

WATTS BAR NUCLEAR PLANT

TECHNICAL INSTRUCTION

TI-50A

ASME SECTION XI

PRESERVICE INSPECTION PROGRAM

UNIT 1

CURRENT REVISION LEVEL 13

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Date Approved 8/14/84

Last page of this instruction: 454

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1C Plant Master File
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Asst. Plant Supt. (Maintenance)
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1C Instrument Maint. Supervisor
Instrument Shop
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Management Svs. Supervisor
1C Mechanical Maint. Supervisor
1C Mechanical Unit Supervisor
1C Operations Supervisor
OPQA - Plant Coordinator
Plant Services Supervisor
Plant Training Officer
1U Plant Training Shift Engineer
Power Stores Unit Supervisor
Preop Test Supervisor
Public Safety
QA Manager, QA and Audit Staff
2C Field Quality Engineering Supervisor
Reactor Unit Supervisor
Safety Engineer
1C Shift Engineer's Office
Stationary Equipment Group
Technical Support Center
1C Unit 1 Control Room
Unit 2 Control Room
1U Regulatory Engineer
1C Inservice Inspection Group-C
2C ISI Programs Section-C
1C NDE Engineering Section-C
1C NDE Engineering Section-WBNP
1C NDE Inspection Section-C
1C NDE Inspection Section-WBNP
1C DCU-B-WBNP-CONST
1C ANI

HISTORY OF REVISION/REVIEW

<u>REV. NO.</u>	<u>DATE</u>	<u>REVISED PAGES</u>	<u>REASON FOR CURRENT REVISION (INCLUDE ALL TEMPORARY CHANGE NUMBERS)</u>
12	3/27/84	All	General revision to update program, added support drawings, tables, incorporated temporary changes 83-137, 83-149, and 84-46, removed calibration block drawings, removed reciprocation charging pump drawings and renumbered all pages.
13	8-14-84	Punchlist, Table of Contents, 2-4, 7, 9, 13-19, 21-36, 38, 42-47, 50, 53, 63-65, 87, 93-106, 113, 120-123, 128, 137, 146, 149, 154, 162-164, 170, 171, 178, 181, 185, 188, 189, 191, 264, 270, 276, 288, 292, 315, 316, 320, 325, 327, 334-342, 405, 413-418, 426, 430-432 Added 4a, 15a, 15b, 35a, 82a, 312a, 417a, 417b, 417c, 432a, 432b, 432c, 432d, 433-454	Revised Request for Relief to incorporate NRC comments, added construction examinations of socket welds, incorporated temporary change TC-84-179, minor corrections and clarification, added reciprocation charging pump, added national board numbers.

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1. Incorporate Scan Plan Data Upon Completion of
PSI, Appendix G
2. Add Appendix F
3. Complete Appendix A
4. Complete Section 6.4.3
5. Complete Appendix E

Jeffrey C. Boulant 7/19/84
Signature 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 of the Watts Bar Nuclear Plant 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 the Operational Quality Assurance Manual, Part II, Section 5.1.

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 nondestructive examinations are not a part of this program, but are included in nondestructive examination procedures (DPM N80E3 and AI-9.7).

2.0 PURPOSE

The Preservice Inspection Program (hereinafter PSI) is preliminary in nature and is employed to obtain detailed information for inclusion in the Inservice Inspection 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-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

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.

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.

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 a modification of Regulatory Guide 1.83, Revision 1.

The following categories shall be in accordance with the 1977 Edition, Summer 1978 Addenda of Section XI:

- (1) Criteria for determining Class 1 and 2 pressure-retaining bolting subject to examination
- (2) Class 2 valve body weld examinations
- (3) Component support integrally welded attachment examinations for piping, pumps, valves and pressure vessels.
- (4) Component support examinations for piping, pumps and valves.
- (5) Technique for ultrasonic examination of piping welds shall be in accordance with IWA-2232(b) and IWA-2232(c) for examinations performed after 9/16/81. (See Request for Relief ISI-1, ISI-4 and ISI-13)
- (6) Standards for examination evaluation of piping welds (IWA-3000) (See Request for Relief ISI-1)
- (7) Interior clad surfaces of reactor vessels and other vessels examination are not required.
- (8) Reactor vessel interior and core support structure examinations.

The repair and replacement program is in accordance with plant instruction AI-9.15 and DPM No. WB82M1.

The use of code cases N-234 and N-235 have been approved for TVA use by NRC.

4.0 METHOD OF IMPLEMENTATION AND RESPONSIBILITIES

Preliminary 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 preliminary piping weld maps should be established by ISI Programs Section of the Nuclear Central Office Quality Engineering Branch from CONST's latest revision weld maps.

Prior to performance of the examinations, each system shall be walked down by the ISI Programs Section to verify that the NUC PR drawings depict field configurations. Any drawing revisions that are necessary as a result of the walkdown will be made before the drawings are included in this program. Also each component drawing shall be reviewed by the responsible ISI Programs Section engineer to ensure that the appropriate information is included on the drawing and shall be approved by the ISI Programs Section supervisor.

The NDE Section shall prepare scan plans 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, Non-Destructive Examination (NDE) procedures to be used, and calibration block number.

Prior to performing examinations on a system or component, the scan plans shall be established and submitted by NDE Section to the Plant Manager for information, and system or component weld maps incorporated in Appendix A of this program.

If variations in piping configurations are discovered or modifications or repairs to piping are made during the course of the PSI, these changes shall be marked on field copies of drawings. This information shall be communicated to the ISI Programs Section which shall be responsible for revising the original drawings. The NDE Section scan plan shall also be revised to reflect these changes. Following completion of each system examination, the revised drawings shall be incorporated into this program as a reference for inservice inspections. All latest revision scan plan information and other pertinent information shall be incorporated in this program as a reference for inservice inspections when all examinations required by this program have been completed.

The preservice examinations will be performed by either Quality Engineering Branch personnel or outside contractors. Contract preparation, administration, and supervision will be the responsibility of the NDE Section. Inspection plans and/or Quality Assurance Programs submitted by outside contractors shall be reviewed and approved by the Quality Engineering Branch prior to use. All specific NDE procedures used during the inspection program shall be reviewed and approved in accordance with OQAM Part II, Section 6.3.

Certain ASME Section III examinations performed in shop and/or by CONST will be identified by the ISI Programs Section and employed to serve for the ASME Section XI PSI. When in shop examination records are employed, the examination data sheets and the applicable data package form, with the ANI sign-off, shall be obtained by the ISI Programs Section. When CONST examination records are employed, CONST examination procedures shall be obtained by the NDE Section for reference (excluding pressure test procedures).

Additionally, the NDE Section representative will be responsible for notifying the Plant Manager of all unacceptable indications as soon as practical. Whenever an unacceptable indication is discovered, the procedure and form in Appendix C shall be utilized. In those cases where an outside contractor is furnishing preservice examination services, the contractor will normally initiate the form in Appendix C under the supervision of the NDE Section representative. See section 16.0 of this program.

Computer monitor programs are used to identify any welds or supports that have been reworked by CONST after the preservice examination has been done. NUC PR shall include provisions for notifying baseline in any work instruction written to modify or rework welds or supports after the preservice exam has been done.

The NDE Section shall maintain the status of completed examinations for each weld or component support required to be examined. Individual component status is kept by transferring all the information from the scan plan to a master plan, as examinations are preformed they are recorded in the master plan for status.

As sections are completed, the NDE Section representative shall sign for completion the appropriate sections of Data Sheet 1 in Appendix B of this program. When all examinations of this program have been completed, Data Sheet 1 shall be signed for completion by the NDE Section representative and reviewed by the NDE Section Supervisor. In the event system or component alterations or repairs are made which require component reexamination, or components are reexamined for other reasons, following sign-off of Data Sheet 1, the appropriate sections of Data Sheet 2 in Appendix B shall be completed and signed by the NDE Section representative.

All preservice examinations shall be completed prior to initial plant startup (Operational Mode 2). Prior to initial plant startup, Data Sheet 2, in addition to Data Sheet 1, in Appendix B shall be signed by the NDE Section representative and reviewed by the NDE Section Supervisor, and the ISI Programs Supervisor, and approved by the Supervisor of the Inservice Inspection Group. After the data sheets 1 and 2 have been approved, the data package cover sheet shall be signed by the QE Branch Chief and the Plant Manager. These data sheets shall be filed at the plant site with PSI examination data and final reports discussed in Section 15.0 of this program.

PSI program preparation is the responsibility of ISI Programs Section of the QE Branch. Any revisions initiated by other groups shall be submitted to the ISI Programs Section for approval prior to incorporating the revisions into this program.

5.0 ABBREVIATIONS AND DEFINITIONS

- 5.1 AIA - Authorized Inspection Agency
- 5.2 AI - Authorized Inspector (may denote an ANI or ANII)
- 5.3 ANI - Authorized Nuclear Inspector
- 5.4 ANII - Authorized Nuclear Inservice Inspector
- 5.5 Components - Denotes items in a nuclear plant such as pressure vessels, piping systems, pumps, valves, and component supports.
- 5.6 Examination - Denotes the performance of all visual observation and nondestructive testing such as radiography, ultrasonic, eddy current, liquid penetrant, and magnetic particle methods.

6.1.1.4 Closure Head Circumferential Weld

The head cap weld will be manually ultrasonically examined from the head O.D. The closure head does not include any meridional welds.

The closure head ring is fabricated of SA-508, Class 2, manganese-molybdenum steel. The closure head hemispherical section is fabricated of SA-533, Gr. B, Class 1, manganese-molybdenum steel. Both sections are clad with weld deposited austenitic stainless steel.

6.1.1.5 Vessel-To-Flange And Head-To-Flange Weld

The vessel-to-flange weld will be ultrasonically examined from the vessel I.D. with remote inspection devices. The head-to-flange weld will be manually ultrasonically examined from the head O.D.

The vessel and closure head flange sections are fabricated of SA-508, Class 2, manganese-molybdenum steel and are clad internally and on the gasket face with weld deposited austenitic stainless steel.

6.1.2 Reactor Vessel Nozzle-To-Vessel Welds And Inside Radiused Sections

There are four inlet nozzles (27.441 inch I.D.) and four outlet nozzles (28.937 inch I.D.). The nozzle-to-vessel welds and nozzle inside radiused sections (including outlet nozzle integral extensions) will be ultrasonically examined from the I.D. using remote inspection devices.

The nozzle forgings are fabricated of SA-508, Class 2, manganese-molybdenum steel and are clad with weld deposited austenitic stainless steel.

6.1.3 Reactor Vessel Penetrations And Attachments

The 78 control rod drives, 4 upper head injection, 1 vent pipe, and 58 instrumentation penetrations shall be visually examined by CONST for leakage during the ASME Section III hydrostatic pressure test.

6.1.4 Reactor Vessel Nozzle-To-Safe End Welds

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

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.

6.1.9 Reactor Vessel Interior And Removable Core-Support Structures

The space above and below the reactor core that is made accessible for visual examination by the removal of components during normal refueling outages shall be visually examined using visual examination method VT-3.

Visual examination method VT-3 shall also be performed on removable core support structures of the vessel. The examinations shall include 100 percent of the visually accessible attachment welds and visually accessible surfaces of the core support structure. The structures shall be removed from the vessel for these examinations.

6.1.10 Reactor Vessel Control Rod Drive Housings

The pressure-retaining welds in the twenty peripheral control rod drive housings shall be ultrasonically examined.

The housings consist of a 6-inch O.D. adapter of SA-182, TP 304 and a 4-inch O.D. body of SB-167.

6.1.11 Reactor Vessel Auxiliary Head Adapters

The pressure-retaining welds in the four auxiliary head adapters shall be ultrasonically examined. The dissimilar metal welds shall also be liquid penetrant examined. The adapters consist of SA-182, TP 304 stainless steel (upper portion), SB-166 (lower portion), and a weld buildup from the vessel head. The weld buildup is considered an integral part of the vessel head and does not require examination.

6.2 Pressurizer

6.2.1 Pressurizer Longitudinal And Circumferential Welds

There are four longitudinal welds and five circumferential welds in the shell cylindrical region. These welds shall be ultrasonically examined. There are no circumferential or meridional head welds.

All shell and head sections are fabricated of SA-533, Gr. A, Class 2, manganese-molybdenum steel and are clad with 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 CONST 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 Vessel Support

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.

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

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

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

6.3.8.1.1.4 Percent Degradation means the percentage of the tube wall thickness affected or removed by degradation.

6.3.8.1.1.5 Defect means an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective.

6.3.8.1.1.6 Plugging Limit means the imperfection depth at or beyond which the tube shall be removed from service and is equal to 40 percent of the nominal tube wall thickness.

6.3.8.1.1.7 Unserviceable
describes the
condition of a tube if
it leaks or contains
a defect large enough
to affect its
structural integrity
in the event of an
Operating Basis
Earthquake, a loss-of-
coolant accident,
or a steam line or
feedwater line break.

6.3.8.1.1.8 Tube Inspection
means an inspection of
the steam generator tube
from the point of entry
(hot leg side) completely
around the U-bend to the
top support of the cold
leg.

6.3.8.1.1.9 Preservice Inspection
means an inspection of
the full length of each
tube in each steam
generator performed by
eddy current techniques
prior to service to
establish a baseline
condition of the tubing.
This inspection shall
be performed prior to
initial power
operation using the
equipment and
techniques expected
to be used during
subsequent inservice
inspections.

6.3.8.1.2 All defective tubes and tubes
containing through-wall cracks shall
be plugged.

1-068A-T006-1	1-068A-T024-1	1-068B-T002-2
-2	-2	-3
-3	-3	-4A
-4	-4	-4B
-5	-5	-6
-6	-6	-7
-7	-7	-8
-8	-8	-9
-9	-9	
-10	-10	1-068B-T003-2
-11	-11	-6
		-7
1-068A-T011-11	1-068A-T030-5	-8
-13		-9
-14	1-068A-T030-6	-11
	-10	-12
1-068A-T012-1	1-068A-T033-11	1-068B-T004-1A
-2	-12	-1B
-3	-13	-1C
-4	-14	-1D
-5	-25	-1E
-6		-1F
-8	1-068A-T034-1	-7
-9	-2	-12
-10	-4	
-11	-5	1-062B-T118-1
-12	-6	-2
	-9	-4
1-068A-T019-2	-10	-5
-5	-11	-7
-12	-12	-19
-14		-22
	1-068A-T015-11	1-062B-T183-1A
1-068A-T020-1	-12	-12
-2	-14	-13
-3	-36	-18
-4	-37	
-5		1-062B-T208-5
-6	1-068A-T016-1	1-062B-D190-25
-7	-2	-26
-10	-3	-27
-11	-4	-28
	-5	-28A
1-068A-T023-2	-7	-29
-4	-8	
-5	-9	1-062B-T217-26
-6	-10	-1
-11		-2
-12	1-068B-T001-2	-3
-13	-4A	-5
-17	-9	
-19	-10	

6.4 Piping

All ASME Class 1 piping systems to be examined are fabricated of stainless steel. The reactor coolant main loop piping straight lengths are centrifugal cast and the elbows are static cast. The upper head injection auxiliary head adapter is included in Section 6.1.11. Specific material specifications for each piping system are included in weld map isometrics in Appendix A. Some examinations cannot be performed (see Request ISI-4).

The following Class 1 piping systems are subject to examination:

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

6.4.1 Circumferential And Longitudinal Pipe Welds

The entire length of each circumferential and longitudinal pipe weld shall be ultrasonically examined as practical.

The following circumferential pipe welds will be radiographically examined (RHRF-D053-5, -1, -12, -4, UHIF-D040-13, UHIF-D041-7, UHIF-D042-13, and UHIF-D043-7.)

6.4.2 Branch Pipe Connection Welds

All branch pipe connection welds exceeding six inches in diameter shall be ultrasonically examined. Each branch pipe connection weld six inches in diameter and smaller shall be liquid penetrant examined.

6.4.3 Piping Socket Welds

Each socket weld shall be liquid penetrant examined as practical. Construction examination records will be used for welds done after 12/79. Welds are listed below.

1-068A-T001-2	1-068A-T002-1	1-068A-T005-2
-3	-2	-7
-4	-3	-10
-5	-4	-11
-6	-5	-12
-7	-6	-13
-11	-7	-17
-12	-8	-18
-13	-9	-19
-17	-10	
-18	-11	
-19		

1-062B-T217-6	1-063A-T048-2	1-063B-T063-3
-22	-3	-4
	-4	-5
1-062B-T198-1	-5	-6
-2	-6	-7
-3	-7	-8
-4	-8	-9
-5	-9	
-6	-10	1-063B-T026-12
-7		-15
-7A	1-063B-T044-12	-16
-7B		
-8	1-063B-T105-1	1-063B-T034-1
-9	-2	-2
-10	-3	-3
-11	-4	-4
-12	-5	-5
-13	-6	-6
-14	-6A	-7
	-6B	-8
1-062B-T225-2	-7	
-3	-8	1-063B-T034-9
-4	-9	
-5	-10	1-063B-T113-11
-6A	-10A	-12
-6B	-10B	-15
-7	-11	-16
-7A	-12	-19
-7B	-12A	-23
-8	-12B	-26
-9	-16	-30
-11	-17	-32
1-074B-T108-1	1-063B-T112-1	1-063B-T060-2
-2	-2	
-3	-6	1-063B-T061-11
-4	-7	-17
-5	-9	
-6	-11	1-063B-T058-19A
-7	-13	-19B
-8		-19C
-9	1-063B-T063-2A	-19D
		-19E
		-19F
		-19G
		-19H

6.4.4 Piping Nozzle Weld

There is one 1½" nozzle weld located on the reactor coolant cold leg number four. CONST radiography examination data will be used. (Weld number RCF-B4-4)

6.4.5 Piping Integrally-Welded Supports

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 Appendix A, Table G)

6.4.6 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 Appendix A, Table G)

6.4.7 Piping Pressure-Retaining Bolting Larger Than 2 Inches in Diameter

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

6.4.8 Piping Pressure-Retaining Bolting 2 Inches and Smaller in Diameter

Class 1 bolting 2 inches and smaller in diameter shall be visually examined. These examinations shall include bolts, studs, and nuts. (See Weld Map Isometrics in Appendix A for location of bolted connections).

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

6.4.9 Piping Safe-End Welds

There are no piping safe-end welds other than those discussed in Sections 6.1.4, 6.2.4, and 6.3.3.

6.5 Reactor Coolant Pumps (4)-RCP

6.5.1 RCP Pressure-Retaining Bolting Larger Than 2 Inches in Diameter

The main flange on each pump includes 24 bolts at 4-1/2 inches in diameter. The bolts shall be ultrasonically examined and shall be surface examined if removed. Threads in the base material and flange ligaments between threaded stud holes shall be visually examined if the connection is disassembled.

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

The main flange bolts are fabricated to SA-540, GR B24.

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

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 no Class 1 valve support components. (See Appendix A, Table E)

6.6.5 Valve Body Welds

There are no Class 1 valves with body welds.

6.6.6 Valve Bodies

The internal pressure boundary surfaces of one valve in each group of valves of the same constructional design (i.e., globe, gate, check), manufacturing method, and manufacturer that performs similar functions in the system shall be visually examined. The examinations shall include valves exceeding 4-inch nominal pipe size. (See Appendix A, Table D.)

6.7 Exempted Components

All components exempted from examination in accordance with IWB-1220 of ASME Section XI shall be visually examined for leakage during system hydrostatic pressure tests. See Section 9.0. Components exempted from examination include component connections, piping, and associated valves (and their supports) that are 1-inch nominal pipe size and smaller.

7.0 COMPONENTS SUBJECT TO EXAMINATION - ASME CLASS 2

The ASME Class 2 (TVA Safety Class B) components to be examined for the PSI are outlined in the following paragraphs. All components to be examined for inservice inspections during the service life of the plant will be examined for the PSI. Selection of areas for examination will be in accordance with paragraph IWC-2411 and Table IWC-2520 of ASME Section XI. The ISI Programs Section shall select areas to be examined or the NDE Section may assist in selecting areas to be examined.

Components that are exempted from examination in accordance with IWC-1220 of ASME Section XI are discussed in Section 7.15 of this program.

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

Where examinations specify a percentage of the total length of weld 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)

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 twenty 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 1 steel plate.

7.1.2 Steam Generator Secondary Nozzle-To-Vessel Welds

There is one feedwater nozzle (16-inch I.D.), one feedwater by-pass nozzle (6-inch I.D.), and one main steam nozzle (32-inch I.D.) 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).

The nozzles are fabricated of SA-508, Class 2, steel.

7.1.3 Steam Generator Integrally-Welded Supports

There are no integrally-welded vessel supports.

7.1.4 Steam Generator Pressure-Retaining Bolting Exceeding 2 Inches in Diameter

There is no steam generator secondary side bolting larger than two inches in diameter.

7.2 Residual Heat Removal Heat Exchangers (2) - RHRHX

7.2.1 RHRHX Circumferential Welds

There are two circumferential welds located at structural discontinuities on the tube side of each RHRHX. A total of two welds from the two heat exchangers will be selected for ultrasonic examination and shall be distributed among the two RHRHX. The welds selected shall be located at different areas. The examinations shall cover at least twenty percent of each weld selected for examination, uniformly distributed among three areas around the vessel circumference. The examination cannot cover twenty percent of the weld, channel cylinder section to channel flange (see Request for Relief ISI-14).

The welds include the channel cylinder section to channel flange weld and the channel cylinder section to channel head weld. The channel flange is fabricated from SS, SA-336-F8. The channel cylinder section and channel head are from SS, SA-240, TP-304.

7.2.2 RHRHX Nozzle-To-Vessel Welds

The channel cylinder section of each RHRHX includes one inlet nozzle (14-inch I.D.) and one outlet nozzle (14-inch I.D.). A total of two nozzle-to-vessel welds from the two RHRHX will be ultrasonically examined and shall be distributed among the two heat exchangers (one inlet nozzle and one outlet nozzle). The examination is limited (see Request for Relief ISI-15).

The nozzles are fabricated from SS, SA-336-F8.

7.2.3 RHRHX Integrally-Welded Supports

There are two integrally-welded support attachments on each RHRHX. A total of two support pad-to-vessel welds from the two heat exchangers will be liquid penetrant examined and shall be distributed among the two heat exchangers (a different support on each heat exchanger).

The support pad (attachment plate is 5/8 inch thick) is fabricated from SS, SA-240, TP-304.

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

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 done and achieve meaningful results (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 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 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 1/3 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.

7.4 Letdown Heat Exchanger (1)-LHX

7.4.1 LHX Circumferential Welds

There are two circumferential welds located at structural discontinuities on the tube side. These welds shall be ultrasonically examined. The examinations shall cover at least twenty percent of each weld, uniformly distributed among three areas around the vessel circumference. This examination cannot be uniformly distributed (see Request for Relief ISI-11).

