

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

SURVEILLANCE INSTRUCTION

1/3-SI-4.6.G

INSERVICE INSPECTION PROGRAM UNITS 1 and 3

REVISION 0

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TENNESSEE VALLEY AUTHORITY
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1/3-SURVEILLANCE INSTRUCTION-4.6.G

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UNITS 1 and 3

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1.0 STATEMENT OF APPLICABILITY

This program outlines details for planning and performing the first interval inservice inspection (ISI) nondestructive examinations (NDEs) for Units 1 and 3 of Browns Ferry Nuclear Plant (BFN) Code Class 1, 2 and 3 equivalent components. The program is organized to fulfill ISI requirements of SSP-6.10, ASME Section XI Inservice Inspection Program; the 1974 Edition, Summer 1975 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code; and applicable portions of the BFN Technical Specification Surveillance Requirement 4.6.G. In accordance with 10 CFR Part 50, 50.55a(g), this program meets the ISI requirements to the extent practical.

Specifics concerning performance of NDE are not a part of this program but are included in NDE procedure QMP 110.5.

ASME Section XI Boundary Drawings and ISI Drawings listed in Appendix B are issued and controlled through BFN Document Control and Records Management (DCRM) and are prepared/revised by ISI Programs.

2.0 PURPOSE

The ISI Program is employed to obtain data which can be used to determine if a component flaw is individual or of a generic nature, which would signal for examination of like components in the system.

Personnel responsible for performance of the examinations should familiarize themselves with the requirements of this program prior to performing the examinations.

The examinations required by this program will establish acceptance for continued use of components during operation.

The ISI Program reflects the built-in limitations caused by original plant design, geometry, construction component materials, and the current technology or state-of-the-art nondestructive testing. The ISI Program will also detail components to be examined, examination methods selected, and schedule charts for planning examinations.

3.0 INSPECTION INTERVALS AND INSPECTION CYCLES

The inservice examinations required by ASME Section XI shall be performed during each inspection interval. The inspection intervals represent calendar years after the unit has been placed into commercial service. The first 10-year interval may be extended by as much as one year to permit inspections to be concurrent with plant outages (if the interval is extended, the following interval shall be decreased by an equivalent amount). If the unit is out of service continuously for one year or more, the inspection interval may be extended for an equivalent period.

The inspection interval shall be separated into three inspection cycles (40-month, 80-month, and 120-month). See Table 3.0-1 for important cycle and interval date information.

3.0 INSPECTION INTERVALS AND INSPECTION CYCLES (continued)

Except for examinations that may be deferred to the end of the inspection interval, the required examinations shall be performed in accordance with the following schedule.

<u>Inspection Cycle</u>	<u>Minimum Examinations Completed, %</u>	<u>Maximum Examinations Completed, %</u>
40-month	25	33-1/3
80-month	50	66-2/3
120-month	100	100

The examinations deferred to the end of the inspection interval shall be completed by the end of the inspection interval.

ISI Program 0-SI-4.6.G incorporated Units 1, 2, and 3 into a concurrent cycle (letter to the Nuclear Regulatory Commission (NRC) L00 801231 705) beginning July 1, 1980. By extending the inspection interval one year (IWA-2400), the 80-month inspection cycle began on July 1, 1981.

TABLE 3.0-1

BROWN FERRY NUCLEAR PLANT
P.O. BOX 2000
DECATUR, AL 35602

<u>UNIT</u>	<u>COMMERCIAL OPERATION</u>	<u>CONCURRENT CYCLE</u>	<u>80-MONTH CYCLE START¹</u>	<u>120-MONTH CYCLE START</u>	<u>END OF FIRST 10-YEAR INTERVAL²</u>
1	8-1-74	7-1-80	7-1-81	11-1-84	One year after startup from extended outage.
3	3-1-77	7-1-80	7-1-81	11-1-84	One year after startup from extended outage.

¹40-month cycle was extended by one year (IWA-2400). The second 10-year interval will only be nine years.

²The program submittal for the second 10-year interval will be based on the code in effect at the time of startup of each unit after the extended outages of the 1984 to 1990's plus time period.

Effective May 24, 1992, the Unit 2 program was incorporated into 2-SI-4.6.G. Units 1 and 3 were incorporated into this program (1/3-SI-4.6.G).

Name and Address of Owner: Tennessee Valley Authority
Chattanooga, Tennessee 37401

4.0 CODES OF RECORD AND CODE CASES

This program was prepared to meet the requirements of the 1974 Edition, Summer 1975 Addenda of Section XI of ASME Boiler and Pressure Vessel Code. Ultrasonic examination technique of piping welds will be in accordance with Appendix III of the 1977 Edition, Summer 1978 Addenda of ASME Section XI (Request for Relief (RFR) ISI-15). Ultrasonic evaluation of piping welds will be in accordance with 1977 Edition, Summer 1978 Addenda of ASME Section XI. The first 40-month inspection cycle requirements for Units 1 and 2 were in accordance with the 1971 Edition, Summer 1971 Addenda of ASME Section XI. Class 2 pressure-retaining bolting which exceeds two inches in diameter shall be volumetrically examined in accordance with Table IWC-2500-1, Examination Category C-D of the 1977 Edition, Summer 1979 Addenda of ASME Section XI. Class 2 pressure-retaining bolting two inches or less in diameter will not be examined (RFR ISI-14).

Beginning January 1, 1992, the preservice inspection (PSI) of pipe welds (Examination Categories B-F, B-J, and C-F) shall be 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 (Reference: RFRs ISI-10 and ISI-15). See Section 14.0 for details.

Code Cases 234, 235, 307-1, 308, 341, 356, 416, 435-1, 460, and 461 have been or shall be used at BFN for the ISI program.

5.0 METHOD OF IMPLEMENTATION AND RESPONSIBILITIES

5.1 ISI Programs responsibilities:

- A. Defining ASME Section XI Code Class 1, 2, and 3 equivalent boundaries in accordance with 10 CFR 50.2, 10 CFR 50.55a, ASME Section XI, and Regulatory Guide 1.26, Revision 3.
- 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. See Appendix B for drawing list.
- C. Preparing/Revising ASME Section XI ISI Drawings that identify the Class 1, 2, and 3 equivalent components (including supports) that require inservice and/or preservice NDE to comply with ASME Section XI requirements. See Appendix B for drawing list.
- D. Preparing/Revising this instruction (ISI Program) and submitting it to:
 1. Site Quality Organization (SQO) for approval and issue as a controlled document.
 2. Site Licensing for subsequent submittal to the NRC.

5.0 METHOD OF IMPLEMENTATION AND RESPONSIBILITIES (continued)

E. Ensuring that this program provides detailed instructions for ISI including the following information as a minimum:

1. The ASME Section XI Code of Record for ISI.
2. The inspection interval.
3. A list of the ASME Section XI Code Class Boundary Drawings.
4. A list of the ASME Section XI ISI Drawings.
5. An examination schedule providing the total number of each code item number, the number of samples for the inspection interval, and the number of samples for each period of the interval.
6. The NDE method to be used for each item number.
7. The ASME examination category and item number for each component.
8. Copies of all RFRs.
9. Name and address of the owner.
10. Name and address of generating plant.
11. Name or number designation of the unit.
12. Commercial operation date of the unit.
13. A description of the system for maintaining status of completed examinations.
14. A discussion of scan plans that provide details of required component examinations, such as component identifiers, NDE procedure, calibration standard reference, ISI Drawing number, sheet number, etc.
15. Augmented examination requirements closely related to ASME Section XI based on other codes/standards, regulatory guides, NRC commitments, etc.
16. A copy of the Notification of Indication (NOI) form.

F. Providing ISI and/or PSI ASME Section XI interpretations as requested by various site organizations or as required in program development and implementation.

5.0 METHOD OF IMPLEMENTATION AND RESPONSIBILITIES (continued)

- G. Providing a list of components requiring examination during each period of the inspection interval that includes the components that must be examined during a specific refueling outage of an inspection interval. This list shall include the component identifier, ASME Section XI examination category and item number, examination method, and ISI Drawing and sheet numbers. It shall be provided to SQO and Inspection Services Organization (ISO) in accordance with plant schedules.
- H. Approving revisions to scan plans affecting component selection or any provision of the listing of components identified in Section 5.1.G.
- I. Providing any additional samples required due to examinations performed.
- J. Notifying Site Engineering of an indication found during the final additional sample examination for their evaluation.
- K. Preparing an RFR when required because of areas that are inaccessible or partially inaccessible for examination or because it is determined that conformance with Code requirements is impractical. ISO shall notify ISI Programs if limited examinations indicate the need to initiate an RFR.
- L. Ensuring that RFRs, including supporting information and any alternative examinations, are documented.
- M. Submitting RFRs to the Site Licensing organization.

5.2 Technical Support responsibilities:

- A. Providing/coordinating dispositions for inspection reports (IRs) in accordance with SSP-3.1. See Section 17.2.

5.3 Site Engineering responsibilities:

- A. Designing, fabricating, erecting, and constructing components to quality standards commensurate with the safety function to be performed. This includes designing for access in accordance with ASME Section XI, IWA-1400(b), and IWA-1500.
- B. Performing engineering evaluations in support of IR dispositions or other examinations indications.
- C. Performing evaluations of indications found during final additional sample examinations to determine if further action is required.

5.0 METHOD OF IMPLEMENTATION AND RESPONSIBILITIES (continued)

5.4 Site Licensing responsibilities:

- A. Filing this Surveillance Instruction (1/3-SI-4.6.G) and revisions with the NRC per IWA-1400(c). ISI Programs shall be included on distribution of correspondence.
- B. Submitting RFRs and summary reports to the NRC. ISI Programs shall be included on distribution of all related correspondence.

5.5 Site Quality Organization (SQO) responsibilities:

- A. Obtaining plant approval of and processing this SI for issue.
- B. Performing NDE per the requirements of this instruction.
- C. Ensuring that ISI/PSI examinations are performed in accordance with TVA NDE procedures or in accordance with contractor procedures that have been authorized for use by ISO.
- D. Providing a list of components scheduled for examination during each refueling outage to ISO for scan plan development. This list is prepared from the ISI Programs list of Section 5.1.G.
- E. Approving the scan plan and revisions and submitting copies of the approved scan plan to site management and the Authorized Nuclear Inservice Inspector (ANII).
- F. Administering Authorized Inspection Agency (AIA) contract and ensuring that services of AIA are used when performing Code required activities. TVA's interface with the Authorized Inspection (AI) for ISI, repairs, and replacements is defined in SSP-6.9 and SSP-6.10.
- G. Providing AIA representative with access to plant and documentation in accordance with IWA-2140 of ASME Section XI.
- H. Notifying ANII prior to performing examinations.
- I. Preparing NOIs, issuing them to ISI Programs, documenting followup examinations, and assuring closure, proper filing, and distribution of copies to ISI Programs.
- J. 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 (i.e., MMIs), copies of the examination data sheets shall be submitted to SQO by the performing organization. These data sheets will be used as examination reports and incorporated into the scan plan.
- K. Ensuring that all scan plan examinations are complete prior to completion of an outage and that all examinations are recorded in the scan plan.

5.0 METHOD OF IMPLEMENTATION AND RESPONSIBILITIES (continued)

- L. Ensuring that ISI Programs is notified of examinations with accessibility problems that may require substitution of a different component for examination.
- M. Notifying ISI Programs of any configuration changes noted during the performance of ISI or PSI examinations.
- N. Preparing ISI Summary Reports, preparing augmented examination summary reports, obtaining ANII signature on NIS-1 form, coordinating summary report reviews with ISI Programs and ISO, and submitting ISI and augmented examination Summary Reports to Site Licensing.
- O. Preparing and submitting Site Final Report to DCRM as a Quality Assurance (QA) record.
- P. Ensuring records used as PSI records from manufacturers or construction organizations comply with procedures.
- Q. Calculation of component support acceptance ranges, if required, in accordance with QMP-110.5, N-GP-7, and N-VT-1.
- R. Maintaining calibration blocks stored at the plant site.

5.6 Inspection Services Organization (ISO) responsibilities:

- A. Preparing/Revising scan plans for each refueling outage of the inspection interval utilizing WELD. 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.
- B. Providing NDE Level III approval of scan plan revisions that affect the additional information of Section 5.6.A and maintaining a scan plan revision history log.
- C. Providing NDE Level III determination if an 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 ISI Programs of this fact.
- D. Approving contractor NDE procedures.
- E. Providing NDE Level III evaluation of successive examinations.
- F. Packaging radiographs for storage and providing them with reader sheets to DCRM as a life of plant record.
- G. Providing copies of QMP-110.5 NDE procedure revisions and evidence of personnel qualifications to DCRM as RIMS records for the service lifetime of the plant in accordance with IWA-1400(k).

5.0 METHOD OF IMPLEMENTATION AND RESPONSIBILITIES (continued)

H. Maintaining as-built calibration standard drawings.

5.7 Site Document Control and Records Management (DCRM) responsibilities:

- A. Issuing controlled copies of ASME Section XI Code Class Boundary Drawings and ISI Drawings to specified distribution lists.
- B. Issuing this program as an SI and providing controlled copies to SQO, the ANI/ANII, ISI Programs, and other organizations as requested.
- C. Maintaining the Site Final Report as a QA life of plant 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.

5.8 The Authorized Nuclear Inservice Inspector (ANII) responsibilities:

- A. Performing the duties of IWA-2120.
- B. He shall have the prerogative and authorization to require requalification of any operator or procedure when he has reason to believe the requirements are not being met.

6.0 ABBREVIATIONS AND DEFINITIONS

- 6.1 AIA - Authorized Inspection Agency.
- 6.2 AI - Authorized Inspector (may denote an ANI or ANII).
- 6.3 ANI - Authorized Nuclear Inspector.
- 6.4 ANII - Authorized Nuclear Inservice Inspector.
- 6.5 Components - Denotes items in a nuclear plant such as pressure vessels, piping systems, pumps, valves, and component supports.
- 6.6 Examination - Denotes the performance of all visual observation and nondestructive testing such as radiography, ultrasonic, eddy current, liquid penetrant, and magnetic particle methods.
- 6.7 Inspection - Denotes verifying the performance of examinations and tests by an Inspector representing an Authorized Inspection Agency.
- 6.8 Maintenance - Those normal functions performed to maintain equipment and systems in an operable status. This work includes but is not limited to the following:
 - Disassembly and reassembly of mechanical joints except where a replacement has taken place.

6.0 ABBREVIATIONS AND DEFINITIONS (continued)

- Lapping or skim cutting on valve seating surfaces.
- Use of injection sealants (e.g., furmanite) or molecular metal (e.g., belzona). Installation of fittings into the pressure boundary for use of injection sealants is a modification activity.
- Buffing, polishing, honing, sandblasting, and other metal removal for purposes other than defect removal.
- Surface preparation for NDE, including removal of weld spatter.

Maintenance activities are exempt from the requirements of this instruction.

- 6.9 Normal Operation - Normal plant operation conditions include reactor startup, operation at power, hot standby, and reactor cooldown to cold shutdown conditions. Test conditions are excluded.
- 6.10 Pressure-Retaining Material - Applies to items such as vessel heads, nozzles, pipes, tubes, fittings, valve bodies, bonnets, disks, pump castings, covers, and boltings which join pressure-retaining items.
- 6.11 Repair - Those operations involving welding, heat treatment, or defect removal which are required to restore a component or piping system to a safe and satisfactory operating condition.
- 6.12 Replacement - Spare and renewal components, appurtenances, and subassemblies or parts of a component or system. It also includes the addition of components (such as valves) and/or system changes (such as deletion of components and rerouting of piping).

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1

The Class 1 components to be examined during the inspection interval are outlined in the following paragraphs. The entire length of each weld described will be examined for the first inspection interval unless otherwise noted. When a portion of a weld length is to be examined during an inservice examination, the areas examined shall be documented (length examined, location, etc.) on the examination data sheet.

All Class 1 components are subject to volumetric, and/or surface examination except components (and their supports) that are three-inch nominal pipe size and smaller (IWB-1220(b)(1) and (b)(3) of ASME, Section XI).

Table A of Appendix A supplies additional information such as distribution of examinations during inspection cycles, reference drawing numbers, and ASME Section XI, Table IWB-2500, Examination Categories.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

7.1 Reactor Vessel

7.1.1 Reactor Vessel Seam Welds

Certain welds listed in this section are not accessible due to sacrificial shielding. No alternate inspection is proposed (see RFR ISI-2). Drawing CHM-1095-A, sheets 1-5, show typical cross sections of the various welds to be examined.

7.1.1.1 Longitudinal and Circumferential Seam Welds in Core Region

There are two circumferential and six longitudinal seam welds in this region. All seam welds in the core region are inaccessible for ISI.

The shell course is a cylindrical weldment fabricated of manganese-molybdenum steel (chemistry in RPV manual), and is clad internally with weld deposited austenitic stainless steel.

7.1.1.2 Lower Head Seam Welds

There are ten longitudinal seam welds and two circumferential seam welds in this region. All the seam welds in the lower head region are inaccessible for ISI due to vessel shielding.

The hemispherical lower head is fabricated of formed and welded sections of manganese-molybdenum steel (chemistry in RPV manual), and is clad internally with weld deposited inconel.

7.1.1.3 Vessel Seam Welds Not in Core Region

There are 9 longitudinal welds outside the core region (totaling 78 feet). In accordance with the SER, 10 percent of this 78 feet of weld in addition to 10 percent of an additional 49 feet to represent the longitudinal weld in 7.1.1.2 above will be examined during the inspection interval. A total of 13.0 feet of longitudinal weld (3.2 feet of three welds [V-5-A, V-5-B, and V-5-C], 2.0 feet of weld V-3-A, and 0.5 feet of 3 welds [V-4-A, V-4-B, and V-4-C]) shall be ultrasonically examined.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

There are 3 circumferential welds in this region (totaling 207 feet). In accordance with the SER, 5 percent of this 207 feet of weld in addition to 5 percent of an additional 93 feet to represent the circumferential weld in 7.1.1.2 above will be examined during the inspection interval. A total of 15.2 feet of circumferential weld (seams C-3-4 and C-4-5) shall be ultrasonically examined.

The shell course is a cylindrical forged weldment fabricated of manganese-molybdenum steel (chemistry in RPV manual), and is clad internally with weld deposited austenitic stainless steel.

7.1.1.4 Closure Head Seam Welds

There are 6 meridional welds, totaling 48 feet; 10 percent of each weld (0.8 feet) is required to be examined during the inspection interval. To simplify the examination, 1 foot of each of the 6 welds (RCH-X-1V, -2V, -3V, -4V, -5V, and -6V) shall be ultrasonically examined. There is 1 circumferential weld (RCH-X-1C), totaling 38 feet; 5 percent (2 feet) of this weld shall be ultrasonically examined during the inspection interval.

The hemispherical dome segment is fabricated of formed and welded sections of manganese-molybdenum steel (chemistry in RPV manual). The closure head is not clad.

7.1.1.5 Vessel-to-Flange Weld

The vessel-to-flange weld (C-5-FLG) is 69 feet long and is accessible for ISI. The entire length of the weld shall be examined during the inspection interval. The ISI of this weld will be performed by ultrasonic techniques.

The flange is fabricated of ASTM-508 manganese-molybdenum steel conforming to Code Case 1332-2 and is clad internally with weld deposited austenitic stainless steel.

7.1.1.6 Head-to-Flange Weld

The head-to-flange weld (RCH-X-2C) is 66 feet long and is accessible for ISI. The entire length of the weld shall be examined during the inspection interval.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

The flange forging is ASTM A-508 CL.2 steel conforming to ASME Code Case 1332-2. It is not clad.

7.1.2 Reactor Vessel Nozzles

All nozzles greater than 3-inch nominal pipe size will be examined during the first inspection interval. Areas to be examined are the nozzle-to-vessel weld, nozzle inside radii at all positions, and nozzle-to-safe end weld.

The nozzles are fabricated of materials listed in the table below.

<u>Nozzle</u>	<u>Material</u>	<u>Safe-End Material</u>
Main Steam	ASTM A-508 CL.2	SA-105, Gr. II
Feedwater	ASTM A-508 CL.2	SA-105, Gr. II
Core Spray	ASTM A-508 CL.2	SA-376, Type 316
CRD	ASTM A-508	SA-336, CL F8
Recirculation (Inlet and Outlet)	ASTM A-508	SA-376, Type 316
Jet Pump Inst.	ASTM-A-508	SA-336, CL F8
Head Vent	ASME A-508 CL.2	SA-105, Gr. II Wld. Neck Flg.
Head Inst.	ASME A-508 CL.2	SA-105, Gr. II Wld. Neck Flg.

The safe-ends for the main steam and feedwater nozzles are not dissimilar metal safe-ends. The remaining nozzles have buttered ends with the specified safe-ends attached.

Drawing CHM-1094-A, sheets 1-7, (Appendix B) show the typical weld cross sections. Table A of Appendix A outlines the size of each nozzle and scheduled inspections.

7.1.3 Reactor Vessel Studs, Nuts, Washers, Bushings, and Flange Ligaments

The examinations shall cover 100 percent of the closure studs (92), nuts, washers, and flange ligaments between threaded stud holes during the inspection interval. The studs and ligaments shall be ultrasonically examined, the nuts shall be ultrasonically and magnetic particle examined, and the washers shall be visually examined. Table A of Appendix A outlines the schedule of examinations.

In addition, the closure studs shall be ultrasonically and magnetic particle examined when removed from the vessel. The bushings shall be visually examined when the closure studs are removed. These examinations need be performed only once during the inspection interval.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

The bolting may be examined in place under tension, when the connection is disassembled, or when the bolting is removed.

Removal of the closure head assembly is in accordance with MMI-1, and provides for the examinations listed. The studs, nuts, and washers are fabricated of alloy steel ASTM A-540 Gr. B-23 or 24, conforming to ASME Code Case 1335-2, Paragraph 4, Class 3.

7.1.4 Reactor Vessel Pressure Retaining Bolting Two Inches and Smaller in Diameter

There is no pressure retaining bolting two inches or smaller in diameter.

7.1.5 Control Rod Drives and Penetrations

The CRD housing welds are exempted from volumetric examination by meeting the makeup exclusion criteria of IWB-1220 (b) (1) of ASME Section XI (see RFR ISI-6). All 40 peripheral CRD housing welds shall be visually examined during system pressure tests to meet the alternate inspection.

There are 55 flux monitor penetrations, 1 level control nozzle penetration, and 1 drain nozzle penetration in the lower head. There are 6 instrumentation nozzle penetrations in the vessel shell. At least 25 percent of each group of penetrations of comparable size and function will be visually examined for signs of leakage during system pressure in accordance with IWA-5240, ASME Section XI.

System pressure tests and VT-2 examination of the penetrations are included in SSP-8.5.

7.1.6 Reactor Vessel Support Skirt Weld

There are four feet of support skirt weld accessible for inservice examination. The weld is accessible in two-foot lengths, 180 degrees apart (30 and 210 degrees). The four feet of weld shall be ultrasonically examined during the inspection interval (see RFR ISI-3). Drawing CHM-1091-A shows a typical cross section of the weld.

Table A of Appendix A outlines the schedule and method of the examinations. The support skirt is fabricated of SA-302, Grade B hull steel.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

7.1.7 Reactor Vessel Cladding

Six austenitic stainless steel clad patches (each 6 x 6 = 36 square inches) have been prepared in the cladding and marked for ease of identification. The visual examinations shall cover 100 percent of each of the patch areas during the inspection interval. The examination will be accomplished using the underwater TV camera. This must be coordinated with the refueling program in order to eliminate any unnecessary delays.

Color photographs, video tapes, or other recording systems of the inspection areas may be used for comparison with earlier visual records.

The reactor vessel head is not clad.

7.1.8 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 integrally 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 visual examinations during the ISI interval are stated in Section 20.19 of this program. This examination may be performed at or near the end of the inspection interval.

