations.

The first additional examination sample shall include items scheduled for this and the subsequent period. If examinations for that item are not scheduled in the subsequent period, the most immediate period containing scheduled examinations of that item shall be examined.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

(b) If the first additional examinations of (1)(a) detect indications exceeding the acceptance standards of Table IWB-3410-1, further additional examinations shall be performed during the outage. The second additional examination sample shall include the remaining items of similar design, size, and function.

(2) Additional examinations for Class 2 equivalent components (IWC) shall be selected in accordance with IWC-2430.

Note: Class 2 piping welds shall be in accordance with the RI-ISI additional examination requirements of Code Case N-577, as outlined in Section 7.12 of this program.

The additional examination samples are defined as those items (welds, areas, or parts) in a particular examination category and item number. Engineering judgment should be documented concerning expansion (or no expansion) into additional systems. The initial sample is the sample scheduled for examination at a particular outage for ASME Section XI credit.

(a) Examinations of the initial sample that reveal indications exceeding the acceptance standards of IWC-3000 shall be extended to include additional examinations in the same outage as the initial examinations. The first additional sample shall include approximately the same number of items examined in the initial sample. The items selected should be those available in the interval sample that have the longest service time from its previous inservice examination.

(b) If the first additional examinations of (2)(a) detect indications exceeding the acceptance standards of Table IWC-3410-1, further additional examinations shall be performed during the outage. The second additional examination sample shall include the remaining items of similar design, size, and function.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

(3) Additional examinations for component supports (IWF) shall be in accordance with section IWF-2430.

(a) If component supports in the initial sample must be subjected to corrective measures in accordance with IWF-3000, the component supports immediately adjacent to those for which corrective action is required shall be examined. Also, the examinations shall be extended to include a first additional sample that includes supports within the system, equal in number and of the same type and function as those scheduled for examination during the period.

(b) When the additional examinations of (3)(a) require corrective measures in accordance with IWF-3000, a second additional sample of the remaining component supports within the system of the same type and function as in (3)(a) shall be examined.

(c) When the additional examinations of (3)(b) require corrective measures in accordance with IWF-3000, examinations shall be extended to include a third additional sample of the remaining nonexempt supports potentially subject to the same failure modes that required corrective measures in (3)(a) and (3)(b). These additional examinations shall include nonexempt component supports in other systems when support failures requiring corrective measures indicate non-system related failure modes. At the request of Component Engineering, Site Engineering shall make the determination of failure mode applicability and select the third additional sample.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

(d) When the additional examinations of (3)(c) require corrective measures in accordance with IWF-3000, examination shall be extended to those exempt component supports that could be affected by the same observed failure modes and could affect nonexempt components. At the request of Component Engineering, Site Engineering shall make the determination of failure mode applicability and select a fourth additional sample of exempt component supports that could affect nonexempt components.

(4) If the final sample examinations in (3)(d) above detect indications exceeding the acceptance standards of Article IWX-3000 of ASME Section XI, Component Engineering shall notify Site Engineering to evaluate the indications and make recommendations(s) for further action, if needed. These actions would be beyond those required by ASME Section XI

7.2.3 Examinations

A. NDE shall be performed in accordance with IWA-2200 of ASME Section XI utilizing the NDE procedures of Inspection Services Organization (ISO) Programs Manual, Section 2, Engineering NDE Procedures, or approved contractor procedures, with the exception of NDE procedures for ultrasonic examination shall be qualified to the requirements of Appendix VIII of ASME Section XI as implemented by the Performance Demonstration Initiative Program (PDI).

B. Personnel performing NDE operations shall be qualified and certified in accordance with IWA-2300 of ASME Section XI as specified in IEP-200 and qualified to the requirements of the 1995 Edition of ANSI/ASNT CP-189 with the exception of NDE personnel performing ultrasonic examinations shall be qualified to the requirements of Appendix VIII of ASME Section XI as implemented by the Performance Demonstration Initiative Program (PDI).

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

C. The inservice examinations may be performed by Component Engineering, ISO, or contractor personnel. Contract preparation, administration, and supervision shall be the responsibility of Component Engineering .

Inspection plans and/or quality assurance programs submitted by contractors shall be reviewed and approved by Nuclear Assurance prior to use. All contractor NDE procedures used during the inspection program shall be reviewed and approved by ISO using IEP-100 as a guideline.

D. A weld reference system shall be established for welds and areas subject to surface or volumetric examination in accordance with IWA-2600.

E. Every attempt shall be made to provide 100% code coverage (volume or area) when performing an exam. When 100% code coverage is not obtained/obtainable, a NDE Level III shall promptly notify Component Engineering. If the coverage is limited due to an obstruction which is removable an evaluation shall be performed by Component Engineering to either allow removal of the obstruction or justify why the obstruction cannot be removed. When less than the required ASME Section XI code examination volume or area is examined, the percentage examined shall be documented on the examination data sheet. The cause of the limitation shall be clearly specified as a part of the data sheet documentation. An NDE level III representative shall review the limitations or impractical examinations during the refueling outage and determine if a code examination was achieved. If greater than 90% code coverage was not achieved, the NDE level III representative shall notify Component Engineering immediately to determine if an alternate component can be selected. If an alternate component cannot be selected the examination volume or area is qualified for request for relief action in accordance with Section 7.6. Reference paragraph 7.1.5 (D).

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.3 Components Subject to Examination

7.3.1 ASME Class 1 Equivalent Components Subject to Examination (IWB)

A. ASME Class 1 equivalent systems are listed below:

- Control Rod Drive Hydraulic System (CRD)
- Core Spray System (CS)
- Feedwater System (FW)
- High Pressure Coolant Injection System (HPCI)
- Main Steam System (MS)
- Reactor Core Isolation Cooling System (RCIC)
- Recirculation System (RECIR)
- Residual Heat Removal (RHR)
- Reactor Pressure Vessel (RPV)
- Standby Liquid Control System (SLC)

B. The specific components subject to examination are identified on ISI drawings listed in Section 2.5. Section 8.4 contains detailed information for selected Class 1 valves. The number of components within each system, the number selected for examination during the interval and the number selected for examination by period are provided in Section 8.1 Examination Schedule - Class 1 Equivalent (IWB) Components.

C. Adherence to IWB-1220 shall be in accordance with the 1989 Edition, No Addenda of ASME Section XI as required by 10 CFR 50.55a(b)(2)(xi). The component size and shape associated with IWB-1220(a) is determined by the calculation referenced in subsection 2.9.2. IWB-1220, footnote 1 allows the exemptions from examination in IWC-1220 to be applied for those components. The make-up exclusion applies to ASME Section XI activities not covered under the Risk - Informed Program.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

D. Selection and scheduling of ASME Class 1 equivalent components is in accordance with IWB-2412, Inspection Program B, IWB-1200 exemptions, and applicable requirements of Table IWB-2500-1.

E. The extent of examination for Category B-F and B-J welds is in accordance with the RI-ISI examination requirements outlined in Section 7.12 of this Program.

F. .The examination of Class 1 equivalent component supports is in accordance with section 7.3.

G. The extent of examination for Category B-D, Item No. B3.90, "Pressure Retaining Nozzle-To-Vessel Welds," shall be (next to the widest part of the weld) one-half (1/2) inch from each side of the weld crown in lieu of one-half (1/2) through-wall thickness from each side of the weld required by the 2001 Edition, 2003 Addenda of ASME Section XI, Code, Table IWB-2500-1, Figures 7 (a) and (b). Reference Request For Relief # 3-PDI-2.

H. The 2001 Edition, 2003 Addenda, ASME Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.100, requires a volumetric examination of the reactor pressure vessel head nozzles inside radius section. In accordance with Code Case N-648-1, TVA will perform an enhanced visual (VT-1) examination, capable of a 1-mil resolution, in accordance with ASME Section XI VT-1 requirements, of the reactor pressure vessel and reactor pressure vessel head nozzles inside radius sections, in accordance with ASME Section XI, VT-1 requirements, This does not apply to the six (N4) Feedwater nozzles. The six Feedwater nozzle inner radius sections will continue to be examined with ultrasonic techniques developed and qualified using GE-NE523-A71-0594-A, Revision 01 and ASME Section XI Code requirements.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

J. Pending completion of the Code Case N-702 and BWRVIP-108 approval process, TVA deferred one operating cycle the seven (7) remaining RPV Nozzles (N2G, N2H, N2J, N2K, N3C, N3D, and N8B) for examinations required for the third period of the second ten – year ISI Inspection interval by extending the interval by adopting a later Edition/Addenda of the Code for IWA-2430 (Reference R08 0402220 725). Therefore, TVA will perform the required NDE examinations of the seven (7) remaining RPV Nozzles in the Spring 2006, Unit 3 Cycle 12 Refueling Outage. The deferred examinations will be performed at that time and will be credited to the third period of the second ten-year ISI inspection interval. This will complete the second ten-year ISI interval .

7.3.1.1 Reactor Vessel Interior

ASME Code Category B-N-1, Item Number B13.10

The space above and below the reactor vessel core that is made accessible by the removal of components during normal refueling outages shall be visually examined (VT-3) during the first refueling outage and at subsequent refueling outages at approximately three-year intervals (a minimum of once an inspection period). Reference Section 8.1, Part 6 and 7.

The areas that are normally accessible include main steam nozzles, feedwater nozzles and spargers, core spray nozzles, piping, and spargers, top guide assembly, instrumentation nozzles, CRD return nozzle, and the RPV annulus area. Reference Section 8.1, Part 6 and 7.

ASME Code Category B-N-2, Item Number B13.20

The accessible RPV attachment welds within the beltline region shall be visually examined (VT-1). The attachment welds within the beltline region are defined as the lower surveillance specimen bracket welds on shell course 2 and the jet pump riser brace pad welds. Reference Section 8.1, Part 6 and 7.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

ASME Code Category B-N-2, Item Number B13.30

The accessible RPV attachment welds outside the beltline region shall be visually examined (VT-3). The attachment welds normally accessible outside the beltline region are defined as the guide rod brackets, steam dryer support brackets, feedwater sparger brackets, core spray piping brackets and pads, RPV shroud support to RPV bottom head, and the surveillance specimen bracket welds on shell course 3. The shroud support leg to bottom RPV head welds are located under the core plate and are normally inaccessible.
Reference Section 8.1, Part 6 and 7.

ASME Code Category B-N-2, Item Number B13.40

The accessible surfaces of the core support structure shall be visually examined (VT-3). The core support structure is defined as the top guide, core plate, control rod guide tubes, control rod drive housings, shroud support ledges, and the fuel support castings. Areas that are accessible during normal refueling outages include the top surface of the top guide and the outer peripheral top surface of the core plate. Reference Section 8.1, Part 6 and 7.

All augmented examination requirements and commitments for BFN vessel internal examinations during the ISI interval are stated in 0-TI-365. Reference Section 8.1, Part 6 and 7.

Note 1:

When visual examinations of RPV internal components are being performed for compliance with 0-TI-365 requirements and maintenance or refueling activities, credit maybe taken for ASME Section XI requirements provided the visual examination meets the minimum requirements of ASME Section XI.

Note 2:

When specialized visual examinations are being performed, for compliance with 0-TI-365 requirements and maintenance or refueling activities, and access to areas are made available that are normally inaccessible, credit for ASME Section XI maybe taken provided the visual examination meets the minimum requirements of ASME Section XI. These examinations shall be considered supplemental examinations.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

Note 3:

All visual examinations performed on RPV internal components that meet the minimum VT-3 criteria, as stipulated in ASME Section XI, shall be considered for ASME Section XI, Code Category B-N-1 credit.

Note 4:

It is permissible to defer the visual examinations for ASME Section XI, Code Category B-N-2 to the end of the inspection interval. However, these examinations maybe performed at any time during the interval.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.3.2 ASME Class 2 Equivalent Components Subject to Examination (IWC)

A. ASME Class 2 equivalent systems are listed below:

- Control Rod Drive Hydraulic System (CRD)
- Core Spray System (CS)
- High Pressure Coolant Injection System (HPCI)
- Main Steam System (MS)
- Reactor Building Closed Cooling Water System (RBCCW)
- Reactor Core Isolation Cooling System (RCIC)
- Residual Heat Removal System (RHR)

B. The specific components subject to examination are identified on ISI drawings listed in Section 2.5. The number of components within each system, the number selected for examination during the interval and the number selected for examination by period are provided in Section 8.1 Examination Schedule - Class 2 Equivalent (IWC) Components.

C. Selection and scheduling of ASME Class 2 equivalent components is in accordance with IWC-2412, Inspection Program B, IWC-1200 exemptions, and applicable requirements of Table IWC-2500-1.

D. Class 2 Piping Welds (C-F-1 and C-F-2) shall be in accordance with the RI-ISI examination requirements outlined in Section 7.12 of this Program.

E. The examination of Class 2 equivalent component supports is in accordance with section 7.3.4.

7.0 INSTRUCTION STEPS/ELEMENTS (Continued)

7.3.3 ASME Class 3 Equivalent Components Subject to Examination (IWD) and Non-Code Class Components

A. ASME Class 3 equivalent systems are listed below:

- Emergency Equipment Cooling Water System (EECW)
- Fuel Pool Cooling System (FPC)
- Residual Heat Removal Service Water System (RHRSW)

B. The specific components subject to examination are identified on ISI drawings listed in Section 2.5. The number of components within each system, the number selected for examination during the interval and the number selected for examination by period are provided in Section 8.1 Examination Schedule - Class 3 Equivalent (IWD) Components.

C. Selection and scheduling of ASME Class 3 equivalent components is in accordance with IWD-2412, Inspection Program B, IWD-1200 exemptions, and applicable requirements of Table IWD-2500-1.

7.0 INSTRUCTION STEPS/ELEMENTS (continued.)

D. The examination of Class 3 equivalent component supports is in accordance with section 7.3.4.

7.3.4 Component Supports Subject to Examination (IWF)

A. ASME Class 1, 2 and 3 equivalent component and piping supports shall be examined in accordance with the rules of IWF-1000.

B. The specific components subject to examination are identified on ISI drawings listed in Section 2.5. The number of supports within each system, the number selected for examination during the interval and the number selected for examination by period are provided in Section 8.1 Examination Schedule, Part 4 - Component Supports (IWF).

C. Selection and scheduling of component supports is in accordance with Table IWF-2410-2, Inspection Program B, IWF-1200 exemptions, and applicable requirements of Table IWF-2500-1.

D. Supports depicted as snubbers on the ISI support drawings are subject to examination outside the boundaries of the snubber (including the pins) in accordance with IWF-5300(c). The examination of snubbers (excluding the pins) and any repair, replacement or adjustment to the snubber itself is addressed by the Snubber Inservice Testing Program (see section 7.8) and RFR # 3-ISI-2.

7.0 INSTRUCTION STEPS/ELEMENTS (continued.)

E. The acceptance range for constant force and variable springs shall be in accordance with the support drawing. If the setting range is not identified on the drawing the applicable general notes contained in the 47B435-series of drawings shall be utilized in accordance with N-VT-1 and N-GP-7.

F. Component supports that have been adjusted in accordance with IWF-3000, repaired, or replaced shall be examined prior to return to service per the applicable examinations listed in Table IWF- 2500-1.

Additionally, for systems that operate above 200 degrees F during normal operation, an additional preservice examination shall be performed on the affected component supports during or following the subsequent system heat-up and cool-down cycle unless determined unnecessary by evaluation. This examination shall be performed during operation or at the next refueling outage. Component supports requiring an additional preservice examination shall be scheduled for examination and added to the applicable scan plan.

7.3.5 Successive Examinations, Class 1, 2, or 3 Components, or Class 1, 2, or 3 Component Supports

Any corrective actions required as a result of ISI examinations shall be handled in accordance with SPP-3.1.

Successive examinations shall be performed in accordance with the requirements of IWB-, IWC-, IWD- and IWF- paragraph -2420.

A. Successive Examinations - Class 1 Equivalent Components

Areas containing flaw indications or relevant conditions evaluated in accordance with IWB-3132.3 or IWB-3142.4 that qualify for continued service shall be re-examined during the next three inspection periods as listed in the inspection schedules. If these re-examinations reveal that the flaw indications remain essentially unchanged for three successive inspections, then the component examination frequency may revert to the original schedule. Components requiring successive examinations shall be scheduled for examination and added to the applicable scan plan. If welded attachments are examined as a result of identified component support deformation and the results of these examinations exceed the acceptance standards of IWB-3410-1, successive examinations shall be performed, if determined necessary, based on an evaluation.

7.0 INSTRUCTION STEPS/ELEMENTS (continued.)

B. Successive Examinations - Class 2 Equivalent Components

Areas containing flaw indications or relevant conditions evaluated in accordance with IWC-3122.4 or IWC-3132.3 that qualify for continued service shall be re-examined during the next inspection period as listed in the inspection schedule. If this re-examination reveals that the flaw indications remain essentially unchanged, then the component examination frequency may revert to the original schedule.

Components requiring successive examinations shall be scheduled for examination and added to the applicable scan plan. If welded attachments are examined as a result of identified component support deformation and the results of these examinations exceed the acceptance standards of IWB-3410-1, successive examinations shall be performed, if determined necessary, based on an evaluation.

C. Successive Examinations - Class 3 Equivalent Components

Areas containing flaw indications or relevant conditions evaluated in accordance with IWD-3000 that qualify for continued service shall be re-examined during the next inspection period as listed in the inspection schedule. If this re-examination reveals that the flaw indications remain essentially unchanged, then the component examination frequency may revert to the original schedule.

Components requiring successive examinations shall be scheduled for examination and added to the applicable scan plan.

If welded attachments are examined as a result of identified component support deformation and the results of these examinations exceed the acceptance standards of IWD-3000, successive examinations shall be performed, if determined necessary, based on an evaluation.

D Successive Examinations for Class 1, 2, and 3 Component Supports (IWF)

Successive examinations for component supports (IWF) shall be determined in accordance with IWF-2420. (See section 7.3.4.F for component supports requiring an additional preservice examination).

When a component support must be subjected to corrective measures in accordance with IWF-3000 that support shall be re-examined during the next inspection period listed in the inspection schedule. If this re-examination do not require additional corrective measures, then the examination frequency may revert to the original schedule. Components requiring successive examinations shall be scheduled for examination and added to the applicable scan plan.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.4 Calibration Standards

Calibration standards are included in ASME Section XI, Appendix I. This appendix includes references to ASME Section XI, Appendix III and ASME Section V for additional requirements. As-built calibration standard drawings and calibration standard material certifications are maintained by ISO. The calibration blocks are stored at the plant site and maintained by ISI personnel.

7.5 Records and Reports

Records and reports shall be prepared in accordance with ASME Section XI, Subarticle IWA-1400, Article IWA-6000.

7.5.1 ISI Summary Report

An ISI summary report for Class 1 and 2 (equivalent) Components shall be prepared and submitted to Site Licensing and other review organizations on a schedule that permits submittal to the NRC within 90 days after turbine generator synchronization following a refueling outage. Examinations, tests, replacements, and repairs conducted since the preceding summary report shall be included.

Information related to the Containment Inservice Inspection Program inspection of Class MC (equivalent) components (IWE) shall also be included in the ISI summary report as applicable. This information is compiled in accordance with 0-TI-376 for inclusion in the ISI summary report (see section 7.5.1.O).

Each summary report shall be formatted to contain the following:

A. Cover Sheet

A cover sheet stating “ASME Section XI Inservice Inspection Summary Report for Browns Ferry Nuclear Plant, Unit 3, “ and the Refueling Outage. The cover sheet shall also provide:

1. Date of document completion.
2. Name and address of owner.
3. Name and address of generating plant.
4. Name or number assigned to the nuclear power unit by TVA.
5. Commercial operation date for the unit.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

B. Table of Contents

A table of contents for the report should follow the title page.

C. Form NIS-1

The Owner's Report for Inservice Inspections, Form NIS-1, as shown in Appendix II of ASME Section XI shall be completed and included.

D. Form NIS-2

The Owner's Report for Repair and Replacement, Form NIS-2, as shown in Appendix II of ASME Section XI shall be completed and included.

E. Introduction and Summary of the Inspection

The introduction should include the following information: Plant, unit number, preservice or inservice examinations, RFO cycle, systems, components, and vessels examined, organizations examinations were performed by, dates examinations were performed, ASME Section Code of Record. The summary should include a brief description of the overall inspection. Included as part of the summary, ASME Class 1, 2, and 3 equivalent components and the integrally welded attachments whose examination results required evaluation analysis (IWB-3132.3 and 3142.4 for Class 1 and 3; and IWC-3122.3 and 3132.3 for Class 2) shall be submitted to the NRC as required by IWB-3134 and 3144 and IWC-3125 and 3134.

F. Examination Summary

The examination summary shall tabulate the ASME Section XI examinations credited for the applicable period. Items should include the following information: category, total number of examinations required for the inspection interval, total number required for for the applicable period, total number credited for the applicable period, and exclusions, exceptions, or deferrals.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

G. Examination Plan

The Examination Plan shall give a detailed description of all areas subject to examination during the inspection. It should contain the following information: examination area, Code Category and Item Number, reference drawing, examination method, examination procedure, examination report number, calibration block, date of examination, and examination results. This plan may be submitted as the computerized Outage Report.

H. Component Re-Examination Reports

The component re-examination section shall give a detailed description of all components subject to re-examination due to rework, repair, or replacement resulting from a Notification of Indication (NOI). This section should contain the examination area, Code Category and Item Number, reference drawing, examination method, examination procedure, examination report number, calibration block, date of examination, and examination results.

I. Summary of Notifications of Indications (NOIs)

The summary of NOIs shall give a short summary of each NOI report along with the indication discrepancy. It should also contain the final disposition including a reference to the corrective action taken.

J. Additional Sample

The additional sample section, if applicable, shall indicate additional sample examinations performed as a result of a failed component. The summary should include reference to the applicable system, the affected component, the number of components examined as a result of the failure, and a description of additional samples and results of the additional sample examinations.

K. Successive Examinations

The successive examination section, if applicable, shall indicate examinations performed as a result of ASME Section XI requirements. This section should contain a reference to the applicable system, the affected components, and the results of the successive examinations.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

L. Analytical Evaluation

The analytical evaluation section for ASME Class 1, 2, and 3 equivalent components and the integrally welded attachments whose examination results require evaluation analysis, if applicable, shall include a short summary of each analytical evaluation, the indication discrepancy, and its location.

A copy of each analytical evaluation should be included, with a reference to the applicable NOI and the component identifier.

M. Augmented Examinations

As applicable, a brief summary of the augmented examinations reportable to the NRC shall be included.

N. Requests for Relief

The summary of requests for relief shall give a short summary of each relief request resulting from the inspection. This section shall summarize any components that did not receive the required examination coverage. The results should indicate the applicable component, Code Class, Code Category, Code Item Number, examination method, and calculated examination coverage. In addition, a description should summarize the access limitations and applicable reason why examination coverage cannot be obtained.

O. Containment Inservice Inspection Program (IWE)

This section, if applicable, should contain evaluations performed in accordance with the requirements of 10 CFR 50 55a(b)(2)(x)(A), evaluation of inaccessible areas, and 10 CFR 50.55a(b)(2)(x)(D), evaluation for additional examinations, as delineated in 0-TI-376.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.5.2 A site final report shall be prepared following each refueling outage and submitted to Records Management for retention as a permanent record. The site final report should contain, but not be limited to, the following:

- An index to record file
- The inservice and preservice NDE examination reports and calibration data sheets
- The ISI Summary Report with appendices prepared per section 7.5.1.
- Personnel certifications
- reference to NDE procedures
- reference to NDE examination records including radiographs and review forms
- Notification of Indication (NOI) Reports
- Scan plans and scan plan revision logs (if applicable)
- Containment Inservice Inspection Report prepared in accordance with 0-TI-376

7.5.3 Radiographs

Radiographs shall be packaged by ISO and transmitted to RM for storage as a life of plant record.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.6 Requests for Relief (RFR)

Impractical code requirements or examinations shall be submitted to NRC as written relief requests in accordance with 10 CFR 50.55a(g)(5). Proposed alternate examinations and information to support the basis and justification for relief shall be included. Relief requests are identified in Section 8.5 of this program and listed in Section 8.1 next to the applicable examination category.

ISO is responsible for notifying Component Engineering of impractical examination requirements and limitations that are encountered during performance of examinations. Reference Paragraph 7.1.5 (D) and 7.2.3 (E).

RFRs shall be prepared in accordance with SPP-9.1. Materials Technology and Codes will be provided an opportunity to review RFRs.

7.7 Repairs and Replacements

ASME Section XI repair and replacement activities are performed in accordance with SPP-9.1 and 0-TI-363. Preservice examinations required for ASME Code Class 1, 2, and 3 (equivalent) repaired/replaced components are in accordance with the code of record specified in this surveillance instruction. The examination categories and NDE method for preservice examinations may be determined from those listed in Section 8.1.

7.8 ASME Section XI Programs Not Addressed By 3-SI-4.6.G

7.8.1 System Pressure Tests
The system pressure test program is identified in SPP-9.1. Additional details are provided in 0-TI-364.

7.8.2 Pump and Valve Inservice Testing
The pump and valve inservice testing program is identified in SPP-9.1 and 0-TI-362.

7.8.3 Snubber Inservice Testing
Snubber inservice examination and testing is in accordance with 3-SI-4.6.H.1 as provided in Request for Relief 3-ISI-2.

7.8.4 Containment Inservice Inspection
The containment inservice inspection program is identified in SPP-9.1 and 0-TI-376.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.9 ISI Data Base Update and Maintenance

7.9.1 Component Engineering is responsible for maintaining the ISI Data Base. ISO may perform update functions at the direction of Component Engineering.

7.9.2 Changes to the ISI Data Base may become necessary for a number of reasons, such as: maintenance activities requiring Code examinations; repair/replacement activities; design changes adding or deleting components; implementation of Code Cases or requests for relief; or changes in planned examination scope due to additional or supplemental examinations.

7.9.3 All changes or updates shall be authorized by the ISI Program Engineer prior to entry into the ISI Data Base.

7.9.4 Upon completion of examinations for a given operating cycle, the ISI Data Base shall be updated to reflect the actual status of completed examinations. This should be done in a timely manner following the refueling outage (within 6 months as a guide) to ensure data base integrity. This update should be based on the completed NDE examination reports.

7.9.5 Scan plan revisions shall include a sign-off that the ISI Data Base has been updated as part of the revision approval cycle.

7.9.6 The ISI Program Engineer is responsible for ensuring that the ISI Data Base is updated in conjunction with ISI Program Plan revisions for items such as design changes, adopted Code Cases, and requests for relief.

7.10 Corrective Action

Any corrective action required as a result of ISI examinations shall be documented in accordance with SPP-3.1, Corrective Action Program.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.11 Augmented Examinations

Augmented examinations are performed in addition to ASME Section XI Code requirements. The augmented examinations may be required by the NRC or be self-imposed by TVA. Typical sources include generic letters, IE Bulletins, technical specifications, vendor recommendations, and industry experience.

The responsible organization or owner shall have technical and administrative responsibility for each augmented examination identified in this section. This responsibility shall include scheduling any examinations through Component Engineering, tracking the status of examinations, and reporting completed examinations. Responsible organizations requesting inclusion of augmented examinations in this section shall submit a written request to the ISI Program Engineer. The written request shall include specific details such as requirement source, identification of components requiring examination, examination frequency, examination method, examination area/volume, acceptance criteria, types of flaws anticipated, areas of high suspect, probability of failure, and reporting requirements. Copies of the written request shall be submitted to ISO and Component Engineering to facilitate nondestructive examination procedure preparation, establishment of training programs, and personnel familiarization.

Prior to each refueling outage, a meeting shall be initiated by the ISI Program Engineer. Meeting attendees shall include the responsible organizations, System Engineering, and ISO. The meeting agenda should include examination plans and schedules, updates on industry experience, and any additional pertinent information.

Following the completion of the augmented examination, Component Engineering shall report to the responsible organization items such as examination results and changes in results from previous examinations. The responsible organization shall determine if a meeting with the Component Engineering and/or other appropriate organizations is necessary to discuss items such as additional examinations to be conducted during the current outage, trends, lessons learned, and identify any future actions such as changes in the frequency of examination.

