

ENCLOSURE 1  
TI-50A Revision 24  
Revised Pages

Revision 24

Brief description of the revisions:

TI-50A, Revision 24, dated August 20, 1992, incorporated the following:  
Revised Sections 3.4 and 12.0 to update nondestructive examination methods, weld reference system, qualification of personnel, and standards for examination to the 1986 Edition of Section XI; revised Section 6.2.7 and Appendix A, Table A, to include examination of the pressurizer seismic lugs; revised Sections 6.6.4, 7.12.4, Appendix A, and Tables A, B, E, and F for valve support components; added augmented Section 19.3 and revised Appendix A, Table C for the ASME Section XI 1983 Edition, Winter 1983 Addenda Augmented Class 2 Examinations; and revised Source Document 20.1.1 and added two more source notes.

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ASME SECTION XI PRESERVICE INSPECTION PROGRAM

Approved by/date:		Implementation Date: <u>9/20/92</u>			
Sponsor	<u>[Signature]</u>	<u>8/4/92</u>	1.	_____	
QA	<u>[Signature]</u>	<u>8/19/92</u>	2.	_____	
			3.	_____	
PM	<u>[Signature]</u>	<u>8/25/92</u>	4.	_____	
ARM	<u>[Signature]</u>	<u>8/20/92</u>	5.	_____	
			TPCN	Eff.	Exp.
			No.	Date	Date

- 3.2 This program was prepared to meet the requirements of the 1974 Edition, Summer 1975 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code.<sup>1</sup> Some items have been updated to later editions of Section XI as discussed in Section 3.4.
- 3.3 Procedures for eddy current examination of heat exchanger tubing, which the Summer 1975 Addenda of ASME Section XI has no provisions for, meets the requirements of the 1974 Edition, Summer 1976 Addenda of ASME Section XI. Steam generator tubing examination requirements are in accordance with WBN Technical Specification which is based on a modification of Regulatory Guide 1.83, Revision 1.<sup>2, 3</sup>
- 3.4 A. For examinations performed before July 1, 1992, the following items have been updated to the 1977 Edition, Summer 1978 Addenda of Section XI:<sup>4</sup>
- (1) Class 2 pressure-retaining bolting (Category C-D) shall be in accordance with IWA-2232, IWA-3000, and Table IWC-2500-1.
  - (2) Class 2 valve body weld examinations (Category C-G) shall be in accordance with IWA-2220, IWA-3000, and Table IWC-2500-1.
  - (3) Component support integrally welded attachment examinations for piping, pumps and valves and pressure vessels (Categories B-H, B-K-1, and C-C) shall be in accordance with IWA-2200, IWA-3000, Table IWB-2500-1, and Table IWC-2500-1.
  - (4) Component support examinations for piping, pumps, and valves (Categories B-K-2 and C-E) shall be in accordance with IWA-2200, IWA-3000, Table IWB-2500-1, and Table IWC-2500-1.
  - (5) Technique for ultrasonic examination of piping welds shall be in accordance with IWA-2232(b) and IWA-2232(c) for examinations performed after October 20, 1981 (see Requests for Relief ISI-1, ISI-4 and ISI-13).
  - (6) Standards for examination evaluation following ultrasonic examination of piping welds (IWA-3000--see Request for Relief ISI-1).
  - (7) Interior clad surfaces of reactor vessels and other vessel examination are not required.
  - (8) Reactor vessel interior and core support structure examinations (Categories B-N-1 and B-N-3) shall be in accordance with IWA-2200 and Table IWB-2500-1.

- (9) Class 1 pressure-retaining welds in piping examinations after July 1, 1989 (Category B-J), shall be in accordance with IWA-2200, IWA-3000, and Table IWB-2500-1 except for extent of examination.
- (10) Class 1 pressure-retaining dissimilar metal welds after September 1, 1991 (Category B-F), shall be in accordance with IWA-2200, IWA-3000, and Table IWC-2500-1.
- (11) Class 2 pressure-retaining welds in piping examinations after September 1, 1991 (Category C-F), shall be in accordance with IWA-2200, IWA-3000, and Table IWC-2300-1, except for extent of examination.

B. For examinations performed after July 1, 1992, the following criteria will be used:

- (1) NDE methods, weld reference system, and standards for examination evaluation will be in accordance with the 1986 Edition of ASME Section XI. This will include all portions of IWA-2200, IWA-2300, IWA-2600, IWA-3000, IWB-3000, IWD-3000, and IWF-3000, as well as all portions of Appendices III, IV, and VI of ASME Section XI. This was approved by the Nuclear Regulatory Commission (NRC) in Frederick J. Hebdon's April 24, 1992 letter to M. O. Medford (A02 920429 005).<sup>31</sup> TVA will use the 1984 Edition of ASNT SNT-TC-1A for certification of NDE personnel as approved by the NRC's January 18, 1990 letter from S. C. Black to O. D. Kingsley, Jr.
- (2) Parts examined and examination requirements for the following categories will be in accordance with the applicable section of Tables IWB-2500-1 and IWC-2500-1 of the 1977 Edition, Summer 1978 Addenda of Section XI:<sup>4</sup>
  - a. Class 2 pressure-retaining bolting (Category C-D).
  - b. Class 2 valve body weld examinations (Category C-G).
  - c. Component support integrally welded attachment examinations for piping, pumps and valves, and pressure vessels (Categories B-H, B-K-1, and C-C).
  - d. Component support examinations for piping, pumps, and valves (Categories B-K-2 and C-E).
  - e. Interior clad surfaces of reactor vessels and other vessels examination are not required.
  - f. Reactor vessel interior and core support structure examinations (Categories B-N-1 and B-N-3).
  - g. Class 1 pressure-retaining welds in piping

(Category B-J). Extent of examination is to the 74S75 Edition.

h. Class 1 pressure-retaining dissimilar metal welds (Category B-F).

i. Class 2 pressure-retaining welds in piping (Category C-F). Extent of examination is to the 74S75 Edition.

3.5 The Repair and Replacement Program is in accordance with WBN ASME Section XI Repair and Replacement Program.

3.6 TVA will use Code Cases N-234, N-235, N-307-1, N-308, N-401, N-402, N-416, N-435-1, and N-461 which have been approved by the NRC as per Regulatory Guide 1.147, as outlined in the applicable NDE Procedure.<sup>5</sup>

3.7 Code Cases N-341 and N-356 were authorized for TVA use by the NRC in G. G. Zech's January 25, 1988, letter to S. A. White (A02 880128 016).<sup>6</sup>

3.8 Code Case N-460 was authorized for TVA use by the NRC in S. C. Black's letter to O. D. Kingsley, Jr. (A02 891213 008).<sup>7</sup>

3.9 TVA will utilize Regulatory Guide 1.150, Revision 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," for its examinations, as outlined in NDE Procedures.<sup>8</sup>

#### 4.0 METHOD OF IMPLEMENTATION AND RESPONSIBILITIES

4.1 A list of weld maps and other pertinent component drawings and tables are included in Appendix A of this program to define areas subject to examination (in addition to Sections 5.0, 6.0, 7.0, and 8.0). The component weld maps should be established by ISI Programs from Modification's latest revision weld maps.

4.2 Prior to performance of the examinations, each system should be walked down by ISI Programs to verify that the ISI Programs drawings depict field configurations. Any drawing changes that are necessary as a result of the walkdown will be made before the drawings are listed in this program. Also, each component drawing shall be reviewed by the responsible ISI Programs Engineer to ensure that the appropriate information is included on the drawing and shall be approved by the ISI Programs Manager or his designee. The PSI drawings are issued and controlled by WBN Document Control and Records Management. System and component weld maps are listed in Appendix A of this program.

4.3 Inspection Services Organization (ISO) shall prepare/revise scan plans using component listings supplied by ISI Programs using component drawings for systems or components requiring examinations. The plans shall include as a minimum references to specific welds or components supports to be examined, ASME Code Category, component drawing number, NDE procedures to be used, and calibration block number.

6.2.4 Pressurizer Nozzle-To-Safe End Welds

Each nozzle includes a welded forging safe end. The nozzle-to-safe end welds shall be ultrasonically and liquid penetrant examined.

Safe-end connections are SA-182, Gr. F-316L forgings.

6.2.5 Pressurizer Pressure Retaining Bolting Larger Than 2 Inches in Diameter

There is no pressure-retaining bolting larger than 2 inches in diameter.

6.2.6 Pressurizer Pressure-Retaining Bolting 2 Inches and Smaller in Diameter

The bolting on the pressurizer manway shall be visually examined. The bolting may be examined either in place under tension or when the bolting is removed.

The manway includes 16 bolts at 1.88 inches in diameter. The bolts are fabricated to SA-193, Gr. B7.

6.2.7 Pressurizer Integrally Welded Support Attachments

6.2.7.1 Pressurizer Support Skirt

The pressurizer support skirt-to-vessel weld shall be ultrasonically examined.

The support skirt (1.5 inches thick) is fabricated of SA-516, Gr. 70, carbon steel plate.

6.2.7.2 Pressurizer Seismic Lugs

There are four integrally welded seismic lugs on the pressurizer. All four lugs shall be surface examined.

6.2.8 Pressurizer Cladding

A clad patch (36 square inches) is in the pressurizer interior cladding near the manway. In accordance with the 1977 Edition, 1978 Addenda of Section XI, no examination is required.

Interior cladding is of austenitic stainless steel.

6.3 Steam Generators (4)<sup>13, 14</sup>

6.3.1 Steam Generator Primary Longitudinal And Circumferential Welds

The primary head-to-tube sheet weld on each generator shall be ultrasonically examined. There are no primary longitudinal welds.

6.5.6 RCP Casings

The internal pressure boundary surfaces of one pump shall be visually examined.

6.5.7 RCP Flywheel

Each RCP flywheel shall undergo a complete ultrasonic examination and shall also be surface examined in accordance with Regulatory Guide 1.14.

Preservice examination is not required by TVA.

The flywheel consists of two plates, approximately 5-inches and 8-inches thick, bolted together. Each plate is fabricated from vacuum degassed A-533, Gr. B, Class 1 steel.

6.6 Valves<sup>13</sup>

6.6.1 Valve Pressure-Retaining Bolting Larger Than 2 Inches in Diameter

There is no Class 1 valve pressure retaining bolting larger than 2 inches in diameter.

6.6.2 Valve Pressure-Retaining Bolting 2 Inches and Smaller in Diameter

Class 1 valve pressure-retaining bolting 2 inches and smaller in diameter shall be visually examined. These examinations shall include bolts, studs, and nuts. (See Appendix A, Table E for valves).

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

6.6.3 Valve Integrally Welded Supports

There are no Class 1 valve integrally welded supports. (See Appendix A, Table E)

6.6.4 Valve Support Components

There are three chemical and volume control and two reactor coolant valves which include component supports connected to the valve operator. Each valve support component shall be visually examined (see Appendix A, Table E).

6.6.5 Valve Body Welds

There are no Class 1 valves with body welds.

7.12 Valves<sup>18, 19</sup>

7.12.1 Valve Body Welds

There are ASME Class 2 valves with body welds. Selection of areas to be examined shall be in accordance with IWC-2411 and Table IWC-2520 of Section XI. (In case of multiple valves of similar design, size, and function and service in a system, the examination of only one valve among each group of multiple valves is required.) These welds shall be surface examined. (See Appendix A Table F.)

7.12.2 Valve Pressure-Retaining Bolting Exceeding 2 Inches in Diameter

There are no ASME Class 2 valve pressure-retaining bolting larger than 2 inches in diameter.

7.12.3 Valve Integrally Welded Supports

There are no Class 2 valve integrally welded supports. (See Appendix A, Table F)

7.12.4 Valve Support Components

There are four feedwater valves which include component supports connected to the valve operator. Each valve support component shall be visually examined (see Appendix A, Table F).

7.13 Exempted Components<sup>20</sup>

All components exempted from examination in accordance with IWC-1220 of ASME Section XI shall be visually examined for leakage during system hydrostatic pressure tests. See Section 9.0 and Appendix A, Table G.

Components exempted from examination include (1) components in systems where both the design pressure and temperature are equal to or less than 275 psig and 200 F, respectively; (2) components in systems or portions of systems, other than emergency core cooling systems, which do not function during normal reactor operation; and (3) component connections, piping, and associated valves, and vessels (and their supports), that are 4-inch nominal pipe size and smaller.

8.0 COMPONENTS SUBJECT TO EXAMINATION - ASME CLASS 3 (TVA SAFETY CLASS C AND D)

In accordance with 10CFR50, Section 50.55a(g)(2), a preservice examination of ASME Class 3 components is not required.

11.6 Volumetric Examination (Eddy Current)<sup>28</sup>

Eddy current examination of heat exchanger tubing shall be conducted in accordance with the provisions of Appendix IV of Section XI of the ASME Boiler and Pressure Vessel Code (Summer 1976 Addenda).

12.0 QUALIFICATIONS OF NONDESTRUCTIVE EXAMINATION PERSONNEL

The qualifications of NDE examination personnel shall be as per paragraphs IWA-1600, IWA-2300, and Table IWA-1600-1 of ASME Section XI 1986 Edition and QMP-102.4. TVA will use the 1984 Edition of ASNT SNT-TC-1A for certification of NDE personnel as approved by the NRC's January 18, 1990 letter from S. C. Black to O. D. Kingsley, Jr.

13.0 ACCEPTANCE CRITERIA

All acceptance standards for ASME Class 1 and 2 components shall be in accordance with IWA-3000 of ASME Section XI except where ASME Section III examinations are employed to satisfy ASME Section XI requirements (see Section 3.0).

14.0 REPAIRS AND REPLACEMENTS

All repairs and replacements shall be performed in accordance with WBN ASME Section XI Repair and Replacement Program. Repairs and replacements as necessary may be coordinated with IST/Repair and Replacement Programs, Nuclear Maintenance.

15.0 RECORDS AND REPORTS

15.1 Recording of and Report of Examinations

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

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- I. Introduction - The introduction should include the following information: plant, unit number, preservice or inservice inspection and cycle number, systems, components and vessels examinations were performed on, organization examinations were performed by, dates examinations were performed, ASME Section XI 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.

When impractical examination requirements are identified in the field, SQO shall notify ISI Programs such that the information may be included in this program and requests for relief may be prepared if necessary. SQO shall submit sketches to ISI Programs to identify areas which cannot be examined in accordance with code requirements.

## 19.0 AUGMENTED INSPECTIONS

### 19.1 Steam Generator Tubes

The augmented examination requirements of the steam generator tubing are included in Technical Specification 4.4.5.0 and Section 6.3.8 of this program. The results of the augmented examination will be included in the PSI report.

### 19.2 Safety Injection System Piping Welds to the Accumulators

This includes piping from: valve FCV 63-118 to Accumulator 1; valve FCV 63-098 to Accumulator 2; valve FCV 63-080 to Accumulator 3; and valve FCV 63-067 to Accumulator 4. This piping shall be examined in accordance with ASME Section XI 1977 Summer 1978 Addenda Category CF. This is a TVA imposed augmented inspection.

### 19.3 ASME Section XI 1983 Edition Winter 1983 Addenda Augmented Class 2 Examinations 32, 33

Preservice examination requirements for the Emergency Core Cooling System (ECCS), High Pressure Safety Injection (HPSI), Residual Heat Removal (RHR), and Containment Spray (CS) Class 2 piping welds will be updated to use portions of the ASME Section XI 1983 Edition Winter 1983 Addenda. Paragraph IWC-1220 (components exempt from examination) and Examination Category C-F-1 of Table IWC-2500-1 will be utilized for exemption requirements, weld selection (parts examined), extent of examination, and examination method. Examination techniques, evaluation standards, and examination requirement/figure number will be in accordance with Section 3.0 of this program. Selected welds that have not already been examined will be examined to establish an information augmented preservice examination. These welds will be included in the preservice NIS-1 report. These information augmented examinations are imposed by the NRC. These augmented examinations were committed to be placed in the PSI Program in J. H. Garrity's November 4, 1991 letter to the NRC (T04 911104 853).

## 20.0 REFERENCES

### 20.1 Source Documents

- 20.1.1 ASME Boiler and Pressure Vessel Code - Section XI through Summer 1975 Addenda, Summer 1976 Addenda, Summer 1978 Addenda, Winter 1983 Addenda, and 1986 Edition.