The general surveillance of the reactor vessel internals is in accordance with MMI-182.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

7.2 Piping Pressure Boundary

The ultrasonic examinations for the inspection interval shall include 100 percent of the area of approximately 25 percent of the Class 1 circumferential weld joints, larger than 3 inches, 100 percent of the Class 1 dissimilar metal weld joints, larger than 3 inches, and 1 foot of the adjoining sections of longitudinal weld joints. Also approximately 25 percent of the branch connections larger than 6 inches in diameter shall be ultrasonically examined. Surface examinations shall include approximately 25 percent of the branch connections 6 inches in diameter and smaller, but greater than 3 inches in diameter. Several welds are inaccessible for ISI. These welds shall be given a "best effort" visual examination during system pressure tests (see RFR ISI-7).

Several welds cannot be examined in accordance with paragraph T-532 of Article 5, ASME Section V, but they are not totally inaccessible. These welds shall receive a "best effort" ultrasonic examination and a surface examination of accessible areas of the weld. These welds shall be noted as requiring the additional surface examination on the ultrasonic examination data sheet (see RFR ISI-8).

Several longitudinal welds are partially inaccessible for examination. No alternate examination is proposed.

7.2.1 Recirculation Piping

The Class 1 recirculation piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table A of Appendix A. Augmented examinations are discussed in Section 20.0, Augmented Examinations.

7.2.2 Main Steam Piping

The Class 1 main steam piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table A of Appendix A. Inaccessible welds are discussed in RFR ISI-7 in Appendix G. The pipe whip protection welds are also scheduled in Table A and are listed individually in Table C of Appendix A.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

7.2.3 Feedwater Piping

The Class 1 feedwater piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table A of Appendix A. Inaccessible welds are discussed in RFR ISI-7 in Appendix G. The pipe whip protection welds are also scheduled in Table A and are listed individually in Table C of Appendix A.

7.2.4 Core Spray Piping

The Class 1 core spray piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table A of Appendix A. Inaccessible welds are discussed in RFR ISI-7 in Appendix G. The pipe whip protection welds are also scheduled in Table A and are listed individually in Table C of Appendix A.

7.2.5 Residual Heat Removal (RHR) Piping

The Class 1 RHR piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table A of Appendix A. Inaccessible welds are discussed in RFR ISI-7 in Appendix G. The pipe whip protection welds are also scheduled in Table A and are listed individually in Table C of Appendix A. [NRC/C] As required by NRC IR 86-03 (Open Item 86-03-03), weld DSRHR-2-5A will be inspected using RT and UT every 1/3 inspection interval [NRC IR 86-03]. See augmented requirement Section 20.18.

7.2.6 Control Rod Drive Hydraulic Return Piping

The Class 1 control rod drive hydraulic return piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table A of Appendix A.

7.2.7 Reactor Water Cleanup Piping

The Class 1 reactor water cleanup piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table A of Appendix A. Augmented examinations are discussed in Section 20.0, Augmented Examinations. The pipe whip protection welds are also scheduled in Table A and are listed individually in Table C of Appendix A.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

7.2.8 Reactor Core Isolation Cooling Piping

The Class 1 reactor core isolation cooling piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table A of Appendix A.

7.2.9 High Pressure Coolant Injection Piping

The Class 1 high pressure coolant injection piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table A of Appendix A.

7.3 Piping Pressure-Retaining Bolting

There is no pressure-retaining bolting 2 inches or larger in diameter in any of the Class 1 piping systems within the scope of this program.

There are 18 pressure-retaining bolted connections with bolting smaller than 2 inches in diameter that shall be given a visual examination that shall cover 100 percent of the bolts, studs, and nuts during the inspection interval. The bolting may be examined either in place, when the connection is disassembled, or when the bolting is removed. See Table A of Appendix A for scheduled examinations.

7.4 Component Supports

7.4.1 Integrally Welded Support Attachments

The Class 1 integral attachments are identified and located on the support location drawings identified in Appendix B. The surface examinations to be performed in lieu of volumetric examinations (see RFR ISI-9 in Appendix G) are scheduled in Table A of Appendix A.

7.4.2 Component Supports

The Class 1 supports are identified and located on the support location drawings identified in Appendix B. The visual examinations are scheduled in Table A of Appendix A. Acceptance criteria for these examinations is covered in Section 13.0, Acceptance Criteria.

Examination and acceptance of variable support settings shall be in accordance with the detailed support drawing. If a total acceptance range is required and is not given on the detail support drawing, it shall be calculated per QMP-110.5, N-GP-7, and N-VT-1.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

7.5 Recirculation Pumps (2)

7.5.1 Recirculation Pump Casing

The recirculation pump casings have no seam welds. The casings are cast stainless steel, ASTM A-351, GR CF8M. There is a requirement for visual examination of the pump internal pressure boundary surfaces when the pump is disassembled during the 10-year interval. Disassembly of the pump is in accordance with MMI-21 and provides for the examinations listed. See Table A of Appendix A for scheduled examinations (see RFR ISI-4).

7.5.2 Recirculation Pump Casing Bolting

There are 16 pump casing studs (ASTM A-540, GR B23) on each of the two pumps. All the casing studs on each pump shall be ultrasonically examined and the stud nuts (ASTM A-194, CL 2H) shall be visually examined during the inspection interval. The ligaments between threaded stud holes and threads in the base material shall be visually examined when the connection is disassembled. The studs shall be given a magnetic particle examination when they are removed. Disassembly of the recirculation pump is in accordance with MMI-21 and provides for the examinations listed. See Table A of Appendix A for scheduled examinations.

7.5.3 Recirculation Pump Supports

There are 3 integrally welded supports on each pump casing. One support on each pump shall be given an ultrasonic examination, and all 6 supports shall be visually examined during the inspection interval. See Table A of Appendix A for scheduled examinations.

7.6 Valve Pressure Boundary

7.6.1 Valve Body Seam Welds

The Unit 1 RWCU system valve FCV 69-1 has a valve body seam weld. The valve was installed and preservice tested during the Unit 1, Cycle 4, outage. The other valves in Class 1 piping systems within the scope of this program are of single-piece cast or forged construction.

7.0 COMPONENTS SUBJECT TO EXAMINATION - TVA CLASS 1 (continued)

7.6.2 Valve Body Internals

Valves subject to examination include those valves exceeding 4-inch nominal pipe size. The valve body internal pressure boundary surfaces of one valve out of each group of the same design, construction, manufacturing method, and manufacturer performing similar functions is required to be examined during the inspection interval. Appendix C, Table 1, provides a list of the valves and their respective group numbers. Visual examinations of internal pressure boundary surfaces during routine maintenance is performed and documented under existing plant administrative procedures (see RFR ISI-5). The existing plant procedures are listed below:

MCIO.001.VLV001	Main Steam Isolation Valves
MCIO.001.VLV002	Main Steam Relief Valves
MMI-13	Main Steam Relief Valves
MMI-51	CSSC Valve Maintenance

The plant personnel responsible for the maintenance of the valves shall send a copy of the completed data sheet to the Section XI Programs and Planning for inclusion in the final ISI report. As an alternate inspection, if a valve from a particular classification has not been disassembled as the end of the inspection interval approaches, a case-by-case study will be made to determine the practicality of disassembling a valve from one of the multiple units solely for visual examination. If necessary, RFR ISI-5 will be revised at that time.

7.6.3 Valve Pressure-Retaining Bolting

None of the Class 1 valve bonnet or flange bolting is 2 inches or larger. The bolting smaller than 2 inches shall all be visually examined during the inspection interval. There are 50 valves (on each unit) with bolting smaller than 2 inches. The examinations will be distributed equally among the three 40-month cycles of the inspection interval. The valves are listed in Appendix C, Tables 1 and 2. See Table A of Appendix A for scheduled examinations.

7.7 Exempted Components

The components exempted from volumetric and surface examination shall be visually examined (VT-2) during system pressure tests in accordance with IWA-5000 and IWB-5000 of ASME Section XI (see Section 7.0). The pressure tests and VT-2 examinations are implemented by SSP-8.5.

8.0 COMPONENTS SUBJECT TO EXAMINATION-TVA CLASS 2

The Class 2 components to be examined for the ISI are outlined in the following paragraphs. Selection of areas for examination are in accordance with paragraph IWC-2411 and Table IWC-2520 of ASME Section XI.

Components that are exempted from examination in accordance with IWC-1220 of ASME Section XI are discussed in Section 8.6 of this program.

Where the program specifies a percentage of the total length of weld is to be examined, the area(s) examined shall be physically marked on the component and documented in the examination report. Where a percentage is not referenced the entire length shall be examined.

Bolting two inches or less in diameter will not be ultrasonically examined (see RFR ISI-14).

Examinations of Class 2 components began during the first 40-month cycle of the inspection interval on Unit 3 and began with the second 40-month cycle on Units 1 and 2.

8.1 RHR Heat Exchangers (4)-RHR Hx

8.1.1 RHR Hx Circumferential Seam Welds

There are two circumferential shell welds on each heat exchanger, each approximately 14 feet in length, totaling 28 feet or 112 feet for the four; two circumferential shell cover welds on each heat exchanger, each approximately 15 feet in length, totaling 30 feet or 120 feet for the four; and one bottom head flange weld on each heat exchanger approximately 2.75 feet in length or 11 feet for the four. A total of two welds, one shell weld and one bottom head flange weld, shall be ultrasonically examined during the inspection interval. The examinations shall cover at least 20 percent of each circumferential weld selected for examination, uniformly distributed among three areas around the vessel circumference. See Table B of Appendix A for scheduled examinations.

The shell and shell cover sections are fabricated to A-515, GR.70. Flange sections are fabricated to A-105, GR.II.

8.1.2 RHR Hx Nozzle Welds

There are two nozzle-to-shell welds on each heat exchanger. The nozzle-to-shell welds are not accessible for examination because of a reinforcement ring covering the nozzle-to-shell weld (see RFR ISI-13). The alternate inspection will be a surface examination of the reinforcement ring welds. A total of one reinforcement ring weld (weld to the nozzle and to the shell) from the four RHR heat exchangers shall be surface examined during the inspection interval. See Table B of Appendix A for scheduled examinations.

8.0 COMPONENTS SUBJECT TO EXAMINATION-TVA CLASS 2 (continued)

The reinforcement rings are fabricated to A-515, GR.70.

8.1.3 RHR Hx Support Attachments

There are three integrally welded support attachments on each heat exchanger. A total of one support shall be surface examined during the inspection interval. The support selected for examination shall be located on a different RHR Hx than those selected for examination in accordance with Sections 8.1.1 and 8.1.2. See Table B of Appendix A for scheduled examinations.

The support attachments are fabricated to ASTM A-283 Gr.D or equal.

8.1.4 RHR Hx Pressure-Retaining Bolting

Each heat exchanger has a shell-to-tube sheet flange connection that has 56 studs with nuts (1-3/8 inches) and a shell cover-to-shell flange connection that has 56 studs with nuts (1-1/2 inches). The bolting is less than two inches in diameter (see RFR ISI-14).

The studs and nuts are fabricated to A-193 Gr.B7 and A-194 Gr.2H, respectively.

8.2 Piping Pressure Boundary

The areas to be examined include circumferential pipe welds, larger than 4 inches diameter, at structural discontinuities or within 3 pipe diameters of the centerline of rigid pipe anchors, longitudinal weld joints in pipe fittings; and branch connection weld joints, larger than 4 inches diameter. The welds are selected for examination using the streaming method, where possible.

8.2.1 Main Steam Piping

The Class 2 main steam piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table B of Appendix A.

8.2.2 RHR Piping

The Class 2 RHR piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table B of Appendix A.

8.0 COMPONENTS SUBJECT TO EXAMINATION-TVA CLASS 2 (continued)

8.2.3 Closed Cooling Water

The Class 2 closed cooling water piping welds are identified and located on drawings listed in Appendix B. The examinations for this inspection interval are scheduled in Table B of Appendix A.

8.3 Piping Pressure-Retaining Bolting

The Class 2 piping flange bolting is located on each RHR pump discharge line. Each connection includes 24 studs (1 inch) and 48 nuts. The bolting is less than two inches in diameter (see RFR ISI-14). The studs and nuts are fabricated to A-193 Gr.B7 and A-194 Gr.2H, respectively.

8.4 Component Supports

8.4.1 Integrally Welded Support Attachments

The Class 2 integral attachments are identified and located on the support location drawings identified in Appendix B. The surface examinations are scheduled in Table B of Appendix A. Four of the restraints cannot be fully examined (see RFR ISI-11).

8.4.2 Component Supports

The Class 2 supports are identified and located on the support location drawings identified in Appendix B. The visual examinations are scheduled in Table B of Appendix A. Acceptance criteria for these examinations is covered in Section 13.0, Acceptance Criteria.

Examination and acceptance of variable support settings shall be in accordance with the detailed support drawing. If a total acceptance range is required and is not given on the detail support drawing, it shall be calculated per QMP-110.5, N-GP-7, and N-VT-1.

8.5 RHR Pumps (4)

8.5.1 RHR Pump Casing

There are no seam welds in the RHR pump casings. The pump casing is fabricated to ASTM A-216, Gr.WCB.

8.5.2 RHR Pump Casing Bolting

There are 24 studs and nuts (1-1/4 inches) on each pump casing. The bolting is less than two inches in diameter (see RFR ISI-14).

8.0 COMPONENTS SUBJECT TO EXAMINATION-TVA CLASS 2 (continued)

The studs and nuts are fabricated to SA-193 Gr.B7 and SA-194 Gr.2H, respectively.

8.5.3 RHR Pump Supports

There are 4 accessible integrally welded supports on each pump casing. One support from one pump shall be given a surface examination, and all the supports on that pump shall be visually examined during the inspection interval. See Table B of Appendix A for scheduled examinations. The pump supports are fabricated to ASTM A-36.

8.6 Exempted Components

Components exempted by IWC-1220, ASME Section XI, shall be visually examined (VT-2) during system pressure tests in accordance with IWA-5000 and IWC-5000. The pressure tests and VT-2 examinations are implemented by SSP-8.5.

Exempted components are: a) components in systems where both the design pressure and temperature are equal to or less than 275 psig and 200 degrees F, respectively; b) components in systems or portions of systems, other than emergency core cooling systems, which do not function during normal reactor operation; c) components which perform an emergency core cooling function, provided the control of fluid chemistry of the contained fluid is verified by periodic sampling and test; and d) component connections, piping, and associated valves, and vessels (and their supports), that are 4 inches nominal pipe size and smaller.

The boundaries of components exempted by a), b), or c) above for the core spray, HPCI, and RCIC systems are listed in Table F of Appendix A. Augmented examinations of welds and supports in these systems are performed per paragraph 20.12 as scheduled in Table B, paragraph J of Appendix A.

9.0 COMPONENTS SUBJECT TO EXAMINATION-TVA CLASS 3

TVA Class 3 components shall be visually examined during system pressure tests in accordance with IWA-5000, IWD-2000, and IWD-5000. The pressure tests are implemented by SSP-8.5.

Component supports for components exceeding four-inch nominal pipe size whose structural integrity is relied upon to withstand design loads when the system function is required shall be visually examined to detect any loss of support capability, and evidence of inadequate restraint (Refer to Section 13.0).

The Class 3 component supports are identified and located on the component support location drawings identified in Appendix B. All component supports shall be visually examined each inspection cycle (every 3-1/3 years) as scheduled in Table E of Appendix A.

9.0 COMPONENTS SUBJECT TO EXAMINATION-TVA CLASS 3 (continued)

Unit 3 was the only unit at BFN required to meet this requirement during the first 40-month inspection cycle. This requirement is applicable for all three units at the beginning of the 80-month inspection cycle (July 1, 1981).

Examination and acceptance of variable support settings shall be in accordance with the detailed support drawing. If a total acceptance range is required and is not given on the detail support drawing, it shall be calculated per QMP-110.5, N-GP-7, and N-VT-1.

System pressure test and VT-2 examination requirements are included in the BFN pressure test program and SSP-8.5.

10.0 AUTHORIZED INSPECTOR (AI)

TVA shall have a contract with an AIA Agency in accordance with ASME Section XI for inservice examinations, repairs, and replacements of TVA Class 1, 2, and 3 (equivalent) components at BFN. The ANII shall verify, assure, or witness that code requirements have been met. He shall have the prerogative and authorization to require requalification of any operator or procedure when he has reason to believe the requirements are not being met. TVA shall provide access for the AI in accordance with IWA-2140 of ASME Section XI.

TVA's interface with the ANII for ISI, repairs, and replacements is defined in SSP-6.9.

11.0 EXAMINATION METHODS

Any nondestructive examination procedures shall meet the requirements stated in this section.

11.1 Visual Examination

A visual examination is employed to provide a report of the general condition of the part, component, or surface to be examined, including such conditions as scratches, wear, cracks, corrosion or erosion on the surfaces, misalignment or movement of the part or component, or evidence of leaking.

Visual examination shall be conducted in accordance with Article 9, Section V of the ASME Code except that lighting shall be sufficient to resolve a 1/32 inch wide black line on an 18 percent neutral gray background.

11.2 Surface Examination

11.2.1 Magnetic Particle

Magnetic particle examination shall be conducted in accordance with Article 7, Section V of the ASME Code.

11.0 EXAMINATION METHODS (continued)

11.2.2 Liquid Penetrant

Liquid penetrant examination shall be conducted in accordance with Article 6, Section V of the ASME Code.

11.3 Volumetric Examination

11.3.1 Radiographic

Radiographic techniques, employing penetrating radiation such as x-rays, gamma rays, or thermalized neutrons, may be utilized with appropriate image recording devices such as photographic film or papers, electrostatic systems, direct-image orthicons, or image converters. For radiographic examinations employing either x-ray equipment or radioactive isotopes and photographic films, the procedure shall be as specified in Article 2, Section V of the ASME Code.

11.3.2 Ultrasonic

Ultrasonic examination shall be conducted in accordance with Article IWA-2232 of ASME Section XI, 1977 Edition, Summer 1978 Addenda (Piping) and Appendix I, 1974 Edition, Summer 1975 Addenda of ASME Section XI (Vessels). Where Appendix I (I-1200) is not applicable, the provisions of Article 5, Section V of the ASME Code shall apply.

12.0 QUALIFICATIONS OF NDE PERSONNEL

Personnel performing NDE operations shall be qualified in accordance with IWA-2300 of ASME Section XI as specified in QMP 102.4.

13.0 ACCEPTANCE CRITERIA

All acceptance standards for ASME Code Class 1, 2, and 3 (equivalent) components shall be in accordance with IWA-3000, IWB-3000, IWC-3000, or IWD-3000 of ASME Section XI, except where ASME Section III or other construction code examinations are employed to satisfy ASME Section XI requirements.

14.0 REPAIRS AND REPLACEMENTS

The repair and replacement program shall be in accordance with SPP-6.9.

All PSIs of pipe welds shall be in accordance with the 1977 Edition, Summer 1978 Addenda of ASME Section XI, IWA-2232, IWA-3000, IWB-2200(c), Table IWB-25500-1 and Table IWC-2500-1 beginning on January 1, 1992 (Reference: RFRs ISI-10 and ISI-15). This will differ from the inservice inspections (ISI) and should not have an effect on the ISI credit examinations. As a precaution for NDE personnel, the major areas of difference are:

14.0 REPAIRS AND REPLACEMENTS (continued)

1. The volume of weld ultrasonically examined for PSI will be the inner 1/3 per Figures IWB-2500-8 and IWC-2520-7 (77S78). The volume examined for ISI will be the full volume (thickness) per Tables IWB-2500 and IWC-2520 (74S75).
2. For B-J branch connection welds, the cutoff for volumetric examination will be 2-inch NPS for PSI per Table IWB-2500-1 (77S78). The cutoff for volumetric examination for ISI will be 6-inch NPS per Table IWB-2600 (74S75).
3. Surface examinations (MT or PT) will be required as a part of all PSI examinations.

15.0 PUMP AND VALVE TESTING

Pump and valve testing shall be in accordance with SSP-8.6.

16.0 RECORDS AND REPORTS

16.1 Recording and Report of Examinations

A detailed report of all examinations shall be prepared by the performing or responsible organization and should contain but not be limited to the following information:

Title Page

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- I. Introduction - The introduction should include the following information: Plant, unit number, PSI or ISI and cycle number, systems, components and vessels examinations were performed on, organization examinations were performed by, dates examinations were performed, ASME Code of Record.
- II. Summary - The summary should include a brief description of the overall inspection.
- III. Summary of Notifications - The summary of notifications shall give a short summary of each notification report along with the indication discrepancy and its location. It should also contain the final disposition including a reference to the corrective action taken and the date of completion.
- IV. Scan Plan - The Scan 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, Weld Size, Reference Drawing, Examination Method, Procedure, Calibration Block, Examiner, Report Number, and Date of Examination.

16.0 RECORDS AND REPORTS (continued)

- V. A Summary of Personnel Certifications.
- VI. Calibration Sheets.
- VII. Examination Data Sheets.
- VIII. Copy of the ISI Report as discussed in Section 16.2.

All procedures and equipment shall be identified sufficiently to permit duplication of the examination at a later date. This shall include initial calibration data for the equipment and any significant changes.

All required and pertinent information will be recorded on the appropriate data sheets by the performing organization. When portions of the inspection work are contracted, a detailed report will be submitted to TVA by the contractor with all pertinent and required information. TVA will retain the original copies of all raw data taken.

NQA shall review and submit the final report to the Plant Manager for review. Data Sheet 1 in Appendix F will be completed and used as a cover sheet for the final report and to document the review process.

16.2 ISI Report for Class 1 and 2 Components

The ISI Report for Class 1 and 2 components shall be submitted within 90 days after the completion of the ISI to the NRC Region II Office in accordance with IWA-6220, ASME Section XI via the Nuclear Technology and Licensing organization [Reference SSP-4.5].

The ISI report shall have a cover sheet providing the following information:

- (1) Date
- (2) Name of owner and address of corporate offices
- (3) Name and address of nuclear generating plant in which the nuclear power unit is located
- (4) Name or number assigned to the nuclear power unit by TVA
- (5) Commercial operation date for unit

All reports shall have a summary providing the following information:

- (1) National Board Number assigned by the manufacturer to the pressure vessel or component.

16.0 RECORDS AND REPORTS (continued)

- (2) Names of the components or parts of the components for which this is a record, including such information regarding size, capacity, material, location, and drawings as may aid accurate identification.
- (3) Name of the manufacturer of the components or parts for which this is a record, including the manufacturer's component or part numbers and such information regarding the manufacturer's corporate office or manufacturing plant locations as may aid in gaining access to the manufacturer's records regarding the components or parts that the manufacturer is maintaining.
- (4) Date of completion of the ISI.
- (5) Name or names of the Inspector(s) when required.
- (6) Name and mailing address of the employer(s) of the Inspector(s).
- (7) Abstract of examinations performed, conditions observed, corrective measures recommended and taken.
- (8) Signature of Inspector, when required.
- (9) Owner's data report for ISI, Form NIS-1 as shown in Appendix II of ASME Section XI.

NQA shall submit the ISI Report to the plant for retention as a quality assurance record in accordance with SSP-3.1. NQA shall maintain a copy of the report for information.

16.3 Records for Class 1, 2, and 3 Components

The following records shall be available for review:

- (1) Examination Plans
- (2) Examination Results and Reports
- (3) Examination Methods and Procedures
- (4) Evaluation of Results
- (5) Corrective Actions and Repairs

16.4 Records of System Pressure Tests

Records of the visual examinations conducted during system pressure tests as required by Sections 7.7, 8.6, and 9.0 of this program shall consist of but not be limited to an itemization of the number and location of leaks found in a system and the corrective actions taken.