SIL's and clarification letters listed in this Augmented Examination Section provide GE's recommendation for reactor internals inspection. The actual scope and criteria for reactor internals inspections will be reviewed and approved by TVA Site Engineering prior to each refueling outage. Any indications found during inspections will receive a review and will be dispositioned by TVA Site Engineering. The responsible organization shall report augmented examination results to the NRC as required by the document initiating the examination.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.11.1 Feedwater Nozzles

The augmented examination requirements for the feedwater nozzles and spargers is contained in NUREG-0619 and BWR Owners Group (BWROG) Licensing Topical Report GE-NE-523-A71-0594, Revision 1, August 1999, Table 6-1. An ultrasonic examination of all the feedwater nozzle bores, and inside blend radii are required every fifth (cycle 16) refueling outage . The alternate examination requirements, contained in Table 6-1 of GE-NE-523-A71-0594, Revision 1, eliminate the need for liquid penetrant examinations. The feedwater spargers are internal to the reactor pressure vessel and shall be visually examined every fourth refueling outage in accordance with Table 6-1 of the above licensing topical report and 0-TI-365. Reporting is required within 6 months after the outage when an inspection was performed. The report of these examinations shall be included with the ISI Summary Report unless a special report is deemed necessary by Component Engineering. Refer to NUREG-0619, Section 4.4.3 for information to be included. Reference TVA submittal dated October 23, 2000 (RIMS # R08 001023713)

Examination Requirement Source: B01-02.

7.11.2 CRD Return Line Reroute

Responsible organization: Site Engineering. The augmented examination requirements of the CRD return line reroute are included in NUREG-0619.

The augmented examination requirements of the CRD return line reroute are contained in NUREG 0619. The welded connections joining the rerouted CRD return line to the reactor water cleanup system was ultrasonically examined during the Cycle 4, Cycle 5, Cycle 7, Cycle 8, and Cycle 9 refueling outages. The NRC commitment to NUREG-0619 to perform ultrasonic examination of the Thermal Mixing Tee base material, welds RCRD-3-44, RCRD-3-45, and RCRDS-3-03 has been fulfilled and is no longer required in accordance with procedure SPP-3.3. Reference Commitment Item Number NCO810101003 and NCO 810101004.

Reference memorandum, Commitment Evaluation Form from TVA to NRC dated October 24, 2000, RIMS # R08001128743.

Examination Requirement Source: B01-02

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.11.3 Augmented Examination of Austenitic Stainless Steel and Dissimilar Metal Welds Susceptible to IGSCC (BWRVIP-75)

Responsible organization: Project Management. Austenitic stainless steel and dissimilar metal circumferential welds in piping four inches or larger in nominal pipe diameter which contain reactor coolant at a temperature above 200 degrees F during power operation shall be examined in accordance with the requirements of BWRVIP-75 as modified by the referenced safety evaluation beginning with the Unit 3, cycle 10 outage. Sample expansion of IGSCC Category B, C, D, or E weldments shall be in accordance with BWRVIP-75. The welds requiring examination per this paragraph are listed in Section 8.3 - Part 1 by IGSCC category. The Stainless Steel and Dissimilar metal welds that are exempt from examination because they contain coolant of 200 degrees or less are listed in Section 8.3 - Part 2,

In addition to the requirements for procedure and personnel qualification in Section 7.2.3.B, the examination procedures and personnel used for IGSCC examinations per BWRVIP-75 shall be qualified to the requirements of Appendix VIII of ASME Section XI as implemented by the Performance Demonstration Initiative Program (PDI).

The IGSCC category and corresponding examination frequency are listed below are in accordance with the BWRVIP-75 and the referenced safety evaluation. This schedule is applicable when the successive examination requirements specified in the safety evaluation are satisfied.

IGSCC CATEGORY	EXAMINATION EXTENT AND SCHEDULE
A	Sampled per the Risk- Informed ISI Program.
B	None in Unit 3.
C	25% sample every 10 years.
D	100 percent every 6 years.
E	25% of the welds with corrosion resistant overlay material every 10 years. 50% of these welds within 6 years. 100% of the non-overlay welds with cracking every 6 years.
F	100 percent every refueling outage
G	100 percent during current outage

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

Any flaws identified that do not meet the IWB-3500 criteria for continued operation without evaluation, or a change found in the condition of the welds previously known to be cracked, shall be reported to the NRC.

Examination Requirement Source: B02-02

7.11.3.1 Risk-Informed Alternative Measures

BWRVIP-75 and the referenced safety evaluation provide the NRC position on IGSCC in BWR austenitic stainless steel piping..

NRC Regulatory Guides 1.174, 1.178 and ASME Code Case N-577 were utilized to develop alternatives to the inspection requirements for IGSCC Category A welds. . These alternatives are identified in the RI-ISI section of this program and are approved in the referenced safety evaluation for BWRVIP-75 implementation.

For specific details on the RI-ISI Program see Section 7.12 of this program.

7.11.4 Reactor Vessel Interior Examinations

Responsible organization: Site Engineering. In addition to the code required ISI examinations in Section 7.3.1, augmented examinations shall be performed at the frequency specified in accordance with procedure 0-TI-365, Reactor Pressure Vessel Internals Inspection (RPVII) Unit 1, 2, and 3. Examination results shall be included in the augmented summary report (notification of unsatisfactory results may impose additional reporting requirements as denoted by the source requirement).

7.11.5 Level Instrumentation Nozzle Safe Ends BWRVIP-49

Responsible organization: Site Engineering

Inspections prior to Unit 3 Cycle 11 refueling outage were required in accordance with GE SIL-571. According to BWRVIP-49, “Instrument Penetration Inspection and Flaw Evaluation Guidelines”, it is the intent that the inspection and evaluation guidelines be followed in place of any prior GE SIL (i. e. GE SIL-571) related to essential safety functions of the instrument penetrations. The BWRVIP-49 document follows ASME Section XI Code examinations, with no additional augmented BWRVIP examinations.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

For commercial dependability, an ASME Section XI, IWB-2500, Code Category B-P, VT-2 examination for instrument penetrations shall be performed as an augmented examination. A VT-2 leakage inspection shall be performed of the safe end to nozzle weld during the drywell leakage test performed each outage. Insulation removal is not necessary to perform the leak check.

Examination Requirement Source: B06-02

7.11.6 Core Plate delta/P/Standby Liquid Control (SLC) Nozzle BWRVIP-27

Responsible organization: Site Engineering

Inspections prior to Unit 3 Cycle 12 refueling outage were required in accordance with GE SIL-571. According to BWRVIP-27, "BWR Standby Liquid Control System/Core Plate deltaP Inspection and Flaw Evaluation Guidelines," it is the intent that the inspection and evaluation guidelines be followed in place of any prior GE SIL (i. e. GE SIL-571) related to essential safety functions of the instrument penetrations. The BWRVIP-27 document follows ASME Section XI Code examinations, with no additional augmented BWRVIP examinations. For commercial dependability, an ASME Section XI, IWB-2500, Code Category B-P, VT-2 examination for instrument penetrations shall be performed as an augmented examination. A VT-2 leakage inspection shall be performed of the safe end to nozzle weld and safe end during the drywell leakage test performed each outage. Insulation removal is required to perform the leak check.

Examination Requirement Source: B06-02

7.11.7 Core-Spray and Recirc Inlet Safe Ends

Responsible organization: Site Engineering. Perform UT inspection of the Core Spray and Recirc Inlet Safe Ends per the recommendation of GE Letter No. BFSE 94-007. The Core Spray and Recirculation Inlet safe ends were replaced with IGSCC resistant material, and in the case of the Recirculation inlet safe ends an improved design was used which eliminated crevices. These changes in materials and design mitigate the possibility of future Inter Granular Stress Corrosion Cracking (IGSCC). Per guidance provided in NRC Generic Letter 88-01 (NUREG 0313 Rev-2) and the recommendation of GE Letter No. BFSE 94-007 these safe ends shall be inspected at the frequency established for Category "A" weldments.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

The accessible areas of the safe end base material which has exposure to the annulus/crevice area created by the thermal sleeve shall be inspected with UT. This inspection should be conducted in conjunction with the augmented UT inspection of the safe end to nozzle weld. Techniques previously used to inspect for safe end (IGSCC) cracking should be utilized as practical in the inspection effort to detect internal diameter (ID) initiated IGSCC indications. The implementation interval started with the Unit-3 cycle-5B outage. The described safe end base material shall be inspected at the same interval as Category "A" weldments. Ideally the inspection should be performed in conjunction with the safe end to nozzle welds which are examined under the current augmented IGSCC examination plan. The report of these examinations shall be included in the augmented summary report unless a special report is deemed necessary by Site Engineering.

Examination Requirement Source: B07-02

7.11.8 Weld Inspection For Pipe Whip Protection

Responsible organization: Site Engineering. Additional examinations shall be performed each inspection interval on selected circumferential pipe welds to provide additional protection against pipe whip in accordance with TSR 3.4.3.2. This TSR identifies the need to meet as closely as possible the requirements of ASME Section XI and NRC accepted alternatives. Therefore, examination volumes, examination methods, and acceptance standards for piping welds examined in accordance with TSR 3.4.3.2 should be similar to the RI-ISI Program. This examination criteria utilized for the RI-ISI Program is specified in Table 1, Examination Category R-A, of Code Case N-577.

The following welds will be examined each inspection interval for pipe whip protection using examination volumes, examination methods, and acceptance standards specified in Item No. R1.11 of Examination Category R-A of Code Case N-577:

GFW-3-09, GFW-3-12, GFW-3-15, GFW-3-26, GFW-3-29, GFW-3-32, KFW-3-13, KFW-3-31, KFW-3-38, KFW-3-39, GMS-3-06, GMS-3-15, GMS-3-24, GMS-3-32, KMS-3-024, KMS-3-104, THPCI-3-070, THPCI-3-070A, THPCI-3-071, and THPCI-3-072.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

The following welds will be examined each inspection interval for pipe whip protection using examination volumes, examination methods, and acceptance standards specified in Item No. R1.16 of Examination Category R-A of Code Case N-577:

TCS-3-407, TCS-3-423, TSCS-3-408, TSCS-3-424, DSRHR-3-04, DSRHR-3-06, DSRHR-3-07, RWCU 3-001-G019, RWCU-3-001-G016, RWCU-3-001-G017, and RWCU-3- 001-G018.

A report of these examinations shall be included with the augmented summary report portion of the ISI Summary Report.

Examination Requirement Source: B04-02

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.12 Risk-Informed Inservice Inspection

7.12.1 Introduction

The objective of the Inservice Inspection Program, 3-SI-4.6.G, is to address all piping locations that are subject to service induced degradation, in accordance with the requirements as specified in 10 CFR 50.55a. In accordance with NRC Regulatory Guides 1.174, 1.178, and Code Case N-577, with NRC approval an alternative inspection program which meets the criteria of 10 CFR 50.55a(a)(3)(i) to provide an acceptable level of quality and safety can be utilized. These Regulatory Guides provide guidance specific to incorporating risk insights to inservice inspection programs of piping.

By incorporating insights from probabilistic safety assessment(PSA), traditional analysis, and operating reactor data an alternative inspection program known as risk informed inservice inspection program (RI-ISI) may be submitted for NRC review and approval.

7.12.2 Purpose

Procedure 3-SI-4.6.G-A of this Program outlines an acceptable alternative approach to the existing Section XI requirements for the scope and frequency of inspection of the ISI Program by utilizing risk informed techniques. 10 CFR 50.55a(a)(3)(i) allows the use of alternatives when authorized by the Director of the Office of Nuclear Reactor Regulation, when the alternative provides an acceptable level of quality and safety. This alternative approach provides an acceptable level of quality and safety per 10 CFR 50.55a(a)(3)(i) by incorporating insights from probabilistic safety assessment and traditional analysis calculations supplemented with reactor operating data. The RI-ISI Program therefore will be enforceable under 10 CFR 50.55a.

7.12.3 Scope

Procedure 3-SI-4.6.G-A of this program outlines the details for risk-informed requirements for inservice inspection of ASME Class 1 and Class 2 equivalent piping**.** The examination requirements of Section XI shall be used for piping evaluated by the risk-informed process. The RI-ISI Program shall be implemented for the Third inspection interval for BFN Unit 3.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.12.4 Frequency

The inspection periods and inspection interval are defined in the Section XI Edition and Addenda as committed to in 3-SI-4.6.G. The piping segments and inspection strategy (i.e. frequency, number of inspections, methods, or all three) are defined in Part 6 of Table R-A and 3-SI-4.6.G-A. Inspections may be increased or relaxed as experience dictates. The number of inspections and the frequency of those inspections will be a product of the systematic application of the Risk-Informed Process.

7.12.5 Living Program

Program Implementation

Nuclear Energy Institute document NEI 04-05 "Living Program Guidance To Maintain Risk-Informed Inservice Inspection Programs For Nuclear Plant Piping Systems" was published in April 2004. The recommendations of this document will be implemented at Browns Ferry Unit 3. As a minimum, updates to 3-SI-4.6.G-A, RI-ISI Program, shall be performed at least on the basis that coincide with the inspection program requirements contained in Section XI under Inspection Program B, 3-SI-4.6.G. Changes to the PSA, piping performance, plant procedures that affect system operating parameters, piping inspections, component and valve lineups, equipment operating modes, or the ability of plant personnel to perform actions associated with accident mitigation shall be reviewed for any RI-ISI Program updates. Leakage and flaws identified during scheduled inspections shall be evaluated for possible RI-ISI Program updates.

7.12.5.2 Performance Monitoring

During each Period, the Program Owner will maintain an awareness of input changes. At the end of each Period, the effects of the changes will be evaluated to determine if a change to the Program is required.

The RI-ISI program will be updated, if required, before the next refueling outage. The Maintenance Rule Expert Panel will review proposed RI-ISI program changes and provide program oversight. The following provides an overview of the RI-ISI program inputs.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

A. Plant Design Feature Changes

Design changes have the potential to change piping configuration and alter stress calculations which were used as input to the calculations performed in support of the RI-ISI program. New systems and branch piping will be evaluated for inclusion into the scope of the RI-ISI program. The existing design impact review process will be used to ensure the impact of design changes on RI-ISI has been appropriately considered prior to final approval. The calculations supporting the RI-ISI program will be entered into TVA's calculation tracking program to ensure appropriate predecessors and inputs are identified and considered during design change preparation and review.

B. Plant PSA Changes

Since the PSA forms the basis for the RI-ISI program, any changes to the PSA or risk significance determination will be evaluated for impact on the RI-ISI program. PSA and design changes will be incorporated into the RI-ISI program as required.

C. Plant Procedure Changes

Changes to plant procedures that affect ISI, such as system operating parameters, test intervals, or the ability of plant operations to perform actions associated with accident mitigation shall be considered in any RI-ISI program update. Additionally, changes in procedures that affect component inspection intervals, valve lineups, or operational modes of equipment shall also be assessed for their impact on changes in postulated failure mechanism initiation or Core Damage Frequency (CDF).

7.0 INSTRUCTION STEPS/ELEMENTS (Continued)

D. Equipment Performance Changes

Equipment performance changes shall be reviewed to ensure that changes in performance parameters (e.g. valve leakage, increased pump testing, vibration problems) are considered in the RI-ISI program update. Specific attention shall be paid to these type conditions if not previously assessed in the qualitative inputs to the component selections of the RI-ISI program. Adverse equipment performance will be evaluated for changes to the RI-ISI inspection scope.

E. Examination Results

When scheduled RI-ISI program NDE examinations, pressure tests and corresponding VT-2 visual examinations for leakage have been completed, and unacceptable flaws, evidence of service related degradation, or indications of leakage have been identified, these conditions shall be evaluated in accordance with plant procedures as applicable to determine the adequacy of the scope of the inspection program and update the RI-ISI program as applicable.

F. Individual Plant and Industry Failure Information

The Program Owner will consider applicable piping failures or degradations identified by the site's corrective action program. Industry awareness will be maintained through the sites Operating Experience program, NRC Generic Letters and Bulletins, site participation in Boiling Water Owners Group initiatives, and participation in the ASME Section XI Code committee activities.

G. Program Review

The Maintenance Rule Expert Panel will provide the oversight role for the RI-ISI program. The Expert Panel will review proposed changes to the program.

As with past reviews, personnel possessing expertise in RI-ISI evaluation and ISI inspection/evaluation will be present during presentation and review of the above items.

7.0 INSTRUCTION STEPS/ELEMENTS (Continued)

7.12.5.3 Corrective Action Program

A corrective action program assures that conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, defective material and equipment and non-conformances, are promptly identified and corrected. When required by SPP-3.1, the measures must ensure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the condition, the cause of the condition, and the corrective action are to be documented and reported to appropriate levels of BFN Site Management.

For Code Piping categorized as High Safety Significance (HSS) the corrective action shall be consistent with the provisions of ASME Section XI.

Any corrective action required as the result of RI-ISI examinations shall be handled in accordance with SPP-3.1.

7.12.5.4 Acceptance Guidelines

The acceptance guidelines for implementation, monitoring and corrective action programs for the RI-ISI program are as follows :

A. The implementation program will be evaluated based on the attributes stated in Sections 7.12.5.1 through 7.12.5.3.

B. Assurance that a nonconforming component will be brought back into conformance in a timely manner. Corrective actions required by ASME Section XI shall continue to be followed.

C. Evaluations within the corrective action program may also include:
   (1) Assuring the root cause of the condition is determined and the corrective actions taken preclude repetition. The identification of the condition, the cause of the condition, and the corrective action are to be documented and reported to appropriate levels of management.

   (2) Determining the impact of the failure or nonconformance on system/train operability since the previous inspection.

7.0 INSTRUCTION STEPS/ELEMENTS (Continued)

(3) Assessing the applicability of the failure or nonconforming condition to other components in the RI-ISI program.

(4) Correcting other susceptible RI-ISI components as necessary.

(5) Incorporating the lessons in the plant data base and computer models, if appropriate.

(6) Assessing the validity of failure rate and unavailability assumptions that can result from piping failure(s) used in the PSA or in support of the PSA.

(7) Considering the effectiveness of the component's inspection strategy in detecting the failure or nonconforming condition.

(8) Reducing the inspection interval and/or adjust inspection methods as appropriate, when the component (or group of components) experiences repeated failures or nonconforming conditions.

D. The corrective action evaluation shall be provided to the PSA and RI-ISI Groups for any model changes and regrouping as appropriate.

E. The RI-ISI program documents shall be revised to document any RI-ISI program changes resulting from corrective actions taken.

F. A program is in place to monitor industry findings (i.e., NADP-3).

G. Examination requirements include all piping evaluated by the risk-informed process and selected for examination.

7.0 INSTRUCTION STEPS/ELEMENTS (Continued)

H. Inspection Program

The examinations shall be completed during each ten-year inspection interval with the following exceptions.

(1) If, during the interval, a reevaluation using the RI-ISI process is conducted and scheduled items are no longer required to be examined, these items may be eliminated.

(2) If, during the interval, a reevaluation using the RI-ISI process is conducted and items are required to be added to the examination program, those items shall be added.

I. Successive Inspections

If piping structural elements are accepted for continued service by analytical evaluation in accordance with N-577-3200, the areas containing the flaws or relevant conditions shall be reexamined during the next three inspection periods referenced in the schedule of the inspection program of N-577-2400.

If the reexaminations required by N-577-2420 (b) reveal that the flaws or relevant conditions remain essentially unchanged for the three successive inspection periods, the piping examination schedule may revert to the original schedule of successive inspections.

J. Additional Inspections Examinations performed in accordance with N-577-2500 that reveal flaws or relevant conditions exceeding the acceptance standards of N-577-3000 shall be extended to include additional examinations. The additional examinations shall include piping structural elements described in Table 1 of Code Case N-577 with the same postulated failure mode and the same or higher failure potential.

7.0 INSTRUCTION STEPS/ELEMENTS (Continued)

The number of additional elements shall be the number of piping structural elements with the same postulated failure mode originally scheduled for that fuel cycle

The scope of the additional examinations may be limited to those more-safety-significant piping structural elements within the systems whose materials and service conditions are determined by an evaluation to have the same postulated failure mode as the piping structural element that contained the original flaw or relevant condition. If the additional examinations required by N-577- 2430 (a) reveal flaws or relevant conditions exceeding the acceptance standards of N-577-3000, the examination shall be further extended to include additional examinations.

These examinations shall include all remaining piping elements within Table 1 of Code Case N-577 whose postulated failure modes are the same as the piping structural elements originally examined in N-577-2430 (a). An evaluation shall be performed to establish when those examinations are to be conducted. The evaluation must consider failure mode and potential.

For the inspection period following the period in which the examinations of N-577-2430 (a) or (b) were completed, the examinations shall be performed as originally scheduled in accordance with N-577-2400.

7.0 INSTRUCTION STEPS/ELEMENTS (Continued)

K. Examination and Pressure Test Requirements

(1) Pressure testing and VT-2 visual requirements are to be performed on Class1, 2, and 3 (equivalent) piping systems in accordance with Section XI as specified in the BFN SPT Program (i.e., SPP-9.1 and SI-3.3 Series).

Examination qualification and methods and personnel qualification are to be in accordance with 3-SI-4.6.G, Section 7.2.3.

L. Acceptance standards for identified flaws and repair/replacement activities are to be in accordance with 3-SI-4.6.G, Sections 6.0 and 7.7.

M. Records and reports shall be prepared and maintained in accordance with 3-SI-4.6.G, Section 7.5.

7.12.6 Risk Informed Inservice Inspection Program Analysis

The Analysis for Risk-Informed Inservice Inspection Program for BFN Unit 3 is outlined in 3-SI-4.6.G-A of this Program.

SECTION 8.0
TABLES/ATTACHMENTS

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
B-A	B1.11	5	RPV	5	-	-	-*	ISI-0220-C	UT	Reference *RFR # 3-ISI-1
B-A	B1.12	15	RPV	15	-	-	15	ISI-0220-C	UT	Deferred
B-A	B1.21	3	RPV	1	-	-	1	ISI-0295-A ISI-0445-C	UT	See Note 1
B-A	B1.22	16	RPV	6	2	2	2	ISI-0295-A ISI-0445-C	UT	See Note 1
B-A	B1.30	1	RPV	1	-	-	1	ISI-0220-C	UT	
B-A	B1.40	1	RPV	1	-	1	-	ISI-0295-A	UT&MT	Exam includes radius to flange (flex)
B-A	B1.51	N/A							UT	
B-B	Various	N/A								
B-D	B3.90	31	RPV	31	10	10	11	ISI-0220-C	UT	Reference RFR # 3-PDI-2 Ref. Paragraph 7.3.1.G
B-D	B3.100	31	RPV	6 25	2 8	2 9	2 8	ISI-0445-C ISI-0295-A ISI-0295-A	UT EVT-1	Ref. Paragraph 7.3.1.H & Code Case N-648-1
B-F	B5.10	*							ST&UT	*See Note 3
B-F	B5.20	N/A								
B-F	B5.30	N/A								

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
B-F	B5.130	N/A								Refer to Category B-J
B-F	B5.140	N/A								Refer to Category B-J
B-F	B5.150	N/A								
B-G-1	B6.10	92	RPV	92	30	30	32	ISI-0267-C	VT-1	
B-G-1	B6.20	92	RPV	88	88	-	-	ISI-0267-C	UT	See note 5.
			RPV	4	4	-	-	ISI-0267-C	ST	RPV studs when removed
B-G-1	B6.40	92	RPV	92	92	-	-	ISI-0267-C	UT	
B-G-1	B6.50	92	RPV	92	*4	-	-	ISI-0267-C	VT-1	*Bushings (When head removed) Ref Code Inquiry #IN04-009
B-G-1	B6.50	92 SETS	RPV	92	30	30	32	ISI-0267-C	VT-1	Washers (Sets of 2)
B-G-1	B6.150	N/A								
B-G-1	B6.180	32	RECIR	16	-	-	16	ISI-0413-C	UT	Pump selected for B-L-2 exam
B-G-1	B6.190	2	RECIR	2	When Disassembled			ISI-0413-C	VT-1	Flange surface
B-G-1	B6.200	32	RECIR	16	-	-	16	ISI-0413-C	VT-1	Pump selected for B-L-2 exam; nuts & washers
B-G-1	B6.200	32	RECIR	16	-	-	16	ISI-0413-C	VT-1	
B-G-1	B6.210	N/A								
B-G-2	N/A	N/A								

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
B-G-2	B7.50	30		*5					VT-1	*See Note 9
			MS/12	*1	*	*	*	ISI-0313-B		
			MS/13	*1	*	*	*	ISI-0313-C		
			RECIR/2	*1	*	*	*	ISI-0328-C		
			RPV/3	*2	*	*	*	ISI-0295-A		
B-G-2	B7.60	N/A								
B-G-2	B7.70	35		*8					VT-1	* See Note 4
			CS/4	*2	*	*	*	ISI-0331-C		
			FW/4	*1	*	*	*	ISI-0327-C		
			MS/8	*1	*	*	*	ISI-0329-C		FVC-1-XX
			MS/13	*1	*	*	*	ISI-0313-B		PCV-1-XXX
			RECIR/4	*2	*	*	*	ISI-0328-C		
			RHR/2	*1	*	*	*	ISI-0330-C		
B-G-2	*See Note 8	185	CRD	*See Note 8	-	-	-	ISI-0293-C	*VT-1	When disassembled and bolts reused
B-J	B9.11	399	*	*	*	*	*			See Section 7.3.1.E * See Note 3
B-J	B9.12	N/A								
B-J	B9.21	N/A								
B-J	B9.22	N/A								
B-J	B9.31	36	*	*	*	*	*			See Section 7.3.1.E * See Note 3
B-J	B9.32	N/A								
B-J	B9.40	N/A								

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
B-K	B10.10	2	RPV/2	2	-	*1	**1	ISI-0416-C	*MT **PT	*RPV Support Skirt **RPV Stabilizers
B-K	B10.20	105		13	4	4	5		ST	
			CS/6	1	-	-	1	ISI-0339-C		
			FW/31	3	-	3	-	ISI-0336-C		
			HPCI/2	1	-	-	1	ISI-0335-C		
			MS/35	4	4	-	-	ISI-0338-C		
			RECIR/20	2	-	-	2	ISI-0337-C		
			RHR/9	1	-	-	1	ISI-0340-C		
			RWCU/2	1	-	1	-	ISI-0334-C		
B-K	B10.30	6	RECIRC/6	1	-	-	1	ISI-0337-C	PT	
B-K	B10.40	2	FW/2	1	-	1	-	ISI-0336-C	ST	
B-L-1	B12.10	N/A								

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
B-L-2	B12.20	2	RECIR	1	*	*	*	ISI-0413-C	VT-3	EXAMINE WHEN DISASSEMBLED
B-M-1	B12.30	N/A								
B-M-1	B12.40	N/A								
B-M-2	B12.50	20 (Groups)		20					VT-3	EXAMINE WHEN
		53 Total Valves	CS/2	3	*	*	*	ISI-0331-C		DISASSEMBLED
			FW/2	2	*	*	*	ISI-0327-C		
			HPCI/2	2	*	*	*	ISI-0333-C		
			MS/1	1	*	*	*	ISI-0313-C		PCV-1-XXX
			MS/1	1	*	*	*	ISI-0329-C		FCV-1-XX
			RCIC/1	1	*	*	*	ISI-0332-C		
			RECIR/2	2	*	*	*	ISI-0328-C		
			RHR/6	6	*	*	*	ISI-0330-C		
			RWCU/2	2	*	*	*	ISI-0332-C		
B-N-1	B13.10	1	RPV	1	1	1	1	ISI-0220-C	VT-3	RPV Interior
B-N-2	B13.20	1	RPV	1	-	-	1	ISI-0220-C	VT-1	RPV beltline attachments
B-N-2	B13.30	1	RPV	1	-	-	1	ISI-0220-C	VT-3	RPV beyond beltline attachments
B-N-2	B13.40	1	RPV	1	-	-	1	ISI-0220-C	VT-3	Core support structure
B-O	B14.10	40	RPV	-	-	-	-	ISI-0293-C	PT	CRD housing weld Ref 7.3.1.C
B-P	B15.10		Refer to system pressure test program SPP-9.1						VT-2	Pressure Test Prog.