TABLE A  
WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 1 COMPONENTS

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<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Examination Category Item No. From Table IWB-2600, Section XI</u>	<u>From Table IWB-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
<b>B. <u>Pressurizer (Continued)</u></b>					
4. Nozzle-to-Safe End Welds All welds before 9/1/91 All welds after 9/1/91	6.2.4	B2.4 B5.20 (see note 2)	B-F B-F (see note 2)	UT, PT UT, PT	CH-M-2570-A
5. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.2.6	B2.11	B-G-2	VT-1	CH-M-2570-A
6. Pressurizer Support Skirt	6.2.7.1	B8.20 (See Note 2)	B-H (See Note 2)	UT	CH-M-2570-A
7. Pressurizer Seismic Lugs	6.2.7.2	B8.20 (See Note 2)	B-H (See Note 2)	MT	CH-M-2570-A
<b>C. <u>Steam Generators</u></b>					
1. Primary Head-to-Tube Sheet Weld	6.3.1	B3.1	B-B	UT	CH-M-2660-B
2. Primary Nozzle-to-Safe End Welds All welds before 9/1/91 All welds after 9/1/91	6.3.3	B3.3 B5.30	B-F B-F	UT, PT UT, PT	CH-M-2660-B
3. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.3.5	B3.10	B-G-2	VT	CH-M-2660-B

NOTE: 1. See Section 6.0 for additional information.  
 2. Item number and examination category from 1977 Edition, 1978 Summer Addenda of Section XI, Table IWB-2500-1.

TABLE A  
WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 1 COMPONENTS

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<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Examination Category Item No. From Table IWB-2600, Section XI</u>	<u>From Table IWB-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
<u>E. Reactor Coolant Pumps (Continued)</u>					
2. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.5.2	B5.9	B-G-2	VT-1	CH-M-2672-B
3. Support Components	6.5.4	B11.20 (See Note 2)	B-K-2 (See Note 2)	VT-3, VT-4	ISI-0121-A
4. Casing Welds	6.5.5	B5.6	B-L-1	PT	ISI-0048-B
5. Casings	6.5.6	B5.7	B-L-2	VT	ISI-0048-B
<u>F. Valves</u>					
1. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.6.2	B6.9	B-G-2	VT	Appendix A, Table E
2. Valve Support Components	6.6.4	B11.30 (See Note 2)	B-K-2 (See Note 2)	VT-3, VT-4	Appendix A, Table E
3. Valve Bodies	6.6.6	B6.7	B-M-2	VT	Appendix A, Table D
<u>G. Exempted Components</u>	6.7	B1.19	B-P	VT	N/A B2.10 B3.9 B4.11 B5.8 B6.8

NOTE: 1. See Section 6.0 for additional information.  
 2. Item number and examination category from 1977 Edition, 1978 Summer Addenda of Section XI, Table IWB-2500-1.

TABLE B  
WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 2 COMPONENTS

WBN  
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<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Examination Category Item No. From Table IWC-2600, Section XI</u>	<u>From Table IWC-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
J. <u>Safety Injection Pumps</u>					
1. Support Components	7.10.4	C3.80 (See Note 2)	C-E (See Note 2)	VT-3	ISI-0120-A
K. <u>Chemical Volume Control Positive Displacement Pump</u>					
1. Support Component	7.11.4	C3.80 (See Note 2)	C-E (See Note 2)	VT-3	ISI-0119-A
L. <u>Valves</u>					
1. Valve Body Welds	7.12.1	C6.20 (See Note 2)	C-G (See Note 2)	PT	ISI-0081-A ISI-0082-A
2. Valve Support Components	7.12.3	C3.110 (See Note 2)	C-E (See Note 2)	VT-3, VT-4	Appendix A, Table F
M. <u>Exempted Components</u>	7.13	N/A	N/A	VT	N/A

NOTES: 1. See Section 7.0 for additional information.  
 2. Item number & examination category from 1977 Edition, 1978 Summer Addenda of Section XI, Table IWC-2500-1.

TABLE C (Continued)

LIST OF DRAWINGS - UNIT #1

<u>DRAWING NO.</u> Series	<u>TITLE</u>
	<u>EXCESS LETDOWN HEAT EXCHANGER</u>
ISI-0076-A	Excess Letdown Heat Exchanger Weld Locations
	<u>REGENERATIVE HEAT EXCHANGER</u>
ISI-0077-A	Regenerative Heat Exchanger Weld Locations
	<u>PIPING AND VALVE WELD MAPS</u>
ISI-0081-A	Mainsteam Relief Valve
ISI-0082-A	Feedwater Check Valve
CHM-2547-B	Reactor Coolant Piping
CHM-2636-C	Residual Heat Removal
CHM-2669-C	Mainsteam
CHM-2671-C	Feedwater
CHM-2758-C	Safety Injection
ISI-0005-C	Chemical and Volume Control
ISI-0365-C	Reactor Coolant System
ISI-0050-C	CVCS Seal Water Injection
ISI-0375-C	High Pressure Safety Injection
ISI-0400-C	Containment Spray
	<u>HANGER LOCATION DRAWING</u> <u>CLASS 1 AND CLASS 2</u>
ISI-0364-C	Reactor Coolant System
ISI-0011-C	Mainsteam
ISI-0020-C	Residual Heat Removal
ISI-0021-C	Safety Injection
ISI-0026-C	Chemical and Volume Control
ISI-0062-C	Feedwater
ISI-0063-C	CVCS Seal Water Injection
ISI-0117-A	Residual Heat Removal Pump Supports
ISI-0118-A	Centrifugal Charging Pump Supports
ISI-0119-A	Reciprocation Charging Pump Supports
ISI-0120-A	Safety Injection Pump Supports
ISI-0121-A	Reactor Coolant Pump Supports
ISI-0124-C	Pressurizer Surge Line

TABLE E  
Class 1 Valves  
Valves Subject to the Requirements of Examination Categories  
Table IWB-2500 of Section XI

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Valve No.	Valve Size	Valve Bolting < = 2"	Valve Bolting > 2"	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
63-588	1 1/2	No	No	No	No	No	Sh 13 of 14 CH-M-2758-C	Kerotest	TVD-D-9958X03-(1)
63-589	1 1/2	No	No	No	No	No	Sh 13 of 14 CH-M-2758-C	Kerotest	TVD-D-9958X03-(1)
63-622	10	Yes	No	No	No	No	Sh 7 of 14 CH-M-2758-C	Westinghouse	934D187
63-623	10	Yes	No	No	No	No	Sh 8 of 14 CH-M-2758-C	Westinghouse	934D187
63-624	10	Yes	No	No	No	No	Sh 9 of 14 CH-M-2758-C	Westinghouse	934D187
63-625	10	Yes	No	No	No	No	Sh 10 of 14 CH-M-2758-C	Westinghouse	934D187
63-632	6	Yes	No	No	No	No	Sh 8 of 14 CH-M-2758-C	Westinghouse	934D185
63-633	6	Yes	No	No	No	No	Sh 7 of 14 CH-M-2758-C	Westinghouse	934D185
63-634	6	Yes	No	No	No	No	Sh 9 of 14 CH-M-2758-C	Westinghouse	934D185
63-635	6	Yes	No	No	No	No	Sh 10 of 14 CH-M-2758-C	Westinghouse	934D185
FCV-62-69	3	Yes	No	No	No	Yes	Sh 1 of 2 ISI-0005-C	Fisher	54A0228

TABLE E  
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Valve No.	Valve Size	Valve Bolting < 2"	Valve Bolting > 2"	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
FCV-62-70	3	Yes	No	No	No	Yes	Sh 1 of 2 ISI-0005-C	Fisher	54A0228
FCV-62-84	2	Yes	No	No	No	Yes	Sh 2 of 2 ISI-0005-C	Fisher	54A0235
62-560	2	No	No	No	No	No	Sh 1 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)
62-561	2	No	No	No	No	No	Sh 2 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)
62-562	2	No	No	No	No	No	Sh 3 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)
62-563	2	No	No	No	No	No	Sh 4 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)
62-564	2	No	No	No	No	No	Sh 1 of 4 ISI-0050-C	Kerotest	TVD-D-9909-(1)
62-565	2	No	No	No	No	No	Sh 2 of 4 ISI-0050-C	Kerotest	TVD-D-9909-(1)
62-566	2	No	No	No	No	No	Sh 3 of 4 ISI-0050-C	Kerotest	TVD-D-9909-(1)
62-567	2	No	No	No	No	No	Sh 4 of 4 ISI-0050-C	Kerotest	TVD-D-9909-(1)
62-576	2	No	No	No	No	No	Sh 1 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)

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Valve No.	Valve Size	Valve Bolting < = 2"	Valve Bolting > 2"	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
PCV-68-334	3	No	No	No	No	No	Sh 1 of 3 ISI-0365-C	Target Rock	1052020-3
PCV-68-340A	3	No	No	No	No	No	Sh 1 of 3 ISI-0365-C	Target Rock	1052020-3
PCV-68-340B	4	Yes	No	No	No	Yes	Sh 2 of 3 ISI-0365-C	Fisher	54A0278
PCV-68-340D	4	Yes	No	No	No	Yes	Sh 2 of 3 ISI-0365-C	Fisher	54A0278

TABLE F  
Class 2 Valves  
Valves Subject to the Requirements of Examination Categories  
Table IWC-2500 of Section XI

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Valve No.	Valve Size	Valve Bolting > 2	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
FCV-3-87	16	No	No	No	No	CH-M-2671-C	Walworth	A-12819-M-1D
FCV-3-100	16	No	No	No	No	CH-M-2671-C	Walworth	A-12819-M-1D
FCV-3-236	6	No	No	No	Yes	CH-M-2671-C	Leslie	717543030D
FCV-3-239	6	No	No	No	Yes	CH-M-2671-C	Leslie	717543030D
FCV-3-242	6	No	No	No	Yes	CH-M-2671-C	Leslie	717543030D
FCV-3-245	6	No	No	No	Yes	CH-M-2671-C	Leslie	717543030D
13-508	16	No	No	No	No	CH-M-2671-C	Walworth	A-12386-M-3
3-509	16	No	No	No	No	CH-M-2671-C	Walworth	A-12386-M-3
3-510	16	No	No	No	No	CH-M-2671-C	Walworth	A-12386-M-3
3-511	16	No	No	No	No	CH-M-2671-C	Walworth	A-12386-M-3
3-638	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001
3-644	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001
3-645	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001
3-652	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001
3-655	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001

REVISION LOG

<u>Revision Number</u>	<u>Implementation Date</u>	<u>Description of Revision</u>
24	09/20/92	Revised Sections 3.4 and 12.0 to update NDE methods, weld reference system, qualification of personnel, and standards for examination to the 1986 Edition of Section XI. Revised Section 6.2.7 and Appendix A, Table A, to include examination of the pressurizer seismic lugs. Revised Sections 6.6.4, 7.12.4, Appendix A, Tables A, B, E, and F, for valve support components. Added augmented Section 19.3 and revised Appendix A, Table C, for the ASME Section XI 1983 Edition, Winter 1983 Addenda Augmented Class 2 Examinations. Revised Source Document 20.1.1 and added two source notes.

SOURCE NOTES (Continued)  
Page 2 of 2

25. ASME Section V through 1975 Summer Addenda, Article 2.
26. ASME Section XI 74/S75, Appendix I, Appendix III.
27. ASME Section V through 1975 Summer Addenda, Article 4, Article 5.
28. ASME Section XI 74/S76, Appendix IV.
29. ASME Section V through 1975 Summer Addenda.
30. Code of Federal Regulations, Title 10, Part 50.55a paragraph (g)(2)
31. ASME Boiler and Pressure Vessel Code, 1986 Edition, Section XI (ASME Section XI 86).
32. ASME Boiler and Pressure Vessel Code 1983 Edition, Winter 1983 Addenda, Section XI (ASME Section XI 83/W83).
33. Commitment number 920203001. J. H. Garrity's November 4, 1991 letter to the NRC (T04 911104 853).

ENCLOSURE 2  
TI-50A Revision 25

Revision 25

Brief description of the revisions:

TI-50A, Revision 25, dated April 29, 1993, incorporated the following: corrected omission of "IWC-3000" in Section 3.4.B(1); revised Section 4.7 for steam generator tube examination contract responsibility; clarified Sections 6.1.11, 6.4, and Table A, A.15, concerning welds in the auxiliary head adapter; revised Sections 6.3.8 and 19 and added augmented examination definition due to Incident Investigation II-S-92-027; added "or studs" to Section 6.3.5; added "digitized storage of data" to Section 15.1; added manual number to Section 20.3.3; revised Section 15.1; added manual number to Section 20.3.3; revised Appendix F; and revised to show current organization titles.

ASME SECTION XI PRESERVICE INSPECTION PROGRAM

Approved by/date:		Implementation Date: <u>5/24/93</u>		
Sponsor	<u>[Signature]</u>	<u>12/16/93</u>	1.	_____
QA	<u>[Signature]</u>	<u>4/29/93</u>	2.	_____
			3.	_____
PM	<u>[Signature]</u>	<u>4/30/93</u>	4.	_____
ARM	<u>[Signature]</u>	<u>4/30/93</u>	5.	_____
			TPCN No.	Eff. Date
				Exp. Date

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## 1.0 STATEMENT OF APPLICABILITY

This Technical Instruction supersedes Surveillance Instruction 4.4.10.1.

This program outlines details for performing the preservice nondestructive examinations (NDEs) of the Watts Bar Nuclear Plant (WBN) American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components (and their supports) containing water, steam, or radioactive material (other than radioactive waste management systems). The program has been organized to comply as practical with the preservice examination requirements of Section XI of the ASME Boiler and Pressure Vessel Code and will be conducted in accordance with SSP-6.10.

The requirements of ASME Section XI are in effect when the requirements of ASME Section III have been satisfied. Criteria for determining that ASME Section III requirements have been satisfied are as follows:

<u>Item</u>	<u>When ASME Section III Requirements are Satisfied</u>
Pressure Vessels and Pumps	When "N" stamped
Valves	When "N" stamped
Piping System	When the hydrostatic pressure test is complete, N-5 data form is completed, piping system "N" stamped or partial piping assemblies "NA" stamped.

Specifics concerning performance of NDEs are not a part of this program, but are included in NDE procedures Quality Methods Procedure (QMP) 102.4 and QMP-110.5.

## 2.0 PURPOSE

The Preservice Inspection (PSI) Program is preliminary in nature and is employed to obtain detailed information for inclusion in the Inservice Inspection (ISI) Program. The examinations required by this program will establish acceptance of components for service.

The PSI Program serves as a means of determining built-in limitations caused by original plant design, geometry, materials of construction of the components, and the current technology or state-of-the-art of nondestructive testing. The PSI Program will also permit verification of the examination methods selected, finalization of detailed procedures, and will establish preservice examination data to be used as a reference for later inservice examinations.

## 3.0 CODES OF RECORD AND CODE CASES<sup>30</sup>

3.1 The code of record in effect six months prior to the date of issue of the Construction Permit was 1971 Edition, Winter 1971 Addenda of Section XI.

- (9) Class 1 pressure-retaining welds in piping examinations after July 1, 1989 (Category B-J), shall be in accordance with IWA-2200, IWA-3000, and Table IWB-2500-1 except for extent of examination.
  - (10) Class 1 pressure-retaining dissimilar metal welds after September 1, 1991 (Category B-F), shall be in accordance with IWA-2200, IWA-3000, and Table IWC-2500-1.
  - (11) Class 2 pressure-retaining welds in piping examinations after September 1, 1991 (Category C-F), shall be in accordance with IWA-2200, IWA-3000, and Table IWC-2300-1, except for extent of examination.
- B. For examinations performed after July 1, 1992, the following criteria will be used:
- (1) NDE methods, weld reference system, and standards for examination evaluation will be in accordance with the 1986 Edition of ASME Section XI. This will include all portions of IWA-2200, IWA-2300, IWA-2600, IWA-3000, IWB-3000, IWC-3000, IWD-3000, and IWF-3000, as well as all portions of Appendices III, IV, and VI of ASME Section XI. This was approved by the Nuclear Regulatory Commission (NRC) in Frederick J. Hebdon's April 24, 1992 letter to M. O. Medford (A02 920429 005). 31 TVA will use the 1984 Edition of ASNT SNT-TC-1A for certification of NDE personnel as approved by the NRC's January 18, 1990 letter from S. C. Black to O. D. Kingsley, Jr.
  - (2) Parts examined and examination requirements for the following categories will be in accordance with the applicable section of Tables IWB-2500-1 and IWC-2500-1 of the 1977 Edition, Summer 1978 Addenda of Section XI: <sup>4</sup>
    - a. Class 2 pressure-retaining bolting (Category C-D).
    - b. Class 2 valve body weld examinations (Category C-G).
    - c. Component support integrally welded attachment examinations for piping, pumps and valves, and pressure vessels (Categories B-H, B-K-1, and C-C).
    - d. Component support examinations for piping, pumps, and valves (Categories B-K-2 and C-E).
    - e. Interior clad surfaces of reactor vessels and other vessels examination are not required.
    - f. Reactor vessel interior and core support structure examinations (Categories B-N-1 and B-N-3).
    - g. Class 1 pressure-retaining welds in piping

references to specific welds or components supports to be examined, ASME Code Category, component drawing number, NDE procedures to be used, and calibration block number.