17.0 NOTIFICATION OF INDICATION (NOI) AND INSPECTION REPORTS (IRs)

- 17.1 Any corrective action required as a result of ISI examinations shall be handled in accordance with SSP-3.4, SSP-3.6, or SSP-3.7.
- 17.2 An IR shall be used to officially document and provide a disposition for an indication that exceeds the acceptance criteria of Article 3000 of the ASME Section XI Code. Technical Support shall provide/coordinate dispositions for IRs in accordance with SSP-3.1.
- 17.3 The NOI Form in Appendix D of this Program is to be used to:
- A. Notify ISI Programs that an indication that exceeds the acceptance criteria of Article 3000 of the ASME Section XI Code has been documented.
 - B. Provide ISO and SQO a method to track examination reports that require reexamination or a documented disposition for closure.
 - C. As a final product, with the disposition from the IR added to Part II of the form, provide ISI Programs a method of determining if additional Code examinations are required.
- 17.4 Functionally, an NOI form shall be initiated and processed as follows:
- A. Part I of an NOI form will be initiated by the NDE examiner when an indication exceeds the acceptance criteria of the NDE procedure being used to perform a scheduled ISI examination. The examiner will sign and date the NOI form. The field supervisor, in the case of contractor-performed examinations, will review the information in Part I and sign and date the NOI form as approving the information. The SQO representative will review for accuracy, sign, and date the NOI form.
 - B. After completion of Part I, SQO shall send a copy of the NOI form and a copy of the IR to ISI Programs as notification that a potential exists for additional examinations to be performed per Section XI.
 - C. SQO shall record the final disposition from the IR on the NOI form in Part II, sign and date the NOI form, and send a copy to ISI Programs for determination of additional examination requirements.
 - D. ISI Programs representative shall check "yes" or "no" for additional examinations and return a copy to SQO.
 - E. SQO shall close the NOI form in Part III by reexamination, in the case where work was performed as a part of the disposition, or by verification of the disposition if no physical work was required to remove or modify the indication.

17.0 NOTIFICATION OF INDICATION (NOI) AND INSPECTION REPORTS (IRs) (continued)

F. The original NOI form shall be filed with the original examination report. A copy of the form shall be sent to ISI Programs for closure of their files. The reexamination report, if applicable, shall reference the original examination report number and the NOI number. The NOI and original examination report shall reference the reexamination report number.

17.5 Additional Sample Selection for CC-1 and CC-2 NOIs

If it is determined that additional examinations are required, these examinations shall be performed during the same outage as the initial examinations. A sample is defined as those items (welds, areas, or parts) as described or intended in a particular examination category and item number and within the same system. For component support samples, the additional examinations may also be limited to component supports within the same examination method (VT3, and VT4). The initial sample is the sample scheduled for examination at a particular outage for Section XI credit.

17.5.1 Evaluation for First Additional Sample

A first additional sample shall be selected for those examinations performed in the initial sample that reveal indications exceeding the corresponding acceptance standards of IWX-3000 of ASME Section XI. The first additional sample shall include approximately the same number of items examined in the initial sample. The first additional sample shall be selected from the 10-year interval sample. The items selected should be from those items that have the longest service time from its previous inservice examinations.

If a system contains a sample within the same examination category and item number as the initial sample which had the indication and is not scheduled for examination this outage, this system sample shall be evaluated to determine if it should be examined this outage to provide a representative sample from each system within a particular examination category and item number. This evaluation should consider, but is not limited to, the type of indication found in the initial sample and similar system design and operating parameters.

The ISI Programs Engineer shall submit the additional sample to the ISO representative for addition to the scan plan.

17.0 NOTIFICATION OF INDICATION (NOI) AND INSPECTION REPORTS (IRs) (continued)

17.5.2 Evaluation for Second Additional Sample

A second additional sample shall be selected for those examinations performed in the first additional sample that reveal indications exceeding the corresponding acceptance standards of IWX-3000 of ASME Section XI. The second additional sample shall include all the remaining items of the 10-year interval sample not examined in the initial or first additional sample during this outage. If no items remain in the 10-year interval sample (e.g., Accelerated Field Weld Program) and indications were found in the first additional sample, a notification of sample results shall be made to NE as described in Section 17.2.3. The ISI Programs Engineer shall submit the second additional sample to the ISO representative for addition to the scan plan.

17.5.3 Notification of Sample Results to Nuclear Engineering

After completion of the second additional sample examinations, ASME Section XI code requirements for additional examinations are complete. If examinations performed in the second additional sample reveal indications exceeding the corresponding acceptance standards of IWX-3000 of ASME Section XI, Nuclear Engineering shall be notified. Nuclear Engineering shall be notified to evaluate the indications and make recommendation(s) for further action, if needed, within this and/or other systems.

This notification shall be sent to the Principal Materials Engineer in Nuclear Engineering by ISI Programs for coordination with the applicable NE staff. Included in the notification should be a summary of the indications found, number of examinations and number of indications in each sample, type of examination performed, examination category and item number, copies of the NOIs, and any other pertinent information.

18.0 CALIBRATION BLOCKS

Many of the basic calibration blocks used for examinations at BFN were fabricated to the 1971 Edition of ASME Section XI. These blocks will continue to be used for ISI work (see RFR ISI-10).

The SQO shall be responsible for storage and control of the calibration blocks onsite as required in Appendix I, I-3150, of ASME Section XI.

ISO shall prepare and retain as-built calibration block drawings.

19.0 REQUESTS FOR RELIEF (RFRs)

Where TVA has determined that certain code requirements or examinations are impractical, TVA will submit written RFRs to NRC with information to support the determinations and any proposed alternate examinations. The impractical code requirements or examinations shall be identified in this program, and references to particular RFRs shall be included.

When impractical examination requirements are identified in the field, the SQO shall notify ISI Programs such that the information may be included in this program, and RFRs may be prepared if necessary.

The RFRs are included in Appendix G. The current RFRs are ISI-2 through ISI-15. Those requiring alternate examination are ISI-5 through ISI-10, ISI-13, and ISI-15.

20.0 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.

20.1 Feedwater Nozzles

The augmented examination of the feedwater nozzles is included in DPM-BF77M2 (NUREG-0312) and updated in NUREG-0619. The requirements are an ultrasonic examination of all the feedwater nozzle safe ends, bores, and inside blend radii every second refueling outage. The feedwater spargers shall be visually examined every fourth refueling outage (MMI-182). A routine liquid penetrant examination shall be performed every 20 years based on the replacement date of the sleeve and seals.

If any indications are found in the safe end they shall be evaluated per ASME Section XI. If any recordable indications (defined in ASME Section V, Article 4, Paragraph T-441.8) are determined to be cracks in any nozzle, the nozzle bore and blend radii shall be liquid penetrant examined and repaired if necessary. If any cracks are detected, remove all spargers and completely examine all nozzles and remove all nozzle cracks.

Reporting is required within 6 months of completing an outage during which an inspection was performed. Refer to NUREG-0619, Section 4.4.3 for information to be included.

20.2 Core Spray Piping

DPM BF76M7 superseded by NUREG-0313 in section 20.10.

20.0 AUGMENTED EXAMINATIONS (continued)

20.3 Core Spray Spargers

The augmented examination requirements of the core spray spargers is included in MMI-182, which implements IE Bulletin 80-13. The spargers shall be visually examined each refueling outage. Volumetric techniques may be used to evaluate any indications. The reporting criteria is listed in MMI-182. If cracks are detected, the NRC onsite inspector and the regional office shall be notified within 24 hours. A written report of the examinations is to be sent to the NRC within 30 days of completion of the examinations.

20.4 Recirculation Pressure Test Connections

The requirement for this examination has been superseded by Generic Letter 88-01 and NUREG-0313, Rev. 2 (see Section 20.16).

20.5 Jet Pump Assemblies and Holddown Beam - Unit 3

The augmented examination requirements of the jet pump assemblies are included in MMI-182, which implements IE Bulletin 80-07. Each jet pump assembly shall be visually examined each refueling outage per these requirements. The jet pump holddown beams shall all be ultrasonically examined each refueling outage. The ultrasonic examination shall be performed using General Electric Procedure TP-508 0642 (Rev. A) or equal. Unit 3 is the only unit where the holddown beams have not been replaced.

The NRC regional office is to be promptly notified following completion of the inspection and a report issued to the NRC within 14 days.

20.6 CRD Return Line Reroute

The augmented examination requirements of the CRD return line reroute are included in NUREG 0619. The requirements are a final liquid penetrant examination of the capped nozzle after the modification.

Also, the welded connections joining the rerouted CRD return line to the reactor water cleanup system shall be ultrasonically examined for three consecutive refueling outages. The weld RCRD-X-45 (X is unit number 1, 2, or 3) will be ultrasonically examined, including the base metal on each side within one wall thickness (nominal wall .531"). The pipe into which the CRD return flow is connected shall also be examined by ultrasonic methods to a distance of at least one pipe diameter downstream of the welded connection. Welds RCRDS-X-3 and RCRD-X-44 shall be ultrasonically examined along with the pipe on the downstream side. The refueling cycles for each unit to be examined are: Cycle 4, Cycle 5, and Cycle 6.

20.0 AUGMENTED EXAMINATIONS (continued)

Reporting is required within 6 months of completing an outage during which an inspection was performed. Refer to NUREG-0619, Section 8.3 for information to be included.

20.7 Reactor Water Cleanup

The requirement for this examination has been superseded by Generic Letter 88-01 and NUREG-0313, Rev. 2 (see Section 20.16).

20.8 Evaluation of Corrosion Damage of Piping Components Exposed to Residue from the March 22, 1975 Fire - Unit 1

The augmented examination requirements of piping components exposed to residue from the March 22, 1975 fire were included in MMI-53 for the first, second, third, and fourth refueling outages. MMI-46 includes the requirements for the sixth refueling outage. The performance and documentation of the examinations will be the responsibility of the SQO. The metallurgical analysis required will be the responsibility of Nuclear Engineering.

The examination of the Unit 1 piping components exposed to residue from the March 22, 1975 fire is a technical specification requirement (4.6.G.3).

A report is required each outage upon completion of the examinations. The data sheet is included in the instruction.

20.9 CRD Scram Discharge Volume

The augmented examination requirements of the Scram Discharge Volume (SDV) piping are included in NUREG-0803. The SDV piping will be examined in accordance with the requirements of ASME Section XI Class 2 components. The inservice examinations of the SDV piping will begin during the second cycle of the first inspection interval. See Table B of Appendix A for weld size and scheduled examinations. Results to be included with the final report (see Section 16.0).

20.10 NUREG-0313, Revision 1

The requirement for this examination has been superseded by Generic Letter 88-01 and NUREG-0313, Revision 2 (see Section 20.16).

20.11 Augmented Examinations in Lieu of Penetration Flued Head Weld Examination

To supplement RFR ISI-7 NRC requires that the first pressure boundary weld outside containment be ultrasonically examined for the penetrations listed in the RFR. The welds to be examined during the first 10-year inspection interval are:

20.0 AUGMENTED EXAMINATIONS (continued)

Feedwater (Units 1 and 3): GFW-19 and GFW-2
Main Steam (Units 1 and 3): GMS-1, GMS-27, GMS-9, and GMS-18

RHR (Unit 1): DRHR-1-3, TRHR-1-194, DRHR-1-12, and TRHR-1-454A
(Unit 3): DRHR-3-3, TRHR-3-194, DRHR-3-12, and TRHR-3-455A
Core Spray (Units 1 and 3): DCS-3 and DCS-12
RWCU (Unit 1): DRWC-1-4E
(Unit 3): DRWC-3-5A

Results to be included with the final report (see Section 16.0).

20.12 Ten Percent Sample of Class 2 Chemical Sampling Exempted Piping

Ten percent of the code required examinations will be performed on the class 2 portions of core spray, RCIC, and HPCI that were initially exempted by chemical sampling and pressure-temperature considerations.

The welds and supports for these systems are identified and located on drawings in Appendix B. The examinations for these systems are scheduled in Table B, paragraph J of Appendix A.

Results of examinations to be included with the final report (see Section 16.0).

20.13 Augmented Examination of Recirculation Inlet Safe-Ends

The requirement for this examination has been superseded by Generic Letter 88-01 and NUREG-0313, Revision 2 (see Section 20.16).

20.14 HPCI Pump Discharge Support Inspection Following Injection

The augmented examination of the supports on the HPCI pump discharge line is imposed by TVA memorandum from G. T. Jones to G. R. Hall and J. R. Pittman (R35 841025 878). Each support from the HPCI pump (including the HPCI turbine and pump pedestals) to the steam tunnel penetration shall be visually examined after each injection. The SQO will be notified to perform the examinations as required by the scram report.

This examination shall be performed in accordance with QMP 110.5 (formerly DPM N80E3) procedure N-VT-1 within three days following the injection. The report is to be submitted with the final report following the next scheduled refueling outage (see Section 16.0).

The supports to be examined are listed below:

Unit 1: HPCIH-1-1, HPCIH-1-2, HPCIH-1-3, H-40, R-7, H-41, H-42, R-8, H-43, H-45, R-9, H-5, H-6, H-7, H-8, R-10, H-10, H-11, and H-12 (drawing ISI-0092-C).

20.0 AUGMENTED EXAMINATIONS (continued)

Unit 3: HPCIH-3-1, HPCIH-3-2, HPCIH-3-3, H-133, H-132, H-131, H-130, R-34, H-134, H-129, H-128, H-75, H-76, H-77, R-24, H-79, and H-80 (drawing CHM-2413-C).

20.15 Augmented Examination of Stainless and Dissimilar Metal Welds Susceptible to IGSCC (U.S. NRC Generic Letter 84-11)

The requirement for this examination has been superseded by Generic Letter 88-01 and NUREG-0313, Revision 2 (see Section 20.16).

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

Austenitic stainless steel and dissimilar metal circumferential welds in piping four inches or larger in nominal pipe diameter which contain reactor coolant at a temperature above 200 degrees F during power operation shall be examined in accordance with the requirements of Generic Letter 88-01 and NUREG-0313, Revision 2. Sample expansion shall be in accordance with Generic Letter 88-01 based on the IGSCC Category (A, B, C, or E) as defined in the generic letter. The welds requiring examination per this paragraph are listed in Table D of Appendix A by IGSCC category. (Unit 1 - Table D-1, and Unit 3 - Table D-3).

In addition to Section 11.0, Examination Methods, the examination procedures used for IGSCC examinations shall meet the requirements of Generic Letter 88-01. In addition to Section 12.0, Qualifications of NDE Personnel, personnel shall be qualified by the program described in Generic Letter 88-01 for performing IGSCC examinations.

The examination schedule is based on the IGSCC category and shall be as indicated.

<u>IGSCC CATEGORY</u>	<u>EXAMINATION EXTENT AND SCHEDULE</u>
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 (at least 50 percent in 6 years).
D	100 percent every 2 refueling cycles.

20.0 AUGMENTED EXAMINATIONS (continued)

<u>IGSCC CATEGORY</u>	<u>EXAMINATION EXTENT AND SCHEDULE</u>
---------------------------	--

- | | |
|---|--|
| 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 current outage.* |

*IGSCC category G welds that are inaccessible for UT examination shall be replaced, corrosion resistant clad on the inside diameter or have local leak detection applied during Cycle 6 for Unit 1 and Cycle 5B for Unit 3.

20.17 Reactor Vessel Interior Visual Examinations

In addition to the code required ISI examinations in section 7.1.8, the following augmented examinations shall be performed at or near the end of the inspection interval unless a different frequency is specified.

- 20.17.1 Feedwater Nozzles, NUREG-0619, See Section 20.1.
- 20.17.2 Core Spray Sparger, NRC IE Bulletin 80-13, Section 20.3.
- 20.17.3 T-box to Thermal Sleeve Weld Joint per GE SIL No. 289.
- 20.17.4 IRM/SRM Dry Tubes per GE SIL No. 409.
- 20.17.5 Jet Pump Sensing Line Brackets per GE SIL No. 420.
- 20.17.6 [NRC/C] Old Design Shroud Head Bolts per GE SIL No. 432 (ultrasonic examination) [NRC 86-0326-224].
- 20.17.7 Jet Pump Assemblies per IE Bulletin 80-07.
- 20.17.8 Shroud Support Access Hole Covers per GE SIL No. 462.

21.0 REFERENCES

- 21.1 ASME Boiler and Pressure Vessel Code, Section XI, 1971 Edition with Addenda through Summer 1971
- 21.2 ASME Boiler and Pressure Vessel Code, Section XI, 1974 Edition with Addenda through Summer 1975
- 21.3 ASME Boiler and Pressure Vessel Code, Section XI, Appendix III, 1977 Edition with Addenda through Summer 1978
- 21.4 ASME Boiler and Pressure Vessel Code, Section V, Articles 2, 6, 7 and 9, 1974 Edition with Addenda through Summer 1975

21.0 REFERENCES (continued)

- 21.5 ASME Boiler and Pressure Vessel Code, Section V, Articles 4 and 5, 1977 Edition with Addenda through Summer 1978
- 21.6 Safety Analysis Report
 - 21.6.1 Browns Ferry Nuclear Plant Final Safety Analysis Report
- 21.7 Technical Specifications
 - 21.7.1 Section 4.6.G, Structural Integrity
- 21.8 Site Standard Practices
 - 21.8.1 SSP-3.1, Quality Assurance Program
 - 21.8.2 SSP-3.4, Corrective Action
 - 21.8.3 SSP-3.6, Problem Evaluation Reports
 - 21.8.4 SSP-3.7, Finding Identification Reports
 - 21.8.5 SSP-4.5, Regulatory Reporting Requirements
 - 21.8.6 SSP-6.1, Conduct of Maintenance
 - 21.8.7 SSP-6.9, ASME Section XI Repair and Replacement Program
 - 21.8.8 SSP-6.10, ASME Section XI Inservice Inspection Program
 - 21.8.9 SSP-8.5, ASME Section XI System Pressure Test
 - 21.8.10 SSP-8.6, ASME Section XI Pump and Valve Inservice Testing
 - 21.8.11 SSP-9.3, Plant Modifications and Design Change Control
- 21.9 TVA Nuclear Quality Assurance
 - 21.9.1 QMP 102.4, Qualification and Certification Requirements for NQA NDE Personnel
 - 21.9.2 QMP 110.5, Nondestructive Examination Procedures Approved for use on CSSC Items at all Nuclear Plants

21.0 REFERENCES (continued)

21.11 Surveillance Instruction, 1, 2, 3-SI-4.6.H.1, Visual Examination of Hydraulic and Mechanical Snubbers

21.12 Mechanical Maintenance Instructions

21.12.1 MCI0.001.VLV001, Main Steam Isolation Valves Atwood Morrill Co. Disassembly, Inspection, Rework, and Reassembly

21.12.2 MCI0.001.VLV002, Main Steam Relief Valves Target Rock Model 7567 Disassembly, Inspection, Rework, and Reassembly

21.12.3 MMI-1, Reactor Vessel and Cavity Disassembly and Reassembly

21.12.4 MMI-13, Main Steam Relief Valves

21.12.5 MMI-21, Reactor Recirculation Pump Rotating Assembly, Removal, and Replacement

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

21.12.7 MMI-51, Maintenance of CSSC/Non-CSSC Valves and Flanges - Units 1, 2, and 3

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

21.12.9 MMI-182, Reactor Vessel Internals Visual and Ultrasonic Inspection - Units 1, 2, and 3

21.13 10 CFR Part 50, 50.55a(g)

21.14 NRC Documents

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

21.14.2 IE Bulletin 80-07, BWR Jet Pump Assembly Failure

21.14.3 NUREG-0312, BWR Feedwater Nozzle Examinations

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

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

21.0 REFERENCES (continued)

- 21.14.6 NUREG-0803, Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping
- 21.15 General Electric Procedure TP-5080642, Rev. A, Jet Pump Beam Ultrasonic Examination
- 21.16 General Electric Service Instruction Letters
 - 21.16.1 GE SIL No. 289, Core Spray Piping Visual Examination
 - 21.16.2 GE SIL No. 409, Incore Dry Tube Cracks
 - 21.16.3 GE SIL No. 420, Inspections of Jet Pump Sensing Lines
 - 21.16.4 GE SIL No. 432, Shroud Head Bolt Cracks
 - 21.16.5 GE SIL No. 462, Shroud Support Access Hole Cover Cracks
- 21.17 Vendor Manuals
 - 21.17.1 CVM 752, B&W Reactor Pressure Vessel Manual, Contract 66C60-90744, NIM-131-1A.(2)
 - 21.17.2 CVM 263, B&J Recirculation Pump Manual, Contract 67C60-91750, NIM-132-2A
 - 21.17.3 BFN-VTM-B260-0030, Bingham Pump Co. RHR Pump Manual, Contract 66C60-90744, NIM-131-1D(4)
 - 21.17.4 CVM 282, VTM-P160-0010, Vendor Technical Manual for Perfex Corp. Heat Exchangers, Types NEN, CEU, CES, and CEN

END OF TEXT

APPENDIX A
EXAMINATION SCHEDULE

TABLE A (UNIT 1)
BROWNS FERRY NUCLEAR PLANT CLASS 1 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
A. <u>Reactor Vessel</u>								
1. Seam welds not in Core Region								
a. Circumferential	15.2 ft.	15.2 ft.	UT	2 ft.	2 ft.	11.2 ft.	B-B	CHM-0992-C CHM-1095-A Sheet 1
b. Longitudinal	13 ft.	13 ft.	UT	1.1 ft.	2.1 ft.	9.8 ft.	B-B	
2. Closure Head Seam Weld	8 ft.	2 ft.	UT	.5 ft.	.5 ft.	1 ft.	B-B	CHM-1095-A Sheet 5
3. Closure Head Meridional Weld	24 ft.	6 ft.	UT	1 ft.	2 ft.	3 ft.	B-B	CHM-1095-A
4. Vessel-to-Flange Circumferential Weld	69 ft.	69 ft.	UT	21 ft.	23 ft.	25 ft.	B-C	CHM-1095-A Sheet 3
5. Head-to-Flange Circumferential Weld	66 ft.	66 ft.	UT	21 ft.	22 ft.	23 ft.	B-C	CHM-1095-A Sheet 4
6. Primary Nozzles								
Main Steam (26") (N3)								
a. Nozzle-to-Vessel and Inside Radii	4	4	UT	1	1	2	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	4	4	UT	1	1	2	B-J	
Core Spray (10") (N5)								
a. Nozzle-to-Vessel and Inside Radii	2	2	UT	1	1	-	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	2	2	UT, PT	1	1	-	B-F	

TABLE A (UNIT CONTINUED)
BROWNS FERRY NUCLEAR CLASS 1 COMPONENTS

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
Feedwater (12") (N4)								
a. Nozzle-to-Vessel and Inside Radii	6	6	UT	2	2	2	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	6	6	UT	2	2	2	B-J	
Recirculation Inlet (12") (N2)								
a. Nozzle-to-Vessel and Inside Radii	10	10	UT	3	4	3	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	10	10	UT,PT	3	4	3	B-F	
Recirculation Outlet (28") (N1)								
a. Nozzle-to-Vessel and Inside Radii	2	2	UT	1	1	-	B-D	CHM-1094-A Sheet 2
b. Nozzle-to-Safe End	2	2	UT,PT	1	1	-	B-F	
Jet Pump Instr. (4") (N8)								
a. Nozzle-to-Vessel and Inside Radii	2	2	UT	1	-	1	B-D	CHM-1094-A Sheet 3
b. Nozzle-to-Safe End	2	2	UT,PT	1	-	1	B-F	
CRD Hydraulic Return (4") (N9)								
a. Nozzle-to-Vessel and Inside Radii	1	1	UT	-	1	-	B-D	CHM-1094-A Sheet 5
b. Nozzle-to-Safe End	1	1	UT,PT	-	1	-	B-F	

1813C

TABLE A (UNIT 1, CONTINUED)
 BROWNS FERRY NUCLEAR PLANT CLASS 1 COMPONENTS

Components	Quantity Inspected			Method of Insp	Exam Category			Remarks
	40-Year Sample	10-Year Sample	40 Month		80 Month	120 Month		
Head Instr. (6") (N6)								
a. Nozzle-to-Vessel and Inside Radii	2	2	UT	1	-	1	B-D	CHM-2102-A CHM-1094-A Sheet 6
b. Nozzle-to-Flange	2	2	UT	1	-	1	B-J	
Head Vent (4") (N7)								
a. Nozzle-to-Vessel and Inside Radii	1	1	UT	-	-	1	B-D	CHM-2102-A CHM-1094-A Sheet 7
b. Nozzle-to-Flange	1	1	UT	-	-	1	B-J	
7. Closure Nuts	92	92	MT,UT	30	30	32	B-G-1	CHM-2001-C
8. Closure Studs	92 4	92 4	UT MT	30 -	30 4	32 -	B-G-1 B-G-1	See Section 7.1.3
9. Closure Washers and Bushings	92 4	92 4	VT VT	30 -	30 4	32 -	B-G-1 B-G-1	See Section 7.1.3
10. Ligaments between Threaded Stud Holes	92	92	UT	30	30	32	B-G-1	See Section 7.1.3
11. CRD Housing Welds	40	40	VT	Inspection During System Pressure Tests			B-0	Request for Relief ISI-6
12. Vessel Penetrations	63	63	VT	Inspection During System Pressure Tests			B-E	
13. Support Skirt Weld	4 ft.	4 ft.	UT	0	2 ft.	2 ft.	B-H	CHM-1091-A
14. Vessel Cladding	6 patches	6 patches	VT	2	2	2	B-I-1	

1813C

TABLE A (UNIT CONTINUED)
 BROWNS FERRY NUCLEAR CLASS 1 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
15. Internals			VT	General Surveillance			B-N-1, B-N-2	BF MMI-182
B. Piping								
1. Recirculation Circumferential								CHM-1081-C
28" SS	31	8	UT	3	2	3	B-J	
22" SS	10	3	UT	1	1	1	B-J	
12" SS	30	7	UT	2	2	3	B-J	
4" SS	1	0	UT	-	-	-	B-J	
Recirculation Branch Pipe Connection Welds								
12" SS	8	2	UT	1	-	1	B-J	
4" SS	3	1	PT	-	1	-	B-J	
2. Main Steam Circumferential								CHM-1082-C
26" CS*	54	14	UT	2	4	8	B-J	
26" CS (Pipe Whip)	6	6	UT	3	2	1	B-J	See Table C
6" CS	50	13	UT	4	5	4	B-J	
Branch Pipe Connection Welds								
10" CS	1	1	UT	1	-	-	B-J	
6" CS	25	6	PT or MT	2	2	2	B-J	
3" CS	1	1	PT or MT	-	1	-	B-J	

*Four welds inaccessible: KMS-1-1, KMS-1-29, KMS-1-56, and KMS-1-81, see Request for Relief ISI-7.

