Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

February 5, 2001

10 CFR 50.55a

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of) Docket No. 50-260
Tennessee Valley Authority)

BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 2 - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI, INSERVICE INSPECTION AND SYSTEM PRESSURE TEST PROGRAMS FOR THE THIRD TEN-YEAR INSPECTION INTERVAL (TAC NO. MB0400)

This letter submits the Third Ten-Year Inservice Inspection (ISI) and System Pressure Test (SPT) Programs for Unit 2 of the Browns Ferry Nuclear Plant. The Code of record for the Third Ten-Year Interval ISI and SPT programs is the 1995 Edition, 1996 Addenda of the ASME Boiler and Pressure Vessel Code, Section XI. The third interval commences May 25, 2001.

The applicable regulation, 10 CFR 50.55a(g), requires that ISI examinations and System Pressure Tests for ASME Code Class 1, 2, and 3 components of a water-cooled nuclear facility meet the ISI requirements of ASME Section XI. In addition, 10 CFR 50.55a(g)(4)(ii) requires that the ISI and System Pressure Test Programs be updated every 10 years to the latest NRC approved Edition and Addenda of Section XI, which is in effect 12 months prior to the start of the next 120-month inspection interval. The enclosed program updates satisfy that requirement.

Enclosure 1 to this letter contains the updated BFN Unit 2 ASME Section XI ISI program which conforms to the 1995 Edition, 1996 Addenda of the ASME Section XI Code. In addition, TVA has incorporated Risk-Informed ISI into the Third Ten-Year Interval

A047

Program. TVA submitted its Risk-Informed ISI program and methodology for the Second Ten-Year ISI Interval to NRC by letters dated June 1, October 16, and December 13, 2000.

There are five requests for relief submitted for staff approval with this program update. Relief request 2-ISI-9, which was submitted to the NRC staff by TVA letter dated March 24, 2000, and accepted by NRC letter dated August 14, 2000, for the remaining term of operation under the existing license, is included for information. TVA anticipates that other ISI requests for relief will be necessary for the BFN Unit 2 Third Ten-Year ISI interval including reactor pressure vessel feedwater nozzle ultrasonic (UT) examinations and certain integral attachment examinations. These relief requests would involve TVA's inability to obtain the specified examination coverage (90 percent) as a result of weld geometry or interferences. These relief requests will be submitted following the performance of the examinations when the specific examination coverage percentage has been determined.

Enclosure 2 provides the updated System Pressure Test Program which conforms to the 1995 Edition, 1996 Addenda of the ASME Section XI Code. TVA is submitting two requests for relief for NRC approval with the System Pressure Test Program update.

There are no new commitments contained in this letter. If you have any questions, please contact me at (256) 729-2636.

Sincerely,

T. E. Abney
Manager of Licensing
and Industry Affairs

Enclosures
cc: See Page 3

cc (Enclosures):
Mr. Paul E. Fredrickson, Branch Chief
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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 2
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI, INSERVICE INSPECTION (ISI) PROGRAM
THIRD TEN-YEAR INSPECTION INTERVAL

INSERVICE INSPECTION (ISI) PROGRAM

(SEE ATTACHED)

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

SURVEILLANCE INSTRUCTION

2-SI-4.6.G

INSERVICE INSPECTION AND RISK - INFORMED INSERVICE INSPECTION PROGRAM UNIT 2

REVISION

PREPARED BY: F. W. FROSCELLO JR.

RESPONSIBLE ORGANIZATION: COMPONENT ENGINEERING

APPROVED BY: DATE:

EFFECTIVE DATE:

LEVEL OF USE: CONTINUOUS USE

VALIDATION DATE: NOT REQUIRED

QUALITY-RELATED

REVISION LOG

Procedure Number: 2-SI-4.6.G Revision Number:

General revision to upgrade Unit 2 Inservice Inspection Program to the Third Ten Year Inspection Interval to the 1995 Edition, 1996 Addenda of ASME Section XI Code.

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 2
Construction Permit Date:	Construction Permit was issued prior to January 1, 1971.
Commercial Operation Date:	March 1, 1975
First 10 Year ISI Interval:	March 1, 1975 to May 24, 1992
Second 10 Year ISI Interval	May 24, 1992 to May 24, 2001
Third 10 Year ISI Interval	May 25, 2001 to May 24, 2011

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 the 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 1995 Edition through the 1996 Addenda of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Division I, in accordance with Title 10 Code of Federal Regulations (CFR) Part 50, 50.55a(g) for the third inspection interval of Browns Ferry Nuclear Plant (BFN) Unit 2. Relief requests are issued for regulatory review and approval when implementation of ASME Section XI requirements is determined to be impractical in accordance with 10CFR50.55a(g)(4). These programs provide for implementation in accordance with the Program B scheduling requirements of ASME Section XI, IWA-2432. In addition, the BFN Risk-Informed Inservice Inspection Program (RI-ISI) shall be utilized as outlined in Section 7.13. The Risk - Informed Inservice Inspection 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 10CFR50.55a(a)(3)(i) providing an acceptable level of quality and safety.

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 2 ISI Component and Component Support Drawings are listed in Section 2.5.2.

1.0 INTRODUCTION (continued)

1.2 Scope

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.

Specifics concerning performance of Nondestructive Examinations (NDE) are not part of this program, but are included in IEP-100, Nondestructive Examination Procedures.

1.0 INTRODUCTION (continued)

1.3 Frequency

1.3.1 Inspection Interval and Inspection Periods

This inspection interval is from May 25, 2001 to May 24, 2011. This is the third inspection interval for BFN Unit 2 and is ten years long. The inspection interval is divided into three periods in accordance with ASME Section XI, IWA-2432, Inspection Program B.

The associated inspection period dates are listed below:

Inspection Period	Minimum Exams	Maximum Exams
First (5/01-5/04)	16%	34%
Second (5/04-5/08)	50%	67%
Third (5/08-5/11)	100%	100%

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 2 is out of service continuously for six months or more.

1.4 CODES OF RECORD AND CODE CASES

1.4.1 Current Code Requirements and Code Cases

This program is in effect for BFN Unit 2 during the third inspection interval which begins May 25, 2001. The Unit 1 and 3 ISI programs are contained in 1-, and 3-SI.4.6.G, respectively.

The code of record for the unit 2 third inspection interval is the 1995 Edition through the 1996 Addenda of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Division I, in accordance with Title 10 Code of Federal Regulations (CFR) Part 50, 50.55a(g)(4) . The effective code edition and addenda are determined in accordance with 10CFR50.55a(b)(2).

The extent and frequency of examination of piping welds for the Third Inspection Interval shall be in accordance with the Risk - Informed Inservice Inspection Program (RI-ISI). This program was implemented in the third inspection period of the second inspection interval as an alternative to the requirements of Subsections IWB and IWC for inservice inspection of Class 1 and 2 piping. The RI-ISI Program is prepared in accordance with 10CFR50.55a(a)(3)(i) and Code Case N-577. This code case provides risk-informed requirements for inservice inspection of Class 1, 2, 3, and Non-Code Class 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 7.13 and Technical Instruction 2-TI-416.

Certification of NDE personnel shall be in accordance with the 1984 Edition of ASNT-TC-1A and 1991Edition of ANSI/ASNT CP-189 as approved by the Nuclear Regulatory Commission.

The Performance Demonstration Initiative Program (PDI) which is mandated by 10CFR50.55a affects the performance of ultrasonic examinations by NDE personnel to the following requirements and shall be implemented on the following dates:

Effective May 22, 2000 NDE personnel performing ultrasonic examinations of bolting and piping shall be certified and qualified in accordance with the PDI Program.

Effective November 22, 2000 NDE personnel performing ultrasonic examinations of Reactor Pressure Vessel welds shall be certified and qualified in accordance with the PDI Program.

Effective November 22, 2001 NDE personnel performing ultrasonic examinations of Weld "Overlay" shall be certified and qualified in accordance with the PDI Program.

Effective November 22, 2002 NDE personnel performing ultrasonic examinations of Reactor Pressure Vessel Nozzles and Dissimilar Metal welds shall be certified and qualified in accordance with the PDI Program.

The following Code Case has been submitted to the NRC for approval and use at BFN Unit 2 in accordance with 10 CFR 50.55a(a)(3)(i):

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

Code Case N-577, Risk-Informed Requirements for Class 1, 2, and 3 Piping, Method A, , Section XI, Division 1, (RIMS # R08000601846), with the more detailed provisions provided in WCAP-14572, Revision 1-NPA, "Westinghouse Owners Group Application Of Risk - Informed Methods To Piping Inservice Inspection Topical Report".

1.4.2 History of Codes of Record and Code Cases

For Unit 2, a preservice inspection (PSI) program was not required. TVA performed a self-imposed PSI program for Class 1 components to the 1971 Edition, Summer 1971 Addenda of ASME Section XI.

1.4.3 For unit 2 the history of the ASME Section XI code of record and Code Cases used are as follows:

A. The first period of the first interval, in effect from March 1, 1975 through July 1, 1981, was to the 1971 Edition, Summer 1971 Addenda of ASME Section XI. The long duration on this period was due to an extension for the fire outage and an additional one year extension in accordance with IWA-2400 to establish concurrent intervals for units 1, 2, and 3 beginning with the second period.

See NRC letter dated June 20, 1986 (A02 860630 006) for approval of these adjustments.

B. The second period (July 1, 1981 through July 7, 1988) and the third period (February 26, 1986 through May 23, 1992) were to the 1974 Edition with Addenda through Summer 1975 of ASME Section XI. Ultrasonic examination

and evaluation of piping welds was upgraded to the 1977 Edition, Summer 1978 Addenda of ASME Section XI for these periods. This included examination per IWA-2232(b), IWA-2232(c), and Appendix III (to the extent specified in Request for Relief ISI-15) and evaluation per IWA-3000, IWB-3000, and IWC-3000 of the 1977 Edition, Summer 1978 Addenda.

The overlap of the second and third periods occurred because of the extended outage from September 15, 1984 to May 24, 1991 and TVA's decision to complete the second and third period examinations during this time to close out the first interval. This decision was made since the first interval had been extended twice and it was prudent to end it and commence with a second inspection interval to a current edition of ASME Section XI.

C. Beginning January 1, 1992, the preservice inspection of pipe welds, including the extent of examination, (Examination Categories B-F, B-J, and C-F) were performed in accordance with the 1977 Edition, Summer 1978 Addenda of ASME Section XI, IWA-2232, IWA-3000, IWB-2200(c), Table IWB-2500-1, and Table IWC-2500-1.

D. Code Cases N-234, 235, 307-1, 308, 341, 356, 416, 435-1, 460, and 461 that were approved by Regulatory Guide 1.147 were used at BFN during the first interval.

E. During the Second Interval (May 24, 1992 through May 24, 2001) the ISI Program was performed to Inspection Program B of the 1986 Edition of Section XI. The extent of examination for category B-J welds was in accordance with the 1974 Edition, Summer 1975 Addenda of ASME Section XI in accordance with 10CFR50.55a(b)(2)(ii).

F. Code Cases N-307-1, N-435-1, N-445, N- 457, N-460, N-461, N-491, and N-524 that were approved by Regulatory Guide 1.147 were used at BFN during the second interval.

The Risk - Informed Inservice Inspection Program (RI-ISI) was implemented in the third inspection period of the second inspection interval, as an alternative to the requirements of Subsections IWB and IWC for inservice inspection of Class 1 and 2 piping, the RI-ISI Program is prepared in accordance with 10CFR50.55a(a)(3)(i) and Code Case N-577.

2.0 REFERENCES

2.1 Technical Requirements

BFN Unit 2 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

10CFR50.55a(g), Code of Federal Regulations.

10CFR50.2, Code of Federal Regulations.

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 Decision making: Inservice Inspection of Piping.

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.

IE Bulletin 80-13, Core Spray Spargers.

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

2.4 Plant Procedures and Instructions

SDP-NADP-1, Conduct of Quality Assessment and Inspection

SDP-NEDP-3, Drawing Control

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

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

3-SI-4.6.G, Inservice Inspection Program for Unit 3

2-TI-140, Pipe Wall Degradation Monitoring Program for Single and Dual Phase Fluid Systems

0-TI-364, ASME Section XI Pressure Tests

0-TI-365, Reactor Pressure Vessel Internals Inspection (RPVII) Units 2 and 3

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

0-TI-400, ASME Section XI Inservice Inspection Program Responsibilities

And Interface Document.
MSI-0-001-INS001, Reactor Vessel Internals Visual and Ultrasonic Inspection

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

MCI-0-068-PMP001, Maintenance of Reactor Water Recirculation Pumps

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.

MCI-0-068-PMP001, Maintenance of Reactor Water Recirculation Pumps.

1-MMI-46, Liquid Penetrant Examination of Piping and Piping Components Which Were Exposed to Residue from Plant Fire Unit 1 and 2.

MMI-53, Evaluation of Corrosion Damage of Piping Components Which Were Exposed to Residue from March 22, 1975 Fire (canceled).

IEP-100, Administration of Nondestructive Examination (NDE) Procedures.

IEP-200, Qualification and Certification Requirements for TVA Nuclear (TVAN) Nondestructive Examination (NDE) Personnel.

2.5 Drawings

2.5.1 Unit 2 Section XI Code Class Boundary Drawings

2-47E2600-57A-ISI, RCS Instrumentation.

2-47E600-58-ISI, Mech. Instr. and Controls.

2-47E610-43-1-ISI, Mech. Control Diag. Sampling and Water Quality.

2-47E2600-301-ISI, CRD Hyd. Sys.

2-47E2600-302-ISI, CRD Hyd. Sys.

2-47E600-599-ISI, Mech. I&C.

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

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

2-164C5981-4-ISI, Rack 25-7.

2-164C5981-5-ISI, Rack 25-7.

2-164C5984-4-ISI, Rack 25-56A.

2-164C5984-5-ISI, Rack 25-56B.

2-164C5985-4-ISI, Rack 25-57.

2-47E801-1-ISI, Main Steam.

2-47E801-2-ISI, Main Steam.

2-47E803-1-ISI, Feedwater.

2-47E803-5-ISI, Feedwater.

2-47E805-3-ISI, Heater Drains, Vents & Miscellaneous Piping

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

2-47E810-1-ISI, Reactor Water Cleanup.

2-47E811-1-ISI, Residual Heat Removal.

2-47E812-1-ISI, High Pressure Coolant Injection.

2-47E813-1-ISI, Reactor Core Isolation Cooling.

2-47E814-1-ISI, Core Spray.

2-47E815-4-ISI, Aux. Boiler Sys.

2-47E817-1-ISI, Nuclear Boiler.

2-47E820-2-ISI, Control Rod Drive Hydraulic.

2-47E2820-6-ISI, Control Rod Drive Hydraulic.

0-47E839-5-ISI, Hypochlorite System.

2-47E822-1-ISI, Reactor Bldg Closed Cooling Water.

2-47E844-2-ISI, Raw Cooling Water.

2-47E852-1-ISI, Floor and Dirty Radwaste Drainage.

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

2-47E854-1-ISI, Standby Liquid Control.

2-47E855-1-ISI, Fuel Pool Cooling.

2-47E856-2-ISI, Demineralized Water.

2-47E858-1-ISI, RHR Service Water.

2-47E859-1-ISI, Emergency Equipment Cooling Water.

2-47E867-3-ISI, Sampling and Water Quality.

2.5.2 Unit 2 ISI Component and Component Support Drawings

ISI-0368-C, Sheets 1 - 15, EECW and RHRSW Pumping Station Class 3.

3-ISI-0390-C, Sheets 1 - 3, EECW Unit 3 Class 3.

1-ISI-0391-C, Raw Cooling Water Unit 1 Class 3.

2.5.3 Unit 2 ISI Bolting, Nozzle, and Weld Drawings

2-CHM-2046-C, Reactor Vessel Nozzle and Weld Locations Class 1.

ISI-0444-C, Reactor Vessel Bottom Head Assy. Class 1.

ISI-0316-A, Reactor Vessel Clad Patches.

ISI-0343-A, Core Differential Pressure and Liquid Control Nozzle Weld Locations.

ISI-0351-A, Instrumentation Nozzles Class 1.

2-ISI-0312-B, Main Steam Bolting Class 1.

ISI-0347-B, Recirculation Inlet Nozzles Class 1.

ISI-0031-C, Reactor Building Closed Cooling Water System Class 2 Welds.

ISI-0040-C, CRD Hydraulic Header Class 2 Welds.

2-ISI-0103-C, Core Spray System Class 2 Welds.

2-ISI-0128-C, HPCI System Class 2 Welds.

2-ISI-0129-C, RCIC System Class 2 Welds.

2-ISI-0221-C, RHR System Class 1 Welds.

2-ISI-0222-C, Main Steam System Class 1 Welds.

ISI-0266-C, Vessel Stud Locations Class 1.

2-ISI-0269-C, Feedwater System Class 1 Welds.

2-ISI-0270-C, Recirculation System Class 1 Welds.

2-ISI-0271-C, Core Spray System Class 1 Welds.

2-ISI-0272-C, RWCU, RCIC, and CRD Systems Class 1 Welds.

2-ISI-0273-C, HPCI System Class 1 Welds.

2-ISI-0292-C, Control Rod Drive Penetrations, Drain Nozzle, and Flux Monitor Nozzles Class 1.

CHM-1090-A, RPV Control Rod Drive Penetration, BFN.

CHM-1091-A, RPV Support Shirt Weld, BFN.

CHM-1094-A, RPV Nozzle to Vessel Wells, BFN.

CHM-1095-A, RPV Vessel and Head Wells, BFN.

2-ISI-0380-C, Standby Liquid Control System Class 1 Welds.

2-ISI-0383-C, Feedwater Instrumentation Class 1 Welds.

2-ISI-0406-C, RHR Heat Exchanger Welds and Supports Class 2.

2-ISI-0407-C, Recirculation Pump Bolting Class 1.

ISI-0408-C, Closure Head Assembly Class 1.

2-ISI-0410-C, Jet Pump Instrument Nozzle Class 1.

2-MSG-0018-C, RHR System Class 2 Welds.

2-MSG-0021-C, Main Steam Class 2 Welds.

2.5.4 Unit 2 ISI Component Support Drawings

ISI-0310-B, RHR Pump Class 2.

ISI-0032-C, Reactor Building Closed Cooling Water System Class 2.

2-ISI-0041-C, CRD Header Class 2.

2-ISI-0079-C, Main Steam System Class 2.

2-ISI-0105-C, Core Spray System Class 2.

2-ISI-0130-C, HPCI System Class 2.

2.0 REFERENCES (continued)

2-ISI-0131-C, RCIC System Class 2.

2-ISI-0133-C, FPC System Class 3.

2-ISI-0145-C, RHR Service Water System Class 3.

2-ISI-0274-C, RWCU, RCIC, and CRD Systems Class 1.

ISI-0275-C, HPCI System Class 1.

2-ISI-0276-C, RHR System Class 1.

2-ISI-0277-C, Feedwater System Class 1.

2-ISI-0278-C, Recirculation System Class 1.

2-ISI-0279-C, Main Steam System Class 1.

ISI-0280-C, Core Spray System Class 1.

2-ISI-0324-C, RHR System Class 2.

2-ISI-0379-C, Standby Liquid Control System Class 1.

2-ISI-0412-C, Main Steam Relief Valve Blowdown Class 2.

2-ISI-0415-C, Reactor Vessel Class 1.