7.4.2 LHX Nozzle-To-Vessel Welds

There are not any nozzles greater than 4 in. diameter. The nozzles are fabricated to SA-312, TP 304.

7.4.3 LHX Integrally-Welded Supports

There are two integrally-welded support attachments (1/2 inch and 3/4 inch thick) on the LHX. Only the 3/4 inch thick support to vessel welds shall be liquid penetrant examined.

The supports are fabricated to SA-240, TP 304.

7.4.4 LHX Pressure Retraining Bolting Exceeding 2 Inches in Diameter

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

7.5 Excess Letdown Heat Exchanger (1)-ELHX

7.5.1 ELHX Circumferential Welds

There is one circumferential weld located at the structural discontinuity on the heat exchanger. This weld shall be ultrasonically examined. The examination shall cover at least twenty percent of the weld and be uniformly distributed among three areas around the vessel circumference. This examination cannot be uniformly distributed (see Request for Relief ISI-11).

The weld is the channel flange to the channel head weld. The channel flange and the channel head are fabricated to SA105II, F/S and SA-240, TP 304, respectively.

7.5.2 ELHX Nozzle To Vessel Welds

There are not any nozzles greater than 4 in. diameter. The nozzles are fabricated to SA-312, TP 304.

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.

7.6 Boron Injection Tank (1)-BIT

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 16-2½ inch diameter manway cover studs and nuts. The bolting shall be volumetrically examined.

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

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

7.7 UHI Water Accumulator (1)-WA

7.7.1 WA-Circumferential Welds

There are two circumferential welds located at the structural discontinuities. These welds shall be ultrasonically examined. The examinations shall cover twenty percent of each weld and shall be uniformly distributed among three areas around the vessel circumference.

These welds include two head to shell welds. The shell and head are fabricated to SA-516-71, GR 70.

7.7.2 WA Nozzle-To-Vessel Welds

There are three 12 inch diameter nozzles on the accumulator, one on the top head and two on the bottom head. These welds shall be ultrasonically examined.

The nozzles are fabricated to SA-350-LF2.

7.7.3 WA Integrally-Welded Supports

The accumulator has an integrally welded support skirt (1 inch thick) attached to the bottom head. The support skirt-to-vessel weld shall be liquid penetrant examined.

The integrally welded portion of the skirt is fabricated to SA-516, GR70.

7.7.4 WA Pressure Retaining Bolting Exceeding 2 Inches in Diameter

There are 32-2½" diameter studs and nuts located on two manholes covers installed on the head and shell. The bolting shall be volumetrically examined.

The studs and nuts are fabricated to SA-193, GRB7 and SA-194, CLH2 respectively.

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

7.8 UHI Surge Tank (1)-ST

7.8.1 ST Circumferential Welds

There are two circumferential welds located at structural discontinuities. These welds shall be ultrasonically examined. The examinations shall cover twenty percent of each weld and shall be uniformly distributed among three areas around the vessel circumference.

These welds include two head-to-shell welds. The shell and heads are fabricated to SA-240, TP 304.

7.8.2 ST Nozzle-to-Vessel Welds

There are not any nozzles greater than 4 inch diameter located on the surge tank.

The nozzles are fabricated to SA-479, TP 304, and SA-182, F304.

7.8.3 ST Integrally-Welded Supports

There are two saddle type support pads (3/8 inch thick) integrally welded to the shell. The pad-to-vessel welds do not require a surface examination.

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

7.8.4 ST Pressure Retaining Bolting Exceeding 2 Inches in Diameter

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

7.9 Piping

Material specifications for each piping system are included in weld map isometrics in Appendix A. Some examinations cannot be performed (see Request for Relief ISI-4). The following ASME Class 2 piping systems are subject to examination:

- Residual Heat Removal
- Safety Injection
- Main Steam
- Feedwater
- Auxiliary Feedwater
- Chemical Volume Control
- Upper Head Injection

7.9.1 Piping Circumferential Welds

Circumferential welds subject to examination shall include those welds at structural discontinuities and welds within three pipe diameters of the centerline of rigid pipe anchors, or anchors at the penetrations of primary containment, or at rigidly anchored components.

Selection of areas to be examined shall be in accordance with IWC-2411 and Table IWC-2520 of ASME Section XI.

The entire length of each weld selected shall be ultrasonically examined.

7.9.2 Piping Longitudinal Welds

Areas subject to examination include longitudinal welds in fittings (i.e., tees, elbows, reducers). The entire length of each weld selected for examination in accordance with IWC-2411 and Table IWC-2520 of ASME Section XI shall be ultrasonically examined.

7.9.3 Branch Pipe Connection Welds

The entire length of all branch pipe connection welds selected for examination in accordance with IWC-2411 and Table IWC-2520 of Section XI will be ultrasonically examined.

7.9.4 Piping Pressure-Retaining Bolting Exceeding 2 Inches in Diameter

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

7.9.5 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 Appendix A, Table H)

7.9.6 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 Appendix A, Table H)

7.10 Residual Heat Removal Pumps (2) - RHRP

7.10.1 RHRP Casing Welds

The RHRP casing does not include any casing welds. The casing is a one piece forging fabricated to SA-182, F304.

7.10.2 RHRP Pressure-Retaining Bolting Exceeding 2 Inches in Diameter

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

7.10.3 RHRP Integrally-Welded Support

There are three integrally-welded support attachments greater than 3/4 inch thick associated with the RHRP. These welds shall be surface examined. The supports are fabricated to SA-240, TP 304.

7.10.4 RHRP Support Components

Each RHRP includes one support component bolted to the pump feet, which are integrally welded to the pump.

Each support component shall be visually examined.

7.11 CVCS Centrifugal Charging Pumps (2) CCP

7.11.1 CCP-Casing Welds

The CCP casing does not include any casing welds.

7.11.2 CCP Pressure Retaining Bolting Exceeding 2 Inches in Diameter

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

7.11.3 CCP-Integrally-Welded Supports

There are four integrally-welded supports greater than 3/4 inch thick associated with the CCP. These supports shall be surface examined.

7.11.4 CCP-Support Components

Each CCP includes a support component bolted to the pump feet, which are integrally welded with the pump. The support component shall be visually examined.

7.12 Safety Injection Pumps (2)-SIP

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

7.12.2 SIP Pressure-Retaining Bolting Exceeding 2 Inches in Diameter

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

7.12.3 SIP Integrally-Welded Supports

There are no integrally-welded supports associated with the SIP.

7.12.4 SIP Support Components

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

7.13 CVCS Positive Displacement Pump (Reciprocating Charging Pump) (1) PDP

7.13.1 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.

7.13.2 PDP Pressure Retaining Bolting Exceeding 2 Inches in Diameter

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

7.13.3 PDP Integrally-Welded Supports

There are no integrally-welded supports associated with the PDP.

7.13.4 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.

7.14 Valves

7.14.1 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. These welds shall be surface examined. (See Appendix A Table F.)

7.14.2 Valve Pressure-Retaining Bolting Exceeding 2 Inches in Diameter

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

7.14.3 Valve Integrally-Welded Supports

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

7.14.4 Valve Support Components

There is no Class 2 valve support components. (See Appendix A, Table F)

7.15 Exempted Components

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 J.

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; (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.

8.1 Hydrostatic Pressure Tests

ASME Class 3, components will be visually examined for leakage by CONST during the system hydrostatic pressure tests required by ASME Section III.

8.2 Supports And Hangers

Supports and hangers for components exceeding 4-inch nominal pipe size whose structural integrity is relied upon to withstand design loads when the system function is required, shall be visually examined to detect any loss of support capability, and evidence of inadequate restraint. (See Appendix A, Table C and I)

9.0 HYDROSTATIC PRESSURE TESTS

ASME Class 1, 2, and 3 components (including exempted components) shall be visually examined for leakage during system hydrostatic pressure tests. These examinations shall be performed by CONST during the ASME Section III hydrostatic tests. Additional pressure test shall be performed in accordance with DPM No. WB82E1.

10.0 AUTHORIZED INSPECTOR

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. TVA shall provide access for the ANI in accordance with IWA-2140 of ASME Section XI. Requirements for interface with the ANI and ANII are included in OQAM Part II, Section 2.3 and 5.1 respectively.

11.0 EXAMINATION METHODS

11.1 Visual Examination

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

11.2 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.

11.3 Visual Examination (VT-4)

- (a) The VT-4 visual examination shall be conducted to determine conditions relating to the operability of components or devices such as mechanical and hydraulic snubbers, components supports, pumps, valves, and spring loaded and constant weight hangers.
- (b) The VT-4 visual examination shall confirm functional adequacy, verification of the settings, or freedom of motion. This examination may require (1) disassembly of components or devices and (2) operability test.

11.4 Surface Examination (Magnetic Particle)

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

11.5 Surface Examination (Liquid Penetrant)

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

11.6 Volumetric Examination (Radiographic)

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

11.7 Volumetric Examination (Ultrasonic)

Ultrasonic examination shall be conducted in accordance with the provisions of Appendix I of Section XI of the ASME Code. Where Appendix I (I-1200) is not applicable, the provisions of Article 5 of Section V of the ASME Code shall apply except as noted in Section 3.0 of this program.

11.8 Volumetric Examination (Eddy Current)

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

Personnel performing nondestructive examination operations shall be qualified in accordance with IWA-2300 of ASME Section XI (Program Procedure 1502.02, Formerly DPM No. N75C01 for NUC PR). Contractor personnel shall possess evidence of certification.

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.

14.0 REPAIRS AND REPLACEMENTS

All repairs and replacements shall be performed in accordance with plant instruction AI-9.15 and DPM No. WB82M1, Preparation of Work Instructions for Repairs and Replacements of ASME Section XI Components, and N-OQAM, Part II, Section 2.3, Repairs and Replacements of ASME Section XI Components. Repairs and replacements as necessary may be coordinated with the Chemical, Metallurgy and Standards Group of the Mechanical Branch.

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
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- I. Introduction - The introduction should include the following information: plant, unit number, preservice or in-service 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: program, performance, personnel, equipment, procedures, evaluations, and results.
- III. Discussion - The discussion should discuss the governing documents (ASME Code, Technical Specifications, etc.), inspection schedule, materials, calibration standards, calibration performance, reporting, recording, interpretation, and brief evaluation.
- IV. Evaluation - Evaluation is based on the indication's location, metal path, general shape, and any tests that could be applied, such as damping. The evaluation section also should contain a listing of each examination performed and the evaluated results.
- V. 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 and the date of completion.
- VI. Scan Plan - The Scan Plan shall give a detailed description of all areas subject to examination during the inspection. It shall contain the following information: examination area, code category, weld size and/or number, reference drawing, examination method, procedure, calibration block, and any reference details pertaining to the exam area, such as the weld number, meridional welds, pump studs.
- VII. Weld and Hanger Maps - The Weld and Hanger Maps are the reference drawings for the inspection. The weld maps are isometric drawings showing the location of both field and shop welds on each vessel, components, and piping system subject to examination. The hanger maps are also

isometrics showing the location of hangers, snubbers, and supports for each vessel, component, or piping system subject to examination.

- VIII. Log by System - The log is the daily status of the inspection section representative of the areas subject to examination during the inspection. This log keeps an up-to-date status of work complete and incomplete.
- IX. Personnel Certifications
- X. Equipment Certifications
- XI. NDE Procedures
- XII. Calibration Block Drawings
- XIII. Calibration Sheets
- XIV. Examination Report Forms

For eddy current examination of heat exchanger tubing, the report shall include a record indicating the tube(s) examined (this may be marked on a tube sheet sketch or drawing), the extent to which each tube was examined, the location and depth of each reported indication, and the identification of the operator(s) and data evaluator(s) who conducted each examination or part thereof, and magnetic tape and strip charts.

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

The NCO NDE Section shall review and submit the final report to the Plant Manager for review. These final reports shall be filed at the plant site with the data sheets of Appendix C of this program as discussed in section 4.0 of this program. Data Package Cover Sheet in Appendix C will be completed and used as a cover sheet for the final report and to document the review process.

15.1.1 Repair and Replacement Reports

The plant shall prepare a summary of repairs and replacements for all ASME Class 1 and 2 components. The report shall include the applicable requirements of IWA-6220 of ASME Section XI and shall be submitted to the NCO Quality

Engineering Branch within 45 days after initial plant startup before the completion of PSI. After reviewing the summary report, the NCO Quality Engineering Branch shall submit it to the NRC via the Manager, Nuclear Licensing, Office of Power, within 90 days after completion of PSI.

15.2 PSI Report for ASME Class 1 and 2 Components

A PSI report(s) for ASME Class 1 and 2 components shall be prepared and submitted to NRC within ninety days after completion of the PSI.

The report shall be prepared by the NDE Section and submitted to the Nuclear Licensing Staff for submittal to NRC.

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

- (1) Date of completion of report
- (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
- (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
- (10) Completed examination reports.
- (11) Completed calibration reports.
- (12) List of component drawings.
- (13) List of TVA NDE personnel and/or copies of contractor personnel certifications.
- (14) List of TVA NDE equipment and/or copies of contractor equipment certifications.
- (15) List of TVA NDE procedures used and/or copies if contractor NDE procedures.

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, 2, and 3 Components

The following records shall be available for review:

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

16.0 NOTIFICATION OF INDICATION

Plant management shall be formally notified of the presence of unacceptable indications detected during the performance of nondestructive examinations. Unacceptable indications are defined by the applicable NDE procedure. Formal notification shall consist of completing and submitting to the Plant Manager the "Notification of Indication" form in Appendix C of this program.

Part I of the "Notification of Indication" shall be completed and signed by the NDE Level II or III examiner detecting the indication. The NDE Section representative shall assign a sequential number and review and sign the form. If the indication is detected by an outside contractor, the contractor's field supervisor shall review and sign the form. The original shall be sent to the plant manager and a copy to the ISI Programs Section.

The plant manager or his assistant shall designate the organization (Outage Modification and Major Maintenance, Plant Maintenance, or the Office of Engineering Design and Construction-OEDC) responsible for preparing a disposition in Part II of the form and performing the associated corrective action. If the organization assigned responsibility for disposition is unable to determine a satisfactory disposition then the form should be sent to the Mechanical Branch for disposition.

The individual responsible for preparation of the disposition shall sign and date Part II of the form. The cognizant supervisor of the appropriate organization shall review and approve the disposition and sign and date Part II of the form. Copies of the form shall be distributed to the plant manager and the ISI Programs Section. The original shall be returned to the NDE Section Representative. One copy shall be filed with the examination report.

If the organization assigned responsibility for disposition is within NUC PR, they shall determine if the unacceptable condition is significant and potentially reportable in accordance with the requirements of N-OQAM, Part III, Section 7.2 and Plant Instruction AI-7.3. Dispositions to correct the condition under the plant maintenance program shall be processed in accordance with N-OQAM, Part II, Section 2.1 and Plant Instruction AI-9.2. Dispositions other than restoring to original requirements shall be processed as modifications in accordance with N-OQAM, Part II, Section 3.0 and Plant Instruction AI-8.5 before licensing and AI-8.8 after licensing. Repair and replacement, activities, including coordination with the Authorized Inspection Agency (AIA), shall be performed in accordance with the requirements of N-OQAM, Part II, Section 2.3 and Plant Instruction AI-9.15. Dispositions to accept the condition as-is shall include in Part II of the form the basis for the disposition. In addition for dispositions to accept the condition as-is, a USQD shall be prepared by the appropriate organization in accordance with established procedures.

If Construction is responsible for corrective action, it shall be performed in accordance with the disposition on the Notification of Indication form and to the satisfaction of the NDE section representative. The organization responsible for corrective action shall include preservice examination requirements in the repair or replacement work instruction described in N-OQAM, Part II, Section 2.3.

Upon completion of corrective action the NDE Section Representative shall verify completion of corrective action, enter the work instruction and/or DCR numbers on the Notification of Indication form, enter the examination report number if re-examination was performed, and sign and date the form, Part III. The signed form shall remain with the examination report for use as a quality assurance record. If re-examination was performed, a copy of the signed form shall also remain with the re-examination report. Copies of the form shall also be distributed to the plant manager and the ISI Programs Section.

17.0 CALIBRATION BLOCKS

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 the NDE Section for all calibration blocks. The blocks shall employ drilled holes and/or notches for calibration reflectors (see Request For Relief ISI-1).

The NDE Section shall ensure that as built calibration block drawings are prepared. The calibration block drawings shall be maintained in accordance with N-OQAM, Part III, Section 3.3.

18.0 REQUESTS FOR RELIEF

Where TVA has determined that certain code requirements or examinations are impractical, TVA will submit written requests for relief to NRC with information to support the determinations with 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.

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

19.0 AUGMENTED INSPECTIONS

19.1 Steam Generator Cold Leg 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.

20.0 REFERENCES

- 20.1 ASME Boiler and Pressure Vessel Code - Section XI through Summer 1975 addenda, Summer 1976 addenda, Summer 1978 addenda.
- 20.2 ASME Boiler and Pressure Vessel Code - Section V through Summer 1975 addenda.
- 20.3 Instruction Manual - 173-inch I.D. Reactor Pressure Vessel - Rotterdam Dockyard Company, Contract No. 71C62-54114-1, N3M-2-3.
- 20.4 Watts Bar Nuclear Plant Administrative Instruction 3.
- 20.5 Watts Bar Nuclear Plant Final Safety Analysis Report.
- 20.6 Westinghouse Technical Manual - Pressurizer, TM 1440-C225, Contract No. 71C60-54114-1, N3M-2-6.
- 20.7 Westinghouse Technical Manual - Vertical Steam Generators, TM 1440-C254, Contract No. 71C62-54114-1, N3M-2-4.
- 20.8 Westinghouse Instruction Manual - Auxiliary Heat Exchangers, Contract No. 71C62-54114-1, N3M-2-30.
- 20.9 Westinghouse Instruction Book - Reactor Coolant Pump, Contract No. 71C62-54114-1, N3M-2-5.
- 20.10 Ingersoll-Rand Instruction Manual - Residual Heat Removal Pumps, Contract No. 71C62-54114-1, N3M-2-30.
- 20.11 Watts Bar Nuclear Plant Operational Quality Assurance Manual, Part II, Section 5.1.
- 20.12 Division Procedure Manual N80E3, N75C01, and N76A10.

TABLE A (CONTINUED)
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>Item No. From Table IWB-2600, Section XI</u>	<u>Examination Category From Table IWB-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
D. <u>Piping (Continued)</u>					
4. Branch Pipe Connection Welds 6" Diameter and Smaller	6.4.2	B4.7	B-J	PT	Appendix A, Piping Weld Location Dwgs
5. Socket Welds	6.4.3	B4.8	B-J	PT	Appendix A, Piping Weld Location Dwgs
6. Piping Nozzle Weld	6.4.4		B-J	RT	CHM-2-2758-C
7. Integrally-Welded Supports	6.4.5	B10.10 (See Note 2)	B-K-1 (See Note 2)	PT	Appendix A, Table G
8. Support Components	6.4.6	B11.10 (See Note 2)	B-K-2 (See Note 2)	VT-3 VT-4	Appendix A, Hanger Location Dwgs
9. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.4.8	B7.50 (See Note 2)	B-G-2 (See Note 2)	VT	Appendix A, Piping Weld Location Dwgs
E. <u>Reactor Coolant Pumps</u>					
1. Pressure-Retaining Bolting Larger Than Two Inches in Diameter	6.5.1	B6.180, B6.190 (See Note 2)	B-G-1 (See Note 2)	UT, VT-1, PT or MT	CH-M-2672-B
2. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.5.2	B7.60 (See Note 2)	B-G-2 (See Note 2)	VT-1	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 A (CONTINUED)
 WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 1 COMPONENTS

<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Item No. From Table IWB-2600, Section XI</u>	<u>Examination Category From Table IWB-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
E. <u>Reactor Coolant Pumps (Continued)</u>					
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
F. <u>Valves</u>					
1. Pressure-Retaining Bolting Two Inches and Smaller in Diameter	6.6.2	B7.70 (See Note 2)	B-G-2 (See Note 2)	VT	Appendix A, Table E
2. Valve Bodies	6.6.6	B6.7	B-M-2	VT	Appendix A, Table D
G. <u>Exempted Components</u>	6.7	B1.19 B2.10 B3.9 B4.11 B5.8 B6.8	B-P	VT	N/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 B

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WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 2 COMPONENTS

<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>
A. <u>Steam Generators</u>					
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. <u>Residual Heat Removal Heat Exchangers</u>					
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
C. <u>Regenerative Heat Exchangers</u>					
1. Circumferential Welds	7.3.1	C1.1	C-A	UT	ISI-0077-A
D. <u>Letdown Heat Exchangers</u>					
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.

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WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 2 COMPONENTS

<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>
E. <u>Excess Letdown Heat Exchanger</u>						
1.	Circumferential Welds	7.5.1	C1.1	C-A	UT	ISI-0076-A
F. <u>Boron Injection Tank</u>						
1.	Circumferential Welds	7.6.1	C1.1	C-A	UT	ISI-0053-B
2.	Nozzle-to-Vessel Welds	7.6.2	C1.2	C-B	UT	ISI-0053-B
3.	Integrally-Welded Supports	7.6.3	C3.10 (See Note 2)	C-C (See Note 2)	PT	ISI-0053-B
4.	Pressure Retaining Bolting Exceeding Two Inches in Diameter	7.6.4	C4.10 (See Note 2)	C-D (See Note 2)	UT	ISI-0053B
G. <u>Upper Head Injection Water Accumulator</u>						
1.	Circumferential Welds	7.7.1	C1.1	C-A	UT	ISI-0073-B
2.	Nozzle-to-Vessel Welds	7.7.2	C1.2	C-B	UT	ISI-0073-B
3.	Integrally-Welded Supports	7.7.3	C3.10 (See Note 2)	C-C (See Note 2)	PT	ISI-0073-B
4.	Pressure Retaining Bolting Exceeding Two Inches in Diameter	7.7.4	C4.10 (See Note 2)	C-D (See Note 2)	UT	ISI-0073B

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

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WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 2 COMPONENTS

<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>
H. <u>Upper Head Injection Accumulator Surge Tank</u>					
1. Circumferential Welds	7.8.1	C1.1	C-A	UT	ISI-0072-A
I. <u>Piping</u>					
1. Circumferential Welds	7.9.1	C2.1	C-F	UT	Appendix A, Piping Weld Location Dwgs
2. Longitudinal Welds	7.9.2	C2.2	C-F	UT	Appendix A, Piping Weld Location Dwgs
3. Branch Pipe Connection Welds	7.9.3	C2.3	C-F	UT	Appendix A, Piping Weld Location Dwgs
4. Integrally-Welded Supports	7.9.5	C3.40 (See Note 2)	C-C (See Note 2)	PT or MT	Appendix A, Table H
5. Support Components	7.9.6	C3.50, C3.60 (See Note 2)	C-E (See Note 2)	VT-3 VT-4	Appendix A, Hanger Location Dwgs
J. <u>Residual Heat Removal Pumps</u>					
1. Integrally-Welded Supports	7.10.3	C3.70 (See Note 2)	C-C (See Note 2)	PT	ISI-0117-A
2. Support Components	7.10.4	C3.80 (See Note 2)	C-E (See Note 2)	VT-3	ISI-0117-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.