- 4.4 Prior to performing examinations on a system or component, the scan plans shall be approved by an NDE Level III individual from ISO. An ASME Section XI Programs representative shall approve scan plans and revisions affecting component selection or the NDE method utilized. ISO shall submit the approved scan plan to the Site Quality Organization (SQO). SQO shall submit copies of the approved scan plan to the Plant Manager and to the ANII.
- 4.5 SQO shall notify the authorized inspection agency (AIA) reasonably in advance of when components are scheduled for examination.
- 4.6 If variations in configuration are discovered or modifications (including additions and deletions) or replacements or repairs are discovered during the course of the PSI, these changes shall be marked on field copies of the appropriate drawings listed in Appendix A. These field corrected copies shall be used in the performance of examinations and as records until the drawing has been revised to reflect the change. Copies of these field corrected drawings shall be transmitted to ASME Section XI Programs using the transmittal form provided in Appendix E. A file and a transmittal number log of the corrected drawings and transmittal form shall be maintained by the SQO for future reference. ASME Section XI Programs shall be responsible for reviewing the proposed change, revising the drawings as necessary, and issuing the revised drawings prior to initial plant startup. Appendix E shall be returned to the SQO after the referenced drawings have been revised by the ASME Section XI Programs representative. The ISO scan plan shall be revised to reflect any PSI examinations performed due to these variations in configuration.
- 4.7 The preservice examinations will be performed by personnel from either Nuclear Assurance (NA), ISO, or outside contractors. Contract preparation, administration, and supervision will be the responsibility of SQO. Corporate Steam Generator Maintenance and Technology is responsible for these contact areas on steam generator tube examinations.
- 4.8 Inspection plans submitted by outside contractors shall be reviewed and approved by NA prior to use. NA verifies the adequacy of prospective contractor quality assurance programs prior to contract award. All specific NDE procedures used during the inspection program shall be reviewed and approved in accordance with WBN's Quality Assurance Program.
- 4.9 Certain ASME Section III examinations performed in-shop and/or during the construction phase will be identified by ASME Section XI Programs and copies employed to serve for the ASME - Section XI PSI. When in-shop examination records are employed, copies of the examination data sheets and the applicable data package form, with the ANI sign-off, shall be obtained by SQO. When examination records during the construction phase are employed, the examination procedures used during the construction

- 4.16 Prior to initial plant startup, Data Sheet 2, in addition to Data Sheet 1, in Appendix B shall be signed. After the data sheets 1 and 2 have been approved, the data package cover sheet shall be signed by the Site Quality Manager. These data sheets shall be filed at the plant with PSI examination data and final reports discussed in Section 15.0 of this program.
- 4.17 ASME Section XI Programs shall be responsible for determining the Piping Component Support Examination Boundaries (Appendix F).
- 4.18 PSI program preparation is the responsibility of ASME Section XI Programs. Any revisions initiated by other groups shall be submitted to ASME Section XI Programs for approval prior to incorporating the revisions into this program.
- 4.19 Revisions to this instruction shall be submitted to the NRC via WBN Site Licensing.
- 4.20 Appendices B and C are Life of Plant documents.

## 5.0 ABBREVIATIONS AND DEFINITIONS

AIA - Authorized Inspection Agency

AI - Authorized Inspector (may denote an ANI or ANII)

ANI - Authorized Nuclear Inspector

ANII - Authorized Nuclear Inservice Inspector

ASME - American Society of Mechanical Engineers

Augmented Examination - All examinations which are not required by ASME Section XI except as identified in items 1 and 2 below.

1. Fabrication and installation NDE performed in accordance with design specification or construction code requirements is not augmented NDE.
2. Leak rate testing required by 10 CFR 50, Appendix J, is not augmented NDE.

Components - Denotes items in a power plant such as vessels, piping systems, pumps, valves, and component supports.

DCN - Design Change Notice

Inservice Inspection (ISI) - Inspections required by ASME Section XI to be completed during each of the inspection intervals for the service lifetime of the power unit. These inspections include NDE, system pressure tests, and pump and valve tests.

Maintenance - Routine servicing or work on an item undertaken to correct or prevent an unsatisfactory condition. Maintenance does not include welding, heat treatment, or defect removal which affects the pressure boundary. Maintenance includes operations such as lapping of

When examinations have been completed on the various components, the data sheet(s) in Appendix B shall be completed.

Table A in Appendix A supplies additional information such as reference drawing numbers and Section XI, Table IWB-2600, examination categories.

## 6.1 Reactor Vessel<sup>13, 14</sup>

### 6.1.1 Reactor Vessel Seam Welds

#### 6.1.1.1 Circumferential Shell Weld - Beltline Region

There is one circumferential weld in the vessel cylindrical shell located behind the neutron shield pads. This weld will be ultrasonically examined using remote inspection devices from the vessel ID with the core internals removed. The vessel shell sections are machined forgings fabricated of SA-508, Class 2, manganese-molybdenum steel and are clad with weld deposited austenitic stainless steel.

There are no base metal repair welds in the beltline region where repair depth exceeds 10 percent nominal of vessel wall.

#### 6.1.1.2 Circumferential Shell Welds

There are three circumferential welds in the vessel cylindrical shell located outside of the beltline region. These welds will be ultrasonically examined using remote inspection devices from the vessel ID with the core internals removed.

The vessel shell section material is identified in section 6.1.1.1.

#### 6.1.1.3 Lower Head Welds

There are six meridional welds and one circumferential weld in the lower head. The welds will be ultrasonically examined using remote inspection devices from the vessel ID with the core internals removed.

Base metal below the lower head circumferential weld is inaccessible for examination from the vessel ID due to instrumentation penetrations (weld No. W01-02). A manual ultrasonic examination of this area will be conducted from the vessel OD (see Request for Relief ISI-6).

6.1.4 Reactor Vessel Nozzle-To-Safe End Welds

The nozzle-to-safe end welds shall be ultrasonically examined from the ID using remote inspection devices. In addition, these welds will be liquid penetrant examined (from OD).

The nozzle ends include a buttered safe-end of 309 and 308L and are extended with a stainless steel ring of SA-182, TP 304.

6.1.5 Reactor Vessel Pressure Retaining Bolting Larger Than 2 Inches in Diameter

All 54 of the vessel closure studs shall be ultrasonically and magnetic particle examined. The closure studs may be ultrasonically examined in place under tension, when the closure head is removed, or when the studs are removed.

The closure nuts shall be magnetic particle examined. The vessel flange ligaments (54) between threaded stud holes shall be ultrasonically examined. This examination is to be done manually. Threads in the base material do not require examination.

The 54 concave washers shall be visually examined.

Studs, nuts, and washers are fabricated of SA-540, GR.B24, nickle-chrome-molybdenum steel with a manganese-phosphate surface treatment.

6.1.6 Reactor Vessel Pressure Retaining Bolting 2 Inches and Smaller in Diameter

There is no pressure retaining bolting 2 inches and smaller in diameter.

6.1.7 Integrally Welded Reactor Vessel Supports

There are no integrally welded vessel supports. The vessel is supported by four support pads located on the bottom of two outlet nozzles (15 and 17) and two inlet nozzles (13 and 14).

6.1.8 Reactor Vessel And Closure Head Cladding

There are six clad patches (36 square inches each) in the vessel cladding and six clad patches (36 square inches each) in the closure head cladding. In accordance with the 1977 Edition, 1978 Summer Addenda of Section XI, no examination is required.

Reactor vessel and closure head cladding is of weld deposited austenitic stainless steel.

6.2.2 Pressurizer Nozzle-To-Vessel Welds And Inside Radiused Sections

There are four 6-inch nozzles, one 4-inch nozzle, and one 14-inch nozzle. The nozzle-to-vessel welds and nozzle inside radiused sections will be ultrasonically examined. The nozzles are fabricated of SA-508, Class 2, manganese-molybdenum steel.

6.2.3 Pressurizer Heater Penetrations

The pressurizer lower head heater penetrations shall be visually examined by Field Engineering for leakage during the ASME Section III hydrostatic pressure test.

6.2.4 Pressurizer Nozzle-To-Safe End Welds

Each nozzle includes a welded forging safe end. The nozzle-to-safe end welds shall be ultrasonically and liquid penetrant examined.

Safe-end connections are SA-182, Gr. F-316L forgings.

6.2.5 Pressurizer Pressure Retaining Bolting Larger Than 2 Inches in Diameter

There is no pressure-retaining bolting larger than 2 inches in diameter.

6.2.6 Pressurizer Pressure-Retaining Bolting 2 Inches and Smaller in Diameter

The bolting on the pressurizer manway shall be visually examined. The bolting may be examined either in place under tension or when the bolting is removed.

The manway includes 16 bolts at 1.88 inches in diameter. The bolts are fabricated to SA-193, Gr. B7.

6.2.7 Pressurizer Integrally Welded Support Attachments

6.2.7.1 Pressurizer Support Skirt

The pressurizer support skirt-to-vessel weld shall be ultrasonically examined.

The support skirt (1.5 inches thick) is fabricated of SA-516, Gr. 70, carbon steel plate.

6.2.7.2 Pressurizer Seismic Lugs

There are four integrally welded seismic lugs on the pressurizer. All four lugs shall be surface examined.

6.3.6 Steam Generator Integrally Welded Vessel Supports

There are no integrally welded vessel supports. The four main support pads are secured to the steam generator field support system by high strength bolts.

6.3.7 Steam Generator Vessel Cladding

A clad patch (36 square inches) is in the steam generator interior cladding near each generator manway. In accordance with the 1977 Edition, 1978 Summer Addenda of Section XI, no examination is required.

The hemispherical chamber is clad with austenitic stainless steel.

6.3.8 Steam Generator Tubing<sup>15, 16</sup>

Corporate Steam Generator Maintenance and Technology (SGMT) shall be responsible for ensuring the adequacy of the technical and administrative requirements of this section. Refer to Technical Specification 5.7.2.12.

Each steam generator tube bundle consists of 4,674 NiCrFe alloy (Inconel SB-163) U-tubes of 0.750 OD by 0.043 average wall thickness.

All tubes shall undergo an augmented preservice inspection by eddy current examination. The preservice examination shall be performed in accordance with Appendix IV of the 1974 Edition, Summer 1976 Addenda of Section XI and Regulatory Guide 1.83, Rev. 1. The results of the augmented examination will be included in the PSI report.

6.3.8.1 Acceptance Criteria (as used in this section)

6.3.8.1.1 Imperfection means an exception to the dimensions, finish or contour of a tube from that required by fabrication drawings or specifications.

Eddy-current testing indications below 20 percent of the nominal tube wall thickness, if detectable, may be considered as imperfections.

6.3.8.1.2 Degradation means a service-induced cracking, wastage, wear, or general corrosion occurring on either inside or outside of a tube.

6.3.8.1.3 Degraded Tube means a tube containing imperfections greater than or equal to 20 percent of the nominal wall thickness caused by degradation.

The following Class 1 piping systems are subject to examination:

- Reactor Coolant
- Chemical and Volume Control
- Residual Heat Removal
- Safety Injection

6.4.1 Circumferential And Longitudinal Pipe Welds 13, 14

Prior to July 1, 1989, the entire length of each circumferential and longitudinal pipe weld shall be ultrasonically examined as practical.

After July 1, 1989, the entire length of each circumferential and longitudinal pipe weld nominal pipe size four inches and greater shall be ultrasonically and liquid penetrant examined. After July 1, 1989, the entire length of each circumferential and longitudinal pipe weld nominal pipe size less than four inches shall be liquid penetrant examined.

The following circumferential pipe welds will be radiographically examined (RHRF-D053-5, -1, -12, -4, RHRF-D055-14, SIF-D092-13, and RCF-D232-1D).

6.4.2 Branch Pipe Connection Welds 13, 14

Prior to July 1, 1989, branch pipe connection exceeding six inches in diameter shall be ultrasonically and liquid penetrant examined. Branch pipe connections six inches in diameter and smaller shall be liquid penetrant examined.

After July 1, 1989, branch pipe connection welds exceeding two inches in diameter shall be ultrasonically and liquid penetrant examined. Each branch pipe connection weld two inches in diameter and smaller shall be liquid penetrant examined.

6.4.3 Piping Socket Welds 13, 14

Each socket weld shall be liquid penetrant examined as practical. Construction phase examination records will be used for welds done after December 1979. Welds are listed below.

1-068B-T002-2	1-062B-T217-6	1-068B-T001-2
-3	-22	-4A
-4A		-9
-4B	1-062B-T198-1	-10
-6	-2	
-7	-3	1-063B-T048-2
-8	-4	-3
-9	-5	-4
	-6	-5

-9	1-063B-T058-19A
	-19B
1-063B-T026-12	-19C
-15	-19D
-16	-19E
	-19F
1-063B-T034-1	-19G
-2	-19H
-3	
-4	
-5	
-6	
-7	
-8	
1-063B-T034-9	
1-063B-T113-11	
-12	
-15	
-16	
-19	
-23	
-26	
-30	
-32	

#### 6.4.4 Piping Integrally Welded Supports<sup>14</sup>

All piping integrally welded external support attachments whose support base material design thickness is 5/8 inch and greater shall be surface examined. Integrally welded external support attachments include those supports which have attachment welds to the piping pressure-retaining boundary. (See PRISIM Data Base)

#### 6.4.5 Piping Support Components<sup>14</sup>

All piping support components shall be visually examined. This examination includes integrally welded and nonintegrally welded support components. The support settings of constant and variable spring type hangers, snubbers, and shock absorbers shall also be verified. (See PRISIM Data Base.)

If modifications (including additions and deletions) or replacements or repairs are discovered during the course of the PSI on support components, these changes (type of support, support settings, boundary type, etc.) shall be marked on field corrected copies of the appropriate listed drawings or tables from Appendix A. These field corrected copies shall be used in the performance of examinations and as records until the drawing or tables has been revised to reflect the change. Copies of these field corrected drawings or tables shall be transmitted to ASME Section XI Programs using the transmittal form provided in Appendix E. A file and a transmittal number log of the corrected drawings or tables and transmittal

6.5.2 RCP Pressure Retaining Bolting 2 Inches and Smaller in Diameter

The No. 1 seal assembly bolting shall be visually examined.

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

6.5.3 RCP Integrally Welded Supports

There are no integrally welded supports associated with the RCP.

6.5.4 RCP Support Components

Each RCP includes three support components bolted to pump feet, which are integrally cast with the pump. Each support component shall be visually examined.

6.5.5 RCP Casing Welds

Each pump includes a two-piece welded type 304SST casing. The casing welds cannot be ultrasonically examined and achieve meaningful results due to limitations of examining integrally cast material. In lieu of this requirement the casing welds shall be surface examined (see Request for Relief ISI-9).

6.5.6 RCP Casings

The internal pressure boundary surfaces of one pump shall be visually examined.

6.5.7 RCP Flywheel

Each RCP flywheel shall undergo a complete ultrasonic examination and shall also be surface examined in accordance with Regulatory Guide 1.14.

Preservice examination is not required by TVA.

The flywheel consists of two plates, approximately 5-inches and 8-inches thick, bolted together. Each plate is fabricated from vacuum degassed A-533, Gr. B, Class 1 steel.

6.6 Valves<sup>13</sup>

6.6.1 Valve Pressure-Retaining Bolting Larger Than 2 Inches in Diameter

There is no Class 1 valve pressure retaining bolting larger than 2 inches in diameter.

be in accordance with paragraph IWC-2411 and Table IWC-2520 of ASME Section XI. ASME Section XI Programs shall select areas to be examined or the NA may assist in selecting areas to be examined.<sup>18</sup>

Components that are exempted from examination in accordance with IWC-1220 of ASME Section XI are discussed in Section 7.13 of this program.<sup>18</sup>

Class 2 vessels shall not be examined prior to the field hydrostatic tests.

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

When examinations have been completed on the various components, the data sheet(s) in Appendix B shall be completed.

Table B in Appendix A supplies additional information such as reference drawing numbers and ASME Section XI Table-2520 examination categories.

## 7.1 Steam Generators (4)<sup>18</sup>

### 7.1.1 Steam Generator Secondary Circumferential Welds

There are five circumferential shell welds located at structural discontinuities on the secondary side of each steam generator. A total of five welds, all at different locations from the four generators, will be selected for ultrasonic examination and shall be distributed among the four generators. The examinations shall cover at least 20 percent of each weld selected for examination, uniformly distributed among three areas around the vessel circumference.

One of the five welds selected for examination is partially inaccessible due to the upper steam generator support arrangement (weld nos. SG-4B-5-1, 2, 3, or 4; see Request for Relief ISI-5). The weld selected for examination will be ultrasonically examined on a best effort basis.

The vessel shell and head sections are fabricated of SA-533, Gr. A, Class 2 steel plate.