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
C-A	C1.10	12	RHR	3	1	1	1	ISI-0422-C	UT	RHR HT EXCH
C-A	C1.20	4	RHR	1	-	-	1	ISI-0422-C	UT	RHR HT EXCH
C-A	C1.30	N/A								
C-B	C2.10	N/A								
C-B	C2.20	N/A								
C-B	C2.31	16	RHR	4	-	2	2	ISI-0422-C	ST	RHR HT EXCH
C-B	C2.32	N/A								
C-B	C2.33	8	RHR	2	2	2	2	ISI-0422-C	VT-2	Nozzle telltale
C-C	C3.10	12	RHR/12	1	-	-	1	ISI-0422-C	ST	
C-C	C3.20	139		16	5	6	5		ST	
			CRD/8	1	-	1	-	ISI-0144-C		
			CS/15	2	-	-	2	ISI-0104-C		
			HPCI/23	2	-	-	2	CHM-2413-C		
			MS/8	1	1	-	-	ISI-0355-C		
			RCIC/9	1	1	-	-	CHM-2412-C		
			RHR/75	8	3	5	-	ISI-0395-C		
			RBCCW/1	1	-	-	1	ISI-0034-C		
C-C	C3.30	4	RHR/4	1	-	-	1	ISI-0311-B	ST	
C-C	C3.40	N/A	N/A	-	-	-	-			
C-D	N/A	N/A								None

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
C-F-1	C5.11	*8								*See Note 3
C-F-1	C5.12	*								
C-F-1	C5.20	N/A								
C-F-1	C5.30	N/A								BWR Plant
C-F-1	C5.40	N/A								BWR Plant
C-F-2	C5.51	*1075								*See Note 3

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
D-A	D1.10	N/A		N/A						
D-A	D1.20	55		6	2	2	2	ISI-0390-C	VT-1	
			EECW/23	2	-	-	2			
			FPC/1	1	1	-	-	CHM-2429-C		
			RHRSW/31	3	1	2	-	CHM-2416-C		
D-A	D1.30	N/A	N/A							
D-A	D1.40	N/A	N/A							
D-B	D2.10	-	ALL	refer to system pressure test program SPP-9.1					VT-2	Pressure Test Prog.

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
F-A	F1.10	139		40	10	14	16		VT-3	
F-A	F1.10A*	4		1	-	-	1		VT-3	* See Note 6
			MS/2	1	-	-	1	ISI-0338-C		
			RWCU/2	-	-	-	-	ISI-0334-C		
F-A	F1.10B*	18		6	1	-	5		VT-3	
			CS/2	1	-	-	1	ISI-0339-C		
			FW/4	1	1	-	-	ISI-0336-C		
			HPCI/1	1	-	-	1	ISI-0335-C		
			MS/8	2	-	-	2	ISI-0338-C		
			RHR/2	1	-	-	1	ISI-0340-C		
			RWCU/1	-	-	-	-	ISI-0334-C		
F-A	F1.10C*	54		15	7	8	2		VT-3	
			CS/6	1	-	1	-	ISI-0339-C		
			FW/10	3	3	1	-	ISI-0336-C		
			HPCI/2	1	-	1	-	ISI-0335-C		
			MS/16	4	4	1	-	ISI-0338-C		
			RECIR/11	3	-	1	2	ISI-0337-C		
			RHR/7	2	-	2	-	ISI-0340-C		
			RWCU/2	1	-	1	-	ISI-0334-C		

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
F-A	F1.10D*	63		16	2	6	8		VT-3	* See Note 6
			CS/4	1	-	-	1	ISI-0339-C		Ref. RFR# 3-ISI-2
			FW/19	6	-	6	-	ISI-0336-C		
			HPCI/1	-	-	-	-	ISI-0335-C		
			MS/19	4	2	-	2	ISI-0338-C		
			RECIR/11	3	-	-	3	ISI-0337-C		
			RHR/6	1	-	-	1	ISI-0340-C		
			RWCU/3	1	-	-	1	ISI-0334-C		
F-A	F1.20	357		57	16	19	22		VT-3	
F-A	F1.20A*	125		20	5	10	5		VT-3	* See Note 6
			CRD/13	2	-	2	-	ISI-0144-C		
			CS/18	3	-	3	-	ISI-0104-C		
			HPCI/19	3	-	-	3	CHM-2413-C		
			RBCCW/3	1	-	-	1	ISI-0034-C		
			RCIC/9	1	-	-	1	CHM-2412-C		
			RHR/63	10	5	5	-	ISI-0395-C		
F-A	F1.20B*	88		15	-	9	6		VT-3	
			CRD/34	6	-	6	-	ISI-0144-C		
			CS/8	1	-	1	-	ISI-0104-C		
			HPCI/13	2	-	-	2	CHM-2413-C		
			MS/4	1	-	1	-	ISI-0355-C		
			RBCCW/1	-	-	-	-	ISI-0034-C		
			RCIC/5	1	-	-	1	CHM-2412-C		
			RHR/23	4	-	1	3	ISI-0395-C		

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
F-A	F1.20C*	118		19	11	-	8		VT-3	* See Note 6
			CS/14	2	-	-	2	ISI-0104-C		
			HPCI/19	3	-	-	3	CHM-2413-C		
			MS/32	5	5	-	-	ISI-0355-C		
			RCIC/5	1	-	-	1	CHM-2412-C		
			RHR/48	8	6	-	2	ISI-0395-C		
F-A	F1.20D*	26		3	-	-	3		VT-3	Ref. RFR# 3-ISI-2
			HPCI/5	-	-	-	-	CHM-2413-C		
			RCIC/3	-	-	-	-	CHM-2412-C		
			RHR/18	3	-	-	3	ISI-0395-C		
F-A	F1.30	152		18	10	8	-		VT-3	
F-A	F1.30A*	47		6	4	2	-		VT-3	* See Note 6
			EECW/16	2	-	2	-	ISI-0390-C		
			RHRSW/31	4	4	-	-	CHM-2416-C		
F-A	F1.30B*	97		11	5	6	-		VT-3	
			EECW/57	6	-	6	-	ISI-0390-C		
			FPC/3	1	1	-	-	CHM-2429-C		
			RHRSW/37	4	4	-	-	CHM-2416-C		
F-A	F1.30C*	8	RHRSW/8	1	1	-	-	CHM-2416-C	VT-3	
F-A	F1.30D*	-	N/A	-	-	-	-			

Examination Category	Item Number	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	ISI Drawing	Exam Method	Remarks
F-A	F1.40	50		22	7	7	8		VT-3	See Note 7
F-A	F1.40A*	N/A	N/A							* See Note 6
F-A	F1.40B*	26		9	0	4	5		VT-3	* See Note 6
			CS/4	1	-	-	1	ISI-0104-C		
			HPCI/3	2	-	-	2	CHM-2413-C		
			RCIC/2	1	-	-	1	CHM-2412-C		
			RHR/16	4	-	3	1	ISI-0311-B		
			RPV/1	1	-	1	-	ISI-0416-C		
F-A	F1.40C*	11		6	3	2	1		VT-3	
			FW/2	1	-	1	-	ISI-0336-C		
			RECIR/8	4	3	1	-	ISI-0337-C		
			RPV/1	1	-	-	1	ISI-0416-C		
F-A	F1.40D*	13		7	4	1	2		VT-3	Ref. RFR# 3-ISI-2
			RCIC/1	1	-	-	1	CHM-2412-C		
			RECIR/12	6	4	1	1	ISI-0337-C		

Examination Category	Item Number	Number of Components	System/ Subtotal	Interval 3 Period 1 Sample	Interval 3 Period 2 Sample	Interval 3 Period 3 Sample	ISI Drawing	Exam Method	Remarks
R-A	R1.11	17	MS/2	2	-	-	ISI-0354-C	UT	
			FW/2	-	-	2	ISI-0327-C	UT	
			RWCU/1	-	-	1	ISI-0332-C	UT	
			RCIC/1	1	-	-	CHM-2408-C	UT	
			HPCI/3	-	-	3	ISI-0333-C	UT	
			RHR/7	-	6	1	ISI-0330-C	UT	
			CS/1	-	-	1	ISI-0331-C	UT	
R-A	R1.16								
	Cat A	13	RECIRC/12	3	4	5	ISI-0328-C	UT	Ref RFR# 3-ISI-16.
			RWCU/1	1	-	-	ISI-0332-C	UT	
	Cat C	15	CS/5	-	2	3	ISI-0331-C	UT	
			RECIRC/2	2	-	-	ISI-0328-C	UT	
			RHR/8	3	1	4	ISI-0330-C	UT	Ref RFR# 3-ISI-16.
	Cat E (SI)	1	RECIRC/1	1	1	-	ISI-0328-C	UT	Examine every 6 years.
	Cat E (OL)	7	RECIRC/6	2	4	-	ISI-0328-C	UT	Examine every 10 years. Ref RFR# 3-ISI-17.
			RHR/1	-	1	-	ISI-0330-C	UT	
	Cat D	1	RHR/1	1	1	1	ISI-0330-C	UT	Examine every 6 years.
	Cat G	2	RHR/2	4	4	2	ISI-0330-C	VT-2	Not accessible for UT. Must be visually examined every outage
R-A	R1.18	15 Line Segments	FW/11	-	-	-			Only those locations required per SPP-9.7
			MS/4	-	-	-			

ASME Section XI, Code Category B-N-1

ITEM NO.	DESCRIPTION	REQUIREMENT	CYCLE 12	CYCLE 13	CYCLE 14	CYCLE 15	CYCLE 16
B13.10	4 – MAIN STEAM NOZZLES (N-3'S)	VT-3					
B13.10	6 – FEEDWATER NOZZLES (N4'S)	VT-3					
B13.10	FEEDWATER SPARGERS	VT-3					
B13.10	CORE SPRAY PIPING	VT-3					
B13.10	2 – CORE SPRAY NOZZLES (N5'S)	VT-3					
B13.10	CORE SPRAY SPARGERS	VT-3					
B13.10	TOP GUIDE ASSEMBLY (TOP SIDE)	VT-3					
B13.10	4 – INSTRUMENTATION NOZZLES (2-N-11'S, 2-N-12'S)	VT-3					
B13.10	CRD RETURN NOZZLE (N9)	VT-3					
B13.20	JP RISER BRACE PAD WELDS	VT-1					
B13.20	SURVEILL. SPECMN. BRACKETS (SHELL COURSE 2)	VT-1					

ASME Section XI, Code Category B-N-2

ITEM NO.	DESCRIPTION	REQUIREMENT	CYCLE 12	CYCLE 13	CYCLE 14	CYCLE 15	CYCLE 16
B13.30	GUIDE ROD BRACKETS	VT-3					
B13.30	STEAM DRYER SUPPORT BRACKETS	VT-3					
B13.30	STEAM DRYER SUPPORT BRACKETS ON TOP HEAD	VT-3					
B13.30	FEEDWATER SPARGER BRACKET	VT-3					
B13.30	CORE SPRAY PIPING BRACKETS AND PADS	VT-3					
B13.30	RPV SHROUD SUPPORT TO RPV BOTTOM HEAD (H-9)	VT-3					
B13.30	SURVEILL. SPECMN. BRACKETS (SHELL COURSE 3)	VT-3					
B13.40	TOP GUIDE	VT-3					
B13.40	CORE PLATE	VT-3					

ASME Section XI, Code Category B-N-1

ITEM NO.	DESCRIPTION	REQUIREMENT	CYCLE 12	CYCLE 13	CYCLE 14	CYCLE 15	CYCLE 16
B13.10	ALL INTERNAL COMPONENTS	VT-3					

ASME Section XI, Code Category B-N-2

ITEM NO.	DESCRIPTION	REQUIREMENT	CYCLE 12	CYCLE 13	CYCLE 14	CYCLE 15	CYCLE 16
B13.30	RPV SHROUD SUPPORT LEGS TO RPV BOTTOM HEAD (H-12)	VT-3					
B13.40	FUEL SUPPORT CASTINGS	VT-3					
B13.40	CONTROL ROD BLADE GUIDE TUBES	VT-3					
B13.40	CONTROL ROD DRIVE HOUSINGS	VT-3					
B13.40	CORE SHROUD SUPPORT ABOVE CORE PLATE	VT-3					
B13.40	CORE SHROUD SUPPORT BELOW CORE PLATE	VT-3					

Section 8.1 Notes:

1. The accessible length of the RPV circumferential and meridional head welds will be ultrasonically examined in accordance with the extent and frequency of examination in Table IWB-2500-1, Examination Category B-A, Item Numbers B1.21 and B1.22. The two bottom head circumferential welds (C-S-LH and C-S-BH) and ten bottom head meridional welds (V-BH-1 through V-BH-10) are inaccessible because of their location in the bottom head and proximity to the CRD and in-core instrumentation housings. These welds will not be scheduled for examination since they are inaccessible. The accessible portions of the seven top head circumferential and meridional welds will be ultrasonically examined.

2. The Feedwater and Main Steam system percentages are maintained by examination of nozzle to safe-end (transition piece) welds under the RPV system.

3. An alternative Risk-Informed Inservice Inspection Program in accordance with Appendix A was implemented in the Second Inspection Interval. Alternative examination requirements for Examination Categories B-F, B-J, C-F-1, and C-F-2 are provided in Examination Category R-A Section 8.1.

4. Number of Groups of Class 1 valves exceeding NPS 4 contained within this system (Examination Category and/or Item Number). All of the bolts or studs and nuts in each connection of one valve within each group of valves shall be visually examined during the inspection interval in accordance with visual examination method VT-1. All of the bolting from one valve within each group of valves shall be examined during the inspection interval when the B-M-2 valve interior surface examination is performed. If the B-M-2 valve interior surface examination is not performed during the interval, then all of the bolting from one valve in each group of valves shall be visually examined in place at the end of the interval.

5. Studs (Bolting) may be examined in place under tension, when connection is disassembled, or when the bolting is removed. Studs shall be surface examined only if removed. The four studs (# 22, 23, 24, and 25) normally removed for refueling have been scheduled under Item Number B6.20. Others shall receive a surface exam if removed in accordance with Table IWB-2500-1, Examination Category B-G-1, NOTES: (1) and (7).

6. F-A item number suffices (A, B, C, D) represent categorization in accordance with NOTE (1) to Table IWF-2500-1, i.e., A = one directional rod hangers, B = multi-directional restraints, C = supports that allow thermal movement such as springs, D = other, including snubbers.

Section 8.1 Notes (cont'd):

7. The Control Rod Drive Hydraulic System lateral restraint clamps and beams are not classified as ASME Code items since they are not part of the core support structure or part of the pressure boundary. Reference DCN # 7792 and General Electric Document # 23A6371

8. Code Category B-G-2, Item No. B7.80, CRD Housing Bolts, Studs, and Nuts, were deleted in the ASME Section XI Division 1 Code 1995 Edition 1995 Addenda. 10 CFR 50.55a published October 01, 2004, 69FR58804 includes a MANDATORY limitation in (b)(2)(xxi) (B), as follows: "(B) The provisions of Table IWB-2500-1 , Examination Category B-G-2, Item No. B7.80, that are in the 1995 Edition are applicable only to reused bolting when using the 1997 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section." If the RPV CRD Flange bolting is disassembled and the bolting is reused, they shall receive a VT-1 Visual examination.

9. Number of Groups of Class 1 Piping Bolted Connections contained within this system (Examination Category and/or Item Number). All of the bolts or studs and nuts in one flange bolted connection among a group of flange bolted connections that are similar in design, size, function, and service shall be visually examined during the inspection interval in accordance with visual examination method VT-1. Examination is required only when a flange is dissassembled. Examination is required only once during the interval.

SECTION 8.2 - AUGMENTED EXAMINATION TABLE

Augmented Examination Category	Ref. Program Section	Number of Components	Exam Reqmt Source Code	Refueling Cycle 12 Sample	Refueling Cycle 13 Sample	Refueling Cycle 14 Sample	Refueling Cycle 15 Sample	Refueling Cycle 16 Sample		Exams Required	Remarks
N/A	7.11.1	6	B01-02	-	-	-	6	-		UT	FW Nzl Bore&IR
N/A	7.11.1	6	B01-02	6	-	-	-	6		VT-1 Reference	FW Spargers
A	7.11.3	71	B02-02	-	-	-	-	-	See Note		
C	7.11.3	79	B02-02	4	3	3	3	8		UT	IGSCC
D	7.11.3	2	B02-02	-	2	-	-	2		UT	IGSCC
E (SI)	7.11.3	1	B02-02	1	-	-	1	-	100% every 6 years	UT	IGSCC
E (OL)	7.11.3	9	B02-02	2	-	5	-	-	25% in 10 years	UT	IGSCC
G	7.11.3	2	B02-02	2	2	2	2	2		VT-2	IGSCC

Note: An alternative Risk-Informed Inservice Inspection Program in accordance with Appendix A was implemented in the Second Period of the Second Inspection Interval. Alternative examination requirements for Examination Categories B-F, B-J, C-F-1, and C-F-2 are provided in Examination Category R-A. The Risk-Informed Program includes the requirements for Augmented Examination Category A.

**Note: Paragraph 7.11.2 UT of Welds and Thermal Mixing Tee no longer required. Commitment fulfilled.

SECTION 8.2 - AUGMENTED EXAMINATION TABLE (cont.)

Augmented Examination Category	Ref. Program Section	Number of Components	Exam Reqmt Source Code	Refueling Cycle 7 Sample	Refueling Cycle 8 Sample	Refueling Cycle 9 Sample	Refueling Cycle 10 Sample	Refueling Cycle 11 Sample	Refueling Cycle 12 Sample	Exams Required	Remarks
			0-TI-365	N/A	7.11.4	-	-	-	-	0-TI-365	RPV
				-	-	-	-	-	-		INTERIOR
N/A	7.11.5 7.11.6	7	B06-02	7	7	7	7	7	7	VT-2	BWRVIP-27 BWRVIP-49
N/A	7.11.7	All	B06-02				as accessible			UT	CS/RECIR SE BM
N/A	7.11.8	31	B04-02	5	4	6	5	11		UT	TSR 3.4.3.2 Pipe Whip

SECTION 8.3-PART 1
UNIT 3 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01/BWRVIP-75

Note: Starting with the Second Period of the Second Interval, the welds to be examined in Category A are those identified by the Risk-Informed Inservice Inspection Program as listed in Section 8.1

WELD NUMBER	SYSTEM	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC CATEGORY
RWR-3-001-G003	RECIR	12	P, SE	A
RWR-3-001-G006	RECIR	12	P, SE	A
RWR-3-001-G009	RECIR	12	P, SE	A
RWR-3-001-G012	RECIR	12	P, SE	A
RWR-3-001-G015	RECIR	12	P, SE	A
RWR-3-001-G016	RECIR	12	P, P	A
RWR-3-001-G017	RECIR	12	P, RT	A
RWR-3-001-G018	RECIR	12	P, T	A
RWR-3-001-G019	RECIR	22	T, X	A
RWR-3-001-G020	RECIR	12	P, T	A
RWR-3-001-G021	RECIR	22	T, X	A
RWR-3-001-G022	RECIR	12	P, T	A
RWR-3-001-G023	RECIR	12	P, RT	A
RWR-3-001-G024	RECIR	12	P, P	A
RWR-3-001-G025	RECIR	28	P, T	A
RWR-3-002-G003	RECIR	12	P, SE	A
RWR-3-002-G006	RECIR	12	P, SE	A
RWR-3-002-G009	RECIR	12	P, SE	A
RWR-3-002-G012	RECIR	12	P, SE	A
RWR-3-002-G015	RECIR	12	P, SE	A
RWR-3-002-G016	RECIR	12	P, P	A
RWR-3-002-G017	RECIR	12	P, RT	A
RWR-3-002-G018	RECIR	12	P, T	A
RWR-3-002-G019	RECIR	22	T, X	A
RWR-3-002-G020	RECIR	12	P, X	A
RWR-3 002-G021	RECIR	22	T, X	A
RWR-3-002-G022	RECIR	12	P, T	A
RWR-3-002-G023	RECIR	12	P, RT	A
RWR-3-002-G024	RECIR	12	P, P	A
RWR-3-002-G025	RECIR	28	P, T	A
SW-TPR-3-19	RECIR28	T, X	A	
SW-TPR-3-21	RECIR	28	T, X	A
RHR-3-002-G001	RHR	24	P, T	A
RHR-3-002-G002	RHR	24	P, V	A
RHR-3-002-G003	RHR	24	P, T	A
RHR-3-002-G004	RHR	24	P, V	A

SECTION 8.3-PART 1
UNIT 3 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01/BWRVIP-75 (cont.)

Note: Starting with the Second Period of the Second Interval, the welds to be examined in Category A are those identified by the Risk-Informed Inservice Inspection Program as listed in Section 8.1

WELD NUMBER	SYSTEM	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC EXAM CATEGORY
RWR-3-001-G001	RPV	12	N, SE	A
RWR-3-001-G004	RPV	12	N, SE	A
RWR-3-001-G007	RPV	12	N, SE	A
RWR-3-001-G010	RPV	12	N, SE	A
RWR-3-001-G013	RPV	12	N, SE	A
RWR-3-002-G001	RPV	12	N, SE	A
RWR-3 002-G004	RPV	12	N, SE	A
RWR-3-002-G007	RPV	12	N, SE	A
RWR-3-002-G010	RPV	12	N, SE	A
RWR-3-002-G013	RPV	12	N, SE	A
RWR-3-003-G001	RPV	4	N, SE	A
RWR-3-003-G050	RPV	4	N, SE	A
RWCU-3-001-G001	RWCU	6	P, PEN	A
RWCU-3-001-042	RWCU	6	P, V	A
RWCU-3-001-G014	RWCU	6	E, P	A
RWCU-3-001-G015	RWCU	6	E, P	A
RWCU-3-001-G016	RWCU	6	E, P	A
RWCU-3-001-G017	RWCU	6	E, P	A
RWCU-3-001-G018	RWCU	6	E, P	A
RWCU-3-001-G019	RWCU	6	E, P	A
RWCU-3-001-G020	RWCU	6	E, P	A
RWCU-3-001-066	RWCU	6	E, P	A
RWCU 3-001-043	RWCU	6	P, V	A
RWCU-3-001-044	RWCU	6	E, V	A
RWCU-3-001-G024	RWCU	6	E, P	A
RWCU-3 001-G025	RWCU	6	P, V	A
RWCU-3-001-G026	RWCU	6	T, V	A
RWCU-3-007-G001	RWCU	4	P, V	A
RWCU-3-007-G002	RWCU	4	P, V	A
RWCU-3-007-G003	RWCU	4	P, V	A
RWCU-3-007-G004	RWCU	4	P, V	A
TCS-3-401	RPV	10	N, SE	A
TCS-3-417	RPV	10	N, SE	A
TSCS-3-402	CS	10	P, SE	A
TSCS-3-418	CS	10	P, SE	A

SECTION 8.3 PART 1
UNIT 3 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01/BWRVIP-75 (cont.)

Note: Starting with the Second Period of the Second Interval, the welds to be examined in Category A are those identified by the Risk-Informed Inservice Inspection Program as listed in Section 8.1

WELD NUMBER	SYSTEM	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC EXAM CATEGORY
RCRD-3-49	CRD	4	E, V	C
RCRD-3-50	CRD	4	E, V	C
RCRD-3-52	CRD	4	P, V	C
DCS-3-04	CS	12	P, P	C
DCS-3-05	CS	12	P, V	C
DCS-3-13	CS	12	P, P	C
DCS-3-14	CS	12	P, V	C
DSCS-3-01	CS	12	E, P	C
DSCS-3-02	CS	12	E, P	C
DSCS-3-07	CS	12	E, P	C
DSCS-3-08	CS	12	E, E	C
DSCS-3-09	CS	12	E, P	C
TCS-3-405	CS	12	E, V	C
TCS-3-406	CS	12	P, V	C
TCS-3-410	CS	12	E, V	C
TCS-3-421	CS	12	E, V	C
TCS-3-422	CS	12	P, V	C
TCS-3-426	CS	12	E, V	C
GR-3-01	RECIR	28	P, PMP	C
GR-3-02	RECIR	28	P, V	C
GR-3-04	RECIR	4	C, P	C
GR-3-07	RECIR	4	C, P	C
GR-3-28	RECIR	28	P, V	C
GR-3-29	RECIR	28	E, V	C
GR-3-30	RECIR	4	C, P	C
GR-3-33	RECIR	4	C, P	C
GR-3-55	RECIR	28	P, T	C
GR-3-56	RECIR	28	E, V	C
GR-3-58	RECIR	28	E, PMP	C
GR-3-61	RECIR	28	P, P	C
GR-3-62	RECIR	28	E, V	C
GR-3-63A	RECIR	4	F, F	C
GR-3-63B	RECIR	4	BC	C

SECTION 8.3-PART1
UNIT 3 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01/BWRVIP-75 (cont.)

Note: Starting with the Second Period of the Second Interval, the welds to be examined in Category A are those identified by the Risk-Informed Inservice Inspection Program as listed in Section 8.1

WELD NUMBER	PIPE SIZE SYSTEM	WELD (INCHES)	IGSCC CONFIG	CATEGORY
KR-3-01	RECIR	4	BC	C
KR-3-02	RECIR	28	E, P	C
KR-3-04	RECIR	4	BC	C
KR-3-23	RECIR	4	BC	C
KR-3-24	RECIR	28	E, P	C
KR-3-26	RECIR	4	BC	C
KR-3-45	RECIR	28	E, P	C
KR-3-46	RECIR	28	P, T	C
KR-3-47	RECIR	28	E, P	C
KR-3-48	RECIR	28	E, P	C
KR-3-49	RECIR	4	BC	C
KR-3-50	RECIR	28	E, P	C
KR-3-51	RECIR	28	E, P	C
KR-3-52	RECIR	28	E, P	C
KR-3-53	RECIR	4	BC	C
DRHR-3-02	RHR	24	P, V	C
DRHR-3-04	RHR	24	E, P	C
DRHR-3-05	RHR	24	P, V	C
DRHR-3-06	RHR	24	P, V	C
DRHR-3-07	RHR	24	P, V	C
DRHR-3-11	RHR	24	P, V	C
DRHR-3-13	RHR	24	E, P	C
DRHR-3-14	RHR	24	E, V	C
DRHR-3-15	RHR	24	P, V	C
DRHR-3-16	RHR	24	E, V	C
DRHR-3-19	RHR	20	P, T	C
DRHR-3-21	RHR	20	E, V	C
DRHR-3-22	RHR	20	P, V	C
DRHR-3-23	RHR	20	P, V	C
DSRHR-3-01	RHR	24	E, P	C
DSRHR-3-02	RHR	24	E, P	C
DSRHR-3-03	RHR	24	P, P	C
DSRHR-3-04	RHR	24	E, P	C
DSRHR-3-04A	RHR	24	E, P	C
DSRHR-3-05	RHR	24	E, P	C
DSRHR-3-05A	RHR	24	E, P	C
DSRHR-3-06	RHR	24	P, P	C
DSRHR-3-07	RHR	24	E, P	C

SECTION 8.3-PART 1
UNIT 3 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01/BWRVIP-75 (cont.)

Note: Starting with the Second Period of the Second Interval, the welds to be examined in Category A are those identified by the Risk-Informed Inservice Inspection Program as listed in Section 8.1

WELD NUMBER	PIPE SIZE SYSTEM	WELD (INCHES)	IGSCC CONFIG	CATEGORY
DSRHR-3-08	RHR	6	BC	C
DSRHR-3-09	RHR	20	E, P	C
DSRHR-3-10	RHR	20	E, P	C
TRHR-3-191	RHR	20	E, V	C
N 1A-SE	RPV	28	N, SE	C
N 1B-SE	RPV	28	N, SE	C
RCRD-3-33	RPV	4	C, N	C
3RWCU-09	RWCU	4	P, V	C
DRHR-3-03	RHR	24	P, V	D
DRHR-3-12	RHR	24	P, V	D
GR-3-03(OL)	RECIR	28	E, V	E
GR-3-27(OL)	RECIR	28	P, PMP	E
GR-3-53(OL)	RECIR	28	P, SE	E
GR-3-54(OL)	RECIR	28	E, P	E
GR-3-57(OL)	RECIR	28	P, V	E
GR-3-59(OL)	RECIR	28	P, SE	E
GR-3-60(OL)	RECIR	28	E, P	E
GR-3-63	RECIR	28	P, V	E
GR-3-64(OL)	RECIR	28	E, PMP	E
DSRHR-3-11(OL)	RHR	20	E, P	E
DRHR-3-03B	RHR	24	P, P	G
DRHR-3-13B	RHR	24	P, P	G

SECTION 8.3 - PART 2
UNIT 3 STAINLESS AND DISSIMILAR METAL WELDS
NOT SUBJECT TO GENERIC LETTER 88-01 EXAMS

WELD NUMBER	SYSTEM	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC CATEGORY		EXAM METHOD
TCS-3-205	CS	12	P,V	NA	N/A	TEMPERATURE EXCLUSION
TCS-3-207	CS	12	E,V	NA	N/A	TEMPERATURE EXCLUSION
DCS-3-03	CS	12	P,V	NA	N/A	TEMPERATURE EXCLUSION
DCS-3-10	CS	12	E,V	NA	N/A	TEMPERATURE EXCLUSION
DCS-3-11	CS	12	P,V	NA	N/A	TEMPERATURE EXCLUSION
DCS-3-12	CS	12	P,V	NA	N/A	TEMPERATURE EXCLUSION
TCS-3-206	CS	12	E,P	NA	N/A	TEMPERATURE EXCLUSION
DSCS-3-14	CS	12	E,P	NA	N/A	TEMPERATURE EXCLUSION
DSCS-3-16A	CS	12	P,PEN	NA	N/A	INACCESSIBLE IN PENETRATION X-16A. TEMPERATURE EXCLUSION.
DSCS-3-16B	CS	12	P,PEN	NA	N/A	INACCESSIBLE IN PENETRATION X-16A. TEMPERATURE EXCLUSION.