2.5.5 Unit 2 Risk-Informed ISI Segment Boundary Drawings

2-001-RIISI-01, Main Steam Risk Informed Segment Boundary

2-001-RIISI-02, Main Steam Risk Informed Segment Boundary

2-001-RIISI-03, Main Steam Risk Informed Segment Boundary

2-001-RIISI-04, Main Steam Risk Informed Segment Boundary

2-002-RIISI-01, Condensate Storage and Supply Risk Informed Segment Boundary

2-002-RIISI-02, Condensate Risk Informed Segment Boundary

2-002-RIISI-03, Condensate Risk Informed Segment Boundary

2-002-RIISI-04, Condensate Risk Informed Segment Boundary

2-003-RIISI-01, Reactor Feedwater Risk Informed Segment Boundary

2-003-RIISI-02, Reactor Feedwater Risk Informed Segment Boundary

2.0 REFERENCES (continued)

2-003-RIISI-03, Reactor Feedwater Risk Informed Segment Boundary

0-023-RIISI-01, Unit 0 RHR Service Water Risk Informed Segment Boundary

1-023-RIISI-01, Unit 1 RHR Service Water Risk Informed Segment Boundary

2-023-RIISI-01, Unit 2 RHR Service Water Risk Informed Segment Boundary

3-023-RIISI-01, Unit 3 RHR Service Water Risk Informed Segment Boundary

0-024-RIISI-01, Units 1and 0 Raw Cooling Water Risk Informed Segment Boundary

1-024-RIISI-01, Unit 1 Raw Cooling Water Risk Informed Segment Boundary

2-024-RIISI-01, Unit 2 Raw Cooling Water Risk Informed Segment Boundary

3-024-RIISI-01, Unit 3 Raw Cooling Water Risk Informed Segment Boundary

3-024-RIISI-02, Unit 3 Raw Cooling Water Risk Informed Segment Boundary

3-024-RIISI-03, Unit 3 Raw Cooling Water Risk Informed Segment Boundary

2-027-RIISI-01, Unit 2 Condenser Circulating Water Risk Informed Segment Boundary

2-063-RIISI-01, Unit 2 Standby Liquid Control Risk Informed Segment Boundary

0-067-RIISI-01, Unit 0 Emergency Equipment Cooling Water Risk Informed Segment Boundary

0-067-RIISI-02, Unit 0 Emergency Equipment Cooling Water Risk Informed Segment Boundary

2-067-RIISI-01, Unit 2 Emergency Equipment Cooling Water Risk Informed Segment Boundary

2-067-RIISI-02, Unit 2 Emergency Equipment Cooling Water Risk Informed Segment Boundary

2-067-RIISI-03, Unit 2 Emergency Equipment Cooling Water Risk Informed Segment Boundary

2-068-RIISI-01, Unit 2 Reactor Water Recirculation, Drains, Vents, and Blowdown Risk Informed Segment Boundary

2-069-RIISI-01, Unit 2 reactor Water Cleanup Demineralizer Risk Informed Segment Boundary

2-069-RIISI-02, Unit 2 reactor Water Cleanup Risk Informed Segment Boundary

2-070-RIISI-01, Unit 2 Reactor Building Closed Cooling Water Risk Informed Segment Boundary

2.0 REFERENCES (continued)

2-070-RIISI-02, Unit 2 Reactor Building Closed Cooling Water Risk Informed Segment Boundary

2-070-RIISI-03, Unit 2 Reactor Building Closed Cooling Water Risk Informed Segment Boundary

2-070-RIISI-04, Unit 2 Reactor Building Closed Cooling Water Risk Informed Segment Boundary

2-071-RIISI-01, Unit 2 Reactor Core Isolation Cooling Risk Informed Segment Boundary

2-071-RIISI-02, Unit 2 Reactor Core Isolation Cooling Risk Informed Segment Boundary

2-071-RIISI-03, Unit 2 Reactor Core Isolation Cooling Risk Informed Segment Boundary

2-073-RIISI-01, Unit 2 High Pressure Coolant Injection Risk Informed Segment Boundary

2-073-RIISI-02, Unit 2 High Pressure Coolant Injection Risk Informed Segment Boundary

2-074-RIISI-01, Unit 2 Residual Heat Removal Risk Informed Segment Boundary

2-074-RIISI-02, Unit 2 Residual Heat Removal Risk Informed Segment Boundary

2-074-RIISI-03, Unit 2 Residual Heat Removal Risk Informed Segment Boundary

2-074-RIISI-04, Unit 2 Residual Heat Removal Risk Informed Segment Boundary

2-074-RIISI-05, Unit 2 Residual Heat Removal Risk Informed Segment Boundary

2-075-RIISI-01, Unit 2 Core Spray System Risk Informed Segment Boundary

2-075-RIISI-02, Unit 2 Core Spray System Risk Informed Segment Boundary

2-078-RIISI-01, Unit 2 Fuel Pool Cooling Risk Informed Segment Boundary

2-085-RIISI-01, Unit 2 Control Rod Drive Risk Informed Segment Boundary

2-085-RIISI-02, Unit 2 Control Rod Drive Risk Informed Segment Boundary

2-085-RIISI-03, Unit 2 Control Rod Drive Risk Informed Segment Boundary

2-085-RIISI-04, Unit 2 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

2.0 REFERENCES (continued)

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, 1995 Edition through the 1996 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 Owners Group (BWROG) Licensing Topical Report, "Alternate BWR Feedwater Nozzle Inspection Requirements", GE-NE-523-A71-0594, Revision 1, August 1999. Reference TVA submittal dated October 23, 2000 (RIMS # R08001023713)

2.8 Miscellaneous Documents

2.8.1 Incident Investigation No. 11-B-93-026 Unit #2 Steam Dryer Bracket Inspection.

2.8.2 DNE Calculation, Exclusion Criteria for ISI Scope. RIMS R14950829109. (MD-Q0999-950033) This reference refers to Section XI activities not covered under the Risk-Informed Program.

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 Engineering 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 IEP-100, Nondestructive Examination 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 IEP-100, which are in compliance with ASME Section XI, Articles IWA-3000, IWB-3000, IWC-3000, IWD-3000, and IWF-3000.

7.0 INSTRUCTION STEPS/ELEMENTS

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

7.1 Responsibilities

7.1.1 Corporate Engineering, Metallurgical & Codes (M&C)

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.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

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.: 10CFR50.2, 10CFR50.55a, 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) Records Management (RM) for subsequent submittal to the ANII.

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

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

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

(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) 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.

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

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

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

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

J. 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.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

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

L. Performing NDE in accordance with this instruction.

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

N. 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.

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

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

Q. 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.

R. 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 performing organization. These data sheets shall be used as examination reports and incorporated into the scan plan.

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

T. 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, augmented examination summary reports, obtaining ANII signatures, coordinating

summary report review with ISO, and submitting augmented examination summary reports to Site Licensing. The reports shall be submitted to Site Licensing at the end of the inservice inspection period.

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

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

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

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

X. Maintaining calibration blocks stored at the plant site.

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

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

7.1.3 Site Engineering Design

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, including revisions, with the NRC in accordance with IWA-1400(c).

B. Submitting Requests for Relief (RFR) and the ISI Summary Report including Form NIS-1 and IW(X)-3600 analytical evaluations to the NRC.

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, calibration standard references, and UT scanning angles.

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.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

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-100 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).

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.

(5) 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.

7.2 INSTRUCTION STEPS/ELEMENTS (continued)

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.

7.2.2 Notification of Indication (NOI)

A. 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 7.13 of this program.

Examinations performed in accordance with Table IWB-2500-1, except for Examination Category B-P, that reveal flaws or relevant conditions exceeding the acceptance standards of Table IWB- 3410-1 shall be extended to include additional examinations during the current outage. The basis for additional expansion (or no expansion) into additional systems should be documented.

(a) The first additional examination sample shall include an additional number of welds, areas, or parts (welds, areas or parts are those described or intended in a particular inspection item of Table IWB-2500-1) included in the inspection item (An inspection item, as listed in Table IWB-2500-1, may comprise a number of welds, areas, or parts of a component required to be examined in accordance with the inspection plan and schedule listed in IWA-2420) equal to the number of welds, areas, or parts included in the inspection item that were scheduled to be performed during the present inspection period.

The additional examinations shall be selected from welds, area, or parts of similar material and service. This additional selection may require inclusion of piping systems other than the one containing the flaws or relevant conditions.

(b) If the first additional examinations of (1)(a) reveal flaws or relevant conditions exceeding the acceptance the acceptance standards of Table IWB-3410-1, the examinations shall be further extended to include additional examinations during the current outage.

These additional examinations shall include the remaining number of welds, areas, or parts of similar material and service subject to the same type of flaws or relevant conditions.

(c) For the inspection period following the period in which the examinations of (1)(a) and (b) were completed, the examinations shall be performed as originally scheduled in accordance with IWB-2400.

(d) If welded attachments are examined as a result of identified component support deformation, and the results of these examinations exceed the acceptance standards of Table IWB-3410-1, additional examinations shall be performed, if determined necessary, based on engineering evaluation.

(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 7.13 of this program.

Examinations performed in accordance with Table IWC-2500-1, except for Examination Category C-H, that reveal flaws or relevant conditions exceeding the acceptance standards of Table IWC-3410-1 shall be extended to include additional examinations during the current outage. The basis for additional expansion (or no expansion) into additional systems should be documented.

(a) The first additional examination sample shall include an additional number of welds, areas, or parts (welds, areas or parts are those described or intended in a particular inspection item of Table IWC-2500-1) included in the inspection item (An inspection item, as listed in Table IWC-2500-1, may comprise a number of welds, areas, or parts of a component required to be examined in accordance with the inspection plan and schedule listed in IWA-2420) equal to 20% of the number of welds, areas, or parts included in the inspection item that are scheduled to be performed during the interval. The additional examinations shall be selected from welds, area, or parts of similar material and service. This additional selection may require inclusion of piping systems other than the one containing the flaws or relevant conditions.

(b) If the first additional examinations of (2)(a) reveal flaws or relevant conditions exceeding the acceptance the acceptance standards of Table IWC-3410-1, the examinations shall be further extended to include additional examinations during the current outage. These additional examinations shall include the remaining number of welds, areas, or parts of similar material and service subject to the same type of flaws or relevant conditions.

(c) For the inspection period following the period in which the examinations of (2)(a) and (b) were completed, the examinations shall be performed as originally scheduled in accordance with IWC-2400.

(d) If welded attachments are examined as a result of identified component support deformation, and the results of these examinations exceed the acceptance standards of Table IWC-3410-1, additional examinations shall be performed, if determined necessary, based on engineering evaluation.

(3) Additional examinations for Class 3 equivalent components (IWD) shall be selected in accordance with IWD-2430.

7.2 INSTRUCTION STEPS/ELEMENTS (continued

Note: Class 3 piping welds shall be in accordance with the RI-ISI additional examination requirements of Code Case N-577, as outlined in Section 7.13 of this program.

Examinations performed in accordance with Table IWD-2500-1, except for Examination Category D-B, that reveal flaws or relevant conditions exceeding the acceptance standards of IWD-3000 shall be extended to include additional examinations during the current outage. The basis for additional expansion (or no expansion) into additional systems should be documented.

(a) The first additional examination sample shall include an additional number of welds, areas, or parts (welds, areas or parts are those described or intended in a particular inspection item of Table IWC-2500-1) included in the inspection item (An inspection item, as listed in Table IWD-2500-1, may comprise a number of welds, areas, or parts of a component required to be examined in accordance with the inspection plan and schedule listed in IWA-2420) equal to 20% of the number of welds, areas, or parts included in the inspection item that are scheduled to be performed during the interval. The additional examinations shall be selected from welds, area, or parts of similar material and service. This additional selection may require inclusion of piping systems other than the one containing the flaws or relevant conditions.

(b) If the first additional examinations of (3)(a) reveal flaws or relevant conditions exceeding the acceptance the acceptance standards of IWD-3000, the examinations shall be further extended to include additional examinations during the current outage. The extent of these additional examinations shall be determined by Engineering based upon engineering evaluation of the root cause of the flaws or relevant conditions. The corrective measures shall be documented in accordance with IWA-6000.

(c) For the inspection period following the period in which the examinations of (2)(a) and (b) were completed, the examinations shall be performed as originally scheduled in accordance with IWD-2400.

(d) If welded attachments are examined as a result of identified component support deformation, and the results of these examinations exceed the acceptance standards of Table IWD-3000,

additional examinations shall be performed, if determined necessary, based on engineering evaluation.

(4) Additional examinations for component supports shall be in accordance with the requirements of IWF-2430. Component support examinations performed in accordance with Table IWF-2500-1 that reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400 shall be extended to include additional examinations during the current outage.

(a) The first additional examination sample that exceed the acceptance standards of IWF-3400 shall include the component supports immediately adjacent to those component supports for which corrective action is required.

The additional examinations shall be extended to include additional supports within the system, equal in number and of the same type and function as those scheduled for examination during the inspection period.

(b) If the additional examinations of (4)(a) reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400, the examinations shall be further extended to include additional examinations during the current outage. These additional examinations shall include the remaining component supports within the system of the same type and function.

(c) When the additional examinations of (4)(b) reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400, the examinations shall be extended to include a third additional sample to include all nonexempt supports potentially subject to the same failure modes that required corrective measures in (4)(a) and (4)(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 additional sample.

(d) When the additional examinations required by (4)(c) reveal flaws or relevant conditions exceeding the acceptance standards of IWF-3400, those exempt component supports that could be affected by the same observed failure modes and could affect nonexempt components examination shall be shall be examined.

At the request of Component Engineering, Site Engineering shall make the determination of failure mode applicability and select an additional sample of exempt component supports that could affect nonexempt components.

7.2.3 Examinations

A. NDE shall be performed in accordance with IWA-2200 of ASME Section XI utilizing the NDE procedures of IEP-100 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). Reference Paragraph 1.4.1 for implementation dates.

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 1984 Edition of ASNT-TC-1A and the 1991 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). Reference Paragraph 1.4.1 for implementation dates.

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% 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 limitation 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 alternative 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.

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 the 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 2.8.2. IWB-1220, footnote 1 allows the exemptions from examination in IWC-1220 to be applied for those components.

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. Starting with the third period of the second interval, Class 1 Piping Welds (B-F and B-J) were in accordance with the RI-ISI examination requirements outlined in Section 7.13 of this Program

F. The examination of Class 1 equivalent component supports is in accordance with Section 7.3.4.

7.3.1.1 Reactor Vessel Interior

The space above and below the vessel core that is made accessible by the removal of components during normal refueling outages shall be visually examined during the first refueling outage and at subsequent refueling outages at approximately three-year intervals.

The welded core support structures and interior attachments (specimen holding bracket, etc.) to the reactor vessel shall be visually examined. The examination shall include 100 percent of the visually accessible attachment welds and core support surfaces.

The attachments are: dryer hold down brackets, dryer support brackets, guide rod brackets, feedwater sparger brackets, core spray sparger brackets, surveillance specimen holder brackets, jet pump riser support brackets and shroud support. The core support structure consists of the top guide and the core plate. All augmented examination requirements and commitments for BFN vessel internal examinations during the ISI interval are stated in 0-TI-365.

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 (MS)
- Reactor Building Closed Cooling Water System (RBCCW)
- 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 7.13 of this Program

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

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), including the Unit 1, Unit 2, Unit 3 and Unit common portions of the system which support common unit operation. See Section 7.3.3.D below.
- Fuel Pool Cooling System (FPC).
- Residual Heat Removal Service Water System (RHRSW), including the unit common headers.

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.

Note: Class 3 components were evaluated for the alternative Risk-Informed inspection program and resulted in no changes to the Class 3 examinations.

Note: Non-Code Class components were evaluated for the alternative Risk-Informed inspection program and resulted in no additional scope of examinations added to the RI-ISI Program.

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.

D. As a part of the BFN Unit 2 recovery and analysis for single unit operation, some Unit 1, Unit 3, and unit common portions of the Emergency Equipment Cooling Water System (EECW) were made operable along with the Unit 2 portions of the system and were included within the scope of this Unit 2 ISI Program Plan.

The boundary extends up to and including the first isolation valve off the common headers (North Header and South Header). These components and component supports are essentially common with respect to unit function.

Subsequently, when Unit 3 was recovered and placed into operation, those components of the above population with Unit 3 designators remained in the Unit 2 ISI Program Plan, since their examination frequencies had already been established, and their functionality is common to both units. These components are included in the examination tables of Section 8.1.

E. 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 IWF-1200.

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 IWF-2410 Table IWF-2410-2, Inspection Program B, IWF-1200 exemptions, and applicable requirements of Table IWF-2500-1.

D. The inservice inspection requirements for snubbers shall be in accordance with the requirements of IWF-5000. Inservice examinations shall be performed in accordance with ASME/ANSI OM, Part 4, using a visual examination (VT-3) method described in IWA-2213. Integral and nonintegral attachments for snubbers, including lugs, bolting, pins, and clamps shall be examined in accordance with the requirements of IWF-5000.

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, or corrected or modified by repair/replacement activities 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, 3, or 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, IWF, and Code Case N-577 Paragraph N-577-2420.

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 of the inspection program of IWB-2400.

If these re-examinations reveal that the flaw indication remain essentially unchanged for three successive inspection periods, 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 Table IWB-3410-1, successive examinations shall be performed, if determined necessary, based on an evaluation by BFN Engineering.

B. Successive Examinations - Class 2 Equivalent Components

Areas containing flaw indications or relevant conditions evaluated in accordance with IWC-3122.3 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 Table IWC-3410-1, successive examinations shall be performed, if determined necessary, based on an evaluation by BFN Engineering.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

C. Successive Examinations - Class 3 Equivalent Components

Same as Successive Examination - Class 2 Equivalent Components (B. above), except for the references to IWB will be IWC.

D. Successive Examinations for 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 is accepted for continued service in accordance with IWF-3112.2 or IWF-3122.2 , the component support shall be reexamined during the next inspection period listed in the schedules of the inspection programs of IWF-2410. When these examinations do not require additional corrective measures during the next inspection period, the inspection schedule may revert to the requirements of IWF-2420-(a).

E. Successive Examinations - Risk-Informed Inservice Inspection

The Successive Examinations shall be performed in accordance with Section 7.13.5.4.I.

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 and Article IWA-6000, and Code Case N-532 (Request For Relief 2-ISI-4).

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.N).

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

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 2, " 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.

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 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.

L. Analytical Evaluation

The analytical evaluation section for ASME Class 1, 2, and 3 equivalent components and the 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.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

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 10CFR50.55a(b)(2)(ix)(A), evaluation of inaccessible areas, and 10CFR50.55a(b)(2)(ix)(D)(1), evaluation for additional examinations, as delineated in 0-TI-376.

7.5.2 Site Final Report

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

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.5.3 Radiographs

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

7.6 Requests for Relief (RFR)

Impractical code requirements or examinations shall be submitted to NRC as written relief requests in accordance with 10CFR50.55a(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. Corporate Engineering Metallurgical 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 2-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 2-SI-4.6.H-1.

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

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.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

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.

7.11 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.

7.0 INSTRUCTION STEPS/ELEMENTS (continued

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.

7.11.1 Weld DSRHR-2-05A

Responsible organization: Site Engineering

Weld DSRHR-2-05A has an indication that was determined to be lack of fusion between layers of welding. It shall receive augmented RT and UT examinations each inspection period to monitor the size of the indication. Evaluation of the indication shall be performed by an ISO NDE level III by comparison to previous examinations. If there is any change, Site Engineering shall be formally requested to provide additional evaluation. A report of the examinations shall be forwarded to the NRC with the NUREG-0313 report of Section 7.11.8. [NRC/C] Reference NRC Inspection Report 86-03, Open Item 86-03-03 (RIMS L29 860925 984)].

ISI Data Base Exam Requirement Source: **D01-02.**

7.11.2 Welds KR-2-14, KR-2-36, KR-2-37, and KR-2-41

Responsible organization: Site Engineering

These welds, which had IGSCC indications that were evaluated to be acceptable for continued operation, were reexamined (Ultrasonic Examination) in the cycle 6 refueling outage per NRC commitment NCO 850264005 (RIMS L44 860311 803). Evaluation of the indication was performed by an ISO NDE level III by comparison to previous examinations. Based on the results of this evaluation, these welds were categorized as NUREG 0313 Category E weldments, and are examined accordingly. Refer to Section 7.11.7 and Section 8.2 Part 1.

ISI Data Base Exam Requirement Source: **D03-02.**

7.0 INSTRUCTION STEPS/ELEMENTS (continued

7.11.3 HPCI Pump Discharge Support Inspection Following Injection

NRC commitment NCO850144002 for the augmented examination of the supports on the HPCI discharge line following an injection was revised on March 7, 1995. The revised commitment requires the examination of the HPCI discharge line supports in accordance with the normal ASME Section XI requirements. The revised commitment number is NCO950027001.

7.11.4 Weld GR-2-64(OL)

[NRC/C] Responsible organization: Site Engineering

This structurally over-layed weld was one of the IGSCC Examination Category E welds examined during the cycle 8 refueling outage. A report of the examinations was forwarded to the NRC with the NUREG-0313 report of Section 7.11.7. This weld is categorized as a NUREG 0313 Category E weld (refer to Section 8.2 Part 1).

ISI Data Base Exam Requirement Source: **B02-02.** [NC094028101]

7.11.5 CRD Return Line Reroute

Responsible organization: Site Engineering

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 6, and Cycle 10 refueling outages. The NRC commitment to NUREG-0619 to perform ultrasonic examination of the Thermal Mixing Tee base material, welds RCRD-2-44, RCRD-2-45, and RCRDS-2-03 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. ISI Data Base Exam Requirement Source: **B01-02**

7.11.6 Feedwater Nozzles

Responsible organization: Site Engineering

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 third 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 shall be visually examined every fourth refueling outage in accordance with Table 6-1 of the above licensing

topical report and MSI-0-001-INS001. 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 # R08001023713)

ISI Data Base Exam Requirement Source: **B01-02.**

7.11.7 Augmented Examination of Austenitic Stainless Steel and Dissimilar Metal Welds Susceptible to IGSCC (Generic Letter 88-01 and NUREG-0313, Rev. 2)

Responsible organization: Site Engineering

Austenitic stainless steel and dissimilar metal circumferential welds in piping four inches or larger NPS that contain reactor coolant at a temperature above 200° F during power operation shall be examined in accordance with the requirements of Generic Letter 88-01 and NUREG-0313, Rev. 2. Sample expansion shall be in accordance with Generic Letter 88-01 (GL 88-01) based on the IGSCC Category (A, B, C, D, or E) as defined in the generic letter. The welds requiring examination per this paragraph are listed in Section 8.2 - Part 1. Stainless steel and dissimilar metal welds that are exempt from examination because they contain coolant of 200 degrees or less are listed in Section 8.2 - Part 2.

In addition to the requirements of Section 7.2.3.A for examination procedures, the examination procedures used for IGSCC examinations shall satisfy the requirements of GL 88-01.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

In addition to the requirements for procedure and personnel qualification in Section 7.2.3.B, the examination procedure and personnel used for IGSCC examinations per GL-88-01 shall be qualified to the requirements of Appendix VIII of ASME Section XI as implemented by the Performance Demonstration Initiative Program (PDI).