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WATTS BAR PRESERVICE INSPECTION PROGRAM - ASME CLASS 2 COMPONENTS

<u>Component</u>	<u>Program Reference Section (See Note 1)</u>	<u>Item No. From Table IWC-2600, Section XI</u>	<u>Examination Category From Table IWC-2600, Section XI</u>	<u>Method of Inspection</u>	<u>Reference Drawing No.</u>
K. <u>Chemical Volume Control Centrifugal Charging Pump</u>					
1. Integrally-Welded Supports	7.11.3	C3.70 (See Note 2)	C-C (See Note 2)	PT	ISI-0118-A
2. Support Components	7.11.4	C3.80 (See Note 2)	C-E (See Note 2)	VT-3	ISI-0018-A
L. <u>Safety Injection Pumps</u>					
1. Support Components	7.12.4	C3.80 (See Note 2)	C-E (See Note 2)	VT-3	ISI-0120-A
M. <u>Chemical Volume Control Positive Displacement Pump</u>					
1. Support Component	7.13.4	C3.80 (See Note 2)	C-E (See Note 2)	VT-3	ISI-0119-A
N. <u>Valves</u>					
1. Valve Body Welds	7.13.1	C6.20 (See Note 2)	C-G (See Note 2)	PT	ISI-0081-A ISI-0082-A
O. <u>Exempted Components</u>	7.14	N/A	N/A	VT	N/A

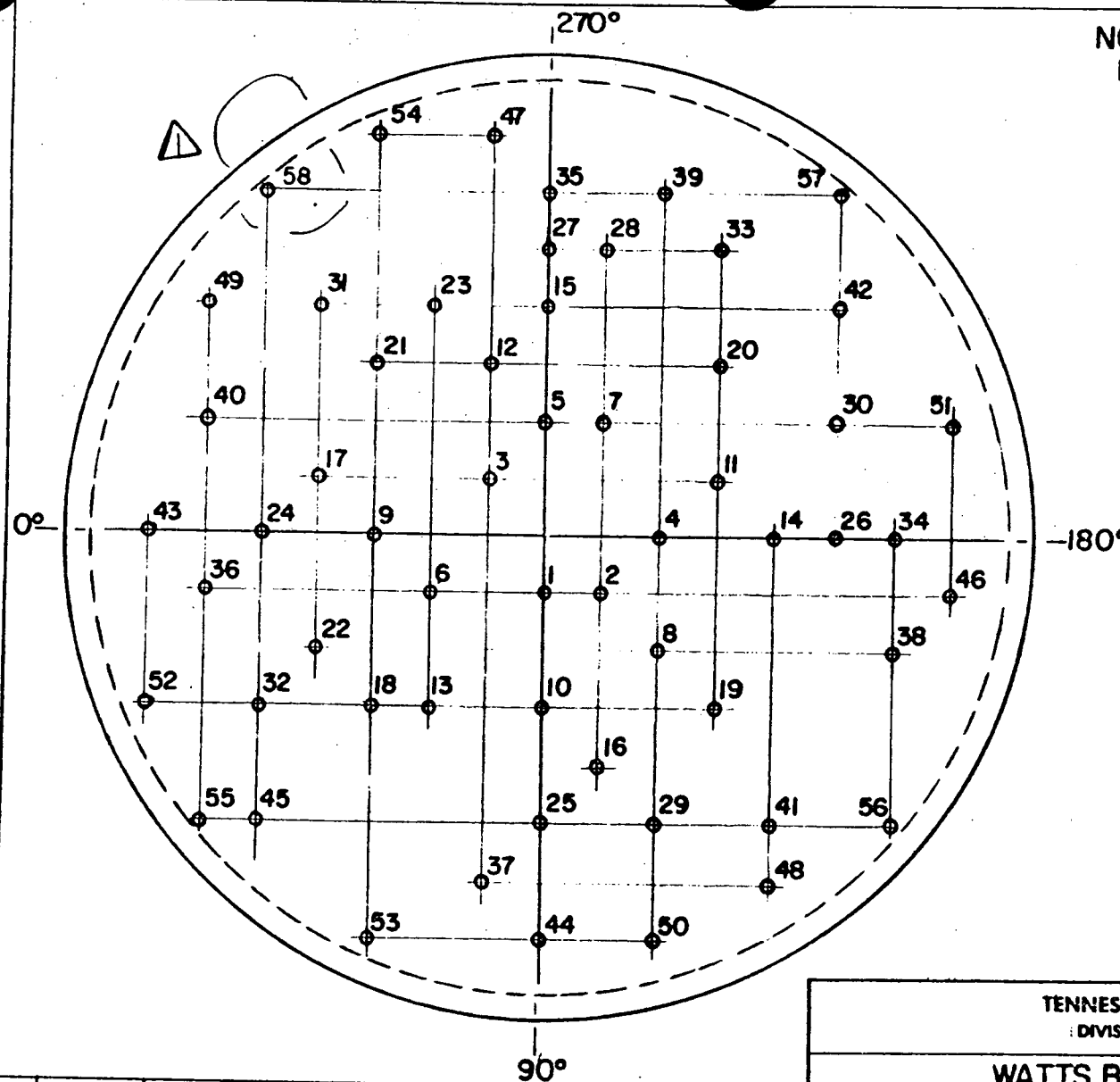
- NOTES: 1. See Section 7.0 for additional information.
 2. Item number and examination category from 1977 Edition, 1978 Summer Addenda of Section XI.

TABLE C (CONTINUED)

LIST OF DRAWINGS -UNIT #1

REACTOR VESSEL

<u>DRAWING NO.</u>	<u>TITLE</u>	<u>APPENDIX A PAGE NO.</u>
<u>HANGER LOCATION DRAWINGS CLASS 1 AND CLASS 2 (CONTINUED)</u>		
ISI-0025-C	Upper Head Injection	140-144
ISI-0026-C	Chemical and Volume Control	145-146
ISI-0063-C	CVCS Seal Water Injection	155-158
ISI-0117-A	Residual Heat Removal Pump Supports	43
ISI-0118-A	Centrifugal Charging Pump Supports	44
ISI-0119-A	Reciprocation Charging Pump Supports	44A
ISI-0120-A	Safety Injection Pump Supports	45
ISI-0121-A	Reactor Coolant Pump Supports	46
ISI-0124-C	Pressurizer Surge Line	159
<u>HANGER LOCATION DRAWINGS CLASS 3</u>		
ISI-0106-C	Safety Injection	160-162
ISI-0107-C	Residual Heat Removal	163
ISI-0108-C	Containment Spray	164
ISI-0109-C	Chemical and Volume Control	165
ISI-0110-C	Fuel Pool Cooling and Cleaning	166-170
ISI-0111-C	Auxiliary Feedwater	171-174
ISI-0112-C	Essential Raw Cooling Water	175-216
Later	Component Cooling	220-223
Later	Raw Service Water and Fire Protection	217-219



NOTES:

1. FOR PENETRATION DETAIL SEE SHEET 3

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TENNESSEE VALLEY AUTHORITY
DIVISION OF NUCLEAR POWER

WATTS BAR NUCLEAR PLANT
UNITS #1 & #2
REACTOR VESSEL
(BOTTOM HEAD PENETRATIONS)

1	7-11-84	CORRECTED PENETRATION # 44	MS DTL
NO	DATE	REVISIONS	CK'D APP.

SCALE: NTS
DRAWN: REV
TRACED
CHECKED: JCC

SUBMITTED

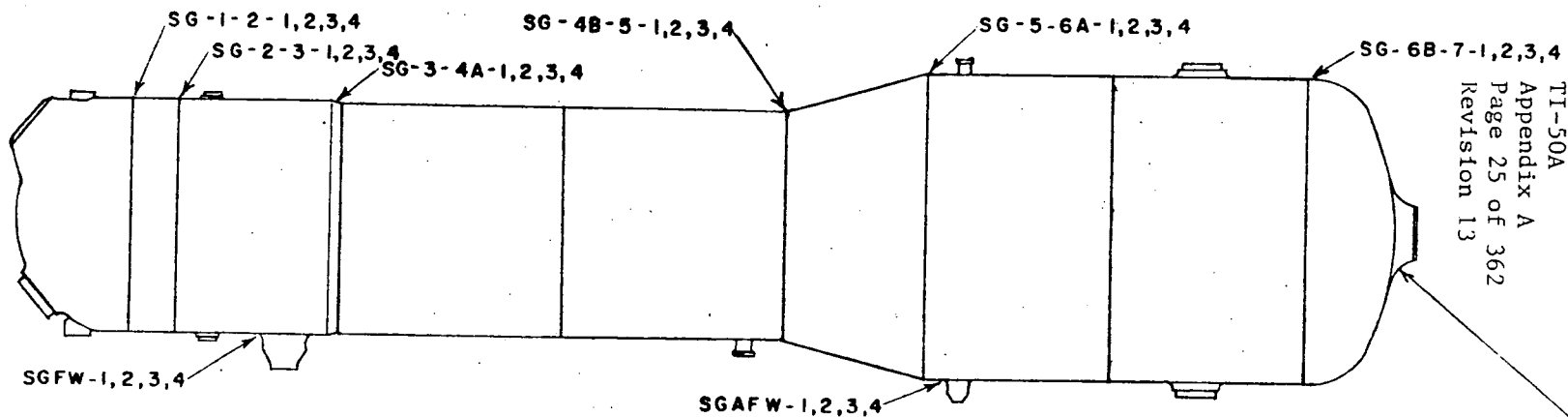
APPROVED

DATE 12/23/80

SHEET 2 OF 7 SHEETS

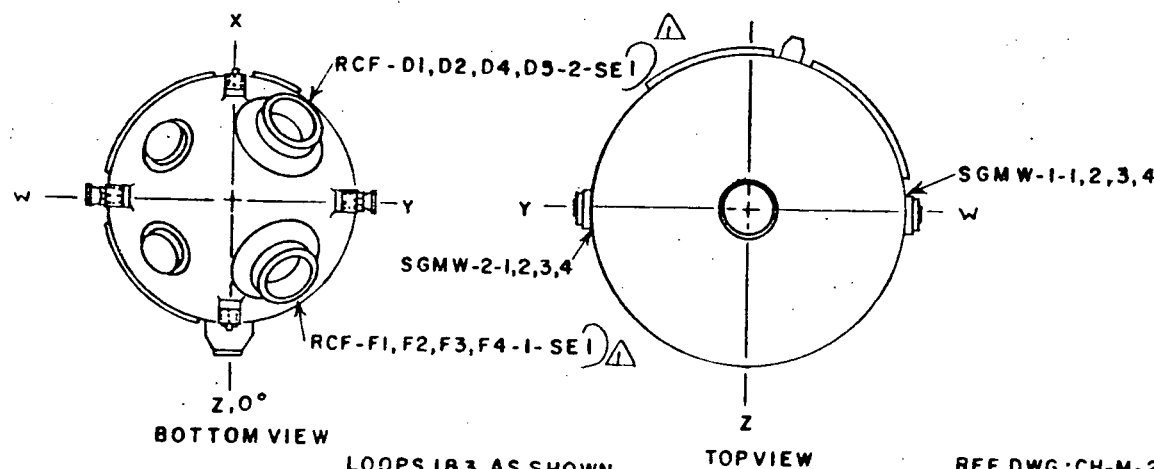
CH-M-2551-A

R



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4 MAIN STEAMNOZZLES
WELD NOS.(TYPICAL):
LOOP1, SGMS-1
LOOP2, SGMS-2
LOOP3, SGMS-3
LOOP4, SGMS-4



BOTTOM VIEW

TOPVIEW

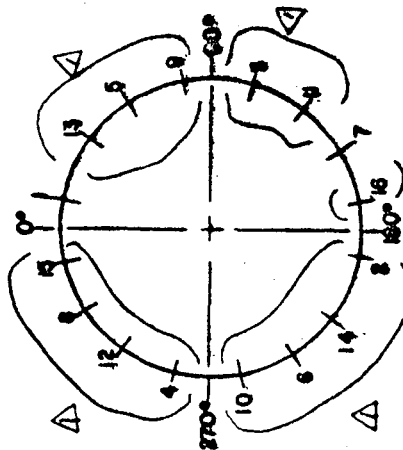
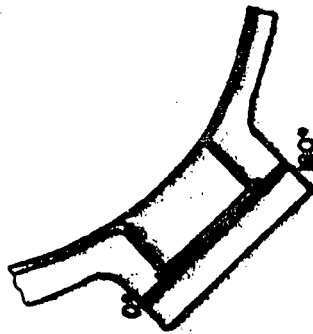
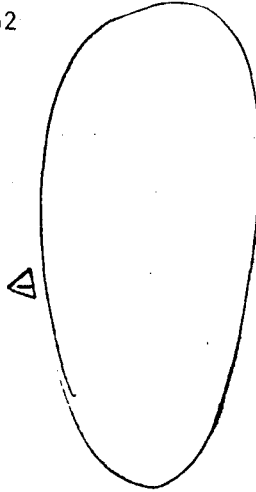
LOOPS 1&3 AS SHOWN
LOOPS 2&4 OPPOSITE HAND

1 BUTTERED SAFE END

REF. DWG.: CH-M-2547-B

1	6-13-84	ADD BUTTERED SAFE END	1/4	102	1/4
NO	DATE	REVISIONS		CK	DATE
TENNESSEE VALLEY AUTHORITY DIVISION OF POWER PRODUCTION					
WATTS BAR NUCLEAR PLANT UNITS #1 & #2 STEAM GENERATOR					
SCALE	NBS	SUBMITTED	APPROVED	DATE	4-26-79
DRAWN				SHEET	1 OF 2 SHEETS
TRACED				CH-M-2660-B	
CHECKED	JLG				

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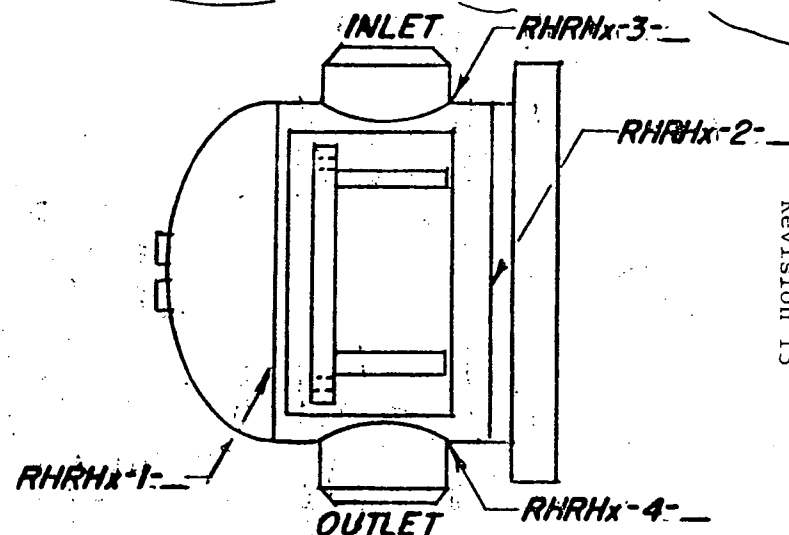
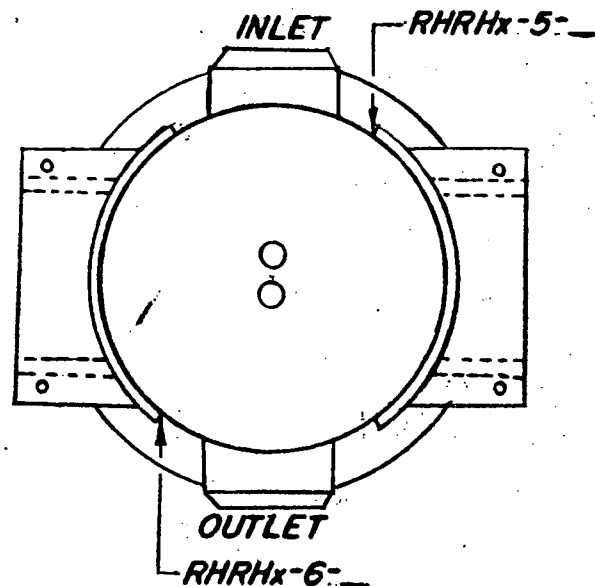
NO DATE	REVISIONS	OK DATE
TENNISSEE VALLEY AUTHORITY DIVISION OF NUCLEAR POWER		
WATTS BAR NUCLEAR PLANT UNIT #1 B #2 STEAM GENERATOR (PRIMARY MOUNTING BOLTING)		
DESIGNED BY	CHECKED BY	DATE
DATE	DATE	DATE
17/1/88	CORRECT BOLT NUMBER SEQUENCE	17/1/88
	AND DELETED NOTE	17/1/88

REFERENCE DRAWINGS

MATERIAL SPECIFICATION

CLASS 2
HEAD
SA-240 TP-304
1" THICK
FITTINGS
SA-336F8

SHELL
SA-240 TP304
1" THICK
FLANGE
SA-336F8



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NOTE: PLACE HEAT EXCHANGER NUMBERS
AT END OF WELD NUMBER

TENNESSEE VALLEY AUTHORITY
DIVISION OF POWER PRODUCTION

WATTS BAR NUCLEAR PLANT
UNITS #1 & #2
RESIDUAL HEAT REMOVAL
HEAT EXCHANGER
CHANNEL WELDS

1	7-11-84	ADD MATERIAL SPECS.			
NO	DATE	REVISIONS			

SCALE: NTS	SUBMITTED	APPROVED	DATE 5/3/79
DRAWN KEY			SHEET 1 OF 1
TRACED			CH-11-1002-2
CHECKED			

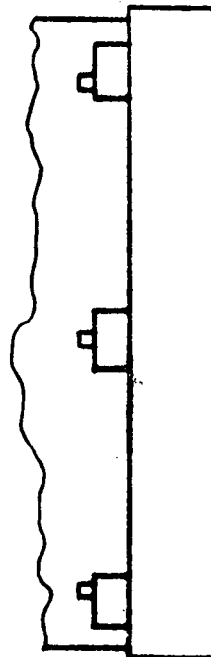
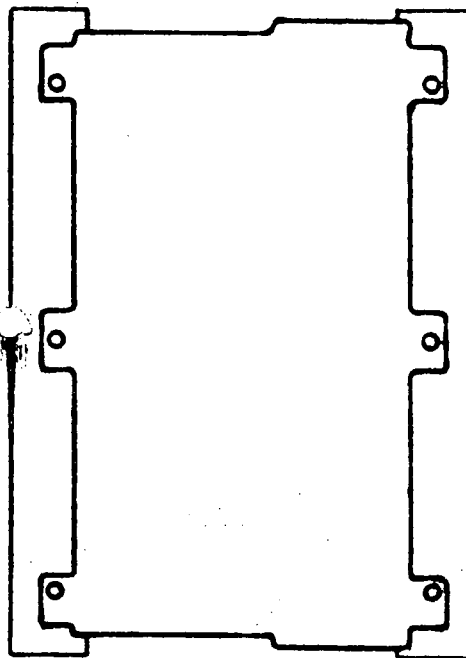
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REFERENCE DRAWINGS

OP-EN742885

NOTES

1. THE PUMP FEET ARE BOLTED TO A COMMON SUPPORT.
2. PUMP SUPPORT NUMBERS
PDPH-1C
PDPH-2C

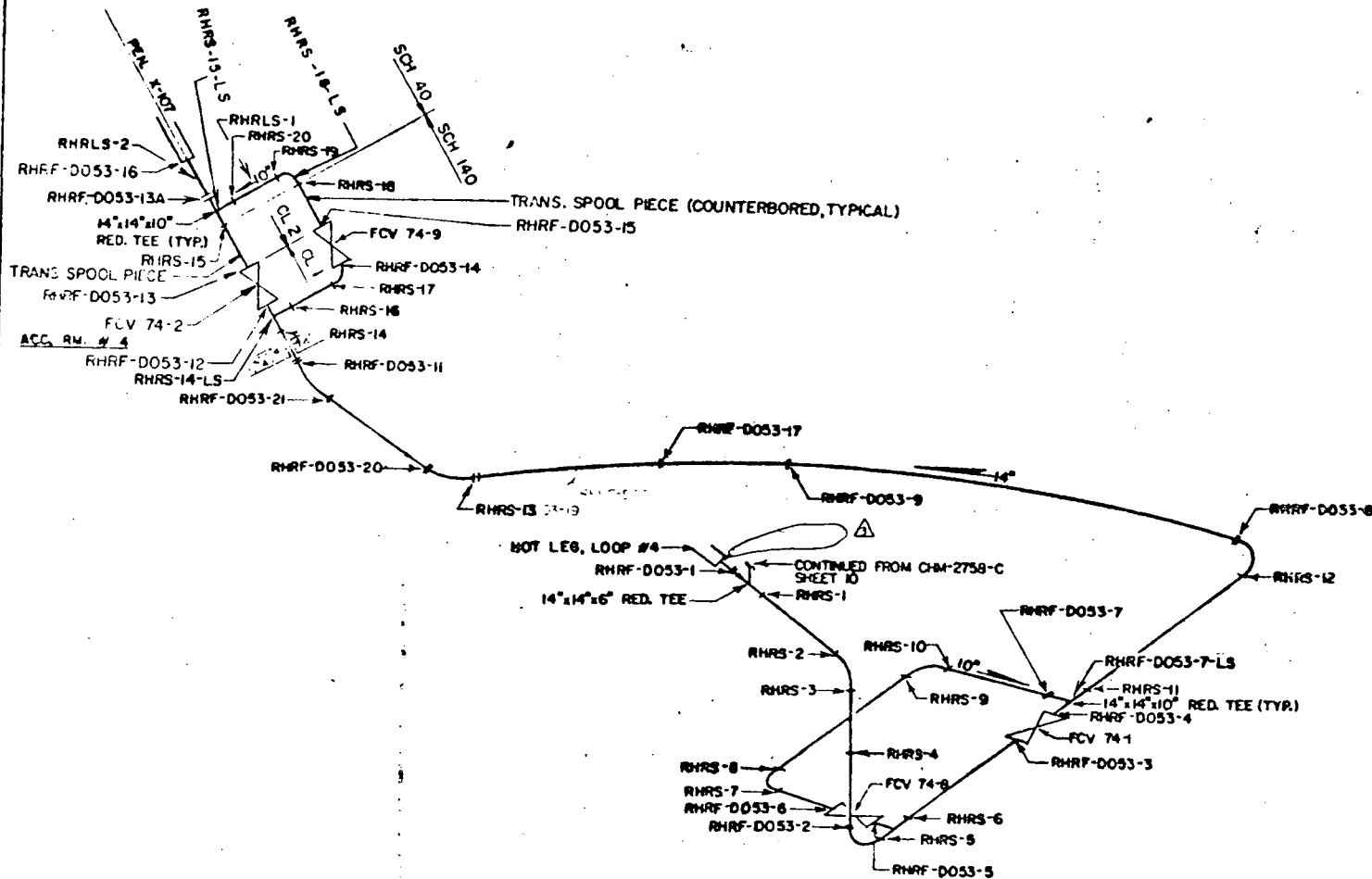


TENNESSEE VALLEY AUTHORITY
DIVISION OF NUCLEAR POWER

WATTS BAR NUCLEAR PLANT
UNITS #1 & #2
RECIPROCATING CHARGING PUMP SUPPORTS
(POSITIVE DISPLACEMENT PUMP)