TABLE A (UNIT 1, CONTINUED)
BROWNS FERRY NUCLEAR PLANT CLASS 1 COMPONENTS

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
3. Feedwater Circumferential								CHM-1080-C
24" CS*	25	6	UT	2	2	2	B-J	
20" CS	7	2	UT	1	-	1	B-J	
12" CS	26	7	UT	1	3	3	B-J	
12" CS (Pipe Whip)	10	10	UT	3	4	3	B-J	See Table C
Branch Pipe Connection Welds								
16" CS	1	1	UT	1	-	-	B-J	
8" CS	1	-	UT	-	-	-	B-J	
4. Core Spray Circumferential								CHM-1089-C
10"	4	1	UT	-	1	-	B-J	
12"	23	6	UT	-	3	3	B-J	
5. RHR Circumferential								CHM-1088-C
24" SS	18	4	UT	1	1	2	B-J	
24" SS (Pipe Whip)	1	1	UT	1	-	-	B-J	See Table C
20" SS	4	1	UT	1	-	-	B-J	
20" Dissimilar	1	1	UT, PT	1	-	-	B-F	
20" CS	2	1	UT	-	1	-	B-J	

*Two welds inaccessible: KFW-1-4, KFW-1-22, see Request for Relief ISI-7.

TABLE A (UNIT 1 CONTINUED)
BROWNS FERRY NUCLEAR REACTOR CLASS 1 COMPONENTS

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
6. CRD Hydraulic Return Circumferential								CHM-1097-C
8" CS	2	1	UT	1	-	-	B-J	
6" CS	1	-	UT	-	-	-	B-J	
4" CS	7	2	UT	-	1	1	B-J	
4" Dissimilar	4	1	UT, PT	-	-	1	B-F	
7. RWCU Circumferential								CHM-1098-C
8" CS	2	1	UT	-	-	1	B-J	
6" SS	5	1	UT	1	-	-	B-J	
6" SS (Pipe Whip)	4	4	UT	1	1	2	B-J	See Table C
4" CS	6	1	UT	-	1	-	B-J	
8. RCIC Circumferential								CHM-1098-C
6" CS	5	1	UT	1	-	-	B-J	
9. HPCI Circumferential								CHM-1099-C
16" CS	1	1	UT	-	1	-	B-J	
14" CS	3	1	UT	-	1	-	B-J	
10" CS	12	2	UT	1	-	1	B-J	
10" CS (Pipe Whip)	4	4	UT	1	1	2	B-J	See Table C
10. Pressure Retaining Bolting	17	17	VT	-	8	9	B-G-2	

1813C

TABLE A (UNIT 1, CONTINUED)
BROWNS FERRY NUCLEAR PLANT CLASS 1 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
11. Pipe and Valve Component Supports								
a. Integrally Welded	101(104*)	25	MT or PT	8	8	9	B-K-1	Appendix E Request for Relief ISI-9
b. Support Components	122(117*)	122	VT	35	39	48	B-K-2	
C. <u>Recirculation Pumps</u>								
1. Pressure Retaining Studs	32	32	VT, UT MT	10 When Removed	10	12	B-G-1	
Nuts	32	32	VT	10	10	12	B-G-1	
2. Ligaments Between	32	32	VT	When connection is disassembled			B-G-1	
3. Integrally Welded Supports	6	2 6	UT VT	1 1	- 2	1 3	B-K-1 B-K-2	Request for Relief ISI-9
4. Pump Casing	2	1	VT	During Normal Maintenance			B-L-2	Request for Relief ISI-4
D. <u>Valves</u>								
1. Valve Bodies								
a. Visual Internals	60		VT	During Normal Maintenance			B-M-2	Request for Relief ISI-5

* Change in numbers due to modifications leading to Unit 2 restart.

TABLE A (UNIT 1 CONTINUED)
BROWNS FERRY NUCLEAR REACTOR CLASS 1 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
b. Valve Body Welds	1	1	UT	0	0	1	B-M-1	
2. Pressure Retaining Bolting	52	52	VT	17	16	19	B-G-2	
E. Exempt Components			VT	Inspection During Hydrostatic Testing			B-P	See Section 7.7

TABLE B (UNIT 1)
BROWNS FERRY NUCLEAR PLANT CLASS 2 COMPONENTS

Components	Quantity Inspected			Method of Insp	40 Month	80 Month	120 Month	Exam Category	Remarks
	40-Year Sample	10-Year Sample							
A. <u>RHR Heat Exchangers</u> CHM-2418-B									
1. Circumferential Welds	12 ft.	3 ft.	UT	1 ft.	1 ft.	1 ft.	C-A	Bottom Head Flg. Weld (RHRG-11)	
	.5 ft.	.5 ft.	UT	.5 ft.			C-A		
2. Nozzle-to-Vessel Welds	2	1	MT or PT	-	1	-	C-B	Request for Relief ISI-13	
3. Integrally Welded Supports	3	1	MT or PT	-	-	1	C-C		
B. <u>Main Steam Piping</u> CHM-2690-C									
1. Circumferential Welds									
26" CS	2	1	UT	1	-	-	C-F		
24" CS	18	5	UT	1	2	2	C-F		
18" CS	10	2	UT	-	1	1	C-F		
6" CS	28	7	UT	2	2	3	C-F		
2. Branch Pipe Connection Weld									
6" CS	1	1	UT	1	-	-	C-F		

1813C

TABLE B (UNIT 1 CONTINUED)
BROWNS FERRY NUCLEAR REACTOR CLASS 2 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
C. <u>RHR Piping</u>								ISI-0362-C
1. Circumferential Welds								
30" CS	6	2		1	-	1		
24" CS	44	11	UT	4	3	4	C-F	
20" CS	51	13	UT	4	5	4	C-F	
18" CS	21	5	UT	1	2	2	C-F	
16" CS	6	1	UT	-	-	1	C-F	
14" CS	5	1	UT	-	-	1	C-F	
12" CS	1	1	UT	-	1	-	C-F	
10" CS	6	2	UT	-	1	1	C-F	
6" CS	21	5	UT	2	1	2	C-F	
D. <u>Closed Cooling Water Piping</u>								ISI-0029-C
1. Circumferential Welds								
8" CS	7	2	UT	-	1	1	C-G	
E. <u>Scram Discharge Volume Tank</u>								ISI-0036-C
1. Circumferential Welds	3	1	UT	-	-	1	C-F	Entire Weld
F. <u>Scram Discharge Volume Piping</u>								ISI-0036-C
1. Circumferential Welds	14	5	UT	2	1	2	C-F	

TABLE B (UNIT 1, CONTINUED)
BROWNS FERRY NUCLEAR PLANT CLASS 2 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
<u>G. Piping and Valve Component Supports</u>								
1. Integrally Welded Supports	110(116*)	28	PT or MT	9	9	10	C-E-1	Appendix E
2. Support Components	211(242*)	211	VT	29	96	86	C-E-2	Appendix E
<u>H. RHR Pumps</u>								ISI-0022-C
1. Integrally Welded Supports	4	1	PT or MT	-	1	-	C-E-1	
2. Support Components	4	4	VT	1	1	2	C-E-2	
<u>I. Exempt Components</u>			VT	Inspection During Hydrostatic Testing				Section 8.6
<u>J. Augmented Inspection</u>								
1. <u>HPCI Piping Circumferential Welds</u>								ISI-0091-C
24"CS	1	0	UT	-	-	-	C-F	Section 19.12
20"CS	3	1	UT	1	-	-	C-F	
16"CS	2	1	UT	-	-	1	C-F	
14"CS	4	1	UT	-	-	1	C-F	
12"CS	1	0	UT	-	-	-	C-F	
10"CS	4	1	UT	-	-	1	C-F	
8"CS	1	0	UT	-	-	-	C-F	

* Change in number due to modifications leading to Unit 2 restart.

TABLE B (UNIT CONTINUED)
 BROWNS FERRY NUCLEAR CLASS 2 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
2. RCIC Piping Circumferential Welds								ISI-0093-C Section 19.12
12"CS	1	0	UT	-	-	-	C-F	
10"CS	3	1	UT	-	1	-	C-F	
8"CS	1	0	UT	-	-	-	C-F	
6"CS	3	1	UT	-	-	1	C-F	
3. Core Spray Piping Circumferential Welds								ISI-0095-C Section 19.12
16"CS	4	1	UT	-	1	-	C-F	
14"CS	3	1	UT	1	-	-	C-F	
12"CS	3	1	UT	1	-	-	C-F	
10"CS	1	0	UT	-	-	-	C-F	
12"SS	1	0	UT	-	-	-	C-F	
4. Integrally Welded Supports	44(38*)	5	MT or PT	1	1	3	C-E-1	Appendix E
5. Support Components	113(120*)	12	VT	4	4	4	C-E-2	Appendix E

* Change in numbers due to modifications leading to Unit 2 restart.

TABLE A (UNIT 3)
BROWNS FERRY NUCLEAR PLANT CLASS 1 COMPONENTS

<u>Components</u>				<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>		
A. <u>Reactor Vessel</u>								
1. Seam Welds Not In Core Region								
a. Circumferential	15.2 ft.	15.2 ft.	UT	2 ft.	2 ft.	11.2 ft.	B-B	ISI-0220-C
b. Longitudinal	13 ft.	13 ft.	UT	1.6 ft.	2.1 ft.	9.3 ft.	B-B	CHM-1095-A Sheet 1
2. Closure Head Seam Weld	8 ft.	2 ft.	UT	.5 ft.	.5 ft.	1 ft.	B-B	CHM-1095-A Sheet 5
3. Closure Head Meridional Weld	24 ft.	6 ft.	UT	2 ft.	2 ft.	2 ft.	B-B	CHM-1095-A
4. Vessel-to-Flange Circumferential Weld	69 ft.	69 ft.	UT	23 ft.	23 ft.	23 ft.	B-C	CHM-1095-A Sheet 3
5. Head-to-Flange Circumferential Weld	66 ft.	66 ft.	UT	22 ft.	22 ft.	22 ft.	B-C	CHM-1095-A Sheet 4
6. Primary Nozzles								
Main Steam (26") (N3)								
a. Nozzle-to-Vessel and Inside Radii	4	4	UT	1	1	2	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	4	4	UT	1	1	2	B-J	
Core Spray (10") (N5)								
a. Nozzle-to-Vessel and Inside Radii	2	2	UT	1	1	-	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	2	2	UT, PT	1	1	-	B-F	

TABLE A (UNIT 2 CONTINUED)
BROWNS FERRY NUCLEAR REACTOR CLASS 1 COMPONENTS

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
Feedwater (12") (N4)								
a. Nozzle-to-Vessel and Inside Radii	6	6	UT	2	2	2	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	6	6	UT	2	2	2	B-J	
Recirculation Inlet (12") (N2)								
a. Nozzle-to-Vessel and Inside Radii	10	10	UT	3	4	3	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	10	10	UT, PT	3	4	3	B-F	
Recirculation Outlet (28") (N1)								
a. Nozzle-to-Vessel and Inside Radii	2	2	UT	1	1	-	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	2	2	UT, PT	1	1	-	B-F	
Jet Pump Instr. (4") (N8)								
a. Nozzle-to-Vessel and Inside Radii	2	2	UT	1	-	1	B-D	CHM-1094-A Sheet 1
b. Nozzle-to-Safe End	2	2	UT, PT	1	-	1	B-F	ISI-0152-A
CRD Hydraulic Return (4") (N9)								
a. Nozzle-to-Vessel and Inside Radii	1	1	UT	-	1	-	B-D	CHM-1094-A Sheet 5
b. Nozzle-to-Safe End	1	1	UT, PT	-	1	-	B-F	
Head Instr. (6") (N6)								
a. Nozzle-to-Vessel and Inside Radii	2	2	UT	1	-	1	B-D	CHM-1094-A Sheet 6
b. Nozzle-to-Flange	2	2	UT	1	-	1	B-J	

1813C

TABLE A (UNIT 3, CONTINUED)
 BROWNS FERRY NUCLEAR PLANT CLASS 1 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
Head Vent (4") (N7)								
a. Nozzle-to-Vessel and Inside Radii	1	1	UT	-	-	1	B-D	CHM-1094-A Sheet 7
b. Nozzle-to-Flange	1	1	UT	-	-	1	B-J	
7. Closure Nuts	92	92	MT, UT	30	30	32	B-G-1	See Section 7.1.3
8. Closure Studs	92	92	UT	30	30	32	B-G-1	ISI-0267-C
	4	4	MT	-	4	-	B-G-1	
9. Closure Washers and Bushings	92	92	VT	30	30	32	B-G-1	See Section 7.1.3
	4	4	VT	-	4	-	B-G-1	
10. Ligaments Between Thread Stud Holes	92	92	UT	30	30	32	B-G-1	
11. CRD Housing Welds	40	40	VT	Inspection During Hydrostatic Tests			B-0	Request for Relief ISI-6
12. Vessel Penetrations	63	63	VT	Inspection During Hydrostatic Tests			B-E	
13. Support Skirt To Vessel Weld	4 ft.	4 ft.	UT	1 ft.	1 ft.	2 ft.	B-H	CHM-1091-A
14. Vessel Cladding	6 patches	6 patches	VT	2	2	2	B-I-1	ISI-0317-A
15. Internals			VT	General Surveillance			BN-1, BN-2	BF MMI-182

TABLE A (UNIT CONTINUED)
 BROWNS FERRY NUCLEAR CLASS 1 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
B. Piping								
1. Recirculation								ISI-0328-C
a. Circumferential								
28" SS	31	8	UT	3	2	3	B-J	
22" SS	12	3	UT	1	1	1	B-J	
12" SS	40	10	UT	3	4	3	B-J	
4" SS	5	1	UT	-	1	-	B-J	
b. Branch Pipe Connection Welds								
12"	8	2	UT	-	-	2	B-J	
4" SS	7	2	PT	-	1	1	B-J	
2. Main Steam								ISI-0329-C See Table C
a. Circumferential								
26" CS	56*	14	UT	5	4	5	B-J	
26" CS (Pipe Whip)	6	6	UT	2	2	2	B-J	
6" CS	50	13	UT	4	5	4	B-J	
b. Branch Pipe Connection Welds								
10" CS	1	1	UT	1	-	-	B-J	
6" CS	25	6	PT, MT	2	2	2	B-J	
3" CS	1	-	PT, MT	-	-	-	B-J	

*Four welds inaccessible: KMS-3-1, KMS-3-29, KMS-3-56, and KMS-3-81. See Request for Relief ISI-7.

TABLE A (UNIT 3, CONTINUED)
BROWNS FERRY NUCLEAR PLANT CLASS 1 COMPONENTS

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
3. Feedwater								ISI-0327-C
a. Circumferential								
24" CS	27*	6	UT	2	2	2	B-J	
20" CS	6	2	UT	1	-	1	B-J	
12" CS	32*	8	UT	2	3	3	B-J	
12" CS (Pipe Whip)	10	10	UT	3	3	4	B-J	See Table C
16" CS	1	-	UT	-	-	-	B-J	
8" CS	1	-	UT	-	-	-	B-J	
4. Core Spray								ISI-0331-C
a. Circumferential								
12" CS	2	-	UT	-	-	-	B-J	
12" Dissimilar	6	6	UT, PT	1	3	2	B-F	
12" CS (Pipe Whip)	4	4	UT	2	1	1	B-J	Table C
10" Dissimilar	2	2	UT, PT	1	-	1	B-F	
10" CS	4	1	UT	-	-	1	B-J	
5. RHR								ISI-0330-C
a. Circumferential								
24" SS	22	6	UT	2	2	2	B-J	
24" SS (Pipe Whip)	3	3	UT	1	1	1	B-J	
20" SS	7	2	UT	1	-	1	B-J	
20" Dissimilar	1	1	UT, PT	1	-	-	B-F	
20" CS	3	1	UT	-	1	-	B-J	
6" Branch Connection	1	-	PT	-	-	-	B-J	
6" Head Spray	Deleted							

*Eight welds inaccessible: KFW-3-4, -22, -40, -41, -42, -43, -44, and -45. See Request for Relief ISI-7.

1813C

TABLE A (UNIT CONTINUED)
BROWNS FERRY NUCLEAR REACTOR CLASS 1 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
6. CRD Hydraulic Return								ISI-0332-C
a. Circumferential								
8" CS	2	1	UT	-	-	1	B-J	
6" CS	1	-	UT	-	-	-	B-J	
4" CS	7	2	UT	-	1	1	B-J	
4" Dissimilar	3	3	UT, PT	1	-	2	B-F	
7. RWCU								ISI-0332-C
a. Circumferential								
8" CS	2	1	UT	1	-	-	B-J	
6" SS	12	3	UT	-	1	2	B-J	
6" SS (Pipe Whip)	4	4	UT	1	3	-	B-J	See Table C
4" CS	6	1	UT	-	1	-	B-J	
8. RCIC								ISI-0332-C
a. Circumferential								
6" CS	4	1	UT	1	-	-	B-J	
9. HPCI								ISI-0333-C
a. Circumferential								
16" CS	1	1	UT	1	-	-	B-J	
14" CS	3	1	UT	-	1	-	B-J	
10" CS	10	2	UT	-	1	1	B-J	
10" CS (Pipe Whip)	4	4	UT	1	1	2	B-J	See Table C
10. Pressure Retaining Bolting	17	17	VT	-	8	9	B-G-2	
11. Pipe and Valve Component Supports								
a. Integrally Welded	101(106*)	25	MT or PT	7	9	9	B-K-1	Request for Relief ISI-9

* Change in numbers due to modifications leading to Unit 2 restart.

TABLE A (UNIT 3, CONTINUED)
BROWNS FERRY NUCLEAR PLANT CLASS 1 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
b. Support Components	114*	114*	VT	34	40	40	B-K-2	
C. <u>Recirculation Pumps</u>								
1. Pressure Retaining Studs	32	32	VT, UT	10	10	12	B-G-1	
		MT	When Removed					
Nuts	32	32	VT	10	10	12	B-G-1	
2. Ligaments Between Threaded Stud Holes	32	32	VT	When Connection is Disassembled			B-G-1	
3. Integrally Welded Supports	6	2	UT	-	-	2	B-K-1	Request for Relief ISI-9
		6	VT	2	2	2	B-K-2	
4. Pump Casing	2	1	VT	During Normal Maintenance			B-L-2	Request for Relief ISI-4
D. <u>Valves</u>								
1. Valve Bodies	60		VT	During Normal Maintenance			B-M-2	Request for Relief ISI-5
2. Pressure Retaining Bolting	50	50	VT	7	24	19	B-G-2	
E. <u>Exempt Components</u>								
			VT	Inspection During Hydrostatic Testing			B-P	See Section 7.7

* Change in numbers due to modifications leading to Unit 2 restart.

TABLE B (UNIT 3)
BROWNS FERRY NUCLEAR CLASS 2 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
A. <u>RHR Heat Exchangers</u>								ISI-0315-B
1. Circumferential Welds	12 ft. .5 ft.	3 ft. .5 ft.	UT UT	1 ft. .5 ft	1 ft. -	1 ft. -	C-A C-A	Bottom Head Flg. Weld (RHRG-11)
2. Nozzle to Vessel Welds	2	1	MT or PT	-	1	-	C-B	Request for Relief ISI-13
3. Integrally Welded Supports	3	1	MT or PT	-	-	1	C-C	
B. <u>Main Steam Piping</u>								ISI-0354-C
1. Circumferential Welds								
26" CS	2	1	UT	1	-	-	C-F	
24" CS	18	4	UT	1	1	2	C-F	
18" CS	10	2	UT	-	1	1	C-F	
6" CS	28	6	UT	2	2	2	C-F	
2. Branch Pipe Connection Weld								
6" CS	1	1	UT	1	-	-	C-F	

TABLE B (UNIT 3, CONTINUED)
BROWNS FERRY NUCLEAR PLANT CLASS 2 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
C. <u>RHR Piping</u>								CHM-2406-C
1. <u>Circumferential Welds</u>								
30" CS	6	1	UT	-	-	1		
24" CS	44	10	UT	2	3	5	C-F	
20" CS	52	14	UT	5	4	5	C-F	
18" CS	21	5	UT	2	-	3	C-F	
16" CS	6	2	UT	1	1	-	C-F	
14" CS	5	1	UT	-	1	1	C-F	
12" CS	1	1	UT	-	1	-	C-F	
10" CS	10	3	UT	1	1	1	C-F	
6" CS	20	4	UT	1	1	2	C-F	
D. <u>Closed Cooling Water Piping</u>								ISI-0033-C
1. <u>Circumferential Welds</u>								
8" CS	8	2	UT	-	1	1	C-G	
E. <u>Scram Discharge Volume Tank</u>								ISI-0143-C
1. <u>Circumferential Welds</u>	3	1	UT	-	-	1	C-F	Entire Weld
F. <u>Scram Discharge Volume Piping</u>								ISI-0143-C
1. <u>Circumferential Welds</u>	14	5	UT	-	1	4	C-F	

TABLE B (UNIT 2 CONTINUED)
BROWNS FERRY NUCLEAR CLASS 2 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
<u>G. Piping and Valve Component Supports</u>								
1. Integrally Welded Supports	108(106*)	27	PT or MT	6	12	9	C-E-1	Appendix E
2. Support Components	189(197*)	189	VT	46	75	68	C-E-2	
<u>H. RHR Pumps</u>								
1. Integrally Welded Supports	4	1	PT or MT	-	1	--	C-E-1	ISI-0311-B
2. Support Components	16	4	VT	-	-	4	C-E-2	
<u>I. Exempt Components</u>								
			VT	Inspection During Hydrostatic Testing				Section 7.7
<u>J. Augmented Inspection</u>								
1. <u>HPCI Piping</u>								CHM-2407-C
Circumferential Welds								Section 19.12
24"CS	1	0	UT	-	-	-	C-F	
20"CS	3	1	UT	-	1	-	C-F	
16"CS	4	1	UT	-	1	-	C-F	
14"CS	5	1	UT	-	-	1	C-F	
12"SS	1	0	UT	-	-	-	C-F	
10"CS	5	2	UT	-	1	1	C-F	
8"CS	1	0	UT	-	-	-	C-F	

* Change in numbers due to modifications leading to Unit 2 restart.