### 7.1.2 Steam Generator Secondary Nozzle-To-Vessel Welds

There is one feedwater nozzle (16-inch ID), one feedwater by-pass nozzle (6-inch ID), and one main steam nozzle (32-inch ID) per generator. A total of three nozzle-to-vessel welds from the four generators will be ultrasonically examined and shall be distributed among three of the generators (one feedwater, one feedwater by-pass, and one main steam nozzle).

7.2.4 RHRHX Pressure-Retaining Bolting Exceeding 2 Inches in Diameter

There is no RHRHX bolting larger than two inches in diameter.

7.3 Regenerative Heat Exchanger (1)-RHX<sup>18</sup>

7.3.1 RHX Circumferential Welds

The regenerative heat exchanger is composed of three heat exchangers interconnected with piping. There are twelve circumferential welds located at structural discontinuities on the heat exchanger. These welds shall be ultrasonically examined. The examinations shall cover at least twenty percent of each weld and shall be uniformly distributed among three areas around the vessel circumference. This examination cannot be uniformly distributed (see Request for Relief ISI-10).

These welds include six channel cylinder section to channel head welds and six channel cylinder section to the tube sheet head welds. The channel cylinder sections are fabricated to SS, SA-351-CF8. The channel heads are fabricated to SS, SA-240-304L. The channel flanges are fabricated to SS, SA-182-F304.

7.3.2 RHX Nozzle-to-Vessel Welds

There are not any nozzles greater than 4 inches in diameter. The nozzles are fabricated to SA-479-304 sch 160 material.

7.3.3 RHX Integrally - Welded Supports

There is one integrally welded support (1/4 inch thick) attachment and three lugs (5/8 inch thick) welded to the heat exchanger. The three (5/8 inch thick) lugs per Westinghouse (April 17, 1989 letter from Robert E. Lochbaum, Westinghouse Mechanical Engineer, TVA Watts Bar site, to Don Cliff, M&A Unit, TVA Watts Bar site) are not functionally required, and no credit has been taken for these welds in the analysis of the heat exchanger. Therefore, there is no integrally welded support attachments exceeding 1/2 inch material design thickness.

7.3.4 RHX Pressure Retraining Bolting Exceeding 2 Inches in Diameter

There is not any pressure retaining bolting included with the RHX.

7.5.3 ELHX Integrally Welded Supports

There are no integrally welded supports to the tube side of the heat exchanger.

7.5.4 ELHX Pressure Retaining Bolting Exceeding 2 Inches in Diameter

There is no ELHX bolting larger than two inches in diameter.

7.6 Boron Injection Tank (1)-BIT<sup>18, 19</sup>

7.6.1 BIT Circumferential Welds

There are two circumferential welds located at structural discontinuities on the BIT. These welds shall be ultrasonically examined. The examinations shall cover twenty percent among three areas around the vessel circumference. There are two head-to-shell welds. The head and shell are fabricated to SA-240, TP304 and SA-351, CF8A respectively.

7.6.2 BIT Nozzle-to-Vessel Welds

There is one nozzle located on each head, both with a 6 inch inside diameter. These nozzle-to-vessel welds shall be ultrasonically examined.

The nozzles are fabricated to SA-182, F304.

7.6.3 BIT Integrally Welded Supports

There are four integrally welded support attachment pads (5/8 inch thick) welded to the shell. These welds shall be liquid penetrant examined.

The pads are fabricated to SA-240, TP 304 material.

7.6.4 BIT Pressure Retaining Bolting Exceeding 2 Inches in Diameter

There are 16 2-inch diameter manway cover studs and nuts. The studs shall be volumetrically examined.

The studs and nuts are fabricated SA-193, GRB7 and SA-194 GR-2H respectively.

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

7.7.3 Branch Pipe Connection Welds

Selection of areas to be examined shall be in accordance with IWC-2411 and Table IWC-2520 of Section XI. Prior to September 1, 1991, the entire length of each branch pipe connection weld shall be ultrasonically examined.

After September 1, 1991, the entire length of each selected pipe branch connection circumferential and longitudinal piping weld shall be surface examined.

7.7.4 Piping Pressure-Retaining Bolting Exceeding 2 Inches in Diameter

There is no pressure-retaining bolting larger than 2 inches in diameter.

7.7.5 Piping Integrally Welded Supports

All piping integrally welded external support attachments whose base material design thickness exceeds 3/4 inch shall be surface examined. Integrally welded external support attachments include those supports which have attachment welds to the piping pressure-retaining boundary. (See PRISIM Data Base)

7.7.6 Piping Support Components

All piping support components shall be visually examined. This examination includes integrally welded and nonintegrally welded support components. The support settings of constant and variable spring type hangers, snubbers, and shock absorbers shall also be verified. (See PRISIM Data Base.)

If modifications (including additions and deletions) or replacements or repairs are discovered during the course of the PSI on support components, these changes (type of support, support settings, boundary type, etc.) shall be marked on field corrected copies of the appropriate listed drawings or tables from Appendix A. These field corrected copies shall be used in the performance of examinations and as records until the drawing or tables have been revised to reflect the change. Copies of these field corrected drawings or tables shall be transmitted to ASME Section XI Programs using the transmittal form provided in Appendix E. A file and a transmittal number log of the corrected drawings or tables and transmittal forms shall be maintained by the SQO for future reference. ASME Section XI Programs shall be responsible for reviewing the proposed change, revising the drawings or tables as necessary, and issuing the revised drawings or table prior to initial plant startup. Appendix E shall be returned to the SQO after the referenced drawings or tables have been revised by the ASME

7.10 Safety Injection Pumps (2)-SIP<sup>19</sup>

7.10.1 The SIP casing does not include any casing welds. The casing consists of two pieces manufactured of SA-182, F304.

7.10.2 SIP Pressure-Retaining Bolting Exceeding 2 Inches in Diameter

There is no SIP bolting larger than two inches in diameter.

7.10.3 SIP Integrally Welded Supports

There are no integrally welded supports associated with the SIP.

7.10.4 SIP Support Components

Each SIP includes a support component bolted to the pump casing. The support component shall be visually examined.

7.11 CVCS Positive Displacement Pump (Reciprocating Charging Pump)  
(1) PDP<sup>19</sup>

7.11.1 PDP Casing Welds

The PDP casing does not include any casing welds. The casing is fabricated to SA-182 F304, SA-204 Type 304, SA-479 T304, and SA-479, 410.

7.11.2 PDP Pressure Retaining Bolting Exceeding 2 Inches in Diameter

There is no PDP bolting larger than two inches in diameter.

7.11.3 PDP Integrally Welded Supports

There are no integrally welded supports associated with the PDP.

7.11.4 PDP Support Components

The PDP includes a support component bolted to the pump feet which are integrally forged with the pump. The support component shall be visually examined.

7.12 Valves<sup>18, 19</sup>

7.12.1 Valve Body Welds

There are ASME Class 2 valves with body welds. Selection of areas to be examined shall be in accordance with IWC-2411 and Table IWC-2520 of Section XI. (In case of multiple valves of similar design, size, and function and

## 10.0 AUTHORIZED INSPECTOR<sup>21</sup>

TVA shall employ an Authorized Inspector(s) in accordance with ASME Section XI. The Inspector 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. SQO shall provide access for the ANII in accordance with IWA-2140 of ASME Section XI. Requirements for interface with the ANI and ANII are included in WBN ASME Section XI Inservice Inspection Program and WBN ASME Section XI Repair and Replacement Program.

## 11.0 EXAMINATION METHODS

If during an examination it is determined by an NDE Level III that a full code exam cannot be performed, the fact shall be documented on the data sheet and a best effort examination shall be performed. ASME Section XI Programs shall be informed in writing of the limited scan.

Data must be provided on the exam sheet so as to determine the percentage of the exam done.

### 11.1 Visual Examination<sup>22</sup>

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 for component; or evidence of leakage.

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

#### 11.1.1 Visual Examination (VT-3)

- (a) The VT-3 visual examination shall be conducted to determine the general mechanical and structural conditions of components and their supports such as the presence of loose parts, debris, or abnormal corrosion products, wear, erosion, corrosion, and the loss of integrity at bolted or welded connections.
- (b) The VT-3 visual examination may require, as applicable to determine structural integrity, the measurement of clearances, detection of physical displacement, structural adequacy of supporting elements, connections between load carrying structural members, and tightness of bolting.
- (c) For component supports and component interiors, the visual examination may be performed remotely with or without optical aids to verify the structural integrity of the component.

12.0 QUALIFICATIONS OF NONDESTRUCTIVE EXAMINATION PERSONNEL

The qualifications of NDE examination personnel shall be as per paragraphs IWA-1600, IWA-2300, and Table IWA-1600-1 of ASME Section XI 1986 Edition and QMP-102.4. TVA will use the 1984 Edition of ASNT SNT-TC-1A for certification of NDE personnel as approved by the NRC's January 18, 1990 letter from S. C. Black to O. D. Kingsley, Jr.

13.0 ACCEPTANCE CRITERIA

All acceptance standards for ASME Class 1 and 2 components shall be in accordance with IWA-3000 of ASME Section XI except where ASME Section III examinations are employed to satisfy ASME Section XI requirements (see Section 3.0).

14.0 REPAIRS AND REPLACEMENTS

All repairs and replacements shall be performed in accordance with WBN ASME Section XI Repair and Replacement Program. Repairs and replacements as necessary may be coordinated with ASME Section XI Programs.

15.0 RECORDS AND REPORTS

15.1 Recording of and Report of Examinations

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

Title Page  
Table of Contents

- I. Introduction - The introduction should include the following information: plant, unit number, preservice or inservice inspection and cycle number, systems, components and vessels examinations were performed on, organization examinations were performed by, dates examinations were performed, ASME Section XI 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

- (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

All reports shall have a summary providing the following information:

- (1) National Board Number assigned by the manufacturer to the pressure vessel or component as applicable.
- (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 and address of principal manufacturer and the principal contract number which will identify the subcontractors.
- (4) Manufacturer's component identification number
- (5) Date of completion of the preservice inspection
- (6) Name or names of the Inspector(s) when required
- (7) Name and mailing address of the employer(s) of the Inspector(s)
- (8) Abstract of examinations performed, conditions observed, corrective measures recommended and taken
- (9) Signature of Inspector, when required

The PSI Report shall have an owner's data report for inservice inspection, Form NIS-1, as shown in Appendix II of ASME Section XI.

### 15.3 Records for ASME Class 1, and 2 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

original requirements shall be processed as modifications in accordance with WBN Modification Workplan Program. Repair and replacement activities, including coordination with the Authorized Inspection Agency (AIA), shall be performed in accordance with the requirements of WBN ASME Section XI Repair and Replacement Program.

If Modifications is responsible for corrective action, it shall be performed in accordance with the disposition on the NOI form and to the satisfaction of the SQO representative. The organization responsible for corrective action shall include preservice examination requirements in the repair or replacement work instruction described in WBN ASME Section XI Repair and Replacement Program. In some instances, the NOI may be dispositioned based on additional information available to the individual responsible for the disposition (e.g., design drawings, drawing notes, specifications, etc.). In this case, a documented justification will be included with the disposition.

Upon completion of corrective action the SQO representative shall verify completion of corrective action, enter the work instruction and/or Design Change Notice (DCN) numbers on the NOI form, enter the examination report number if reexamination was performed, and sign and date the NOI form, Part III. The signed NOI form shall remain with the original examination report for use as a quality assurance record. If reexamination was performed, a copy of the signed NOI form shall also remain with the reexamination report. Copies of the NOI form shall also be distributed to the plant manager or his designee and ASME Section XI Programs by the SQO. The NOI form does not take the place of the requirements of the WBN Corrective Action Program.

#### 17.0 CALIBRATION BLOCKS<sup>1, 29</sup>

Calibration blocks will be used for ultrasonic examinations (a calibration tube will be used for eddy current examination of steam generator tubing). The blocks will be fabricated to the general requirements of ASME Section V and ASME Section XI. The blocks shall be fabricated of the material to be examined or equivalent P numbers. Mill test reports shall be obtained and retained by ISO for all calibration blocks. The blocks shall employ drilled holes and/or notches for calibration reflectors (see Request For Relief ISI-1).

ISO shall maintain as-built calibration block drawings. The calibration blocks shall be stored at the plant site and maintained by SQO personnel.

#### 18.0 REQUESTS FOR RELIEF

Where TVA has determined that certain code requirements or examinations are impractical, TVA will submit these requests for relief to the NRC for approval via Site Licensing 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 requests for relief shall be included.

19.1 Steam Generator Tubes

The augmented examination requirements of the steam generator tubing are included in Section 6.3.8 of this program.

19.2 Safety Injection System Piping Welds to the Accumulators

ASME Section XI Programs shall be responsible for ensuring the adequacy of the technical and administrative requirements of this section. This includes piping from: valve FCV 63-118 to Accumulator 1; valve FCV 63-098 to Accumulator 2; valve FCV 63-080 to Accumulator 3; and valve FCV 63-067 to Accumulator 4. This piping shall be examined in accordance with ASME Section XI 1977 Summer 1978 Addenda Category CF as described in Section 3.4.B. These welds will be included in the preservice NIS-1 report. This is a TVA imposed augmented inspection.

19.3 ASME Section XI 1983 Edition Winter 1983 Addenda Augmented Class 2 Examinations 32, 33

ASME Section XI Programs shall be responsible for ensuring the adequacy of the technical and administrative requirements of this section. Preservice examination requirements for the Emergency Core Cooling System (ECCS), High Pressure Safety Injection (HPSI), Residual Heat Removal (RHR), and Containment Spray (CS) Class 2 piping welds will be updated to use portions of the ASME Section XI 1983 Edition Winter 1983 Addenda. Paragraph IWC-1220 (components exempt from examination) and Examination Category C-F-1 of Table IWC-2500-1 will be utilized for exemption requirements, weld selection (parts examined), extent of examination, and examination method. Examination techniques, evaluation standards, and examination requirement/figure number will be in accordance with Section 3.0 of this program. Selected welds that have not already been examined will be examined to establish an information augmented preservice examination. These welds will be included in the preservice NIS-1 report. These information augmented examinations are imposed by the NRC. These augmented examinations were committed to be placed in the PSI Program in J. H. Garrity's November 4, 1991 letter to the NRC (T04 911104 853).

20.0 REFERENCES

20.1 Source Documents

- 20.1.1 ASME Boiler and Pressure Vessel Code - Section XI through Summer 1975 Addenda, Summer 1976 Addenda, Summer 1978 Addenda, Winter 1983 Addenda, and 1986 Edition.
- 20.1.2 ASME Boiler and Pressure Vessel Code - Section V through Summer 1975 addenda.
- 20.1.3 Watts Bar Nuclear Plant Final Safety Analysis Report.
- 20.1.4 Code of Federal Regulation, Title 10, Part 50.55a.

TABLE A  
WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 1 COMPONENTS

WBN  
 TI-50A  
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<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Examination Category Item No. From Table IWB-2600, Section XI</u>	<u>From Table IWB-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
<b>A. Reactor Vessel</b>					
1. Circumferential Shell Weld-Beltline Region	6.1.1.1	B1.1	B-A	UT	CH-M-2551-A
2. Circumferential Shell Welds	6.1.1.2	B1.2	B-B	UT	CH-M-2551-A
3. Lower Head Welds	6.1.1.3	B1.2	B-B	UT	CH-M-2551-A
4. Closure Head Circumferential Weld	6.1.1.4	B1.2	B-B	UT	CH-M-2549-A
5. Vessel-to-Flange and Head-to-Flange Welds	6.1.1.5	B1.3	B-C	UT	CH-M-2549-A
6. Nozzle-to-Vessel Welds and Inside Radiused Sections	6.1.2	B1.4	B-D	UT	CH-M-2547-B
7. Vessel Penetrations and Attachments	6.1.3	B1.5	B-E	VT	CH-M-2551-A & CH-M-2684-C
8. Nozzle-to-Safe End Welds	6.1.4	B1.6	B-F	UT, PT	CH-M-2547-B
All welds before 9/1/91		B5.10 (see note 2)	B-F (see note 2)	UT, PT	
All welds after 9/1/91					
9. Closure Studs and Nuts	6.1.5	B1.8	B-G-1	UT, MT	CH-M-2551-A

NOTE: 1. See Section 6.0 for additional information.  
 2. Item number and examination category from 1977 Edition, 1978 Summer Addenda of Section XI, Table IWB-2500-1.