Group Number	Valve Number	Size (inch)	System	ISI Dwg Number	Vendor Dwg No.	Material Spec	Valve Type	Vendor	Forging/ Casting	Comments
1	3-554	24	Feedwater	ISI-0327-C	20788-H	A-216 WCB	Check	Atw & Mor	Casting	2
	3-558	24		ISI-0327-C	20788-H	A-216 WCB	Check	Atw & Mor	Casting	2
	3-568	24		ISI-0327-C	20788-H	A-216 WCB	Check	Atw & Mor	Casting	2
	3-572	24		ISI-0327-C	20788-H	A-216 WCB	Check	Atw & Mor	Casting	2
2	HCV 3-67	24		ISI-0327-C	035879-2	A-216 WCB	Gate	Powell	Casting	NO B-G-2 BOLTING
	HCV 3-66	24		ISI-0327-C	035879-2	A-216 WCB	Gate	Powell	Casting	
3	FCV 68-1	28	Recirc.	ISI-0328-C	94-12086	A351 CF8	Gate	Darling	Casting	2
	FCV 68-77	28		ISI-0328-C	94-12086	A351 CF8	Gate	Darling	Casting	2
4	FCV 68-3	28		ISI-0328-C	94-12086	A351 CF8	Gate	Darling	Casting	2
	FCV 68-79	28		ISI-0328-C	94-12086	A351 CF8	Gate	Darling	Casting	2
5	FCV 1-14	26	Main Stm.	ISI-0329-C	20851-H	A216 WCB	Globe	Atw & Mor	Casting	2
	FCV 1-26	26		ISI-0329-C	20851-H	A216 WCB	Globe	Atw & Mor	Casting	2
	FCV 1-37	26		ISI-0329-C	20851-H	A216 WCB	Globe	Atw & Mor	Casting	2
	FCV 1-51	26		ISI-0329-C	20851-H	A216 WCB	Globe	Atw & Mor	Casting	2
	FCV 1-15	26		ISI-0329-C	20851-H	A216 WCB	Globe	Atw & Mor	Casting	2
	FCV 1-27	26		ISI-0329-C	20851-H	A216 WCB	Globe	Atw & Mor	Casting	2
	FCV 1-38	26		ISI-0329-C	20851-H	A216 WCB	Globe	Atw & Mor	Casting	2
	FCV 1-52	26		ISI-0329-C	20851-H	A216 WCB	Globe	Atw & Mor	Casting	2

Group Number	Valve Number	Size (inch)	System	ISI Dwg Number	Vendor Dwg No.	Material Spec	Valve Type	Vendor	Forging/ Casting	Comments
6	PCV 1-4	6		ISI-0313-B	PL-7657F-100	See Note 3	Relief	Trgt Rck	Casting	2
	PCV 1-179	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1- 5	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-18	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-19	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-22	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-23	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-30	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-31	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-34	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-41	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-180	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
	PCV 1-42	6		ISI-0313-B	PL-7657F-100		Relief	Trgt Rck	Casting	2
7	HCV 74-69	24	RHR	ISI-0330-C	035880-3	A351 CF8M	Gate	Powell	Casting	NO B-G-2 BOLTING
	HCV 74-55	24		ISI-0330-C	035880-3	A351 CF8M	Gate	Powell	Casting	
8	FCV 74-68	24		ISI-0330-C	20800-H	A351 CF8M	Check	Atw&Mor	Casting	2
	FCV 74-54	24		ISI-0330-C	20800-H	A351 CF8M	Check	Atw&Mor	Casting	2
9	FCV 74-67	24		ISI-0330-C	A-12334-M3A	A351 CF8M	Gate	Walworth	Casting	NO B-G-2 BOLTING
	FCV 74-53	24		ISI-0330-C	A-12334-M3A	A351 CF8M	Gate	Walworth	Casting	

Group Number	Valve Number	Size (inch)	System	ISI Dwg Number	Vendor Dwg No.	Material Spec	Valve Type	Vendor	Forging/ Casting	Comments
10	HCV 74-49	20	RHR	ISI-0330-C	036207-2	A351 CF8M	Gate	Powell	Casting	NO B-G-2 BOLTING
11	FCV 74- 47	20		ISI-0330-C	A-12332-M1C	A216 WCB	Gate	Walworth	Casting	NO B-G-2 BOLTING
12	HCV 75-55	12	C Spray	ISI-0331-C	036034-2	A351 CF8M	Gate	Powell	Casting	2
	HCV 75-27	12		ISI-0331-C	036034-2	A351 CF8M	Gate	Powell	Casting	2
13	FCV 75-54	12		ISI-0331-C	PD-420652	A351 CF8M	Check	Rockwell	Casting	2
	FCV 75-26	12		ISI-0331-C	PD-420652	A351 CF8M	Check	Rockwell	Casting	2
14	FCV 75-53	12		ISI-0331-C	IVP-11978	A351 CF8M	Gate	Walworth	Casting	NO B-G-2 BOLTING
	FCV 75-25	12		ISI-0331-C	IVP-11978	A351 CF8M	Gate	Walworth	Casting	
15	69-500	6	RWCU	ISI-0332-C	P-33160-20	A182 F316	Gate	Velan	Forging	NO B-G-2 BOLTING
16	FCV 69-1	6		ISI-0332-C	W 9825078	SA351 CF8M	Gate	BW/IP INTNL.	Casting	NO B-G-2 BOLTING
	FCV 69-2	6		ISI-0332-C	W 9825079	SA351 CF8M	Gate	BW/IP INTNL.	Casting	
17	FCV 71-40	6	RCIC	ISI-0332-C	PD-42068B	A216 WCB	Check	Rockwell	Casting	NO B-G-2 BOLTING

Group Number	Valve Number	Size (inch)	System	ISI Dwg Number	Vendor Dwg No.	Material Spec	Valve Type	Vendor	Forging/ Casting	Comments
18	69-628	4	RWCU	ISI-0333-C	C-23650	SA-351 CF8M	Check	Anchor Darling	Casting	1
	69-629	4		ISI-0332-C	C-23650	SA-351 CF8M	Check	Anchor Darling	Casting	1
19	FCV 73-2	10	HPCI	ISI-0333-C	PB-139989	A216 WCB	Gate	Crane	Casting	NO B-G-2 BOLTING
	FCV 73-3	10		ISI-0333-C	PB-139989	A216 WCB	Gate	Crane	Casting	
20	FCV 73-45	14		ISI-0333-C	PD-420687	A216 WCB	Check	Rockwell	Casting	NO B-G-2 BOLTING
21	FCV 74-48	20	RHR	ISI-0330-C	A-12331-M1C	A351 CF8M	Gate	Walworth	Casting	NO B-G-2 BOLTING

NOTES

1 Exempt from B-M-2 examination due to size.

2 Pressure Retaining Bolting

3 MSRV's with serial numbers 1014, 1015, 1016, 1032, 1033, and 1034 are complete forgings (A105).

All other MSRV's have cast bodies (A216 WCB) with forged top works (A105). At least one cast and one forged valve body will be examined during the inspection interval.

SECTION 8.5
REQUESTS FOR RELIEF
UNIT 3 REQUESTS FOR RELIEF SUMMARY LISTING

RFR	DESCRIPTION	SUBMITTED	APPROVED
3-PDI-2	Relief for reducing the examination volume of Category B-D, Item No. B3.90, RPV Pressure Retaining Nozzle To Vessel Welds.		September 19, 2001 for Interval 2
3-PDI-4	Relief to use ASME Section XI, Appendix VIII and Performance Demonstration Initiative (PDI) for Reactor Vessel Flange Welds.		
3-ISI-1 Rev.01	Permanent Relief from inservice inspection requirements of 10 CFR 50.55a(g) for the volumetric examination of the BFN Unit 3 RPV circumferential welds (Code Category B-A, Item Nos. B1.11).		November 18, 1999 for duration of original license
3-ISI-2	Relief to use alternate inspection and test plan for snubbers developed in accordance with GL 90-09 and approved by NRC.		May 3, 1999 for Interval 2
3-ISI-3	Relief to utilize ASME Code Case N-524 for Longitudinal Welds in Code Class 1, and 2 Piping. This RFR is no longer utilized due to implementation of RI-ISI .	n/a	n/a
3-ISI-4	Withdrawn	n/a	n/a
3-ISI-5	Withdrawn	n/a	n/a
3-ISI-6	Relief to utilize ASME Code Case N-532 to utilize Owners Activity Report (OAR) vs. NIS-1 and NIS-2 Summary reports. Not implemented at BFN. Not re-submitted for Interval 3.	n/a	n/a

SECTION 8.5
REQUESTS FOR RELIEF
UNIT 3 REQUESTS FOR RELIEF SUMMARY LISTING (CONT'D)

RFR	DESCRIPTION	SUBMITTED	APPROVED
3-ISI-7, Revision 01	Relief due to limitations in volumetric examinations of RPV Nozzle to Vessel Welds and Inner Radii ASME XI Code Category B-D, first and second period.	n/a	n/a
3-ISI-8	Relief to allow use of wire type penetramenters in lieu of plaque type penetrameters for performing radiographic inspections per Section III 1992 Edition as referenced from N-416-1. N-416-1 is not applicable to ASME Section XI 2001 Edition with 2003 Addenda; therefore not needed for Interval 3.	n/a	n/a
3-ISI-9	Relief to allow use of ASME Code Case N-323-1 in conjunction with best effort volumetric examination for the accessible weld surface of the RPV Skirt Weld. Revised for Interval 3 to address B-K and 50.55a(b)(x)(xxi)(c).	n/a	n/a
3-ISI-10	Relief to utilize the 1995 Edition with the 1996 Addenda of the ASME XI Code vs. The 1986 Edition of the Code for the examination of the RPV Head Nuts Code Category B-G-1. Incorporated into ASME Section XI 2000 Edition with 2003 Addenda; not needed for Interval 3.	n/a	n/a
3-ISI-11	Relief to utilize the requirements of ASME Code Case N-648-1, "Alternate Requirements for Inner Radius Examination of Class 1 Reactor Vessel Nozzles, Section XI, Division I", for examination of BFN Unit 3 RPV Head Nozzles using a direct visual (VT-1) examination in lieu of the required volumetric examination.	n/a	March 13, 2002 for Interval 2 n/a Interval 3
3-ISI-12	Relief due to limitations in volumetric examinations of Full Penetration piping welds Code Category R-A, Item no. R1.16. Awaiting NRC approval.	n/a	n/a

SECTION 8.5
REQUESTS FOR RELIEF
UNIT 3 REQUESTS FOR RELIEF SUMMARY LISTING (CONT'D)

RFR	DESCRIPTION	SUBMITTED	APPROVED
3-ISI-13	Relief from performing Volumetric examination of the RPV N10 Inner Radius Section Code Category B-D, Item No. B3.100. RFR Withdrawn, reference TVA letter to NRC dated January 16, 2004.	n/a	n/a
3-ISI-14	Relief to perform EVT-1 from the Vessel ID vs. UT of RPV Nozzle Inner Radius Sections, Code Category B-D, Item No. B3.100. Not needed due to use of Code Case N-648-1.	n/a	n/a
3-ISI-15	Relief to perform EVT-1 from the Vessel ID vs. UT of RPV Nozzle Inner Radius Sections, Code Category B-D, Item No. B3.100.	n/a	n/a
3-ISI-16	Relief from the requirements of ASME Section XI, Appendix VIII, Supplement 10, Qualification Requirements For Dissimilar Metal Piping Welds.		October 8, 2003 for Interval 2
3-ISI-17	Relief from the requirements of ASME Section XI, Appendix VIII, Supplement 11, Examination of Piping Weld Overlays.		December 19, 2003 for Interval 2
3-ISI-18	Relief to reduce the scope of volumetric examinations of the RPV Nozzle to Vessel Shell welds and Nozzle Blend Radii, Code Category B-D, Item No. B3.90 and B3.100. Withdrawn for Interval 2. Not re-submitted for Interval 3.	n/a	n/a
3-ISI-19	Relief from obtaining 100% code coverage of the volumetric examination of the RPV Vertical Shell welds due to limitations, Code Category B-A, Item No. B1.12.	n/a	n/a
3-ISI-20	Relief to allow use of ASME Code Case N-700, Alternative Rules for Selection of Classes 1, 2, and 3 Vessel Welded Attachments for Examination..		July 18, 2005 for Interval 2

SECTION 8.5
REQUESTS FOR RELIEF

UNIT 3 REQUESTS FOR RELIEF SUMMARY LISTING (CONT'D)

RFR	DESCRIPTION	SUBMITTED	APPROVED
3-ISI-21	Relief to allow use of Updated Risk-Informed Inservice Inspection Program.		

TENNESSEE VALLEY AUTHORITY (TVA)
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI INSERVICE INSPECTION (ISI) PROGRAM

BROWNS FERRY NUCLEAR PLANT (BFN)
3rd 10-YEAR INSPECTION INTERVAL FOR UNIT 3

REQUEST FOR RELIEF - No. 3-PDI-2

EXECUTIVE SUMMARY

TVA's current ISI programs' Code requirements for the examination volumes of the Class I reactor vessel pressure-retaining nozzle-to-vessel welds (Examination Category B-D, Items No. B3.90 - Inspection. Program B) are shown in Figures IWB-2500-7(a) and IWB-2500-7(b) of the applicable ASME Section XI Codes. These figures require that licensees perform examinations of the weld volumes and the adjacent vessel or nozzle base metal material regions to the extent of a length equivalent to one-half (1/2) the vessel shell thickness (t_s)[i.e. $t_s/2$] beyond the end of the weld's boundary. The extent of the examination volume for a given nozzle-to-vessel weld dictates the exam time and the amount of radiation dose exposure of the personnel involved. Historical improvements it the ultrasonic examination techniques and the qualifications of the examiners in accordance with the Section XI Appendix VIII has reduced the necessity of having the nozzle-to-vessel weld exam volumes be as large as currently required in Figures IWB- 2500-7 (a) and (b). TVA proposes to reduce the required examination volume's extent (next to the widest part of the weld) from one-half of the shell thickness to one-half inch beyond the boundary of the weld. The reduction of the exam volume in lieu of the current ASME Section XI Code required examination volumes will result in a reduction of examination time and the associated examination personnel radiation exposure while maintaining an acceptable level of quality and safety. Except for the proposed reduced examination volumes, TVA will continue to perform the volumetric examinations in accordance with the other specific aspects and requirements of the ASME Code for these exams. Accordingly, pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested to use the reduced examination volumes in lieu of the requirements shown in ASME Section XI Figures, IWB-2500-7 (a) and (b).

REQUEST FOR RELIEF - No. 3-PDI-2

SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

ASME Class I equivalent (TVA Class A) Reactor Pressure Vessel Pressure Nozzle-To-Vessel welds.

ASME SECTION XI CODE EDITION/ADDENDA:

The applicable Edition and Addenda of Record (with incorporated ASME Code Cases, as approved) For Browns Ferry Unit 3 is the 2001 Edition with addenda through the 2003 Addenda.

CODE REQUIREMENTS:

In accordance with the applicable plant's and unit's ISI Program ASME Section XI Code- of-Record rules for Inservice Inspection of Nuclear Power Plant Components; the requirements for nozzle-to-vessel weld examination volume shown in Section XI, Subsection IWB, Examination Category B-D Full Penetration Welds of Nozzles in Vessels - Inspection Program B, Code Item Number B3.90, with Figures IWB-2500-7(a) and IWB-2500-7(b) are applicable.

In addition, by reference in the applicable ASME Section XI Code paragraphs on Ultrasonic Examinations (UT), i.e. paragraph IWA-2232; Article 4 of ASME Section V [from the corresponding Code Edition and Addenda] is referenced as the requirements to which UT examinations must be conducted on vessel welds greater than two inches in thickness.

REQUEST FOR RELIEF - No. 3-PDI-2

REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

The specific Code requirement from which relief is requested is the requirement to perform the volumetric examination of the indicated nozzle-to-vessel welds in accordance with the examination volume requirements shown in ASME Section XI Subsection IWB, Figures IWB-2500-7(a) & (b). Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested to perform the Code examination on a reduced volume of one-half inch beyond the widest part of the boundary of the deposited weld material in lieu of the requirements of ASME Section XI Figures IWB-2500-7(a) and IWB-2500-7(b). When performing the examinations of nozzle-to-vessel welds, TVA will comply with the special requirements imposed in 10 CFR 50.55a(b)(2)(xv)(K)(1) and 10 CFR 50.55a(b)(2)(xv)(K)(2). These requirements dictate that the examination scanning processes must also be performed in such a manner to detect flaws oriented axially with the nozzle. TVA will continue to perform the required UT examinations in accordance with the Final Rule, except that the exam volume will be reduced.

BASIS FOR RELIEF:

Inservice examination of selected Reactor Pressure Vessel (PPV) nozzle-to-vessel welds at TVA nuclear plants is currently performed in accordance with the requirements of 10 CFR 50.55a, plant Technical Specifications and/or Technical Requirements, as applicable, and the associated ASME Section XI ISI Program Codes-of-Record Editions and Addenda of the ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The applicable ISI Program based Code Editions (the 2001 Edition through the 2003 Addenda for Browns Ferry Unit 3) invokes the examination volume requirements of Figures IWB-2500-7(a) and IWB'B-2500-7(b). This Code also invokes the examination requirements of ASME Section XI Appendix 1, Article 1-2000 which in turn reference ASME Section V, Article, of the associated Editions and Addenda of Section V. Under the new required Appendix VIII procedures the required examinations will be performed using procedures developed and qualified in accordance with the mandated requirements of the ASME Code, Section XI, Division 1, 2001 Edition with the 2003 Addenda of Appendix VIII and Supplement 7. These procedures provide for a more rigorous methodology for Ultrasonic Examinations.

JUSTIFICATION FOR GRANTING RELIEF:

The examination volume required by Figures IWB-2500-7(a) and (b) for the reactor vessel pressure retaining nozzle-to-vessel welds extends far beyond the weld and the heat effected zones into the base metal, and is unnecessarily large. This extends examination time significantly, increases the radiation exposure of exam support personnel, and results in no net increase in safety; as the additional area being examined is a base-metal region of the reactor vessel shell or nozzle wall areas where industry experience has shown service-induced cracks are not prone to occurring. In addition, these regions have been extensively examined during the fabrication and installation periods before the were put in service and during the inservice examinations already performed.

REQUEST FOR RELIEF - No. 3-PDI-2

The reduction of UT examination volumes adjacent to the widest part of the weld from one-half of the vessel wall thickness to one-half inch beyond the weld boundary eliminates base metal material volume to be examined that was extensively examined - during construction and preservice examinations, where applicable; and, eliminates areas which are not located in the high-stressed areas of the weld geometry. The high-stressed areas of the various nozzle-to-vessel weld configurations and areas where flaws are most likely to initiate are adequately addressed and contained in the examination volume defined by the area one-half inch beyond the weld boundary

In addition, use of these proposed examination boundaries will be conducted in conjunction with TVA's programmatic implementation of the mandated use of ASME Section XI, Appendix VIII. TVA will implement these requirements in accordance with the requirements shown in ASME Section XI Appendix VIII of the 2001 Edition with the 2003 Addenda, as amended by the Final Rule and as required in paragraphs 10 CFR 50.55a(b)(2)(xiv), (xv),and (xvi); and in 10 CFR 50.55a(g)(6)(ii)(C). TVA complies with these requirements through the use of the Electric Power Research Institute's (EPRI) program document (IR-2005-83), "Performance Demonstration Initiative (PDI) Program Description," Revision 4, except where specific relief from certain parts of the Code has been requested and granted. These procedures will ensure that the performance-based UT methodologies used and the techniques will be qualified and examination personnel will be certified by a performance demonstration.

The use of the reduced examination volumes in lieu of the identified ASME Section XI referenced requirements could reduce on-vessel examination time by as much as 12 hours of outage critical path schedule time, which translates to cost savings in the order of $14,400 for the actual exam costs and some reduction of examination support personnel radiation exposure. An equivalent reduction in the outage duration translates to a replacement power cost savings of from approximately $225,000 to $350,000, depending upon the circumstances of the outage. The personnel radiation exposure is dependent upon the choice of RPV examination equipment (i.e. automated versus manual) and by the degree of plant RPV contamination and/or decontamination conducted prior to the exam.

It should also be noted that a similar request for relief has been submitted by the Florida Power and Light Co.'s St. Lucie nuclear power plant and was subsequently granted. St. Lucie's Unit 2 Request for Relief No. 25 was approved by the NRC Staff in a letter dated October 4, 1999. In addition, this request is similar to a request (ISI- 17) recently approved for use at the Nine Mile Point Nuclear Station in a letter dated March 29, 2001.

In conclusion, use of the reduced examination volume requirements in conjunction with the application of the Appendix VIII implementing PDI program will provide sufficient assurance that RPV nozzle-to-vessel welds have remained free of service induced flaws or identify such flaws prior to failure. The application of the PDI techniques will enhance quality of the UT examinations and ensure plant safety and pressure boundary reliability. Therefore, the proposed alternative provides for an acceptable level of quality and safety and, pursuant to 10 CFR 50.55a(a)(3)(i), relief to use the reduced examination volumes maybe granted.

REQUEST FOR RELIEF - No. 3-PDI-2

ALTERNATIVE EXAMINATIONS:

TVA will perform the examinations of the RPV nozzle-to-vessel welds as follow:

1. Ultrasonic examinations of the RPV nozzle-to-vessel welds in accordance with the requirements of ASME Section XI Appendix VII with examination volumes to include regions up to one-half inch beyond the weld boundary.

2. In accordance with the requirements shown in ASME Section XI Appendix VIII of the 2001 Edition with the 2003 Addenda, as amended by the Final Rule and as required in paragraphs 10 CFR 50.55a(b)(2)(xiv), (xv), and (xvi); and in 10 CFR 50.55a(g)(6)(ii)(C), TVA complies with these requirements through the use of the Electric Power Research Institute's (EPRI) program document (IR-2005-83), "Performance Demonstration Initiative (PDI) Program Description," Revision 4, except where specific relief from certain parts of the Code has been requested and granted.

3. Continued periodic system pressure tests of the RPV per ASME Section XI requirements of Table IWB-2500-1, for Category B-P items.

IMPLEMENTATION SCHEDULE:

Upon approval by the NRC Staff, TVA will implement the provisions of this request during the 3rd ISI, program interval for Browns Ferry Unit 3 and conduct the next scheduled RPV nozzle-to-vessel weld examinations accordingly.

Reference NRC Safety Evaluation Report (SER) for approval Dated September 19, 2001, (RIMS # L44010925002).

ATTACHMENT TO THE RELIEF:

None.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 3

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI,

REQUEST FOR RELIEF
USE OF APPENDIX VIII AND PERFORMANCE DEMONSTRATION INITIATIVE (PDI) METHODOLOGIES FOR PERFORMANCE OF THE ULTRASONIC EXAMINATION OF REACTOR PRESSURE VESSEL SHELL-TO-FLANGE WELDS IN LIEU OF THE REQUIREMENT OF APPENDIX I AND THE ASSOCIATED ARTICLE 4, ASME SECTION V

3-PDI-4

TVA requests approval of an alternative to ASME Section XI, paragraph IWA-2232 of 2001 Edition with the 2003 Addenda for the 10-year Reactor Pressure Vessel (RPV) examinations performed at Browns Ferry Unit 3.

EXECUTIVE SUMMARY:

In accordance with 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from the specific requirements of performing the volumetric examination of the reactor pressure vessel (RPV) circumferential shell-to-flange welds in the subject TVA units in accordance with the requirement of Appendix I of Section XI. In addition, the guidance of Regulatory Guide (RG) 1.150, Revision 1, was historically applied with these processes. In lieu of the requirements of Appendix I and its associated sub-requirements of Article 4 of Section V, TVA will use the techniques, personnel, and equipment qualified to meet the requirements of ASME Section XI Appendix VIII, Supplements 4 and 6 of the 2001 Edition through the 2003 Addenda, as administered by the Electric Power Research Institute's (EPRI) Performance Demonstration Initiative (PDI) processes. This proposed alternative represents the best available methodology in qualification of equipment and personnel performing ultrasonic examinations and uses an examination process that has provided and will provide the highest practical quality and greatest amount of coverage for the performance of the shell-to-flange weld examinations. As such, the proposed alternative methodology provides an acceptable level of quality and safety. In addition, the approval of this relief results in savings in the cost of performing the examinations, with not having to incorporate the use of two different sets of examination equipment, and also results in lower personnel radiation exposure from not having to use a different methodology for the shell-to-flange weld. Note that this request for relief is similar to that requested in the Duke Energy Company request for the Oconee, McGuire, and Catawba Nuclear Stations, RR-04-GO-002, submitted initially in a letter to the NRC, dated July 14, 2004 (see ML042040261) and approved by the Staff in a letter dated October 20, 2004 (see ML042810601).

I SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED:

ASME Code Class 1 Reactor Pressure Vessel (RPV) Upper Vessel Shell-to-Flange Welds, Table IWB-2500-1 Category B-A, Item Number B1.30, TVA ISI Program Weld Designation 3-C-5-FLG.

II APPLICABLE CODE EDITION AND ADDENDA FOR THE GIVEN EXAM

2001 Edition with the 2003 Addenda

III CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED:

In accordance with ASME Section XI, paragraph IWA-2232, "Ultrasonic examinations shall be conducted in accordance with Appendix I."

Further, in accordance with Appendix I, paragraph I-2110(b) "Ultrasonic examination of reactor vessel-to-flange welds, closure head-to-flange welds, and integral attachment welds shall be conducted in accordance with Article 4 of Section V, except that alternative examination beam angles may be used."

IV RELIEF REQUESTED:

Pursuant to 10 CFR 50.55a(a)(3)(i), TVA requests relief from performing the designated vessel shell-to-flange weld examination in accordance with the requirements of ASME Section XI, paragraph IWA-2232, Appendix I, and the associated Article 4 of Section V methodology in accordance with paragraph I-2110(b).

V BASIS FOR RELIEF:

In accordance with ASME Section XI, Subarticle IWA-2232, TVA is required to perform ultrasonic examinations (UT) of the RPV upper shell-to-flange welds (at the indicated plants and units) using Section XI, Appendix I, which in turn requires the use of the NDE methodologies and processes of ASME Section V, Article 4. In addition, the guidance of RG-1.150, Revision 1, was historically applied. The above listed weld is the only circumferential shell weld in the RPV that is not examined in accordance with the requirements of ASME Section XI, Appendix VIII, as mandated in 10 CFR 50.55a with the issuance of the rule change shown in the Federal Register Notice 64 FR 51370, dated September 22, 1999. This rule change mandated the use of ASME Section XI, Appendix VIII, Supplements 4 and 6 for the conduct of RPV examinations. It has been recently stated in EPRI PDI coordination meetings between the PDI committee members and the NRC Staff representatives that the NRC Staff expectations are that licensees should submit requests for relief to use the more technically advanced Appendix VIII/PDI processes for the shell-to-flange weld exams, in lieu of the Section XI Appendix I and its associated Section V, Article 4 processes.

VI PROPOSED ALTERNATIVES

TVA proposes to use the procedures, personnel, and equipment qualified to meet the requirements of ASME Section XI Appendix VIII, Supplements 4 and 6 of the 2001 Edition through the 2003 Addenda, as administered by the Electric Power Research Institute's (EPRI) Performance Demonstration Initiative (PDI) processes to conduct the required vessel-to-flange weld examinations.