IGSCC CATEGORY	EXAMINATION EXTENT AND SCHEDULE
A	25 percent every 10 years (at least 12 percent in 6 years).
B	50 percent every 10 years after initial post-stress improvement (SI) examination (at least 25 percent in 6 years).
C	100 percent within next 2 refueling cycles after initial post-SI examination, then 100 percent every 10 years (at least 50 percent in 6 years).
D	100 percent every 2 refueling cycles.
E	50 percent next refueling cycle after crack discovery and/or overlay. 100 percent every 2 refueling cycles thereafter.
F	100 percent every refueling outage.
G	100 percent during each outage.*

*The two IGSCC Category G welds (DRHR-2-03B and -13B) are to be examined (VT-2) for leakage during each refueling outage per NRC Letter A02 930223 002. These welds are inspected as part of the primary system pressure test performed per 2-SI-3.3.1.A.

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 under the guidelines of NUREG-0313, Rev. 2.

ISI Data Base Exam Requirement Source: **B02-02.**

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

7.11.7.1 Risk-Informed Alternative Measures

Generic Letter 88-01 provides the NRC positions on IGSCC in BWR austenitic stainless steel piping and requests the licensee to indicate if they intend to propose alternative measures.

NRC Regulatory Guides 1.174, 1.178 and ASME Code Case N-577 were utilized to develop alternatives to the inspection requirements of Generic Letter 88-01. These alternatives are identified in the RI-ISI section of this program.

For specific details on the RI-ISI Program see Section 7.13 of this program.

7.11.8 Technical Surveillance Requirement (TSR) 3.4.3.2

Responsible organization: Site Engineering.

Additional ultrasonic and surface examinations shall be performed each inspection interval on certain circumferential pipe welds to provide additional protection against pipe whip in accordance with TSR 3.4.3.2. The welds requiring examination each interval for pipe whip protection are:

TCS-2-407, TCS-2-423, TSCS-2-408, TSCS-2-424, GFW-2-09,
GFW-2-12, GFW-2-15, GFW-2-26, GFW-2-29, GFW-2-32, KFW-2-13, KFW-2-31, KFW-2-38, KFW-2-39, THPCI-2-070, THPCI-2-070A, THPCI-2-071, THPCI-2-072, GMS-2-06, GMS-2-15, GMS-2-24,
GMS-2-32, KMS-2-024, KMS-2-104, DSRHR-2-04, DSRHR-2-06, DSRHR-2-07, DSRWC-2-03 (OL), DSRWC-2-04 (OL),
DSRWC-2-05 (OL), and DSRWC-2-06.

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

ISI Data Base Exam Requirement Source: **B04-02.**

7.11.9 RPV Interior Examinations

Augmented examinations of RPV interior components are performed in accordance with 0-TI-365, Reactor Pressure Vessel Internals Inspection (RPVII) Units 2 and 3

7.11.10 Instrument Nozzle Safe Ends SIL-571

Responsible organization: Site Engineering

Perform UT and visual inspection of the stainless steel level instrumentation nozzle safe ends and stainless steel core differential pressure/standby liquid control (SLC) nozzle safe ends per the recommendation of SIL-571. The recommendations are to perform a visual leak check of the safe ends during the drywell leak check effort performed each outage. Insulation removal is not necessary to perform the leak check. A UT inspection of the accessible areas of all the safe end base material shall be performed. Per GE Letter No. BFSE 94-005

these stainless steel safe ends should be UT inspected following 15 years of hot operation time and then at a frequency of once every second 24 month fuel cycle or once every third 18 month fuel cycle as applicable.

The implementation interval shall start with the Unit 2 Cycle 7 refueling outage. Leakage inspections shall be performed as described during the Cycle 7 outage and during each subsequent refueling outage. UT inspection shall be performed during the Cycle 9 refueling outage and then at every second refueling cycle following Cycle 9.

ISI Data Base Exam Requirement Source: **B07-02.**

7.11.11 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 Unit 2 Core Spray and Recirc Inlet Safe Ends were replaced during the Cycle 5 outage. The safe ends were replaced with IGSCC resistant material, and in the case of the Recirc-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. 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 2 Cycle 5 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 also classified category "A".

7.12 Voluntary Examinations

Certain examinations are done on a voluntary basis to obtain additional information to support inservice inspections or to resolve a problem identified through the corrective action program. Key voluntary examinations are defined and documented in this Section.

7.13 Risk-Informed Inservice Inspection

7.13.1 Introduction

The objective of the Inservice Inspection Program, 2-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 10CFR50.55a. 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 10CFR50.55a(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.

7.13.2 Purpose

Appendix 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. 10CFR50.55a(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 10CFR50.55a(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 10CFR50.55a.

7.13.3 Scope

Appendix A of this program outlines the details for risk-informed requirements for inservice inspection of ASME Class 1, and 2 equivalent piping. Reference Paragraph 7.3.3.B. Piping in systems evaluated as part of the plant Probabilistic Safety Assessment (PSA), but outside the current Section XI examination boundaries may be included. The examination requirements of Section XI shall be used for piping evaluated by the risk-informed process. The RI-ISI Program was implemented in the Third Period of the second inspection interval for BFN Unit 2.

7.13.4 Frequency

The inspection periods and inspection interval are defined in the Section XI Edition and Addenda as committed to in 2-SI-4.6.G. The piping segments and inspection strategy (i.e. frequency, number of inspections, methods, or all three) are defined in Appendix 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.

7.13.5 Living Program

Program Implementation

As a minimum updates to Appendix 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, 2-SI-4.6.G. The RI-ISI Program shall be evaluated as new information becomes available that could impact the program. 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.

7.13.5.2 PERFORMANCE MONITORING

During each operating cycle, the Program Owner will maintain an awareness of input changes. The BFN site control processes that provide input into the RI-ISI program will be enhanced to include the appropriate guidance. After each refueling outage, 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.

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. Consequently, the Design Control program will be revised to recognize RI-ISI and to ensure impact is appropriately evaluated during design preparation, review, and implementation.

The existing design impact review process will also 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.

This would also include changes to risk significance categories mandated by the Maintenance Rule Expert Panel. 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).

D. Equipment Performance Changes

Equipment performance changes shall be reviewed with system engineers and maintenance 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.

7.13.5.3 Corrective Action Program

A corrective action program consistent with Regulatory Guide 1.174 shall be established to assure 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. For Non-Code and Code Exempt piping categorized as High Safety Significance (HSS), the corrective action shall be consistent with the provisions of ASME Section XI, unless a specific alternative is submitted for NRC approval.

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

7.13.5.4 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 7.13.5.1 through 7.13.5.3.

7.0 INSTRUCTION STEPS/ELEMENTS (continued)

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.

(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. Reduce 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.

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 standard of N-577-3000, the examinations 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.

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 2-SI-4.6.G, Section 7.2.3. In addition to the requirements of Section 7.2.3 for IGSCC examinations, procedures and personnel qualifications shall be in accordance with Generic Letter 88-01 as stated in Section 7.11.7.

L. Acceptance standards for identified flaws and repair/replacement activities are to be in accordance with 2-SI-4.6.G, Sections 6.0 and 7.7.

M. Records and reports shall be prepared and maintained in accordance with 2-SI-4.6.G, Section 7.5.

7.13.6 Risk Informed Inservice Inspection Program Analysis

The Analysis for Risk-Informed Inservice Inspection Program for BFN Unit 2 is outlined in Appendix A of this Program.

SECTION 8.0
TABLES/ATTACHMENTS

SECTION 8.1 EXAMINATION SCHEDULE
PART 1 - CLASS 1 EQUIVALENT (IWB) COMPONENTS

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
B-A	B1.11	5	RPV	5	-	-	-*	CHM-2046-C	UT	RPV Shell Circ Weld See Section 7.11.9 *See RFR 2-ISI-9
B-A	B1.12	15	RPV	15	-	-	15	CHM-2046-C	UT	RPV Shell Long Weld See Section 7.11.9
B-A	B1.21	3	RPV	1	-	-	1	ISI-0408-C & ISI-0444-C	UT	RPV Circ Top Hd Wld (RCH-2-1C). *See Note 1
B-A	B1.22	16	RPV	6	2	2	2	ISI-0408-C & ISI-0444-C	UT	RPV Mer Top Hd Wld (RCH-2-XV). *See Note 1
B-A	B1.30	1	RPV	1	-	-	1	CHM-2046-C	UT	RPV Flg Weld (C-5-FLG)
B-A	B1.40	1	RPV	1	-	-	1	ISI-0408-C	UT	RPV Hd-Flg Weld (RCH-2-2C)
B-A	B1.40	1	RPV	1	-	-	1	ISI-0408-C	MT	RPV Hd-Flg Flex Area (RCH-2-2C-FLEX)

SECTION 8.1 EXAMINATION SCHEDULE
PART 1 - CLASS 1 EQUIVALENT (IWB) COMPONENTS (Continued)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
B-A	B1.51	N/A	RPV	N/A	-	-				RPV Repair Weld(s) None
B-B		N/A		N/A						None
B-D	B3.90	31(*8)	RPV	31	10	10	11	CHM-2046-C & ISI-0408-C & ISI-0380-C & ISI-0444-C	UT	RPV Noz-Ves Wld
B-D	B3.100	31(*8)	RPV	31	10	10	11	CHM-2046-C & ISI-0408-C & ISI-0380-C & ISI-0444-C	UT	RPV Noz IR
B-F	B5.10	17 (*4)	RPV	N/A	-	-	-	ISI-2070-C ISI-2071-C ISI-0272-C ISI-0410-C	N/A	Noz-SE Wld ≥ 4"
B-F	B5.20	N/A (*4)		N/A					N/A	
B-F	B5.30	N/A		N/A						None
B-G-1	B6.10	92	RPV	92	22	35	35	ISI-0266-C	VT-1	Clos Hd Nuts
B-G-1	B6.20	92	RPV	92	26	35	31	ISI-0266-C	UT(*2)	Studs (In Place)
B-G-1	B6.30	92	RPV	4(*2) 92 (if studs removed}	-	-	4(*2)	ISI-0266-C	MT & UT(*2)	Studs (When Removed)
B-G-1	B6.40	92	RPV	92	22	35	35	ISI-0266-C	UT	Threads (When Head Removed)

SECTION 8.1 EXAMINATION SCHEDULE
PART 1 - CLASS 1 EQUIVALENT (IWB) COMPONENTS (Continued)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
B-G-1	B6.50	92 sets	RPV	92 sets	22 sets	35 sets	35 sets	ISI-0266 -C	VT-1	Washer (Sets of 2)
B-G-1	B6.50	92	RPV	92	22	35	35	ISI-0266-C	VT-1	Bushings (When Head Removed)
B-G-1	B6.150	N/A		N/A						None
B-G-1	B6.180	32	RECIR	16(*3)	-	-	16	ISI-0407-C	UT	Recir Pump Bolting
B-G-1	B6.190	2(*9)	RECIR	1(*3)	1(*3)	-	-	ISI-0407-C	VT-1	Flange Face
B-G-1	B6.200	32	RECIR	16(*3)	-	-	16	ISI-0407-C	VT-1	Recir Pump Nuts
B-G-1	B6.200	32	RECIR	16(*3)	-	-	16	ISI-0407-C	VT-1	Recir Pump Washers
B-G-1	B6.210	N/A		N/A						None
B-G-2	B7.10	N/A		N/A						None
B-G-2	B7. 50	30		30	5	11	14		VT-1	Pipe Bolting ≤ 2"
			MS/25	25	4	10	11	ISI-0312-B		
			RECIR/2	2	1	-	1	ISI-0270-C		
			RPV/3	3	-	1	2	ISI-0408-C		Bolting to RPV Hd Noz
B-G-2	B7.60	N/A		N/A						None

SECTION 8.1 EXAMINATION SCHEDULE
PART 1 - CLASS 1 EQUIVALENT (IWB) COMPONENTS (Continued)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
B-G-2	B7.70	37		9(*6)	4	3	2		VT-1	Valve Bolting ≤ 2"
			CS/4	2(*6)	1	-	1	ISI-0271-C		See Section 8.3
			FW/4	1(*6)	1	-	-	ISI-0269-C		
			MS /8	1(*6)	1	-	-	ISI-0222-C		FCV-1-??
			MS/13	1(*6)	-	1	-	ISI-0312-B		PCV-1-???
			RECIR/6	3(*6)	1	2	-	ISI-0270-C		
			RHR/2	1(*6)	-	-	1	ISI-0221-		
B-J	B9.11	399 (*4)		N/A	-	-	-		N/A	Circumferential Welds ≥ 4"
			CS/31	-	-	-	-	ISI-0271-C		
			FW/76	-	-	-	-	ISI-0269-C		
			HPCI/20	-	-	-	-	ISI-0273-C		
			MS/120	-	-	-	-	ISI-0222-C		
			RCIC/6	-	-	-	-	ISI-0272-C		
			RECIR/78	-	-	-	-	ISI-0270-C		
			RHR/36	-	-	-	-	ISI-0221-C		
			RPV/13	-	-	-	-	ISI-0222-C *		
								ISI-0269-C &		RPV Noz-SE Alloy
								ISI-0408-C		Steel Welds (Not Dism
			RWCU/19	-	-	-	-	ISI-0272-C *		Metal)

SECTION 8.1 EXAMINATION SCHEDULE
PART 1 - CLASS 1 EQUIVALENT (IWB) COMPONENTS (Continued)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
B-J	B9.21	22 (*4)		N/A	-	-	-		N/A	Circumferential Welds < 4"
				-						
			FW/14	-	-	-	-	ISI-0222-C		
			MS/2	-	-	-	-	ISI-0222-C		
			RPV/1	-	-	-	-	ISI-0272-C		
			RWCU/1	-	-	-	-	ISI-0272-C		
			SLC/4	-	-	-	-	ISI-0380-C		
B-J	B9.31	42 (*4)		N/A	-	-	-		N/A	Branch Connections ≥4"
			MS/26	-	-	-	-	ISI-0222-C		
			RECIR/15	-	-	-	-	ISI-0270-C		
			RHR/1	-	-	-	-	ISI-0221-C		
B-J	B9.32	8 (*4)		N/A	-	-	-		N/A	Branch Connections <4"
			RHR/4	-	-	-	-	ISI-0221-C		
			RECIR/2	-	-	-	-	ISI-0270-C		
			RWCU/2	-	-	-	-	ISI-0272-C		
B-J	B9.40	233 (*4)		N/A	-	-	-		N/A	Socket Welds
			FW/62	-	-	-	-	ISI-0222-C		
			MS/74	-	-	-	-	ISI-0222-C		
			RCIC/15	-	-	-	-	ISI-0272-C		
			RHR/12	-	-	-	-	ISI-0221-C		
			RECIRC/12	-	-	-	-	ISI-0270-C		
			SLC/40	-	-	-	-	ISI-0380-C		
			RWCU/33	-	-	-	-	ISI-0272-C		
B-K	B10.10	2	RPV/2	2	1	-	1	ISI-0415-C	UT/MT MT or PT	RPV SPRT Skirt per RFR# 2-ISI-10 RPV Stabilizers

SECTION 8.1 EXAMINATION SCHEDULE
PART 1 - CLASS 1 EQUIVALENT (IWB) COMPONENTS (Continued)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
B-K	B10.20	101		14	5	6	3		PT or MT	Piping Welded Attachments
			CS/6	1	-	1	-	ISI-0280-C	MT or PT	
			FW/29	3	3	-	-	ISI-0277-C	MT or PT	
			HPCI/2	1	1	-	-	ISI-0275-C	MT or PT	
			MS/36	5	-	5	-	ISI-0279-C	MT or PT	
			RECIR/20	2	-	-	2	ISI-0278-C	PT	
			RHR/6	1	1	-	-	ISI-0276-C	PT	
			RWCU/2	1	-	-	1	ISI-0274-C	PT	
B-K	B10.30	6	RECIR	1	-	-	1	ISI-0278-C	PT	Pump Welded Attachments
B-K	B10.40	2	FW	1	-	-	1	ISI-0277-C	MT or PT	Valve Welded Attachments
B-L-1	B12.10	N/A		N/A						None
B-L-2	B12.20	2	RECIR	1(*7)	1(*7)	-	-	ISI-0407-C	VT-3	Pump Casing Interior

SECTION 8.1 EXAMINATION SCHEDULE
PART 1 - CLASS 1 EQUIVALENT (IWB) COMPONENTS (Continued)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
B-M-1	B12.30	N/A		N/A						None
B-M-1	B12.40	N/A		N/A						None
B-M-2	B12.50	55		21(*5)	*	*	*		VT-3	Valve Body > 4" See Section 8.3
			CS/6	3	*	*	*	ISI-0271-C		
			FW/6	2	*	*	*	ISI-0269-C		
			HPCI/3	2	*	*	*	ISI-0273-C		
			MS/21	2	*	*	*	ISI-0222-C		
			RCIC/1	1	*	*	*	ISI-0272-C		
			RECIR/6	3	*	*	*	ISI-0270-C		
			RHR/9	6	*	*	*	ISI-0221-C		
			RWCU/3	2	*	*	*	ISI-0272-C		
B-N-1	B13.10	1	RPV	1	1	1	1	CHM-2046-C	VT-3	RPV Interior
B-N-2	B13.20	1	RPV	1	-	-	1	CHM-2046-C	VT-1	RPV Interior Att in Beltline Region
B-N-2	B13.30	1	RPV	1	-	-	1	CHM-2046-C	VT-3	RPV Interior Att Beyond Beltline Region
B-N-2	B13.40	1	RPV	1	-	-	1	CHM-2046-C	VT-3	Shroud Supp Surfaces
B-O	B14.10	40	RPV	4	-	-	4	ISI-0292-C	PT	CRD Housing weld
B-P	ALL		----------	See Section 7.8 and SPP-9.1----------					VT-2	Pressure Test Program

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) Studs (Bolting) may be examined in place under tension (B6.20), when connection is disassembled (B6.20, or when the bolting is removed (B6.30). Studs shall be surface examined only if removed. The four studs normally removed for refueling have been scheduled under Item Number B6.30. Others shall receive a surface exam if removed in accordance with Table IWB-2500-1, Examination Category B-G-1, NOTE: (1).

(*3) Examine bolting of only one pump in accordance with Table IWB-2500-1, B-G-1, NOTE: (3) in conjunction with B-L-2, NOTE: (1).

(*4) Reference SECTION 8.1 EXAMINATION SCHEDULE PART 6 - RISK - INFORMED INSPECTIONS for Examination Categories B-F Item No. B5.10 and B5.20 and B-J Item No. B9.11, B9.21, B9.31, B9.32, and B9.40.

(*5) Examine only one valve per Group in accordance with Table 2500-1, B-M-2, NOTE: (3). There are 21 Groups of Class 1 valves NPS 4 or larger.

(*6) 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

NOTES:

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.

(*7) Examine only one pump in accordance with Table IWB-2500-1, B-L-2, NOTE: (1), (2) and (3).

(*8) At least 25% but not more than 50% of the RPV nozzles shall be examined by the end of the first period, and the remainder by the end of the inspection interval, in accordance with Table IWB-2500-1, Category B-D, Note: (2).

(*9) Examination includes 1 (one) inch annular surface of flange suurounding each stud , in accordance with Table IWB-2500-1, Category B-G-1, Note: (4).

SECTION 8.1 EXAMINATION SCHEDULE
PART 2 - CLASS 2 EQUIVALENT (IWC) COMPONENTS

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
C-A	C1.10	12	RHR	3(*1)	1	1	1	ISI-0406-C	UT	RHRHX RHRG-2-07 Shell RHRG-2-08 Circ. RHRG-2-09 Head
C-A	C1.20	4	RHR	1(*1)	-	-	1	ISI-0406-C	UT	RHRHX RHRG-2-10 Circ
C-A	C1.30	N/A		N/A						None
C-B	C2.10	N/A		N/A						None
C-B	C2.21	4	RHR	1(*2)	1	-	-	ISI-0406-C	UT&MT	RHRHX RHRG-2-11 Head Noz Weld.
C-B	C2.22	N/A		N/A						None
C-B	C2.31	16	RHR	4(*2)	-	2	2	ISI-0406-C	MT	RHRHX RHRG-2-05A Noz Rein RHRG-2-05B forcing RHRG-2-06A Plate RHRG-2-06B Welds.
C-B	C2.32	N/A		N/A						None
C-B	C2.33	8	RHR	2(*2)(*5)	2	2	2	ISI-0406-C	VT-2	RHRHX RHRG-2-05 & -06, Noz Reinforcing Plt relief "telltale" hole @ Press Test.
C-C	C3.10	12	RHR	1(*3)	-	-	1	ISI-0406-C	MT	Pressure Vessel Welded Attachments RHRHX
C-C	C3.20	148		17	6	5	6		MT or PT	Piping Welded
			CRD/6	1	1	-	-	ISI-0041-C	PT	Attachments
			CS/16	2	2	-	-	ISI-0105-C	MT or PT	
			HPCI/17	2	-	2	-	ISI-0130-C	MT or PT	
			MS/10	1	1	-	-	ISI-0079-C	MT or PT	
			RBCCW/1	1	1	-	-	ISI-0032-C	MT or PT	
			RCIC/9	1	1	-	-	ISI-0131-C	MT or PT	
			RHR/89	9		3	6	ISI-0324-C	MT or PT	

SECTION 8.1 EXAMINATION SCHEDULE
PART 2 - CLASS 2 EQUIVALENT (IWC) COMPONENTS

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
C-C	C3.30	4	RHR	1	-	-	1	ISI-0310-B	MT or PT	Pump Welded Attachments
C-C	C3.40	N/A		N/A						None
C-D		N/A		N/A						None
C-F-1	C5.11	13 (*4)		N/A	-	-	-		N/A	Dissim metal & SS circ welds > 4".
			CS/6	-	-	-	-	ISI-0103-C		
			HPCI/5	-	-	-	-	ISI-0128-C		
			RHR/2	-	-	-	-	MSG-0018-C		
C-F-1	C5.20	N/A		N/A						BWR Plant
C-F-1	C5.30	N/A		N/A						None
C-F-1	C5.40	N/A		N/A						None

SECTION 8.1 EXAMINATION SCHEDULE
PART 2 - CLASS 2 EQUIVALENT (IWC) COMPONENTS

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
C-F-2	C5.51	1092 (*4)		N/A	-	-	-		N/A	CS Circ Welds > 4".
			CRD/72	-	-	-	-	ISI-0040-C		
			CS/164	-	-	-	-	ISI-0103-C		
			HPCI/161	-	-	-	-	ISI-0128-C		
			MS/114	-	-	-	-	MSG-0021-C		
			RBCCW/16	-	-	-	-	ISI-0031-C		
			RCIC/84	-	-	-	-	ISI-0129-C		
			RHR/481	-	-	-	-	MSG-0018-C		Includes containment heat removal.
C-F-2	C5.60	N/A		N/A						BWR Plant
C-F-2	C5.70	N/A		N/A						None
C-F-2	C5.81	5 (*4)		N/A					N/A	
			RHR/3	-	-	-	-	MSG-0018-C		Sweep-o-let branch connection
			CS/1	-	-	-	-	ISI-0103-C		
			MS/1	-	-	-	-	MSG-0021-C		
C-G	C6.10	N/A		N/A						None
C-G	C6.20	N/A		N/A						None
C-H	ALL	--	ALL	--See Section 7.8 and SPP-9.1.			--			VT-2 Pressure Test Program.