TABLE A  
WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 1 COMPONENTS

WBN  
 TI-50A  
 Appendix A  
 Revision 25  
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<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Examination Category Item No. From Table IWB-2600, Section XI</u>	<u>From Table IWB-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
<b>B. <u>Pressurizer (Continued)</u></b>					
4. Nozzle-to-Safe End Welds All welds before 9/1/91 All welds after 9/1/91	6.2.4	B2.4 B5.20 (see note 2)	B-F B-F (see note 2)	UT, PT UT, PT	CH-M-2570-A
5. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.2.6	B2.11	B-G-2	VT-1	CH-M-2570-A
6. Pressurizer Support Skirt	6.2.7.1	B8.20 (See Note 2)	B-H (See Note 2)	UT	CH-M-2570-A
7. Pressurizer Seismic Lugs	6.2.7.2	B8.20 (See Note 2)	B-H (See Note 2)	HT	CH-M-2570-A
<b>C. <u>Steam Generators</u></b>					
1. Primary Head-to-Tube Sheet Weld	6.3.1	B3.1	B-B	UT	CH-M-2660-B
2. Primary Nozzle-to-Safe End Welds All welds before 9/1/91 All welds after 9/1/91	6.3.3	B3.3 B5.30	B-F B-F	UT, PT UT, PT	CH-M-2660-B
3. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.3.5	B3.10	B-G-2	VT	CH-M-2660-B

NOTE: 1. See Section 6.0 for additional information.  
 2. Item number and examination category from 1977 Edition, 1978 Summer Addenda of Section XI, Table IWB-2500-1.

TABLE A  
WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 1 COMPONENTS

WBN  
 TI-50A  
 Appendix A  
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<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Examination Category Item No. From Table IWB-2600, Section XI</u>	<u>From Table IWB-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
<b>D. <u>Piping (Continued)</u></b>					
4. Socket Welds All Welds before 7/1/89 All Welds after 7/1/89	6.4.3	B4.8 B9.40 (See Note 2)	B-J B-J (See Note 2)	PT PT	Appendix A, Piping Weld Location Dwgs List
5. Integrally-Welded Supports	6.4.4	B10.10 (See Note 2)	B-K-1 (See Note 2)	PT	PRISIM Data Base
6. Support Components	6.4.5	B11.10 (See Note 2)	B-K-2 (See Note 2)	VT-3 VT-4	Appendix A, Support Location Dwgs List
7. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.4.7	B4.12	B-G-2	VT	Appendix A, Piping Weld Location Dwgs List
<b>E. <u>Reactor Coolant Pumps</u></b>					
1. Pressure-Retaining Bolting Larger Than Two Inches in Diameter	6.5.1	B5.1	B-G-1	UT, VT-1, PT or MT	CH-M-2672-B

- NOTES: 1. See Section 6.0 for additional information.  
 2. Item number and examination category from 1977 Edition, 1978 Summer Addenda of Section XI, Table IWB-2500-1.

TABLE B  
WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 2 COMPONENTS

WBN  
 TI-50A  
 Appendix A  
 Revision 25  
 Page 53 of 140

<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Examination Category Item No. From Table IWC-2600, Section XI</u>	<u>From Table IWC-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
<b>A. <u>Steam Generators</u></b>					
1. Circumferential Welds	7.1.1	C1.1	C-A	UT	CH-M-2660-B
2. Nozzle-to-Vessel Welds	7.1.2	C1.2	C-B	UT	CH-M-2660-B
<b>B. <u>Residual Heat Removal Heat Exchangers</u></b>					
1. Circumferential Welds	7.2.1	C1.1	C-A	UT	CH-M-2662-A
2. Nozzle-to-Vessel Welds	7.2.2	C1.2	C-B	UT	CH-M-2662-A
3. Integrally-Welded Supports	7.2.3	C3.10 (See Note 2)	C-C (See Note 2)	PT	CH-M-2662-A
<b>C. <u>Regenerative Heat Exchangers</u></b>					
1. Circumferential Welds	7.3.1	C1.1	C-A	UT	ISI-0077-A
<b>D. <u>Letdown Heat Exchangers</u></b>					
1. Circumferential Welds	7.4.1	C1.1	C-A	UT	ISI-0075-A
2. Integrally-Welded Supports	7.4.3	C3.10 (See Note 2)	C-C (See Note 2)	PT	ISI-0075-A

NOTES: 1. See Section 7.0 for additional information.  
 2. Item number and examination category from 1977 Edition, 1978 Summer Addenda of Section XI, Table IWC-2500-1.

TABLE B  
WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 2 COMPONENTS

WBN  
 TI-50A  
 Appendix A  
 Revision 25  
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<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Examination Category Item No. From Table IWC-2600, Section XI</u>	<u>From Table IWC-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
<b>G. Piping (Continued)</b>					
3. Branch Pipe Connection Welds	7.7.3				
a. Welds prior to 9/1/91		C2.3	C-F, C-G	UT	Appendix A, Piping Weld Location Dwgs List
b. Circumferential & longitudinal welds after 9/1/91		C5.31, C5.32 (see note 2)	C-F	PT or MT	
4. Integrally-Welded Supports	7.7.5	C3.40 (See Note 2)	C-C (See Note 2)	PT or MT	PRISIM Data Base
5. Support Components	7.7.6	C3.50, C3.60 (See Note 2)	C-E (See Note 2)	VT-3 VT-4	Appendix A, Support Location Dwgs List
<b>H. Residual Heat Removal Pumps</b>					
1. Integrally-Welded Supports	7.8.3	C3.70 (See Note 2)	C-C (See Note 2)	PT	ISI-0117-A
2. Support Components	7.8.4	C3.80 (See Note 2)	C-E (See Note 2)	VT-3	ISI-0117-A
<b>I. Chemical Volume Control Centrifugal Charging Pump</b>					
1. Integrally-Welded Supports	7.9.3	C3.70 (See Note 2)	C-C (See Note 2)	PT	ISI-0118-A
2. Support Components	7.9.4	C3.80 (See Note 2)	C-E (See Note 2)	VT-3	ISI-0018-A

NOTES: 1. See Section 7.0 for additional information.  
 2. Item number & examination category from 1977 Edition, 1978 Summer Addenda of Section XI, Table IWC-2500-1.

TABLE C

LIST OF DRAWINGS - UNIT #1

<u>DRAWING NO.</u> Series	<u>TITLE</u>
<u>REACTOR VESSEL</u>	
CHM-2549-A	Reactor Vessel Closure Head
CHM-2551-A	Reactor Vessel
CHM-2684-C	Upperhead Penetrations
CHM-2685-B	Auxiliary Head Adapter
ISI-0012-A	Control Rod Drive Housing
<u>REACTOR COOLANT PUMPS</u>	
ISI-0048-B	Reactor Coolant Pump Casing Weld Locations
CHM-2672-B	RCP Main Flange Bolt Circle
<u>PRESSURIZER</u>	
CHM-2570-A	Pressurizer
<u>STEAM GENERATORS</u>	
CHM-2660-B	Steam Generator
<u>RESIDUAL HEAT REMOVAL HEAT EXCHANGERS</u>	
CHM-2662-A	Residual Heat Removal Heat Exchanger Channel Welds
<u>BORON INJECTION TANK</u>	
ISI-0053-B	Boron Injection Tank Weld Locations
<u>LETDOWN HEAT EXCHANGER</u>	
ISI-0075-A	Letdown Heat Exchanger Weld Locations

TABLE D  
 Class 1 Valves  
 Valves Subject to the Requirements of Examination Category B-M-2 of  
 Table IWB-2500-1 of Section XI

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-63-67	I	B-ACT	SIS	10"	GATE	MO	1	CH-M-2758-C	115E013	W	ASTM-A182 F316	PSIV	Forging
FCV-63-80	I	B-ACT	SIS	10"	GATE	MO	1	CH-M-2758-C	115E013	W	ASTM-A182 F316	PSIV	Forging
FCV-63-98	I	B-ACT	SIS	10"	GATE	MO	1	CH-M-2758-C	115E013	W	ASTM-A182 F316	PSIV	Forging
FCV-63-118	I	B-ACT	SIS	10"	GATE	MO	1	CH-M-2758-C	115E013	W	ASTM-A182 F316	PSIV	Forging
63-558	I	AC-ACT	SIS	6"	CK	SA	2	CH-M-2758-C	934D185	W	ASTM-A182 F316	PSIV	Forging
63-559	I	AC-ACT	SIS	6"	CK	SA	2	CH-M-2758-C	934D185	W	ASTM-A182 F316	PSIV	Forging
63-560	I	AC-ACT	SIS	10"	CK	SA	3	CH-M-2758-C	934D187	W	ASTM-A182 F316	PSIV	Forging
63-561	I	AC-ACT	SIS	10"	CK	SA	3	CH-M-2758-C	934D187	W	ASTM-A182 F316	PSIV	Forging
63-562	I	AC-ACT	SIS	10"	CK	SA	3	CH-M-2758-C	934D187	W	ASTM-A182 F316	PSIV	Forging
63-563	I	AC-ACT	SIS	10"	CK	SA	3	CH-M-2758-C	934D187	W	ASTM-A182 F316	PSIV	Forging
63-622	I	C-ACT	SIS	10"	CK	SA	4	CH-M-2758-C	934D187	W	ASTM-A182 F316	PSIV	Forging
63-623	I	C-ACT	SIS	10"	CK	SA	4	CH-M-2758-C	934D187	W	ASTM-A182 F316	PSIV	Forging
63-624	I	C-ACT	SIS	10"	CK	SA	4	CH-M-2758-C	934D187	W	ASTM-A182 F316	PSIV	Forging
63-625	I	C-ACT	SIS	10"	CK	SA	4	CH-M-2758-C	934D187	W	ASTM-A182 F316	PSIV	Forging
63-632	I	C-ACT	SIS	6"	CK	SA	5	CH-M-2758-C	934D185	W	ASTM-A182 F316	PSIV	Forging

TABLE E  
Class 1 Valves  
Valves Subject to the Requirements of Examination Categories  
Table IWB-2500 of Section XI

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Valve No.	Valve Size	Valve Bolting < = 2"	Valve Bolting > 2"	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
63-543	2	No	No	No	No	No	Sh 8 of 8 CH-M-2636-C	Kerotest	TVD-D-9911X03-(1)
63-545	2	No	No	No	No	No	Sh 8 of 8 CH-M-2636-C	Kerotest	TVD-D-9911X03-(1)
63-640	8	Yes	No	No	No	No	Sh 7 of 8 CH-M-2636-C	Westinghouse	934D186
63-641	6	Yes	No	No	No	No	Sh 7 of 8 CH-M-2636-C	Westinghouse	934D185
63-643	8	Yes	No	No	No	No	Sh 8 of 8 CH-M-2636-C	Westinghouse	934D186
63-644	6	Yes	No	No	No	No	Sh 8 of 8 CH-M-2636-C	Westinghouse	934D185
FCV-74-1	14	Yes	No	No	No	No	Sh 1 of 8 CH-M-2636-C	Westinghouse	115E622
FCV-74-2	14	Yes	No	No	No	No	Sh 1 of 8 CH-M-2636-C	Westinghouse	115E622
FCV-74-8	10	Yes	No	No	No	No	Sh 1 of 8 CH-M-2636-C	Westinghouse	1167E79
FCV-74-9	10	Yes	No	No	No	No	Sh 1 of 8 CH-M-2636-C	Westinghouse	1167E79
FCV-63-67	10	Yes	No	No	No	No	Sh 10 of 14 CH-M-2758-C	Westinghouse	115E013

TABLE E  
Class 1 Valves  
Valves Subject to the Requirements of Examination Categories  
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Valve No.	Valve Size	Valve Bolting < = 2"	Valve Bolting > 2"	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
63-560	10	Yes	No	No	No	No	Sh 7 of 14 CH-M-2758-C	Westinghouse	934D187
63-561	10	Yes	No	No	No	No	Sh 8 of 14 CH-M-2758-C	Westinghouse	934D187
63-562	10	Yes	No	No	No	No	Sh 9 of 14 CH-M-2758-C	Westinghouse	934D187
63-563	10	Yes	No	No	No	No	Sh 10 of 14 CH-M-2758-C	Westinghouse	934D187
63-581	3	Yes	No	No	No	No	Sh 4 of 14 CH-M-2758-C	Westinghouse	934D183
63-582	1 1/2	No	No	No	No	No	Sh 11 of 14 CH-M-2758-C	Borg Warner	80880
63-583	1 1/2	No	No	No	No	No	Sh 12 of 14 CH-M-2758-C	Borg Warner	80880
63-584	1 1/2	No	No	No	No	No	Sh 13 of 14 CH-M-2758-C	Borg Warner	80880
63-585	1 1/2	No	No	No	No	No	Sh 13 of 14 CH-M-2758-C	Borg Warner	80880
63-586	1 1/2	No	No	No	No	No	Sh 11 of 14 CH-M-2758-C	Kerotest	TVD-D-9958X03-(1)
63-587	1 1/2	No	No	No	No	No	Sh 12 of 14 CH-M-2758-C	Kerotest	TVD-D-9958X03-(1)

TABLE E  
Class 1 Valves  
Valves Subject to the Requirements of Examination Categories  
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Valve No.	Valve Size	Valve Bolting < = 2"	Valve Bolting > 2"	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
FCV-62-70	3	Yes	No	No	No	Yes	Sh 1 of 2 ISI-0005-C	Fisher	54A0228
FCV-62-84	2	Yes	No	No	No	Yes	Sh 2 of 2 ISI-0005-C	Fisher	54A0235
62-560	2	No	No	No	No	No	Sh 1 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)
62-561	2	No	No	No	No	No	Sh 2 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)
62-562	2	No	No	No	No	No	Sh 3 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)
62-563	2	No	No	No	No	No	Sh 4 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)
62-564	2	No	No	No	No	No	Sh 1 of 4 ISI-0050-C	Kerotest	TVD-D-9909-(1)
62-565	2	No	No	No	No	No	Sh 2 of 4 ISI-0050-C	Kerotest	TVD-D-9909-(1)
62-566	2	No	No	No	No	No	Sh 3 of 4 ISI-0050-C	Kerotest	TVD-D-9909-(1)
62-567	2	No	No	No	No	No	Sh 4 of 4 ISI-0050-C	Kerotest	TVD-D-9909-(1)
62-576	2	No	No	No	No	No	Sh 1 of 4 ISI-0050-C	Kerotest	TVD-D-9911-(1)

TABLE E  
 Class 1 Valves  
 Valves Subject to the Requirements of Examination Categories  
 Table IWB-2500 of Section XI

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Valve No.	Valve Size	Valve Bolting < = 2"	Valve Bolting > 2"	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
FCV-68-332	3	Yes	No	No	No	No	Sh 1 of 3 ISI-0365-C	Westinghouse	115E010
FCV-68-333	3	Yes	No	No	No	No	Sh 1 of 3 ISI-0365-C	Westinghouse	115E010

TABLE E  
 Class 1 Valves  
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Valve No.	Valve Size	Valve Bolting < 2"	Valve Bolting > 2"	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
68-549	2	No	No	No	No	No	Sh 3 of 3 ISI-0365-C	Kerotest	TVD-D-9909X03-(1)

TABLE F  
 Class 2 Valves  
 Valves Subject to the Requirements of Examination Categories  
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Valve No.	Valve Size	Valve Bolting < = 2"	Valve Bolting > 2"	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
HCV-74-34	8	No	No	No	No	No	CH-M-2636-C	Westinghouse	115E017
HCV-74-36	8	No	No	No	No	No	CH-M-2636-C	Westinghouse	115E017
HCV-74-37	8	No	No	No	No	No	CH-M-2636-C	Westinghouse	115E017
74-514	8	No	No	No	No	No	CH-M-2636-C	Westinghouse	934D179
74-515	8	No	No	No	No	No	CH-M-2636-C	Westinghouse	934D179
74-520	8	No	No	No	No	No	CH-M-2636-C	Westinghouse	115E017
74-521	8	No	No	No	No	No	CH-M-2636-C	Westinghouse	115E017
74-524	8	No	No	No	No	No	CH-M-2636-C	Westinghouse	115E017
74-525	8	No	No	No	No	No	CH-M-2636-C	Westinghouse	115E017

TABLE F  
 Class 2 Valves  
 Valves Subject to the Requirements of Examination Categories  
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Valve No.	Valve Size	Valve Bolting > 2	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
PCV-1-5	6	No	No	No	No	CH-M-2669-C	Copes Vulcan	174269
PCV-1-12	6	No	No	No	No	CH-M-2669-C	Copes Vulcan	174269
PCV-1-23	6	No	No	No	No	CH-M-2669-C	Copes Vulcan	174269
PCV-1-30	6	No	No	No	No	CH-M-2669-C	Copes Vulcan	174269
1-512	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-513	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-514	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-515	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-516	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-517	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-518	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-519	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-520	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-521	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040
1-522	6	No	Yes	No	No	CH-M-2669-C	Dresser	3NC-040

TABLE F  
 Class 2 Valves  
 Valves Subject to the Requirements of Examination Categories  
 Table IWC-2500 of Section XI

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Valve No.	Valve Size	Valve Bolting > 2	Valve Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
FCV-3-87	16	No	No	No	No	CH-M-2671-C	Walworth	A-12819-M-10
FCV-3-100	16	No	No	No	No	CH-M-2671-C	Walworth	A-12819-M-10
FCV-3-236	6	No	No	No	Yes	CH-M-2671-C	Leslie	717543030D
FCV-3-239	6	No	No	No	Yes	CH-M-2671-C	Leslie	717543030D
FCV-3-242	6	No	No	No	Yes	CH-M-2671-C	Leslie	717543030D
FCV-3-245	6	No	No	No	Yes	CH-M-2671-C	Leslie	717543030D
13-508	16	No	No	No	No	CH-M-2671-C	Walworth	A-12386-M-3
3-509	16	No	No	No	No	CH-M-2671-C	Walworth	A-12386-M-3
3-510	16	No	No	No	No	CH-M-2671-C	Walworth	A-12386-M-3
3-511	16	No	No	No	No	CH-M-2671-C	Walworth	A-12386-M-3
3-638	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001
3-644	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001
3-645	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001
3-652	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001
3-655	6	No	Yes	No	No	CH-M-2671-C	Borg Warner	455KAB1-001

TABLE G

ASME Class 2 (TVA Safety Class B) Components Exempt From Examination

System	Reference Drawings	Boundary of Exempted Components	Basis for Exemption (See Notes)
CVC (62)	47W809-1	All Components from the 8" RWST pump supply line to the centrifugal charging pumps 1A-A and 1B-B and up to the 4" line leading to the reciprocating charging pump 1C.	1
SIS (63)	47W811-1 47W810-1 47W812-1	All components from and including the refueling water storage tank, FCV-63-8 and FCV-63-11 to LCV-62-135, LCV-62-136, to the supply side of the SIS pumps 1A-A and 1B-B, FCV-63-1, HCV-74-34, FCV-72-21, and FCV-72-22.	1
	47W811-1 47W812-1	All-components from the containment sump to FCV-63-72, FCV-63-73, FCV-72-44, and FCV-72-45.	1
	47W811-1	All components from valve FCV-63-118 to and including accumulator 1.	3
	47W811-1	All components from valve FCV-63-98 to and including accumulator 2.	3
	47W811-1	All components from valve FCV-63-80 to and including accumulator 3.	3
	47W811-1	All components from valve FCV-63-67 to and including accumulator 4.	3

DATA PACKAGE COVER SHEET

PRESERVICE BASELINE INSPECTION FOR TENNESSEE VALLEY AUTHORITY  
WATTS BAR NUCLEAR PLANT

Unit 1

All preservice inspection requirements have been conducted in accordance with this program.