VII JUSTIFICATION FOR GRANTING RELIEF:

ASME Section V, Article 4, describes the required techniques to be used for the UT of welds in ferretic pressure vessels with wall thicknesses greater than 2 inches. The techniques were first published in ASME Section V in the 1974 Edition, summer 1975 Addenda. The calibration techniques, recording criteria and flaw sizing methods are based upon the use of a distance-amplitude-correction curve (DAC) derived from machined reflectors in a basic calibration block. UT performed in accordance with Section V, Article 4, used recording thresholds of 50 percent DAC for the outer 80 percent of the required examination volume and 20 percent DAC from the clad/base metal interface to the inner 20 percent margin of the examination volume. Indications detected in the designated exam volume portions, with amplitudes below these thresholds, were therefore not required to be recorded. Use of the Appendix VIII/PDI processes would enhance the quality of the examination results reported because the detection sensitivity is more conservative and the procedure requires the examiner to evaluate all indications determined to be flaws regardless of their associated amplitude. The recording thresholds in Section V, Article 4, requirements and in the guidelines of RG-1.150, Revision 1, are generic and somewhat arbitrary and do not take into consideration such factors as flaw orientation, which can influence the amplitude of UT responses.

The EPRI Report NP-6273, "Accuracy of Ultrasonic Flaw Sizing Techniques for Reactor Pressure Vessels," dated March 1989, established that UT flaw sizing techniques based on tip diffraction are the most accurate. The qualified prescriptive-based UT procedures of ASME Section V, Article 4 have been applied in a controlled process with mockups of RPVs which contained real flaws and the results statistically analyzed according to the screening criteria in Appendix VIII of ASME Section XI. The results show that the procedures in Section V, Article 4, are less effective in detecting flaws than procedures qualified in accordance with Appendix VIII as administered by the PDI processes. Appendix VIII/PDI qualification procedures use the tip diffraction techniques for flaw sizing. The proposed alternative Appendix VIII/PDI UT methodology uses analysis tools based upon echo dynamic motion and tip diffraction criteria which has been validated, and is considered more accurate than the Section V, Article 4 processes.

UT performed in accordance with the Section V, Article 4 processes requires the use of beam angles of 0^{o}, 45^{o}, 60^{o}, and 70^{o} with recording criteria that precipitates equipment changes. Having to perform these process changes is time consuming and results in increased radiation exposure for the examination personnel. Having to comply with the specific ASME Section XI, Appendix I requirements for the RPV circumferential shell-to-flange weld, when the data is obtained using a less technically advanced process, results in an examination that does not provide a compensating increase in quality and safety for the higher costs and personnel exposures involved.

Past RPV shell-to-flange examinations already performed at TVA plants and units (i.e., for BFN Units 2 and 3) used automated and manual UT systems operated by qualified vendors. The examination coverage achieved during the 2001 exam of the Unit 2 weld (during the 2^{nd} ISI program interval) resulted in a coverage of approximately 76.6 percent which is less than the required essentially 100 percent. Manual examination techniques were performed from the outside surfaces of the RPV during the Unit 2 examination in order to maximize the coverage. Examination coverage performed from the inside surfaces was limited due to the taper in the vessel wall at the edge of the weld area and the obstructions

encountered with the guide rods and the steam nozzle plugs with the specific UT equipment used during the exam. The manual examination of the weld volume performed from the outside surfaces was limited by the flange configuration. This limited exam with a percentage of coverage of less than 90 percent was the subject of a BFN Unit 2 relief request number RR 2-ISI-14. This relief was reviewed by the NRC and found to be acceptable. A safety evaluation report (SER), on this relief, was issued by the NRC in a letter to J. A. Scalice, from Allen G. Howe, dated April 3, 2003, [see TAC NOS. MB5309, MB8130, MB8132, and MB8133 (ML030970815)]. The examination performed on the Unit 3 RPV used a different set of newer designed UT equipment and thereby achieved a calculated coverage of 95 percent. Therefore, the Unit 3 examination results did not require the submittal and review of a relief request.

For future RPV shell-to-flange weld examinations TVA does not anticipate any less coverage than the required minimum of 90 percent of coverage. However, if any such limitations are encountered during the conduct of the examinations, separate individual relief requests will be submitted, as needed.

Procedures, equipment, and personnel qualified through the Appendix VIII, Supplements 4 and 6 PDI programs have shown to have a high probability of detection of flaws and are generally considered superior to the techniques employed earlier for RPV examinations. This results in increased reliability of RPV inspections and conditions where an acceptable level of quality and safety is provided with the proposed alternative methodologies. Accordingly, approval of this alternative evaluation process is requested pursuant to 10 CFR 50.55a(a)(3)(i).

VIII IMPLEMENTATION SCHEDULE AND DURATION:

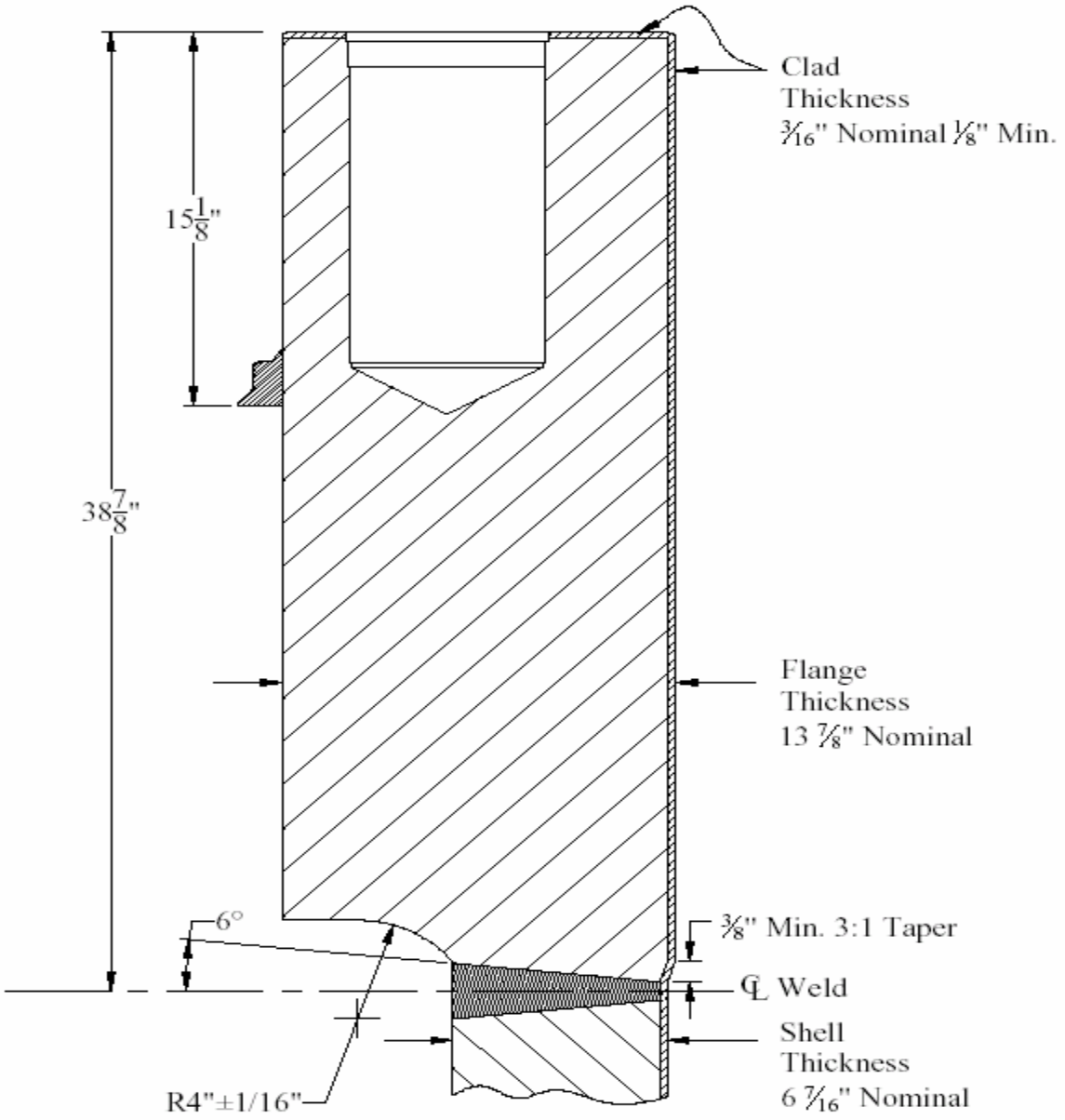
This alternative will be applied for BFN Unit 3 until the end of the unit's current ten-year ISI Program interval when the unit's corresponding ISI and In-service Inspection programs are updated:

BFN Unit 3 is currently in the first period of its third 10-year ISI program interval which extends from November 19, 2005 through November 18, 2015.

IX Precedents

This request for relief is similar to, and closely follows the content and statements made in, the relief requested in the Duke Energy Company request for the Oconee, McGuire, and Catawba Nuclear Stations, RR-04-GO-002, submitted initially in a letter to the NRC, dated July 14, 2004 (see ML042040261) and approved by the Staff in a letter dated October 20, 2004 [see TAC NOS. MC3804, MC3805, MC3807, MC3810 (ML042810601)]. In addition, other similar approved requests include those for the Southern California Edison Company with the San Onofre Unit 3 in a letter dated January 3, 2003 [TAC No. MB6708 (ML030150218)] and with the Public Service Enterprise Group Salem Unit 1 plant in a letter dated May 3, 2001 [TAC No. MB1234 (ML011060083)].

Figure 1
BFN Units 1, 2, & 3 RPV Flange to Shell Weld



TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT
UNIT 3 SECOND 10-YEAR INTERVAL
REVISED RELIEF REQUEST - 3-ISI-1, REVISION 1

Executive Summary: In accordance with 10 CFR 50.55a(a)(3)(i) TVA requests permanent relief (i.e., for the remaining term of operation under the existing license) from the inservice inspection requirements of 10 CFR 50.55a(g) for the volumetric examination of the reactor pressure vessel circumferential welds (ASME Code Section XI, Table IWB-2500-1, Examination Category B-A, Item No. B1.11, Circumferential Shell Welds). This request for relief is consistent with the guidance provided in NRC Generic Letter 98-05, "Boiling Water Reactor Licensees Use of the BWRVIP-05 Report to Request Relief From Augmented Examination Requirements on Reactor Pressure Vessel Circumferential Shell Welds" dated November 10, 1998. As part of this relief request, TVA also requests elimination of the successive examinations required by the ASME Code paragraph IWB-2420(b) for the RPV circumferential shell weld flaw areas. Section 2.8.1 of the Final Safety Evaluation of the BWR Vessel and Internals Project BWRVIP-05 Report dated July 28, 1998, permits the elimination of the successive examinations if certain outlined conditions are satisfied. TVA has met the stated conditions of the NRC SER for the BWRVIP-05 Report for the BFN Unit 3 RPV.

TVA has previously requested relief, for one operating cycle (Cycle 8), from performing successive examinations of the Unit 3 reactor pressure vessel (RPV) circumferential shell weld flaw areas and was granted relief by NRC in a letter dated August 17, 1998. In accordance with the existing approved relief request, these 15 flaws would be required to be reexamined during the BFN Unit 3 Cycle 9 refueling outage (Spring 2000).

REQUEST FOR RELIEF 3-ISI-1 (cont.)

This request for relief addresses the Code required scheduled circumferential shell weld examinations and the successive examinations required by IWB-2420(b) applicable to the RPV flaws identified (Fall 1993) during the BFN Unit 3 extended outage. The ASME Section XI Code paragraph IWB-2420(b) requires that RPV shell welds with flaws that were evaluated as being acceptable for continued service be reexamined in the next three inspection periods. To comply with this requirement, TVA must reexamine the Unit 3 RPV shell weld flaws during the Cycle 9 refueling outage, unless relief is granted.

The Code of Record for the Second Ten Year Inservice Inspection Interval is the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, 1989 Edition (no addenda).

TVA performed Unit 3 augmented RPV examinations (Fall 1993) during the extended outage as required by 10 CFR 50.55a(g)(6)(ii)(A). The intent of 10 CFR 50.55a(g)(6)(ii)(A) was to require licensees to perform an expanded RPV shell weld examination, as specified in the 1989 Edition of ASME Section XI, on an “expedited” basis. “Expedited,” in this context, effectively means during the inspection interval that the rule was approved or the first period of the next inspection interval. The final rule was published in the Federal Register on August 6, 1992.

The BFN Unit 3 RPV examination results identified fifteen flaws, located in circumferential shell welds, that exceeded the ASME Section XI Code acceptance criteria specified in Subarticle IWB-3500. TVA performed an evaluation of the indications in accordance with the ASME Section XI Code, paragraph IWB-3600, and determined that the BFN Unit 3 RPV was acceptable for continued service.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

The indications, all in the RPV shell welds, were oriented in the weld areas in such a manner as to indicate they were related to the fabrication of the vessel, and were characterized as subsurface flaws. The size and location of the flaws are such that the NDE techniques and capabilities used at the time of the vessel fabrication would not have readily identified the flaws.

One flaw located in the circumferential shell weld area (C-3-4) within the overlapping region of the longitudinal shell weld (V-4-B) examination boundary will be examined during the performance of the longitudinal weld examinations (Note: The flaw is reported in both the circumferential and longitudinal examination data report, numbers 12-015 and 14-002 respectfully). TVA is scheduled to perform all Code required and augmented RPV weld examinations in the Third Period (Spring 2004) of the Second Inspection Interval.

Justification for this request for relief is based upon, (1) TVA's previous evaluation of the flaws that determined an acceptable level of quality and safety exists, (2) NRC's concurrence with TVA's evaluation dated August 17, 1998, (3) TVA's determination that the BFN Unit 3 RPV flaws satisfy the criteria outlined in the NRC Final Safety Evaluation

Report (SER) dated July 28, 1998, for the BWRVIP-05 Report, and (4) the BWRVIP-05 report supports justification for excluding the examinations of the RPV circumferential shell welds. Therefore, in accordance with the guidance provided in GL 98-05 and pursuant to 10 CFR 50.55a(a)(3)(i), TVA asks that request for relief 3-ISI-1, Revision 1, be authorized for BFN Unit 3.

Note: TVA is including this request for relief in the BFN Unit 3 ASME Section XI ISI Third Interval Program for information since the request was submitted in the Second ISI Interval for the remaining life of the plant under the existing license. In addition, Table 1 was corrected to delete vessel shell to flange weld C-5-FLG since it is classified as B1.30 rather than B1.11 in ASME Section XI, Table IWB-2500-1.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

Unit: Three (3)

System: Reactor Pressure Vessel

Components: The components list for this request for relief is divided into two parts. The first list is for the permanent relief from examination of the BFN Unit 3 RPV circumferential welds. The second list comprises the Unit 3 RPV circumferential weld flaws that TVA is requesting relief from subsequent reinspection.

Listed below are the BFN Unit 3 RPV circumferential welds from which TVA is requesting permanent relief from volumetric examination:

Weld Description	Examination Category and Exam Method	Table IWB-2500-1 Item Number
Vessel Shell Weld - C-2-3 Circumferential vessel shell weld, (GE Designation H23)	B-A, Volumetric	B1.11
Vessel Shell Weld - C-3-4 Circumferential vessel shell weld, (GE designation H34)	B-A, Volumetric	B1.11
Vessel Shell Weld - C-4-5 Circumferential vessel shell weld, (GE designation H45)	B-A, Volumetric	B1.11
Vessel shell weld - C-1-2, Circumferential vessel shell weld, (GE designation H12	B-A, Volumetric	B1.11
Vessel Shell Weld - C-BH-1, Circumferential vessel shell weld, (GE designation HBH)	B-A, Volumetric	B1.11

REQUEST FOR RELIEF 3-ISI-1 (cont.)

Listed below are the BFN Unit 3 RPV circumferential weld flaws that TVA is requesting relief from successive volumetric examinations.

TVA/GE RPV Weld Designation	**Flaw Indication Report Nos.**
C-5FLG / VFW	20-007
	20-008
	20-009
	20-011
	20-012
C-4-5 / H45	16-075
	16-076
C-3-4 / H34	12-015*
	12-069
	12-116
	12-144
	12-145
	12-148
C-2-3 / H23	08-026
	08-067

* - Same flaw reported in Exam Summary Reports 12-015 for RPV circumferential weld C-3-4 and RPV longitudinal weld 14-002.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

ASME Code Class: ASME Code Class 1

Section XI Edition: 1989 Edition, no addenda

Code Table: IWB-2500-1

Examination Category: B-A, Pressure Retaining Welds in Reactor Vessel

Examination Item Number: See Table Above

Code Requirement: (1) ASME Section XI, 1989 Edition (no addenda), Table IWB-2500-1, Examination Category B-A, Item No. B1.11, volumetric examination of reactor pressure vessel circumferential welds.

(2) ASME Section XI, 1989 Edition (no addenda), Subarticle IWB-2420(b) "If flaw indications or relevant conditions are evaluated in accordance with IWB-3132.4 or IWB-3142.4, respectively, and the component qualifies as acceptable for continued service, the areas containing such flaw indications or relevant conditions shall be reexamined during the next three inspection periods listed in the schedule of the inspection program for IWB-2410."

Code Requirement From Which Relief Is Requested: In accordance with 10 CFR 50.55a(a)(3)(i) TVA is requesting relief from the ASME Code requirements shown below. TVA's proposed alternative provides an acceptable level of quality and safety and is consistent with the NRC's SER for the BWRVIP-05 Report and the guidance provided in GL 98-05.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

(1) Permanent relief (i.e., for the remaining term of operation under the existing license) is requested from the inservice inspection requirements for the volumetric examination of reactor pressure vessel circumferential welds, ASME Section XI, Table IWB-2500-1, Examination Category, A, Item B1.11, Circumferential Shell Welds, as outlined in the NRC SER for the BWRVIP-05 Report and as permitted byGL 98-05.

(2) Relief is also requested from the ASME Code Subarticle IWB-2420(b) requirement which states that flaw indications or relevant conditions, evaluated to be acceptable for continued service, be reexamined during the next three inspection periods.

List Of Items Associated With The Relief Request: See Tables Above

Basis for Relief: The basis for this request for relief is outlined in the NRC SER for the BWRVIP-05 Report and the guidance outlined in GL 98-05. These documents provide the basis for the elimination of inspections of the BWR RPV circumferential shell welds. The BWRVIP-05 Report SER concluded that the probability of failure of the BWR RPV circumferential shell welds is orders of magnitude lower than that of the axial shell welds. In addition, NRC conducted an independent risk-informed assessment of the analysis contained in the BWRVIP-05 Report SER. The NRC assessment and GL 98-05 concluded that the inspection of BWR RPV circumferential shell welds does not measurably affect the probability of failure. The industry examination results identified in the BWRVIP-05 topical report (Reference EPRI report No. TR-105697), indicate that the necessity for performance of the circumferential shell weld volumetric examinations is not warranted based upon the low probability of failure of these welds.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

The basis for relief from performing successive examinations of the Unit 3 RPV circumferential shell weld flaw areas is outlined in the three conditions of Section 2.8.1 of the BWRVIP-05 Report SER. The alternative criteria outlined in Section 2.8.1 eliminates examinations for "non-threatening" flaws (e.g., such as embedded flaws from material manufacturing or vessel fabrication which experience negligible or no growth during the design life of the vessel) provided the conditions below are satisfied.

- The flaw is characterized as subsurface.
- The NDE technique and evaluation that detected and characterized the flaw as originating from material manufacture or vessel fabrication is documented in a flaw evaluation report.
- The vessel containing the flaw is acceptable for continued service in accordance with IWB-3600 and the flaw is demonstrated acceptable for the intended service life of the vessel.

Justification, not to perform the successive examinations required by the ASME Code IWB-2420(b) is based upon TVA's compliance with the conditions specified above in section 2.8.1 of the NRC SER for the BWRVIP-05 Report.

- The flaws are subsurface. NRC concluded the flaws were subsurface in Section 4.0 of its SER dated August 17, 1998, for BFN Request for Relief 3-ISI-1, Revision 0.
- The GE flaw evaluation shows that the maximum indication depths (2a) will not exceed the ASME Code allowable flaw depths during the intended service life of the vessel.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

These conditions are also addressed in a memorandum from General Electric to TVA, dated November 21, 1997, on the subject "Extension of Unit 3 Vessel Flaw Handbook Results to 40 Years." The referenced memorandum summarizes the Ultrasonic (UT) Indication Evaluations as stated below:

"The indications found during the 1993 UT exam which exceeded the IWB-3500 acceptance standards were all subsurface flaws, and all were circumferentially oriented. The allowable subsurface flaw plots are reproduced as Figures 8-10 (See Attachment 1) with the UT exam indications plotted against the allowable circumferential flaw curves. The maximum indication depths (2a) for each seam weld are well within the allowables. The indications are acceptable when compared to the allowable flaw curves, which show allowables which are conservative for up to 40 years of operation. Therefore, the indications are acceptable without further inspection when considering vessel fatigue and irradiation embrittlement degradation mechanisms."
A listing of the fifteen flaws (as designated in the inspection report) and their associated shell welds is as follows:

REQUEST FOR RELIEF 3-ISI-1 (cont.)

TVA/GE RPV Weld Designation	**Flaw Indication Report Nos.**
C-5FLG / VFW	20-007
	20-008
	20-009
	20-011
	20-012
C-4-5 / H45	16-075
	16-076
C-3-4 / H34	12-015*
	12-069
	12-116
	12-144
	12-145
	12-148
C-2-3 / H23	08-026
	08-067
V-4-B / V4	14-002*

* - Same flaw reported in Exam Summary Reports 12-015 and 14-002.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

The flaw area located in the circumferential shell weld and the overlapping longitudinal shell weld boundary is located above the beltline region of the reactor vessel. A schematic map/sketch of the Unit 3 RPV and the weld locations is shown in Attachment 2. A table compiling the fifteen flaws with the results of their ASME Code IWB-3600 evaluation data and copies of the GE Examination Summary Report sheets for the indicated welds, showing the report terms and definitions and the flaw sizing data for the 15 analyzed flaws, are shown in Attachments 3, 4, and 5 and were previously reviewed by NRC for 3-ISI-1 Revision 0, and documented in the staff's SER dated August 17, 1998.

NRC Information Notice (IN) 97-63 provided guidance regarding evaluations that should be considered when asking for relief. The NRC fracture analysis report dated August 14, 1997, Table 7-1, contained three reference cases used in their analysis. Using this guidance, TVA's evaluation found that the Unit 3 RPV fracture mechanics analysis was within the NRC bounding analysis.

TVA has addressed the two areas of concern outlined in the Permitted Action Section of Generic Letter 98-05: (1) the Unit 3 RPV level of embrittlement expected at the end of the period for which relief is requested in the most limiting RPV circumferential shell-weld areas, (2) the probability and expected frequency of the occurrence of a low temperature/high pressure transient on the Unit 3 RPV. It is TVA's position that the low probability of failure and growth of the subsurface flaws does not warrant the additional expenditures and man-rem exposures that would result from performing the ASME Code required successive examinations. TVA's compliance with NRC Generic Letter 98-05 Permitted Action Items one and two is described below.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

(1) Comparison of the BFN Unit 3 RPV Brittle Fracture Information to the BWRVIP-05 and NRC Assessments of the Probability of Failure of BWR RPV Circumferential Welds:

The BWRVIP-05 Report and the NRC Staff's independent risk-informed assessment of the initiative reports concluded that the probability of failure of the BWR RPV circumferential shell welds is orders of magnitude lower than that of the axial shell welds. Additionally, the NRC assessment demonstrated that inspection of the RPV circumferential shell welds does not measurably affect the probability of failure.

The independent NRC assessment included a Probabilistic Fracture Mechanics (PFM) analysis to estimate RPV failure probabilities. Three key assumptions in the PFM are: (1) the neutron fluence was that estimated to be the end-of-license mean fluence; (2) the chemistry values are mean values based on vessel types; and (3) the potential for beyond design basis events is considered. Although the BWRVIP-05 Report provided the technical basis supporting the relief request, the information previously submitted in TVA's response (Attachments 4 and 5) dated June 12, 1998, and July 31, 1998, to NRC request for additional information shows the conservatism of the NRC analysis for the Browns Ferry Unit 3 RPV. For plants with RPVs fabricated by Babcock and Wilcox the mean end-of-license neutron fluence used in the NRC PFM analysis was 0.053 x 10^{19} n/cm^2. However, the highest fluence anticipated at the end of the period of 32 EFPY for BFN Unit 3 (in the RPV belt line region) is 0.11 x 10^{19} n/cm^2 on the inside vessel surface.

This fluence calculation was based on the power uprate 32 EFPY operating curve information submitted in TVA's response (Attachments 4 and 5) dated June 12, 1998, and July 31, 1998, to NRC request for additional information. Thus, embrittlement for the BFN Unit 3 RPV due to fluence effects is less than the value obtained in the NRC analysis shown in the SER (Table 2.6-4) for the BWRVIP-05 Report.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

Additional BFN Unit 3 RPV shell weld information requested by the NRC staff to be included in the relief request is provided in Attachments 4 and 5. However, no flaws that required additional evaluation in accordance with the ASME Section XI Code, Subarticles IWB-3132.4 and IWB-3600 were recorded for the RPV axial welds or the C-1-2 circumferential weld in the beltline region.

The beltline region circumferential shell weld (C-1-2) was chosen for analysis to provide a basis for comparison to the NRC bounding analysis and as the Unit 3 RPV region where these calculated parameters would result in comparatively conservative values. The materials would also be representative of the Unit 3 RPV circumferential shell welds in general. The flaws in the Unit 3 RPV that required evaluation were located in circumferential shell welds designated as C-5-FLG, C-4-5, C-3-4, V-4-B (flaw is actually located in the circumferential shell weld area within the overlapping region of the longitudinal shell weld examination boundary), and C-2-3. The weld areas in question are located above and out of the RPV beltline region with expected fluence levels in varying degrees lower than those calculated for the beltline region.

Therefore, any embrittlement and subsequent calculated ΔRT_{NDT} for the welds containing the flaws would be less than that calculated for the welds in the beltline region. The calculated ΔRT_{NDT} for the circumferential weld in the beltline region is 51.23 ^{o}F. This value assumes that the fluence at the flaw is equivalent to the inside surface fluence and does not take credit for attenuation. By comparison, using the mean fluence value and the weld chemistry assumed for the Babcock & Wilcox RPVs shown in Table 2.6-4 of the BWRVIP-05 Report SER, ΔRT_{NDT} for the NRC analysis and BWRVIP limiting plant specific analysis would be 79.8 ^{o}F.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

In addition, the calculated upper bound RT_{NDT} value for the BFN Unit 3 beltline welds is minus 62.46 ^{o}F; while the Mean Adjusted RT_{NDT} value [i.e., Inner Surface ^{o}F], shown in Table 2.6-4 of the BWRVIP-05 Report SER, is 99.8 ^{o}F. A compilation of the Unit 3 RPV calculated ΔRT_{NDT} values at the estimated fluence values for 32 EFPH is shown in the table shown on the following page.

Additional conservatism is present in the above calculations since the changes in the calculated Upper Bound RT_{NDT} value assume that the fluence factors at the inside surface of the vessel were representative of the fluence in the flaw regions. The fifteen flaws for the Unit 3 RPV are subsurface flaws and the additional thickness of RPV wall material would result in a lessened effect on the change in the RT_{NDT} values. Thus, the calculated values for the BFN Unit 3 RPV circumferential welds are substantially less than the corresponding values computed using the NRC's bounding analysis and there is conservatism in the already low circumferential weld failure probabilities for the BFN Unit 3 circumferential welds containing the flaws.

These calculations support TVA's position that any growth in the existing Unit 3 RPV circumferential weld flaws is highly unlikely and the performance of the successive examinations is not warranted. It should also be noted that the BWRVIP-05 Report is a statistically based analysis that assumes the RPV augmented examinations have not been performed and, therefore, uses the premise that the distribution of flaw sizes follows a normal distribution and range of sizes.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

TABLE 1
BROWNS FERRY UNIT 3 RPV SHELL WELD INFORMATION
FOR 32 EFFECTIVE FULL-POWER YEARS (EFPY)

	Beltline Region Circumferential Shell Weld, C-1-2, between Unit 3 RPV Shells Course 1 and Course 2 (Mk-57/58) Weld Material Heat No. D51852 and D55733
Neutron fluence at the end of 32 EFPY (inside surface at weld C-1-2)	**0.11×10^{19} n/cm^2**
Initial (unirradiated) reference temperature	**-40 ^{o}F**
Weld Chemistry Factor (CF)	**117.45**
Weld copper content	**0.09%**
Weld Nickel content	**0.67%**
Increase in reference temperature due to irradiation (ΔRT_{NDT})	**51.23 ^{o}F**
Margin term	**51.23 ^{o}F**
Mean adjusted reference temperature (ART)	**11.23 ^{o}F**
	62.46 ^{o}F

REQUEST FOR RELIEF 3-ISI-1 (cont.)