SECTION 8.1 EXAMINATION SCHEDULE
PART 2 - CLASS 2 EQUIVALENT (IWC) COMPONENTS

NOTES:

(*1) Examinations limited to one vessel of similar design, size, function in accordance with Table IWC-2500-1, Examination Category C-A, NOTE: (3).

(*2) Examinations limited to one vessel of similar design, size, function in accordance with Table IWC-2500-1, Examination Category C-B, NOTE: (4).

(*3) Examination requirement: For multiple vessels of similar design, function, and service, only one welded attachment weld of only one of the multiple vessels shall be selected for examination in accordance with Table IWC-2500-1, Examination Category C-C, NOTE: (4).

(*4) Reference SECTION 8.1 EXAMINATION SCHEDULE PART 6 - RISK - INFORMED INSPECTIONS for Examination Categories C-F-1 Item No. C5.11, C-F-2 Item No.C5.51 and C5.81.

(*5) The telltale hole in reinforcing plate shall be examined for evidence of leakage while the vessel is under going the system leakage test (IWC-5220), as required by Examination Category C-H, Table IWC-2500-1, Note: (5).

SECTION 8.1 EXAMINATION SCHEDULE
PART 3 - CLASS 3 EQUIVALENT (IWD) COMPONENTS

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
D-A	D1.10	N/A		N/A						None
D-A	D1.20	80		10	3	3	4		VT-1	Welded Attachments.
			EECW/47	5	2	1	2	ISI-0368-C		
			FPC/1	1	-	-	1	ISI-0133-C		
			RCW/3	1	-	1	-	ISI-0391-C		
			RHRSW/29	3	1	1	1	ISI-0145-C		
D-A	D1.30	N/A		N/A						
D-A	D1.40	N/A		N/A						
D-B	D2.10 Thru D2.80	N/A		All	See Section 7.8 and SPP-9.1				VT-2	Pressure Test Program

SECTION 8.1 EXAMINATION SCHEDULE
PART 4 - COMPONENT SUPPORTS (IWF)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
F-A	F1.10	138		39	14	12	13		VT-3	Class 1 Pipe Supports. Subtotals follow below.
F-A	F1.10A	6		2	1	1	-		VT-3	ONE DIRECTIONAL RIGID SUPPORTS
			MS/5	1	1	-	-	ISI-0279-C		
			RECIR/1	1	-	1	-	ISI-0278-C		
F-A	F1.10B	17		6	2	2	2		VT-3	MULTIDIRECTIONAL RIGID SUPPORTS.
			FW/4	1	1	-	-	ISI-0277-C		
			HPCI/1	1	1	-	-	ISI-0275-C		
			MS/5	1	-	1	-	ISI-0279-C		
			RHR/3	1	-	-	1	ISI-0276-C		
			RWCU/2	1	-	-	1	ISI-0274-C		
			CS/2	1	-	1	-	ISI-0280-C		

SECTION 8.1 EXAMINATION SCHEDULE
PART 4 - COMPONENT SUPPORTS (IWF)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
F-A	F1.10C	59		13	3	5	5		VT-3	Variable Supports. (Constant Force, Springs, ETC.)
			CS/6	1	1	-	-	ISI-0280-C		
			FW/10	2	2	-	-	ISI-0277-C		
			HPCI/2	1	-	1	-	ISI-0275-C		
			MS/16	4	-	4	-	ISI-0279-C		
			RECIR/13	2	-	-	2	ISI-0278-C		
			RHR/10	2	-	-	2	ISI-0276-C		
			RWCU/2	1	-	-	1	ISI-0274-C		
F-A	F1.10D	56		18	8	4	6		VT-3	Variable Supports. (Snubbers)
			CS/4	2	2	-	-	ISI-0280-C		
			FW/19	6	6	-	-	ISI-0277-C		
			HPCI/1	0	-	-	-	ISI-0275-C		
			MS/20	6	-	4	2	ISI-0279-C		
			RECIR/9	3	-	-	3	ISI-0278-C		
			RHR/3	1	-	-	1	ISI-0276-C		

SECTION 8.1 EXAMINATION SCHEDULE
PART 4 - COMPONENT SUPPORTS (IWF)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
F-A	F1.20	328		52	16	17	19		VT-3	CLASS 2 PIPE SUPPORTS. SUBTOTALS FOLLOW BELOW
F-A	F1.20A	107		18	6	5	7		VT-3	ONE DIRECTIONAL RIGID SUPPORTS
			CRD/14	2	2	-	-	ISI-0041-C		
			CS/16	2	2	-	-	ISI-0105-C		
			HPCI/25	4	-	-	4	ISI-0130-C		
			MS/1	1	1	-	-	ISI-0079-C		
			RBCCW/2	1	1	-	-	ISI-0032-C		
			RCIC/10	2	-	-	2	ISI-0131-C		
			RHR/39	6	-	5	1	ISI-0324-C		
F-A	F1.20B	58		10	3	3	4		VT-3	MULTIDIRECTIONAL RIGID SUPPORTS
			CRD/13	2	2	-	-	ISI-0041-C		
			CS/8	1	1	-	-	ISI-0105-C		
			HPCI/7	1	-	-	1	ISI-0130-C		
			MS/4	1	-	-	1	ISI-0079-C		
			RCIC/4	1	-	-	1	ISI-0131-C		
			RHR/22	4	-	3	1	ISI-0324-C		
F-A	F1.20C	122		21	6	8	7		VT-3	Variable Supports. (Constant Force, Springs, ETC.)
			CS/14	3	3	-	-	ISI-0105-C		
			HPCI/14	3	3	-	-	ISI-0130-C		
			MS/32	4	-	-	4	ISI-0079-C		
			RCIC/5	1	-	1	-	ISI-0131-C		
			RHR/57	10	-	7	3	ISI-0324-C		

SECTION 8.1 EXAMINATION SCHEDULE
PART 4 - COMPONENT SUPPORTS (IWF)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
F-A	F1.20D	41		3	1	1	1		VT-3	Variable Supports. (Snubbers,)
			HPCI/6	0	-	-	-	ISI-0130-C		
			RCIC/3	0	-	-	-	ISI-0131-C		
			RBCCW/1	1	1	-	-	ISI-0032-C		
			RHR/31	2	-	1	1	ISI-0324-C		
F-A	F1.30	269		35	4	16	15		VT-3	CLASS 3 PIPE SUPPORTS. SUBTOTALS FOLLOW BELOW.
F-A	F1.30A	99		12	3	5	4		VT-3	ONE DIRECTIONAL RIGID SUPPORTS.
			EECW/66	8	-	5	3	ISI-0368-C		
			FPC/1	1	-	-	1	ISI-0133-C		
			RCW/4	1	1	-	-	ISI-0391-C		
			RHRSW/28	2	2	-	-	ISI-0145-C		
F-A	F1.30B	156		20	1	11	8		VT-3	MULTIDIRECTIONAL RIGID SUPPORTS.
			EECW/124	16	-	9	7	ISI-0368-C		
			FPC/4	1	-	-	1	ISI-0133-C		
			RCW/5	1	1	-	-	ISI-0391-C		
			RHRSW/23	2	-	2	-	ISI-0145-C		
F-A	F1.30C	10		2	0	0	2		VT-3	Variable Supports. (Constant Force, Springs, ETC.)
			EECW/1	0	-	-	-	ISI-0368-C		
			RHRSW/9	2	-	-	2	ISI-0145-C		
F-A	F1.30D	4		1	-	-	1		VT-3	Variable Supports. (Snubbers)
			EECW/4	1	-	-	1	ISI-0368-C		

SECTION 8.1 EXAMINATION SCHEDULE
PART 4 - COMPONENT SUPPORTS (IWF)

Examination Category	Item No	Number of Components	System/ Subtotal	Third Inspection Interval Sample	First Period Sample	Second Period Sample	Third Period Sample	Components Shown On ISI Drawing #	Exam(s) Required	Remarks
F-A	F1.40	74		33	11	11	11			ALL CLASSES OF COMPONENT SUPPORTS (NOT PIPE SUPPORTS). SUBTOTALS FOLLOW BELOW.
F-A	F1.40A	1	RCIC/1	1	0	0	1	ISI-0131-C	VT-3	ONE DIRECTIONAL RIGID SUPPORTS
F-A	F1.40B	48		16(*1)	6	6	4		VT-3	MULTIDIRECTIONAL RIGID SUPPORTS.
			CRD/6	3(*1)	3	-	-	ISI-0041-C		TANK SUPPORTS.
			CS/4	1(*1)	1	-	-	ISI-0105-C		PUMP SUPPORTS
			EECW/16	2(*1)	2	-	-	ISI-0368-C		PUMP & STRAINER SUPPORTS
			HPCI/3	3	-	-	3	ISI-0130-C		TURBINE & PUMP SUPPORTS.
			RCIC/2	2	-	2	-	ISI-0131-C		TURBINE & PUMP SUPPORTS.
			RHR/12	3(*1)	-	3	-	ISI-0406-C		RHR HX SUPPORTS.
			RHR/4	1(*1)	-	1	-	ISI-310-B		RHR PUMP SUPPORTS
			RPV/1	1	-	-	1	ISI-0415-A		RPV SUPPORT.
F-A	F1.40C	13		10(*1)	5	1	4		VT-3	Variable Supports. (Snubbers, Constant Force, Springs, ETC.)
			FW/2	2	2	-	-	ISI-0277-C		VALVE SUPPORTS
			RECIR/2	2	2	-	-	ISI-0278-C		VALVE SUPPORTS
			RECIR/6	3(*1)	-	-	3	ISI-0278-C		RECIR PUMP SUPPORTS
			RHR/2	2	-	1	1	ISI-0324-C		VALVE SUPPORTS
			RPV/1	1	1	-	-	ISI-0415-C		RPV STABILIZER
F-A	F1.40D	12							VT-3	Variable Supports.(Snubbers,)
			RECIRC/12	6	-	4	2	ISI-0278-C		RECIR PUMP SUPPORTS

SECTION 8.1 EXAMINATION SCHEDULE
PART 4 - COMPONENT SUPPORTS (IWF)

NOTE:

(*1) For multiple components other than piping, within a system of similar design, function, and service, the supports of only one of the multiple components are required to be examined. See Table -2500-1, Examination Category F-A, Note: (3).

SECTION 8.1 EXAMINATION SCHEDULE
PART 5 - AUGMENTED EXAMINATIONS(*1)

Augmented Exam Category	Ref. Program Section	Number of Components	Exam Regmt 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
A	7.11.7	47	B02-02	-	-------	6(12%)in	6 years--	--12(25%) in 10 years	UT	Section 8.2 NUREG-0313
C	7.11.7	115	B02-02	-	115	58(50%)	in 6 years	115(100%) in 10 years	UT	Section 8.2 NUREG-0313
D	7.11.7	7	B02-02	4	3	4	3	4	UT	Section 8.2 NUREG-0313
E	7.11.7	16	B02-02	9	7	9	7	9	UT	Section 8.2 NUREG-0313
G	7.11.7	2	B02-02	2	2	2	2	2	VT-2	Section 8.2 NUREG-0313
NA(*2)	7.11.7	15	B02-02	-		-		-	N/A	Stainless Welds, Temp Exclusion NUREG-0313
B-D	7.11.6	6	B01-02	6	-	-	6	-	UT	NUREG-0619 Feedwater, Nozzle, Bore & SE
B-N-1	7.11.6	6	B01-02	6	-	-	-	6	VT-1	NUREG-0619 FN Nozzles Spargers

SECTION 8.1 EXAMINATION SCHEDULE
PART 5 - AUGMENTED EXAMINATIONS(*1)

Augmented Exam Category	Ref. Program Section	Number of Components	Exam Regmt 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
B-J	7.11.8	31	B04-02	9	-	11	-	11	UT & PT or MT	TSR 3.4.3.2 Pipe Whip
B-D	7.11.10	7	B07-02	-	7	-	7	-	UT	GE SIL-571
C	7.11.1	1	D01-02	1	-	-	1	1	UT&RT	
E	7.11.2	4	D03-02	4	-	4	-	4	UT	
E	7.11.4	1	B02-02			1		1		Classified as NUREG 0313 Category E . See Section 8.2 Part 1.

NOTES:

(*1) Most of these components are considered within the Code examination numbers presented in Parts 1 through 4 of this Section. Where one examination may serve as Code credit and as Augmented credit, it shall be so credited.

(*2) These stainless steel welds contain coolant at a temperature of 200 degrees or less during power operation and do not require examination under NUREG-0313. These welds are listed in Section 8.2, Part 2.

SECTION 8.1 EXAMINATION SCHEDULE
PART 6 - RISK-INFORMED INSPECTIONS

Examination Category	Item No.	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	16	FW/2	-	-	2	2-ISI-0269-C	UT	
			HPCI/6	6	-	-	2-ISI-0273-C 2-ISI-0128-C	UT	
			MS/2	-	-	2	2-MSG-0021-C	UT	
			RCIC/1	-	-	1	2-ISI-0129-C	UT	
			RHR/4	-	4	-	2-MSG-0018-C	UT	
			RWCU/1	-	1	-	2-ISI-0272-C	UT	
R-A	R1.16								Examination procedures shall satisfy the requirements of GL 88-01(NUREG-0313)
	Cat C	37	CS/6	6	-	-	2-ISI-0271-C	UT	
			RECIRC/17	1	7	9	2-ISI-0270-C	UT	
			RHR/9	1	6	2	2-ISI-0221-C	UT	
			RWCU/5	-	5	-	2-ISI-0272-C	UT	
	Cat D	3	RHR/1	1	1	1	2-ISI-0221-C	UT	
			RWCU/2	-	2	2	2-ISI-0272-C	UT	
	Cat E	11	RECIRC/9	5	9	9	2-ISI-0270-C	UT	
			RHR/2	-	2	2	2-ISI-0221-C	UT	
R-A	R1.18	171*(1)	FW/88	-	-	-	-	-	Only those locations required per SPP-9.7
			MS/83	-	-	-	-	-	

*(1) Selection of Flow Accelerated Corrosion grids to be examined is determined each refueling cycle by BFN Engineering.

SECTION 8.2 - PART 1
UNIT 2 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01

WELD EXAM NUMBER	SYSTEM	EXAM METHOD	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC CATEGORY
2RA5	RECIR	UT	12	P,P	A
2RA6	RECIR	UT	12	P,SE	A
2RB5	RECIR	UT	12	P,P	A
2RB6	RECIR	UT	12	P,SE	A
2RC5	RECIR	UT	12	P,P	A
2RC6	RECIR	UT	12	P,SE	A
2RD5	RECIR	UT	12	P,P	A
2RD6	RECIR	UT	12	P,SE	A
2RE5	RECIR	UT	12	P,P	A
2RE6	RECIR	UT	12	P,SE	A
2RF5	RECIR	UT	12	P,P	A
2RF6	RECIR	UT	12	P,SE	A
2RG5	RECIR	UT	12	P,P	A
2RG6	RECIR	UT	12	P,SE	A
2RH5	RECIR	UT	12	P,P	A
2RH6	RECIR	UT	12	P,SE	A
2RJ5	RECIR	UT	12	P,P	A
2RJ6	RECIR	UT	12	P,SE	A
2RK5	RECIR	UT	12	P,P	A
2RK6	RECIR	UT	12	P,SE	A
2RA1	RPV	UT	12	N,SE	A
2RB1	RPV	UT	12	N,SE	A
2RC1	RPV	UT	12	N,SE	A
2RD1	RPV	UT	12	N,SE	A
2RE1	RPV	UT	12	N,SE	A
2RF1	RPV	UT	12	N,SE	A
2RG1	RPV	UT	12	N,SE	A
2RH1	RPV	UT	12	N,SE	A
2RJ1	RPV	UT	12	N,SE	A
2RK1	RPV	UT	12	N,SE	A
JP-2-1A	RPV	UT	4	N,SE	A
JP-2-1B	RPV	UT	4	N,SE	A
DRWC-2-07A	RWCU	UT	6	P,P	A
DRWC-2-07B	RWCU	UT	6	P,P	A
RWC-2-001-G001	RWCU	UT	4	V,V	A
RWC-2-001-G002	RWCU	UT	4	E,V	A
RWCU-2-003-G001	RWCU	UT	6	E,P	A
RWCU-2-003-G002	RWCU	UT	6	E,P	A
RWCU-2-003-G003	RWCU	UT	6	PEN,P	A
RWCU-2-003-025	RWCU	UT	6	P,V	A
RWCU-2-003-026	RWCU	UT	6	V,P	A
RWCU-2-004-G082	RWCU	UT	4	P,V	A
RWCU-2-004-G083	RWCU	UT	4	P,V	A
TCS-2-401	RPV	UT	10	N,SE	A
TCS-2-417	RPV	UT	10	N,SE	A
TCS-2-403	CS	UT	10	P,SE	A
TSCS-2-418	CS	UT	10	P,SE	A

SECTION 8.2 - PART 1
UNIT 2 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01

WELD EXAM NUMBER	SYSTEM	EXAM METHOD	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC CATEGORY
DCS-2-04	CS	UT	12	P,P	C
DCS-2-05	CS	UT	12	P,V	C
DCS-2-07	CS	UT	12	P,P	C
DCS-2-13	CS	UT	12	P,P	C
DCS-2-13A	CS	UT	12	P,P	C
DCS-2-14	CS	UT	12	P,V	C
DSCS-2-01	CS	UT	12	E,P	C
DSCS-2-02	CS	UT	12	E,P	C
DSCS-2-09	CS	UT	12	P,P	C
TCS-2-405	CS	UT	12	E,V	C
TCS-2-406	CS	UT	12	P,V	C
TCS-2-410	CS	UT	12	E,V	C
TCS-2-422	CS	UT	12	P,V	C
TCS-2-426	CS	UT	12	E,P	C
GR-2-01RECIR	UT	28	P,PMP	C	
GR-2-02RECIR	UT	28	P,V	C	
GR-2-03RECIR	UT	28	E,V	C	
GR-2-04RECIR	UT	4	C,P	C	
GR-2-07RECIR	UT	4	C,P	C	
GR-2-08RECIR	UT	28	T,X	C	
GR-2-09RECIR	UT	12	P,P	C	
GR-2-12RECIR	UT	12	P,P	C	
GR-2-18RECIR	UT	22	H,X	C	
GR-2-19RECIR	UT	12	P,P	C	
GR-2-22RECIR	UT	12	P,P	C	
GR-2-25RECIR	UT	22	H,V	C	
GR-2-26RECIR	UT	22	H,V	C	
GR-2-27RECIR	UT	28	P,PMP	C	
GR-2-28RECIR	UT	28	P,V	C	
GR-2-29RECIR	UT	28	E,V	C	
GR-2-30RECIR	UT	4	C,P	C	
GR-2-33RECIR	UT	4	C,P	C	
GR-2-34RECIR	UT	28	P,X	C	
GR-2-35RECIR	UT	12	P,P	C	
GR-2-38RECIR	UT	12	P,P	C	
GR-2-41RECIR	UT	12	P,R	C	
GR-2-44RECIR	UT	22	H,X	C	
GR-2-48RECIR	UT	12	P,P	C	
GR-2-51RECIR	UT	22	H,V	C	

SECTION 8.2 - PART 1
UNIT 2 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01