\_\_\_\_\_  
Site Quality Manager

\_\_\_\_\_  
Date

\_\_\_\_\_  
Plant Manager

\_\_\_\_\_  
Date

DATA SHEET 1 (Cont'd)

EXAMINATION SECTION

SOO REPRESENTATIVE

DATE

Class 1 Components (Continued)

Piping

- 6.4.1
- 6.4.2
- 6.4.3
- 6.4.4
- 6.4.5
- 6.4.7

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RCP

- 6.5.1
- 6.5.2
- 6.5.4
- 6.5.5
- 6.5.6

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Valves

- 6.6.2
- 6.6.6

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Class 2 Components  
Steam Generators

- 7.1.1
- 7.1.2

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RHRHX

- 7.2.1
- 7.2.2
- 7.2.3

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RHX

- 7.3.1
- 7.3.3

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LEX

- 7.4.1
- 7.4.3

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DATA SHEET 1 (cont'd)

<u>EXAMINATION SECTION</u>	<u>SOO REPRESENTATIVE</u>	<u>DATE</u>
<u>Class 2 Components (Continued)</u>		
<u>SIP</u>		
7.10.4	_____	
<u>PDP</u>		
7.11.4	_____	
<u>Valves</u>		
7.12.1	_____	

All examinations required by the referenced sections of this data sheet have been conducted in accordance with this program.

_____	_____
SQO Representative	Date
Reviewed By: _____	_____
ISO Representative	Date
Reviewed By: _____	_____
ASME Section XI Programs Representative	Date
Approved By: _____	_____
Site Quality Manager	Date

DATA SHEET 2 CONTINUATION SHEET

Component:

Component Identification:

Reference Drawing:

Program Section:

Examination Method:

Reason for Reexamination:

Reexamination completed in accordance with this program.

\_\_\_\_\_  
SQO Representative

\_\_\_\_\_  
Date

REQUEST FOR RELIEF ISI-1

Components:

- 1) Various piping systems and 2) uncladded vessel welds in ferritic material less than 2 inches in thickness.

Class:

ASME Class 1 and 2 (TVA Safety Class A and B)

Inspection Requirement:

Ultrasonic examination of welds, paragraph T-530 of ASME Section V, Article 5, thru Summer 1975 Addenda as referenced in paragraph IWA-2232 of ASME Section XI thru Summer 1975 Addenda.

Basis for Relief:

- A. Paragraph T-533 of Article 5 of ASME Section V requires in part that drilled holes, parallel to the contact surface of the calibration block, be used to establish the primary reference response of the equipment and to construct a distance-amplitude-correction curve (DCA). No known technique exists for inducing drilled holes, which are parallel to the contact surface, in the circumferential direction of curved calibration blocks. It is virtually impossible, using standard ultrasonic examination techniques, to establish a repeatable distance-amplitude-correction curve in materials less than approximately 0.375-inch thick using drilled holes caused by saturation of the part by ultrasound. Additionally, drilled holes are not representative of the reflectivity of flaws which are of major concern, i.e., surface cracks, incomplete penetration, and stress corrosion cracking.

The inherent difficulties of utilizing drilled holes as reference reflectors, particularly in the area of austenitic and high nickel welds, is an industry recognized problem, and steps have been taken to address this in later addenda to both ASME Section V and Section XI. Paragraph T-547 of the winter 1978 addenda to ASME Section V required the use of longitudinal and circumferential notches located on the I.D. and O.D. surface of the calibration block at a nominal depth of  $10\%t$  in ferritic materials. Paragraph T-548 of this document allows these techniques to be modified and/or supplemented for the Section XI, Appendix III-4500 and IWA-2232, which require recording of all indications greater than  $50\%$  DAC with an evaluation required of those indications greater than  $100\%$  DAC.

Request for Relief ISI-2 has been withdrawn.

REQUEST FOR RELIEF ISI-4

Components: Pressure-retaining welds in piping (See List Below)

Class: ASME Class 1 and 2 (TVA Safety Class A and B)

Inspection Requirement: Volumetric examination of longitudinal, circumferential, and pipe branch connection welds, examination categories B-F, B-J, C-F, and C-G.

Basis for Relief: In some cases, it will be impractical to ultrasonically examine all welds in accordance with paragraph T-532 of Article 5, Section V of the ASME Code or Appendix III, Subarticle III-4400 of Section XI of ASME Code 1977 Edition, Summer 1978 Addenda, and achieve meaningful results, i.e., nonremovable hanger interference or valve and pump casings adjoining the welds.

Each weld had a construction radiographic examination performed in accordance with ASME Section III.

Alternate Inspection: Ultrasonic examinations will be performed to the extent practical and supplemented with Section XI surface examinations on all accessible areas of the weld.

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number <sup>1</sup>	Code Category <sup>2</sup>	Drawing Number	Physical Configuration <sup>3</sup>	Scan <sup>4</sup> /Limitation	Approximate Percent Code Examined	Remarks
FWF-D001-6 16" Diameter	CG	CHM-2671-C Sheet 1	E/V	3/No Scan. 4,5,6/Limited	71%	No scan 3 due to valve. Scan 4, 5, and 6 limited from 0530 to 0630, 0830 to 0930, and 1130 to 0100 due to permanent support. By-Directional coverage achieved from scan 4 side in accessible areas utilizing 12/8 V scan. (Notes 5 and 6)
FWF-D372-8 6" Diameter	C-G	CHM-2671-C Sheet 6	R/R	3/No scan 4/No scan	50%	No scans 3 and 4 due to reducer weld configuration.
FWS-4B 16" Diameter	C-G	CHM-2671-C Sheet 1	Pen F/ Pen P	No scan	0%	No examination due to weld inside penetration.
FWS-41 16" Diameter	CG	CHM-2671-C Sheet 4	R/P	4,5,6/Limited	81%	Scans 4, 5, and 6 limited from 0300 to 0500 due to permanent welded lug brace. (Note 5)
FWS-63 6" Diameter	C-G	CHM-2671-C Sheet 7	Pen F/ Pen P	No scan	0%	No examination due to weld inside penetration
MSF D006-1F 6" Diameter	C-G	CHM-2669-C Sheet 4	V/F	3/No scan 4/No scan	50%	No scans 3 and 4 due to valve to flange weld configuration
MSS-8 32" Diameter	C-G	CHM-2669-C Sheet 1	E/P	A11/Limited	83%	All scans limited from 0500 to 0700 (Approx. 17") due to permanent support (Note 5)

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number <sup>1</sup>	Code Category <sup>2</sup>	Drawing Number	Physical Configuration <sup>3</sup>	Scan <sup>4</sup> /Limitation	Approximate Percent Code Examined	Remarks
RCF-A-T129-7 3" Diameter	B-J	ISI-0365-C Sheet 1	V/P	3/No scan 4/Limited	82%	No scan 3 due to flange. Scan 4 limited to (4) integral attachment lugs. Bi - directional coverage achieved in accessible areas from scan 4 side utilizing 12/8 V scan. (Notes 6 and 8)
RCF-B1-2 27.5" ID	B-J	CHM-2747-B Sheet 1	N/P	3,4/Limited	74%	Scan 3 limited due to pump nozzle transition. Scan 4 limited due to branch connection (Note 10)
RCF-B2-2 27.5" ID	B-J	CHM-2547-B Sheet 1	N/P	3/No scan 4,5,6/Limited	51%	No scan 3 due to nozzle transition. Scan 4 limited due to branch connection. Scans 5 and 6 limited due to weld concavity preventing transducer coupling. (Note 10)
RCF-B3-2 27.5" ID	B-J	CHM-2547-B Sheet 1	N/P N/P	3/No scan 5,6/Limited	60%	No scan 3 due to nozzle transition. Scans 5 and 6 limited due to weld concavity preventing transducer coupling (Note 10)

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number <sup>1</sup>	Code Category <sup>2</sup>	Drawing Number	Physical Configuration <sup>3</sup>	Scan <sup>4</sup> /Limitation	Approximate Percent Code Examined	Remarks
RCF-D2-2-SE 29" ID	B-F	CHM-2660-B Sheet 1	Safe end/N	4,5,6/No scan	25%	No scan 4 due to nozzle transition. No scans 5 and 6 due to nozzle transition and weld taper preventing transducer coupling (Note 10)
RCF-D4-1 29" ID	B-F	CHM-2547-B Sheet 1	Nozzle Safe End/P	5,6 Limited	87%	Scans 5 and 6 limited due to weld concavity preventing transducer coupling (Note 10)
RCF-D4-2 29" ID	B-F	CHM-2547-B Sheet 1	E/N	4/No scan	50%	Manual examination 77/S78. No scan 4 due to nozzle transition. Scans 5 and 6 limited to upstream side due to nozzle transition and weld taper (Note 10)
RCF-D4-2-SE 29" ID	B-F	CHM-2660-B Sheet 1	Safe end/ N	4,5,6/No scan	25%	No scan 4 due to nozzle transition. No scans 5 and 6 due to nozzle transition and weld taper preventing transducer coupling (Note 10)
RCF-D5-1 29" ID	B-F	CHM-2547-B Sheet 1	Nozzle safe end/P	4,5,6/Limited	76%	Scans 4, 5, and 6 limited due to weld concavity preventing transducer coupling (Note 10)
RCF-D5-2 29" ID	B-F	CHM-2547-B Sheet 1	E/N	4/No scan	50%	Manual examination 77/S78. No scan 4 due to nozzle transition. Scans 5 and 6 limited to upstream side due to nozzle transition and weld taper (Note 10)
RCF-D5-2-SE 29" ID	B-F	CHM-2660-B Sheet 1	Safe end/ N	4,5,6/No scan	25%	No scan 4 due to nozzle transition. No scans 5 and 6 due to nozzle transition and weld taper preventing transducer coupling (Note 10)

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number <sup>1</sup>	Code Category <sup>2</sup>	Drawing Number	Physical Configuration <sup>3</sup>	Scan <sup>4</sup> /Limitation	Approximate Percent Code Examined	Remarks
RCF-F3-1 31" ID	B-F	CHM-2547-B Sheet 1	Nozzle Safe End/E	3/No scan 5,6/Limited	42%	Automated examination 77/S78. No scan 3 and limited scans 5 and 6 due to nozzle transition (Note 10)
RCF-F3-1-SE 31" ID	B-F	CHM-2660-B Sheet 1	N/Safe end	3,5,6/No scan 4/Limited	24%	No scans 3, 5, and 6 due to nozzle transition. Scan 4 limited due to nozzle taper (Note 10)
RCF-F3-4 31" ID	B-J	CHM-2547-B Sheet 1	E/Pump	4/No scan 3,5,6/Limited	69%	No scan 4 and scans 3, 5, and 6 limited due to nozzle transition and weld taper preventing transducer coupling (Note 10)
RCF-F4-1 31" ID	B-F	CHM-2547-B Sheet 1	Nozzle Safe End/E	3/No scan 5,6/Limited	25%	Automated examination 77/S78. No scan 3 due to nozzle transition. Limited scans 5 and 6 due to weld contour O.D. configuration. (Note 10)
RCF-F4-1-SE 31" ID	B-F	CHM-2660-B Sheet 1	N/Safe end	3/No scan 4,5,6/Limited	22%	No scan 3 and limited scan 4, 5, and 6 due to nozzle transition/weld taper preventing transducer coupling (Note 10)
RCF-F4-2 31" ID	B-J	CHM-2547-B Sheet 1	E/P	All/Limited	75%	All scans limited due to weld contour O.D. configuration (Note 10)
RCF-F4-4 31" ID	B-J	CHM-2547-B Sheet 1	E/Pump	4/No scan 3/Limited	73%	No scan 4 and limited scan 3 due to nozzle transition/weld taper preventing transducer coupling (Note 10)

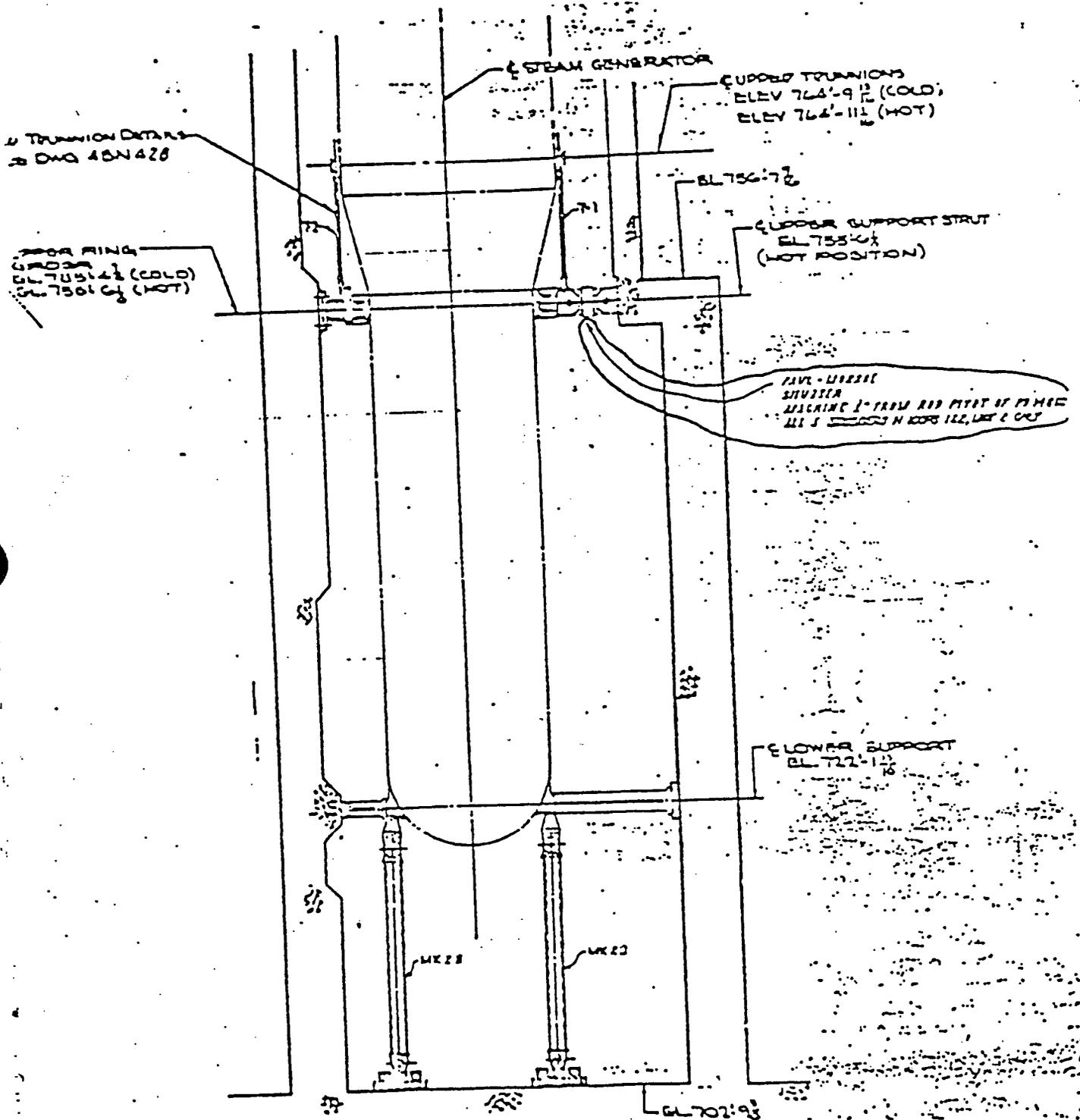
REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number <sup>1</sup>	Code Category <sup>2</sup>	Drawing Number	Physical Configuration <sup>3</sup>	Scan <sup>4</sup> /Limitation	Approximate Percent Code Examined	Remarks
RCW-14 3" Diameter	B-J	ISI-0365-C Sheet 1	F/V	No scan	0%	No examination due to component geometry (Note 8)
RCW-15 3" Diameter	B-J	ISI-0365-C Sheet 1	F/V	No scan	0%	No examination due to component geometry (Note 8)
RHRS-022A 14" Diameter	C-F	CHM-2636-C Sheet 2	Pen F/ Pen P	No scan	0%	No examination due to weld inside penetration
RHRS-35A 14" Diameter	C-F	CHM-2636-C Sheet 3	Pen P/ Pen F	No scan	0%	No examination due to weld inside penetration
RHRS-159A 12" Diameter	C-F	CHM-2636-C Sheet 6	Pen P/ Pen F	No scan	0%	No examination due to weld inside penetration
SIF-D089-6 10" Diameter	B-J	CHM-2758-C Sheet 7	V/T	3/No scan 4/No scan	50%	No scan 3 and 4 due to valve to tee weld (Note 7)
SIF-D090-5 10" Diameter	B-J	CHM-2758-C Sheet 8	V/T	3/No scan 4/No scan	50%	No scan 3 and 4 due to valve to tee weld configuration (Note 7)
SIF-D090-6 6" Diameter	B-J	CHM-2758-C Sheet 8	P/V	3/No scan 4/Limited	84%	No scan 3 due to valve. Scan 4 limited between 0200 to 0500 due to weldolet. Scan 4 utilized 12/8 V scan for Bi-directional coverage (Notes 5, 6, and 7)