TVA has performed the required RPV augmented examinations. As a result, the presence of flaws in the Unit 3 RPV and their size and distribution is a known quantity. The flaws encountered in the Unit 3 RPV are bounded in the BWRVIP-05 Report and the NRC assessment. Thus, for TVA, there is additional assurance of the validity of these analyses compared to the inherent uncertainty, when applying the same results to other plants which have not performed the examinations.

In addition, should unexpected growth in the RPV flaws occur, a margin exists between the calculated flaw sizes and the allowable ASME Section XI limits calculated using the requirements of Subarticle IWB-3600. This is shown in the summary of the Unit 3 RPV inspection results table in Attachment 3. The summary indicates that the smallest margin is a factor of 3.1 below the initial flaw size which would be acceptable for the service lifetime of the RPV under the ASME Section XI, Subarticle IWB-3600 acceptance criteria. In summary, the analysis supports TVA's proposed request for relief 3-ISI-1, Revision 1, and demonstrates that the BFN Unit 3 RPV vessel welds are bounded by the NRC's Generic Letter 98-05, the BWRVIP-05 Report SER, and the staff's independent assessment.

(2) Generic Letter 98-05 Permitted Action Item
(2)Review of BFN Unit 3 Procedural and Administrative Controls to Prevent RPV Low-Temperature / High -Pressure Transient Events

The NRC staff stated in GL 98-05 that beyond design-basis events occurring during plant shutdown could leadto cold over-pressure events that could challenge vessel integrity. Although unlikely, the industry concluded that condensate and control rod drive pumps could cause conditions that could lead to cold over-pressure events that could challenge vessel integrity. For a BWR to experience such an event, the plant would require several operator errors. The NRC staff's assessment described several types of events that could be precursors to BWR RPV cold over-pressure transients. These were identified as precursors because no cold over-pressure event has occurred at a U.S. BWR.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

The staff assessment identified one actual cold over-pressure event that occurred during shutdown at a non-U.S. BWR. This event apparently included several operator errors that resulted in a maximum RPV pressure of 1150 psi with a temperature range of 79^{o}F to 88^{o}F. The operating procedures for BFN Unit 3 are sufficient to prevent a cold over-pressure event from occurring during activities such as the system leak test performed at the conclusion of each refueling outage. Thus, the challenge to the BFN Unit 3 RPV from a non-design basis cold over-pressure transient is unlikely. The following discussion will provide further information to support TVA's conclusion.

BFN Operations procedures and administrative control processes are in place to minimize the potential for occurrence of RPV cold over-pressurization events. These processes include plant operating procedures, plant evolution planning and scheduling, administrative controls, and operator training.

Since cold over-pressurization events are most likely to occur during normal cold shutdown conditions, BFN operating procedures are written, to require that RPV water level, pressure, and temperature are established and maintained in well controlled bands. Plant licensed Unit Operators frequently monitor these parameters for abnormalities and indications of unwanted transients. Also, any plant evolution which requires changes in these critical parameters is performed under the oversight of the Shift Manager who is also notified immediately of any abnormalities in the indications. Therefore, any deviation of these parameters from the established bands are promptly identified and corrected. In addition to these procedures, unit conditions for on-going activities which potentially can effect the maintenance of acceptable operating conditions and available contingency systems and plans are discussed by unit operations personnel at the time of shift turnover.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

These administrative controls and procedures provide assurance that activities which could adversely affect RPV water level, temperature, and pressure are precluded. Nuclear Experience reviews and industry operating histories have shown that inadequate work-control processes and procedures can precipitate a cold over-pressurization event. For BFN, outage work is controlled through planning and scheduling activities performed by the Outage Management and Work Control Team. Unit and system work activities are carefully reviewed and coordinated to avoid conditions which could adversely affect the unit's RPV water level, temperature, and pressure. Plant activities are routinely coordinated through the use of a Plan-of-the Day (POD) which contains a list of activities to be performed and frequently contains cautionary notes on the activities. These PODs are reviewed and discussed with station management and copies are maintained in appropriate locations. Changes to these PODs are approved through the Operations Department Management and the Shift Manager. In addition, during outages, work on unit systems and components is coordinated through work control centers which provide an additional level of unit operations oversight.

In the main control room, the Shift Manager is required to maintain cognizance of any activity which could potentially affect reactivity, reactor water level, or decay heat removal. Unit reactor operators are required to provide positive control of reactor water level, temperature, and pressure within the specified bands, promptly report when operation outside the required bands occurs, and notify the Shift Manager of any restoration corrective measures being taken. As part of the outage work control process, special procedures such as hydrostatic testing require pre-job briefings conducted with operations personnel for any activity which could potentially affect critical plant parameters. The pre-job briefing includes all cognizant individuals involved in the work activities.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

Expected plant system and component responses and contingency actions to mitigate unexpected conditions are also discussed. When the plant is in cold shutdown, plant procedures require that the RPV head vent valves be opened after the reactor has been cooled to less than 212^{o}F. Administrative and plant operations control procedures for this evolution and for controlling reactor water level, temperature, and pressure are an integral part of operator initial and requalification training. Responses to abnormal water level and RPV conditions are also part of the operator's training. In addition, unit-specific brittle-fracture operating pressure-temperature limit curves and procedures have been developed to provide the appropriate guidance for compliance with the operating limits and the associated Technical Specification requirements.

Review of High Pressure Injection Sources:

RPV water injection sources during cold shutdown conditions include three systems. During normal cold shutdown, RPV water level and pressure are controlled through the Control Rod Drive (CRD) and the Reactor Water Cleanup (RWCU) Systems. RPV conditions are controlled through a "feed and bleed" process using these two systems. The RPV and its piping system are not placed in solid water conditions and after the plant is cooled below 212^{o}F, the head vent valves are opened. If either one of the RWCU or CRD Systems fail, the licensed Unit Operator would adjust the other system to maintain the proper water level and pressure. In addition, BFN also has water level instrumentation with setpoints for high and low water levels that alarm at 39 inches high and 27 inches low to alert operators that a level transient is in progress and action is required. During these plant activities the CRD system typically injects water at a rate of less than 60 gallons per minute (gpm). Injection rates at this level allow the operator sufficient time to compensate for unanticipated level and pressure changes.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

Therefore, the probability of an occurrence of a high-pressure/low temperature event, from these two systems, that places RPV conditions outside the pressure-temperature curve limits is low. In addition to the RWCU and CRD Systems, the Standby Liquid Control System is another high-pressure source to the RPV. For BFN, SLC System operation occurs only if the system is manually initiated by operator action in accordance with emergency operating procedures. Thus, SLC operation will not occur during cold shutdown operations except under stringently controlled test conditions. In the event of an inadvertent injection, the SLC injection rate (approximately 50 gpm) is sufficiently low to allow operators to intervene and control the reactor pressure.

During cold shutdown periods following refueling, the RPV is pressure tested in accordance with the applicable ASME Code Section XI requirements. BFN hydrostatic tests of the RPV and the reactor coolant system are designated as complex and infrequently performed tests. For these type of tests, BFN requires a detailed pre-job briefing with all individuals participating in the test. Also, BFN has a dedicated operator for RPV water level and pressure control. RPV and reactor coolant system pressure testing is a carefully controlled plant evolution which receives special operations management oversight and utilizes procedural controls to ensure that the test does not precipitate a transient outside the specified safety limits. These tests are also performed after the RPV and system are heated to the proper system inservice pressure test temperatures prior to increasing the system pressure. During these tests the RPV pressure, water level, and temperature are controlled through the CRD and RWCU Systems using the “feed and bleed” process. Increases (or decreases) in system pressure are limited to 50 pounds per square inch (psi) per minute. For example, if any RWCU valve fails, then the CRD pump is tripped and the RPV is depressurized. This practice minimizes the probability of exceeding the specified Technical Specification pressure-temperature limits during the system pressure test.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

During plant startup following a cold shutdown, the High Pressure Coolant Injection (HPCI) and the Reactor Core Isolation Cooling (RCIC) pumps provide a possible means to over-pressurize the RPV. However, for BFN, these systems have high pressure steam-driven pumps, which have automatic isolation set-points of 100 psi and 50 psi, respectively; and will not function when the plant is in cold shutdown.

Based upon the above evaluation the likelihood of a cold over-pressure transient event placing the Unit 3 RPV in non-design conditions is very low. In addition, the probability of the occurrence of a cold over-pressure transient precipitating extremely accelerated growth of the indicated Unit 3

RPV subsurface flaws are sufficiently low to provide an acceptable level of quality and safety. Therefore, the probability of an occurrence of a cold over-pressure transient is considered to be less than or equal to the probability used in the analysis described in the NRC independent evaluation performed in the assessment of the BWRVIP-05 Report.

Additional Supporting Evaluations and Industry Experience

TVA's analysis supports an evaluation that, in the case of the Unit 3 RPV, the number of flaws, their size, location, and characterization as subsurface and “non-threatening” indications makes their reexamination less significant. The GE analysis of the Unit 3 RPV flaws supports continued operation of the BFN Unit 3, without further inspection and when considering vessel fatigue and irradiation embrittlement degradation mechanisms, for the current licensing period (40 years). GE’s analysis indicates that the margin of safety for these flaws, under assumed aggressive growth for the service life of the vessel, is a factor of 3.1 times the maximum allowable by ASME Section XI Code analysis under Subarticle IWB-3600.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

The GE Vessel Flaw Handbook analysis, GENE-523-B1301869-129, is shown in Attachment 1. The TVA technical evaluation of the GE report data, as it affects the IWB-3600 calculations, is shown in the compiled tables shown in Attachments 3, 4 and 5. The BFN Unit 3 RPV indications are subsurface flaws and not exposed to the plant water chemistry environment directly. The probability of crack growth induced in the vessel materials as the result of water-borne stress-crack corrosion agents is extremely low.

The 15 indications recorded and analyzed in the BFN Unit 3 RPV four shell circumferential welds and oriented in the weld areas as to indicate that they were most probably were related to the fabrication of the vessel. In addition, the flaws identified as being subsurface flaws, as characterized in the GE response to NRC Request for Additional Information (Attachments 4 and 5) and as concurred with in the NRC SER to TVA dated August 17, 1998. The size of the flaws and their locations are such that the NDE techniques and capabilities used at the time of the vessel fabrication would not have readily identified the presence of these flaws. As stated in the original augmented inspection results (TVA letter to the NRC, dated March 6, 1995), TVA performed a review of the Unit 3 RPV fabrication radiographs and determined that less than 50 percent of the currently recorded flaws were discernible in the fabrication radiographs. However, correlation between the discernible flaws in the radiographs and the indications from the current ultrasonic examination was determined to be within plus or minus two inches. Given the relative sensitivity and improvements in the NDE techniques since the fabrication of the vessel, the correlation between the two sets of examinations supports the technical judgment that the flaws were present in the RPV weld areas from the time of fabrication. In addition, the flaw sizes and projected flaw sizes at the end of the Unit 3 RPV service-life, assuming aggressive flaw growth, are such that large margins of safety are present for the expected operating conditions. This is supported by the GE analysis shown in Attachment 1 and accepted by the NRC Safety Evaluation Report dated August 17, 1998, and confirmed by the BWRVIP-05 Report SER dated July 28, 1998.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

Projected flaw sizes at the end of service-life are judged to be several factors below the ASME allowable limits resulting from calculations performed in accordance with Subarticle IWB-3600. It should also be noted that the limits on allowable flaw sizes imposed in the ASME Code in Subarticle IWB-3600 result in flaw sizes that are below those that would be allowed using materials fracture mechanics applied to the design accident conditions.

This additional margin of safety is an integral part of the ASME calculation processes and provides further justification that there is sufficient margin to support not having to perform the additional successive examinations, in accordance with ASME Section XI, IWB-2420(b).

In conjunction, TVA is proposing that the scheduled ASME Section XI Code RPV circumferential shell weld examinations be permanently eliminated in accordance with Generic Letter 98-05 and BWRVIP-05 guidance. TVA's safe operating period for the BFN Unit 3 RPV, as shown by the GE analysis in Attachment 3, has been extended to the full 40 year service-life as described in GL 98-05 Permitted Action Item Number (1). Based upon industry experience and TVA's position that the flaws have been present since the fabrication of the vessel, the performance of a reexamination of the BFN RPV circumferential weld flaw areas is not warranted in Cycle 9. The flaw area located in the circumferential shell weld (C-3-4) area within the overlapping longitudinal weld boundary (V-4-B) will be examined in conjunction with the longitudinal weld examinations performed in the Third Inspection Period scheduled with other ASME Section XI Code and Augmented RPV examinations.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

The GERIS 2000 system previously used to perform the RPV augmented examinations would be utilized for reexamination of the flaw areas and is projected to cost $800,000 for the reexaminations. In addition, man-rem radiation exposures encountered during the conduct of a RPV examination for one outage has been estimated from industry experience to be on the order of 12.2 man-rem per unit inspection. Any additional weld examination data obtained for the BFN Unit 3 RPV from the successive examinations would not warrant the increased cost to TVA and the additional exposure to personnel with no apparent increase in the margin of safety.

Therefore, in accordance with the guidance provided in GL 98-05 and supported by the BWRVIP-05 Report SER, considering the increased costs and personnel exposure, it is TVA's position that the performance of the successive examinations, during the Unit 3 Cycle 9 outage to comply with the ASME Section XI Code requirements of Subarticle IWB-2420(b), is not technically warranted and would not provide an apparent increase in quality and safety.

Alternative Examination:

As an alternative, TVA proposes to perform only the RPV longitudinal weld examinations during the Third Inspection Period (Spring 2004) of the Second Ten-Year Inservice Inspection Interval in conjunction with the scheduled ASME Section XI Code and Augmented RPV Examinations.

This relief would be in effect for the BFN Unit 3 circumferential shell weld examinations and the ASME Section XI Code required circumferential shell weld flaw successive examinations of IWB-2420(b) for the remaining term of operation under the existing license.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

Justification For The Granting Of Relief:

Based upon the previous stated technical justifications, performance of the successive examination of the Unit 3 RPV weld flaws, in accordance with the ASME Code requirements, is not warranted. This position is supported by actual industry inspection experience, industry initiatives, and their supporting calculations that these type of flaws have an extremely low probability of propagation to failure. TVA has determined through evaluation, reviews, and engineering judgment that these flaws are fabrication related and have been present since the construction of the vessel. Further, the additional costs and personnel exposure that would be incurred without any apparent increase in safety does not warrant the performance of the examinations. All of these combined factors provide reasonable assurance of the continued structural integrity of the BFN Unit 3 RPV. In addition, it is TVA's position that any additional knowledge and data obtained during successive examinations performed during the Unit 3 Cycle 9 outage would not provide any increase in the quality of the RPV or increase the margin of safety associated with the RPV flaws identified in the circumferential shell welds.

Therefore, pursuant to 10 CFR 50.55a (a)(3)(i), TVA requests that relief be granted for; (1) permanent relief from the inservice inspection requirements for volumetric examination of reactor pressure vessel circumferential shell welds, ASME Section XI, Table IWB-2500-1, Examination Category B-A, Item B1.11, Circumferential Shell Welds as permitted by Generic Letter 98-05, and (2) elimination of the Code required successive examinations of IWB-2420(b) for the RPV circumferential shell welds as outlined in the NRC SER, Section 2.8.1 for the BWRVIP-05 Report.

REQUEST FOR RELIEF 3-ISI-1 (cont.)

Further, in accordance with the guidance specified in the NRC SER, Section 4.0 for the BWRVIP-05 Report, TVA intends to examine the RPV circumferential welds should axial weld examinations reveal an active mechanistic mode of degradation. The scope and schedule of these examinations would be submitted to NRC for approval.

Implementation Schedule:

This Request for Relief will be implemented during the Second Ten Year ISI Inspection Interval for Browns Ferry Unit 3 and continue in effect for the remaining term of operation under the existing license.

Reference NRC Safety Evaluation Report (SER) approval on November 18, 1999.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT, UNIT 3
THIRD 10-YEAR INTERVAL
REQUEST FOR RELIEF NO. 3-ISI-2

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 continue use the examination and testing plans currently defined in the Technical Requirements Manual (TR 3.7.4). The current Technical Requirements Manual requirements have been promulgated and approved by NRC, while ASME Section XI imposes overlapping requirements which do not enhance the quality or safety of the subject snubber examination and testing.

Components: Component/piping snubbers

Code Class: 1, 2 and 3

Examination Category: N/A

Item Number: N/A

Code Requirement: 2001 Edition of ASME Section XI with 2003 Addenda
IWF-5300(a) and (b) inservice examination and testing in accordance with the first Addenda to ASME/ANSI OM-1987, Part 4, with OMa-1988.

IWF-5400 Repairs and Replacements of snubbers shall be in accordance with the first Addenda to ASME/ANSI OM-1987, Part 4, with OMa-1988.

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

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 2001 Edition , 2003 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, with OMa-1988, Sections 2.3, Inservice Examination, 2.4, Examination Documentation, and 3.2, Inservice Operability Testing, and 3.3, Testing Documentation.

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

Code Requirement From Which Relief is Requested: (continued)

a) IWF-5400 Repairs and Replacements of snubbers shall be in accordance with the first Addenda to ASME/ANSI OM-1987, Part 4, with OMa-1988., Sections 1.5.6, Snubber Maintenance or Repair, and 1.5.7, Snubber Modification and Replacement

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

c) IWA-2110, Duties of the Inspector (for involvement for snubber examination).

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," 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 existing TRM program for examination and testing of snubbers was promulgated and accepted by NRC.

The implementation of OM-1987, Part 4, with OMa-1988 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, 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: 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, Anchor/Darling, or Fronek 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, 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.

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

Testing of repaired and replaced snubbers 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-SNB004, "Removing and Reinstalling Pacific Scientific Mechanical, Bergen-Patterson, Anchor/Darling, Fronek, and Grinnell Hydraulic, and Bergen Patterson, or Lisega Torus Dynamic Restraint Snubbers."

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, with OMa-1988, and utilizes NRC guidance not incorporated into the OM Code referenced by the 2001 Edition, 2003 addenda 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 (failure mode groups) and testing plans (10%, 37, or 55). 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 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 in-operability or even a violation of a TRM requirement.

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

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

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 on 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/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 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.

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

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

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, with OMa-1988.

Based on the justification provided, BFN's 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 request that relief be granted from the 2001 Edition, 2003 addenda 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 third ten-year ASME Section XI inspection interval for snubber examination and testing in lieu of the code requirements listed above.

Reference NRC Safety Evaluation Report (SER) approval on May 21, 1999 for second interval.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 3
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI,
APPENDIX VIII, SUPLEMENT 10,
QUALIFICATION REQUIREMENTS FOR DISSIMILIAR METAL PIPING WELDS,

REQUEST FOR RELIEF 3-ISI-16

EXECUTIVE SUMMARY:

In accordance with 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from inservice inspection requirements of the 2001 Edition through the 2003 Addenda of Section XI, Appendix VIII, Supplement 10, "Qualification Requirements For Dissimilar Metal Piping Welds", of the ASME Boiler and Pressure Vessel Code. The Performance Demonstration Initiative (PDI) Program for implementing the Supplement 10 qualification program for dissimilar metal welds is not in strict compliance with the requirements of Supplement 10 of the 2001 Edition through the 2003 Addenda. TVA proposes to use the PDI Program for implementation of Appendix VIII, Supplement 10 as amended in the Attachment of this enclosure. The amendments to Supplement 10 as shown in the Attachment were coordinated with PDI, and the NRC.

SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED:

Pressure Retaining Piping Welds subject to examination using procedures, personnel, and equipment qualified to ASME Section XI, Appendix VIII, Supplement 10 criteria.

CODE REQUIREMENTS:

The following paragraphs or statements are from ASME Section XI, Appendix VIII, Supplement 10 and identify the specific requirements that are included in this request for relief.

Item 1 - Paragraph 1.1(b) states in part - Pipe diameters within a range of 0.9 to 1.5 times a nominal diameter shall be considered equivalent.

Item 2 - Paragraph 1.1(d) states - All flaws in the specimen set shall be cracks.

REQUEST FOR RELIEF 3-ISI-16 (cont'd)

Item 3 - Paragraph 1.1(d)(1) states - At least 50 percent of the cracks shall be in austenitic material. At least 50 percent of the cracks in austenitic material shall be contained wholly in weld or buttering material. At least 10 percent of the cracks shall be in ferritic material. The remainder of the cracks may be in either austenitic or ferritic material.

Item 4 - Paragraph 1.2(b) states in part - The number of unflawed grading units shall be at least twice the number of flawed grading units.

Item 5 - Paragraph 1.2(c)(1) and 1.3(c) state in part - At least 1/3 of the flaws, rounded to the next higher whole number, shall have depths between 10 percent and 30 percent of the nominal pipe wall thickness. Paragraph 1.4(b) distribution table requires 20 percent of the flaws to have depths between 10 percent and 30 percent.

Item 6 - Paragraph 2.0 first sentence states - The specimen inside surface and identification shall be concealed from the candidate.

Item 7 - Paragraph 2.2(b) states in part - The regions containing a flaw to be sized shall be identified to the candidate.

Item 8 - Paragraph 2.2(c) states in part - For a separate length sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate.

Item 9 - Paragraph 2.3(a) states - For the depth sizing test, 80 percent of the flaws shall be sized at a specific location on the surface of the specimen identified to the candidate.

Item 10 - Paragraph 2.3(b) states - For the remaining flaws, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.

Item 11 - Table VIII-S2-1 provides the false call criteria when the number of unflawed grading units is at least twice the number of flawed grading units.

REQUEST FOR RELIEF 3-ISI-16 (cont'd)

RELIEF REQUESTED:

Relief is requested to use the following alternative requirements for implementation of Appendix VIII, Supplement 10 requirements. The alternative requirements will be implemented through the PDI Program.

A copy of the proposed revision to Supplement 10 is attached. It identifies the proposed alternatives and allows them to be viewed in context. It also identifies additional clarifications and enhancements for information. The proposed revisions to Supplement 10 have been submitted to the ASME Section XI for consideration and were approved by the ASME Section XI Subcommittee in February 2003. Final ASME Code approval is pending.

BASIS FOR RELIEF:

Item 1 - The proposed alternative to Paragraph 1.1(b) states:

"The specimen set shall include the minimum and maximum pipe diameters and thicknesses for which the examination procedure is applicable. Pipe diameters within 1/2 inches (13 mm) of the nominal diameter shall be considered equivalent. Pipe diameters larger than 24 inches (610 mm) shall be considered to be flat. When a range of thicknesses is to be examined, a thickness tolerance of ±25 percent is acceptable."

Technical Basis - The change in the minimum pipe diameter tolerance from 0.9 times the diameter to within 1/2 inches of the nominal diameter provides tolerances more in line with industry practice. Though the alternative is less stringent for small pipe diameters they typically have a thinner wall thickness than larger diameter piping. A thinner wall thickness results in shorter sound path distances that reduce the detrimental effects of the curvature. This change maintains consistency between Supplement 10 and the recent revision to Supplement 2.

Item 2 - The proposed alternative to Paragraph 1.1(d) states:

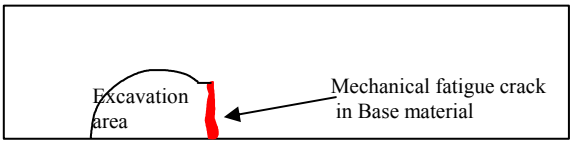
"At least 60 percent of the flaws shall be cracks, and the remainder shall be alternative flaws. Specimens with IGSCC shall be used when available. Alternative flaws, shall meet the following requirements:

(1) Alternative flaws, if used, shall provide crack-like reflective characteristics and shall only be used when implantation of cracks would produce spurious reflectors that are uncharacteristic of service-induced flaws.
(2) Alternative flaws shall have a tip width no more than 0.002 inches (.05 mm).

REQUEST FOR RELIEF 3-ISI-16 (cont'd)

Note, to avoid confusion the proposed alternative modifies instances of the term "cracks" or "cracking" to the term "flaws" because of the use of alternative flaw mechanisms."

Technical Basis - As illustrated below, implanting a crack requires excavation of the base material on at least one side of the flaw. While this may be satisfactory for ferritic materials, it does not produce a useable axial flaw in austenitic materials because the sound beam, which normally passes only through base material, must now travel through weld material on at least one side, producing an unrealistic flaw response. In addition, it is important to preserve the dendritic structure present in field welds that would otherwise be destroyed by the implantation process. To resolve these issues, the proposed alternative allows the use of up to 40 percent fabricated flaws as an alternative flaw mechanism under controlled conditions. The fabricated flaws are isostatically compressed which produces ultrasonic reflective characteristics similar to tight cracks.



Item 3 - The proposed alternative to Paragraph 1.1(d)(1) states:

"At least 80 percent of the flaws shall be contained wholly in weld or buttering material. At least one and no more than 10 percent of the flaws shall be in ferritic base material. At least one and no more than 10 percent of the flaws shall be in austenitic base material."

Technical Basis - Under the current Code, as few as 25 percent of the flaws are contained in austenitic weld or buttering material. Recent experience has indicated that flaws contained within the weld are the likely scenarios. The metallurgical structure of austenitic weld material is ultrasonically more challenging than either ferritic or austenitic base material. The proposed alternative is therefore more challenging than the current Code.

Item 4 - The proposed alternative to Paragraph 1.2(b) states:

"Personnel performance demonstration detection test sets shall be selected from Table VIII-S10-1. The number of unflawed grading units shall be at least 1-1/2 times the number of flawed grading units."

REQUEST FOR RELIEF 3-ISI-16 (cont'd)

Technical Basis - Table S10-1 provides a statistically based ratio between the number of unflawed grading units and the number of flawed grading units. The proposed alternative reduces the ratio to 1.5 times to reduce the number of test samples to a more reasonable number from the human factors perspective. However, the statistical basis used for screening personnel and procedures is still maintained at the same level with competent personnel being successful and less skilled personnel being unsuccessful. The acceptance criteria for the statistical basis are in Table VIII-S10-1.

Item 5 - The proposed alternative to the flaw distribution requirements of Paragraph 1.2(c)(1) (detection) and 1.3(c) (length) is to use the Paragraph 1.4(b) (depth) distribution table (see below) for all qualifications.

Flaw Depth (% Wall Thickness)	**Minimum** Number of Flaws
10-30%	20%
31-60%	20%
61-100%	20%

Technical Basis - The proposed alternative uses the depth sizing distribution for both detection and depth sizing because it provides for a better distribution of flaw sizes within the test set. This distribution allows candidates to perform detection, length, and depth sizing demonstrations simultaneously utilizing the same test set. The requirement that at least 75 percent of the flaws shall be in the range of 10 to 60 percent of wall thickness provides an overall distribution tolerance yet the distribution uncertainty decreases the possibilities for testmanship that would be inherent to a uniform distribution. It must be noted that it is possible to achieve the same distribution utilizing the present requirements, but it is preferable to make the criteria consistent.

Item 6 - The proposed alternative to Paragraph 2.0 first sentence states:

"For qualifications from the outside surface, the specimen inside surface and identification shall be concealed from the candidate. When qualifications are performed from the inside surface, the flaw location and specimen identification shall be obscured to maintain a "blind test."

Technical Basis - The current Code requires that the inside surface be concealed from the candidate. This makes qualifications conducted from the inside of the pipe (e.g., PWR nozzle to safe end welds) impractical.

REQUEST FOR RELIEF 3-ISI-16 (cont'd)

The proposed alternative differentiates between ID and OD scanning surfaces, requires that they be conducted separately, and requires that flaws be concealed from the candidate. This is consistent with the recent revision to Supplement 2.

Items 7 and 8 - The proposed alternatives to Paragraph 2.2(b) and 2.2(c) state:

"... containing a flaw to be sized may be identified to the candidate."

Technical Basis - The current Code requires that the regions of each specimen containing a flaw to be length sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region (Note, that length and depth sizing use the term "regions" while detection uses the term "grading units" - the two terms define different concepts and are not intended to be equal or interchangeable). To ensure security of the samples, the proposed alternative modifies the first "shall" to a "may" to allow the test administrator the option of not identifying specifically where a flaw is located. This is consistent with the recent revision to Supplement 2.