WELD EXAM NUMBER	SYSTEM	EXAM METHOD	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC CATEGORY
GR-2-52RECIR	UT	22	H,V	C	
GR-2-54RECIR	UT	28	E,P	C	
GR-2-55RECIR	UT	28	P,T	C	
GR-2-56RECIR	UT	28	E,V	C	
GR-2-57RECIR	UT	28	P,V	C	
GR-2-58RECIR	UT	28	E,PMP	C	
GR-2-60RECIR	UT	28	E,P	C	
GR-2-62RECIR	UT	28	E,V	C	
GR-2-63RECIR	UT	28	P,V	C	
GR-2-63A	RECIR	UT	4	F,F	C
GR-2-63B	RECIR	UT	4	BC	C
KR-2-01RECIR	UT	4	BC	C	
KR-2-02RECIR	UT	28	E,P	C	
KR-2-03RECIR	UT	28	P,T	C	
KR-2-04RECIR	UT	4	BC	C	
KR-2-11RECIR	UT	22	R,X	C	
KR-2-12RECIR	UT	22	H,X	C	
KR-2-13RECIR	UT	12	BC	C	
KR-2-15RECIR	UT	22	C,H	C	
KR-2-19RECIR	UT	12	BC	C	
KR-2-20RECIR	UT	12	BC	C	
KR-2-23RECIR	UT	4	BC	C	
KR-2-24RECIR	UT	28	E,P	C	
KR-2-25RECIR	UT	28	P,T	C	
KR-2-26RECIR	UT	4	BC	C	
KR-2-33RECIR	UT	22	R,X	C	
KR-2-34RECIR	UT	22	H,X	C	
KR-2-35RECIR	UT	12	BC	C	
KR-2-42RECIR	UT	12	BC	C	
KR-2-45RECIR	UT	28	E,P	C	
KR-2-46RECIR	UT	28	P,T	C	
KR-2-47RECIR	UT	28	E,P	C	
KR-2-48RECIR	UT	28	E,P	C	
KR-2-49RECIR	UT	4	BC	C	
KR-2-50RECIR	UT	28	E,P	C	
KR-2-51RECIR	UT	28	E,P	C	
KR-2-52RECIR	UT	28	E,P	C	
KR-2-53RECIR	UT	4	BC	C	

SECTION 8.2 - PART 1
UNIT 2 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01

WELD EXAM NUMBER	SYSTEM	EXAM METHOD	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC CATEGORY
DRHR-2-02	RHR	UT	24	P,V	C
DRHR-2-04	RHR	UT	24	E,P	C
DRHR-2-05	RHR	UT	24	P,V	C
DRHR-2-06	RHR	UT	24	P,V	C
DRHR-2-07	RHR	UT	24	P,V	C
DRHR-2-08	RHR	UT	24	P,V	C
DRHR-2-13	RHR	UT	24	E,P	C
DRHR-2-14	RHR	UT	24	E,V	C
DRHR-2-15	RHR	UT	24	P,V	C
DRHR-2-16	RHR	UT	24	E,V	C
DRHR-2-17	RHR	UT	24	P,V	C
DRHR-2-18	RHR	UT	24	P,T	C
DRHR-2-19	RHR	UT	20	P,T	C
DRHR-2-21	RHR	UT	20	E,V	C
DRHR-2-23	RHR	UT	20	P,V	C
DSRHR-2-01	RHR	UT	24	E,P	C
DSRHR-2-02	RHR	UT	24	P,P	C
DSRHR-2-03	RHR	UT	24	P,P	C
DSRHR-2-04	RHR	UT	24	E,P	C
DSRHR-2-04A	RHR	UT	24	E,P	C
DSRHR-2-05	RHR	UT	24	E,P	C
DSRHR-2-05A	RHR	UT	24	E,P	C
DSRHR-2-06	RHR	UT	24	P,P	C
DSRHR-2-07	RHR	UT	24	E,P	C
DSRHR-2-08	RHR	UT	6	BC	C
DSRHR-2-09	RHR	UT	20	E,P	C
DSRHR-2-10	RHR	UT	20	E,P	C
DSRHR-2-11	RHR	UT	20	E,P	C
TRHR-2-191	RHR	UT	20	E,V	C
N 1A-SE	RPV	UT	28	N,SE	C
N 1B-SE	RPV	UT	28	N,SE	C
DRWC-2-01	RWCU	UT	6	P,V	C
DRWC-2-01A	RWCU	UT	6	P,V	C
RWCU-2-003-027	RWCU	UT	6	E,V	C
RWCU-2-003-044	RWCU	UT	6	P,E	C
DSRWC-2-01	RWCU	UT	6	E,P	C

SECTION 8.2 - PART 1
UNIT 2 WELDS REQUIRED TO BE EXAMINED PER
GENERIC LETTER 88-01

WELD EXAM NUMBER	SYSTEM	EXAM METHOD	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC CATEGORY
DSRWC-2-02	RWCU	UT	6	E,P	C
DSRWC-2-06	RWCU	UT	6	E,P	C
RCRD-2-49	CRD	UT	4	E,V	D
RCRD-2-50	CRD	UT	4	E,V	D
RCRD-2-52	CRD	UT	4	P,V	D
DRHR-2-03	RHR	UT	24	P,V	D
DRHR-2-11	RHR	UT	24	P,V	D
DRHR-2-12	RHR	UT	24	P,V	D
RCRD-2-33	RPV	UT	4	C,N	D
TCS-2-421(OL)	CS	UT	12	E,V	E
GR-2-15(OL)	RECIR	UT	12	P,R	E
GR-2-45(OL)	RECIR	UT	12	P,P	E
GR-2-53RECIR	UT	28	P,SE	E	
GR-2-59(OL)	RECIR	UT	28	P,SE	E
GR-2-61(OL)	RECIR	UT	28	P,P	E
GR-2-64(OL)	RECIR	UT	28	E,PMP	E
KR-2-14RECIR	UT	12	BC	E	
KR-2-36RECIR	UT	12	BC	E	
KR-2-37RECIR	UT	22	C,H	E	
KR-2-41RECIR	UT	12	BC	E	
DRHR-2-09	RHR	UT	24	P,T	E
DRHR-2-22	RHR	UT	20	P,V	E
DSRWC-2-03(OL)	RWCU	UT	6	E,P	E
DSRWC-2-04(OL)	RWCU	UT	6	E,P	E
DSRWC-2-05(OL)	RWCU	UT	6	E,P	E
DRHR-2-03B	RHR	VT-2	24	P,P	G
DRHR-2-13B	RHR	VT-2	24	P,P	G

SECTION 8.2 - PART 2
UNIT 2 STAINLESS AND DISSIMILAR METAL WELDS
NOT SUBJECT TO GENERIC LETTER 88-01 EXAMS

WELD NUMBER	SYSTEM	PIPE SIZE (INCHES)	WELD CONFIG	IGSCC CATEGORY	METHOD	EXAM
DCS-2-01	CS	12	P,V	NA	N/A	TEMPERATURE EXCLUSION
DCS-2-02	CS	12	E,V	NA	N/A	TEMPERATURE EXCLUSION
DCS-2-03	CS	12	P,V	NA	N/A	TEMPERATURE EXCLUSION
DCS-2-10	CS	12	E,V	NA	N/A	TEMPERATURE EXCLUSION
DCS-2-11	CS	12	P,V	NA	N/A	TEMPERATURE EXCLUSION
DCS-2-12	CS	12	P,V	NA	N/A	TEMPERATURE EXCLUSION
DSCS-2-14	CS	12	E,P	NA	N/A	TEMPERATURE EXCLUSION
DSCS-2-15	CS	12	E,P	NA	N/A	TEMPERATURE EXCLUSION
DSCS-2-16A	CS	12	P,PEN	NA	N/A	INACCESSIBLE IN PENETRATION X-16A. TEMPERATURE EXCLUSION.
DSCS-2-16B	CS	12	P,PEN	NA	N/A	INACCESSIBLE IN PENETRATION X-16A. TEMPERATURE EXCLUSION.
SHPCI-2-1	HPCI	12	F,P	NA	N/A	TEMPERATURE EXCLUSION
SHPCI-2-2	HPCI	12	E,P	NA	N/A	TEMPERATURE EXCLUSION
SHPCI-2-3	HPCI	12	E,P	NA	N/A	TEMPERATURE EXCLUSION
SHPCI-2-4	HPCI	12	E,P	NA	N/A	TEMPERATURE EXCLUSION
SHPCI-2-5	HPCI	12	E,P	NA	N/A	TEMPERATURE EXCLUSION

SECTION 8.3 ASME CLASS 1 EQUIVALENT VALVE LIST

GROUP NUMBER	VALVE NUMBER	SIZE INCH	SYSTEM	ISI DWG NUMBER	VENDOR	VENDOR DWG NO.	MA SPE
1	3-554 3-558 3-568 3-572	24	FW	ISI-0269-C	ATWOOD & MORRILL	20788-H	A-2
2	HCV3-66 HCV3-67	24	FW	ISI-0269-C	POWELL	035879-2	A-2
3	FCV68-01 FCV68-77	28	RECIR	ISI-0270-C	DARLING	94-12086	A35
4	FCV68-03 FCV68-79	28	RECIR	ISI-0270-C	DARLING	94-12086	A35
5	FCV68-33 FCV68-35	22	RECIR	ISI-0270-C	DARLING	94-12086	A35
6	FCV1-14 FCV1-15 FCV1-26 FCV1-27 FCV1-37 FCV1-38 FCV1-51 FCV1-52	26	MS	ISI-0222-C	ATWOOD & MORRILL	20851-H	A21

SECTION 8.3 ASME CLASS 1 EQUIVALENT VALVE LIST (Continued)

GROUP NUMBER	VALVE NUMBER	SIZE INCH	SYSTEM	ISI DWG NUMBER	VENDOR	VENDOR DWG NO.	MAT SPEC
7	PCV1-004 PCV1-005 PCV1-018 PCV1-019 PCV1-022 PCV1-023 PCV1-030 PCV1-031 PCV1-034 PCV1-041 PCV1-042 PCV1-179 PCV1-180	6	MS	ISI-0312-B	TARGET ROCK	PL-7657-100	A216 & A1
8	HCV74-69 HCV74-55	24	RHR	ISI-0221-C	POWELL	035880-3	A351
9	FCV74-54 FCV74-68	24	RHR	ISI-0221-C	ATW00D & MORRILL	20800-H	A351
10	FCV74-53 FCV74-67	24	RHR	ISI-0221-C	WALWORTH	A-12334-M1E	A351
11	HCV74-49	20	RHR	ISI-0221-C	POWELL	036207-2	A351
12	FCV74-47	20	RHR	ISI-0221-C	WALWORTH	A-12332-M1C	A216

SECTION 8.3 ASME CLASS 1 EQUIVALENT VALVE LIST (Continued)

GROUP NUMBER	VALVE NUMBER	SIZE INCH	SYSTEM	ISI DWG NUMBER	VENDOR	VENDOR DWG NO.	MAT SPEC
13	HCV75-27 HCV75-55	12	CS	ISI-0271-C	POWELL	0360334-2	A351
14	FCV75-26 FCV75-54	12	CS	ISI-0271-C	ROCKWELL	PD-420652	A351
15	FCV75-25 FCV75-53	12	CS	ISI-0271-C	WALWORTH	IVP-1198	A351
16	69-500	6	RWCU	ISI-0272-C	VELAN	P-33160-20	A182
17	FCV69-01 FCV69-02	6	RWCU	ISI-0272-C	BW/IP INTNL. BW/IP INTNL	W 9825123 W 9825098	SA35 SA35
18	FCV71-40	6	RCIC	ISI-0272-C	ROCKWELL	PD-420688	A216
19	FCV73-02 FCV73-03	10	HPCI	ISI-0273-C	CRANE	PB-139989	A216
20	FCV73-45	14	HPCI	ISI-0273-C	ROCKWELL	PD-420687	A216
21	FCV74-48	20	RHR	ISI-0221-C	WALWORTH	A-12331-M1C	A351
22	69-630	4	RWCU	ISI-0272-C	ANCHOR/ DARLING	C23650	SA35

NOTE

1 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 8.4
REQUESTS FOR RELIEF

UNIT 2 REQUESTS FOR RELIEF SUMMARY LISTING

RFR	DESCRIPTION
2-ISI-8, Rev. 1	Relief to allow use of wire type penetrameters in lieu of plaque type penetrameters for performing radiographic inspections
2-ISI-9	Permanent Relief from inservice inspection requirements of 10 CFR 50.55a(g) for the volumetric examination of the BFN Unit 2 RPV circumferential welds (Code Category B-A, Item Nos. B1.11).
2-ISI-10, Rev. 1	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 Support Skirt Weld
2-ISI-13	Relief to use alternate inspection and test plan for snubbers developed in accordance with GL 90-09 and approved by NRC
2-ISI-14	Relief to use ASME Code Case N-532 which allows the use of an outage activity report (OAR) in lieu of the NIS-1 and NIS-2 Summary Reports. The OAR is submitted at the end of each inspection period rather than 90-days following each refueling outage.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT,
UNIT 2
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI, INSERVICE INSPECTION (ISI) PROGRAM
THIRD 10-YEAR INSPECTION INTERVAL

REQUEST FOR RELIEF 2-ISI-8, REVISION 1

Executive Summary: In accordance With 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from specified inservice inspection requirements in Section XI of the ASME Boiler and Pressure Vessel Code. TVA is seeking approval to use wire type IQI's (Image Quality Indicators) in lieu of plaque type IQI's for performing radiographic inservice inspections. IQI's (penetrameters) are used to assure that the radiographic quality level achieved produces the Code required sensitivity, definition, and contrast in the radiographic examination process of materials.

The applicable edition of ASME Code Section XI for BFN Unit 2 for its Third 10-Year Inservice Inspection (ISI) is the 1995 Edition, 1996 Addenda. By letter dated March 9, 1995, TVA submitted a request for relief that proposed to use ASME Code Case N-416-1, "Alternate Pressure Test Requirement for Welded Repairs or Installation of Replacement Items by Welding, Class 1, 2, and 3, Section XI Division 1," which invokes the ASME Code Section III, 1992 Edition, no Addenda, in the performance of nondestructive examination of piping weldments. The NRC staff approved the request for relief by letter dated August 18, 1995. ASME Section III, Article NB-5111and NC-5111, require that "...Radiographic examination shall be in accordance with Section V, Article 2, except that ...the penetrameters of Table NB-5111-1 (NC-5111-1) shall be used in lieu of those shown in Table T-276" (of ASME Section V). Tables NB-5111-1 and NC-5111-1 specify only plaque type penetrameters. They do not address the equivalency or use of wire IQIs. However, equivalent wire type IQIs were incorporated into these tables in ASME Section III, 1992 Edition 1993 Addenda.

This request for relief is consistent with a request submitted for BFN Units 2 and 3 for the Second Ten-Year Inservice Inspection Interval by letter dated April 27, 1999. The NRC staff approved the request for relief by letter dated April 29, 1999.

Therefore, pursuant to 10 CFR 50.55a (a) (3) (i), TVA requests relief be granted for the BFN Unit 2 Third Ten-Year Inservice Inspection Interval.

Unit: Two (2)

System: All ASME Code Class 1, 2, and 3 Systems

Components: Various

ASME Code Class: ASME Code Class 1, 2, and 3 (Equivalent)

Section XI Edition: 1995 Edition, 1996 Addenda

Code Table: N/A

Examination Category: N/A

Examination Item Number: N/A

Code Requirement: ASME Code Section III, 1992 Edition, no Addenda, Articles NB-5111 and NC-5111, require that "….Radiographic examination shall be in accordance with Section V, Article 2, except that … the penetrameters (IQI's) of Table NB-5111-1 (NC-5111-1) shall be used in lieu of those shown in Table T-276" (of Section V Article 2).

Code Requirements From Which Relief Is Requested: Relief is requested from using ASME Code Section III, 1992 Edition, no Addenda, Articles NB-5111 and NC-5111, which require that "….Radiographic examination shall be in accordance with Section V, Article 2, except that … the penetrameters of Table NB-5111-1 (NC-5111-1) shall be used in

lieu of those shown in Table T-276" (of Section V Article 2).

List Of Items Associated With The Relief Request: ASME Code Class 1, 2, and 3 Components addressed in the BFN Repair and Replacement Program.

Basis For Relief: TVA considers that plaque type penetrameters are more difficult to use due to their physical placement and radiographic characteristics. The placement of flat plaques on curved surfaces of piping components usually require shimming. After positioning the plaque on the test material and performing a radiographic examination, the recorded radiographic characteristics of the essential T-hole is often obscured or distorted due to specimen anomalies, part geometry, or film artifacts outside the are of interest. These difficulties create potential re-radiography conditions. The re-radiography has a negative ALARA impact due to the potential additional radiation exposure to the radiography personnel.

The use of wire type IQIs are superior to plaque type IQIs for some nuclear piping component applications. Wire IQIs may be placed directly across the area of interest, thus encompassing the examination area range of density and geometry. The one-inch minimum length of the IQI wire minimizes the concern of IQI sensitivity loss due to distortion, anomalies, and part geometry. The wire type IQIs provide the same function as the plaque type IQI's by assuring adequate radiographic quality has been achieved.

Alternative Examination: TVA proposes to use the wire type Image Quality Indicators (IQIs) for radiography examinations as provided for in ASME Section III, 1992 Edition, 1993 Addenda.

Justification For The Granting of Relief: TVA considers that plaque type IQI's are more difficult to use than wire type IQI's due to their physical placement and radiographic characteristics. The placement of flat plaques on curved surfaces of pipe components usually

require shimming. After positioning the plaque on test material and performing a radiographic examination, the recorded radiographic characteristics of the essential T-hole is often obscured or distorted due to specimen anomalies, part geometry, or film artifacts outside the area of interest. These difficulties create potential re-radiography conditions. The re-radiography has a negative ALARA impact due to the additional radiation exposure to the radiography personnel.

Wire IQIs have been shown to provide quality and sensitivity equivalent to plaque type IQI's as documented in Table 4 of ASTM E747-87. Equivalent sensitivity has also been demonstrated in ASME Section V, Article 22, Standard SE-747. Because of the equivalent sensitivity, the proposed alternative (i.e., wire IQIs) provides equivalent results to the current testing method of plaque type IQI's. Therefore, the quality of the inspection and resulting safety of the plant, based on the inspection results are not impacted by this proposed alternative.

The intent of this request for relief is to apply the sensitivity level specified in Tables NB-5111-1 and NC-5111-1 to the selection of the appropriate wire type IQI from Table 4 of Standard SE-747. The information provided above supports the proposed use of wire type IQI's and provides an acceptable level of quality and safety, and the use of plaque type IQI's may result in unusual difficulty without a compensating increase in the level of quality and safety.

Implementation Schedule:

This request for relief is applicable to the Third Ten Year Inservice Inspection Interval for BFN Unit 2.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 2
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI, INSERVICE (ISI) AND AUGMENTED INSPECTION PROGRAM
THIRD TEN-YEAR INSPECTION INTERVAL

REQUEST FOR RELIEF 2-ISI-9, REVISION 1

Executive Summary: TVA is requesting permanent relief from the inservice inspection requirements for volumetric examination of reactor pressure vessel (RPV) circumferential shell welds. This request applies to the remaining term of operation under the existing license.

This request for relief will eliminate examination of the BFN Unit 2 RPV circumferential shell welds and 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.

The intent of 10 CFR 50.55a rule change was to require licensees to perform an expanded RPV shell weld examination as specified in the 1989 Edition of the ASME Section XI Code, 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 change was published in the Federal Register on August 6, 1992.

The examination schedule for the RPV axially oriented welds shall continue as required by the ASME Section XI Code.

TVA is scheduled to perform the RPV shell weld examinations required by the ASME Section XI Code and the expedited RPV

shell weld examinations in the third period (Spring 2001) of the Second Inservice Inspection Interval.

The BWRVIP-05 Report and the associated NRC SER supports exclusion of the examinations of the RPV circumferential shell welds provided certain limiting conditions regarding end of license vessel embrittlement and cold over-pressurization events are satisfied. TVA has satisfied the limiting conditions specified in GL 98-05 for BFN Unit 2.

This request for relief is consistent with ones submitted to NRC for BFN Unit 3 by TVA letters dated June 25, 1999, and October 22, 1999, and for BFN Unit 2 by TVA letter dated March 24, 2000. NRC letter to TVA dated November 18, 1999, approved the BFN Unit 3 request for relief.

Therefore, in accordance with the guidance provided in GL 98-05 and pursuant to 10 CFR50.55a(a)(3)(i), TVA requests that relief be granted from performing the volumetric examinations of the BFN Unit 2 RPV circumferential shell welds.

Note: TVA is including this request for relief in the BFN Unit 2 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.

Unit: Two (2)

System: Reactor Pressure Vessel (RPV)

Components: Table 1 lists the BFN Unit 2 RPV circumferential welds for which TVA is requesting permanent relief from volumetric examination. The proposed relief is for the remaining term of operation under the existing license.