SCALE: <i>NYS</i>	DRAWN: <i>ADN</i>	DATE: <i>9-2-83</i>
TRACED: <i>TCG</i>	APPROVED: <i>[Signature]</i>	SHEET 1 OF 1 SHEETS
		10-019-A

CONT. ON SHEET 2 OF 7



CLASS 1
 PIPE
 14" 8 10" SCH. 140, SA-376 TP. 315 S
 FITTINGS
 14" 8 10" SCH. 140, SA-403 WP 316 S

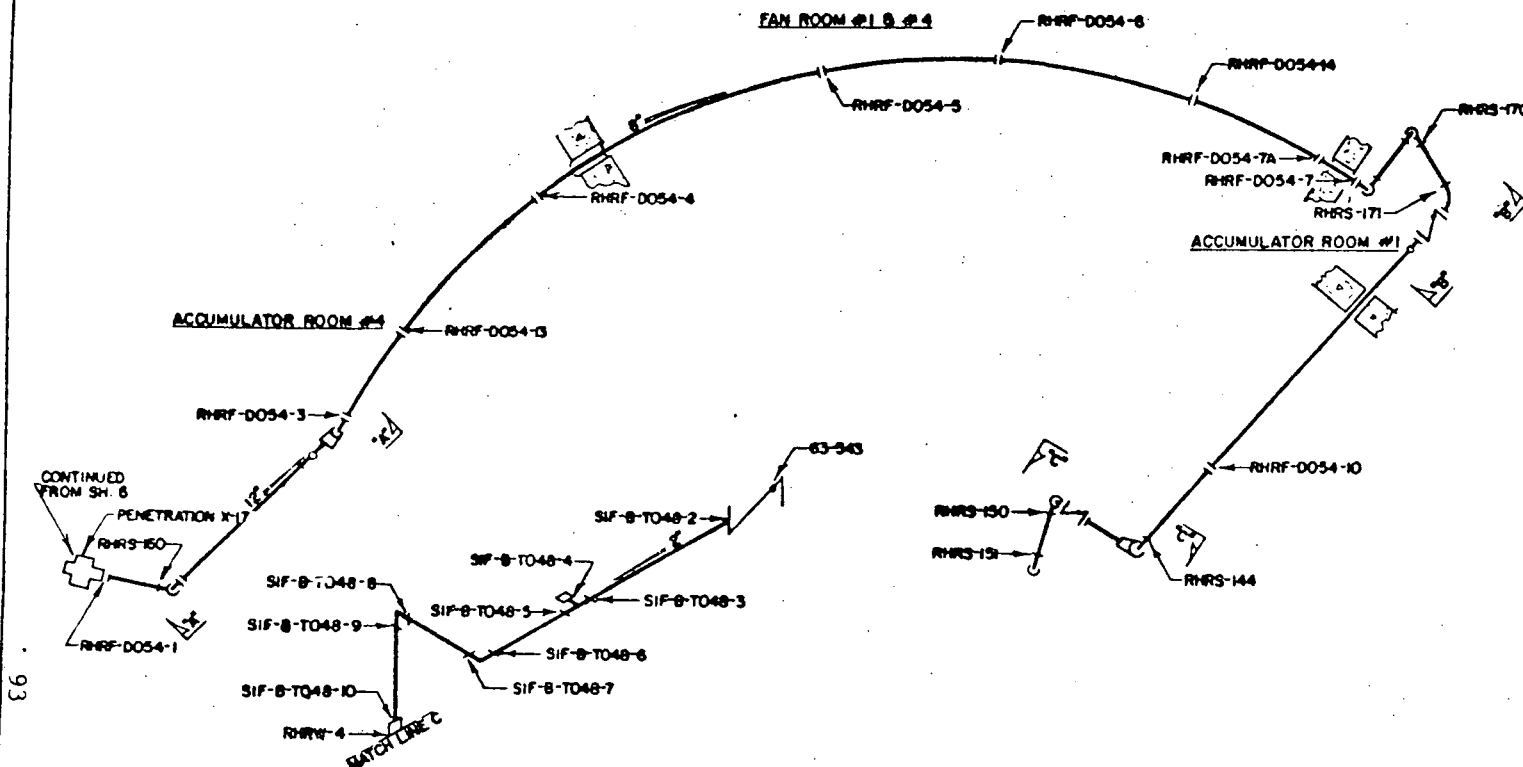
CLASS 2
 PIPE
 14" SCH. 40, SA-358 CL. 1 TP 304 W
 10" SCH. 40S, SA-312 TP 304 W
 FITTINGS
 14" SCH. 40, SA-403 WP 304 W
 10" SCH. 40S, SA-403 WP 304 WWO
 TRANSITION SPOOL PIECES
 14" SCH. 140, SA-358 CL. 1 TP 304 S
 10" SCH. 140, SA-312 TP 304 S

REF. DWGS.
 DRAVO E-2879-1C-53

SHOP WELDS RHRF-1 THRU RHRF-21

NO.	DATE	REVISIONS
1	7-12-84	DELETED WELD NUMBER 14
2	1-14-84	CHANGE 303 TO 304 W
3	10-16-81	ADD CONTINUOUS RHRF-21
4	10-16-81	WELD NUMBERS REV
5	10-16-81	WELD NUMBERS REV

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REFERENCE DRAWINGS

WBN-E-2879 C-34
SC 435-7 SH.6

MATERIAL SPECIFICATION

CLASS 1

PIPING

SEAMLESS STAINLESS STEEL
SA 376 TP 304

8" SCH. 160

6" SCH. 160

2" SCH. 160

FITTINGS

SEAMLESS STAINLESS STEEL
SA 403 WP 304

8" SCH. 160

6" SCH. 160

STAINLESS STEEL
SA 182 P 304

2" 6000# S/W

CLASS 2

PIPING

SEAMLESS STAINLESS STEEL
SA 376 TP 316

12" SCH. 140

SA 376 TP 304

8" SCH. 160

FITTINGS

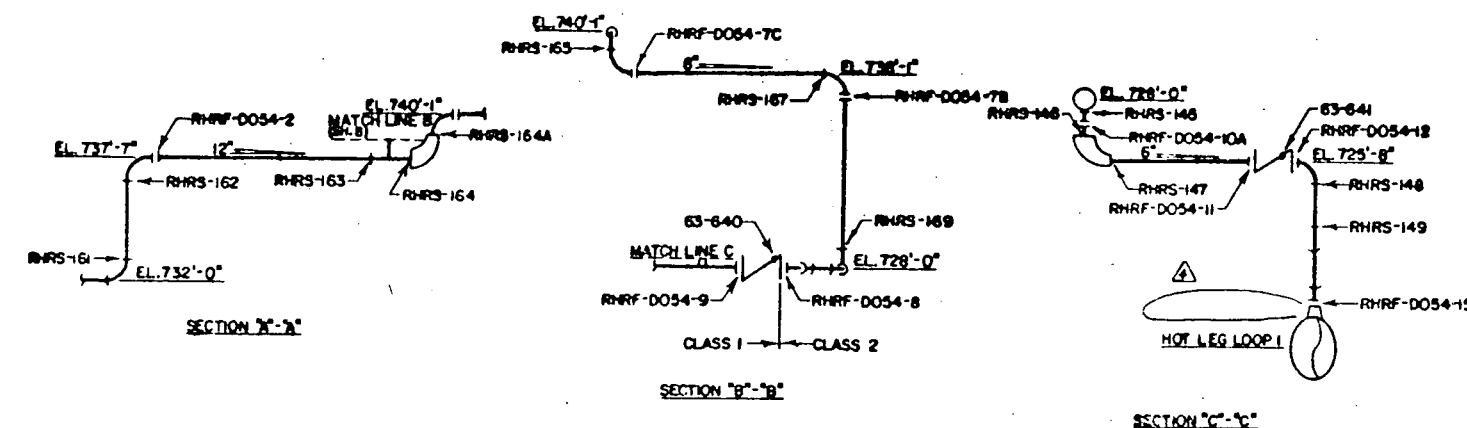
SEAMLESS STAINLESS STEEL
SA 403 WP 316

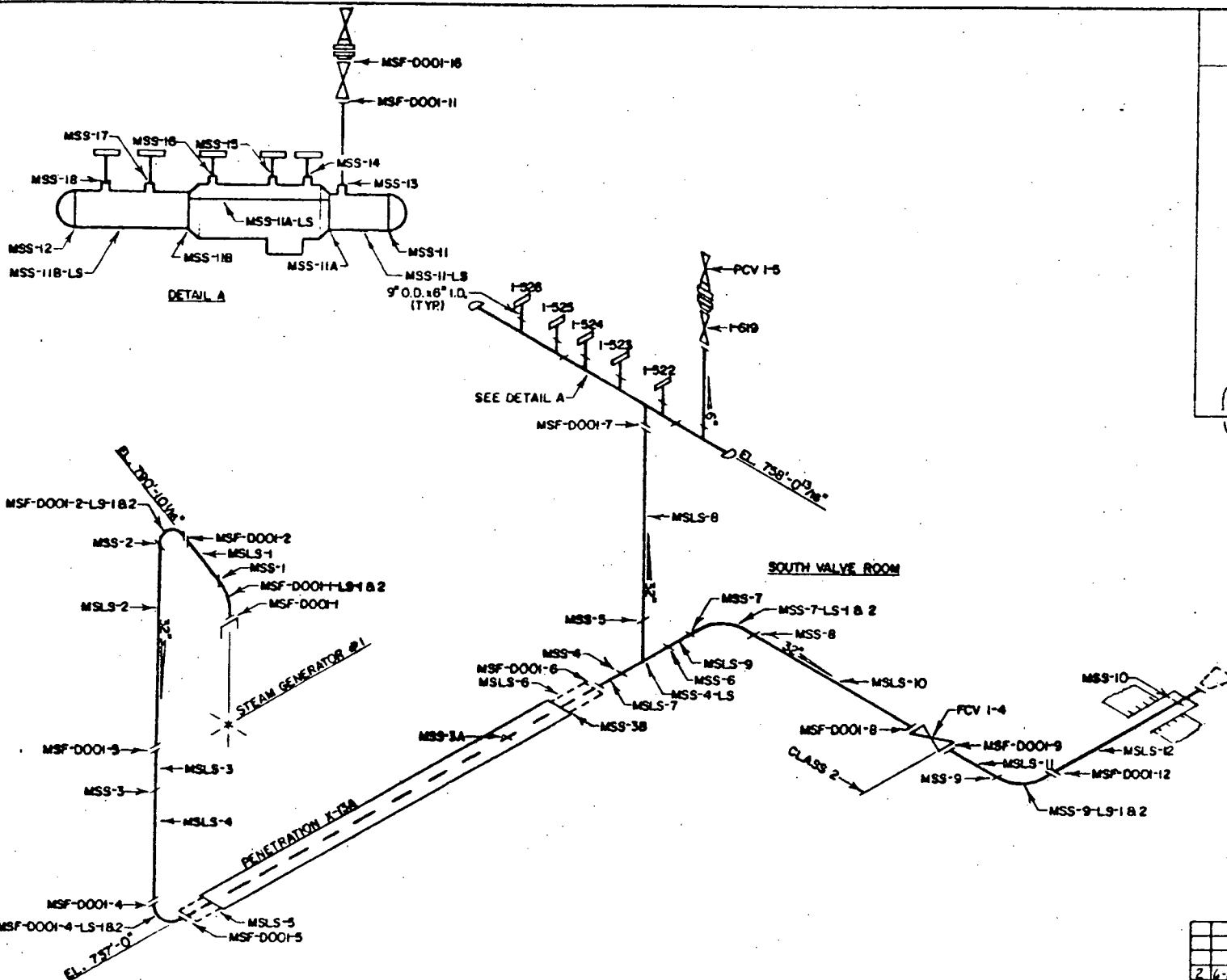
12" SCH. 140

SA 403 WP 304

8" SCH. 160

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REFERENCE DRAWINGS

WBN-E-2878 IC-1
WBN-E-2880 IC-203
47W331

MATERIAL SPECIFICATIONS

CLASS 2

PIPE

SA-155 KCF 70 CL. 1
32" O.D. x 1.175" M.W.

FITTINGS

SA-234 WPB-W
32" O.D. x 1.175" M.W.

HEADER

PIPE
SA-106 GR. B
6" XXS

FITTINGS

SA-234 WPB
30" x 1.109" M.W. WELDED CAP

FLANGES

SA-105

9" O.D. x 6" I.D. 1500 #

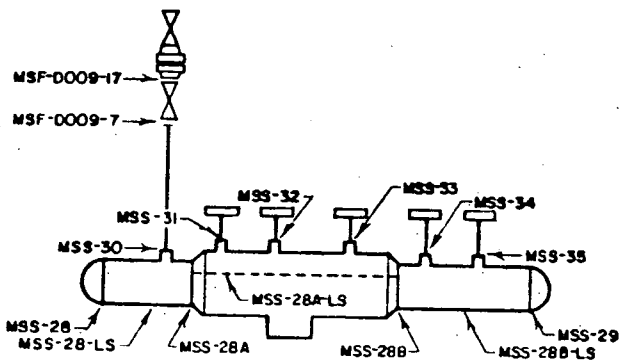
RELIEF VALVE MANIFOLD

SA-234 WPBW, 2.875" M.W.

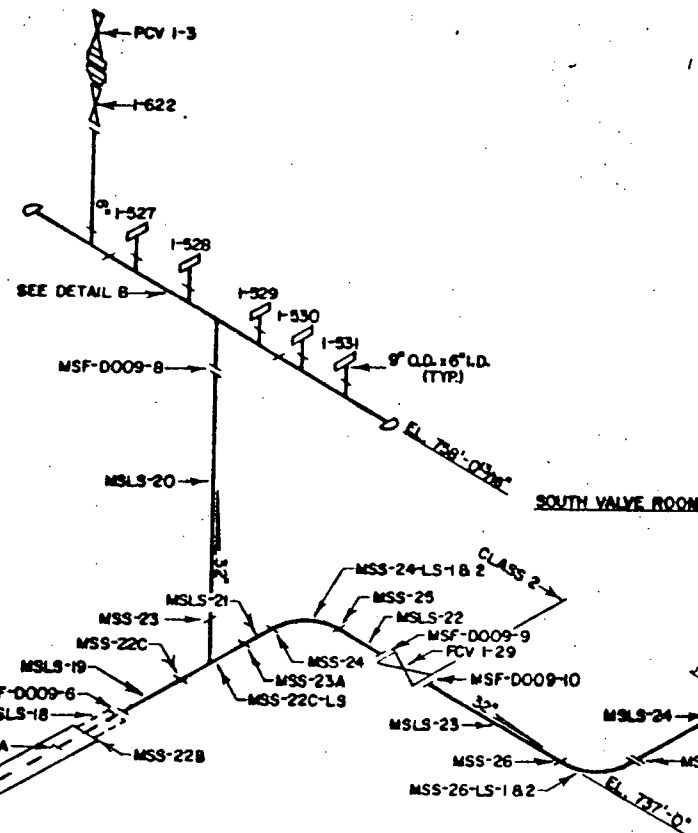
WBNP
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2	6-14-84	ADD MAT. SPECS. 11A	MA DTP
1	6-27-83	REWORK AND ADD LOW. SEALS 11V	ICC/APP
NO.	DATE	REVISIONS	CHKD/APP
TENNESSEE VALLEY AUTHORITY			
DIVISION OF NUCLEAR POWER			
WATTS BAR NUCLEAR PLANT			
UNIT #1			
MAINSTEAM SYSTEM			
WELD LOCATIONS			
SCALE: 1/2" = 1'-0"	DATE: 6-22-83	BY: JTB	CHKD: JTB
DESIGNED BY: JTB	REVIEWED BY: JTB	APPROVED BY: JTB	DATE: 6-22-83
CHN-2669-C R2			

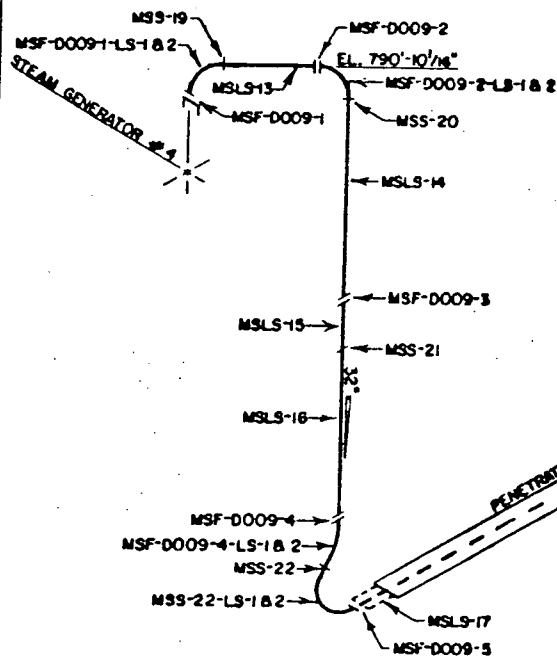
SHOP WELD MSS-1 THRU MSS-18, MSS-32, MSS-11A, AND MSS-11B
PIPE LONG SEAM WELDS MSL-1 THRU MSL-12



DETAIL B



SOUTH VALVE ROOM



SHOP WELDS MSS-19 THRU MSS-35, MSS-22A, MSS-22B, MSS-22C, MSS-23A, MSS-28A, AND MSS-28B
PIPE LONG SEAM WELDS MSLS-13 THRU MSLS-24

REFERENCE DRAWINGS

WBN-E-2878 IC-9
WBN-E-2880 IC-204
47W331

MATERIAL SPECIFICATIONS

CLASS 2

PIPE

SA-155 KCF 70 CL. 1
32" O.D. x 1.175" M.W.

FITTINGS

SA-234 WPB-W
32" O.D. x 1.175" M.W.

HEADER

PIPE
SA-106 GR. B
6" XXS

FITTINGS

SA-234 WPB

30" x 1.109" M.W. WELDED CAP

FLANGES

SA-105

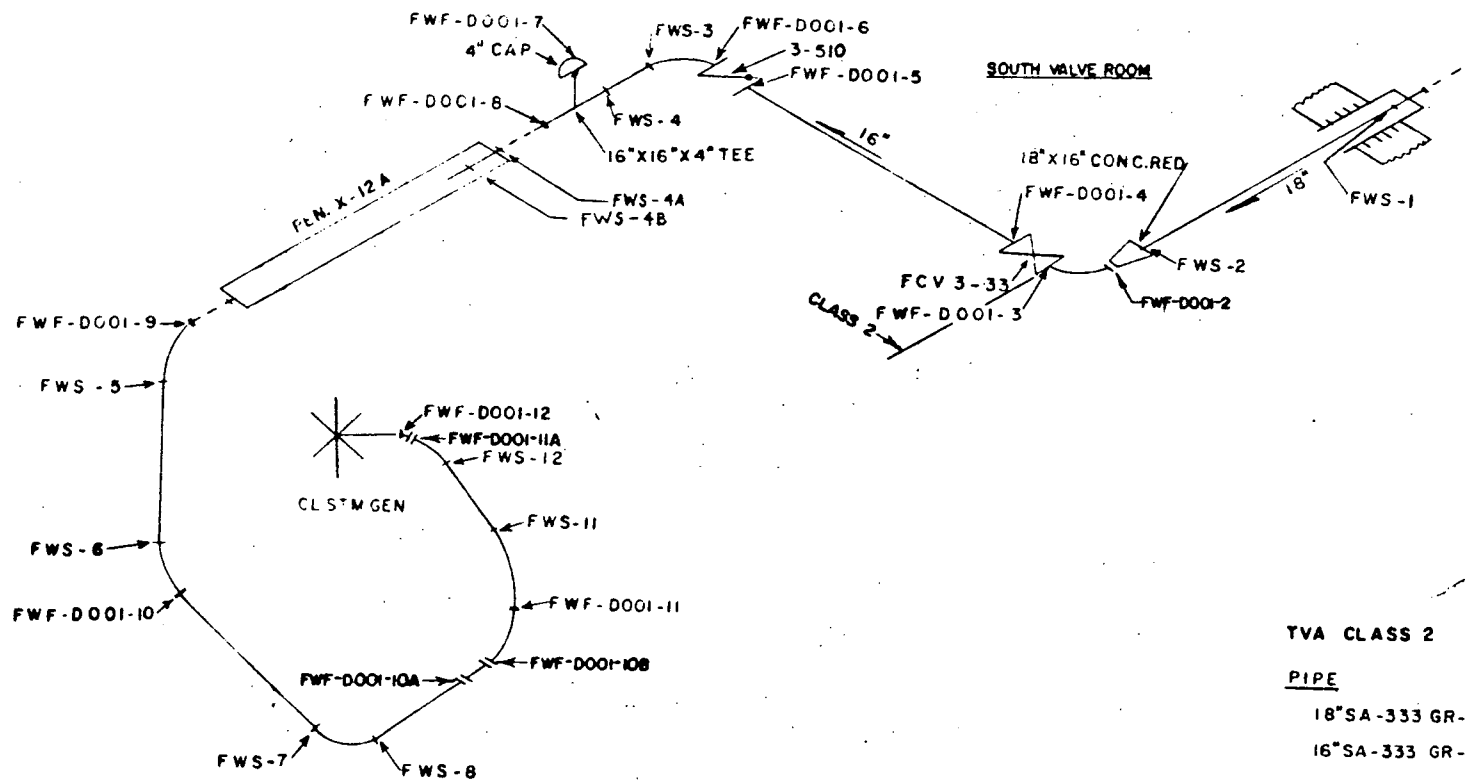
9" O.D. x 6" I.D. 1500#

RELIEF VALVE MANIFOLD

SA-234 WPBN, 2.875" M.W.