Items 9 and 10 - The proposed alternative to Paragraph 2.3(a) and 2.3(b) state:

"... regions of each specimen containing a flaw to be sized may be identified to the candidate."

Technical Basis - The current Code requires that a large number of flaws be sized at a specific location. The proposed alternative changes the "shall" to a "may" which modifies this from a specific area to a more generalized region to ensure security of samples. This is consistent with the recent revision to Supplement 2. It also incorporates terminology from length sizing for additional clarity.

Item 11 - The proposed alternative modifies the acceptance criteria of Table VIII-S2-1 as follows:

Technical Basis - The proposed alternative is identified as new Table S10-1 (see attachment). It was modified to reflect the reduced number of unflawed grading units and allowable false calls. As a part of ongoing Code activities, Pacific Northwest National Laboratory has reviewed the statistical significance of these revisions and offered the revised Table S10-1.

REQUEST FOR RELIEF 3-ISI-16 (cont'd)

ALTERNATIVE EXAMINATION:

In lieu of the requirements of ASME Section XI, 2001 Edition, 2003 Addenda, Appendix VIII, Supplement 10, the proposed alternative shall be used. The proposed alternative is described in the enclosure (Attachment).

The Attachment is a juxtaposition of the ASME Section XI, 2001 Edition with the 2003 Addenda, Appendix VIII, Supplement 10 requirements and the proposed changes to Supplement 10 that have been approved by ASME Section XI Subcommittee and form the basis for relief outlined above.

JUSTIFICATION FOR GRANTING RELIEF:

Pursuant to 10 CFR 50.55a(a)(3)(i), approval is requested to use the proposed alternatives described above in lieu of the ASME Section XI, Appendix VIII, Supplement 10 requirements. Compliance with the proposed alternatives will provide an adequate level of quality and safety for examination of the affected welds. Approval for BFN Units 1, 2, and the second interval for Unit 3 was received October 8, 2003.

IMPLEMENTATION SCHEDULE:

This alternative will be used for BFN Units 1, 2, and 3 until the end of each unit's respective current ten-year ISI interval as follows:

BFN Unit 1 is currently in the third period of the first interval which extends from August 1, 1974 until 1-year after restart from the current extended outage.

BFN Unit 2 is currently in the first period of the third ten-year interval which extends from May 25, 2001 through May 24, 2011.

BFN Unit 3 first period of the third ten-year interval will begin November 19, 2005 and extend through November 18, 2015.

ATTACHMENT: Table listing the proposed alternative to ASME Section XI, 2001 Edition, 2003 Addenda, Appendix VIII, Supplement 10.

Attachment

Supplement 10 - Qualification Requirements For Dissimilar Metal Piping Welds

Proposed Amendments

SUPPLEMENT 10 - QUALIFICATION REQUIREMENTS FOR DISSIMILAR METAL PIPING WELDS		
Current Requirement	**Proposed Change**	**Reasoning**
	1.0 SCOPE	
	Supplement 10 is applicable to dissimilar metal piping welds examined from either the inside or outside surface. **Supplement 10 is not applicable to piping welds containing supplemental corrosion resistant clad (CRC) applied to mitigate Intergranular Stress Corrosion Cracking (IGSCC).**	A scope statement provides added clarity regarding the applicable range of each individual Supplement. The exclusion of CRC provides consistency between Supplement 10 and the recent revision to Supplement 2 (Reference BC 00-755). Note, an additional change identifying CRC as "in course of preparation" is being processed separately.
1.0 SPECIMEN REQUIREMENTS	**2.0 SPECIMEN REQUIREMENTS**	Renumbered
Qualification test specimens shall meet the requirements listed herein, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, weld joint configuration, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.	Qualification test specimens shall meet the requirements listed herein, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, weld joint configuration, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.	No Change
1.1 General. The specimen set shall conform to the following requirements.	**2.1 General.** The specimen set shall conform to the following requirements.	Renumbered
	(a) The minimum number of flaws in a specimen set shall be ten.	New, changed minimum number of flaws to 10 so sample set size for detection is consistent with length and depth sizing.
(a) Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.	(**b**) Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.	Renumbered

(b) The specimen set shall include the minimum and maximum pipe diameters and thicknesses for which the examination procedure is applicable. Pipe diameters within a range of 0.9 to 1.5 times a nominal diameter shall be considered equivalent. Pipe diameters larger than 24 in. shall be considered to be flat. When a range of thicknesses is to be examined, a thickness tolerance of ±25% is acceptable.	(**c**) The specimen set shall include the minimum and maximum pipe diameters and thicknesses for which the examination procedure is applicable. Pipe diameters within **1/2 in. (13 mm) of the** nominal diameter shall be considered equivalent. Pipe diameters larger than 24 in. **(610 mm)** shall be considered to be flat. When a range of thicknesses is to be examined, a thickness tolerance of ±25% is acceptable.	Renumbered, metricated, the change in pipe diameter tolerance provides consistency between Supplement 10 and the recent revision to Supplement 2 (Reference BC 00-755)
(c) The specimen set shall include examples of the following fabrication condition:	(**d**) The specimen set shall include examples of the following fabrication condition**s**:	Renumbered, changed "condition" to "conditions"
(1) geometric conditions that normally require discrimination from flaws (e.g., counterbore or weld root conditions, cladding, weld buttering, remnants of previous welds, adjacent welds in close proximity);	(1) geometric **and material** conditions that normally require discrimination from flaws (e.g., counterbore or weld root conditions, cladding, weld buttering, remnants of previous welds, adjacent welds in close proximity**, weld repair areas**);	Clarification, some of the items listed relate to material conditions rather than geometric conditions. Weld repair areas were added as a result of recent field experiences.
(2) typical limited scanning surface conditions (e.g., diametrical shrink, single-side access due to nozzle and safe end external tapers).	(2) typical limited scanning surface conditions shall be included as follows: (a) for outside surface examination, **weld crowns,** diametrical shrink, single-side access due to nozzle and safe end external tapers **(b) for inside surface examination, internal tapers, exposed weld roots, and cladding conditions for inside surface examinations**). **(e) Qualification requirements shall be satisfied separately for outside surface and inside surface examinations.**	Differentiates between ID and OD scanning surface limitations. Requires that ID and OD qualifications be conducted independently (Note, new paragraph 2.0 (identical to old paragraph 1.0) provides for alternatives when "a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure.").

(d) All flaws in the specimen set shall be cracks.		Deleted this requirement, because new paragraph 2.3 below provides for the use of "alternative flaws" in lieu of cracks.

(1) At least 50% of the cracks shall be in austenitic material. At least 50% of the cracks in austenitic material shall be contained wholly in weld or buttering material. At least 10% of the cracks shall be in ferritic material. The remainder of the cracks may be in either austenitic or ferritic material.	**2.2 Flaw Location.** At least **80%** of the **flaws** shall be contained wholly in weld or buttering material. At least **one and no more than** 10% of the **flaws** shall be in ferritic **base** material. **At least one and no more than 10% of the flaws shall be in austenitic base material.**	Renumbered and re-titled. Flaw location percentages redistributed because field experience indicates that flaws contained in weld or buttering material are probable and represent the more stringent ultrasonic detection scenario.
(2) At least 50% of the cracks in austenitic base material shall be either IGSCC or thermal fatigue cracks. At least 50% of the cracks in ferritic material shall be mechanically or thermally induced fatigue cracks.	**2.3 Flaw Type.** **(a) At least 60% of the flaws shall be cracks, and the remainder shall be alternative flaws. Specimens with IGSCC shall be used when available. Alternative flaws shall meet the following requirements:** **(1) Alternative flaws, if used, shall provide crack-like reflective characteristics and shall only be used when implantation of cracks would produce spurious reflectors that are uncharacteristic of service-induced flaws.** **(2) Alternative flaws shall have a tip width no more than 0.002 in. (.05 mm).**	Renumbered and re-titled. Alternative flaws are required for placing axial flaws in the HAZ of the weld and other areas where implantation of a crack produces metallurgical conditions that result in an unrealistic ultrasonic response. This is consistent with the recent revision to Supplement 2 (Reference BC 00-755). The 40% limit on alternative flaws is needed to support the requirement for up to 70% axial flaws. Metricated
(3) At least 50% of the cracks shall be coincident with areas described in (c) above.	**(b)** At least 50% of the **flaws** shall be coincident with areas described in **2.1(d)** above.	Renumbered. Due to inclusion of "alternative flaws", use of "cracks" is no longer appropriate.

	2.4 Flaw Depth. All flaw depths shall be greater than 10% of the nominal pipe wall thickness. **F**law depths shall exceed the nominal clad thickness when placed in cladding. **Flaws in the sample set shall be distributed as follows:** Flaw Depth (% Wall Thickness) — Minimum Number of Flaws **10-30% — 20%** **31-60% — 20%** **61-100% — 20%** **At least 75% of the flaws shall be in the range of 10 to 60% of wall thickness.**	Moved from old paragraph 1.3(c) and 1.4 and re-titled. Consistency between detection and sizing specimen set requirements (e.g., 20% vs. 1/3 flaw depth increments, e.g., original paragraph 1.3(c))
1.2 Detection Specimens. The specimen set shall include detection specimens that meet the following requirements.		Renumbered and re-titled and moved to paragraph 3.1(a). No other changes
(a) Specimens shall be divided into grading units. Each grading unit shall include at least 3 in. of weld length. If a grading unit is designed to be unflawed, at least 1 in. of unflawed material shall exist on either side of the grading unit. The segment of weld length used in one grading unit shall not be used in another grading unit. Grading units need not be uniformly spaced around the pipe specimen.		Renumbered to paragraph 3.1(a)(1). No other changes.
(b) Detection sets shall be selected from Table VIII-S2-1. The number of unflawed grading units shall be at least twice the number of flawed grading units.		Moved to new paragraph 3.1(a)(2).

(c) Flawed grading units shall meet the following criteria for flaw depth, orientation, and type.		Flaw depth requirements moved to new paragraph 2.4, flaw orientation requirements moved to new paragraph 2.5, flaw type requirements moved to new paragraph 2.3, "Flaw Type".
(1) All flaw depths shall be greater than 10% of the nominal pipe wall thickness. At least 1/3 of the flaws, rounded to the next higher whole number, shall have depths between 10% and 30% of the nominal pipe wall thickness. However, flaw depths shall exceed the nominal clad thickness when placed in cladding. At least 1/3 of the flaws, rounded to the next whole number, shall have depths greater than 30% of the nominal pipe wall thickness.		Deleted, for consistency in sample sets the depth distribution is the same for detection and sizing.
(2) At least 30% and no more than 70% of the flaws, rounded to the next higher whole number, shall be oriented axially. The remainder of the flaws shall be oriented circumferentially.	**2.5 Flaw Orientation.** **(a)** For other than sizing specimens at least 30% and no more than 70% of the flaws, rounded to the next higher whole number, shall be oriented axially. The remainder of the flaws shall be oriented circumferentially.	Note, this distribution is applicable for detection and depth sizing. Paragraph 2.5(b)(1) requires that all length- sizing flaws be oriented circumferentially.
1.3 Length Sizing Specimens. The specimen set shall include length sizing specimens that meet the following requirements.		Renumbered and re-titled and moved to new paragraph 3.2
(a) All length sizing flaws shall be oriented circumferentially.		Moved, included in new paragraph 3.2(a)
(b) The minimum number of flaws shall be ten.		Moved, included in new paragraph 2.1 above
(c) All flaw depths shall be greater than 10% of the nominal pipe wall thickness. At least l/3 of the flaws, rounded to the next higher whole number, shall have depths		Moved, included in new paragraph 2.4 above after revision for consistency with detection distribution

between 10% and 30% of the nominal pipe wall thickness. However, flaw depth shall exceed the nominal clad thickness when placed in cladding. At least 1/3 of the flaws, rounded to the next whole number, shall have depths greater than 30% of the nominal pipe wall thickness.		
1.4 Depth Sizing Specimens. The specimen set shall include depth sizing specimens that meet the following requirements.		Moved, included in new paragraphs 2.1, 2.3, 2.4
(a) The minimum number of flaws shall be ten.		Moved, included in new paragraph 2.1

(b) Flaws in the sample set shall not be wholly contained within cladding and shall be distributed as follows:		Moved, potential conflict with old paragraph 1.2(c)(1); "However, flaw depths shall exceed the nominal clad thickness when placed in cladding.". Revised for clarity and included in new paragraph 2.4
Flaw Depth (% Wall Thickness) / **Minimum** Number of Flaws 10-30% 20% 31-60% 20% 61-100% 20% The remaining flaws shall be in any of the above categories.		Moved, included in paragraph 2.4 for consistent applicability to detection and sizing samples.
	(b) Sizing Specimen sets shall meet the following requirements.	Added for clarity
	(1) Length-sizing flaws shall be oriented circumferentially.	Moved from old paragraph 1.3(a)
	(2) Depth sizing flaws shall be oriented as in 2.5(a).	Included for clarity. Previously addressed by omission (i.e., length, but not depth had a specific exclusionary statement)
2.0 CONDUCT OF PERFORMANCE DEMONSTRATION	**3.0 PERFORMANCE DEMONSTRATION**	Renumbered
The specimen inside surface and identification shall be concealed from the candidate. All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited.	**Personnel and procedure performance demonstration tests shall be conducted according to the following requirements.** **(a) For qualifications from the outside surface, the specimen inside surface and identification shall be concealed from the candidate. When qualifications are performed from the inside surface, the flaw location and specimen identification shall be obscured to maintain a "blind test".** All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of	Differentiate between qualifications conducted from the outside and inside surface.

	particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited.	

2.1 Detection Test. Flawed and unflawed grading units shall be randomly mixed	**3.1 Detection Test.**	Renumbered, moved text to paragraph 3.1(a)(3)
	(a) The specimen set shall include detection specimens that meet the following requirements.	Renumbered, moved from old paragraph 1.2.
	(1) Specimens shall be divided into grading units. (a) Each grading unit shall include at least 3 in. **(76 mm)** of weld length. (b)The end of each flaw shall be separated from an unflawed grading unit by at least 1 in. **(25 mm)** of unflawed material. A flaw may be less than 3 in. in length. (c) The segment of weld length used in one grading unit shall not be used in another grading unit. (d) Grading units need not be uniformly spaced around the pipe specimen.	Renumbered, moved from old paragraph 1.2(a). Metricated. No other changes.
	(2) Personnel performance demonstration detection test sets shall be selected from Table VIII-S**10**-1. The number of unflawed grading units shall be at least 1-1/2 times the number of flawed grading units.	Moved from old paragraph 1.2(b). Table revised to reflect a change in the minimum sample set to 10 and the application of equivalent statistical false call parameters to the reduction in unflawed grading units. Human factors due to large sample size.
	(3) Flawed and unflawed grading units shall be randomly mixed.	Moved from old paragraph 2.1

	(b) Examination equipment and personnel are qualified for detection when **personnel demonstrations** satisfy the acceptance criteria of Table **VIII S10-1** for both detection and false calls.	Moved from old paragraph 3.1. Modified to reflect the 100% detection acceptance criteria of procedures versus personnel and equipment contained in new paragraph 4.0 and the use of 1.5X rather than 2X unflawed grading units contained in new paragraph 3.1(a)(2). Note, the modified table maintains the screening criteria of the original Table VIII-S2-1.
2.2 Length Sizing Test	**3.2 Length Sizing Test**	Renumbered
(a) The length sizing test may be conducted separately or in conjunction with the detection test.	(a) **Each reported circumferential flaw in the detection test shall be length-sized.**	Provides consistency between Supplement 10 and the recent revision to Supplement 2 (Reference BC 00-755).
(b) When the length sizing test is conducted in conjunction with the detection test, and less than ten circumferential flaws are detected, additional specimens shall be provided to the candidate such that at least ten flaws are sized. The regions containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.	(b) When the length-sizing test is conducted in conjunction with the detection test, and less than ten circumferential flaws are detected, additional specimens shall be provided to the candidate such that at least ten flaws are sized. The regions containing a flaw to be sized **may** be identified to the candidate. The candidate shall determine the length of the flaw in each region.	Change made to ensure security of samples, consistent with the recent revision to Supplement 2 (Reference BC 00-755). Note, length and depth sizing use the term “regions” while detection uses the term “grading units”. The two terms define different concepts and are not intended to be equal or interchangeable.
(c) For a separate length sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.	(c) For a separate length-sizing test, the regions of each specimen containing a flaw to be sized **may** be identified to the candidate. The candidate shall determine the length of the flaw in each region.	Change made to ensure security of samples, consistent with the recent revision to Supplement 2 (Reference BC 00-755).
	(d) Examination procedures, equipment, and personnel are qualified for length-sizing **when** the RMS error of the flaw length measurements, as compared to the true flaw lengths, do not exceed 0.75 in**. (19 mm).**	Moved from old paragraph 3.2(a) includes inclusion of “when” as an editorial change. Metricated.
2.3 Depth Sizing Test	**3.3 Depth Sizing Test**	Renumbered

(a) For the depth sizing test, 80% of the flaws shall be sized at a specific location on the surface of the specimen identified to the candidate.	(a) **The depth-sizing test may be conducted separately or in conjunction with the detection test. For a separate depth-sizing test, the regions of each specimen containing a flaw to be sized may be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.**	Change made to ensure security of samples, consistent with the recent revision to Supplement 2 (Reference BC 00-755).
(b) For the remaining flaws, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.	(b) **When the depth-sizing test is conducted in conjunction with the detection test, and less than ten flaws are detected, additional specimens shall be provided to the candidate such that at least ten flaws are sized. T**he regions of each specimen containing a flaw to be sized **may** be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.	Change made to be consistent with the recent revision to Supplement 2 (Reference BC 00-755). Changes made to ensure security of samples, consistent with the recent revision to Supplement 2 (Reference BC 00-755).
	(c) Examination procedures, equipment, and personnel are qualified for depth sizing when the RMS error of the flaw depth measurements, as compared to the true flaw depths, do not exceed 0.125 in. **(3 mm).**	Moved from old paragraph 3.2(b). Metricated.
3.0 ACCEPTANCE CRITERIA		Delete as a separate category. Moved to new paragraph detection (3.1) and sizing 3.2 and 3.3
3.1 Detection Acceptance Criteria. Examination procedures, equipment, and personnel are qualified for detection when the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for both detection and false calls.		Moved to new paragraph 3.1(b), reference changed to Table S10 from S2 because of the change in the minimum number of flaws and the reduction in unflawed grading units from 2X to 1.5X.
3.2 Sizing Acceptance Criteria		Deleted as a separate category. Moved to new paragraph on length 3.2 and depth 3.3

(a) Examination procedures, equipment, and personnel are qualified for length sizing the RMS error of the flaw length measurements, as compared to the true flaw lengths, is less than or equal to 0.75 in.		Moved to new paragraph 3.2(d), included word “when” as an editorial change.

(b) Examination procedures, equipment, and personnel are qualified for depth sizing when the RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 in.		Moved to new paragraph 3.3(c)
	4.0 PROCEDURE QUALIFICATION	New
	Procedure qualifications shall include the following additional requirements. **(a) The specimen set shall include the equivalent of at least three personnel performance demonstration test sets. Successful personnel performance demonstrations may be combined to satisfy these requirements.** **(b) Detectability of all flaws in the procedure qualification test set that are within the scope of the procedure shall be demonstrated. Length and depth sizing shall meet the requirements of paragraph 3.1, 3.2, and 3.3.** **(c) At least one successful personnel demonstration shall be performed.** **(d) To qualify new values of essential variables, at least one personnel qualification set is required. The acceptance criteria of 4.0(b) shall be met.**	New. Based on experience gained in conducting qualifications, the equivalent of 3 personnel sets (i.e., a minimum of 30 flaws) is required to provide enough flaws to adequately test the capabilities of the procedure. Combining successful demonstrations allows a variety of examiners to be used to qualify the procedure. Detectability of each flaw within the scope of the procedure is required to ensure an acceptable personnel pass rate. The last sentence is equivalent to the previous requirements and is satisfactory for expanding the essential variables of a previously qualified procedure

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TABLE VIII-~~S2~~-1
PERFORMANCE DEMONSTRATION DETECTION TEST
ACCEPTANCE CRITERIA

Detection Test Acceptance Criteria		False Call Test Acceptance Criteria	
No. of Flawed Grading Units	**Minimum Detection Criteria**	**No. of Unflawed Grading Units**	**Maximum Number of False Calls**
~~5~~	~~5~~	~~10~~	~~0~~
~~6~~	~~6~~	~~12~~	~~1~~
~~7~~	~~6~~	~~14~~	~~1~~
~~8~~	~~7~~	~~16~~	~~2~~
~~9~~	~~7~~	~~18~~	~~2~~
10	8	~~20~~ 15	~~3~~ 2
11	9	~~22~~ 17	~~3~~ 3
12	9	~~24~~ 18	~~3~~ 3
13	10	~~26~~ 20	~~4~~ 3
14	10	~~28~~ 21	~~5~~ 3
15	11	~~30~~ 23	~~5~~ 3
16	12	~~32~~ 24	~~6~~ 4
17	12	~~34~~ 26	~~6~~ 4
18	13	~~36~~ 27	~~7~~ 4
19	13	~~38~~ 29	~~7~~ 4
20	14	~~40~~ 30	~~8~~ 5

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 3
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI,
INSERVICE INSPECTION (ISI) PROGRAM
(THIRD TEN-YEAR INSPECTION INTERVAL)

REQUEST FOR RELIEF 3-ISI-17

Executive Summary: In accordance with 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from inservice inspection requirements of the 2001 Edition through 2003 Addenda of Section XI, Appendix VIII, Supplement 11, "Qualification Requirements For Full Structural Overlaid Wrought Austenitic Piping Welds", of the ASME Boiler and Pressure Vessel Code. The Performance Demonstration Initiative (PDI) Program for implementation of the Supplement 11 qualification program for overlay welds is not in strict compliance with the requirements of Supplement 11 of the 2001 Edition through the 2003 Addenda. TVA proposes to use the PDI Program for implementation of Appendix VIII, Supplement 11 as amended in attachment to this request for relief. The amendments to Supplement 11 as shown in attachment were coordinated with PDI, NRC, and Pacific Northwest National Laboratory (PNNL).

Units: Three (3)

System(s): Recirculation (RECIRC), and Residual Heat Removal (RHR) Systems

Components: Piping Welds with Structural Weld Overlay

ASME Code Class: ASME Code Class 1

Section XI Edition: 2001 Edition, 2003 Addenda

REQUEST FOR RELIEF 3-ISI-17 (cont'd)

Code Table: Westinghouse Owners Group (WOG) Topical Report WCAP-14572, Revision 1-NP-A, Table 4.1-1

Examination Category: R-A, Risk-Informed Piping Examinations

Examination Item Number: R1.16, Elements Subject To Intergranular Stress Corrosion Cracking (IGSCC)

Code Requirement: The 2001 Edition of ASME Section XI, with addenda through 2003, WCAP-14572, Revision 1-NP-A, Table 4.1-1, Examination Category R-A, Item No. R1.16, requires a volumetric (UT) examination of the pipe weld including the overlay. The UT examination must be performed using personnel, procedures, and equipment qualified in accordance with Appendix VIII, Supplement 11.

Code Requirements From Which Relief Is Requested: Relief is requested from the requirement to qualify personnel, procedures, and equipment in accordance with Appendix VIII, Supplement 11 as stated in the 2001 Edition through the 2003 Addenda of the ASME Section XI Code.

List Of Items Associated With The Relief Request: Weld Overlays that currently require examination in the Unit 3 Risk-Informed ISI Program

WELD #	SYSTEM	PIPE SIZE	CATEGORY
GR-3-53	RECIRC	28.0"	E
DSRHR-3-11	RHR	20.0"	E

Weld Overlays in the BFN Unit 3 Risk-Informed ISI Program that currently do not require examination:

WELD #	SYSTEM	PIPE SIZE	CATEGORY
GR-3-03	RECIRC	28.0"	E
GR-3-27	RECIRC	28.0"	E
GR-3-54	RECIRC	28.0"	E
GR-3-57	RECIRC	28.0"	E
GR-3-59	RECIRC	28.0"	E
GR-3-60	RECIRC	28.0"	E
GR-3-64	RECIRC	28.0"	E

REQUEST FOR RELIEF 3-ISI-17 (cont'd)

Basis For Relief:

The requirements of ASME Section XI, Appendix VIII, Supplement 11, as stated in the 2001 Edition through the 2003 Addenda are not practical to implement. The requirements were amended to improve the implementation process. The amended requirements are contained in the attachment to this relief request. The EPRI sponsored PDI amendments to Supplement 11, as shown in the attachment, were coordinated with PDI, NRC, and PNNL.

The proposed amended requirements of Supplement 11 for the qualification of personnel, procedures, and equipment will provide an alternative with an acceptable level of quality and safety.

Alternate Requirement:

TVA proposes to utilize personnel, procedures, and equipment qualified in accordance with ASME section XI, Appendix VIII, Supplement 11 as amended by the Attachment, which is the EPRI administered PDI Program.

Justification For The Granting Of Relief:

The proposed amended criteria (as shown in the attachment) to the requirements of the ASME Section XI, 2001 Edition with addenda through 2003, Appendix VIII, Supplement 11, which were coordinated through PDI, NRC, and PNNL, provides an alternative with an acceptable level of quality and safety.

NOTE: This request for relief (RFR) is consistent with one submitted by Brunswick Steam Electric Plant to the NRC by letters dated July 16, 2002 and February 11, 2003. The NRC approved the request for relief by letter dated March 26, 2003. The original 3-ISI-17 request for relief for the BFN Unit 3 Second Interval was approved by letter dated December 19, 2003.

Implementation Schedule:

This request for relief is applicable to the Unit 3 third Ten-Year ISI inspection interval which expires on November 18, 2015.

Attachment:

Table – Comparison of ASME Section XI, Appendix VIII, Supplement 11, Code Case N-653, and PDI Alternative.

ATTACHMENT

3-ISI-17

Comparison of ASME Section XI, Appendix VIII, Supplement 11, Code Case N-653, and PDI Alternative

SUPPLEMENT 11 - QUALIFICATION REQUIREMENTS FOR FULL STRUCTURAL OVERLAID WROUGHT AUSTENETIC PIPING WELDS	CODE CASE N-653 (Provided for Information Only)	PDI PROGRAM: The Proposed Alternative to Supplement 11 Requirements
1.0 SPECIMEN REQUIREMENTS		
Qualification test specimens shall meet the requirements listed herein, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, weld joint configuration, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.	**No Change**	**No Change**
1.1 General. The specimen set shall conform to the following requirements.	**No Change**	**No Change**

(a) Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.	**No Change**	**No Change**
(b) The specimen set shall consist of at least three specimens having different nominal pipe diameters and overlay thicknesses. They shall include the minimum and maximum nominal pipe diameters for which the examination procedure is applicable. Pipe diameters within a range of 0.9 to 1.5 times a nominal diameter shall be considered equivalent. If the procedure is applicable to pipe diameters of 24 inches or larger, the specimen set must include at least one specimen 24 inches or larger but need not include the maximum diameter. The specimen set must include at least one specimen with overlay thickness within -0.1 inches to +0.25 inches of the maximum nominal overlay thickness for which the procedure is applicable.	**No Change**	***(b)* The specimen set shall consist of at least three specimens having different nominal pipe diameters and overlay thicknesses. They shall include the minimum and maximum nominal pipe diameters for which the examination procedure is applicable. Pipe diameters within a range of 0.9 to 1.5 times a nominal diameter shall be considered equivalent. If the procedure is applicable to pipe diameters of 24 inches or larger, the specimen set must include at least one specimen 24 inches or larger but need not include the maximum diameter. The specimen set shall include specimens with overlays not thicker than 0.1 inches more than the minimum thickness, nor thinner than 0.25 inches of the maximum nominal overlay thickness for which the examination procedure is applicable.** .
(c) The surface condition of at least two specimens shall approximate the roughest surface condition for which the examination procedure is applicable.	**No Change**	**No Change**

(d) Flaw Conditions		
(1) Base metal flaws. All flaws must be cracks in or near the butt weld heat-affected zone, open to the inside surface, and extending at least 75 percent through the base metal wall. Flaws may extend 100 percent through the base metal and into the overlay material; in this case, intentional overlay fabrication flaws shall not interfere with ultrasonic detection or characterization of the cracking. Specimens containing IGSCC shall be used when available.	(1) Base metal flaws. All flaws must be in or near the butt weld heat-affected zone, open to the inside surface, and extending at least 75 percent through the base metal wall. Intentional overlay fabrication flaws shall not interfere with ultrasonic detection or characterization of the cracking. Specimens containing IGSCC shall be used when available. At least 70 percent of the flaws in the detection and sizing tests shall be cracks. Alternative flaw mechanisms, if used, shall provide crack-like reflective characteristics and shall be limited by the following: (1) Flaws shall be limited to when implantation of cracks precludes obtaining a realistic ultrasonic response. (2) Flaws shall be semi-elliptical with a tip width of less than or equal to 0.002 inches.	(1) Base metal flaws. All flaws must be in or near the butt weld heat-affected zone, open to the inside surface, and extending at least 75 percent through the base metal wall. Intentional overlay fabrication flaws shall not interfere with ultrasonic detection or characterization of the base metal flaws. Specimens containing IGSCC shall be used when available. At least 70 percent of the flaws in the detection and sizing tests shall be cracks and the remainder shall be alternative flaws. Alternative flaw mechanisms, if used, shall provide crack-like reflective characteristics and shall be limited by the following: (a) The use of Alternative flaws shall be limited to when the implantation of cracks produces spurious reflectors that are uncharacteristic of actual flaws. (b) Flaws shall be semi-elliptical with a tip width of less than or equal to 0.002 inches.