TABLE 1

Weld Description	Category and Exam Method	Table IWB-2500-1 Item Number
Vessel Shell to Shell Weld No.C-4-5	B-A, Volumetric	B1.11
Vessel Shell to Shell Weld No. C-3-4	B-A, Volumetric	B1.11
Vessel Shell to Shell Weld No. C-2-3	B-A, Volumetric	B1.11
Vessel Shell to Shell Weld No. C-1-2 (Located in Belt-line Region)	B-A, Volumetric	B1.11
Vessel Shell to Bottom Head Weld No. C-BH-1	B-A, Volumetric	B1.11

ASME Code Class: ASME Code Class 1

Section XI Edition: 1986 Edition, no addenda

Code Table: IWB-2500-1

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

Examination Item Number: B1.11 (Circumferential Shell Welds)

Code Requirement From Which Relief Is Requested: The inservice inspection requirements for the volumetric examination of RPV circumferential welds, ASME Section XI, Table IWB-2500-1, Examination Category B-A, Item B1.11, Circumferential Shell Welds, and the (expedited) augmented

examination requirements of 10 CFR 50.55a(g)(6)(ii)(A) for vessel circumferential welds.

List Of Items Associated With The Relief Request: See Table 1

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 examinations 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 Electric Power Research Institute 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.

TVA has addressed the two areas of concern outlined in the Permitted Action Section of Generic Letter 98-05: (1) the Unit 2 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 2 RPV.

(1) Generic Letter 98-05 Permitted Action Item No. 1, Comparison Of The BFN Unit 2 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. For plants with RPVs fabricated by Babcock and Wilcox (B & W), the mean end-of-license neutron fluence used in the NRC PFM analysis was 0.053 x 10^{19} n/cm^2. The highest fluence anticipated at the end of the period of 32 EFPY for BFN Unit 2 (in the RPV belt line region, weld C-1-2) is 0.11 x 10^{19} n/cm^2 on the inside vessel surface. This fluence value was based on the BFN Unit 2 power uprate 32 EFPY operating curve information. The embrittlement for the BFN Unit 2 RPV due to fluence effects is less than the value obtained in the NRC limiting analysis for B & W RPV's shown in the SER (Table 2.6-4) for the BWRVIP-05 Report. A comparison of the limiting BFN Unit 2 RPV circumferential shell weld analysis versus the NRC limiting analysis for B & W RPV's is provided in Table 2 below.

The BFN Unit 2 beltline region circumferential shell weld (C-1-2) was chosen for analysis to provide a basis for comparison to the NRC limiting analysis and as the Unit 2 RPV region where these calculated parameters would result in comparatively conservative values. The materials would also be representative of the Unit 2 RPV circumferential shell welds in general. The information in Table 2 represents the beltline region circumferential shell weld C-1-2, located between Unit 2 RPV shells course 1 and course 2. As shown in Table 2, the RT_{NDT} for BFN Unit 2 is much lower than the NRC limiting case. Therefore, the conditional failure probability for BFN Unit 2 circumferential welds is bounded by the conditional failure probabilities in the NRC SER through the end of the current license period.

TABLE 2

PARAMETER	BFN UNIT 2 Weld C-1-2	LIMITING B&W RPV
Fluence (10^{19} n/cm^2)	0.11	0.095
Initial RT_{NDT}	- 40°F	20°F
Chemistry Factor	116.8	196.7
Cu (Wt %)	0.09%	0.31%
Ni (Wt %)	0.65%	0.59%
ΔRT_{NDT}	50.9°F	79.8%
Mean RT_{NDT} [Initial RT_{NDT} + ΔRT_{NDT}]	10.9°F	99.8°F

(2) Generic Letter 98-05 Permitted Action Item No. 2, Review Of BFN Unit 2 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 lead to 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. 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°F to 88°F. The operating procedures for BFN Unit 2 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 2 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 Operation 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 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. These administrative controls and procedures provide assurance that activities which could adversely effect RPV water level, temperature, and pressure are precluded.

Nuclear Experience reviews and industry operating histories have shown that inadequate work-control processes and procedures could 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 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. 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°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 re-qualification 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°F, the head vent valves are opened. If either one of the RWCU or CRD Systems fail, the Unit Operator would adjust the other system to maintain the proper water level and pressure. In addition, BFN also has water level instrumentation with set-points 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. 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 Section XI Code requirements. BFN hydrostatic tests of the RPV and the reactor coolant system are designated as complex and infrequently performed tests. For these types 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.

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 2 RPV in non-design conditions is very low. 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.

Alternative Examination:

As an alternative, TVA proposes to perform only the RPV longitudinal shell weld examinations during the third inspection period (Spring 2001) of the Second Ten-Year ISI Interval in conjunction with the scheduled ASME Section XI Code and augmented RPV Examinations.

Justification For The Granting Of Relief:

Based upon the previous stated technical justifications, performance of the examination of the Unit 2 RPV circumferential shell welds 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. 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. These factors provide reasonable assurance of the continued structural integrity of the BFN Unit 2 RPV. Therefore, pursuant to 10 CFR 50.55a (a)(3)(i), TVA requests that permanent relief be granted from the inservice inspection and the augmented inspection requirements of 10 CFR 50.55a(g)(6)(ii)(A), 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 GL 98-05.

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 shell 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.

This request for relief is consistent with ones submitted to NRC for BFN Unit 3 by TVA letters dated June 25, 1999, and October 22, 1999, and for BFN Unit 2 by TVA letter dated March 24, 2000. NRC letter to TVA dated November 18, 1999, approved the BFN Unit 3 request for relief.

Implementation Schedule: This Request for Relief will be implemented during the Second Ten Year ISI Inspection Interval for Browns Ferry Unit 2 and continue in effect for the remaining term of operation under the existing license.

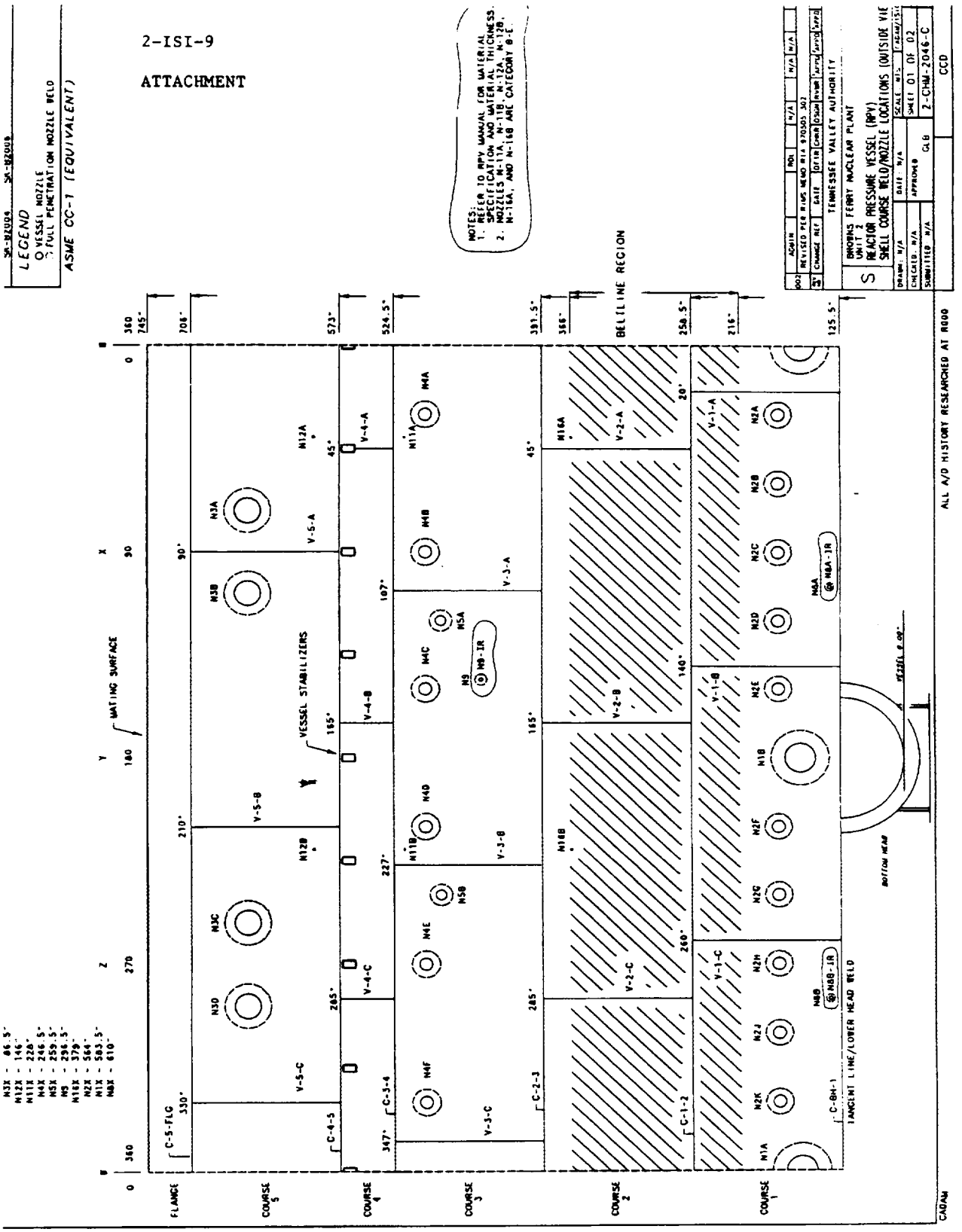
Attachment: Brown Ferry Unit 2 RPV shell weld location schematic drawing

Attachment

2-ISI-9, Revision 1

2-ISI-9

ATTACHMENT



TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 2
ASME SECTION XI INSERVICE INSPECTION PROGRAM
(THIRD TEN-YEAR INSPECTION INTERVAL)

REQUEST FOR RELIEF 2-ISI-10, REVISION 1

Executive Summary:

During a review of the BFN Units 2 and 3 ASME Section XI programs for future outage inspections, TVA determined that access to the inside weld surface of the reactor pressure vessel (RPV) support skirt (see attachments 1 and 2) would be restricted. It was also determined that examination and support personnel would encounter high radiation levels. The enclosed request for relief seeks to provide an alternative examination that will provide an acceptable level of quality and safety.

The weld configuration for the BFN Unit 2 RPV support skirt weld requires a surface examination of the outside and inside weld surfaces. For the inside weld surface, access is restricted because of high radiation and obstructions due to uniquely fitted mirror insulation panels covering the inside weld surface. Control Rod Drive housings and high radiation levels also limit access by the examiner.

As an alternative, TVA is proposing to use the requirements of ASME Code Case N-323-1, which allows a surface examination of the accessible weld surface only. TVA will also perform a best-effort volumetric (ultrasonic) examination from the accessible surface of the weld to detect service related flaws in the inside weld surface.

	TVA's use of the alternative requirements of Code Case N-323-1 in conjunction with the best-effort volumetric examination from the accessible weld surface will provide reasonable assurance of the structural integrity of the weld. TVA's proposed alternative is consistent with the alternative examination requirements, accepted for use at Browns Ferry Nuclear Plant Unit 2 and 3, as stipulated by NRC letter dated June 19, 2000. Therefore, in accordance with 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from inservice inspection requirements in the 1995 Edition, 1996 Addenda, Section XI of the ASME Boiler and Pressure Vessel Code for Category B-K, Integral Attachments For Vessels (RPV support skirt), Item No. B10.10.
Unit:	Two (2)
System:	Reactor Pressure Vessel (RPV)
Components:	Integral Attachments for Vessels (RPV Support Skirt)
ASME Code Class:	ASME Code Class 1
Section XI Edition:	1995 Edition, 1996 Addenda
Code Table:	IWB-2500-1
Examination Category:	B-K (Integral Attachments for Vessels)
Examination Item Number:	B10.10 (Integrally Welded Attachments)
Code Requirement:	The 1995 Edition, 1996 Addenda, ASME Section XI, Table IWB-2500-1, Examination Category B-K, Item B10.10 requires a surface or

volumetric examination as applicable based on the configuration of the support skirt to vessel weld. BFN Unit 2 RPV support skirt configuration is illustrated in ASME Section XI Code, Figure IWB-2500-13 which requires a surface examination of areas A-B (outside surface) and C-D (inside surface).

Code Requirements From Which Relief Is Requested:

Relief is requested from the requirement to perform a surface examination of the RPV support skirt weld examination area C-D (restricted access), as illustrated in Figure IWB-2500-13.

List Of Items Associated With The Relief Request:

RPV Support Skirt weld No: RPV-SUPP-2-1-IA

Basis For Relief Request:

The examination area C-D of Figure IWB-2500-13 is not accessible for examination due to the location, configuration, and insulation covering the C-D weld area. The bottom head and support skirt weld inside surface (C-D area) are covered with mirror insulation. The insulation fits uniquely around each control rod drive (CRD) penetration and in close proximity with the head, taking the contour/shape of the head. The only way to gain access inside the support skirt is through one eighteen-inch diameter access opening. Removal of the uniquely indexed insulation in such a limited space and then passing it through the 18-inch diameter access hole would require extensive time and personnel exposure.

Physical access by the examiner is limited because of high radiation levels and obstructions due to the CRD housings. Magnetic particle examination (yoke) cannot be used due to the space restrictions. The use of dye penetrant examination would require a very thorough cleaning of the weld and adjacent base material to remove rust and scale. The preparation of the weld would potentially require using techniques such as manual wire brushing since power tools may not fit into the limited area.

Radiological Control (RADCON) has indicated that a dose rate in these areas would be approximately 150 to 200 millirem/hour. It is estimated that approximately 56 man-hours would be required (6 people at 8 hours to remove/install insulation, and 2 people at 4 hours to perform the examination). A total of 11.2 REM could be received by all involved personnel.

Further, there are no industry bulletins or reported failures of the subject weld. Thus, the hardship associated with the examination of the inside surface is unwarranted when industry experience and ALARA principles are considered.

Alternative Examination:

TVA will comply with the requirements of ASME Section XI, Code Case N-323-1 for the configuration illustrated in Figure 1 of the Code Case. In addition to the Code Case requirements, TVA will perform a best-effort volumetric (ultrasonic) examination from the accessible side of the weld to detect service related flaws in the inside weld surface.

Justification For The Granting Of Relief:

Code Case N-323-1 which was approved December 31, 1996, by ASME permits an alternative to the requirements of the 1986 Edition of ASME Section XI, Table IWB-2500-1, Examination Category B-H, Item B8.10 when only one surface of the weld is accessible for examination. Code Case N-323-1 permits a surface examination from the accessible side only of the attachment weld. A copy of Code Case N-323-1 is provided as Attachment 3 to this request for relief.

As a point of clarification, the ASME Code, Section XI 1995 Addenda deleted Examination Category B-H (Examination Item No. B8.10) and was reclassified as Examination Category B-K, (Examination Item No. B10.10).

The proposed alternative Code Case examination requirements have been evaluated by the ASME Section XI Code Committee and have been judged technically acceptable. The Code Case was incorporated into the 1997 Addenda of the ASME Section XI Code, not as an alternative, but as the ASME Code requirement.

In addition to the alternative Code Case requirements, TVA will perform a best-effort volumetric (ultrasonic) examination from the accessible side of the weld to detect service related flaws in the inside weld surface.

Using the alternative examination methods stated above, TVA considers that an acceptable level of quality and safety will be achieved and public health and safety will not be compromised.

TVA's proposed alternative is consistent with the alternative examination requirements, accepted for use at Hatch Nuclear Plant, as stipulated by NRC letter to Southern Nuclear Operating Company, Incorporated, dated February 11, 2000.

Also, the proposed alternative is consistent with the alternative examination requirements, accepted for use at Brown's Ferry Nuclear Plant Unit 2 Cycle 11 (Spring 2001) refueling outage and preparation for the Unit 3 Cycle 10 (Spring 2002) refueling outage, as stipulated by NRC letter to TVA dated March 24,2000.

Implementation Schedule:

This request for relief is applicable to the Third Ten Year Inservice Inspection Interval for BFN Unit 2.

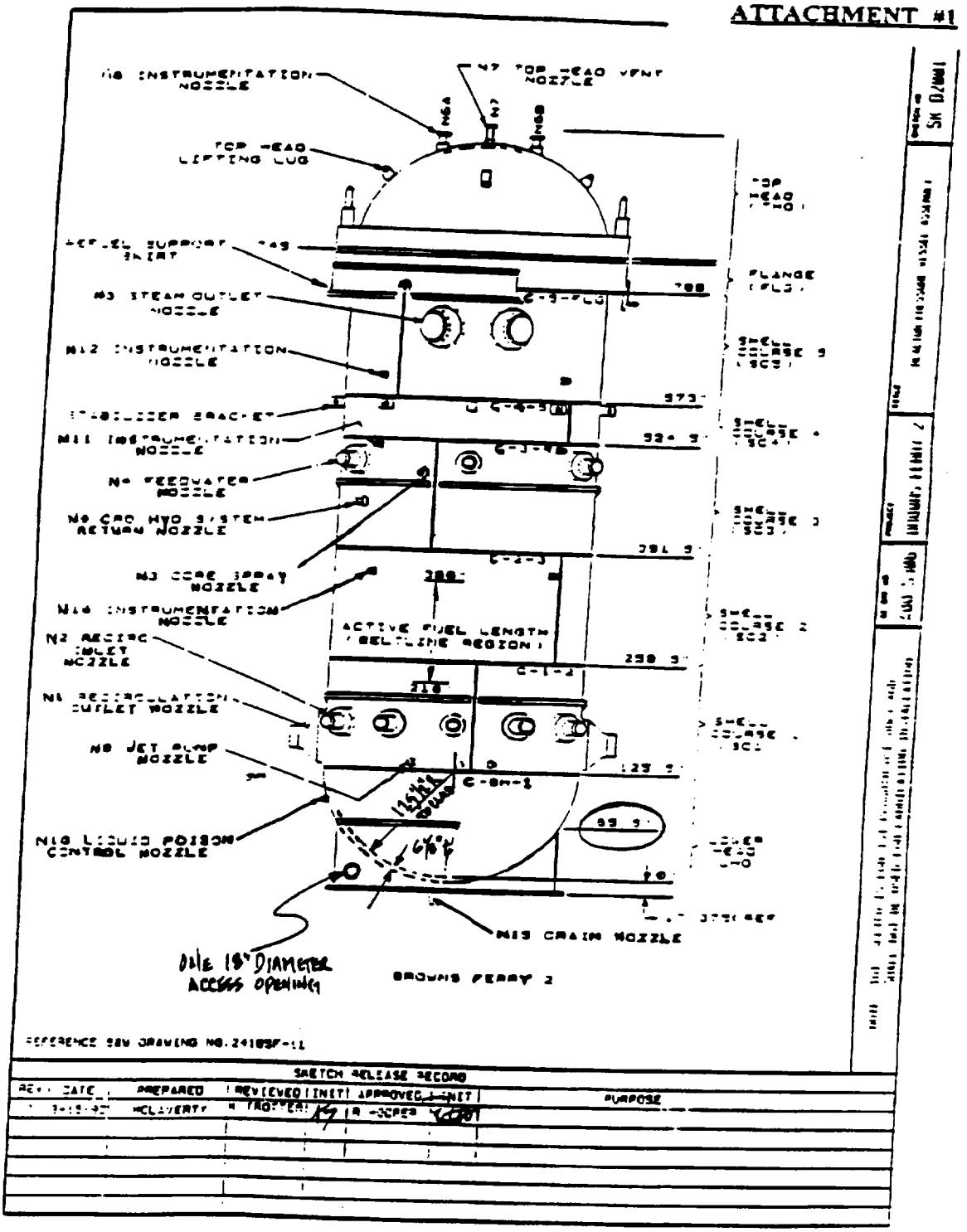
Attachments:

1. Sketch of BFN Unit 2 Reactor Pressure Vessel Assembly
2. Sketch of BFN Unit 2 Support Skirt to Vessel Weld Configuration
3. Code Case N-323-1, Alternate Examination For Welded Attachments to Pressure Vessels

2-ISI-10

ATTACHMENT 1

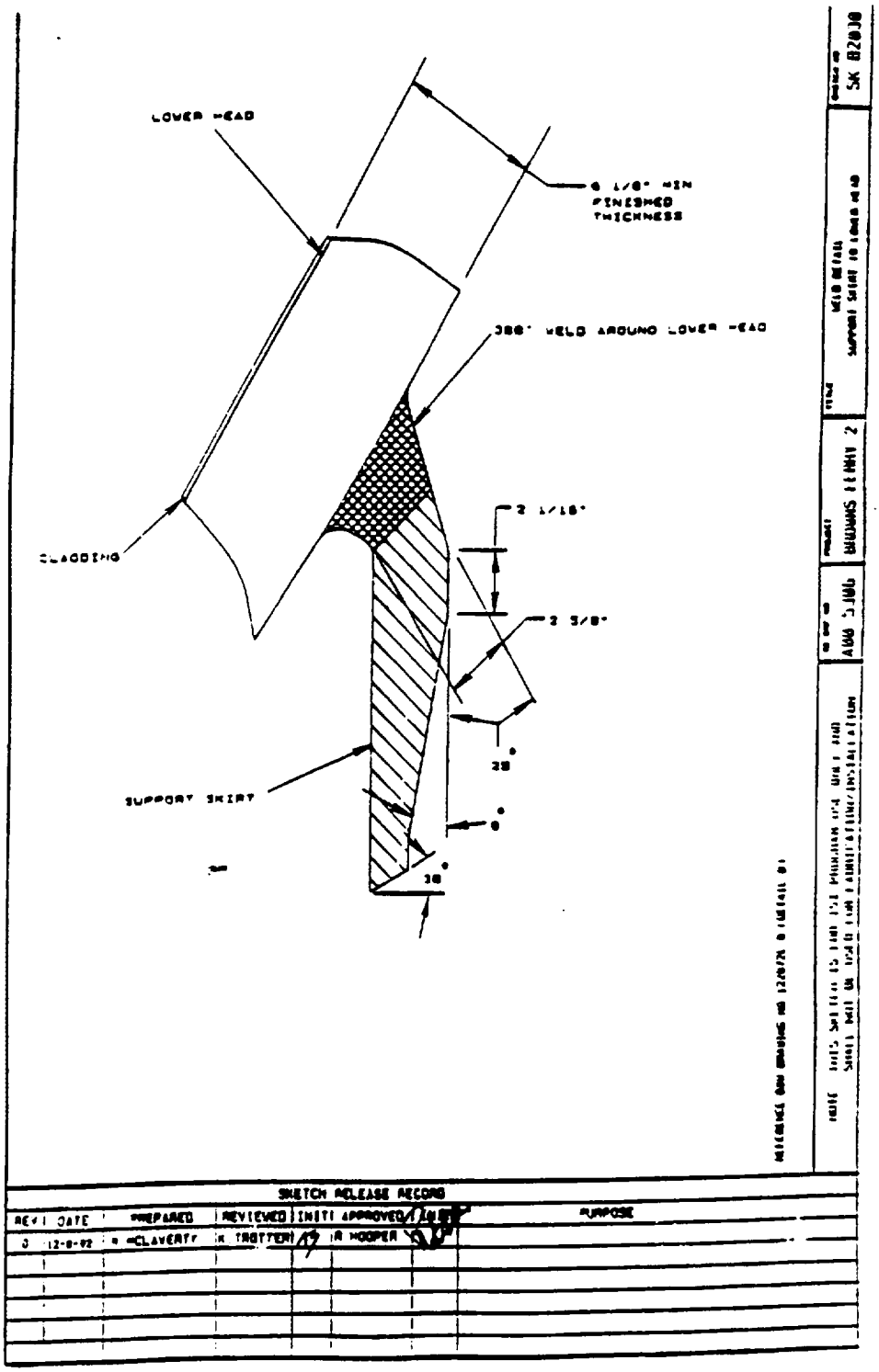
ATTACHMENT #1



2-ISI-10

ATTACHMENT 2

ATTACHMENT #2



2-ISI-10

ATTACHMENT 3

ATTACHMENT #3

CASE
N-323-1

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: December 31, 1996
See Numerical Index for expiration and any reaffirmation dates.