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NO.	DATE	REVISIONS	OK'D APR.
3	6-14-84	ADD MAT. SPECS. <i>ML</i>	<i>ML</i>
2	6-27-83	RETHROW AND ADD LONG SEAM WELDS <i>JCL</i>	<i>JCL</i>
1	1-7-82	CORRECT AND ADD WELD MTS. ACTV <i>JCL</i>	<i>JCL</i>
Tennessee Valley Authority DIVISION OF NUCLEAR POWER WATTS BAR NUCLEAR PLANT UNIT #1 MAINSTREAM SYSTEM WELD LOCATIONS			
SCALE	875'	DATE	6-27-83
DESIGN	<i>ML</i>	DATE	2-23-83
APPV	<i>ML</i>	DATE	6-27-83
CHN-2669-C/R			



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TVA CLASS 2

PIPE

18"SA-333 GR-6 SCH 80

16"SA-333 GR-6 SCH 80

FITTINGS

18"X16"SA-420WPL6SCH80,SMLS

16"90°EII SA-420WPL6SCH80,SMLS

REF. DRAWING:

△ WBN E-2879 IC-1

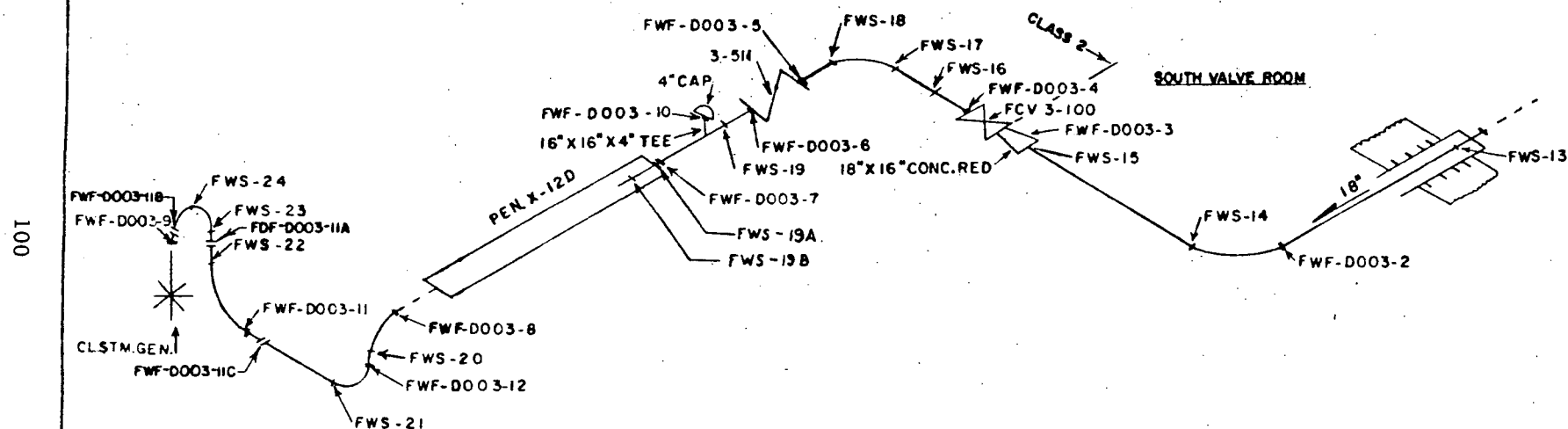
TENNESSEE VALLEY AUTHORITY
 DIVISION OF POWER PRODUCTION

WBNP
 FEEDWATER WELD MAP
 UNIT 1 LOOP 1

2	4-7-84	CORRECT REF DRAWING WPL	WBS	77
1	1-19-84	ADD ROOM NAME, NO. DELETE, AND CHANGE	WBS	77
		WELL NOS., CLASSTIC CLASS DESIGNATIONS		
		ADD CLASS BREAK & DELETE REF. DRG. REV		
NO.	DATE	REVISIONS	CK	APP

SCALE	SUBMITTED	APP	DATE
AS SHOWN		YJB	
DATE			

CHM-2671-C 92



SEE SHEET ONE FOR NOTES

REF DRAWING
 WBNE-2879 IC-3

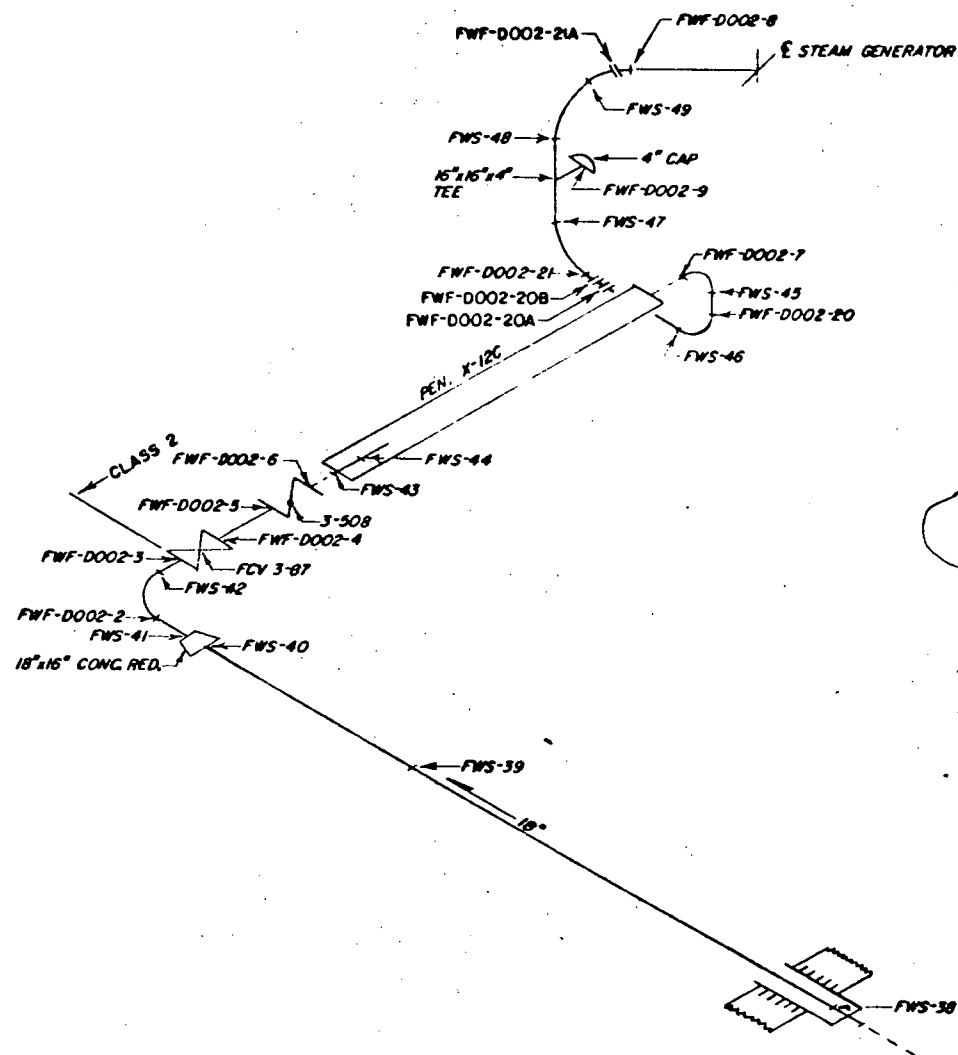
NO.	DATE	REVISIONS	CKD	APP
2	6-7-84	CORRECT REF DRAWING	HA	SLB
1	1-14-84	ADD AND DELETE WELDS, ADD ROOM MARKS	SLB	WLB
		MOD CLASS BREAK, DELETE REF. DWG. KEY		
TENNESSEE VALLEY AUTHORITY				
DIVISION OF POWER PRODUCTION				
WBNP				
FEEDWATER WELD MAP				
UNIT 1 LOOP 4				
SCALE	DATE	BY	DATE	BY
1/8\"	1/8\"	SLB	1/8\"	SLB
CHM-2671-C				



WBN E-2879 IC-2

SEE SHEET ONE FOR NOTES

[illegible]



MBNP
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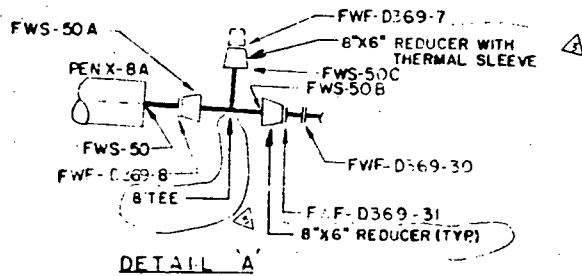
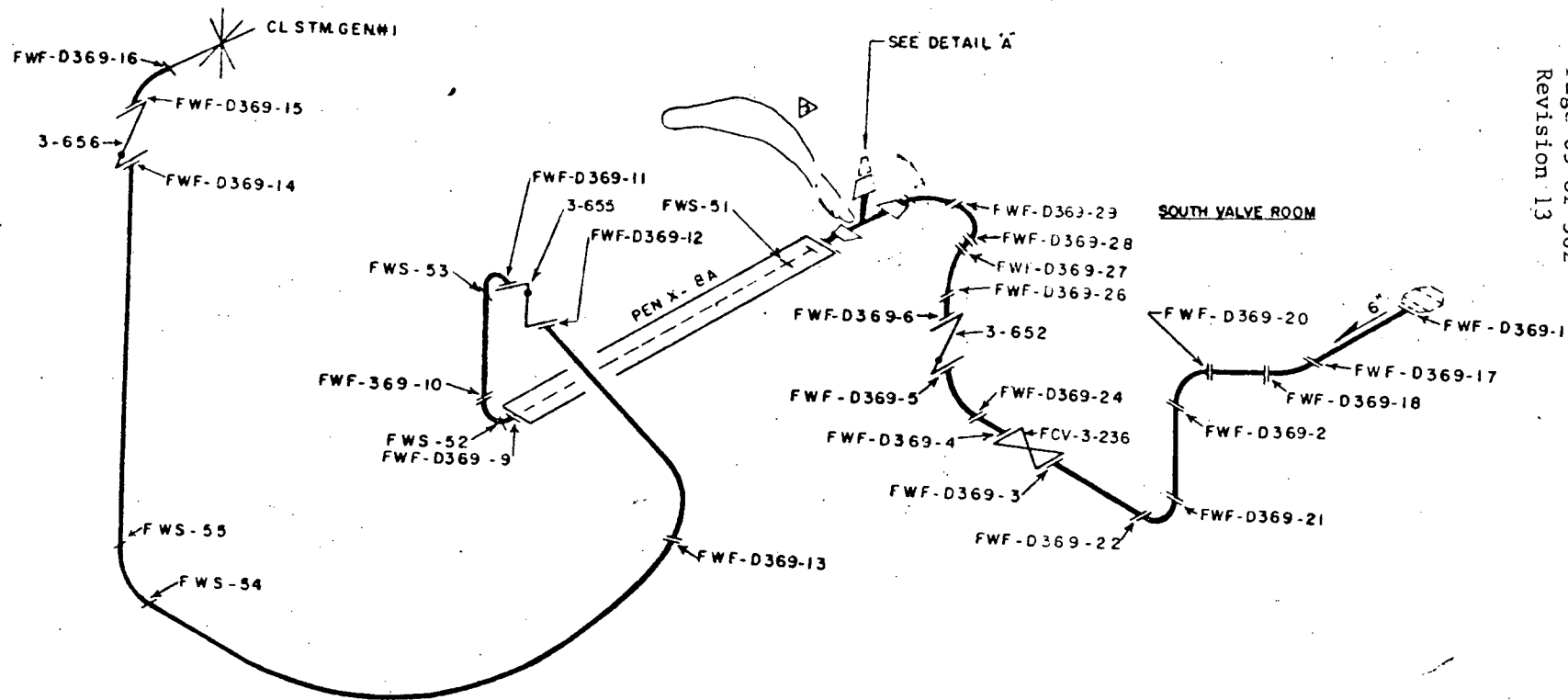
SEE SHEET 1 FOR NOTES

TENNESSEE VALLEY AUTHORITY
DIVISION OF POWER PRODUCTIONWATTS BAR NUCLEAR PLANT
UNIT 1
FEEDWATER
WELD MAP LOOP 3

NO.	DATE	REVISIONS	CK'D	APP.
2	6-7-84	CORRECT REF. DRAWING	SLB	JTS
1	1-14-84	ADD AND DELETE WELDS, ADD ROOM NAME	SLB	JTS
		CLASS BREAK & DELETE REF. DNG. KEY		

SCALE: NTS	QUANTITY	DATE: 5/4/89	CH: N-2871-C

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REF DRAWING
 WBN E-2879 IC 369

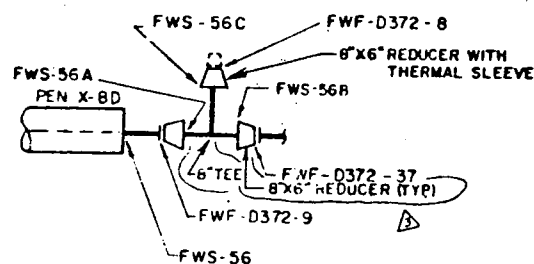
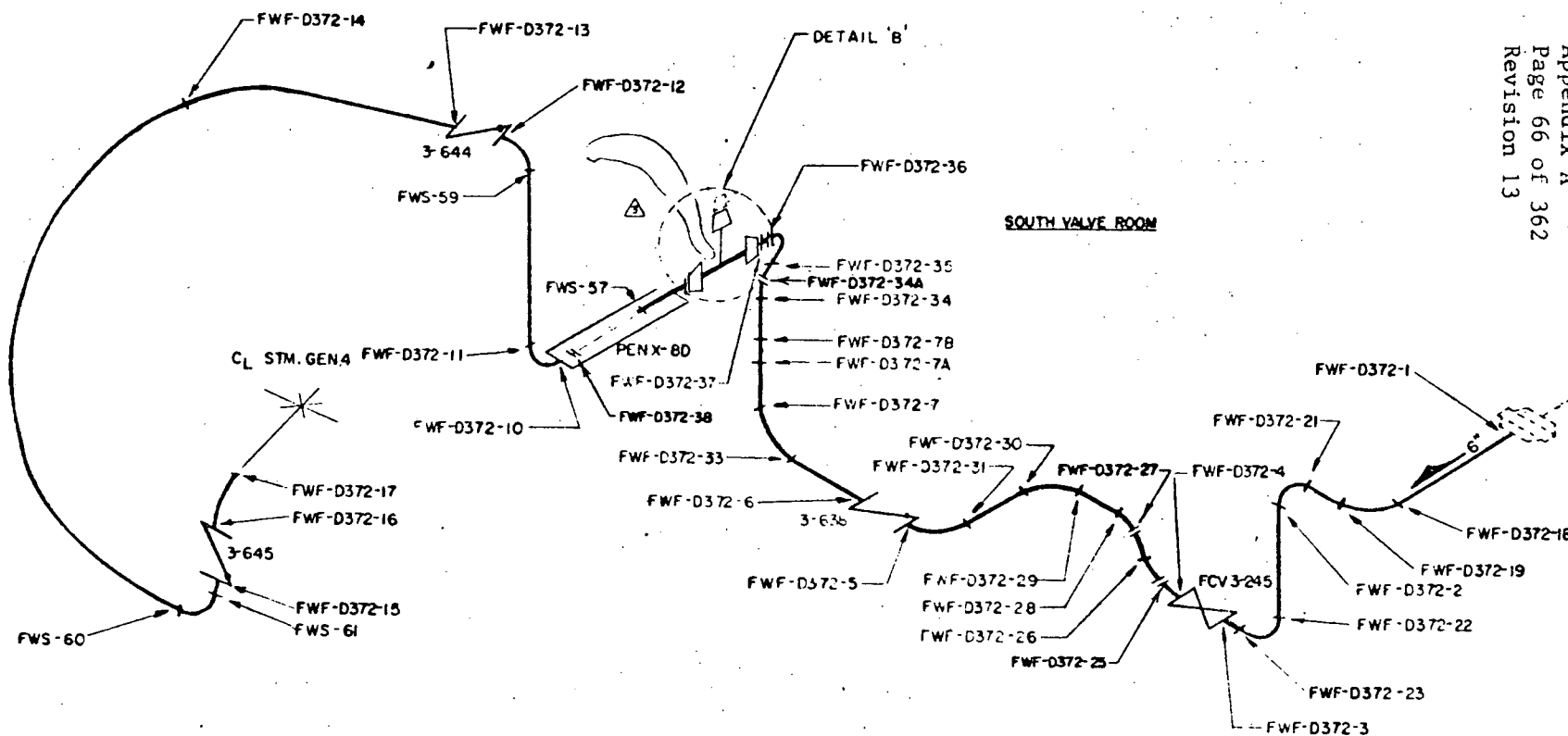
TVA CLASS 2
 PIPE
 6" SA-333 GR6 SCH 80

FITTINGS
 SA-420 WPL6
 6" SCH 80
 8" SCH 80
 THERMAL SLEEVE SA-350 LFE
 8" X 6" SCH 80

NO.	DATE	REVISIONS
3	7-13-64	ADD MATERIAL AND NOTE TO THERMAL SLEEVE
2	1-14-64	TEK + CORRECT WELDING
1	1-6-62	DELETE REPLATED WELD NOS. AND

TENNESSEE VALLEY AUTHORITY DIVISION OF POWER PRODUCTION	
WBNP 6" FEEDWATER WELD MAP UNIT 1 LOOP 1	
DATE: 7-13-64	APPROVED: [Signature]
BY: [Signature]	DATE: 7-13-64

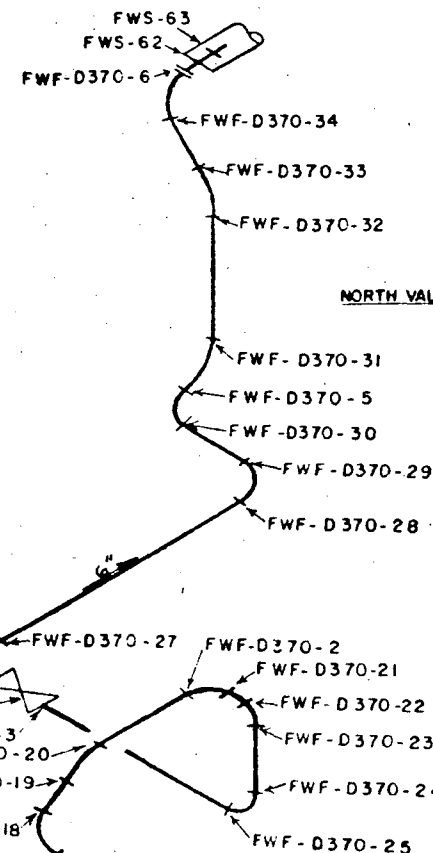
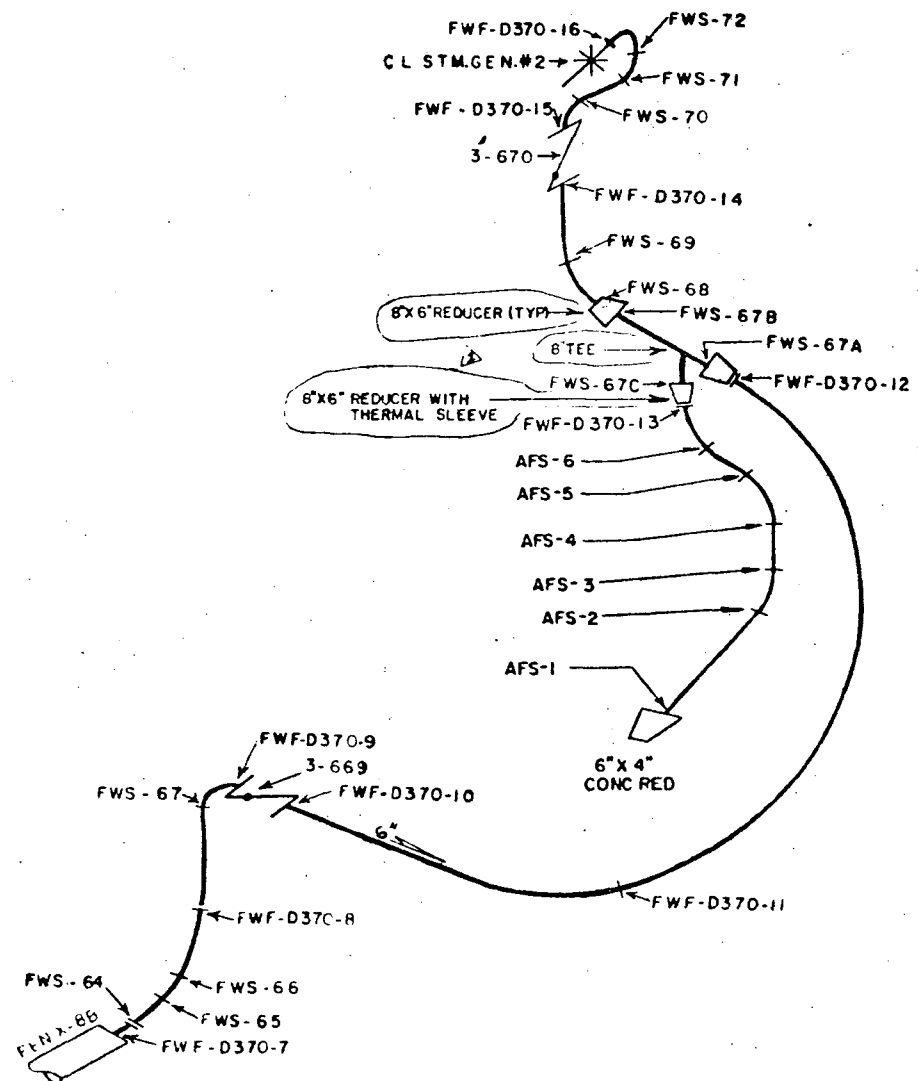
WBNP
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REF. DRAWING
 WBN E 2879 IC-372

SEE SHEET #5 FOR NOTES

TENNESSEE VALLEY AUTHORITY DIVISION OF POWER PRODUCTION			
WBNP 6" FLEEWATER WELD MAP		UNIT 1 LOOP 4	
NO.	DATE	REVISIONS	BY
3	7-13-84	ADD NOTE TO THERMAL TEE AND CORRECT REVISION DWS VHL	WQ
2	1-14-84	ADD WELDS FROM VARIOUS DATE RE DWS VHL	WQ
1	1-8-82	DELETE REPEATED WELD REVISIONS AND ADD WELDS	WQ
DATE		REVISIONS	BY
			WQ