TABLE B (UNIT 3, CONTINUED)
BROWNS FERRY NUCLEAR PLANT CLASS 2 COMPONENTS

1813C

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
2. RCIC Piping Circumferential Welds								CHM-2408-C Section 19.12
12"CS	1	0	UT	-	-	-	C-F	
10"CS	3	1	UT	-	1	-	C-F	
8"CS	1	0	UT	-	-	-	C-F	
6"CS	3	1	UT	-	-	1	C-F	
3. Core Spray Piping Circumferential Welds								ISI-0102-C Section 19.12
16"CS	4	1	UT	-	1	-	C-F	
14"CS	3	1	UT	-	1	-	C-F	
12"CS	3	1	UT	-	-	1	C-F	
10"CS	1	0	UT	-	-	-	C-F	
12"SS	1	0	UT	-	-	-	C-F	
4. Integrally Welded Supports	45(43*)	5	MT or PT	-	-	5	C-E-1	Appendix E
5. Support Components Chemical Exemption	127(125*)	13	VT	-	6	7	C-E-2	Appendix E

* Change in numbers due to modifications leading to Unit 2 restart.

TABLE C
WELD INSPECTION FOR PIPE WHIP PROTECTION

System

Weld Identification

Main Steam
Units 1 & 3

GMS-32, GMS-15, GMS-24, GMS-6, KMS-104, KMS-24

Feedwater
Units 1 & 3

KFW-39, GFW-15, KFW-38, GFW-9, GFW-12, KFW-13, GFW-26, KFW-31, GFW-29, GFW-32

RHR
Unit 1
Unit 3

DSRHR-8A, DSRHR-7, DSRHR-4
DSRHR-4, DSRHR-6, DSRHR-7

Core Spray
Unit 1
Unit 3

DSCS-12, DSCS-4, DSCS-11, DSCS-5
TSCS-407, TSCS-408, TSCS-423, TSCS-424

RWCU
Units 1 & 3

DSRWC-4, DSRWC-6, DSRWC-3, DSRWC-5

HPCI
Unit 1
Unit 3

THPCI-154, THPCI-152, THPCI-153, THPCI-153B
THPCI-72, THPCI-70, THPCI-71, THPCI-70A

NOTE: 100% of the pipe whip protection welds must be examined each interval per Technical Specification 4.6.G.

1813C

APPENDIX A
TABLE D-1
UNIT 1 WELDS REQUIRED TO BE EXAMINED BY
GENERIC LETTER 88-01 (NUREG-0313, REV. 2)

(LATER)

APPENDIX A
TABLE D-3
UNIT 3 WELDS REQUIRED TO BE EXAMINED BY
GENERIC LETTER 88-01 (NUREG-0313, REV. 2)

I. Core Spray System

<u>Weld Number</u>	<u>Pipe Size (Inches)</u>	<u>Weld Configuration*</u>	<u>Code Exam Category</u>	<u>IGSCC Exam Category</u>
DCS-3-3	12	P to V	BJ	G
DCS-3-4	12	P to P	BJ	C
DCS-3-5	12	P to V	BJ	D
DCS-3-12	12	P to V	BF	G
DCS-3-13	12	P to P	BJ	D
DCS-3-14	12	P to V	BJ	C
DSCS-3-1	12	E to P	BJ	C
DSCS-3-2	12	E to P	BJ	D
DSCS-3-7	12	E to P	BJ	D
DSCS-3-8	12	E to P	BJ	G
DSCS-3-9	12	P to P	BJ	D
TCS-3-401	10	N to SE	BF	D
TCS-3-405	12	(CS) E to V	BF	D
TCS-3-406	12	(CS) P to V	BF	D
TCS-3-410	12	(CS) E to V	BF	D
TCS-3-417	10	N to SE	BF	D
TCS-3-421	12	(CS) E to V	BF	D
TCS-3-422	12	(CS) P to V	BF	D
TCS-3-426	12	(CS) E to V	BF	D
TSCS-3-402	10	(CS) P to SE	BF	D
TSCS-3-418	10	(CS) P to SE	BF	D
DCS-3-10	12	E to (CS) V	CF1	D
DCS-3-11	12	P to V	CF1	D
DSCS-3-14	12	E to P	CF1	D
TCS-3-205	12	P to (CS) V	CF1	D
TCS-3-206	12	E to P	CF1	D
TCS-3-207	12	P to V	CF1	D

TABLE D-3 (cont)

II. Reactor Pressure Vessel System

<u>Weld Number</u>	<u>Pipe Size (Inches)</u>	<u>Weld Configuration*</u>	<u>Code Exam Category</u>	<u>IGSCC Exam Category</u>
JP-3-1A (OL)	4	ER to SE	BJ	E
JP-3-1B (OL)	4	ER to SE	BJ	E
JP-3-2A	8	ER to ER	BJ	D
JP-3-2B	8	ER to ER	BJ	D
JP-3-3A	12	ER to P	BJ	D
JP-3-3B	12	ER to P	BJ	D
JP-3-4A	12	F to P	BJ	D
JP-3-4B	12	F to P	BJ	D
N8A-SE	4	N to SE	BF	E
N8B-SE	4	N to SE	BF	E

III. Reactor Water Cleanup System

DRWC-3-1	6	P to V	BJ	D
DRWC-3-1A	6	P to V	BJ	D
DRWC-3-2	6	E to V	BJ	G
DRWC-3-3	6	P to V	BJ	G
DRWC-3-4	6	E to P	BJ	D
DRWC-3-5A	6	P to P	BJ	D
DRWC-3-5B	6	P to V	BJ	D
DSRWC-3-1	6	E to P	BJ	G
DSRWC-3-1A	6	E to P	BJ	G
DSRWC-3-2	6	E to P	BJ	D
DSRWC-3-3	6	E to P	BJ	C
DSRWC-3-4	6	E to P	BJ	F
DSRWC-3-5	6	E to P	BJ	D
DSRWC-3-6	6	E to P	BJ	D
DSRWC-3-7	6	E to P	BJ	D
DSRWC-3-7A**	6	P to P	BJ	G

**Potential inaccessible weld within penetration X-14. There is no assurance that it exists.

TABLE D-3 (cont)

<u>Weld Number</u>	<u>Pipe Size (Inches)</u>	<u>Weld Configuration*</u>	<u>Code Exam Category</u>	<u>IGSCC Exam Category</u>
<u>IV. Recirculation System</u>				
<u>Weld Number</u>	<u>Pipe Size (Inches)</u>	<u>Weld Configuration*</u>	<u>Code Exam Category</u>	<u>IGSCC Exam Category</u>
GR-3-1	28	Pmp to P	BJ	C
GR-3-2	28	P to V	BJ	C
GR-3-3	28	E to V	BJ	D
GR-3-4	4	C to P	BJ	G
GR-3-7	4	C to P	BJ	G
GR-3-8	28	T to X	BJ	G
GR-3-9	12	P to S	BJ	G
GR-3-10	12	E to P	BJ	G
GR-3-11	12	P to SE	BJ	G
GR-3-12	12	P to S	BJ	G
GR-3-13	12	E to P	BJ	C
GR-3-14	12	P to SE	BJ	C
GR-3-15	12	P to W	BJ	G
GR-3-16	12	E to P	BJ	C
GR-3-17	12	P to SE	BJ	G
GR-3-18	22	H to X	BJ	G
GR-3-19	12	P to S	BJ	G
GR-3-20	12	E to P	BJ	C
GR-3-21	12	P to SE	BJ	G
GR-3-22	12	P to S	BJ	G
GR-3-23	12	E to P	BJ	G
GR-3-24	12	P to SE	BJ	G
GR-3-25	22	H to V	BJ	G
GR-3-26	22	H to V	BJ	G
GR-3-27	28	Pmp to P	BJ	D
GR-3-28	28	P to V	BJ	D
GR-3-29	28	E to V	BJ	D
GR-3-30	4	C to P	BJ	G
GR-3-33	4	C to P	BJ	G
GR-3-34	28	T to X	BJ	G
GR-3-35	12	P to S	BJ	G
GR-3-36	12	E to P	BJ	C
GR-3-37	12	P to SE	BJ	G
GR-3-38	12	P to S	BJ	G
GR-3-39	12	E to P	BJ	C
GR-3-40	12	P to SE	BJ	G
GR-3-41	12	P to W	BJ	G
GR-3-42	12	E to P	BJ	C
GR-3-43	12	P to SE	BJ	G

TABLE D-3 (cont.)

IV. Recirculation System (Cont.)

<u>Weld Number</u>	<u>Pipe Size (Inches)</u>	<u>Weld Configuration*</u>	<u>Code Exam Category</u>	<u>IGSCC Exam Category</u>
GR-3-44	22	H to X	BJ	G
GR-3-45	12	P to S	BJ	G
GR-3-46	12	E to P	BJ	G
GR-3-47	12	P to SE	BJ	G
GR-3-48	12	P to S	BJ	G
GR-3-49	12	E to P	BJ	G
GR-3-50	12	P to SE	BJ	G
GR-3-51	22	H to V	BJ	G
GR-3-52	22	H to V	BJ	G
GR-3-53	28	P to SE	BJ	D
GR-3-54	28	E to P	BJ	C
GR-3-55	28	P to T	BJ	C
GR-3-56	28	E to V	BJ	D
GR-3-57	28	P to V	BJ	C
GR-3-58	28	E to Pmp	BJ	D
GR-3-59	28	P to SE	BJ	D
GR-3-60	28	E to P	BJ	C
GR-3-61	28	P to P	BJ	D
GR-3-62	28	E to V	BJ	C
GR-3-63	28	E to V	BJ	C
GR-3-63A	4	C to P	BJ	G
GR-3-63B	4	BC	BJ	G
GR-3-64	28	E to Pmp	BJ	D
KR-3-1	4	BC	BJ	G
KR-3-2	28	E to P	BJ	D
KR-3-3	28	P to T	BJ	C
KR-3-4	4	BC	BJ	G
KR-3-11	12	W to X	BJ	G
KR-3-12	22	H to X	BJ	G
KR-3-13	12	H to S	BJ	G
KR-3-14	12	H to S	BJ	G
KR-3-15	22	C to H	BJ	C
KR-3-16	12	E to P	BJ	G
KR-3-17	12	E to P	BJ	G
KR-3-18	12	E to P	BJ	G
KR-3-19	12	H to S	BJ	G
KR-3-20	12	H to S	BJ	G
KR-3-21	12	E to P	BJ	G
KR-3-22	12	E to P	BJ	G
KR-3-23	4	BC	BJ	G
KR-3-24	28	E to P	BJ	D
KR-3-25	28	P to T	BJ	C

TABLE D-3 (cont)

IV. Recirculation System (Cont.)

<u>Weld Number</u>	<u>Pipe Size (Inches)</u>	<u>Weld Configuration*</u>	<u>Code Exam Category</u>	<u>IGSCC Exam Category</u>
KR-3-26	4	BC	BJ	G
KR-3-33	28	W to X	BJ	G
KR-3-34	22	H to X	BJ	C
KR-3-35	12	H to S	BJ	G
KR-3-36	12	H to S	BJ	G
KR-3-37	22	C to H	BJ	C
KR-3-38	12	E to P	BJ	G
KR-3-39	12	E to P	BJ	C
KR-3-40	12	E to P	BJ	G
KR-3-41	12	H to S	BJ	G
KR-3-42	12	H to S	BJ	G
KR-3-43	12	E to P	BJ	G
KR-3-44	12	E to P	BJ	G
KR-3-45	28	E to P	BJ	C
KR-3-46	28	P to T	BJ	C
KR-3-47	28	E to P	BJ	C
KR-3-48	28	E to P	BJ	D
KR-3-49	4	BC	BJ	G
KR-3-50	28	E to P	BJ	C
KR-3-51	28	E to P	BJ	D
KR-3-52	28	E to P	BJ	D
KR-3-53	4	BC	BJ	G
N1A-SE	28	N to SE	BF	D
N1B-SE	28	N to SE	BF	D
N2A-SE	12	N to SE	BF	G
N2B-SE	12	N to SE	BF	G
N2C-SE	12	N to SE	BF	G
N2D-SE	12	N to SE	BF	G
N2E-SE	12	N to SE	BF	G
N2F-SE	12	N to SE	BF	G
N2G-SE	12	N to SE	BF	G
N2H-SE	12	N to SE	BF	G
N2J-SE	12	N to SE	BF	G
N2K-SE	12	N to SE	BF	G

TABLE D-3 (cont)

V. Residual Heat Removal System

<u>Weld Number</u>	<u>Pipe Size (Inches)</u>	<u>Weld Configuration*</u>	<u>Code Exam Category</u>	<u>IGSCC Exam Category</u>
DRHR-3-2	24	(CS) P to V	CF	D
DRHR-3-11	24	(CS) P to V	CF	D
DRHR-3-3	24	E to P	BJ	G
DRHR-3-4	24	E to P	BJ	G
DRHR-3-5	24	E to V	BJ	G
DRHR-3-6	24	P to V	BJ	G
DRHR-3-7	24	E to V	BJ	G
DRHR-3-8	24	P to V	BJ	C
DRHR-3-9	24	P to T	BJ	G
DRHR-3-12	24	P to V	BJ	G
DRHR-3-13	24	E to P	BJ	C
DRHR-3-14	24	E to V	BJ	C
DRHR-3-15	24	P to V	BJ	C
DRHR-3-16	24	E to V	BJ	G
DRHR-3-17	24	P to V	BJ	G
DRHR-3-18	24	P to T	BJ	G
DRHR-3-19	20	P to T	BJ	C
DRHR-3-21	20	E to V	BJ	C
DRHR-3-22	20	P to V	BJ	G
DRHR-3-23	20	P to V	BJ	G
DSRHR-3-1	24	E to P	BJ	G
DSRHR-3-2	24	E to P	BJ	C
DSRHR-3-3	24	P to P	BJ	G
DSRHR-3-4	24	E to P	BJ	G
DSRHR-3-4A	24	E to E	BJ	C
DSRHR-3-5	24	E to P	BJ	C
DSRHR-3-5A	24	E to P	BJ	C
DSRHR-3-6	24	P to P	BJ	G
DSRHR-3-7	24	E to P	BJ	G
DSRHR-3-8	6	BC	BJ	G
DSRHR-3-9	20	E to P	BJ	G
DSRHR-3-10	20	E to P	BJ	C
DSRHR-3-11	20	E to P	BJ	G
TRHR-3-191	20	(CS) E to V	BF	D
DRHR-3-3B(X-13A)**	24	P to P	BJ	G
DRHR-3-13B(X-13B)**	24	P to P	BJ	G

**Potential inaccessible weld within penetration. There is no assurance that it exists.

TABLE D-3 (cont)

VI. Control Rod Drive Hydraulic System

<u>Weld Number</u>	<u>Pipe Size (Inches)</u>	<u>Weld Configuration*</u>	<u>Code Exam Category</u>	<u>IGSCC Exam Category</u>
RCRD-3-33	4	C to N	BF	D
RCRD-3-49	4	(CS) E to V	BF	D
RCRD-3-50	4	(CS) E to V	BF	D
RCRD-3-52	4	(CS) P to V	BF	D

*Definitions for symbols used within weld configuration column are as follows.

- | | |
|------------------------------|---------------------------|
| BC - Branch connection | P - Pipe |
| C - Cap | Pmp - Pump |
| (CS) - Carbon steel | S - Sweepolet (Fitting) |
| E - Ell (Fitting) | SE - Safe-end |
| ER - Eccentric Reducer | T - Tee (Fitting) |
| F - Special Flat Plate | V - Valve |
| H - 22" Recirculation Header | W - Weldolet (Fitting) |
| N - Nozzle | X - Cross (4-way Fitting) |

TABLE E
BROWNS FERRY NUCLEAR PLANT CLASS 3 COMPONENTS

UNIT 1

<u>Components</u>	<u>40-Year Sample</u>	<u>10-Year Sample</u>	<u>Method of Insp</u>	<u>Quantity Inspected</u>			<u>Exam Category</u>	<u>Remarks</u>
				<u>40 Month</u>	<u>80 Month</u>	<u>120 Month</u>		
A. RHRSW Supports	92(76*)	92	VT	92	92	92	IWD-2600	ISI-0085-C
B. EECW Supports	97(111*)	97	VT	97	97	98*	IWD-2600	ISI-0086-C
C. Fuel Pool Cooling Supports	64(72*)	64	VT	64	64	64	IWD-2600	ISI-0090-C

UNIT 3

A. RHRSW Supports	145(102*)	145	VT	145	145	145	IWD-2600	CHM-2416-C
B. EECW Supports	148(122*)	148	VT	148	148	148	IWD-2600	CHM-2417-C
C. FPC Supports	52(55*)	52	VT	52	52	52	IWD-2600	CHM-2429-C

TABLE F

CLASS 2 EXEMPTED COMPONENTS

CORE SPRAY (47W813-1)

1. Chemistry Exemption

- a. From discharge of pumps A, B, C, and D to FCV 75-25, FCV 75-53, FCV 75-22, and FCV 75-50 (including pumps A, B, C, and D).
- b. From suppression pool header to the suction of pumps A, B, C, and D and to HCV 75-12, HCV 75-40, and HCV 75-31.

2. Components which do not operate, other than ECCS, during normal reactor operation.

- a. Pump test lines from FCV 75-50 and FCV 75-22 to the suppression pool.

RCIC (47W813-1)

1. Chemistry Exemption

- a. Pump discharge to FCV 71-40 (including pump).
- b. Pump drive turbine discharge to suppression pool (including drive turbine).

2. Pressure and Temperature Exemption

- a. Suppression pool suction from 16-inch core spray and 71-502 to pump suction.

HPCI (47W812-1)

1. Chemistry Exemption

- a. Main pump discharge to FCV 73-35 and FCV 73-45 (including pump).
- b. Booster pump discharge to main pump suction.
- c. From FCV 73-3 and 73-586 to turbine inlet (including turbine).
- d. From turbine outlet to suppression pool.

2. Pressure and Temperature Exemption

- a. From suppression pool suction and 73-505 to booster pump suction.

END OF APPENDIX A

APPENDIX B
LIST OF ASME SECTION XI BOUNDARY DRAWINGS
AND ISI DRAWINGS

BFN ASME SECTION XI BOUNDARY DRAWINGS
UNITS 1, 2, AND 3
(COLOR CODED-REPRODUCTIONS NOT AVAILABLE)

<u>DRAWING NO.</u>	<u>SYSTEM</u>
1. 47W600-57A - ISI	RCS Instrumentation
2. 47W600-58A - ISI	RCS Instrumentation
3. 47W600-135A - ISI	RCS Instrumentation
4. 47W610-43-1 - ISI	Condensate/RHR/RHRSW/RWCU/S&WQ Instrumentation
5. 47W610-43-4 - ISI	Main Steam/Feedwater/S&WQ Instrumentation
6. 47W1600-301 - ISI	RCS Instrumentation
7. 47W2600-302 - ISI	RCS Instrumentation
8. GE117C2556 - ISI	RCS Instrumentation
9. GE117C2563 - ISI	RCS Instrumentation
10. GE117C2564 - ISI	RCS Instrumentation
11. GE164C5981 - ISI	RCS Instrumentation
12. GE164C5984 - ISI	RCS Instrumentation
13. GE164C5985 - ISI	RCS Instrumentation

NOTE: Since these are color coded drawings, reproductions are not available. Controlled sets are available in most of the major organizations (MODS, MAINT, NE, QA, etc.) to be used by anyone with a need to determine Section XI boundaries.

BFN ASME SECTION XI BOUNDARY DRAWINGS
UNITS 1 AND 3
(COLOR CODED-REPRODUCTIONS NOT AVAILABLE)

<u>DRAWING NO.</u>	<u>SYSTEM</u>
1. 47W801-1 - ISI	Main Steam
2. 47W801-2 - ISI	Main Steam
3. 47W807-2 - ISI	Turbine Drains and Miscellaneous Piping
4. 47W820-2 - ISI	CRD Hydraulic
5. 47W820-6 - ISI	CRD Hydraulic
6. 47W854-1 - ISI	Standby Liquid Control
7. 47W855-1 - ISI	Fuel Pool Cooling

NOTE: Since these are color coded drawings, reproductions are not available. Controlled sets are available in most of the major organizations (MODS, MAINT, NE, QA, etc.) to be used by anyone with a need to determine Section XI boundaries.

BFN ASME SECTION XI BOUNDARY DRAWINGS
UNIT 1
(COLOR CODED-REPRODUCTIONS NOT AVAILABLE)

<u>DRAWING NO.</u>	<u>SYSTEM</u>
1. 1-47E803-1 - ISI	Feedwater
2. 1-47E810-1 - ISI	RWCU
3. 1-47E811-1 - ISI	RHR
4. 1-47E812-1 - ISI	HPCI
5. 1-47E813-1 - ISI	RCIC
6. 1-47E814-1 - ISI	Core Spray
7. 1-47E817-1 - ISI	Nuclear Boiler
8. 1-47E822-1 - ISI	RBCCW
9. 1-47E844-2 - ISI	Raw Cooling Water
10. 1-47E852-1 - ISI	Floor and Dirty Radwaste Drain
11. 1-47E852-2 - ISI	Clean Radwaste and Decon Drain
12. 1-47E856-2 - ISI	Demineralized Water
13. 1-47E858-1 - ISI	RHRWS
14. 1-47E859-1 - ISI	EECW

NOTE: Since these are color coded drawings, reproductions are not available. Controlled sets are available in most of the major organizations (MODS, MAINT, NE, QA, etc.) to be used by anyone with a need to determine Section XI boundaries.

BFN ASME SECTION XI BOUNDARY DRAWINGS
UNIT 3
(COLOR REPRODUCTIONS NOT AVAILABLE)

<u>DRAWING NO.</u>	<u>SYSTEM</u>
1. 3-47E803-1 - ISI	Feedwater
2. 3-47E810-1 - ISI	RWCU
3. 3-47E811-1 - ISI	RHR
4. e-47E812-1 - ISI	HPCI
5. 3-47E813-1 - ISI	RCIC
6. 3-47E814-1 - ISI	Core Spray
7. 3-47E817-1 - ISI	Nuclear Boiler
8. 3-47E822-1 - ISI	RBCCW
9. 3-47E844-2 - ISI	Raw Cooling Water
10. 3-47E852-1 - ISI	Floor and Dirty Radwaste Drain
11. 3-47E852-2 - ISI	Clean Radwaste and Decon Drain
12. 3-47E856-2 - ISI	Demineralized Water
13. 3-47E858-1 - ISI	RHRSW
14. 3-47E859-1 - ISI	EECW
15. 3-47E859-2 - ISI	EECW
16. 3-47E866-5 - ISI	Air Conditioning Chilled Water
17. 3-47E866-7 - ISI	Air Conditioning Chilled Water

NOTE: Since these are color coded drawings, reproductions are not available. Controlled sets are available in most of the major organizations (MODS, MAINT, NE, QA, etc.) to be used by anyone with a need to determine Section XI boundaries.

LIST OF ISI DRAWINGS - UNIT 1

DRAWING NO.