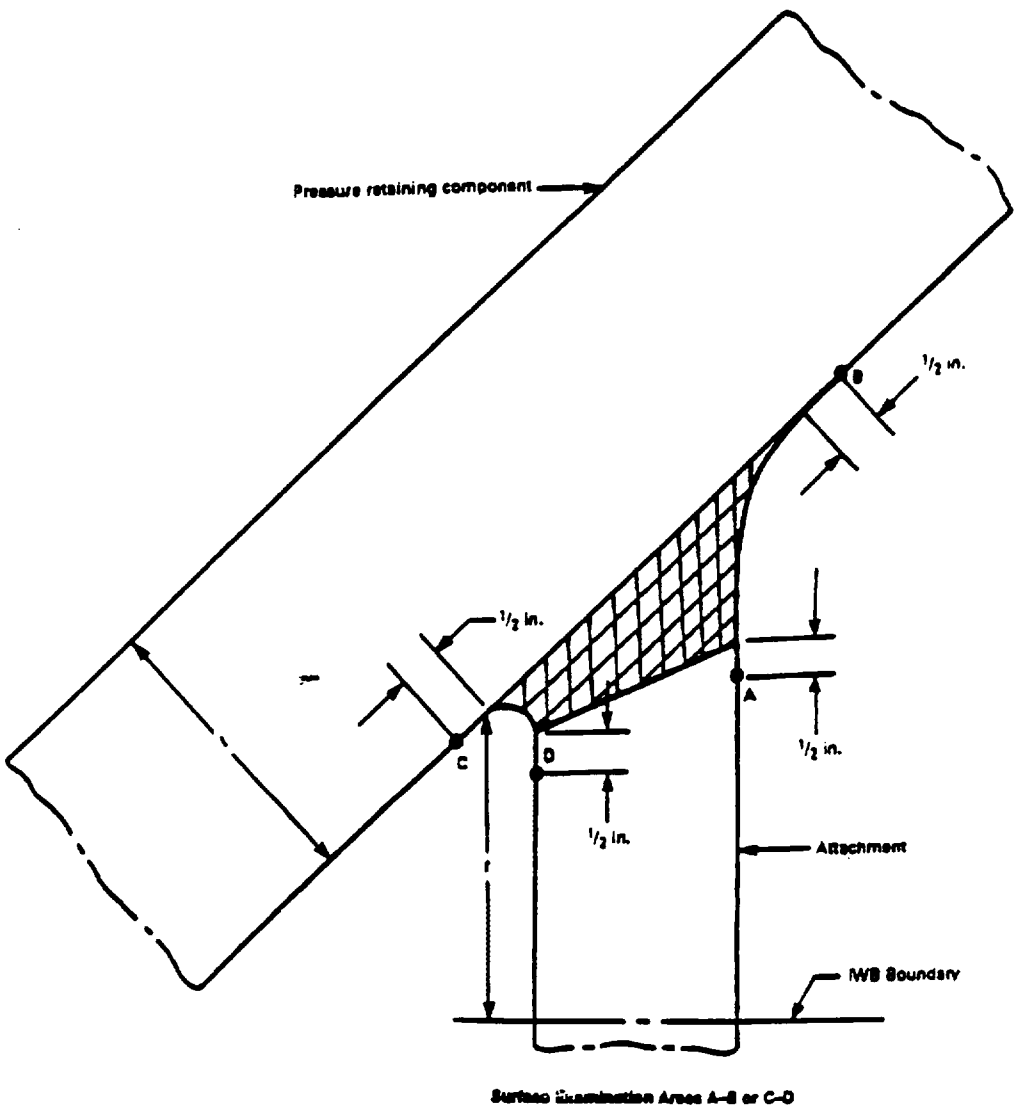
Case N-323-1
Alternative Examination for Welded Attachments to Pressure Vessels
Section XI, Division 1

E *Inquiry:* What alternative to the requirements of Examination Category B-K of the 1995 Addenda or Examination Category B-H from the Winter 1981 Addenda, through the 1995 Edition may be performed for welded attachments to pressure vessels as shown in Figs. 1 and 2 when only one side of the attachment weld is accessible for examination?

E *Reply:* It is the opinion of the Committee that as an alternative to the requirements of Examination Category B-K of the 1995 Addenda or Examination Category B-H from Winter 1981 Addenda to the 1995 Edition:

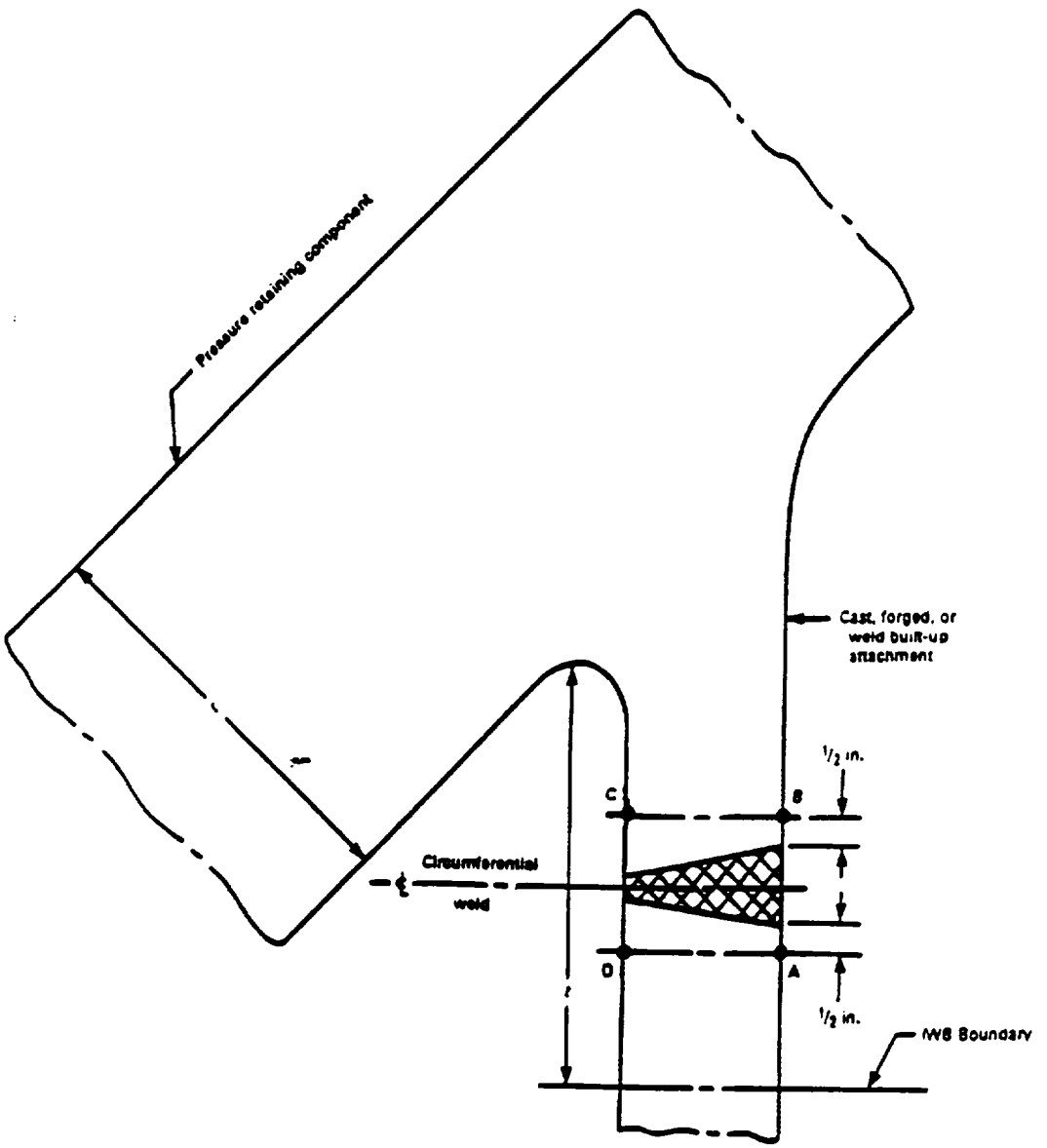
(a) for the configuration shown in Figs. 1 and 2, a surface examination from the accessible side of the attachment weld may be performed or;

(b) for the configuration shown in Fig. 2, a volumetric examination of Volume A-B, C-D from the accessible side of the attachment weld may be performed.



Surface Examination Areas A–B or C–D

FIG. 1 WELDED ATTACHMENT



Surface Examination Areas A–B or C–D

FIG. 2 WELDED ATTACHMENT

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 2
ASME SECTION XI INSERVICE INSPECTION PROGRAM
(THIRD TEN YEAR INSPECTION INTERVAL)

REQUEST FOR RELIEF 2-ISI-13

Executive Summary: Pursuant to 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from the identified ASME Section XI Code requirements related to examination and testing of snubbers. TVA proposes to continue to use the examination and testing plans currently defined in the BFN Technical Requirements Manual (TR 3.7.4). The current Technical Requirement Manual criteria have been promulgated and approved by the NRC, while ASME Section XI imposes overlapping requirements which do not enhance the quality or safety of the snubber examination and testing program.

Unit: Two (2)

System: Various

Components: Component/Piping Snubbers

ASME Code Class: 1, 2, and 3

Section XI Edition: 1995 Edition, 1996 addenda

Code Table: N/A

Examination Category: N/A

Examination Item Number: N/A

Requirement From Which Relief Is Requested: The 1995 Edition, 1996 Addenda of ASME Section XI, Article IWF-1000 provides the requirements for inservice inspection (ISI) of Class 1, 2, 3, and MC component supports. This includes the visual examination of

snubbers. Article IWF-5000 contains the inservice test requirements (IST) for snubbers.

Basis For Relief: ASME Section XI, Class 1, 2, and 3 equivalent snubbers are examined and tested in accordance with BFN Plant Technical Requirements Manual (TRM), TR 3.7.4, TR 3.7.4. The TRM is prepared in accordance with the guidance provide by the 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 examination would also be required to be certified in accordance with the American Society of Nondestructive Examination (ASNT) SNT-TC-1A "Personnel Qualification and Certification in Nondestructive Testing" and ANSI/ASNT CP-189. This is an additional qualification and 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 the NRC.

Implementing the ASME Section XI, 1995 Edition, 1996 Addenda would be a duplication of an existing program accepted by the NRC without a compensating increase in the level of quality and safety.

Alternative Examination: The BFN TRM, TR 3.7.4, requirements will be utilized for the examination and testing of snubbers for preservice, inservice, and

repairs/replacement activities. The procedures utilized for these examinations are:

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

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

2-SI-4.6.H-2B, "Functional Testing of Bergen-Patterson Hydraulic Snubbers"

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

MPI-0-000-SNB-002, "Hydraulic Shock and Sway Arrestor Bergen-Patterson Unit Disassembly and Reassembly"

MPI-0-000-SNB-004, "Instructions for Removing and Reinstalling Pacific Scientific Mechanical, Bergen-Patterson Grinnell Hydraulic, and Torus Dynamic Restraints"

This will include the pin-to-pin area inclusive of applicable snubbers. Testing of repaired and replaced snubbers 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-0-000SNB-004, "Instructions for Removing and Reinstalling Pacific Scientific Mechanical, Bergen-Patterson Grinnell Hydraulic, and Torus Dynamic Restraints."

Snubber examination and testing data will be maintained in accordance with the requirements of TR 3.7.4, the site corrective action program, SSP-3.1, and the implementing procedures (2-SI-4.6.H-1, 2-SI-4.6.H-2A, 2-SI-4.6.H-2B, 2-SI-4.6.H-2C, MPI-0-000-SNB-002, and MPI-0-000-SNB-004).

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

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 ASME/ANSI OM, part 4 ASME Section XI Code 1995 Edition, 1996 Addenda requirements. The current program, as defined by TR 3.7.4, utilizes NRC guidance not included in the 1995 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 Generic Letter 90-09. ASME Section XI, 1995 Edition, 1996 Addenda has a different basis for the examination and testing plans. It is impractical to implement the requirements of both programs because of the resulting duplication of examination and testing efforts; e.g. 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 the NRC. The difference in the two programs could create confusion when selecting test samples, applying acceptance criteria, corrective actions, and examination schedules for failed snubbers. This situation would increase the possibility of applying the wrong action due to conflicting requirements thus creating a nonconformance condition, 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 proposed to examine and test snubbers in accordance with BFN TR 3.7.4.

Subarticle IWF-5400 of the 1995 Edition, 1996 Addenda of the code provides the

requirements for repair and replacement of snubbers to be in accordance with IWA-4000. IWF-5200 provides that examinations shall be performed in accordance with ASME/ANSI OM, Part 4 TR 3.7.4 (TSR 3.7.4.6). This program requires replacement snubbers and snubbers that 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-SNB-004 provides visual examination criteria for installation of a snubber after repair or replacement. The ASME Section XI repair/replacement program at BFN documents the verification of acceptability for repairs and replacements per 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 as 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 requirements and 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 the oversight of the TRM snubber program implementation for both the 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 the oversight that ensures an acceptable level of quality and safety exist without ANII involvement in these activities. ANII involvement will be maintained in 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.

ASME Section XI, 1995 Edition, 1996 Addenda Subarticle IWA-6230 provides requirements for ISI and IST documentation for snubbers in the framework of a summary report. Under the alternate requirements for snubbers, there will be no ASME Section XI ISI and IST to document in a summary report. TR 3.7.4 is implemented by surveillance instructions 2-SI-4.6.H-1, 2-SI-4.6.H-2A, 2-SI-4.6.H-2B, and 2-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. They include data sheets for documenting the visual examination and functional test data and results, 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 alternate ISI and IST program, including the generated QA records documenting snubber ISI and IST provides an acceptable level of quality and safety when compared to the requirements of ASME Section XI, 1995 Edition 1996 Addenda.

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 requests that relief be granted from the ASME Section XI, 1995 Edition, 1996 Addenda requirements related to ISI and IST of snubbers.

TVA's relief is consistent with request for relief 3-ISI-2 submitted by TVA letters dated January 22, 1997, and October 29, 1998, for the BFN Unit 3 Second Ten Year Inservice Inspection Interval. The NRC staff approved the request for relief by letter dated May 3, 1999.

Implementation Schedule:

This request for relief is applicable to the Third Ten Year Inservice Inspection Interval for BFN Unit 2.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT
UNIT 2
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI, INSERVICE INSPECTION (ISI) PROGRAM
THIRD 10-YEAR INTERVAL

REQUEST FOR RELIEF 2-ISI-14

Executive Summary: TVA is requesting to use the alternate requirements in ASME Code Case N-532 in lieu of the NIS-1 and NIS-2 Outage Summary Reports for certification of ASME Section XI inspections and repair and replacement activities. Code Case N-532 requires the same level of assurance and third party certification as the current NIS-1 and NIS-2 forms. Also, Code Case N-532 requires additional information to be provided at the end of each inspection period (i.e., 3.3, 6.7 and 10.0 years) within the ten-year inspection interval related to percentage of examinations completed.

TVA concludes that Code Case N-532 provides an equal or superior degree of information related to repairs/replacements and ISI examinations completed when compared to the NIS-1 and NIS-2 Summary Reports.

Components: NIS-1 and NIS-2 Summary Reports

Code Class: 1, 2, and 3

Examination Category: N/A

Examination Item Number: N/A

Code Requirement: 1995 Edition, 1996 Addenda, of ASME Section XI, IWA-6210 (c), and IWA-6210(d) and (e) requirements for NIS-1 and NIS-2 summary report preparation and submittal, IWA-6230 (b), (c) and (d), IWA-6240 and IWA-6310. [The references to IWA-6000 are the equivalent references from the 1995 Edition 1996 Addenda of ASME Section

XI to the references in Code Case N-532 from the 1992 Edition of ASME Section XI]

Code Requirement From Which Relief Is Requested:

In accordance with 10CFR50.55a(a)(3)(i), relief is requested to use Code Case N-532, "Alternative Requirements to Repair and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000: Section XI, Division 1" in lieu of the 1995 Edition 1996 Addenda ASME Section XI requirements listed above.

Basis For Relief:

The 1995 Edition 1996 Addenda of ASME Section XI requires the preparation and submittal of NIS-1 and NIS-2 summary reports within 90 days of the completion of each refueling outage. This requires resources to be diverted from restart of the applicable unit to preparation of the NIS-1 and NIS-2 within the prescribed time frame. It also presents an unnecessary time constraint on the utility for submittal of the summary reports to NRC.

Code Case N-532 allows an alternate method for the certification of repairs and replacements in conjunction with the preparation and submittal of the Owner's Activity Report (OAR). Code Case N-532 requirements for submittal of the OAR to NRC at the end of the inspection period, which allows flexibility of resources at the end of a refueling outage. The information required for Form NIS-2A, "Repair/Replacement Certification Record," and OAR-1, "Owner's Activity Report" provide the same level of assurance and third party certification as the corresponding NIS-2, "Owner's Report for Repairs and Replacements", and NIS-1, "Owner's Report for Inservice Inspections" from the 1995 Edition 1996 Addenda of ASME Section XI. Code Case N-532 requires additional information to be provided at the end of the inspection period, related to percentage of examinations completed, that assures both the Owner and NRC Code compliance has been achieved.

It is concluded that Code Case N-532 provides an equal or superior degree of information related to repairs/replacements and ISI examinations

completed when compared to the NIS-1 and NIS-2 required by the 1995 Edition 1996 Addenda of ASME Section XI Code.

Alternate Examinations: None Required.

Justification For The Granting Of Relief:

Code Case N-532 was developed by ASME Section XI as an alternative to the provisions in ASME Section XI related to repair/replacement documentation and inservice summary report preparation. The requirements currently prescribed by the 1995 Edition 1996 Addenda of ASME Section XI result in preparation of the NIS-1 and NIS-2 summary reports for submittal to NRC within 90 days of each refueling outage. Code Case N-532 makes similar information available for review at the plant site and requires submittal of the OAR form at the end of the ISI inspection period. The information presented in the OAR is more concise than that currently required by the NIS-1 and NIS-2. This request for relief is consistent with one submitted for BFN Unit 3 (3-ISI-6) by TVA letter dated January 22, 1997, and accepted by NRC letter dated May 21, 1999.

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

Implementation Schedule: Code Case N-532 will be implemented during the Third 10-year ISI inspection interval for Browns Ferry Unit 2.

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

2-ISI-14

Attachment 1

Approval Date: December 12, 1994

See Numeric Index for expiration and any reaffirmation dates.

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

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

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

1.0 CERTIFICATION OF THE REPAIR OR REPLACEMENT

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

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

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

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

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

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

2.0 OWNER'S ACTIVITY REPORT PREPARATION AND SUBMITTAL

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

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

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

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

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

FORM NIS-2A REPAIR/REPLACEMENT CERTIFICATION RECORD

OWNER'S CERTIFICATE OF CONFORMANCE

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

Plan number _____ conforms to the requirements of Section XI.