REQUEST FOR RELIEF ISI-4 (Continued)

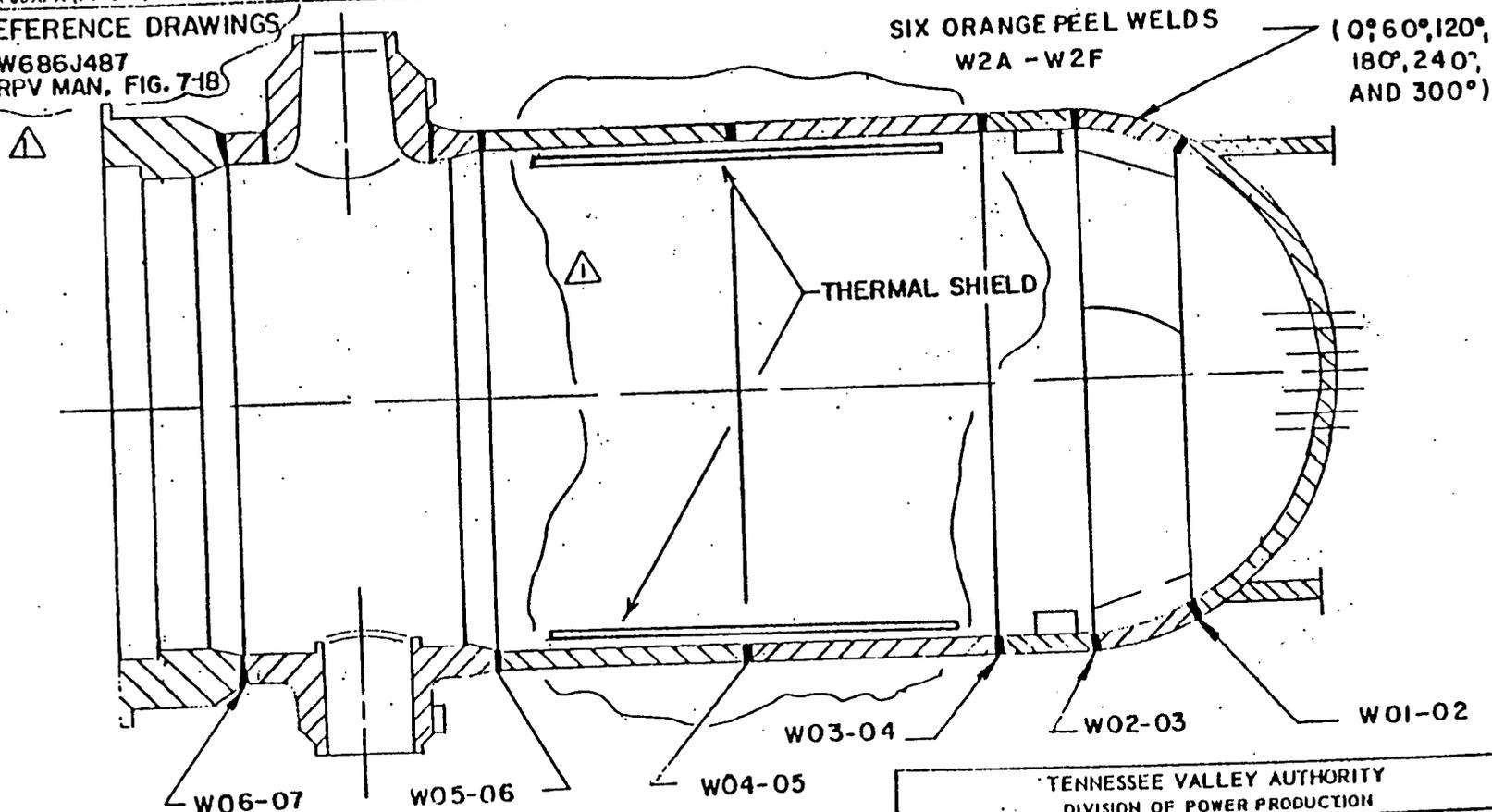
- NOTES:
1. LS following seam number indicates longitudinal seam.
  2. Categories determined in accordance with ASME XI 74S75.
  3. P = Pipe, V = Valve, E = Elbow, T = TEE, R = Reducer, F = Flange, N = Nozzle, Pen P = Penetration Process Pipe, and Pen F = Penetration Flued Head.
  4. Scans 3 and 4 are perpendicular to circumferential welds.  
Scans 5 and 6 are parallel to circumferential welds.  
Scans 7 and 8 are perpendicular to longitudinal welds.  
Scans 9 and 10 are parallel to longitudinal welds.
  5. Limitations are expressed in o'clock references. In general, the exact limitation is noted rather than a percentage of the required examinations.
  6. Examinations conducted from one side of the weld provide full coverage within the variable limits of weld penetrability and opposite surface conditions.
  7. This weld can be exempt from examination to the later code since the stress level and usage factor were below the limits under loads associated with specific seismic events and operational conditions. [1977 Edition, Summer 1978 Addenda, Table IWB 2500-1, Category B-J, Noted (1)(b).]
  8. This weld can be exempt from volumetric examination by the later code since the nominal pipe size is less than four inches. (1977 Edition, Summer 1978 Addenda, Table 2500-1, Category B-J)
  9. This weld was added to the request because the program was updated to later requirement (1977 Edition, Summer 1978 Addenda) on Class 1 piping weld examinations performed after 7-1-89. The exemption size on branch connections decreased from 74S75 (welds exceeding 6") to 77S78 (welds exceeding 2") for welds requiring volumetric examination.
  10. The examination was performed from the O.D. surface to the extent of examination requirements of ASME Section XI 1977 Edition, Summer 1978 Addenda.





TVA 6690-A (PP-2-60)

REFERENCE DRAWINGS  
W686J487  
RPV MAN. FIG. 7-1B



TENNESSEE VALLEY AUTHORITY  
DIVISION OF POWER PRODUCTION

WATTS BAR NUCLEAR PLANT  
UNITS #1 & #2  
REACTOR VESSEL  
(SEAM WELDS)

NO.	DATE	REVISIONS	CK'D	APP.
1	4-7-82	ADD THERMAL SHIELD AND REF. DWG.	DAO	MJB

SCALE: N.T.S.    SUBMITTED    APPROVED: *[Signature]*    DATE: 10-3-78  
 DRAWN: RAS    CHECKED:    SHEET 1 OF 7 SHEETS  
 CH-M 2551A RI

MJB  
TI-50A  
Appendix D  
Revision 25  
Page 109 of 140

WBN  
TI-50A  
Appendix D  
Revision 25  
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REQUEST FOR RELIEF ISI-7 HAS BEEN WITHDRAWN

REQUEST FOR RELIEF ISI-9

Components: Reactor coolant pumps (four per unit)

Class: ASME Class 1 (TVA Safety Class A)

Inspection Requirement: Volumetric examination of pressure-retaining welds in pump casing, examination category B-L-1.

Basis for Relief: Each reactor coolant pump casing consists of a two-piece welded type 304 SST casting. The present capability of ultrasonic testing is not sufficient to examine cast material of this thickness and achieve meaningful results.

Alternate Inspection: All four welds will be surface examined for the preservice examinations.

REQUEST FOR RELIEF ISI-10 (Continued)

Alternate Inspection:

These five circumferential welds shall be volumetrically examined in all accessible areas. This will exceed the 20-percent examination requirements.

REQUEST FOR RELIEF ISI-11

Components:

Letdown Heat Exchanger and Excess Letdown Heat Exchanger

Class:

ASME Class 2 (TVA Safety Class B)

Inspection Requirement:

Volumetric examination of at least 20 percent of each circumferential butt weld (head-to-shell, tube sheet-to-shell) in examination category C-A. This examination shall be uniformly distributed among three areas around the vessel circumference.

Basis for Relief:

Twenty percent of the circumferential welds can be examined, however, because of geometrical interference we cannot distribute the examination area uniformly.

Alternate Inspection:

The circumferential welds shall be volumetrically examined in all accessible areas. This will exceed the 20 percent examination requirements.

REQUEST FOR RELIEF ISI-13

Components: Ultrasonic Examination Techniques of Piping Welds

Class: ASME Class 1 and 2 (TVA Safety Class A and B)

Inspection Requirement: Ultrasonic Examination

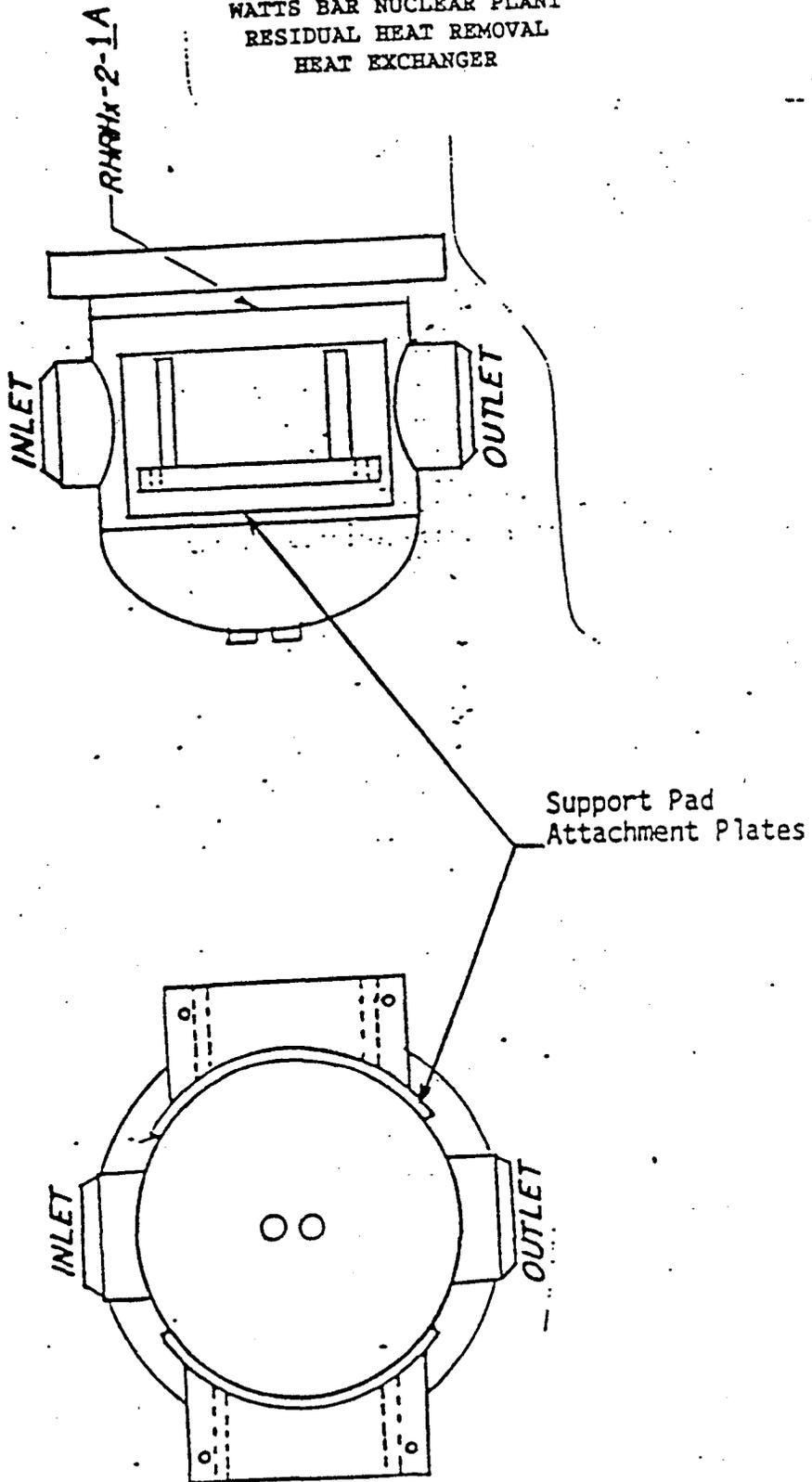
Basis for Relief: In accordance with Title 10 of Code of Federal Regulation, Part 50, Section 50.55a, paragraph g(4)(IV), in-service examinations of components, tests of pumps and valves, and system pressure tests, may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of this section, subject to the limitations and modifications listed in paragraph (b) of this section, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met.

The Watts Bar Preservice Program is based on 1974 Edition, Summer 1975 Addenda.