TITLE

Reactor Vessel

CHM-0992-C. Reactor Vessel Weld and Nozzle Locations
CHM-2001-C Vessel Stud Locations
CHM-2002-C Control Rod Drive Penetrations (Locations)
CHM-2102-A Closure Head Assembly
MSG-0020-A Reactor Vessel Clad Patches

Residual Heat Removal Heat Exchangers

CHM-2418-B RHR Heat Exchanger Welds

Piping System Weld Locations

CHM-1080-C Feedwater System - Code Class 1
CHM-1081-C Recirculation System - Code Class 1
CHM-1082-C Main Steam System - Code Class 1
CHM-1088-C Residual Heat Removal System - Code Class 1
CHM-1089-C Core Spray System - Code Class 1
CHM-1097-C CRD Hydraulic Return Line - Code Class 1
CHM-1098-C Reactor Water Cleanup and RCIC - Code Class 1
CHM-1099-C High Pressure Coolant Injection - Code Class 1
ISI-0362-C RHR Shutdown Supply - Code Class 2
CHM-2690-C Main Steam System - Code Class 2
ISI-0029-C Closed Cooling Water System - Code Class 2
ISI-0093-C RCIC - Code Class 2
ISI-0091-C HPCI - Code Class 2
ISI-0095-C Core Spray - Code Class 2
ISI-0036-C CRD Header - Code Class 2
ISI-0409-C Jet Pump Instrumentation Nozzle Class 1
ISI-0159-A Core Differential Pressure and Liquid Control Nozzle Class 1
ISI-0160-A Instrumentation Nozzles Class 1
MSG-0019-B Recirculation Inlet Nozzles Class 1

LIST OF ISI DRAWINGS - UNIT 1 (Continued)

<u>DRAWING NO.</u>	<u>TITLE</u>
	<u>Piping System Support Locations</u>
CHM-2036-C	Feedwater System - Code Class 1
CHM-2037-C	Recirculation System - Code Class 1
CHM-2038-C	Main Steam System - Code Class 1
CHM-2039-C	RHR System - Code Class 1
CHM-2040-C	Core Spray System - Code Class 1
CHM-2042-C	Reactor Water Cleanup and RCIC - Code Class 1
CHM-2043-C	High Pressure Coolant Injection - Code Class 1
ISI-0363-C	RHR Shutdown Supply - Code Class 2
ISI-0030-C	Closed Cooling Water - Code Class 2
ISI-0049-C	Main Steam System - Code Class 2
ISI-0094-C	RCIC - Code Class 2
ISI-0092-C	HPCI - Code Class 2
ISI-0096-C	Core Spray - Code Class 2
ISI-0037-C	CRD Header - Code Class 2
ISI-0085-C	RHR Service Water - Code Class 3
ISI-0391-C	Raw Cooling Water - Code Class 3
ISI-0090-C	Fuel Pool Cooling - Code Class 3
	<u>Pipe Bolting</u>
ISI-0027-B	Main Steam Bolting - Code Class 1
	<u>Pump Support</u>
ISI-0022-B	RHR Pump Support - Code Class 2
	<u>Reactor Vessel Support</u>
ISI-0414-C	Reactor Vessel Support - Code Class 1
	<u>Pump Bolting</u>
ISI-0420-C	Recirculation Pump Bolting - Code Class 1

LIST OF ISI DRAWINGS - UNIT 3

<u>DRAWING NO.</u>	<u>TITLE</u>
	<u>Reactor Vessel</u>
ISI-0267-C	Vessel Stud Locations
ISI-0293-C	Control Rod Drive Penetrations (Locations)
ISI-0220-C	Reactor Vessel Weld and Nozzle Locations
ISI-0295-A	Closure Head Assembly
ISI-0317-A	Reactor Vessel Clad Patches
	<u>Residual Heat Removal Heat Exchangers</u>
ISI-0315-B	RHR Heat Exchanger Welds
	<u>Piping System Weld Locations</u>
ISI-0327-C	Feedwater System - Code Class 1
ISI-0328-C	Recirculation System - Code Class 1
ISI-0329-C	Main Steam System - Code Class 1
ISI-0330-C	Residual Heat Removal System - Code Class 1
ISI-0331-C	Core Spray System - Code Class 1
ISI-0332-C	Reactor Water Cleanup, RCIC, and CRD - Code Class 1
ISI-0333-C	High Pressure Coolant Injection - Code Class 1
ISI-0411-C	Jet Pump Instrumentation Nozzle - Code Class 1
ISI-0354-C	Main Steam Code Class 2
ISI-0393-C	Residual Heat Removal System - Code Class 2
ISI-0033-C	Closed Cooling Water - Code Class 2
CHM-2408-C	RCIC - Code Class 2
CHM-2407-C	HPCI - Code Class 2
ISI-0102-C	Core Spray - Code Class 2
ISI-0143-C	CRD Header - Code Class 2
ISI-0344-A	Core Differential Pressure and Liquid Control Nozzle - Class 1
ISI-0346-A	Instrumentation Nozzles - Class 1
ISI-0348-B	Recirculation Inlet Nozzles - Class 1

LIST OF ISI DRAWINGS - UNIT 3 (Continued)

<u>DRAWING NO.</u>	<u>TITLE</u>
	<u>Piping System Support Locations</u>
ISI-0334-C	Reactor Water Cleanup and RCIC - Code Class 1
ISI-0335-C	High Pressure Coolant Injection - Code Class 1
ISI-0336-C	Feedwater System - Code Class 1
ISI-0337-C	Recirculation System - Code Class 1
ISI-0338-C	Main Steam System - Code Class 1
ISI-0339-C	Core Spray System - Code Class 1
ISI-0340-C	RHR System - Code Class 1
ISI-0395-C	RHR System - Code Class 2
ISI-0355-C	Main Steam System - Code Class 2
ISI-0034-C	Closed Cooling Water - Code Class 2
ISI-0104-C	Core Spray - Code Class 2
CHM-2413-C	HPCI - System Code Class 2
CHM-2412-C	RCIC - System Code Class 2
ISI-0144-C	CRD Header - Code Class 2
CHM-2416-C	RHR SW - Code Class 3
CHM-0390-C	ECCW - Code Class 3
CHM-2429-C	Fuel Pool Cooling System - Code Class 3
	<u>Pipe Bolting</u>
ISI-0313-B	Main Steam Bolting - Code Class 1
	<u>Pump Support</u>
ISI-0311-B	RHR Pump Support - Code Class 2
	<u>Pump Bolting</u>
ISI-0413-C	Recirculation Pump Bolting - Code Class 1
	<u>Reactor Vessel Support</u>
ISI-0416-C	Reactor Vessel Support - Code Class 1

END OF APPENDIX B

APPENDIX C
CLASS 1 VALVE DATA

APPENDIX C
TABLE 1
CLASS 1 VALVE DATA

VALVE NO.	CODE CLASS	VALVE CAT.	PIPING SYSTEM	VALVE SIZE	VALVE TYPE	VALVE ACT.	GROUP NO.	TVA Dwg. No. (WELD MAP)	VENDOR Dwg. No.	VENDOR	MATERIAL SPEC.	VALVE FUNCTION	FORGING/CASTING
3-554	1	AC	Fdwtr.	24"	Ck	SA	1	CHM-1080-C	20788-H	Atwood&Morri1	A-216 WCB	PSIV	Casting
3-558	1	AC	Fdwtr.	24"	Ck	SA	1	CHM-1080-C	20788-H	Atw&Mor	A-216 WCB	PSIV	Casting
3-568	1	AC	Fdwtr.	24"	Ck	SA	1	CHM-1080-C	20788-H	Atw&Mor	A-216 WCB	PSIV	Casting
3-572	1	AC	Fdwtr.	24"	Ck	SA	1	CHM-1080-C	20788-H	Atw&Mor	A-216 WCB	PSIV	Casting
HCV 3-67	1		Fdwtr.	24"	Gate	Man	2	CHM-1080-C	035879-2	Powell	A-216 WCB	Maint.	Casting
HCV 3-66	1		Fdwtr.	24"	Gate	Man	2	CHM-1080-C	035879-2	Powell	A-216 WCB	Maint.	Casting
FCV 68-1	1		Recirc	28"	Gate	MO	3	CHM-1081-C	94-12086	Darling	A351 CF8	Oper.	Casting
FCV 68-77	1		Recirc	28"	Gate	MO	3	CHM-1081-C	94-12086	Darling	A351 CF8	Oper.	Casting
FCV 68-3	1	B	Recirc	28"	Gate	MO	4	CHM-1081-C	94-12086	Darling	A351 CF8	PSIV	Casting
FCV 68-79	1	B	Recirc	28"	Gate	MO	4	CHM-1081-C	94-12086	Darling	A351 CF8	PSIV	Casting
FCV 68-33	1		Recirc	22"	Gate	MO	5	CHM-1081-C	94-12086	Darling	A351 CF8	Oper.	Casting
FCV 68-35	1		Recirc	22"	Gate	MO	5	CHM-1081-C	94-12086	Darling	A351 CF8	Oper.	Casting
FCV 1-14	1	A	M. Stm.	26"	Globe	CO	6	CHM-1082-C	20851-H	Atw&Mor	A216 WCB	PSIV	Casting
FCV 1-26	1	A	M. Stm.	26"	Globe	CO	6	CHM-1082-C	20851-H	Atw&Mor	A216 WCB	PSIV	Casting
FCV 1-37	1	A	M. Stm.	26"	Globe	CO	6	CHM-1082-C	20851-H	Atw&Mor	A216 WCB	PSIV	Casting
FCV 1-51	1	A	M. Stm.	26"	Globe	CO	6	CHM-1082-C	20851-H	Atw&Mor	A216 WCB	PSIV	Casting
FCV 1-15	1	A	M. Stm.	26"	Globe	CO	6	CHM-1082-C	20851-H	Atw&Mor	A216 WCB	PSIV	Casting
FCV 1-27	1	A	M. Stm.	26"	Globe	CO	6	CHM-1082-C	20851-H	Atw&Mor	A216 WCB	PSIV	Casting
FCV 1-38	1	A	M. Stm.	26"	Globe	CO	6	CHM-1082-C	20851-H	Atw&Mor	A216 WCB	PSIV	Casting
FCV 1-52	1	A	M. Stm.	26"	Globe	CO	6	CHM-1082-C	20851-H	Atw&Mor	A216 WCB	PSIV	Casting
PCV 1-4	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck	See Note 1	MSRV	Casting
PCV 1-179	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-5	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-18	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-19	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-22	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-23	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-30	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-31	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-34	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-41	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-180	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
PCV 1-42	1	C	M. Stm.	6"	Rel	SA	7	ISI-0027-C	PL-7657F-100	Trgt Rck		MSRV	Casting
HCV 74-69	1		RHR	24"	Gate	Man	8	CHM-1088-C	035880-3	Powell	A351 CF8M	Maint.	Casting
HCV 74-55	1		RHR	24"	Gate	Man	8	CHM-1088-C	035880-3	Powell	A351 CF8M	Maint.	Casting

APPENDIX C
TABLE 1 (Continued)
CLASS 1 VALVE DATA

VALVE NO.	CODE CLASS	VALVE CAT.	PIPING SYSTEM	VALVE SIZE	VALVE TYPE	VALVE ACT.	GROUP NO.	TVA Dwg. No. (WELD MAP)	VENDOR Dwg. No.	VENDOR	MATERIAL SPEC.	VALVE FUNCTION	FORGING/CASTING
FCV 74-68	1	AC	RHR	24"	Ck	SA	9	CHM-1088-C	20800-H	Atw&Mor	A351 CF8M	PSIV	Casting
FCV 74-54	1	AC	RHR	24"	Ck	SA	9	CHM-1088-C	20800-H	Atw&Mor	A351 CF8M	PSIV	Casting
FCV 74-67(d)	1	A	RHR	24"	Gate	MO	10	CHM-1088-C	A-12334-M1E	Walworth	A351 CF8M	PSIV	Casting
FCV 74-53	1	A	RHR	24"	Gate	MO	10	CHM-1088-C	A-12334-M1E	Walworth	A351 CF8M	PSIV	Casting
HCV 74-49	1		RHR	20"	Gate	Man	11	CHM-1088-C	036207-2	Powell	A351 CF8M	Maint.	Casting
FCV 74-47(d)	1	A	RHR	20"	Gate	MO	12	CHM-1088-C	A-12332-M1C	Walworth	A216 WCB	PSIV	Casting
85-577(a)	1		CRD	4"	Gate	Man	15	CHM-1097-C	P-339231-13	Velan	A182 TP316	Maint.	Forging
HCV 75-55	1		C Spray	12"	Gate	Man	16	CHM-1089-C	036034-2	Powell	A351 CF8M	Maint.	Casting
HCV 75-27	1		C Spray	12"	Gate	Man	16	CHM-1089-C	036034-2	Powell	A351 CF8M	Maint.	Casting
FCV 75-54	1	AC	C Spray	12"	Ck	SA	17	CHM-1089-C	PD-420652	Rockwell	A351 CF8M	PSIV	Casting
FCV 75-26	1	AC	C Spray	12"	Ck	SA	17	CHM-1089-C	PD-420652	Rockwell	A351 CF8M	PSIV	Casting
FCV 75-53(d)	1	A	C Spray	12"	Gate	MO	18	CHM-1089-C	IVP-11978	Walworth	A351 CF8M	PSIV	Casting
FCV 75-25	1	A	C Spray	12"	Gate	MO	18	CHM-1089-C	IVP-11978	Walworth	A351 CF8M	PSIV	Casting
69-500	1		RWCU	6"	Gate	Man	19	CHM-1098-C	P-33160-20	Velan	A182 F316	Maint.	Forging
FCV 69-1(b)	1	A	RWCU	6"	Gate	MO	20	CHM-1098-C	435KAA-002	Borg-Warner	SA 105	PSIV	Forging
FCV 69-1(c)	1	A	RWCU	6"	Gate	MO	21	CHM-2073-C	P-33160-20	Velan	A182 F316	PSIV	Forging
FCV 69-2	1	A	RWCU	6"	Gate	MO	21	CHM-1098-C	P-33160-20	Velan	A182 F316	PSIV	Forging
69-579(a)	1	AC	RWCU	4"	CK	SA	22	CHM-1098-C	P-35177-4	Velan		PSIV	
69-580(a)	1		RWCU	4"	Gate	Man	23	CHM-1098-C	P-35177-3	Velan	A105 GR11	Maint.	Forging
FCV 71-40	1	A	RCIC	6"	Ck	SA	24	CHM-1098-C	PD-42068B	Rockwell	A216 WCB	PSIV	Casting

- (a) Exempt from B-M-2 examination due to size.
 (b) Unit 1.
 (c) Unit 3.
 (d) No B-G-2 bolting.

APPENDIX C
TABLE 1 (Continued)
CLASS 1 VALVE DATA

VALVE NO.	CODE CLASS	VALVE CAT.	PIPING SYSTEM	VALVE SIZE	VALVE TYPE	VALVE ACT.	GROUP NO.	TVA Dwg. No. (WELD MAP)	VENDOR Dwg. No.	VENDOR	MATERIAL SPEC.	VALVE FUNCTION	FORGING/CASTING
FCV 73-2(d)	1	A	HPCI	10"	Gate	MO	25	CHM-1099-C	PB-139989	Crane	A216 WCB	PSIV	Casting
FCV 73-3	1	A	HPCI	10"	Gate	MO	25	CHM-1099-C	PB-139989	Crane	A216 WCB	PSIV	Casting
FCV 73-45	1	A	HPCI	14"	Ck	CO	26	CHM-1099-C	PD-420687	Rockwell	A216 WCB	PSIV	Casting
FCV 74-48(d)	1	A	RHR	20"	Gate	MO	27	CHM-1088-C	A-12331-M1C	Walworth	A351 CF8M	PSIV	Casting

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).

Valve Actuation

MO - Motor Operated
CO - Cylinder Operated
SA - Self-Actuating
Man - Manual

(d) No B-G-2 bolting.

APPENDIX C
TABLE 2

System	Valve Numbers (Flow Diagram Number)
Feedwater	96A (3-554), 28A (3-558), 29A (HCV 3-67), 96B (3-568), 28B (3-572), 29B (HCV 3-66)
Recirculation	43A (FCV 68-1), 53A (FCV 68-3), 65A (FCV 68-35), 65B (FCV 68-33), 53B (FCV 68-79), 43B (FCV 68-77)
Main Steam	FCV 1-15, FCV 1-14, PCV 1-5, 1-501, PCV 1-4, FCV 1-27, FCV 1-26, PCV 1-23, PCV 1-22, PCV 1-19, PCV 1-18, FCV 1-38, FCV 1-37, PCV 1-34, PCV 1-31, PCV 1-30, FCV 1-52, FCV 1-51, PCV 1-42, 1-537, PCV 1-41
RHR	81A (HCV 74-69), 46A (FCV 74-68), 25A (FCV 74-67), 81B (HCV 74-55), 46B (FCV 74-54), 25B (FCV 74-53), HCV 74-49, FCV 74-48, FCV 74-47
CRD Return	85-577, 85-576
Core Spray	14A (HCV 75-27), 13A (FCV 75-26), 12A (FCV 75-25), 14B (HCV 75-55), 13B (FCV 75-54), 12B (FCV 75-53)
RWCU	69-500, FCV 69-1, FCV 69-2, 69-580
RCIC	FCV 71-40
HPCI	FCV 73-2, FCV 73-3, FCV 73-45

END OF APPENDIX C

APPENDIX D
NOTIFICATION OF INDICATION (NOI) FORM

APPENDIX D
NOTIFICATION OF INDICATION

PART I - FINDINGS

NOI Number _____ Plant/Unit _____ ISI Dwg./Sh. No. _____
Examination Report No. _____ Component ID _____

Description of Indication (Sketch/Photograph if Required for Clarification):

Signature of Examiner/Certification Level: _____ Date _____
Signature of Field Supervisor (Contractor): _____ Date _____
Signature of SQO Representative: _____ Date _____

PART II-DISPOSITION

Disposition Recorded By _____ Date _____

PART III

ADDITIONAL EXAMINATIONS

Additional Sample Required: ___ Yes, ___ No

Attach list of items in additional sample, if required.

VERIFICATION OF CLOSURE

Verification of Completed Corrective Action Required by Disposition
Reexamination Examination Report Number, if Applicable: _____
Comments: _____

Signature of SQO Representative: _____ Date _____

APPENDIX E

TABLE 13

COMPONENT SUPPORT INFORMATION
(DELETED)

APPENDIX F
DATA SHEETS

APPENDIX F
Data Sheet 1

BROWNS FERRY NUCLEAR PLANT
UNIT _____, CYCLE _____
INSERVICE INSPECTION FINAL REPORT

Reviewed by:

Site Quality Organization Representative

Plant Manager

APPENDIX F
Data Sheet 2

Plant Manager
Browns Ferry Nuclear Plant

All in-service inspection work scheduled during the unit ____, cycle ____
outage for the area designated below is complete. Also, all corrective
actions specified in the Notification of Indication forms submitted during
this outage are verified and the required reinspections are acceptable.

 / Drywell

 / Total Plant

Site Quality Organization Representative

APPENDIX F

Data Sheet 3

Date: _____

FIELD CORRECTED DRAWING(S) TRANSMITTAL

TO: ISI Programs
BR 5S 38A-C

Transmittal Number: _____
(Year) (Sequential)

Plant: BFN

Unit/Outage: _____

The drawing(s) listed below from SI-4.6.G have been field marked with variations in configuration or component identification changes discovered during the course of inservice or preservice examinations. Please revise the controlled copy of this/these drawing(s) in the SI prior to the next refueling outage.

- | | |
|----------|-----------|
| 1. _____ | 7. _____ |
| 2. _____ | 8. _____ |
| 3. _____ | 9. _____ |
| 4. _____ | 10. _____ |
| 5. _____ | 11. _____ |
| 6. _____ | 12. _____ |

Signature of Examiner/Date _____

Signature of Field Supervisor _____

RETURN TO: Site Quality ISI
TOB C-BFN

Drawings have been revised as necessary to reflect the changes noted.

ISI Programs Representative: _____

Date: _____

END OF APPENDIX F

APPENDIX G
REQUESTS FOR RELIEF

REQUEST FOR RELIEF ISI-2

Components: Reactor Pressure Vessel

Class: 1

Function Pressure-retaining component.

Test Requirement: Volumetric examination of reactor pressure vessel pressure-retaining welds, examination categories B-A and B-B.

Basis for Relief: The Browns Ferry Nuclear Plant was designed and under construction before the issuance of Section XI. As a result, only those welds above the sacrificial shield are accessible for inservice inspection. Access has not been provided in the sacrificial shield area for external examinations nor does the BWR design permit internal examinations in this area. Only those welds above the sacrificial shield and portions of welds as may be accessible at nozzle access points will be examined during the inservice inspection intervals.

Alternate Inspection: None.

REQUEST FOR RELIEF ISI-2 (SUPPLEMENT)

A. Welds that Cannot Be Examined

Lower head bottom section to lower head center section circumferential seam weld (approximately 39 ft. long).* The lower head center section contains four longitudinal welds (approximately 2.5 ft. long each).* All other welds are identified on Drawing CHM-0992-C (unit 1)** and the inaccessible ones are listed below:

<u>Weld Identification</u>	<u>Category</u>
C-S-BH (Circ. Seam approximately 54 ft. long)	B-B
V-BH-2 (Long. Seam approximately 6.5 ft. long)	B-B
V-BH-3 (Long. Seam approximately 6.5 ft. long)	B-B
V-BH-4 (Long. Seam approximately 6.5 ft. long)	B-B
V-BH-5 (Long. Seam approximately 6.5 ft. long)	B-B
V-BH-6 (Long. Seam approximately 6.5 ft. long)	B-B
V-BH-1 (Long. Seam approximately 6.5 ft. long)	B-B
C-BH-1 (Circ. Seam approximately 69 ft. long)	B-B
V-1-B (Long. Seam approximately 11 ft. 1 inch long)	B-A
V-1-A (Long. Seam approximately 11 ft. 1 inch long)	B-A
V-1-C (Long. Seam approximately 11 ft. 1 inch long)	B-A
C-1-2 (Circ. Seam approximately 69 ft. long)	B-A
V-2-B (Long. Seam approximately 11 ft. 1 inch long)	B-A
V-2-A (Long. Seam approximately 11 ft. 1 inch long)	B-A
V-2-C (Long. Seam approximately 11 ft. 1 inch long)	B-A
C-2-3 (Circ. Seam approximately 69 ft. long)	B-A
V-2-C (Long. Seam approximately 11 ft. 1 inch long)	B-B
V-3-B (Long. Seam approximately 11 ft. 1 inch long)	B-B

B. Welds That Can Be Examined

<u>Weld Identification</u>	<u>Category</u>
V-3-A (Approximately 4.5 ft. of 11 ft. 1 inch Long. Seam at nozzle opening)	B-B
C-3-4 (Approximately 27 ft. of 69 ft. Circ. Seam accessible at nozzle opening)	B-B
V-4-B (Approximately 10 inches of 4' - 0-3/8" Long. Seam accessible above biological shield)	B-B
V-4-A (Approximately 10 inches of 4' - 0-3/8" Long. Seam accessible above biological shield)	B-B
V-4-C (Approximately 10 inches of 4' - 0-3/8" Long. Seam accessible above biological shield)	B-B
C-4-5 (Approximately 4.5 ft. of 69 Ft. Circ. Seam accessible by removable insulation)	B-B
V-5-A (Total Long. Seam 11 ft. 1 inch accessible by removable insulation)	B-B

REQUEST FOR RELIEF ISI-2 (SUPPLEMENT) (Cont'd)

V-5-C (Total Long. Seam 11 ft. 1 inch accessible by removable insulation) B-B
V-5-B (Total Long. Seam 11 ft. 1 inch accessible by removable insulation) B-B

C. Summary

<u>Code Category</u>	<u>Code Required Weld Length Accessible</u>	<u>Code Required weld Length Inaccessible</u>	<u>Accessible Length Not Required By Code</u>
B-A	NONE	6.6 ft. Long. Seam 6.6 ft. Circ. Seam	NONE
B-B	5.9 ft. Long. Seam 7.0 ft. Circ. Seam	7.1 ft. Long. Seam 8.1 ft. Circ. Seam	31.9 ft. Long. Seam 24.5 ft. Circ. Seam

*Category B-B

**CHM-2046-C (Unit 2) and ISI-0220-C (Unit 3) details same weld numbers.

REQUEST FOR RELIEF ISI-3

Components: Reactor Pressure Vessel Support Skirt

Class: 1

Function Support component.

Test Requirement: Volumetric examination of support attachment weld to vessel, examination category B-H.

Basis for Relief: Approximately 6 feet of the attachment weld would require examination to meet code requirements. However, nonremovable reactor vessel insulation limits inservice examination. Two access ports, approximately 180 degrees apart, provide access for examination of two 2-foot lengths. Four feet of the support skirt-to-reactor vessel weld will be ultrasonically examined during each inspection interval.

Alternate Inspection: None.

REQUEST FOR RELIEF ISI-4
REVISION 1

Components: Reactor Recirculation Pumps

Class: 1

Function Provides a variable reactor power rate by varying core coolant flowrate.

Test Requirement: Visual examination of pump internal pressure boundary surfaces, examination category B-L-2.

Basis for Relief: During maintenance, if required, visual examination of the recirculation pump internal pressure boundary surface is performed and documented under existing plant procedures.

In the absence of required maintenance, as is the case with the recirculation pumps at Browns Ferry during the first 10-year interval, disassembly of a recirculation pump solely to perform a visual examination of internal surfaces is impractical. This would represent unnecessary exposure of employees to high radiation and contamination areas and excessive expense to TVA.