Type Code Symbol Stamp _____

Certificate of Authorization No. _____ Expiration Date _____

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

CERTIFICATE OF INSERVICE INSPECTION

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

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

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

Date _____

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

FORM OAR-1 OWNER'S ACTIVITY REPORT

Report Number _____

Owner _____
(Name and Address of Owner)

Plant _____
(Name and Address of Plant)

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

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

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

Edition and Addenda of Section XI applicable t the inspectin plan _____

Date and revision of inspection plan _____

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

_____

CERTIFICATE OF CONFORMANCE

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

Certificate of Authorization No. _____ (if applicable) Expiration Date _____

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

CERTIFICATE OF INSERVICE INSPECTION

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

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

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

Date _____

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

TABLE 1
ABSTRACT OF EXAMINATIONS AND TESTS

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

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

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

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

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

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 2
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI,
SYSTEM PRESSURE TEST PROGRAM
THIRD TEN-YEAR INSPECTION INTERVAL

SYSTEM PRESSURE TEST (SPT) PROGRAM

(SEE ATTACHED)

BFN UNIT 2

SYSTEM PRESSURE TEST PROGRAM

1995 EDITION, 1996 ADDENDA OF ASME-XI CODE

INSERVICE SYSTEM PRESSURE TEST PROGRAM
FOR THE THIRD 10-YEAR INTERVAL

BROWNS FERRY NUCLEAR PLANT
UNIT 2

INSERVICE PRESSURE TEST PROGRAM

Owner:	Tennessee Valley Authority
Address of Corporate Office:	Knoxville Office Complex 400 Commerce Avenue Knoxville, Tennessee 37902
Name and Address of Nuclear Power Plant:	Browns Ferry Nuclear Plant Post Office Box 2000 Decatur, Alabama 35609-2000
Applicable Nuclear Units:	Browns Ferry Nuclear Plant Unit 2
Commercial Operation Date:	March 1, 1975

TABLE OF CONTENTS

1.0 STATEMENT OF APPLICABILITY

This program outlines the requirements for performing ASME Section XI system pressure tests during the third 10-year inspection interval for Browns Ferry Nuclear Plant (BFN) Unit 2 systems which are classified ASME Code Class 1, 2 or 3 or equivalent, and contain water, steam or radioactive waste (other than radioactive waste management system).

Pressure tests will be performed in accordance with the Section XI Editions, Addenda, Code Cases, Requests for Relief and additional provisions specified below. Details concerning performance of system pressure tests are not part of this program outline, but are contained in plant surveillance instructions. Performance of pressure tests required because of Repair/Replacement activities will be prescribed and controlled by the work documents performing the Repair/Replacement work. Section XI pressure testing of Class MC components following Repair/Replacement work will be performed under these same requirements.

The requirements of this program are applicable during the third 10-year inspection interval which begins on May 25, 2001.

2.0 PURPOSE

This program is designed to meet the requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code which pertain to the inservice pressure testing of pressure retaining code class 1, 2 and 3 components, and pressure testing required following Repair/Replacement activities (including Class MC), at BFN during the third 10-year inspection interval. Compliance with Section XI of the ASME Boiler and Pressure Vessel Code is required by Part 50 of Title 10 of the Code of Federal Regulations.

3.0 INSPECTION INTERVAL AND INSPECTION PERIODS

The third 10-year inspection interval for BFN Unit 2 begins on May 25, 2001. The third 10-year inspection interval will end in May 2011, and

will be divided into three inspection periods, three years, four years and three years respectively. The dates of the three inspection periods are:

First inspection period - May 25, 2001 to May 24, 2004

Second inspection period - May 25, 2004 to May 24, 2008

Third inspection period - May 25, 2008 to May 24, 2011

4.0 CODES OF RECORD

4.1 PRIMARY CODE EDITION

This program is prepared to meet the requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1995 Edition through the 1996 Addenda.

4.2 ADOPTED PORTIONS OF LATER EDITIONS AND ADDENDA

None.

4.3 ADOPTED ASME SECTION XI CODE CASES

Code Case N-416-1 - Alternative Pressure Test Requirements for Welded Repairs or Installation of Replacement Items by Welding. (with additional conditions listed in Regulatory Guide 1.147, Revision 12)

Code Case N-498-1 - Alternative Requirements for 10-year System Hydrostatic Pressure Testing for Class 1, 2, and 3 Systems.

Code Case N-522 - Pressure Testing of Containment Penetration Piping when piping and isolation valves are Class 2 and the balance of the piping system is outside the scope of Section XI. (with additional conditions listed in Regulatory Guide 1.147, Revision 12)

4.4 ADDITIONAL PROGRAM PROVISIONS

In addition to the requirements prescribed in the ASME Boiler and Pressure Vessel Code, 1995 Edition through the 1996 Addenda, BFN will institute additional test condition holding time provisions similar to those described in IWA-5213 of the 1989 Edition of the Code and clarified as follows. Section IWA-5211 and Table IWA-5210-1 of the 1989 Edition provided test descriptions and cross-referenced Code Class test requirements. BFN will use those general definitions and that logic to implement the additional test condition holding time provisions.

For the purposes of these additional hold time provisions the system leakage test as described in IWA-5211(a) 1995 Edition/1996 Addendum will be broken into categories as described in IWA-5211(a),(b), and (c) and IWA-5213(a),(b), and (c) of the 1989 Edition. These hold time requirements are from the 1989 Edition and will be in addition to the 1995 Edition/1996 Addendum Code requirements.

Class 1 system leakage tests will follow IWA-5213(a).

Class 2 system leakage tests for standby systems will follow IWA-5213(b).

Class 2 system leakage tests for in service systems will follow IWA-5213(c).

Class 3 system leakage tests for standby systems will follow IWA-5213(b).

Class 3 system leakage tests for in service systems will follow IWA-5213(c).

Note: System hydrostatic and pneumatic test hold time requirements are almost identical in both subject editions of the Code. System hydrostatic and pneumatic tests will follow the requirements of the 1995 Edition/1996 Addendum of the Code.

5.0 REQUEST FOR RELIEF

All requests for relief (RFR) from the requirements of Section XI of the ASME Boiler and Pressure Vessel Code which pertain to inservice pressure tests shall be submitted to the United States Nuclear Regulatory Commission (NRC) for approval pursuant to paragraph 50.55a(a)3 of Title 10 of the Code of Federal Regulations Part 50.

Upon approval by NRC, all RFRs and commitments for alternate testing shall become part of this program. The RFRs listed below pertain to the Third 10-year inspection interval for BFN Unit 2.

2-SPT-10, Rev. 2	(Code Case N-546) - Alternate Requirements for Qualification of VT-2 Examination Personnel
2-SPT-11, Rev. 2	(Code Case N-566) - Corrective Action for Leakage Identified at Bolted Connections

6.0 TENTATIVE SYSTEM PRESSURE TEST SCHEDULE

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN), UNIT 2

SYSTEM DESCRIPTION	CODE CLASS	UNIT 2 FUEL CYCLE				
		12	13	14	15	16
Reactor Recirculation (Primary system)	1	L[1]	L[1]	L[1]	L[1]	L[1, 5]
Main Steam System	2	L		L		L
Drywell Equipment and Floor Drain penetrations	2	L		L		L
Fuel Pool Cooling	3	L		L		H
Standby Liquid Control	2	L		L		L
Core Spray	2		L[2]		L[3]	L
Control Rod Drive	2		L[2]		L[3]	L
Residual Heat Removal	2	L		L		L
High Pressure Coolant Injection	2	L		L	L[4]	
Reactor Core Isolation Cooling	2		L[2]		L[3]	L
Reactor Building Closed Cooling Water penetrations	2	L		L	L[4]	
RHR Service Water	3	L		L		H
Emergency Equipment Cooling Water	3		L[2]		L[3]	H

LEGEND: L - System leakage test {IWA-5211(a)}

H - System hydrostatic test {IWD-5222 & IWA-5211(b)}, or code case N-498-1 equivalent

Notes:
[1] - Cycle refueling outage prior to startup
[2] - Before 5/24/2004
[3] - Before 5/24/2008

[4] - After 5/25/2008
[5] - All Class 1 pressure retaining components {IWB-5222(b)}

Note: Code references in this section are from the 1995 Edition/1996 Addendum.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 2
ASME SECTION XI, SYSTEM PRESSURE TEST (SPT) PROGRAM
(THIRD INSPECTION INTERVAL)

REQUEST FOR RELIEF 2-SPT-10, REVISION 2
(ASME CODE CASE N-546)

EXECUTIVE SUMMARY:

As a proposed alternative, in accordance with 10 CFR 50.55a(a)(3)(i), to the VT-2 visual inspection qualification requirements (ASME Code Section XI, Subarticle IWA-2300) it is requested that trained, experienced, plant personnel that meet specific vision requirements be qualified to perform the required ASME Section XI leakage inspections. ASME Code Case N-546 (Attachment A) specifies alternate requirements for VT-2 inspectors.

TVA previously submitted similar requests for relief for BFN Unit 2 identified as 2-SPT-10 for NRC review. A revised version of 2-SPT-10 was accepted for use at BFN Unit 2 by NRC letter dated October 16, 1997. Revision 2 of this RFR is consistent with that approved request.

UNIT: BFN Unit 2

ISI INTERVAL: Third ASME Section XI ISI/SPT Interval,
(Start Date: May 25, 2001)

SYSTEMS: Various American Society of Mechanical Engineers (ASME) Section XI Systems

COMPONENTS: Class 1, 2, 3 and MC Pressure Retaining Components

CODE CLASS: 1, 2, 3 and MC

FUNCTION: Pressure Retaining Boundary

ASME CODE REQUIREMENT(S): ASME Section XI, 1995 Edition through 1996 Addenda, Subarticle IWA-2300 requires that personnel performing VT-2 visual examinations be qualified and certified using a written, approved procedure prepared in accordance with SNT-TC-1A and the additional requirements of Division 1 of ASME Section XI.

ASME CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED: Relief is requested from the inspector qualification requirements stipulated in ASME Section XI, Subsection IWA-2300.

BASIS FOR RELIEF: In accordance with 10 CFR 50.55a(a)(3)(i) TVA proposes to use an alternative to the ASME Section XI Code requirement specified above. The use of Code Case N-546, "Alternative Requirements for Qualification of VT-2 Examination Personnel," will allow experienced plant personnel to perform VT-2 visual examinations during the performance of system pressure tests and provide an acceptable level of quality and safety.

Experienced plant personnel are knowledgeable of the plant systems and routinely perform walkdowns of plant systems looking for abnormalities such as leaks in piping systems. They are more familiar with the location of piping systems and can therefore perform VT-2 examinations in a more timely manner. Using experienced plant personnel will also eliminate the need for hiring additional personnel fully certified to IWA-2300. This is especially pertinent during refueling outages when pressure

tests are performed and the number of IWA-2300 certified personnel are limited.

Since the VT-2 examination is a check for the evidence of leakage, the use of plant personnel qualified to the N-546 alternative requirements, and who typically perform this type of examination during their daily activities, will not compromise the quality or safety of the systems examined.

TVA considers the ASME Code Case N-546 requirements to be an acceptable alternative to the qualification of VT-2 (visual examination personnel) using a written, approved procedure prepared in accordance with SNT-TC-1A and the additional requirements of ASME Section XI, Division 1.

ALTERNATIVE REQUIREMENTS:

As an alternative to the existing ASME Section XI requirements, BFN will utilize the provisions of ASME Code Case N-546 and additional criteria. ASME Code Case N-546 states:

1. Personnel must have at least 40 hours plant walkdown experience, such as that gained by licensed and non-licensed plant operators, local leak rate personnel, system engineers, and inspection and non-destructive examination personnel.

2. Individuals must have at least four hours of training in Section XI requirements and plant specific procedures for visual examinations.

3. Each person must meet (annual) vision test requirements in

accordance with the 1995 Edition of the ASME Section XI Code, Paragraph IWA-2321. (Note: IWA-2321 was not changed between the 1995 Edition and the 1996 Addenda.)

In addition to the requirements of ASME Code Case N-546, TVA will also:

1. Develop procedural guidelines for obtaining consistent quality VT-2 visual examinations.

2. Document and maintain records to verify the qualifications of personnel selected to perform VT-2 visual examinations.

3. Implement independent review and evaluation of leakage by persons other than those that performed the VT-2 visual examinations.

JUSTIFICATION FOR GRANTING RELIEF:

The use of Code Case N-546, with the additional requirements listed, will allow experienced plant personnel to perform VT-2 visual examinations following maintenance, modifications, and during the performance of system pressure tests. Experienced plant personnel are knowledgeable of the plant systems and routinely perform walkdowns of plant systems looking for abnormalities such as leaks in piping systems. They are more familiar with the location of piping systems and can therefore, perform VT-2 examinations in a more timely manner.

Using experienced plant personnel will also eliminate the need for hiring additional personnel fully

certified to IWA-2300, especially during refueling outages when pressure tests are performed and the number of IWA-2300 certified personnel are limited.

Since the VT-2 examination is an examination for the evidence of leakage, the use of plant personnel qualified to the N-546 alternate requirements, and who typically perform this type of examination during their daily activities, will not compromise the quality or safety of the systems examined.

TVA considers the ASME Code Case N-546 requirements to be an acceptable alternative to the qualification of VT-2 (visual examination personnel) using a written, approved procedure prepared in accordance with SNT-TC-1A and the additional requirements of ASME Section XI, Division 1.

IMPLEMENTATION SCHEDULE: The request for relief is applicable to the BFN Unit 2, ASME Section XI Program, third inspection interval.

ATTACHMENT: Attachment 1, ASME Code Case N-546, Alternative Requirements for Qualification of VT-2 Examination Personnel

2-SPT-10, Revision 2

ATTACHMENT 1

Approval Date: August 24, 1995

See Numeric Index for expiration and any reaffirmation dates.

Case N-546
Alternative Requirements for Qualification of VT-2 Examination Personnel
Section XI, Division 1

Inquiry: What alternative to the requirements of IWA-2300 may be used for qualification of VT-2 visual examination personnel?

Reply: It is the opinion of the Committee that VT-2 visual examination personnel need not be qualified nor certified to comparable levels of competence in accordance with the referenced standard (i.e., ANSI N45.2.6, ASNT SNT-TC-1A, or ASNT CP-189) provided the examination personnel are qualified in accordance with the following requirements.

(a) At least 40 hr plant walkdown experience, such as that gained by licensed and nonlicensed operators, local leak rate personnel, system engineers, and inspection and nondestructive examination personnel.

(b) At least 4 hr of training on Section XI requirements and plant specific procedures for VT-2 visual examination.

(c) Vision test requirements of IWA-2321, 1995 Edition.

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 2
ASME SECTION XI, SYSTEM PRESSURE TEST (SPT) PROGRAM
THIRD TEN-YEAR INSPECTION INTERVAL

REQUEST FOR RELIEF 2-SPT-11, REVISION 2
(ASME CODE CASE N-566)

EXECUTIVE SUMMARY:

As a proposed alternative, in accordance with 10 CFR 50.55a(a)(3)(i), to the mandatory removal of bolting from leaking bolted connections (ASME Code Section XI, Subarticle IWA-5250(a)(2)) it is requested that a corrective action plan should be allowed following a specific evaluation of the bolted connection structural integrity and susceptibility of the bolting to corrosion and potential failure. The corrective action plan may or may not require removal of bolting.

TVA previously submitted similar requests for relief for BFN Unit 2 identified as 2-SPT-11 for NRC review. A revised version of 2-SPT-11 was accepted for use at BFN Unit 2 by NRC letter dated June 12, 1998. Revision 2 of this RFR is consistent with that approved request.

The approved RFR was based on Code Case N-566, however Code Case N-566 does not prescribe or reference any specific variables or conditions which should be part of the bolted connection evaluation. Subsequent review by TVA of NRC accepted relief requests from Oyster Creek and V.C. Summer (NRC letters dated October 3, 1996, and September 22, 1997) indicate that an evaluation option may be acceptable to the staff

provided a similar minimum set of evaluation variables and corrective actions are prescribed in the request for relief.

UNIT: BFN Unit 2

ISI INTERVAL: Third ASME Section XI ISI/SPT Interval, (Start Date: May 25, 2001)

SYSTEMS: Various American Society of Mechanical Engineers (ASME) Section XI Systems

COMPONENT: Class 1, 2, 3 and MC bolted connections that have leakage identified in the course of an IWA-5000 pressure test.

CODE REQUIREMENT: ASME Section XI, 1995 Edition through 1996 Addenda, Subarticle IWA 5250(a)(2) requires that the source of leakage detected during the conduct of a system pressure test shall be located and evaluated by the Owner for corrective measures. If leakage occurs at a bolted connection on other than a gaseous system, one of the bolts shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100. The bolt selected shall be the one closest to the source of leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100.

CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED: Relief is requested from the requirement in ASME Section XI, Subarticle IWA-5250(a)(2) which, in all cases, requires removal of

bolting from leaking bolted connections (which were identified in the course of an IWA-5000 pressure test).

BASIS FOR RELIEF:

Relief from the bolt removal requirements of IWA-5250(a)(2) is requested under 10 CFR 50.55(a)(3)(i), in which the proposed alternative provides an acceptable level of quality and safety. Some of the problems associated with the current requirements of IWA-5250(a)(2) are summarized as follows:

- IWA-3100 does not provide an acceptance standard for a VT-3 bolt inspection.
- The requirement calls for bolt removal without regard to the size of the leakage or the corrosiveness of the fluid.
- The requirement increases the radiological dose to workers for leaks that are often not a challenge to operational or structural limits.
- Bolts sometimes cannot be removed without damaging the bolt or cannot be removed due to component configuration.
- It is not a requirement of the Code that the licensee must stop the leakage, and inspection of the bolting is not necessarily going to stop the leak.
- Removing one bolt at a time, if allowed by system conditions, may actually increase the leakage.

- In many cases, implementation of the requirement may cause the plant an unnecessary transient or delay startup.

In addition to the problems associated with the requirements of IWA-5250(a)(2), the ASME Working Group-Pressure Testing concluded that the system integrity of a bolted connection is not necessarily compromised by leakage and recommended the approval of Code Case N-566. This relief request is essentially a conservative subset of the Code Case.

ALTERNATIVE EXAMINATIONS:

As an alternative to the existing Section XI requirements, the source of all leakage at bolted connections detected by VT-2 examination during a system pressure test shall be evaluated to determine the susceptibility of the bolting to corrosion and potential failure. This evaluation will consider the following variables at a minimum:

- Location of leakage
- History of leakage
- Fastener materials
- Evidence of corrosion, with the connection assembled
- Corrosiveness of the process fluid
- History and studies of similar fastener material in a similar environment
- Other components in the vicinity that may be degraded due to the leakage

When the evaluation of the above variables is concluded, and if the evaluation determines that the leaking condition has not degraded the fasteners, then no further

action is required. However, reasonable attempts to stop the leakage shall be taken.

If the bolted connection evaluation, using the variables above, indicates the need for further evaluation, or if no evaluation is performed, then a bolt closest to the source of leakage shall be removed. The bolt will receive a VT-1 examination and will be evaluated for corrosion in accordance with IWA-3100(a) and dispositioned in accordance with IWB-3140 or IWC-3130, as applicable. If the information from the bolted connection evaluation is supportive, the removal of the bolt for VT-1 examination may be deferred to the next refueling outage. When the removed bolting shows evidence of rejectable degradation, all remaining bolts, in the connection, shall be removed and receive a VT-1 examination and evaluation in accordance with IWB-3140 or IWC-3130, as applicable.

JUSTIFICATION FOR GRANTING RELIEF:

This relief request is more prescriptive and more conservative than Code Case N-566. It also addresses many of the implementation and radiological hardships associated with IWA-5250(a)(2) and maintains the conclusions of the ASME Committee by assuring that a proper evaluation of the connection and/or the bolting is performed. The bolted connection evaluation must consider specific factors which, if indicative of degradation, must be dispositioned in accordance with IWB-3140 or IWC-3130, as applicable, of ASME Section XI. Due to the fact that the bolted connection evaluation is more comprehensive than the simple bolt

inspection currently required by IWA-5250, coupled with the benefit that these alternative requirements ensure structural integrity is maintained, and reduce the operational, maintenance, and radiological hardships of the current requirements, this relief request provides an acceptable level of quality and safety and should be considered as an acceptable alternative in accordance with 10 CFR 50.55a(a)(3)(i). This conclusion is further supported by the fact that the ASME has approved Code Case N-566 and this relief request is essentially a conservative subset of the Code Case.

IMPLEMENTATION SCHEDULE: This request for relief is applicable to the BFN Unit 2, ASME Section XI Program, Third ISI Inspection Interval.

ATTACHMENT: Attachment 1, ASME Code Case N-566, Corrective Action for Leakage Identified at Bolted Connections

2-SPT-11, Revision 2

Attachment 1

Approval Date: August 9, 1996

See Numeric Index for expiration and any reaffirmation dates.

Case N-566
Corrective Action for Leakage Identified at Bolted Connections
Section XI, Division 1

Inquiry: What alternative to the requirements of IWA-5250(a)(2) may be used when leakage is detected at bolted connections?

Reply: It is the opinion of the Committee that, as an alternative to the requirements of IWA-5250(a)(2), one of the following requirements shall be met for leakage at bolted connections:

(a) The leakage shall be stopped, and the bolting and component material shall be reviewed for joint integrity.

(b) If the leakage is not stopped, the joint shall be evaluated in accordance with IWB-3142.4 for joint integrity. This evaluation shall include consideration of the number and condition of bolts, leaking medium, bolt and component material, system function, and leakage monitoring.