(2) Overlay fabrication flaws. At least 40 percent of the flaws shall be non-crack fabrication flaws (e.g., sidewall lack of fusion or laminar lack of bond) in the overlay or the pipe-to-overlay interface. At least 20 percent of the flaws shall be cracks. The balance of the flaws shall be of either type.	**No Change**	**No Change**
(e) Detection Specimens		
(1) At least 20 percent but less than 40 percent of the flaws shall be oriented within ±20 degrees of the pipe axial direction. The remainder shall be oriented circumferentially. Flaws shall not be open to any surface to which the candidate has physical or visual access. The rules of IWA-3300 shall be used to determine whether closely spaced flaws should be treated as single or multiple flaws.	**(1) At least 20 percent but less than 40 percent of the base metal flaws shall be oriented within ±20 degrees of the pipe axial direction. The remainder shall be oriented circumferentially. Flaws shall not be open to any surface to which the candidate has physical or visual access.**	**(1) At least 20 percent but less than 40 percent of the base metal flaws shall be oriented within ±20 degrees of the pipe axial direction. The remainder shall be oriented circumferentially. Flaws shall not be open to any surface to which the candidate has physical or visual access.**

(2) Specimens shall be divided into base and over-lay grading units. Each specimen shall contain one or both types of grading units.	(2) Specimens shall be divided into base metal and overlay fabrication grading units. Each specimen shall contain one or both types of grading units. Flaws shall not interfere with ultrasonic detection or characterization of other flaws.	(2) Specimens shall be divided into base metal and overlay fabrication grading units. Each specimen shall contain one or both types of grading units. Flaws shall not interfere with ultrasonic detection or characterization of other flaws.
(a)(1) A base grading unit shall include at least 3 inches of the length of the overlaid weld. The base grading unit includes the outer 25 percent of the overlaid weld and base metal on both sides. The base grading unit shall not include the inner 75 percent of the overlaid weld and base metal overlay material, or base metal-to-overlay interface.	*(a)(1)* A base metal grading unit shall include at least 1 inch of the length of the overlaid weld. The base metal grading unit includes the outer 25 percent of the overlaid weld and base metal on both sides. The base metal grading unit shall not include the inner 75 percent of the overlaid weld and base metal overlay material, or base metal-to-overlay interface.	*(a)(1)* The base metal grading unit includes the overlay material and the outer 25 percent of the original overlaid weld. The base metal grading unit shall extend circumferentially for at least 1 inch and shall start at the weld centerline and be wide enough in the axial direction to encompass one half of the original weld crown and a minimum of 0.50” of the adjacent base material.
(a)(2) When base metal cracking penetrates into the overlay material, the base grading unit shall include the overlay metal within 1 inch of the crack location. This portion of the overlay material shall not be used as part of any overlay grading unit.	(a)(2) When base metal cracking penetrates into the overlay material, the base metal grading unit shall not be used as part of any overlay fabrication grading unit.	(a)(2) When base metal flaws penetrate into the overlay material, the base metal grading unit shall not be used as part of any overlay fabrication grading unit.

(a)(3) When a base grading unit is designed to be unflawed, at least 1 inch of unflawed overlaid weld and base metal shall exist on either side of the base grading unit. The segment of weld length used in one base grading unit shall not be used in another base grading unit. Base grading units need not be uniformly spaced around the specimen.	(a)(3) Sufficient unflawed overlaid weld and base metal shall exist on all sides of the grading unit to preclude interfering reflections from adjacent flaws.	(a)(3) Sufficient unflawed overlaid weld and base metal shall exist on all sides of the grading unit to preclude interfering reflections from adjacent flaws.
(b)(l) An overlay grading unit shall include the overlay material and the base metal-to-overlay interface of at least 6 square inches. The overlay grading unit shall be rectangular, with minimum dimensions of 2 inches.	*(b)*(l) An overlay fabrication grading unit shall include the overlay material and the base metal-to-overlay interface for a length of at least 1 inch.	*(b)*(l) An overlay fabrication grading unit shall include the overlay material and the base metal-to-overlay interface for a length of at least 1 inch.

(b)(2) An overlay grading unit designed to be unflawed shall be surrounded by unflawed overlay material and unflawed base metal-to-overlay interface for at least 1 inch around its entire perimeter. The specific area used in one overlay grading unit shall not be used in another overlay grading unit. Overlay grading units need not be spaced uniformly about the specimen.	(b)(2) Overlay fabrication grading units designed to be unflawed shall be separated by unflawed overlay material and unflawed base metal-to-overlay interface for at least 1 inch at both ends. Sufficient unflawed overlaid weld and base metal shall exist on both sides of the overlay fabrication grading unit to preclude interfering reflections from adjacent flaws. The specific area used in one overlay fabrication grading unit shall not be used in another overlay fabrication grading unit. Overlay fabrication grading units need not be spaced uniformly about the specimen.	(b)(2) Overlay fabrication grading units designed to be unflawed shall be separated by unflawed overlay material and unflawed base metal-to-overlay interface for at least 1 inch at both ends. Sufficient unflawed overlaid weld and base metal shall exist on both sides of the overlay fabrication grading unit to preclude interfering reflections from adjacent flaws. The specific area used in one overlay fabrication grading unit shall not be used in another overlay fabrication grading unit. Overlay fabrication grading units need not be spaced uniformly about the specimen.

(b)(3) Detection sets shall be selected from Table VIII-S2-1. The minimum detection sample set is five flawed base grading units, ten unflawed base grading units, five flawed overlay grading units, and ten unflawed overlay grading units. For each type of grading unit, the set shall contain at least twice as many unflawed as flawed grading units.	(b)(3) Detection sets shall be selected from Table VIII-S2-1. The minimum detection sample set is five flawed base metal grading units, ten unflawed base metal grading units, five flawed overlay fabrication grading units, and ten unflawed overlay fabrication grading units. For each type of grading unit, the set shall contain at least twice as many unflawed as flawed grading units. For initial procedure qualification, detection sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.	(b)(3) Detection sets shall be selected from Table VIII-S2-1. The minimum detection sample set is five flawed base metal grading units, ten unflawed base metal grading units, five flawed overlay fabrication grading units, and ten unflawed overlay fabrication grading units. For each type of grading unit, the set shall contain at least twice as many unflawed as flawed grading units. For initial procedure qualification, detection sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.

(f) Sizing Specimen		
(1) The minimum number of flaws shall be ten. At least 30 percent of the flaws shall be overlay fabrication flaws. At least 40 percent of the flaws shall be cracks open to the inside surface.	**(1) The minimum number of flaws shall be ten. At least 30 percent of the flaws shall be overlay fabrication flaws. At least 40 percent of the flaws shall be cracks open to the inside surface. For initial procedure qualification, sizing sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.**	(1) The minimum number of flaws shall be ten. At least 30 percent of the flaws shall be overlay fabrication flaws. At least 40 percent of the flaws shall be open to the inside surface. Sizing sets shall contain a distribution of flaw dimensions to assess sizing capabilities. For initial procedure qualification, sizing sets shall include the equivalent of three personnel qualification sets. To qualify new values of essential variables, at least one personnel qualification set is required.
(2) At least 20 percent but less than 40 percent of the flaws shall be oriented axially. The remainder shall be oriented circumferentially. Flaws shall not be open to any surface to which the candidate has physical or visual access.	**No Change**	**No Change**
(3) Base metal cracking used for length sizing demonstrations shall be oriented circumferentially.	**No Change**	**(3) Base metal flaws used for length sizing demonstrations shall be oriented circumferentially.**

(4) Depth sizing specimen sets shall include at least two distinct locations where cracking in the base metal extends into the overlay material by at least 0.1 inches in the through-wall direction.	**No Change**	**(4) Depth sizing specimen sets shall include at least two distinct locations where a base metal flaw extends into the overlay material by at least 0.1 inches in the through-wall direction.**
2.0 CONDUCT OF PERFORMANCE DEMONSTRATION		
The specimen inside surface and identification shall be concealed from the candidate. All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited.	**The specimen inside surface and identification shall be concealed from the candidate. All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited. The overlay fabrication flaw test and the base metal flaw test may be performed separately .**	**The specimen inside surface and identification shall be concealed from the candidate. All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited. The overlay fabrication flaw test and the base metal flaw test may be performed separately.**
2.1 Detection Test.		
Flawed and unflawed grading units shall be randomly mixed. Although the boundaries of specific grading units shall not be revealed to the candidate, the candidate shall be made aware of the type or types of grading units (base or overlay) that are present for each specimen.	**Flawed and unflawed grading units shall be randomly mixed. Although the boundaries of specific grading units shall not be revealed to the candidate, the candidate shall be made aware of the type or types of grading units (base metal or overlay fabrication) that are present for each specimen.**	**Flawed and unflawed grading units shall be randomly mixed. Although the boundaries of specific grading units shall not be revealed to the candidate, the candidate shall be made aware of the type or types of grading units (base metal or overlay fabrication) that are present for each specimen.**

2.2 Length Sizing Test		
(a) The length sizing test may be conducted separately or in conjunction with the detection test.	**No Change**	No Change
(b) When the length sizing test is conducted in conjunction with the detection test and the detected flaws do not satisfy the requirements of 1.1(f), additional specimens shall be provided to the candidate. The regions containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.	**No Change**	**No Change**
(c) For a separate length sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.	No Change	**No Change**
(d) For flaws in base grading units, the candidate shall estimate the length of that part of the flaw that is in the outer 25 percent of the base wall thickness.	*(d)* For flaws in base metal grading units, the candidate shall estimate the length of that part of the flaw that is in the outer 25 percent of the base metal wall thickness.	*(d)* For flaws in base metal grading units, the candidate shall estimate the length of that part of the flaw that is in the outer 25 percent of the base metal wall thickness.

2.3 Depth Sizing Test.		
For the depth sizing test, 80 percent of the flaws shall be sized at a specific location on the surface of the specimen identified to the candidate. For the remaining flaws, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.	The candidate shall determine the depth of the flaw in each region.	(a) The depth sizing test may be conducted separately or in conjunction with the detection test.
		(b) When the depth sizing test is conducted in conjunction with the detection test and the detected flaws do not satisfy the requirements of 1.1(f), additional specimens shall be provided to the candidate. The regions containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.
		(c) For a separate depth sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.

3.0 ACCEPTANCE CRITERIA		
3.1 Detection Acceptance Criteria.		
Examination procedures, equipment, and personnel are qualified for detection when the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for both detection and false calls. The criteria shall be satisfied separately by the demonstration results for base grading units and for overlay grading units.	**Examination procedures are qualified for detection when all flaws within the scope of the procedure are detected and the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for false calls. Examination equipment and personnel are qualified for detection when the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for both detection and false calls. The criteria shall be satisfied separately by the demonstration results for base metal grading units and for overlay fabrication grading units.**	(a) Examination procedures are qualified for detection when:
		1) All flaws within the scope of the procedure are detected and the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for false calls.
		(2) At least one successful personnel demonstration has been performed meeting the acceptance criteria defined in (b).
		(b)Examination equipment and personnel are qualified for detection when the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for both detection and false calls.

		(c) The criteria in (a), (b) shall be satisfied separately by the demonstration results for base metal grading units and for overlay fabrication grading units.
3.2 Sizing Acceptance Criteria.		
Examination procedures, equipment, and personnel are qualified for sizing when the results of the performance demonstration satisfy the following criteria.	No Change	**No Change**
(a) The RMS error of the flaw length measurements, as compared to the true flaw lengths, is less than or equal to 0.75 inches. The length of base metal cracking is measured at the 75 percent through-base-metal position.	No Change	***(a)* The RMS error of the flaw length measurements, as compared to the true flaw lengths, is less than or equal to 0.75 inches. The length of base metal flaws is measured at the 75 percent through-base-metal position.**
(b) All extensions of base metal cracking into the overlay material by at least 0.1 inches are reported as being intrusions into the overlay material.	This requirement is omitted.	This requirement is omitted.
(c) The RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 inches.	*(b)* The RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 inches.	*(b)* The RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 inches.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 3
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI, INSERVICE INSPECTION (ISI) PROGRAM

REQUEST FOR RELIEF 3-ISI-20

EXECUTIVE SUMMARY

This request for relief proposes to adopt Code Case N-700, Alternative Rules for Selection of Classes 1, 2, and 3 Vessel Welded Attachments for Examination.

The BFN Unit 3 ISI program is based on the 2001 Edition of ASME Section XI with the 2003 Addenda. The 2001 Edition with 2003 Addenda currently states in Examination Categories B-K and C-C that "For multiple vessels of similar design, function, and service, only one welded attachment of only one of the multiple vessels shall be selected for examination." There is no criterion for selection of the one welded attachment that must be examined. The 2003 Addenda does not specifically address selection criteria for single vessels.

Code Case N-700 provides criteria for selection of Class 1, 2, and 3 welded attachments for examination. Code Case N-700 requires that for multiple vessels of similar design, function and service, only one welded attachment of only one of the multiple vessels shall be selected for examination. The case also requires that only one welded attachment on a single vessel be examined. However, the case also requires that the attachment selected for examination on one of the multiple vessels or the single vessel, as applicable, to be an attachment under continuous load during operation if such an attachment exists.

The requirements of Code Case N-700 provide an adequate level of quality and safety for selection of the Class 1, 2, and 3 vessel welded attachments for examination. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i) it is requested that relief be granted.

REQUEST FOR RELIEF 3-ISI-20 (cont'd)

SYSTEM/COMPONENTS(S) FOR WHICH RELIEF IS REQUESTED

Class 1, 2, and 3 Vessel Welded Attachments

CODE REQUIREMENTS

Table IWB-2500-1, Examination Category B-K, Footnote 4;
Table IWC-2500-1, Examination Category C-C, Footnote 4; and
Table IWD-2500-1, Examination Category D-A, Footnote 3 of the 2001 Edition, 2003 Addenda of ASME Section XI

RELIEF REQUESTED

Relief is requested to use the alternatives of Code Case N-700 for the selection of Class 1, 2, and 3 vessel welded attachments for examination.

BASIS FOR RELIEF

The BFN Unit 3 ISI program is based on the 2001 Edition of ASME Section XI with 2003 Addenda.

Code Case N-509, Alternative Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments, was incorporated in the 1995 Edition, 1995 Addenda of ASME Section XI. The technical basis for development of Code Case N-509 concluded that operational transients/water hammers to be the major potential for welded attachment failures (possibility exists for corrosion related failures). The technical basis of Code Case N-509 also concluded that welded attachment failures have been identified as a result of connected support member deformation and had not been identified by the Section XI examinations. That is the basis for Code Case N-509 and the 1995 Addenda, and later addenda, which requires welded attachments to be examined whenever component support deformation is identified. In addition, a sampling plan for welded attachments was maintained.

Code Case N-509 and the 2001 Edition with 2003 Addenda state in Examination Categories B-K and C-C that "For multiple vessels of similar design, function and service, only one welded attachment of only of the multiple vessels shall be selected for examination". There is no criterion for selection of the one welded attachment that must be examined. Code Case N-509 and the 2001 Edition with 2003 Addenda do not specifically address selection criteria for single vessels.

REQUEST FOR RELIEF 3-ISI-20 (cont'd)

Code Case N-700 utilizes the basis for development of Code Case N-509 to provide criteria for selection of Class 1, 2, and 3 vessel welded attachments for examination. Code Case N-700 requires that for multiple vessels of similar design, function and service, only one welded attachment of only one of the multiple vessels shall be selected for examination. The code case requires that only one welded attachment on a single vessel be examined. However, the case also requires that the attachment selected for examination on one of the multiple vessels or the single vessel, as applicable, to be an attachment under continuous load during operation if such an attachment exists.

ALTERNATIVE EXAMINATION

In lieu of the requirements specified in the earlier CODE REQUIREMENTS section, Code case N-700 will be used for selection of Class 1, 2, and 3 vessel welded attachments for examination. Code case N-700 was approved by the ASME Code Committee on November 18, 2003.

JUSTIFICATION FOR GRANTING RELIEF

Code Case N-509 was incorporated in the 1995 Edition, 1995 Addenda of ASME Section XI. The technical basis for development of Code Case N-509 concluded that operational transients/water hammers to be the major potential for welded attachment failures (possibility exists for corrosion related failures). The technical basis of Code Case N-509 also concluded that welded attachment failures have been identified as a result of connected support member deformation and have not been identified by the present code examinations. That is the basis for Code Case N-509 and the 1995 Addenda, and later addenda, which requires welded attachments to be examined whenever component support deformation is identified. In addition, a sampling plan for welded attachments was maintained. For Class 1 and 2 multiple vessels this sampling plan requires only one welded attachment of only one of the multiple vessels shall be selected for examination. There is no criterion for selection of the one welded attachment that must be examined. Code Case N-509 and the 2003 Addenda do not specifically address selection criteria for single vessels.

REQUEST FOR RELIEF 3-ISI-20 (cont'd)

Code Case N-700 utilizes the basis for development of Code Case N-509 to provide criteria for selection of Class 1, 2, and 3 welded attachments for examination. Code Case N-700 requires that for multiple vessels of similar design, function, and service, only one welded attachment of only one of the multiple vessels shall be selected for examination. The case requires that only one welded attachment on a single vessel be examined. However, the case also requires that the attachment selected for examination on one of the multiple vessels or the single vessel, as applicable, to be an attachment under continuous load during operation if such an attachment exists.

Pursuant to 10 CFR 50.55a(a)(3)(i), approval is requested to use the proposed alternatives described above in lieu of the requirements specified in the earlier CODE REQUIREMENTS section. Compliance with the proposed alternatives will provide an adequate level of quality and safety for selection of the Class 1, 2, and 3 vessel welded attachments for examination.

NOTE: The original 3-ISI-20 request for relief for the BFN Unit 3 Second Interval was approved by letter dated July 18, 2005.

IMPLEMENTATION SCHEDULE

The alternative will be used for BFN Unit 3 until the end of the third inspection interval.

BFN Unit 3 first inspection period of the third inspection interval will begin November 19, 2005. The second inspection interval is currently scheduled to end on November 18, 2015.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 3
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI, INSERVICE INSPECTION (ISI) PROGRAM

REQUEST FOR RELIEF 3-ISI-21

EXECUTIVE SUMMARY

This request for relief proposes to adopt Risk-Informed Selection of Class 1 and Class 2 Piping Welds for Examination. The proposed process is similar to that originally submitted April 23, 1999 and authorized in a letter dated February 11, 2000 from Richard P. Corella, Chief, Section 2 to Mr. J. A. Scalice, Chief Nuclear Officer and Executive Vice President TVA (TAC No. MA5355).

The BFN Unit 3 ISI program is based on the 2001 Edition of ASME Section XI with the 2003 Addenda.

The Risk-Informed process provides an adequate level of quality and safety for selection of the Class 1 and Class 2 Piping Welds for examination. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i) it is requested that relief be granted.

SYSTEM/COMPONENTS(S) FOR WHICH RELIEF IS REQUESTED

Class 1 and Class 2 Piping Welds

CODE REQUIREMENTS

Table IWB-2500-1, Examination Category B-F and Category B-J; Table IWC-2500-1, Examination Category C-F-1 and Category C-F-2 of the 2001 Edition, 2003 Addenda of ASME Section XI

RELIEF REQUESTED

Relief is requested to use a risk-informed process as an alternative for the selection of Class 1 and Class 2 Piping Welds for examination.

REQUEST FOR RELIEF 3-ISI-21 (cont'd)

BASIS FOR RELIEF

The BFN Unit 3 ISI program is based on the 2001 Edition of ASME Section X with 2003 Addenda. The Unit 3 ISI program for the examination of Class 1 and Class 2 piping welds is in accordance with a risk-informed process submitted April 23, 1999. NRC approved this request on February 11, 2000 (TAC No. MA5355). In the original submittal, TVA committed to review and adjust the risk ranking of piping segments as a minimum on an ASME period basis. This review and adjustment has been performed after each ASME period since approval, and the first periodic review was used as one of the bases for the development of the Nuclear Energy Institute document 04-05, "Living Program Guidance To Maintain Risk-Informed Inservice Inspection Programs For Nuclear Plant Piping Systems", published April, 2004.

ALTERNATIVE EXAMINATION

In lieu of the requirements specified in the earlier CODE REQUIREMENTS section, the Risk-Informed process will be used for selection of Class 1 and Class 2 Piping Welds for examination.

JUSTIFICATION FOR GRANTING RELIEF

The Unit 3 ISI program for the examination of Class 1 and Class 2 piping welds is in accordance with a risk-informed process submitted April 23, 1999. NRC approved this request on February 11, 2000 (TAC No. MA5355). In the original submittal, TVA committed to review and adjust the risk ranking of piping segments as a minimum on an ASME period basis. The first period of implementation of the RI-ISI program was the second period of the Interval 2, which ended November 19, 2002. Several changes took place prior to the end of that period, including revision of the PSA and initiation of hydrogen water chemistry/noble metals injection, so a review was performed in March 2002. This review and subsequent update was presented to and approved by the Expert Panel March 14, 2002. To satisfy the Periodic Review requirements the program was again reviewed after the final outage of the period. This review and update was presented to and approved by the Expert Panel December 19, 2002. This review was used by the Nuclear Energy Institute Task Force as one of the bases for NEI 04-05, "Living Program Guidance To Maintain Risk-Informed Inservice Inspection Programs For Nuclear Plant Piping Systems", published April, 2004. The final outage of the third Period of Interval 2 took place in March 2004. The final periodic review of the Interval was presented to and approved by the Expert Panel June 8, 2005. The updated program resulting from this and previous reviews is the subject of this relief request.

REQUEST FOR RELIEF 3-ISI-21 (cont'd)

As part of the Browns Ferry Unit 1 Restart project, a Risk-Informed ISI program has been developed. Based on precedents in the rest of the industry and at the other TVA nuclear facilities, it was decided to limit the scope of the Unit 1 program to Class 1 and Class 2 only. For consistency, the revised Unit 3 program was also limited to this scope. Revised programs were developed for both full scope and the reduced scope. The same segments were determined to be significant regardless of scope; therefore, limiting scope to Class 1 and Class 2 only has no impact on the resulting program, but simplifies future review. It is anticipated that the Unit 2 program will be revised similarly at the end of the current Interval.

In accordance with the guidance provided by NEI 04-05, a table is provided as Attachment 1 identifying the number of welds added to and deleted from the originally approved RI-ISI program. The deletions from the previous program are entirely attributable to lower failure rates due to the implementation of the hydrogen water chemistry/noble metal injection program, with the corresponding impact on IGSCC.

A new Delta Risk Evaluation was performed, and the revised program continues to represent a risk reduction when compared to the last deterministic Section XI inspection program. . The original program represented a reduction of 9.4E-07 in regards to CDF and 2.68E-07 in regards to LERF, while the revised program represents a reduction of 2.23E-07 in regards to CDF and 3.80E-09 in regards to LERF. The smaller reduction is due to a decreased total Base Case CDF and LERF. The previous values were 1.159E-05 and 3.251E-06 respectively, while the revised values are 2.345E-06 and 2.484E-08. The decrease in Base Case CDF and LERF is also attributable to lower failure rates due to the implementation of the hydrogen water chemistry/noble metal injection program.

IMPLEMENTATION SCHEDULE

The alternative will be used for BFN Unit 3 until the end of that unit's third ten-year ISI program inspection interval, subject to the review and update guidance of NEI 04-05. The third inspection interval is currently scheduled to end on November 18, 2015.

REQUEST FOR RELIEF 3-ISI-21 (cont'd)
Attachment 1

STRUCTURAL ELEMENT SELECTION RESULTS AND COMPARISON TO ORIGINAL PROGRAM AND PREVIOUS RI-ISI PROGRAM

System		# Segs	Original Program (1989 ASME & GL88-01)											Previous RI-ISI Program (a) (b) (c)								Revised RI-ISI Program (a) (b) (c)							
			ASME XI Elements (d)				Augmented Elements							RI-ISI Examinations								RI-ISI Examinations							
			B-F	B-J	C-F-1	C-F-2	A	C	D	E	G	Dual Credit (XI & Aug)	FAC(e)	R1.11	R1.16	R1.18	A	C	D	E	G	R1.11	R1.16	R1.18	A	C	D	E	G
001	MS	56		38		10							295	2 Cl 2		4						2 Cl 2		4					
002	CDW	36											478																
003	FW	46		23									321	2 Cl 1		11						2 Cl 1		11					
063	SLC	5																											
068	RECIRC	16	14	18			44	32		9		32 Cl 1			28 A 9 E		28	32		9			12 A 2 C 7 E		12	30		9	
069	RWCU	19		7			19	1				6 Cl 1		1 Cl 1	9 A		9	1				1 Cl 1	1 A		1	1			
070	RBCCW	17																											
071	RCIC	12		1		5								1 Cl 2								1 Cl 2							
073	HPCI	11		5	5	11								1 Cl 1 2 Cl 2								1 Cl 1 2 Cl 2							
074	RHR	31		10	2	35	4	27	2	1	2	10 Cl 1 2 Cl 2		2 Cl 1 4 Cl 2	7 C 1 E 2 G			27	2	1	2	3 Cl 1 4 Cl 2	8 C 1 D 1 E 2 G			27	2	1	2
075	CS	15	2	10	6	13		19				10 Cl 1			4 A 10 C		4	19				1 Cl 1	5 C			15			
078	FPC	1																											
085	CRD	31	1			6		4				1 Cl 1						4								3			
Total Examinations		392	17	112	13	80	67	83	2	10	2	59 Cl 1 2 Cl 2		6 Cl 1 9 Cl 2	70	15	41	83	2	10	2	8 Cl 1 9 Cl 2	39	15	13	76	2	10	2
Total Elements		1383	17	357	111	898																							

Notes: (a) System pressure test requirements and VT-2 visual examinations shall continue to be performed in all ASME Code Class 1, 2, and 3 systems.

(b) Augmented programs including FAC and Reactor Nozzle Thermal Fatigue Cracking (NUREG-0619) continue

(c) Augmented program for IGSCC Categories C through G (VIP-075, GL88-01, NUREG-0313) continues.

(d) The current ASME Section XI ISI Program examines a minimum of 25% of the Class 1 and a minimum of 7.5% of the Class 2 elements

(e) The FAC Augmented Program examines approximately 10% of the identified locations each refueling outage.

Section 8.6 – Class 1 Piping Flange Bolted Connections Group List

GROUP NUMBER	COMPONENT NUMBER	SIZE (INCHES)	SYSTEM	ISI DWG NUMBER	COMMENTS
1	MSBC-3-01	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-02	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-03	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-04	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-05	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-06	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-07	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-08	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-09	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-10	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-11	6	Main Steam	3-ISI-0313-B-01	
	MSBC-3-12	6	Main Steam	3-ISI-0313-B-01	
2	PCV1-3-004-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-005-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-018-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-019-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-022-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-023-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-030-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-031-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-034-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-041-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-042-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-179-PBC	6	Main Steam	3-ISI-0313-B-01	
	PCV1-3-180-PBC	6	Main Steam	3-ISI-0313-B-01	
3	RBC-3-1	4	Recirc.	3-ISI-0328-C-01	
	RBC-3-2	4	Recirc.	3-ISI-0328-C-02	
4	N6A-3-1-BC	6	RPV	3-ISI-0328-C-01	
	N6B-3-2-BC	6	RPV	3-ISI-0328-C-01	
5	N7-3-3-BC	4	RPV	3-ISI-0328-C-01	