Disassembly of this pump could require transport of the motor outside of containment; consequently, a possibility of damage to the pump, pump motor, or other safety-related equipment exists. Time required for this major task of disassembly, examination, and reassembly would consume at least three weeks of 24-hours-per-day work. Radiation dose rates of the pump exterior will average 10-20 rem/hour. This would result in a cumulative dose of between 100 and 300 man-rem.

The benefit received from this major effort is minimal considering employees exposure, potential damage to safety-related equipment, and cost. Relief from the visual examination B-L-2 requirement is, therefore, requested.

Alternate Inspection:

- A. None planned. As long as the flows, pressure and temperatures are as specified in the Byron-Jackson recirculation pump manual, no disassembly for routine visual examination is recommended.
- B. Conduct the required Code visual inspection of the interior during the cycle 6 outage.

REQUEST FOR RELIEF ISI-4 (Cont'd)

- Alternate Monitoring:
- A. Install monitoring instrumentation on each pump for pump shaft vibration caused by mechanical fatigue-driven crack growth with appropriate control room instrumentation.
 - B. Install monitoring instrumentation for contamination of component cooling water (CCW) by reactor coolant water caused by crack growth in the pump covers to the extent that a leak path develops between the two systems with appropriate control room instrumentation.

REQUEST FOR RELIEF ISI-5
REVISION 1

Components: Valves exceeding 4-inch pipe size

Class: 1

Function Various

Test Requirement: Visual examination of internal pressure boundary surfaces, examination category B-M-2.

Basis for Relief: During routine maintenance, visual examinations of valve body internal pressure boundary surfaces are performed and documented under existing plant administrative procedures. If no valve within a group has been disassembled for maintenance as the end of the interval approaches, relief from the visual examination B-M-2 requirements is requested. The attachments hereto present the valve groups requiring visual examination and the specific groups for each Browns Ferry Nuclear Plant unit for which relief is requested.

Alternate Inspection: If no valves from a particular group have been disassembled as the end of the interval approaches, the valves comprising that group shall be visually examined for leakage when the system pressure tests (IWA-5000) are conducted in accordance with the requirements for Category B-P.

TABLE 1
REQUEST FOR RELIEF ISI-5

Valve Groups Requiring Internal Pressure Boundary Visual Examination (B-M-2)

<u>Group Number</u>	<u>System</u>	<u>Valve Type</u>	<u>Valve Size</u>	<u>Manufacturer</u>	<u>Valve Numbers</u>
1	FW	Check	24"	Atwood & Morrill	3-554, 3-558, 3-568, 3-572
2	FW	Gate	24"	Powell	HCV3-66, HCV3-67
3	Recirc.	Gate	28"	Darling	FCV68-1, FCV68-77
4	Recirc.	Gate	28"	Darling	FCV68-3, FCV68-79
5	Recirc.	Gate	22"	Darling	FCV68-33, FCV68-35
6	MS	Globe	26"	Atwood & Morrill	FCV1-14, FCV1-15, FCV1-26, FCV1-27, FCV1-37, FCV1-38, FCV1-51, FCV1-52
7	MS	Relief	6"	Target Rock	PCV1-4, PCV1-5, PCV1-18, PCV1-19, PCV1-22, PCV1-23, PCV1-30, PCV1-31, PCV1-34, PCV1-41, PCV1-42, PCV1-179, PCV1-180
8	RHR	Gate	24"	Powell	HCV74-69, HCV74-55
9	RHR	Check	24"	Atwood & Morrill	FCV74-54, FCV74-68
10	RHR	Gate	24"	Walworth	FCV74-53, FCV74-67
11	RHR	Gate	20"	Powell	HCV74-49
12	RHR	Gate	20"	Walworth	FCV74-47
13	RHR	Check	6"	Velan	74-691
14	RHR	Gate	6"	Walworth	FCV74-77, FCV74-78
16	CS	Gate	12"	Powell	HCV75-27, HCV75-55
17	CS	Check	12"	Rockwell	FCV75-26, FCV75-54
18	CS	Gate	12"	Walworth	FCV75-25, FCV75-53
19	RWCU	Gate	6"	Velan	69-500
20*	RWCU	Gate	6"	Borg-Warner*	FCV69-1*
21	RWCU	Gate	6"	Velan	FCV69-1**, FCV69-2
24	RCIC	Check	6"	Rockwell	FCV71-40
25	HPCI	Gate	10"	Crane	FFCV73-2, FCV73-3
26	HPCI	Check	14"	Rockwell	FCV73-45
27	RHR	Gate	20"	Walworth	FCV74-48

*Unit 1 only
**Units 2 & 3

TABLE 2

REQUEST FOR RELIEF ISI-5

Unit 1 Valve Groups Not Opened for Maintenance

<u>Group Number(s)</u>	<u>Function</u>	<u>Basis For Relief.</u>
Later	Later	Later

TABLE 2

REQUEST FOR RELIEF ISI-5

Unit 2 Valve Groups Not Opened for Maintenance

<u>Group Number(s)</u>	<u>Function</u>	<u>Basis For Relief</u>
2	Maintenance	Block valve to vessel; fuel must be removed and vessel drained.
3	Operation	Requires fuel removal and vessel drained. Bonnets have been seal welded to prevent leakage.
4	Pressure safety isolation	Requires fuel removal and vessel drained. Bonnets have been seal welded to prevent leakage.
5	Operation	Requires fuel removal and vessel drained. Bonnets have been seal welded to prevent leakage.
8	Maintenance	Requires fuel removal and vessel drained.
11	Maintenance	Requires fuel removal, vessel drained, and both RHR loops out-of-service.
12	Pressure safety isolation	Requires fuel removal, vessel drained, and both RHR loops out-of-service.
16	Maintenance	Requires fuel removal and vessel drained.
18	Pressure safety isolation	Requires leak rate testing.
19	Maintenance	Requires fuel removal and vessel drained.
21	Pressure safety isolation	Requires leak rate testing.
27	Pressure safety isolation	Requires leak rate testing. Requires both RHR loops to be out-of-service.

TABLE 4

REQUEST FOR RELIEF ISI-5

Unit 3 Valve Groups Not Opened for Maintenance

<u>Group Number(s)</u>	<u>Function</u>	<u>Basis For Relief</u>
Later	Later	Later

REQUEST FOR RELIEF ISI-6

Components: Control Rod Drive Housing Welds
Class: 1
Function Pressure-retaining component.
Test Requirement: Volumetric examination of peripheral CRD housing welds, examination category B-0.

Basis for Relief: Should the CRD housing weld fail, the leakage path to the failure meets the make-up exclusion criteria and is therefore excluded from volumetric examination in accordance with IWB-1220(b)(1). The make-up supply system is equivalent to 4-inch nominal pipe size. The smallest leakage path area would be realized between the guide cap and thermal sleeve as shown on the attached diagrams. The following calculations verify exclusion of volumetric examination in accordance with IWB-1220(b)(1):

For 3-inch nominal pipe size (maximum code exclusion):
 $D = 3.068$ inches, $A = (\pi)(D^2/4)$, where A = internal transverse area
 D = inside diameter

$$A_{3\text{-in.}} = 7.39 \text{ in.}^2$$

For the thermal sleeve:
 $D_{TS} = 4.25$ inches
 $A_{TS} = 14.19 \text{ in.}^2$

For the guide cap:
 $D_{GC} = 4.125$ inches
 $A_{GC} = 13.26 \text{ in.}^2$

Total leakage path area:

$$A_{LP} = A_{TS} - A_{GC} = 14.19 \text{ in.}^2 - 13.36 \text{ in.}^2 = 0.83 \text{ in.}^2$$

$$A_{3\text{-in.}} = 7.39 \text{ in.}^2$$
$$A_{LP} = 0.83 \text{ in.}^2$$

Therefore, $A_{LP} < A_{3\text{-in.}}$

Alternate Inspection: All peripheral CRD housing welds shall be visually examined during the system hydrostatic pressure tests in accordance with IWB-1220(c).

REQUEST FOR RELIEF ISI-7

Components: Inaccessible welds in piping penetrations and under rigid pipe restraints

Class: 1

Function Pressure-retaining component.

Test Requirement: Volumetric examination of pressure-retaining welds in piping, examination category B-J.

Basis for Relief: The penetration flued head to process pipe welds are inaccessible for any type of examination. The penetrations involved are feedwater, two per unit 24" O.D., main steam four per unit 26" O.D., RHR four per unit 2-24" O.D., 1-20" O.D., 1-6" O.D., core spray two per unit 12" O.D., RWCU one per unit 6" O.D., and HPCI one per unit 10" O.D. Four main steam welds and two feedwater welds on each unit are located under rigid pipe restraints and are inaccessible for volumetric examination. The welds located under the rigid pipe restraints are identified in the inservice inspection program. There are also six feedwater welds on unit 3 located under pipe supports (KFW-3-40, KFW-3-41, KFW-3-42, KFW-3-43, KFW-3-44, and KFW-3-45).

Alternate Inspection: A "Best Effort" visual examination will be performed during the system hydrostatic pressure test.

REQUEST FOR RELIEF ISI-8

REVISION 2

<u>Components:</u>	Pressure-Retaining Welds in Piping
<u>Class:</u>	1 and 2
<u>Function</u>	Pressure-retaining component.
<u>Test Requirement:</u>	Volumetric examination of longitudinal, circumferential, pipe branch connection and valve body welds, examination categories B-J, B-F, C-F, and B-M-1.
<u>Basis for Relief:</u>	In some cases it will be impractical to inspect all welds in accordance with paragraph T-532 of Article 5, Section V, of the ASME Code, i.e., nonremovable hanger interference or valve and pump casings adjoining the welds. These welds will be noted on the ultrasonic examination data sheets.
<u>Alternate Inspection:</u>	In addition to the visual examination performed during system leakage and hydrostatic pressure tests, a "best effort" ultrasonic examination will be performed. Also, a surface examination will be performed on accessible areas of the weld(s).
<u>Reporting</u>	The tables attached hereto provide a listing of the welds which are covered by this request for relief. Units 1 and 3 welds will be added as the end of the first 10-year interval for those units approaches.

TABLE 1

REQUEST FOR RELIEF ISI-8

UNIT 1 WELDS REQUIRING ALTERNATE SURFACE EXAMINATION WHEN ACCESSIBLE

<u>WELD IDENTIFICATION</u>	<u>SCAN LIMITATION</u>	<u>REASON</u>
Later	Later	Later

TABLE 2
REQUEST FOR RELIEF ISI-8

UNIT 2 WELDS REQUIRING ALTERNATE SURFACE EXAMINATION WHEN ACCESSIBLE

<u>Weld Identification</u>	<u>Scan Limitation</u>	<u>Reason</u>
TCCW-2-1 (8")	3/No Scan;4/5:30-7:00	3/Penetration; 4/Weld-0-Let
TCCW-2-5 (8")	3/No Scan;3/6:30-7:30	4/Penetration; 3/2" pipe attachment
DCS-2-3 (12")	3 & 4/No Scan	3/Valve Geometry; 4/Penetration
DCS-2-12 (12")	3 & 4/No Scan	3/Valve Geometry; 4/Penetration
TCS-2-406 (12")	4/No Scan; 3/2:00	4/Valve Geometry; 3/Welded Brace
TCS-2-421 (12")	3/No Scan; 4/8:30-9:00	3/Valve Geometry; 4/Instrument Line
RCRD-2-49 (4")	3/No Scan; 4/5:00-7:00	3/Valve Geometry; 4/Inner Radius
RCRDS-2-2 (6")	3 & 4/No Scan	3 & 4/Tee & Reducer Geometry
KFW-2-26 (24")	3,4,5,&6/12:00	3-6/1" Pipe Attachment
KFW-2-28 (20")	3,4,5,&6/12:00	3-6/1" Pipe Attachment
N4A-SE (12")	All scans limited	All/Safe-End Configuration
N4B-SE (12")	3,4,5,&6/8:00 & 9:00	3-6/ 3/4" Diameter Welded Pads
N4D-SE (12")	4/No Scan; all/12:00-3:00, 4:00-6:00	4/Configuration; All/ Sensor Line Attachments
N4E-SE (12")	4/No Scan; All/8:00-9:00, 12:00-3:00, 4:00-6:00	4/Configuration; All/ Sensor Line Attachments

TABLE 2 (Continued)
REQUEST FOR RELIEF ISI-8

UNIT 2 WELDS REQUIRING ALTERNATE SURFACE EXAMINATION WHEN ACCESSIBLE

<u>Weld Identification</u>	<u>Scan Limitation</u>	<u>Reason</u>
N4F-SE (12")	All Scans limited	All/Safe-End Configuration
THPCI-2-72 (10")	3/No Scan; 4/5:00-7:00	3/Valve Geometry; 4/Brace
GMS-2-2 (26")	3/No Scan; 4/ 1/2 node penetration	3/Valve 4/Penetration
GMS-2-2-LS (26")	7,8,9,&10/2" through 12"	7-10/ Penetration
GMS-2-10-LS (26")	7,8,9,&10/4" through 12"	7-10/ Penetration
KMS-2-25-LS1 @ 6:00 (26")	11,12,13,&14/No Scans	11-14/Covered by I-beam
KMS-2-54-LS (26")	11,12,13,&14/8" through 12"	11-14/Non-Removable Insulation
DRWC-2-1A (6")	3 & 4/No Scan	3/Reducer Geometry; 4/Valve Geometry
DRWC-2-2 (6")	4/No Scan; 3/11:30-12:30	4/Valve Geometry; 3/1" Weld-O-Let
DRWC-2-3 (6")	3/No Scan; 4/10:00-11:00, 5:30-6:30	3/Valve Geometry; 4/Vent Pipe & Instrument Line
GR-2-3-LS2 @ 12:00 (28")	11,12,13,&14/No Scans	11-14/Support Lug
GR-2-8 (28")	3 & 4/No Scan	3 & 4/Cross to Tee & Tee Geometry
GR-2-34 (28")	3 & 4/No Scan	3 & 4/Cross to Tee & Tee Geometry
GR-2-56 (28")	4/No Scan; 3,5,&6/ 11:45 to 12:30 & 10:30	4/Configuration; 3-6/Weld Attachment

TABLE 2 (Continued)
REQUEST FOR RELIEF ISI-8UNIT 2 WELDS REQUIRING ALTERNATE SURFACE EXAMINATION WHEN ACCESSIBLE

<u>Weld Identification</u>	<u>Scan Limitation</u>	<u>Reason</u>
GR-2-63A (4")	No Scans	Seal Welded Blind Flange
KR-2-51-LS (28")	7,8,9,&10/6" through 12"	7-10/Rigid Restraint
DRHR-2-3 (24")	3 & 4/No Scan	3/Valve Geometry; 4/Penetration
DRHR-2-3-LS (24")	7,8,9,&10/4" through 12"	7-10/Penetration
DRHR-2-5 (24")	4/No Scan; 3/11:00-1:00	4/Valve Geometry; 3/Support Attachment
DRHR-2-12 (24")	3 & 4/No Scan	3/Valve Geometry; 4/Penetration
TRHR-2-110 (18")	3,4,5,&6/6:00	3-6/Non-Removable Support
TRHR-2-262 (20")	3 & 4/11:00-1:00 & 3:00	3 & 4/Hanger Mounting Bracket & Catwalk Support
TRHR-2-462 (6")	3,4,5,&6/5:00-7:00	3-6/Welded Support

TABLE 3

REQUEST FOR RELIEF ISI--8

UNIT 3 WELDS REQUIRING ALTERNATE SURFACE EXAMINATION WHEN ACCESSIBLE

<u>Weld Identification</u>	<u>Scan Limitation</u>	<u>Reason</u>
Later	Later	Later

REQUEST FOR RELIEF ISI-9

Components: Integrally-Welded External Support Attachments for Piping and Valves

Class: 1

Function Support components.

Test Requirement: Volumetric examination of the support attachment welds, examination categories B-K-1.

Basis for Relief: During the first Browns Ferry baseline inspection, the ultrasonic examinations of the integrally-welded Class 1 supports were meaningless because of the lack of penetration indications that existed for the full length of the support welds. The supports were fabricated to ANSI B31.1.0 and General Electric Company specification 21A2100. The GE specification required a full penetration weld and surface examination requirements, which would not verify penetration. The TVA Division of Engineering Design has taken actual weld dimensions of randomly-chosen piping supports and compared the load capabilities of these welds as installed to the loads based on design the supports would see during operation. As indicated in the attached analysis, all supports studied have high factors of safety in their load-carrying capability; therefore, we feel the integrally-welded supports on the primary coolant piping are acceptable as installed. Further ultrasonic examinations of these supports would be meaningless.

Alternate Inspection: Class 1 integrally-welded supports will be liquid penetrant examined in place of ultrasonic examinations. The liquid penetrant examinations performed during each inspection interval will cover 25 percent of the integrally-welded supports.

PIPE SUPPORTS-PRIMARY COOLANT PIPING

COMPARISON OF DESIGN LOADS AND WELDS TO "AS-BUILT"

Pipe Support No.	Design Load	Load Capability of		Factor of Safety As Installed
		Weld As Designed	Weld As Installed	
CSR-8	1,000 lb	* 39,188 lb	44,467 lb	44.5
CSR-9	2,000 lb	* 39,188 lb	51,034 lb	25.5
CSR-1	1,000 lb	* 39,188 lb	44,467 lb	44.5
CSR-2	2,000 lb	* 39,188 lb	51,034 lb	25.5
RHR-69	4,200 lb	*110,000 lb	115,200 lb	24.4
RHR-68	8,400 lb	*	76,776 lb	9.2
RHR-67	8,000 lb	* 98,129 lb	117,755 lb	14.7
SSA1,2,5, & 6	1,250 lb	*	57,600 lb	46.1
SSA8 (X) SSA9 (Z)	12,993 lb	* 87,000 lb	57,600 lb	4.4
SSA7 (Z) SSB7 (Z)	4,375 lb	* 72,194 lb	86,400 lb	19.7
SSC4 (Z)	17,750 lb	* 72,194 lb	57,600 lb	3.2
SSB4 (Z)	15,000 lb	* 72,194 lb	57,600 lb	3.8
SSB6 (X)	19,900 lb	* lb	72,000 lb	3.6
SSB5 (Y)	13,800 lb	* lb	57,600 lb	4.2
SSC1 (Z)	27,500 lb	* lb	126,000 lb	4.6
SSB2 (X)	30,600 lb	* lb	151,200 lb	5.0

BLANKS INDICATE INSUFFICIENT INFORMATION AVAILABLE

*The "Designed" weld would equal or exceed the strength of the attachment if it were a full penetration bevel weld as shown. The load capacity shown is the tensile or shear strength of the attachment.

NOTE: The load capacities of the "as installed" welds are based on an allowable shear strength of 14,500 psi, or 600 lb per 16th of an inch of leg per linear inch of weld for fillet welds.

ADDITIONAL INFORMATION REGARDING
INSERVICE INSPECTION PROGRAM REQUEST FOR RELIEF ISI-9
BROWNS FERRY NUCLEAR PLANT UNIT 3
(DOCKET NO. 50-296)

To provide justification for Request for Relief ISI-9 an analysis was performed on a selection of integral supports that are subject to fatigue loading. Integral welds in the latest sample indicated substantially higher stress allowable factors of safety with a minimum factor of 8.3 calculated.

Attached is a list of assumptions used in the analysis and a summary of analysis results. Based on these results, we believe that the integral support welds are entirely acceptable, and relief from the inservice volumetric examination requirements of the ASME Section XI Code is justified.

ASSUMPTIONS

1. Due to lack of full penetration, fillet welds were assumed with a base dimension equal to the specified penetration groove opening.
2. Restraint loads as specified by the support assembly drawings were applied.
3. Effective area of the fillet welds was in accordance with paragraph XVII-2452.5, Appendix XVII, Section III, ASME Code.
4. Shear and tensile stresses in the welds were combined by the maximum shear stress formula to compare with the fillet weld shear allowables presented in paragraph NF-3291.1-1, Subsection NF, Section III, ASME Code. The minimum specified shear allowable is applied in all cases.
5. No stress concentration factors were applied. The high factors of safety more than offset any concentration effects.

SUMMARY OF RESULTS

PIPE INTEGRAL ATTACHMENT WELDS

<u>HANGER</u>	<u>LOAD(POUNDS)</u>	<u>MAXIMUM SHEAR STRESS</u>	<u>SAFETY FACTOR</u>
RHR-R-74	840	463 PSI	39
RHR-H-1*	15940	2155 PSI	8.3
RHR-H-3*	11075	1367 PSI	13.2
MS-H-B1, -C1*	3606	740 PSI	24.3
MS-H-B2, -C2*	6350	1425 PSI	12.6
RWC-H-1*	1300	854 PSI	21.0
HPCI-H-1 (H152)	6060	1630 PSI	11.0
HPCI-H-2 (H48)	2368	1070 PSI	16.8
RH-2, -12*	11800	1780 PSI	10.1
RH-1, -9*	13400	1719 PSI	10.5
RH-10, -11*	8900	1342 PSI	13.4

*For these lugs, drawings call out full penetration plus fillet welds.

REQUEST FOR RELIEF ISI-10

Components: Ultrasonic Calibration Standards

Class: 1 and 2

Function Ultrasonic calibration for examination of welded components.

Test Requirement: Ultrasonic calibration blocks fabricated to 1974 Edition, Summer 1975 Addenda, of Section XI, IWA-2232.

Basis for Relief: Ultrasonic calibration blocks employed for the Browns Ferry baseline examination were fabricated to the 1971 Edition of Section XI. These blocks will continue to be used for future examinations to ensure the repeatability of data. The pipe blocks have 5%T sawtooth notches running circumferentially around the inside and outside diameters. One side-drilled hole is placed in the side of the block parallel to the longitudinal axis of the curved blocks. Pipe block curvature is within 0.9 to 1.5 times the diameter of the pipe examined; and thickness and hole size are according to ASME Section III, Figure IX-3432.1 of the 1971 Edition, Summer 1971 Addenda. Material for all blocks was the same or equivalent "P" number except as discussed in the attached file note and shown in the mill test report also attached.

Alternate Inspection: Future examinations which require fabrication of new calibration blocks will be performed using calibration blocks which will meet the 1974 Edition, Summer 1975 Addenda of Section XI, except for piping blocks which will as a minimum meet the 1977 Edition, Summer 1978 Addenda of ASME Section XI.

FILE NOTE

DETERMINATION OF ACOUSTIC PROPERTIES OF VARIOUS CALIBRATION BLOCKS FOR USE IN INSERVICE INSPECTIONS AT BROWNS FERRY NUCLEAR PLANT.

During recent metallurgical examinations of calibration blocks used for baseline and inservice inspections at Browns Ferry, it was shown that four calibration blocks were not made from material of the same or equivalent P number as the material that was examined. Since this same or equivalent P number is required by Appendix IX of Section III of the ASME Boiler and Pressure Vessel Code, it was necessary to determine the acoustic properties of these four blocks with respect to material of the components.

Calibration blocks BF-11C, BF-12C, BF-13, and Automation Industries AISI 4340 3-inch area amplitude block S.N. 1219 were used to examine materials of different P number. The velocity and attenuations in these blocks were compared to the material they were used to examine as described in the following paragraphs.

Block BF-11C was made from A515 grade 70 material while block BF-12C was made from A515 grade 55 material. Both blocks were used to calibrate for A533 grade B material. To demonstrate similarity, both blocks were compared to BF-10C, which is A533 grade B, for sound velocity and attenuation.

Using a Krautkramer type USIP-1CW ultrasonic flow detector, with an Automation Industries 2.25 MHz, type SFB 3/8-inch effective diameter crystal, these back reflections from the 3.007-inch side of BF-12C were placed at the 3-, 6-, and 9-inch locations on the CRT graticule. The crystal was then placed on the 3.992-inch of BF-11C. Back reflections were observed at the 4- and 8-inch locations on the CRT graticule. After this, the crystal was placed on the 4.032-inch side of BF-10C. The first back reflections occurred between 4.000 and 4.050 inches and was interpreted to be 4.025 inches. The second back reflection occurred between 8.000 and 8.100 inches and was interpreted to be 8.050 inches. By the above process, it was determined that the velocity of sound was essentially the same through all three blocks.