NORTH VALVE ROOM

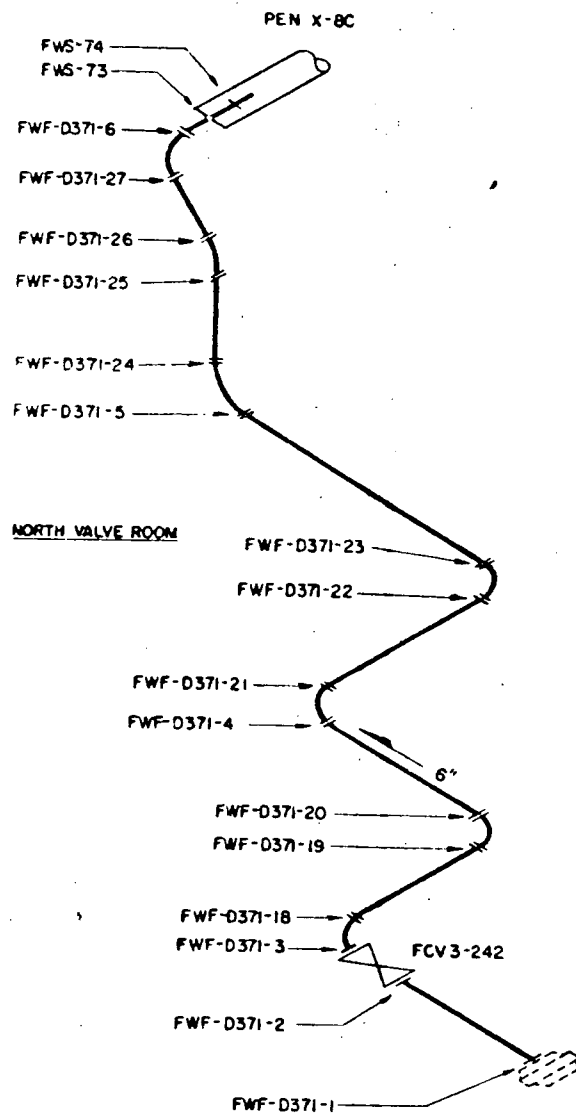
WBNP
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SEE SHEET #5 FOR NOTES

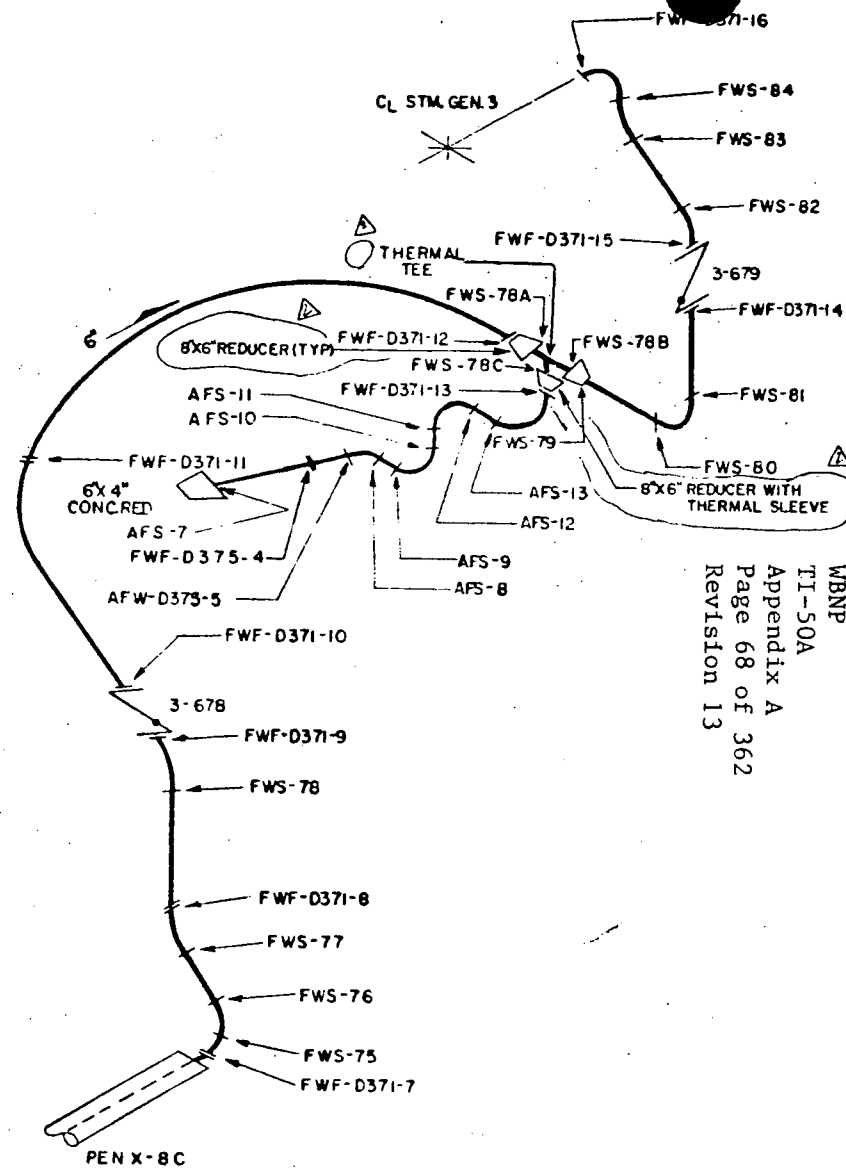
REF DRAWING

WBN E-2879 IC-370
IC-374

TENNESSEE VALLEY AUTHORITY			
DIVISION OF POWER PRODUCTION			
WBNP			
6" FEEDWATER WELD MAP			
UNIT 1 LOOP 2			
NO.	DATE	REVISIONS	BY
1	7-14-84	CORRECTED REFERENCE DWG. #1 ADD ROOM NAME & DELETE REF. DWG. #1	WJB
2	7-14-84	AND NOTE TO THERMAL TEE AND SEE SHEET 5	WJB
3	7-14-84	ADD ROOM NAME & DELETE REF. DWG. #1	WJB
4	7-14-84	ADD ROOM NAME & DELETE REF. DWG. #1	WJB
5	7-14-84	ADD ROOM NAME & DELETE REF. DWG. #1	WJB
6	7-14-84	ADD ROOM NAME & DELETE REF. DWG. #1	WJB
7	7-14-84	ADD ROOM NAME & DELETE REF. DWG. #1	WJB
8	7-14-84	ADD ROOM NAME & DELETE REF. DWG. #1	WJB
9	7-14-84	ADD ROOM NAME & DELETE REF. DWG. #1	WJB
10	7-14-84	ADD ROOM NAME & DELETE REF. DWG. #1	WJB



NORTH VALVE ROOM



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REF DRAWING
WBN/E-2879 IC-371, IC-375

SEE SHEET #5 FOR NOTES

TENNESSEE VALLEY AUTHORITY
DIVISION OF POWER PRODUCTION

WBNP
6" FEEDWATER WELD MAP
UNIT 1 LOOP 3

NO.	DATE	REVISIONS
2	7-13-84	ADD NOTE TO THERMAL TEE AND CORRECT REFERENCE Dwg. #4
1	1-14-84	ADD ROOM NAME & Dwg. REF. Dwg. #1

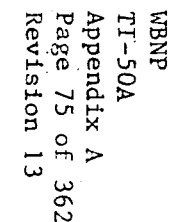
SCALE: 1/4" = 1'-0"	DATE: 6-18-83
BY: JWB	CHKD: CHM
APPROVED: JWB	DATE: 6-18-83

CHM-267-C

L THE FITTING BETWEEN WELDS
SIS-91 AND SIF-D089-12 HAS
A LONGITUDINAL WELD.

WBN-E-2879 IC-69
SK, 435-7 SH. 2

2" 6000# S/W



SHOP WELDS SIS-87 SIS-87 TRV SIS-90 SIS-94, AND SIS-95.

4	6-6-84	DELETE WELD NOS. 44	84	7	11
3	1-14-84	CORRECT AND ADD WELD NOS. NOTES, ROOM NAMES, CHANGE CLASS DESIGNATIONS AND	84	11	11
2	9-23-81	DELETE REF. DING REV LEVEL KEY	81	11	11
1	1-15-81	WELD NOS. 44 TO 100	81	11	11
NO.	DATE	REVISIONS	NO.	DATE	REVISIONS

TENNESSEE VALLEY AUTHORITY
 DIVISION OF POWER PRODUCTION
 WBNP
 SAFETY INJECTION WELD MAP
 UNIT 1 L-1

SCALE 1/2"	APPROVED	DATE
DESIGNED BY	11/2	11/2
CHECKED BY		
DATE		

CHN 3783-C

REFERENCE DRAWINGS

SK. 435-18 SH. 1-2 WESTINGHOUSE
WBN E-2879 IC-40 7243 001

MATERIAL SPECIFICATIONS

CLASS 1

PIPE

SA 376 TP 316

12" SCH 140

8" SCH 160

8" SCH 140

SA 312 TP 304

5" SCH 140, 0.515" NW

SA 376 TP 304

2" SCH 160

FITTINGS

SA 403 WP 316

12" SCH 140

8" SCH 160

8" SCH 140

SA 182 F 304

2" 6000# S.W.

CLASS 2

PIPE

SA 376 TP 316

12" SCH 140

FITTINGS

SA 403 WP 316

12" SCH 140

120

RACEWAY

CONTINUED
FROM SH. 5

PENETRATION X-108

UHF-DO40-1

UHF-DO40-3

87-562

UHF-DO40-2

UHS-64

UHS-2

UHS-1

EL. 712'-8 3/4"

UHS-4

UHS-3

UHF-DO40-4

UHS-5

UHF-DO40-5

UHS-6

UHF-DO40-6

UHS-7

UHS-8

UHS-14

UHF-DO40-7

UHS-9

UHS-10

UHS-12

UHS-13

UHF-DO40-9

UHF-DO40-10

UHF-DO40-11

UHF-DO40-12

UHF-DO40-13

UHF-DO40-14

UHF-DO40-15

UHF-DO40-16

UHF-DO40-17

UHS-16

UHS-17

UHS-18

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UHS-223

UHS-224

UHS-225

UHS-226

UHS-227

UHS-228

UHS-229

UHS-230

UHS-231

UHS-232

UHS-233

UHS-234

UHS-235

UHS-

REFERENCE DRAWINGS

WBN E-2879 IC-42 WESTINGHOUSE
SK. 435-18 SH. 1-2 7243 D01

MATERIAL SPECIFICATIONS

CLASS 1

PIPE

SA 376 TP 316

12" SCH 140

8" SCH 160

8" SCH 140

SA 312 TP 304

5" SCH 140, O. 545" N.W.

SA 376 TP 304

2" SCH 160

FITTINGS

SA 403 WP 316

12" SCH 140

8" SCH 160

8" SCH 140

SA 182 F 304

2" 6000# S.W.

CLASS 2

PIPE

SA 376 TP 316

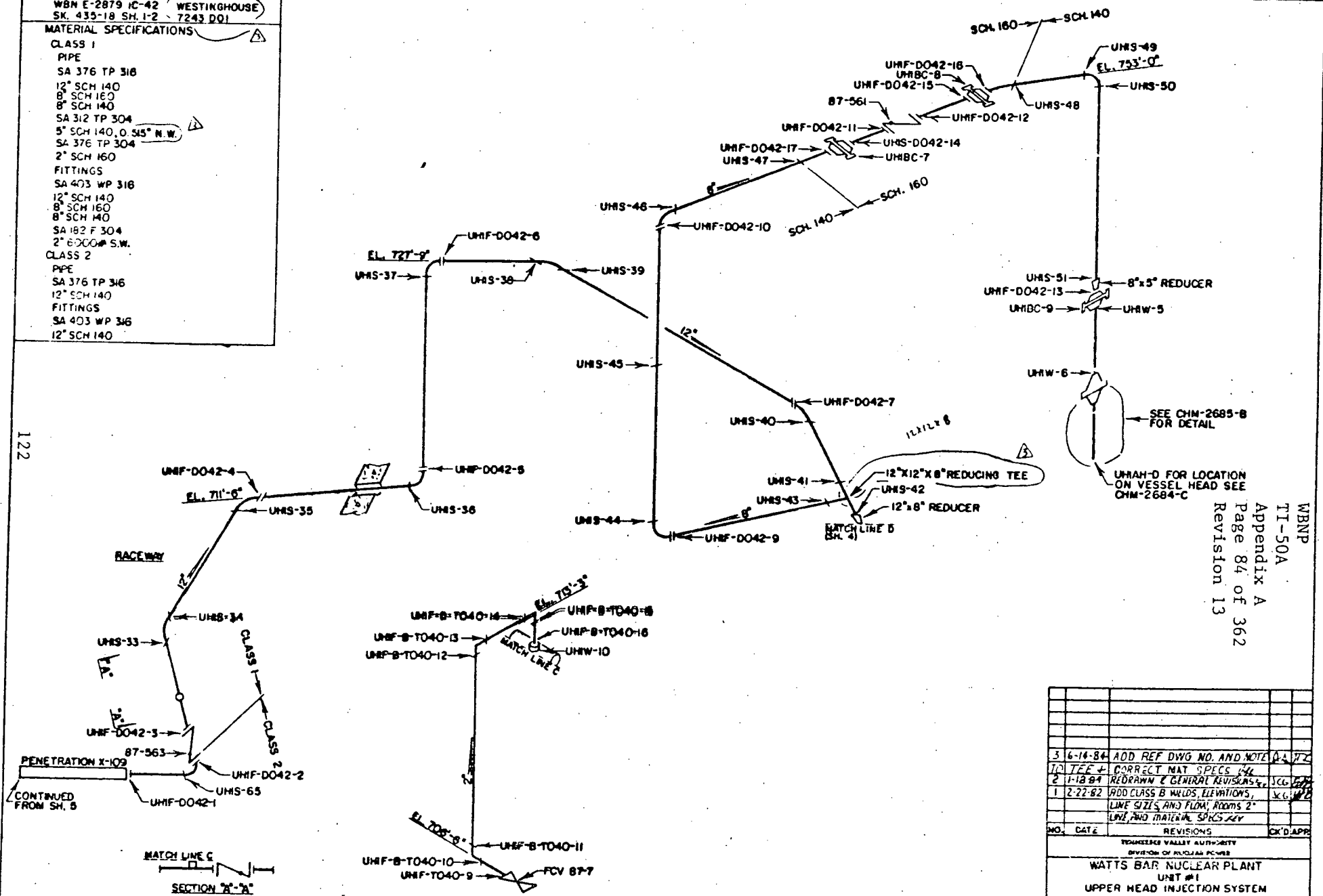
12" SCH 140

FITTINGS

SA 403 WP 316

12" SCH 140

122



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NO.	DATE	REVISIONS	CHK'D APPR
3	6-14-84	ADD REF DWG NO. AND NOTE	
1	1-12-84	ADD TEE + CORRECT MAT SPECS	
2	1-18-84	REDRAWN & GENERAL REVISIONS	
1	2-22-82	ADD CLASS B WELDS, ELEVATIONS, LINE SIZES AND FLOW ROOMS 2"	
		LINE AND MATERIAL SPECS REV	
WATTS BAR NUCLEAR PLANT			
UNIT #1			
UPPER HEAD INJECTION SYSTEM			
WELD LOCATIONS			
DESIGN	DATE	REVISIONS	CHK'D APPR
WBN	1-12-84	1	
WBN	1-18-84	2	
WBN	2-22-82	1	

ISI-0004-C193

REFERENCE DRAWINGS

WBN E-2879 IC-42 WESTINGHOUSE
WBN E-2879 IC-43 7242 DQ1

MATERIAL SPECIFICATIONS

CLASS I

PIPE

SA 376 TP 316

8" SCH 160

8" SCH 140

SA 312 TP 304

5" SCH 140 0.515" N.W.

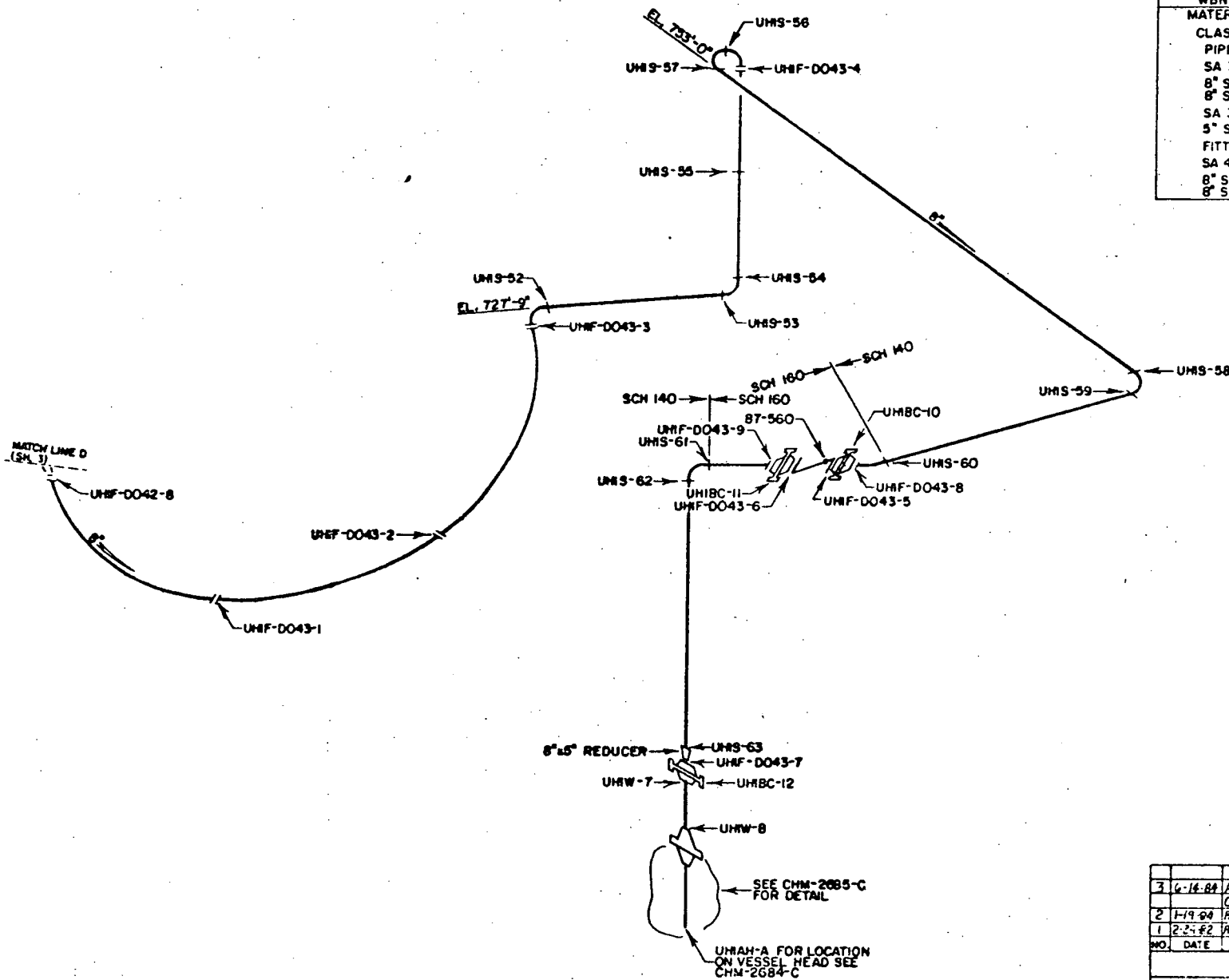
FITTINGS

SA 403 WP 316

8" SCH 160

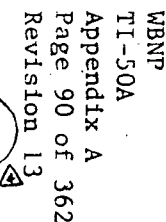
8" SCH 140

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NO.	DATE	REVISIONS	EX'D APP
3	6-14-84	ADD REF. DWG. AND CORRECT MAT. SPECS. 144	WJG/ST
2	1-19-84	REDRAWN TO GENERAL POSITION 141	WJG/ST
1	2-25-82	ADD ELEVATIONS 141	WJG/ST

TENNESSEE VALLEY AUTHORITY DIVISION OF NUCLEAR POWER			
WATTS BAR NUCLEAR PLANT UNIT #1 UPPER HEAD INJECTION SYSTEM WELD LOCATIONS			
DESIGN WJS	APPROVED WJS	DATE 6-14-84	BY WJS
WJG	WJG	WJG	WJG
ISI-C004-C-R			



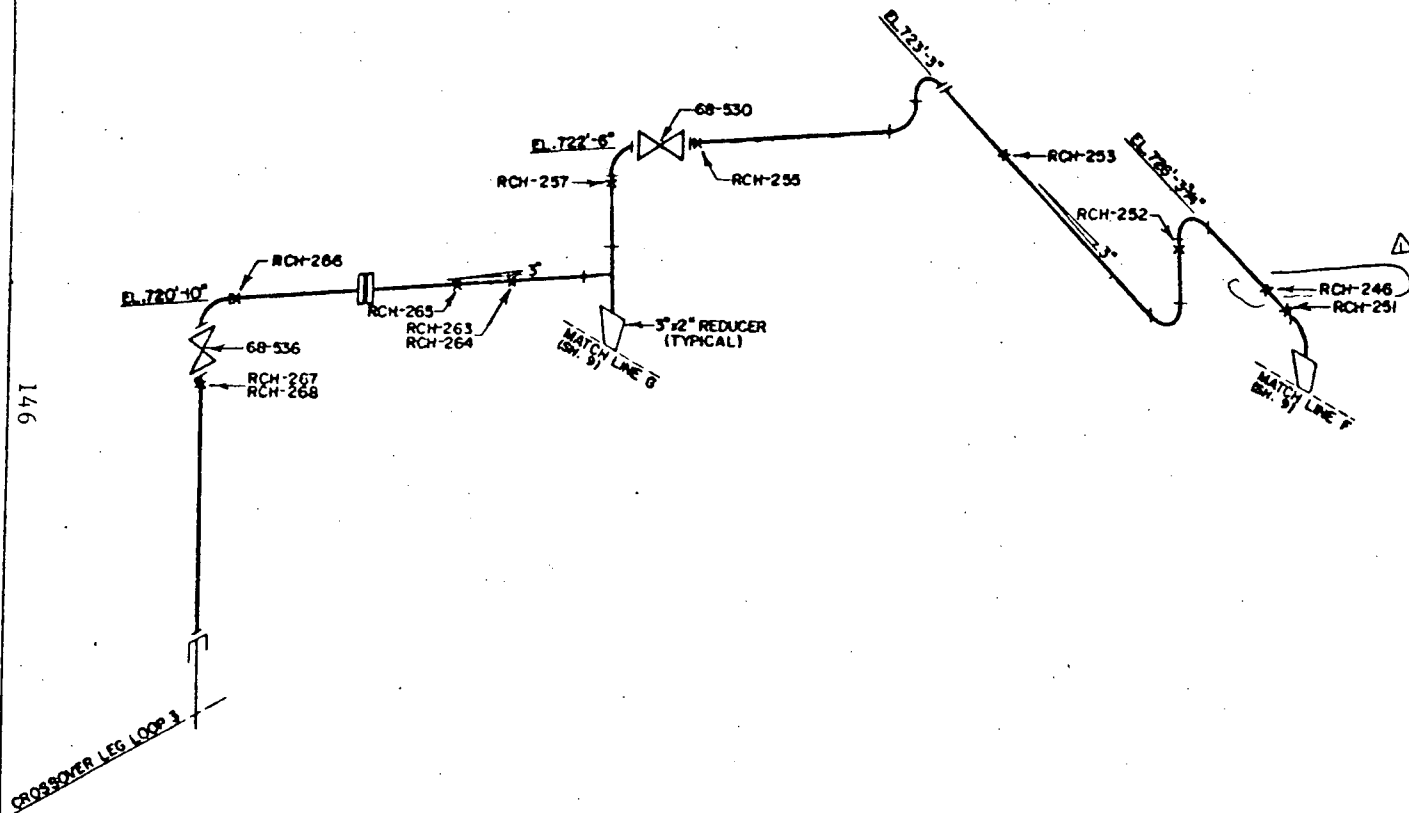
NOTE CLASS I
A 376 SEAML STNL STL PIPE
6" SCH 160 TP 304
4" SCH 160 TP 304