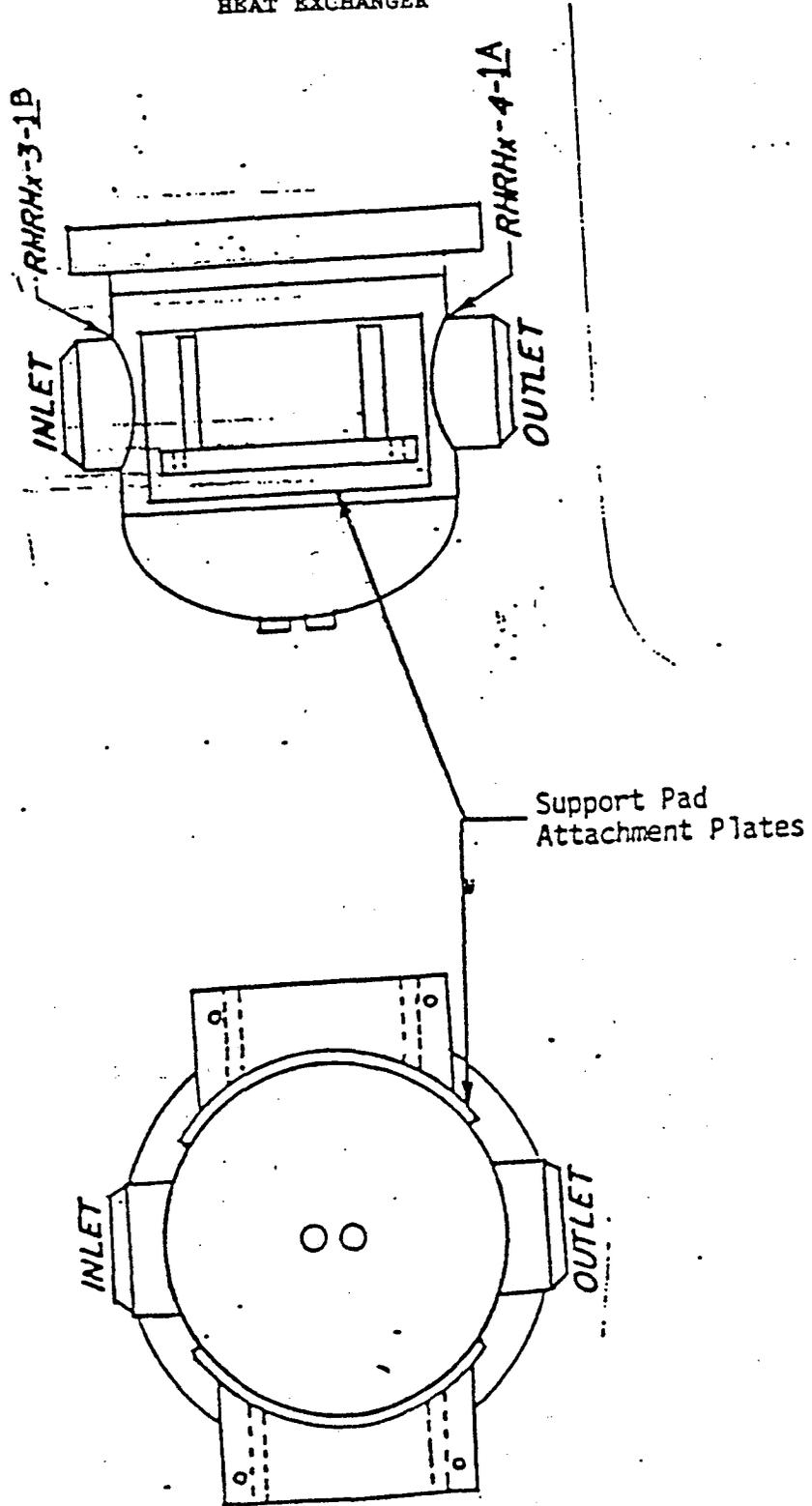
The ultrasonic examination technique [IWA-2232(b), IWA-2232(c), and Appendix III] and evaluation (IWA-3000) of piping welds is being updated to the 1977 Edition, Summer 1978 Addenda of ASME Section XI except for Appendix III, Paragraph III-3410 material, III-3430 calibration notches, and III-4450 inaccessible welds. TVA is requesting to update to only portions of the related areas of the respective editions and addenda.

Alternate Inspection: As specified in Request for Relief ISI-1 and ISI4.

WATTS BAR NUCLEAR PLANT  
RESIDUAL HEAT REMOVAL  
HEAT EXCHANGER



WATTS BAR NUCLEAR PLANT  
RESIDUAL HEAT REMOVAL  
HEAT EXCHANGER



APPENDIX F  
GUIDELINES FOR DETERMINING PIPING  
COMPONENT SUPPORT EXAMINATION BOUNDARIES

5.2 ASME Section XI Programs or its designee is responsible for determining the acceptance range for all component supports in the PSI Program that require acceptance ranges.

5.3 SQO is responsible for examination of component supports within the examination boundary as set forth by this instruction. Any examiner, inspector, or engineer may request boundary clarification where questions exist by submitting the Component Support Examination Boundary Clarification Request (Attachment 1) to ASME Section XI Programs.

## 6.0 IMPLEMENTATION

### 6.1 Determination of Component Support Examination Boundary

#### 6.1.1 General

6.1.1.1 ASME Section XI Programs and SQO shall use the following methodology to determine the component support examination boundary.

- 1) In all cases involving attachments welded to pressure retaining components and/or supports welded to building structure/existing steel, the weld shall be included within the examination boundary.
- 2) Concrete bolt anchors, such as "red-head" or "rawl" anchors, are not included within the Section XI code boundary and, therefore, do not fall within the examination boundary. Even though anchors may be listed on a support bill of materials, they are not required to be examined. (This note pertains to anchors only, not the associated bolting.)
- 3) All shims and lugs adjacent to the supported pipe shall be examined. Even though the shims and lugs may not be listed on the support bill of materials, they are required to be examined.
- 4) For component supports that do not have a bill of materials, items to be examined shall be described in the PRISIM Data Base with the specific PSI Support number. For TVA designed supports, the examination boundary may be determined from TVA drawings. These drawings should be referenced on ASME Section XI program drawings.
- 5) Notification of Indication (NOI) forms shall be used to report unacceptable indications on component supports only if the criteria in A, B, and C, below, are met.

6.1.1.4 As supports are added or revised in the PRISIM Data Base, this instruction shall be used to determine or revise the examination boundary for that support.

6.1.2 Supports Attached to Building Floor, Wall, Ceiling, or Embedded Plate

For supports attached to building floor, wall, ceiling or embedded plates, the boundary shall be defined as the point(s)/area(s) of contact between the support and the building structure, along the support load path(s), up to, but not including the pressure retaining component. In addition to the requirements of 6.1.1.1, each item in the support bill of materials, except concrete anchors and material used as a spacer to allow grouting between the base plate and the building floor, wall, or ceiling, is to be included within the boundary.

This category of supports shall be considered Examination Boundary Type A and so designated in the PRISIM Data Base.

6.1.3 Supports Attached to Existing Supports

NOTE: For clarity, Support A is the support being reviewed for boundary determination and Support B is the "existing support" to which Support A is attached.

The boundary of Support A shall be defined as the point(s)/area(s) of contact between Support A and Support B, along the support load path(s), up to, but not including, the pressure retaining component. In addition to the requirements of 6.1.1.1, each item in Support A bill of materials is to be included within the boundary.

This category of supports shall be considered Examination Boundary Type B and so designated in the PRISIM Data Base. In the PRISIM Data Base, Support B will be identified as the support to which Support A is attached. ("Examine to Support B.")

6.1.4 Supports Attached to Existing Steel

For supports attached to existing steel, the boundary shall be defined as the point(s)/area(s) of contact between the support and "existing steel", along the support load path(s), up to, but not including the pressure retaining component. In addition to the requirements of 6.1.1.1, all items listed on the support bill of materials are to be included within the boundary.

This category of supports shall be considered Examination Boundary Type C and so designated in the PRISIM Data Base.

6.2.2 For variable spring hangers, constant force supports, and snubbers, the examiner or engineer shall use the drawing obtained per 6.2.1 above to verify that the thermal movement and support model information given on the support drawing matches the corresponding information given in the Scan Plan or implementing instruction (WR, WP, etc.). If the movement and model information do not match:

- a. The examiner as SQO Representative shall contact ASME Section XI Programs. When immediate action is required, ASME Section XI Programs may provide verbal instructions to the requesting examiner or SQO Representative to enable them to perform the examination. Verbal instructions shall be confirmed within 14 working days using the Component Support Clarification Request Form following the guidelines as stated in paragraph (b) below.
- b. The examiner or engineer may submit a Component Support Examination Boundary Clarification Request Form to ASME Section XI Programs. SQO or ASME Section XI Programs, upon receipt of a request, shall review the discrepancy and make any necessary changes to the examination boundary. If a request has been submitted, the request will be completed and returned to the requesting examiner or engineer to enable them to perform the examination. A support shall not be examined until any discrepancies on that support are eliminated. Any changes in the Examination Boundary Type will be incorporated in the PRISIM data base.

**NOTE:** See Attachments 2-5 for example boundaries of each examination boundary type.

ATTACHMENT 1

COMPONENT SUPPORT EXAMINATION BOUNDARY CLARIFICATION REQUEST

Plant: WBN Unit: 1 Date: \_\_\_\_\_

Component Support No.: \_\_\_\_\_ Rev.: \_\_\_\_\_

Person Requesting: \_\_\_\_\_

Request:

\*\*\*\*\*

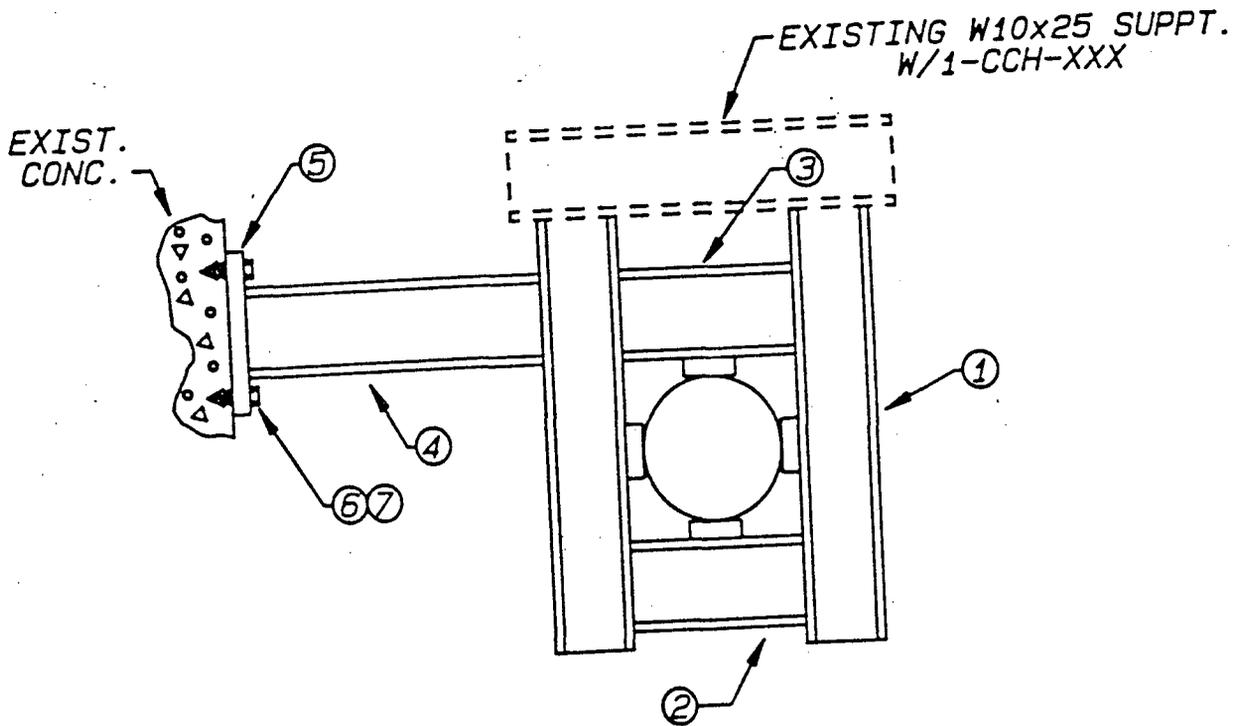
Responding ASME Section XI Programs Representative:

\_\_\_\_\_ Date: \_\_\_\_\_

Response:

Did "Examination Boundary Type" change: \_\_\_\_\_ Yes \_\_\_\_\_ No

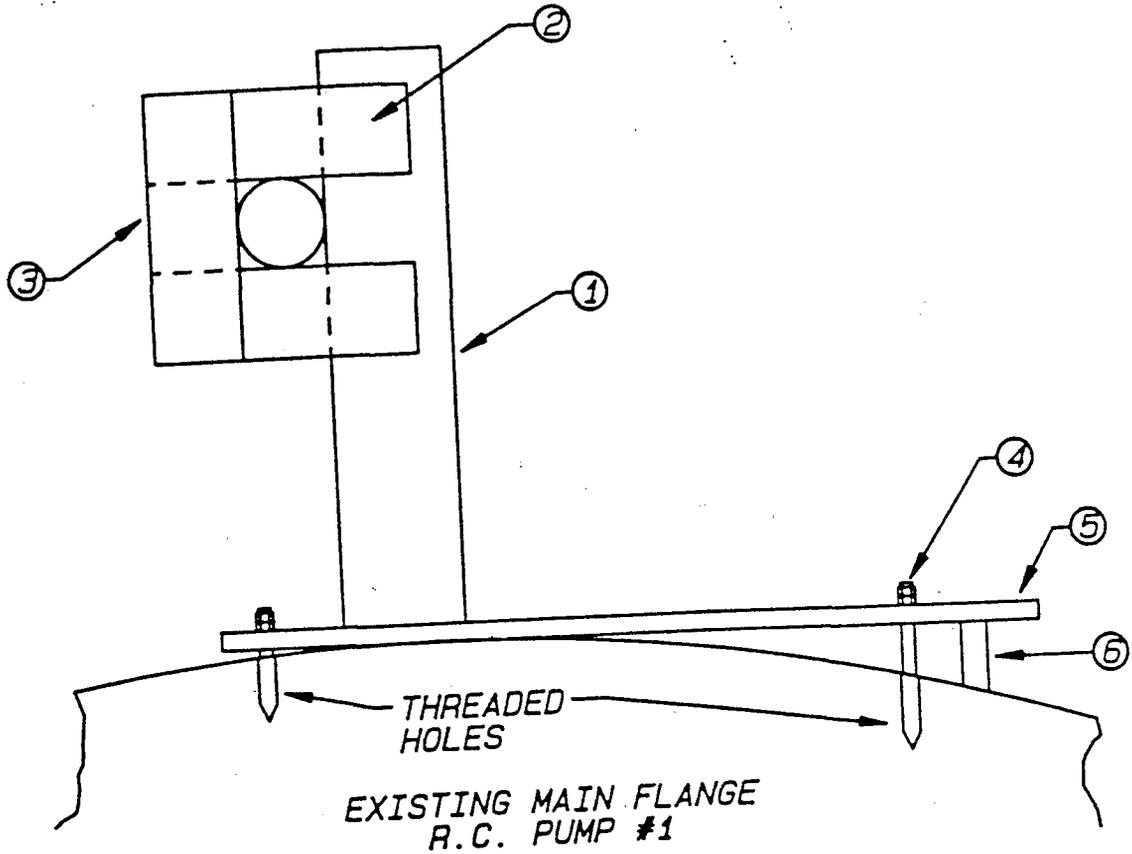
ATTACHMENT 3  
EXAMPLE - TYPE B (AND A) EXAMINATION BOUNDARY



PCS	FOR 1 UNIDIRECTIONAL SUPPORT	
2	①	W6 x 20 x 3'-11 3/8"
1	②	W6 x 20 x 1'-7 1/8"
1	③	W6 x 20 x 1'-7 1/8"
1	④	TS 5 x 5 x 1/2 x 4'-0"
1	⑤	PL. 3/4" x 10" x 0'-10" LG W/4 13/16" $\Phi$ HOLES
4	⑥	3/4" $\Phi$ BOLTS
4	⑦	3/4" RAWLS S.O.E.F. #6010

BOUNDARY: EXAMINE ALL ITEMS ON BILL OF MATERIALS EXCEPT #7 (ANCHORS). ALSO EXAMINE SHIMS.  
 DO NOT EXAMINE "EXISTING" W10 x 25.

ATTACHMENT 5  
EXAMPLE - TYPE D EXAMINATION BOUNDARY



PCS	FOR 1 GUIDE
1	① T.S. 6" x 6" x 3/8", 4'-1/2" LG.
2	② 1/2" x 3" C.S. PLATE, 9 3/16" LG.
1	③ 1/2" x 3" C.S. PLATE, 9" LG.
4	④ 7/8" $\Phi$ S.S. STUD, 3 7/8" LG. W/ (2) HEX NUTS
1	⑤ 1" x 12" C.S. PLATE, 20 1/2" LG.
1	⑥ 1" x 4 1/2" C.S. PLATE, 12" LG.

BOUNDARY: EXAMINE ALL BILL OF MATERIALS ITEMS.

REVISION LOG

<u>Revision Number</u>	<u>Implementation Date</u>	<u>Description of Revision</u>
24	09/20/92	Revised Sections 3.4 and 12.0 to update NDE methods, weld reference system, qualification of personnel, and standards for examination to the 1986 Edition of Section XI. Revised Section 6.2.7 and Appendix A, Table A, to include examination of the pressurizer seismic lugs. Revised Sections 6.6.4, 7.12.4, Appendix A, Tables A, B, E, and F, for valve support components. Added augmented Section 19.3 and revised Appendix A, Table C, for the ASME Section XI 1983 Edition, Winter 1983 Addenda Augmented Class 2 Examinations. Revised Source Document 20.1.1 and added two source notes.
25	5-24-93	Corrected omission of "IWC-3000" in Section 3.4.B(1). Revised Section 4.7 for SG tube examination contract responsibility. Clarified Sections 6.1.11 and 6.4 and Table A, A.15 concerning welds in the auxiliary head adapter. Revised Section 6.3.8 and Section 19 and added augmented examination definition due to Incident Investigation II-S-92-027. Added "or studs" to Section 6.3.5. Added "digitized storage of data" to Section 15.1. Revise calibration block responsibilities in section 17.0. Added manual number to Section 20.3.3. Revised Appendix F. Revised to show current organizational titles.