To check attenuation an Automation Industries 5 MHz, type SFB, 3/8-inch effective diameter crystal was placed on the 4-inch thickness of BF-10C. With the first back reflection set at 60 percent of full scale, the gain setting read 42 dB. The gain was then increased to 51 dB to bring the second back reflection up to 60 percent scale height. This gave an attenuation of 0.75 dB/inch. This procedure was repeated on the 4-inch side of BF-11C with a change in dB from 58 to 42. This gave an attenuation of 2.5 dB/inch. The 2.2-inch side of BF-12C was then evaluated and a change in dB from 36 to 45 was necessary to bring the second back reflection up to 60 percent full scale. This gave an

DETERMINATION OF ACOUSTIC PROPERTIES OF VARIOUS CALIBRATION BLOCKS FOR
USE IN INSERVICE INSPECTION AT BROWNS FERRY NUCLEAR PLANT

Summary

<u>Calibration Block No.</u>	<u>Material</u>	<u>Attenuation</u>
BF-10C	A533, Grade B	0.75 dB/inch
BF-11C	A515, Grade 70	2.50 dB/inch
BF-12C	A515, Grade 55	1.50 dB/inch

Attenuation is less in BF-10C than in either BF-11C or BF-12C. Therefore, use of BF-12 to calibrate a scope for use in testing A533, grade B, material will result in a test more sensitive than required and is acceptable.

Block BF-13 was found to have the same attenuation as the 65.5-inch studs for which it was used as a calibration block.

Block Automation Industries AISI 4340 was formed to have the same attenuation as the nuts for which it was used as a calibration block.

There were no variations or discrepancies in any of the velocity or propagation tests.

Description of the Blocks:

BF-10C A533, Grade B
Supplied by Magnaflux
Used for flange-to-vessel welds
Attenuation - 0.75 dB/inch

BF-11C A515, Grade 70
Used for nozzle-to-head, head, and nozzle-to-vessel welds
Supplied by SWRI after unit 1 inspection
Attenuation - 2.25 dB/inch

BF-12C A515, Grade 55
Used for support skirt welds
Attenuation - 1.5 dB/inch

BF-13 Crucible 422
Used for 65.5-inch studs
Attenuation - same as studs

attenuation of 1.5 dB/inch. All three measurements were reported three times with the same results. It can be seen that calibration with BF-11C or BF-12C would give a more sensitive examination than is required.

BF-13, which is A437 grade B4C, is used to calibrate for A540 grade B23 material. Using an Automation Industries 5-MHz, type SFB, 3/8-inch effective diameter crystal, the 100-inch scale of the ultrasonic instrument was checked for linearity using an Automation Industries' AISI 4340 3-inch block S.N. 1219 and a 65.6-inch reactor closure head stud made from A540 grade B23 material. When the crystal was placed on the 69-inch BF-13, a back reflection was seen within 1 inch of the desired reading, which is as close as the scale can be resolved on the 100-inch scale. To check for attenuation, the back reflection of BF-13 was set at 80 percent scale height with a gain setting of 43 dB. The same amplitude was obtained on the reactor closure head stud using 42 dB. On the basis of the above tests, BF-13 is considered a satisfactory calibration block for A540 grade B23 material.

The Automation Industries' AISI 4340 3-inch area amplitude block S.N. 1219 is also used for examining recirculation pump nuts made from A194 Cl. 24 material. Both nut and block were 3 inches thick. Both distances measured 3 inches by using the USIP-1CW Krautkramer ultrasonic flow detector with an Automation Industries 5 MHz, type SFB, 3/8-inch effective diameter crystal. Attenuation was checked on the nut by setting the first back reflection to 50 percent of full scale and then bringing the second back reflection up to 60 percent by using the gain control. A total of 12 dB was required to do this, giving a material attenuation of 2 dB/inch. This was repeated for the calibration block with identical results. These two materials are therefore considered similar with respect to velocity and attenuation.

COMBUSTION ENGINEERING, INC. (CE)
TVA - BROWNS FERRY
ULTRASONIC CALIBRATION BLOCKS

<u>TVA Identif.</u>	<u>CE Identif.</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Ni</u>	<u>Cr</u>	<u>Mo</u>	<u>V</u>	<u>Comments</u>
BF-1C	P-14607	0.204	0.96	0.03	0.016	0.21	<0.010	<0.01	<0.01	0.001	A106, GR.B
BF-2S	P-14608	0.035	0.47	0.019	0.012	0.41	9.940	18.67	0.06	0.030	A358, 304 SS
BF-3C	P-14609	0.250	0.93	0.019	0.021	0.14	<0.010	<0.01	<0.01	<0.001	A106, GR. B
BF-4S	P-14610	0.048	1.66	0.032	0.016	0.41	9.600	18.54	0.2	0.040	A358, 304 SS
BF-5C	P-14611	0.250	0.85	0.003	0.022	0.17	0.030	0.01	<0.01	<0.001	A106, GR. B
BF-6S	P-14612	0.053	1.60	0.021	0.018	0.52	10.470	10.37	0.17	0.050	A358, 304 SS
BF-7C	P-14614	0.260	0.0	0.004	0.020	0.13	<0.010	<0.01	<0.01	<0.001	A105, GR. B
BF-8S	P-14614	0.035	1.60	0.020	0.009	0.53	0.510	10.17	0.10	0.040	A240, 304 SS
BF 9C	P-14615	0.230	0.62	0.007	0.017	0.02	0.010	<0.01	<0.01	<0.001	A36 (A283)
BF-10C	P-14616	0.230	1.22	0.010	0.015	0.22	0.470	0.09	0.49	<0.003	A533, GR. B
BF-11C	P-14617	0.330	0.74	0.008	0.023	0.21	0.070	0.02	<0.01	<0.001	A515, GR. 70
BF-12C	P-14618	0.220	0.65	0.011	0.024	0.20	0.040	<0.01	<0.01	<0.001	A515, GR. 55
BF-13	P-14619	0.250	0.87	0.020	0.014	0.33	0.750	11.19	0.93	0.250	A437, BR. B4C
BF-15C	P-14620	0.210	0.44	0.013	0.020	0.11	0.020	<0.01	<0.01	<0.001	A519, GR. MT 1020

1821C

Description of the Blocks:

Automation Industries AISI 4340, 3-inch area amplitude block S.N. 1219
Contains 1/8-inch flat bottom hole 3 inches from top surface
Total length of block approximately 3-3/4 inches.
Used for nuts
Attenuation - identical to the nuts

The procedure for determining attenuation is given in Krautkramer
ultrasonic test instructions.

REQUEST FOR RELIEF ISI-11

System: Main steam

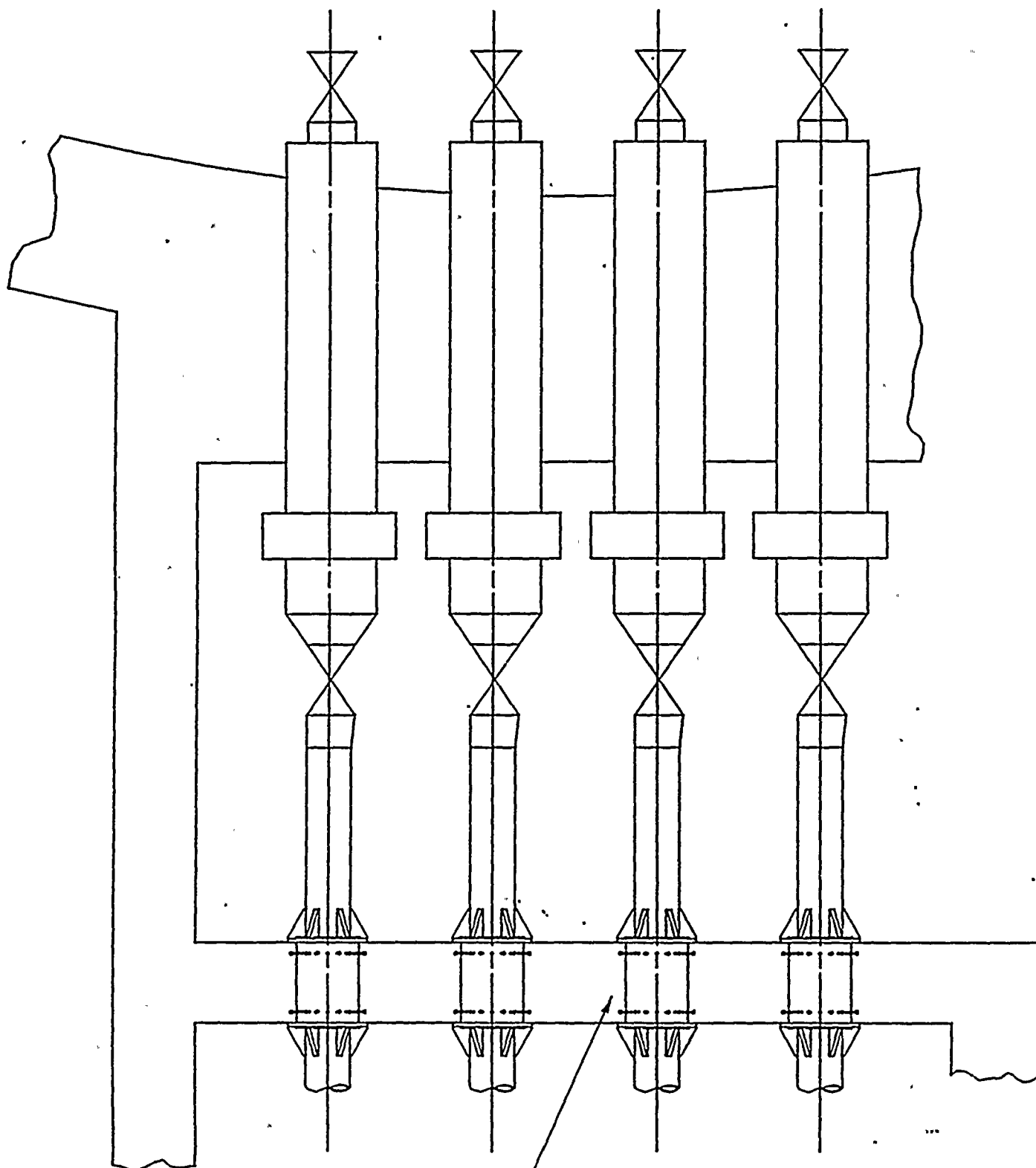
Class: 2

Test Requirement: Surface examination of support members for piping examination category C-E-1.

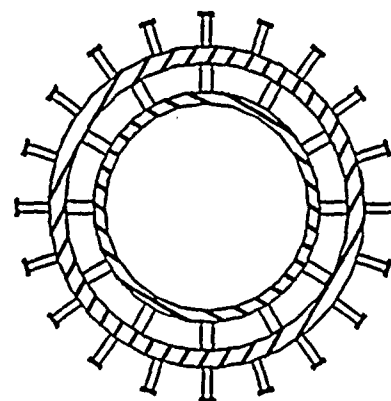
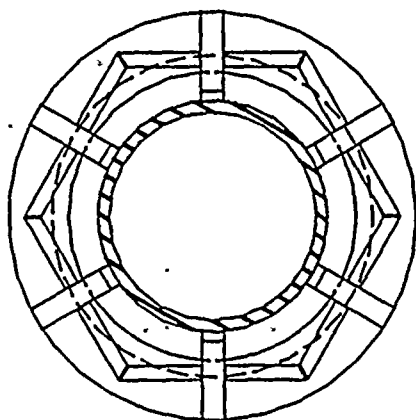
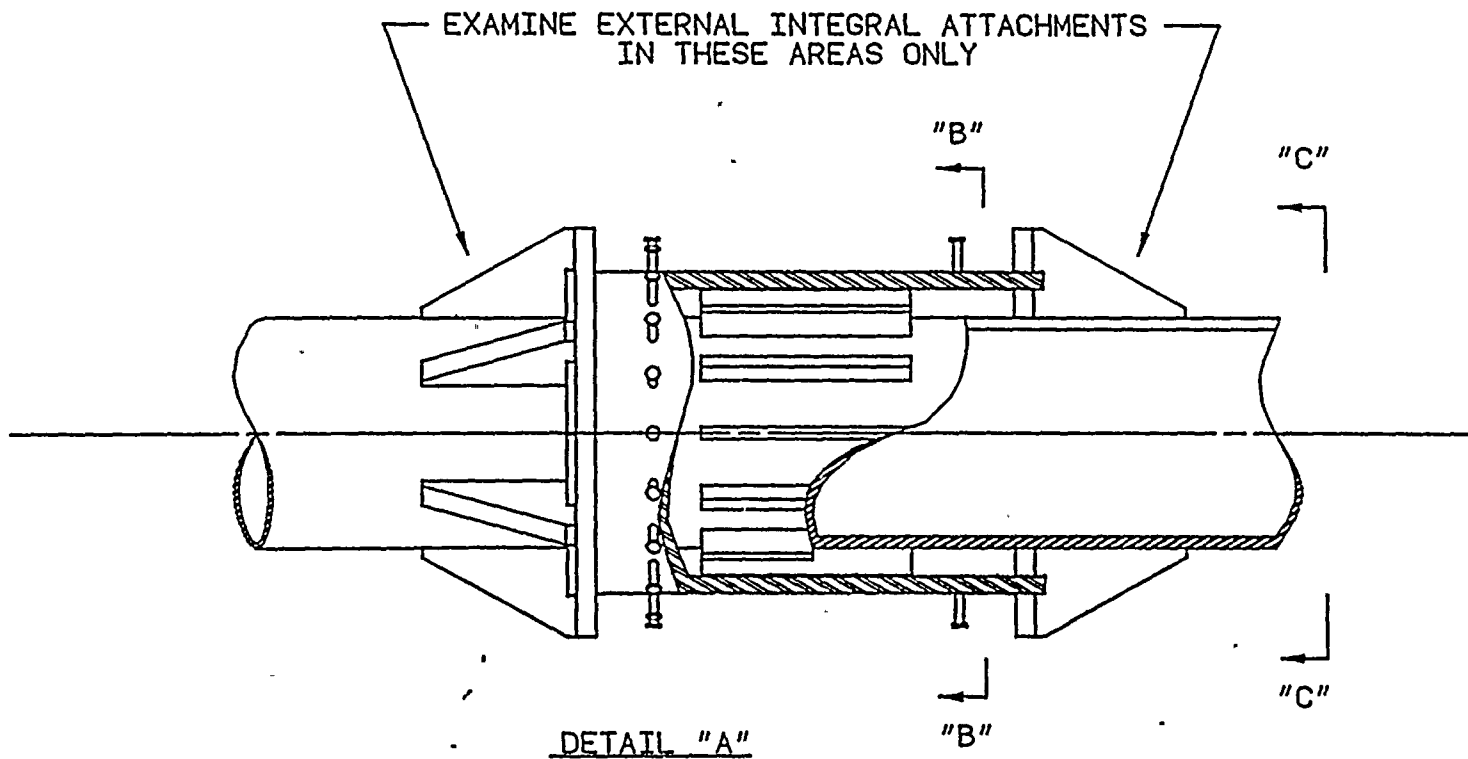
Basis for Relief: The main steam system includes four special restraints, each of which is partly embedded in a wall. Each embedded restraint includes 12 guide lugs which are welded to the process pipe. These welds are inaccessible for examination. Each restraint also includes 12 stop plates welded to the process pipe which are accessible for examination. They shall be surface examined during the inspection interval (see attached drawings).

Alternate Inspection: None.

MAIN STEAM PIPING



SPECIAL RESTRAINTS
SEE DETAIL "A"



REQUEST FOR RELIEF ISI-12

Components: Pressure retaining longitudinal welds in piping

Class: 1

Function: Pressure retaining component

Test Requirement: Volumetric examination of pressure-retaining longitudinal welds in piping, examination category B-J.

Basis for Relief: See the attached supplement for weld identification, estimated extent of code examination, and reason for limitation.

Alternate Inspection: A surface examination will be performed on the accessible code required length of the weld.

REQUEST FOR RELIEF ISI-12
(SUPPLEMENT)
UNIT 3

<u>Long Seam Adjacent to Weld</u>	<u>Percent Inspection</u>	<u>Limitation</u>
GR-3-62	0	Prohibited by support lug
KR-3-51	50	Scan limited to 6" by support
DCS-3-4	25	Scan limited to 5" by support
DCS-3-5	65	Scan limited to 8" by support
DCS-3-13	50	Scan limited to 6" by penetration
GMS-3-2	16	Scan limited to 2" by penetration
GMS-3-3	50	Scan limited to 6" by support
GMS-3-9	50	Scan limited to 6" by penetration
GMS-3-10	15	Scan limited to 2" by penetration
GMS-3-11	50	Scan limited to 6" by penetration
GMS-3-15	15	Partial scan limited by insulation ring
GMS-3-32	15	Partial scan limited by insulation ring
GMS-3-18	50	Scan limited to 6" by penetration
GMS-3-19	25	Scan limited to 3" by penetration
GMS-3-20	15	Scan limited to 6" by penetration
GMS-3-27	50	Scan limited to 6" by penetration

REQUEST FOR RELIEF ISI-12
 (SUPPLEMENT)
 UNIT 3

<u>Long Seam Adjacent to Weld</u>	<u>Percent Inspection</u>	<u>Limitation</u>
GMS-3-28	15	Scan limited to 2" by penetration
GMS-3-29	50	Scan limited to 6" by penetration
DSRHR-3-9	35	Scan limited to 4" by support
DSRHR-3-7	35	Scan limited to 4" by support
DSRHR-3-6	35	Scan limited to 4" by support
DSRHR-3-5A	10	Scan limited to 1" by elbow radius
DSCS-3-4	75	Scan limited by elbow curvature
DRHR-3-13	50	Scan limited to 6" by penetration
KMS-3-105	75	Partial scan limited by support lug

REQUEST FOR RELIEF ISI-13

Components: RHR Heat Exchangers - units 1, 2, and 3

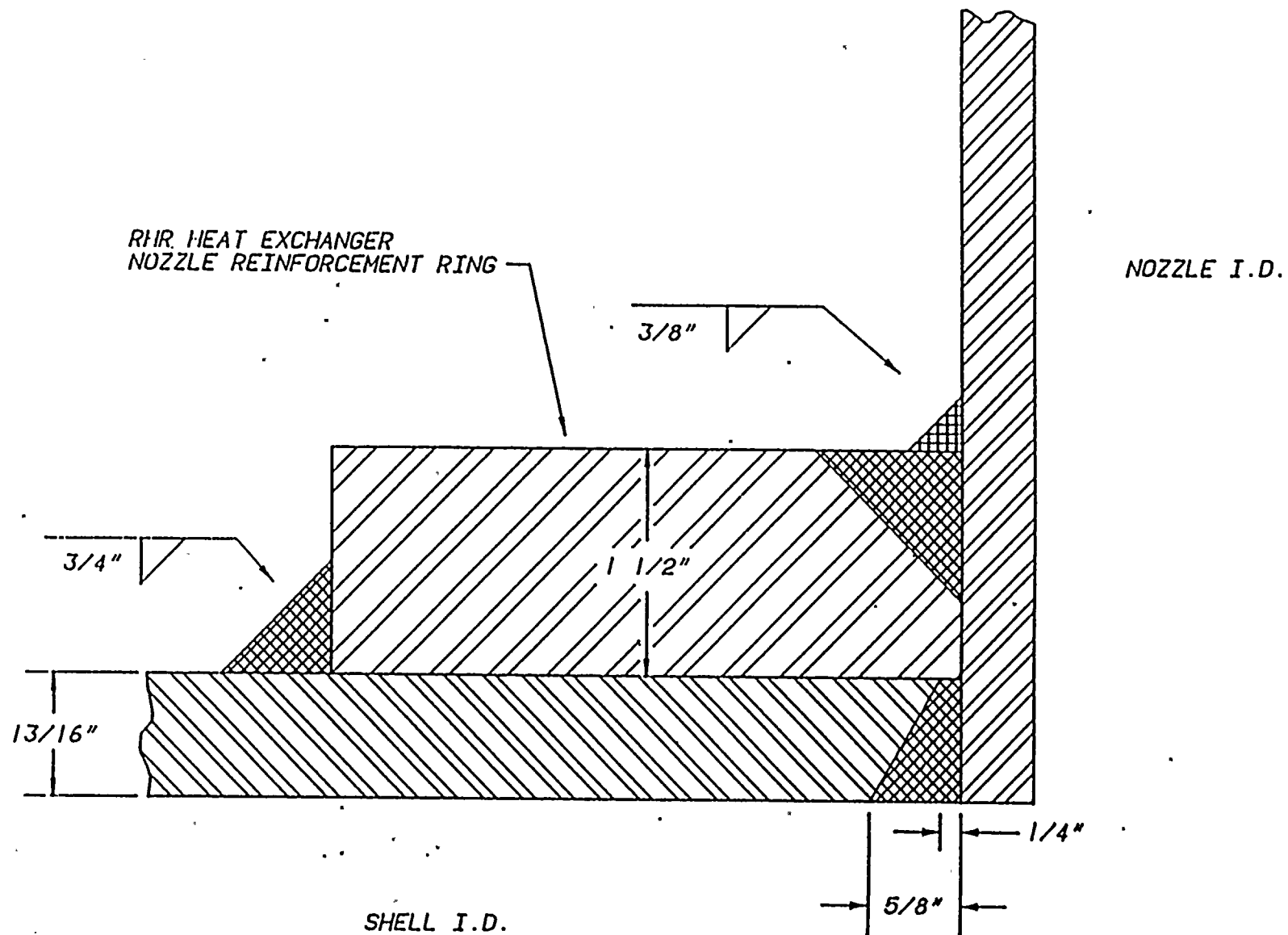
Class: 2

Function: Pressure retaining nozzle welds in vessels

Test Requirement: Volumetric examination of nozzle-to-vessel attachment welds, examination category C-B.

Basis for Relief: The RHR heat exchangers nozzle-to-vessel attachment weld is covered by a reinforcement ring (shown in the attached sketch) which does not allow access to any of the attachment weld.

Alternate Inspection: The reinforcement ring welds are accessible and will be given a surface examination. Two reinforcement rings on each unit will be examined over the 40-year inspection interval in accordance with IWC-2411 on ASME Section XI.



REQUEST FOR RELIEF ISI-14

Components: Pressure-retaining bolting

Class: 2

Inspection Requirements: Visual, surface, and volumetric examination of pressure-retaining bolting exceeding one inch in diameter, examination category C-D.

Basis for Relief: Examination of class 2 pressure-retaining bolting in accordance with the Summer 1975 Addenda of Section XI exceeds inspection requirements for class 1 pressure-retaining bolting. We do not feel an increased level of safety is obtained from a more restrictive examination of class 2 components. An examination program for class 2 pressure-retaining bolting similar to that for class 1 would be desirable. This type of examination has been incorporated in later additions of the code which Browns Ferry will be required to meet in the future.

Alternate Inspection: Class 2 pressure-retaining bolting exceeding two inches in diameter shall be volumetrically examined in accordance with Table IWC-2500-1, examination category C-D of the 1977 Edition, Summer 1979 Addenda of Section XI. Pressure-retaining bolting two inches or less in diameter will not be examined.

REQUEST FOR RELIEF ISI-15

Components: Ultrasonic examination technique of piping welds.

Class: 1 and 2

Function: Ultrasonic calibration and examination of welded piping components.

Test Requirement: Appendix III - III-3410 Material.
III-3430 Calibration Notches.
III-4450 Inaccessibility Welds.

Basis for Relief: The ultrasonic examination (IWA-2232(b), IWA-2232(c), and Appendix III) and evaluation (IWA-3000) of piping welds is being updated to the 1977 Edition, Summer 1978 Addenda of ASME Section XI to provide state-of-the-art methods for both. There are existing requests for relief (addressed to the 1974 Edition of the ASME Code) from the test requirements listed above. We do not believe the existing requests for relief (ISI-8 and ISI-10) affect the overall purpose of updating the examination and evaluation techniques.

We request relief to remain to the 1974 Edition, Summer 1975 Addenda and the existing requests for relief for calibration block material, calibration notches, and inaccessible welds.

Alternate Inspection: As specified in ISI-8 and ISI-10.

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