1	7-13-84	ADD NOTE TO WELDS	WEL	1/2
2	1-20-84	ADD CLASS DESIGNATION: CHANGE GFV	WEL	1/2
		BLOCK AND DELETE ACT ONE REV. 1858 ACT		
2	2-23-82	ADD MATCH LINE KEY	WEL	1/2
1	9-21-84	ADD (REVISIONS) AND (REV. 1) NO. 200	WEL	1/2
		NEW REFERENCE DESIGNS KEY		
NO	DATE	REVISIONS	BY	DATE

TENNESSEE VALLEY AUTHORITY
 DIVISION OF POWER PRODUCTION

WATTS BAR NUCLEAR PLANT
 UNIT #1
 REACTOR COOLANT SYSTEM
 WELD LOCATIONS

SCALE 1/2" = 1'-0" 1/4" = 1'-0"	SUBMITTED 1/23/84	DATE 1/23/84	SCALE 1/2" = 1'-0" 1/4" = 1'-0"
---------------------------------------	----------------------	-----------------	---------------------------------------



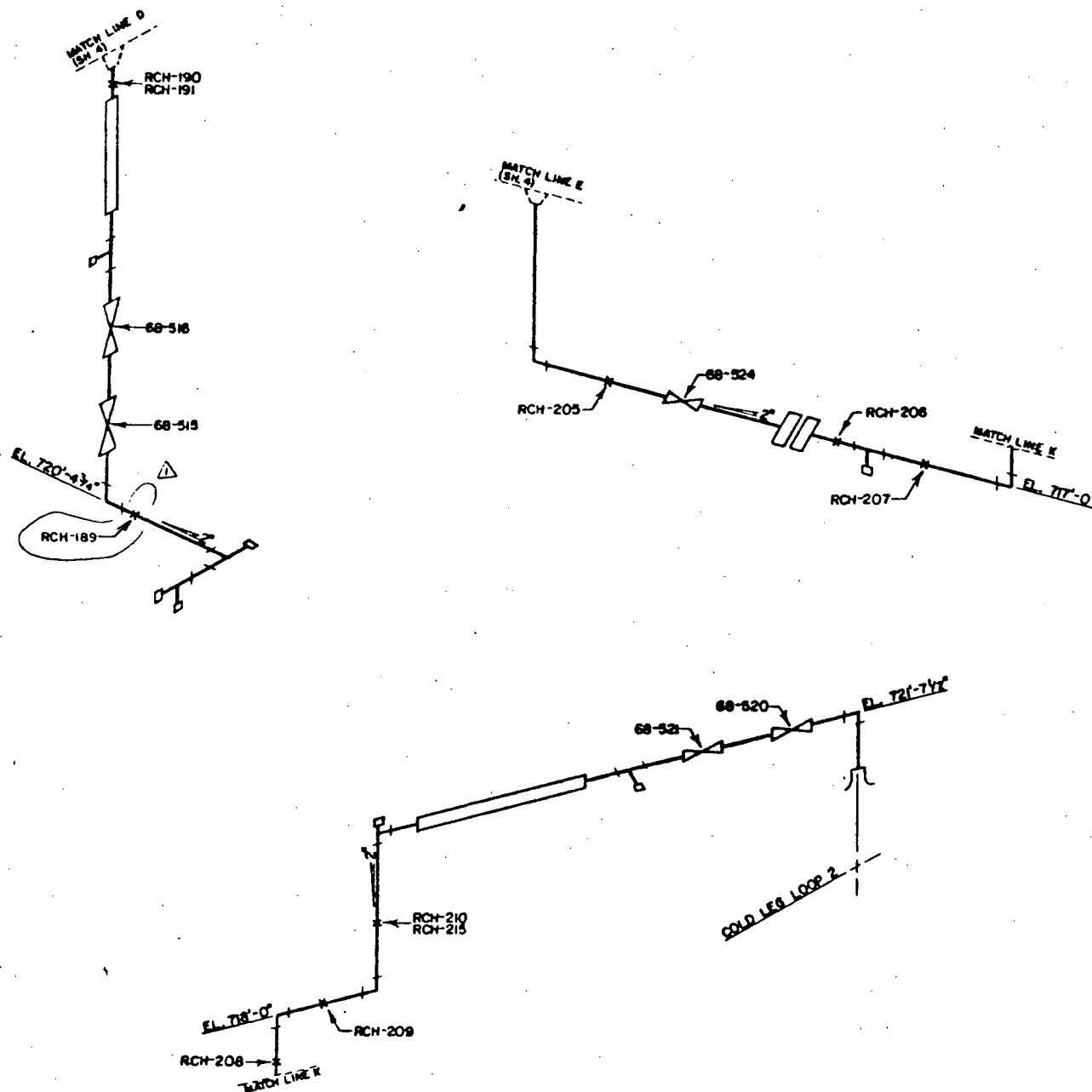
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NO.	DATE	REVISIONS	BY	CHKD BY
1	7-16-84	ADD HANGER	JH	CK
TENNESSEE VALLEY AUTHORITY DIVISION OF NUCLEAR POWER				
WATTS BAR NUCLEAR PLANT				
UNIT #:				
REACTOR COOLANT SYSTEM				
HANGER LOCATIONS				
DESIGN	MTS	DATE	BY	CHKD BY
47W465-203	7-16-84	7-16-84	JH	CK

REFERENCE DRAWINGS
47W463-209
CLASS I

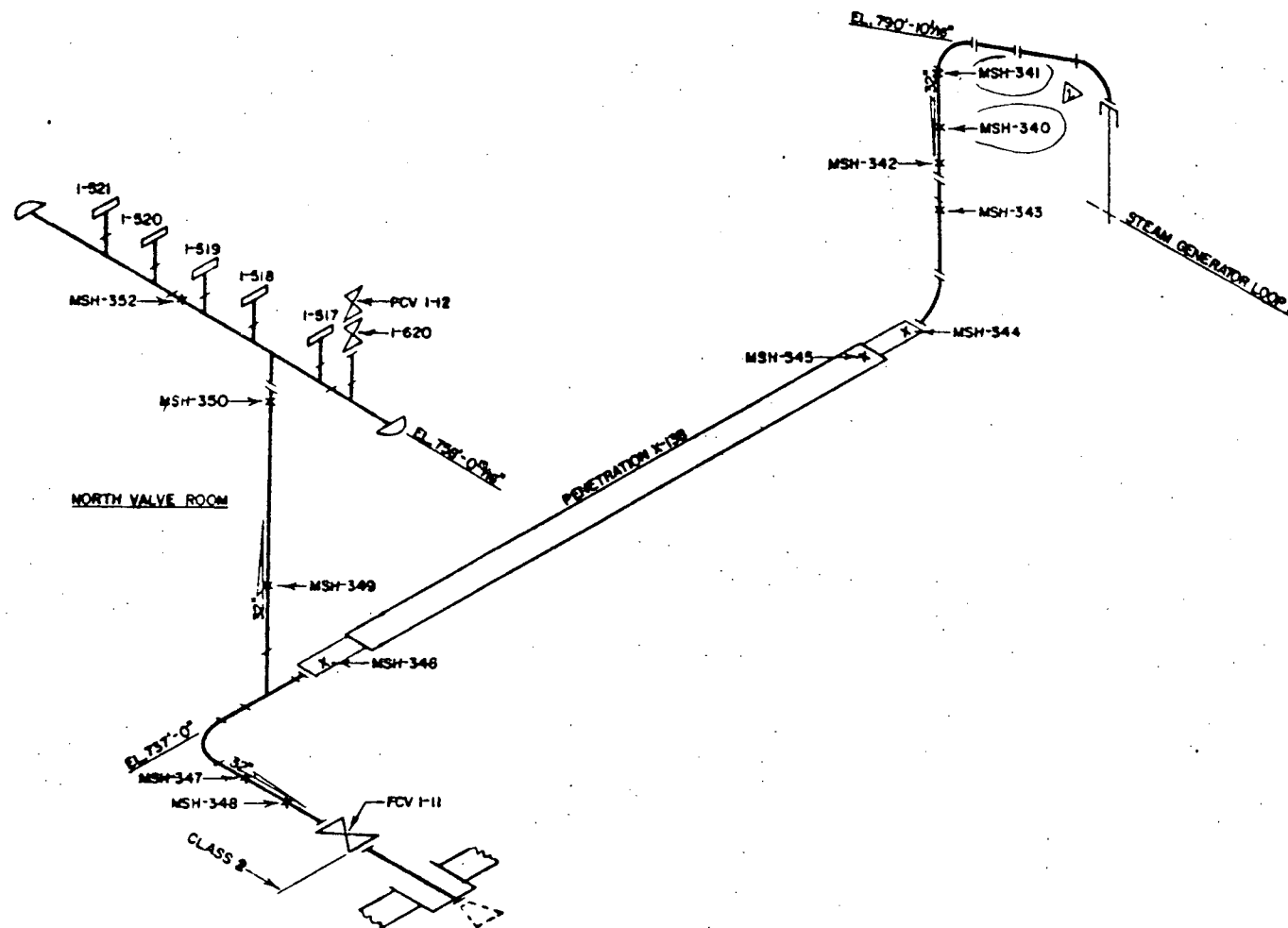
MBNP
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149



1	7-11-84	ADD HANGER 14	REVISION
2	DATE	REVISIONS	OK'D APP
TENNESSEE VALLEY AUTHORITY DIVISION OF NUCLEAR POWER			
WATTS BAR NUCLEAR PLANT UNIT #1 REACTOR COOLANT SYSTEM			
HANGER LOCATIONS			
DESIGN	805	REVISION	805-01
DATE	8/82	BY	805-01
APP'D		BY	805-01
DATE		BY	805-01

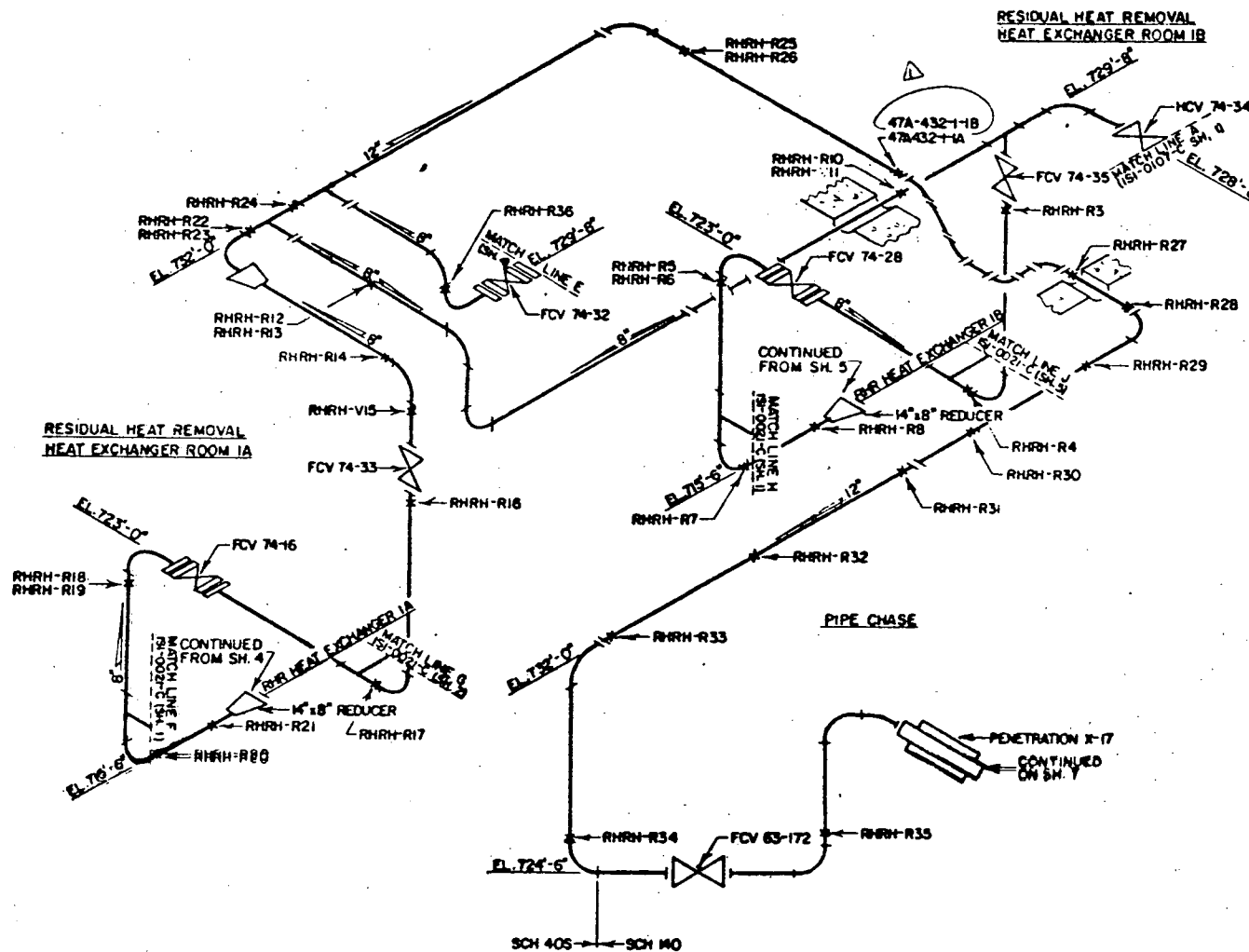
REFERENCE DRAWINGS
47W400-214
CLASS 2



WBNP
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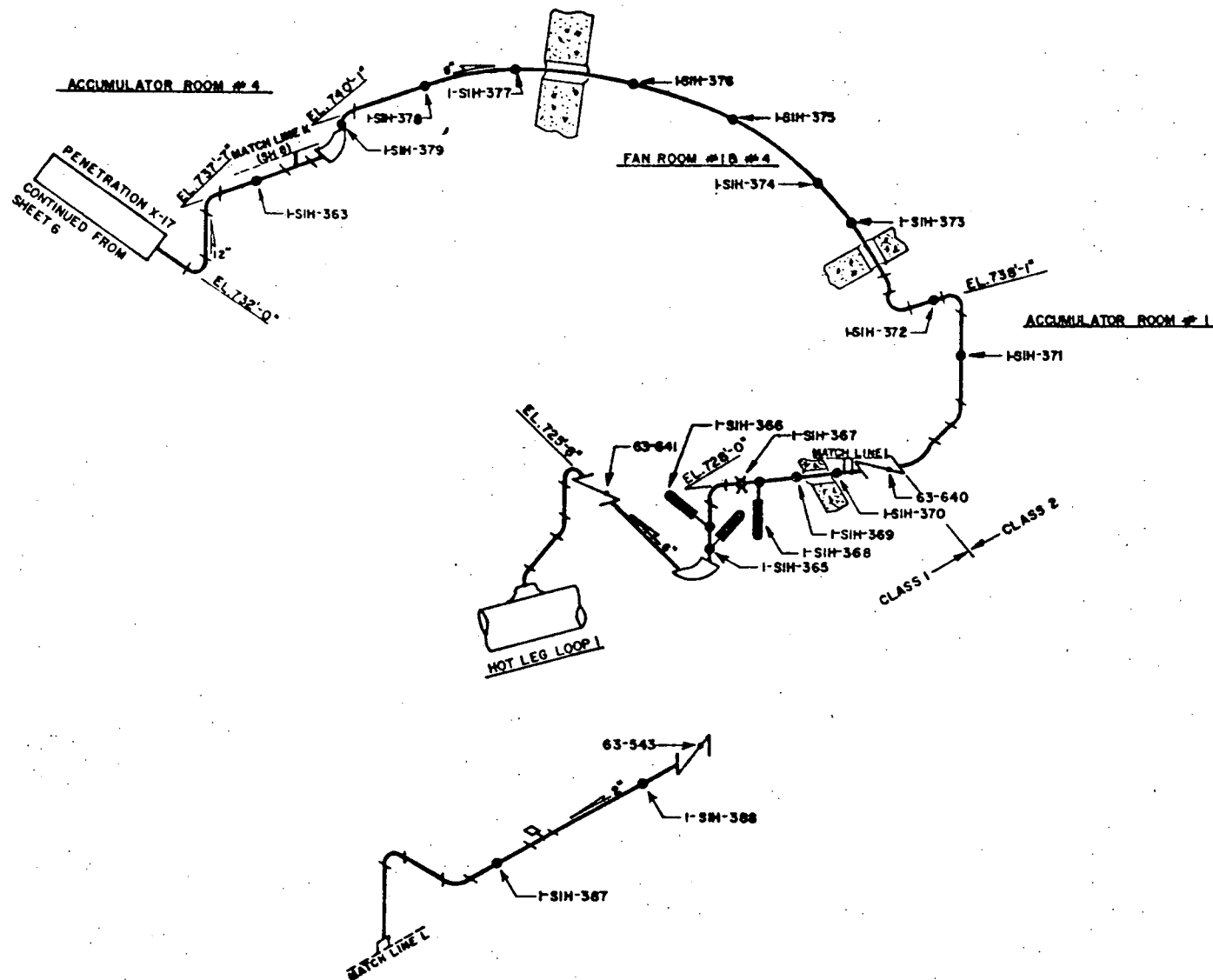
NO.	DATE	REVISIONS	EXG APP
2	6-6-84	CORRECT HANGER LOCATION	HA
1	1-20-84	CORRECT REFERENCE DRAWING	ATV
Tennessee Valley Authority DIVISION OF NUCLEAR POWER			
WATTS BAR NUCLEAR PLANT UNIT #1			
MAINSTEAM SYSTEM HANGER LOCATIONS			
DESIGN	BY	DATE	BY
REV	BY	DATE	BY
APPROVED	BY	DATE	BY

REFERENCE DRAWINGS
 CHN-2636-C
 47-W432-200
 CLASS 2



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1	6-13-84	ADD HANGER 144	SI 22
NO.	DATE	REVISIONS	CRD APP
TENNESSEE VALLEY AUTHORITY			
DIVISION OF NUCLEAR POWER			
WATTS BAR NUCLEAR PLANT			
UNIT #1			
RESIDUAL HEAT REMOVAL SYSTEM			
HANGER LOCATIONS			
SCALE	AS SHOWN	DATE	11-81
BY	ISI	CHKD	ISI
APP'D	ISI	DATE	11-81



REFERENCE DRAWINGS

47W435-228

LEGEND

- RIGID HANGER
- ✕ VARIABLE SUPPORT
- SNUBBER

CLASS 1&2

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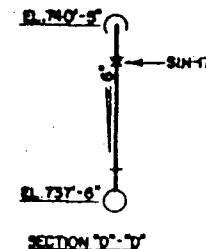
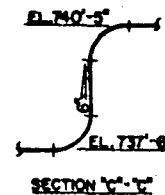
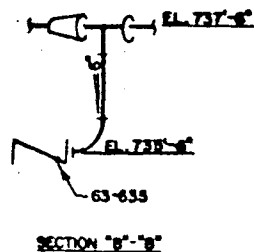
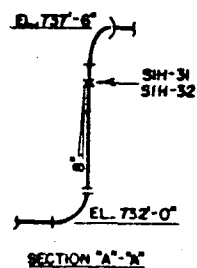
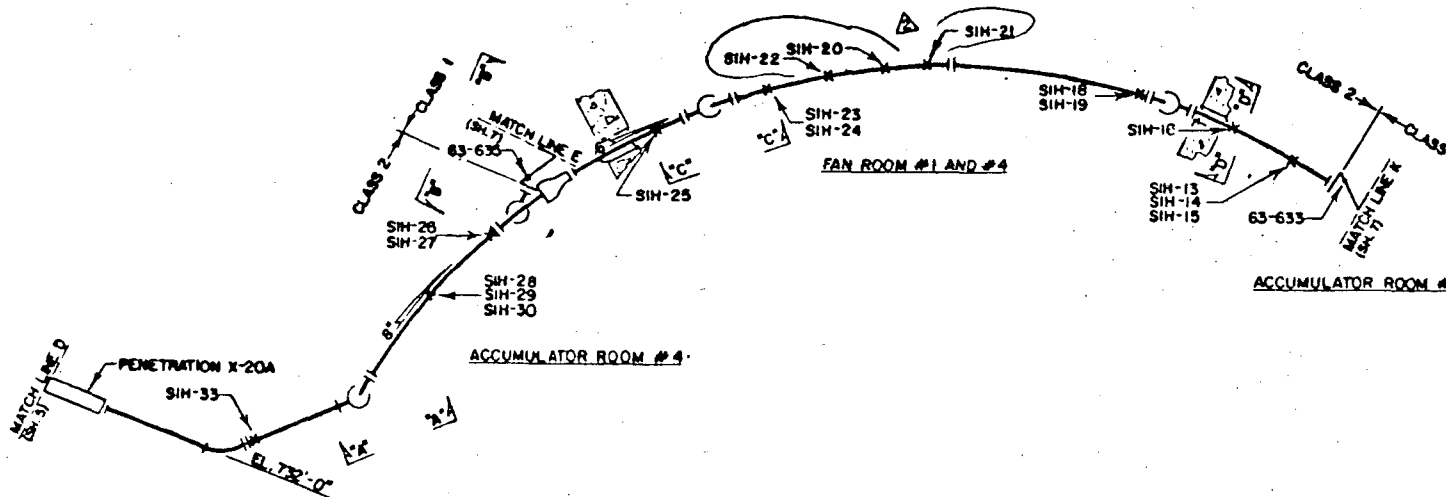
NO.	DATE	REVISIONS	APPROVED	DATE
2	5-11-84	REDRAWN JAA	JCG	5-11-84
1	1-23-84	CORRECT REFERENCE DWG NO	JCG	1-23-84
Tennessee Valley Authority				
DIVISION OF NUCLEAR POWER				
WATTS BAR NUCLEAR PLANT				
UNIT #1				
RESIDUAL HEAT REMOVAL SYSTEM				
SUPPORT LOCATIONS				
SCALE	NTS	REVISIONS	APPROVED	DATE
DATE	1-23-84	REVISIONS	APPROVED	DATE
DATE	1-23-84	REVISIONS	APPROVED	DATE
DATE	1-23-84	REVISIONS	APPROVED	DATE
15F-0020-C				R2

REFERENCE DRAWINGS

47W435-260

47W435-261

CLASS 2

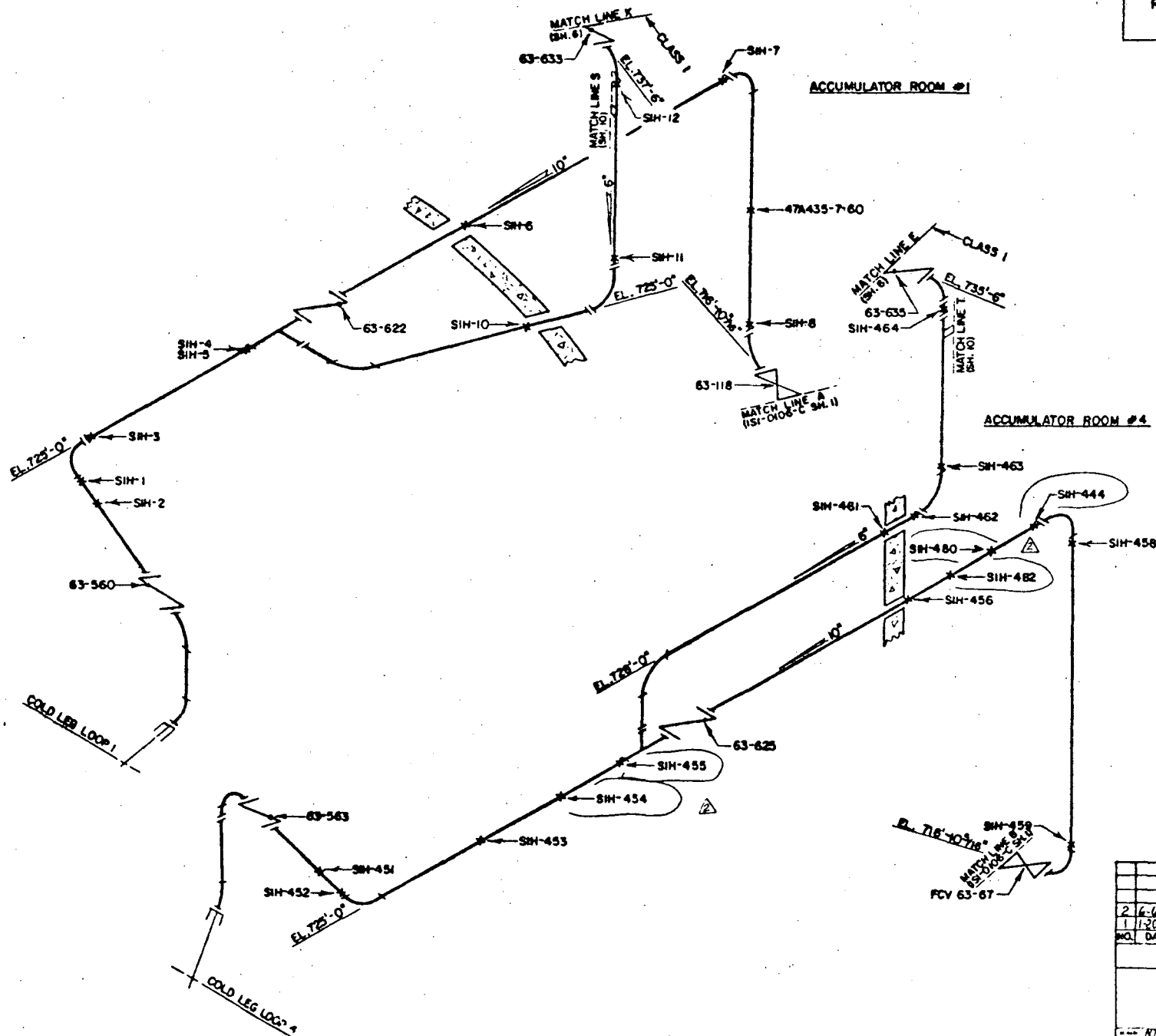


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NO.	DATE	REVISIONS	CK'D	APP'D
2	6-6-84	CORRECT HANGER LOCATIONS IN 260		
1	1-20-84	CORRECT REFERENCE DRAWINGS 260		
TENNESSEE VALLEY AUTHORITY DIVISION OF NUCLEAR POWER				
WATTS BAR NUCLEAR PLANT UNIT #1 SAFETY INJECTION SYSTEM HANGER LOCATIONS				
DESIGNED BY	NTS	CHECKED BY	NEV	DATE
DATE	8-19-81	DATE	8-19-81	

REFERENCE DRAWINGS
47W435-260
47W435-261
CLASS I

171



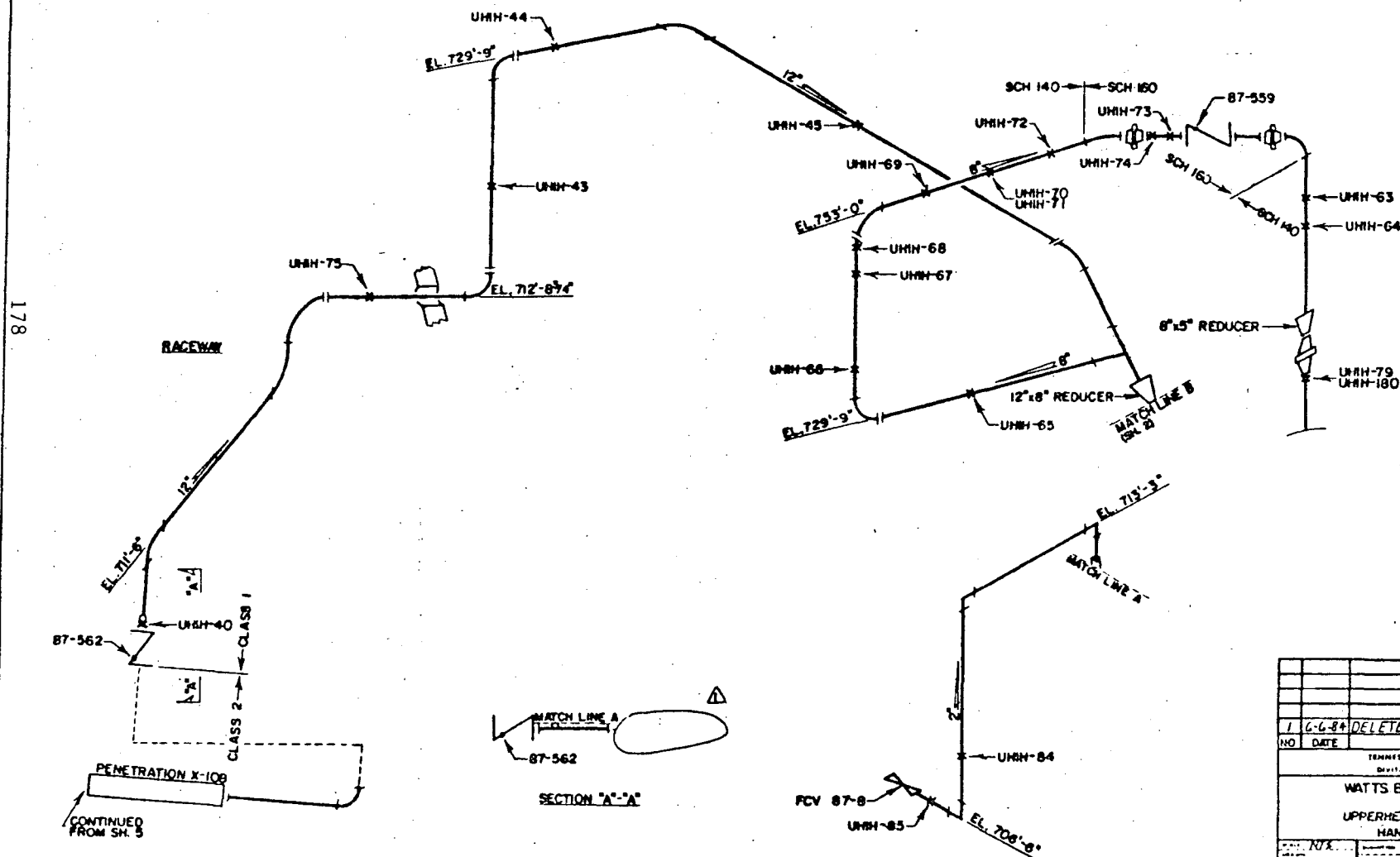
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NO.	DATE	REVISIONS	BY	CHKD	APP
2	6-6-84	CORRECT HANGER LOCATIONS	JH	JH	JH
1	12-0-82	CORRECT REFERENCE DRAWINGS	KEY	JH	JH
TENNISSEE VALLEY AUTHORITY					
DIVISION OF NUCLEAR POWER					
WATTS BAR NUCLEAR PLANT					
UNIT #1					
SAFETY INJECTION SYSTEM					
HANGER LOCATIONS					
REV	RTS	DATE	BY	CHKD	APP
1	RTS	8-20-81	RTS	RTS	RTS
2	RTS	8-20-81	RTS	RTS	RTS
3	RTS	8-20-81	RTS	RTS	RTS
4	RTS	8-20-81	RTS	RTS	RTS
5	RTS	8-20-81	RTS	RTS	RTS
6	RTS	8-20-81	RTS	RTS	RTS
7	RTS	8-20-81	RTS	RTS	RTS
8	RTS	8-20-81	RTS	RTS	RTS
9	RTS	8-20-81	RTS	RTS	RTS
10	RTS	8-20-81	RTS	RTS	RTS
11	RTS	8-20-81	RTS	RTS	RTS
12	RTS	8-20-81	RTS	RTS	RTS
13	RTS	8-20-81	RTS	RTS	RTS
14	RTS	8-20-81	RTS	RTS	RTS
15	RTS	8-20-81	RTS	RTS	RTS
16	RTS	8-20-81	RTS	RTS	RTS
17	RTS	8-20-81	RTS	RTS	RTS
18	RTS	8-20-81	RTS	RTS	RTS
19	RTS	8-20-81	RTS	RTS	RTS
20	RTS	8-20-81	RTS	RTS	RTS
21	RTS	8-20-81	RTS	RTS	RTS
22	RTS	8-20-81	RTS	RTS	RTS
23	RTS	8-20-81	RTS	RTS	RTS
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93	RTS	8-20-81	RTS	RTS	RTS
94	RTS	8-20-81	RTS	RTS	RTS
95	RTS	8-20-81	RTS	RTS	RTS
96	RTS	8-20-81	RTS	RTS	RTS
97	RTS	8-20-81	RTS	RTS	RTS
98	RTS	8-20-81	RTS	RTS	RTS
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R2

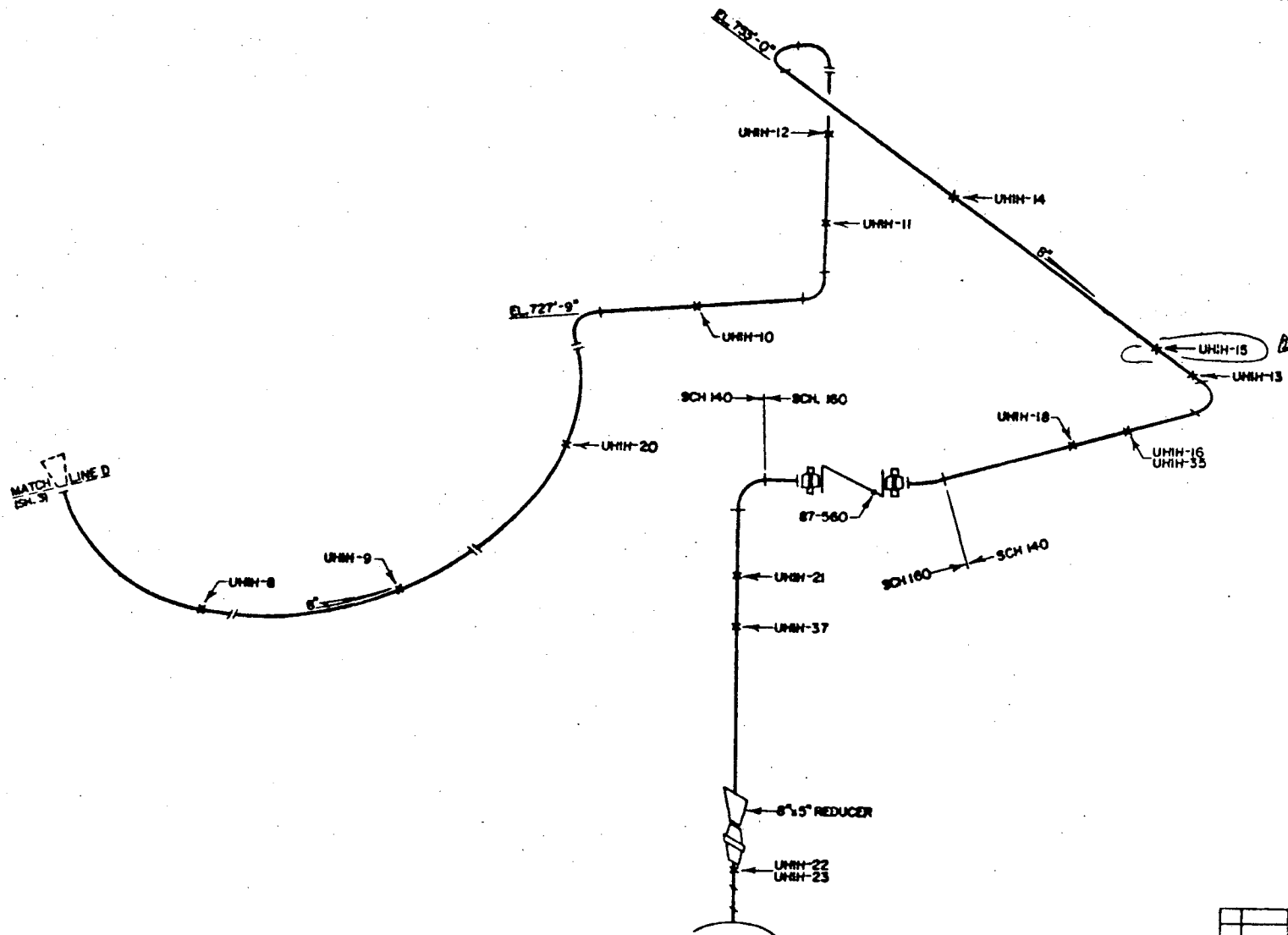
REFERENCE DRAWINGS
47W435-251
0600200-15-02
CLASS 1 & 2

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NO	DATE	REVISIONS	EXD APP
1	6-6-84	DELETED ELEVATION 74 78 72	
TENNESSEE VALLEY AUTHORITY DIVISION OF NUCLEAR POWER			
WATTS BAR NUCLEAR PLANT UNIT #1 UPPERHEAD INJECTION SYSTEM HANGER LOCATIONS			
DATE	REV	BY	APP
11/1/84	1	WJB	SI-0025-C

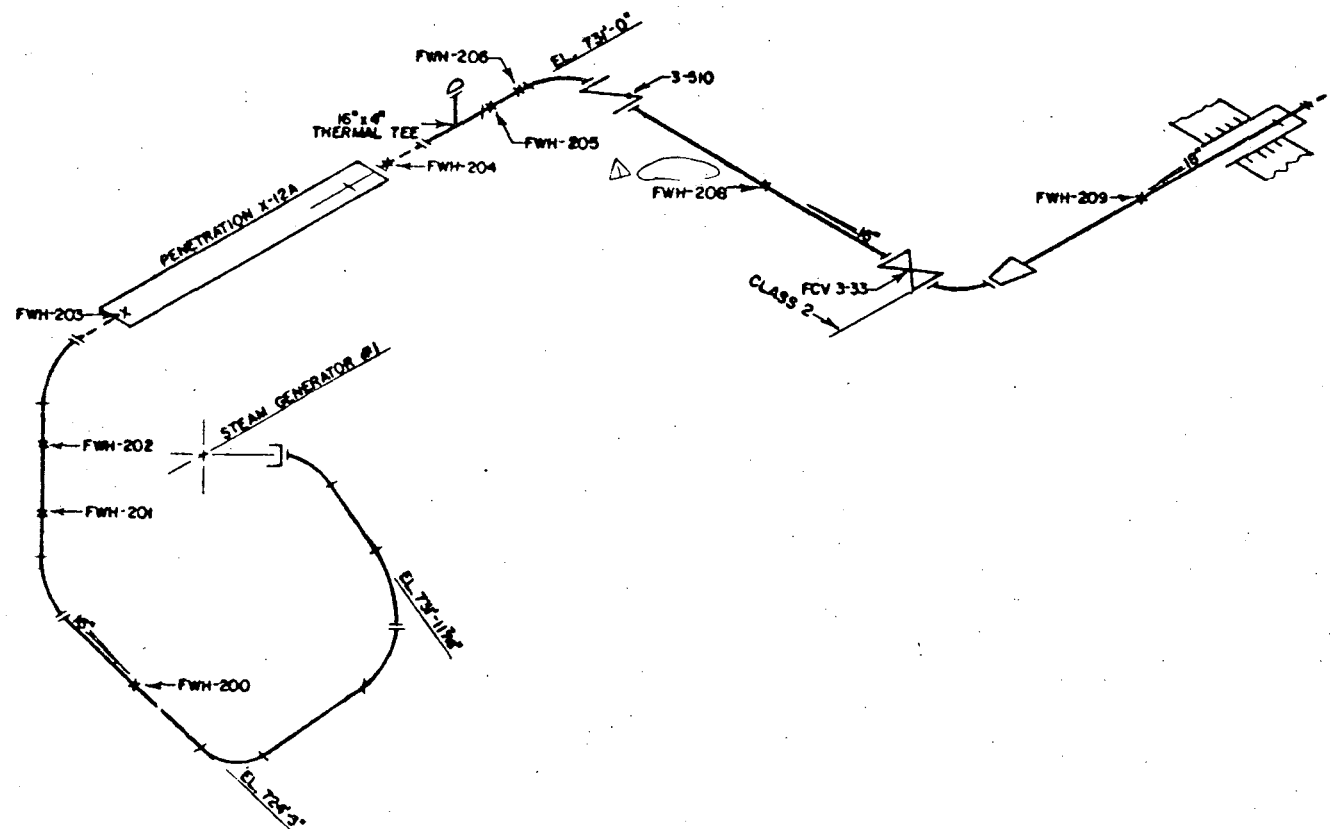
REFERENCE DRAWINGS
47W435-252
CLASS I



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2	7-12-84	CORRECT HANGER LOCATION	W. J. G. / J. C. O.
1	1-20-84	CORRECT HANGER NUMBER KEY	J. C. O.
NO.	DATE	REVISIONS	CR'D APP
TENNESSEE VALLEY AUTHORITY			
DIVISION OF NUCLEAR POWER			
WATTS BAR NUCLEAR PLANT			
UNIT #1			
UPPERHEAD INJECTION SYSTEM			
HANGER LOCATIONS			
BY: NLS	DATE: 8-25-84	BY: JCB	DATE: 8-25-84
BY: XY	DATE: 8-25-84	BY: JCB	DATE: 8-25-84
BY: JCB	DATE: 8-25-84	BY: JCB	DATE: 8-25-84

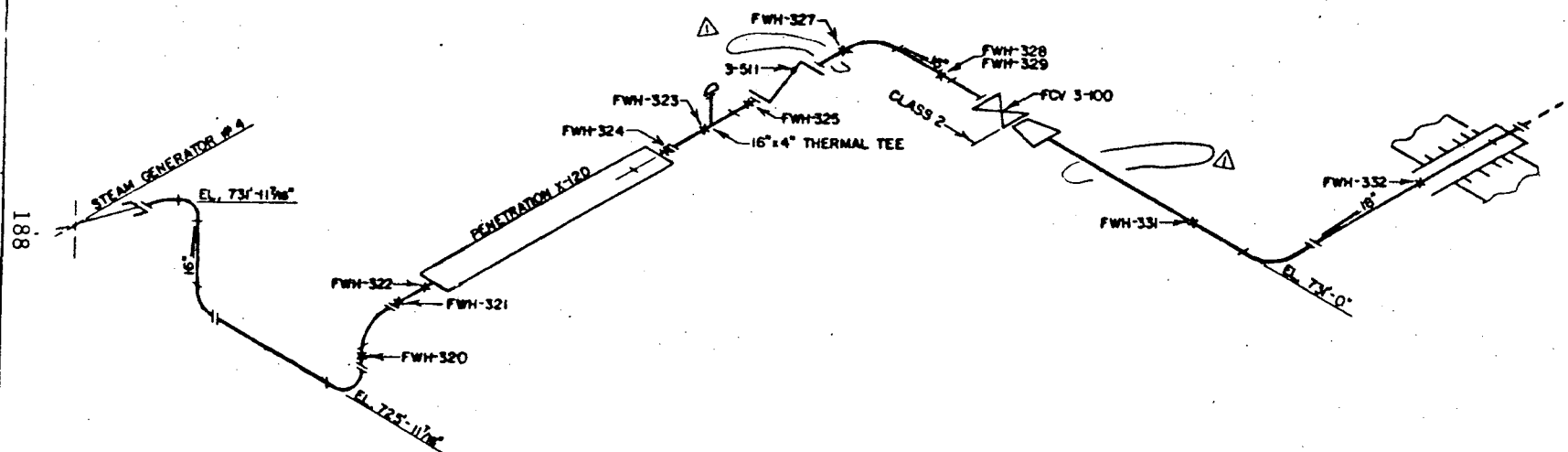
CLASS 2



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1	6-13-89	DELETE HANGER IN	NA 07
NO.	DATE	REVISIONS	CD/JP
<p>TEXAS VALLEY AUTHORITY DIVISION OF NUCLEAR POWER WATTS BAR NUCLEAR PLANT UNIT #1 FEEDWATER SYSTEM HANGER LOCATIONS</p>			
10-10-89 10-10-89 10-10-89 10-10-89	NTS KY KY KY	10-10-89 10-10-89 10-10-89 10-10-89	10-10-89 10-10-89 10-10-89 10-10-89

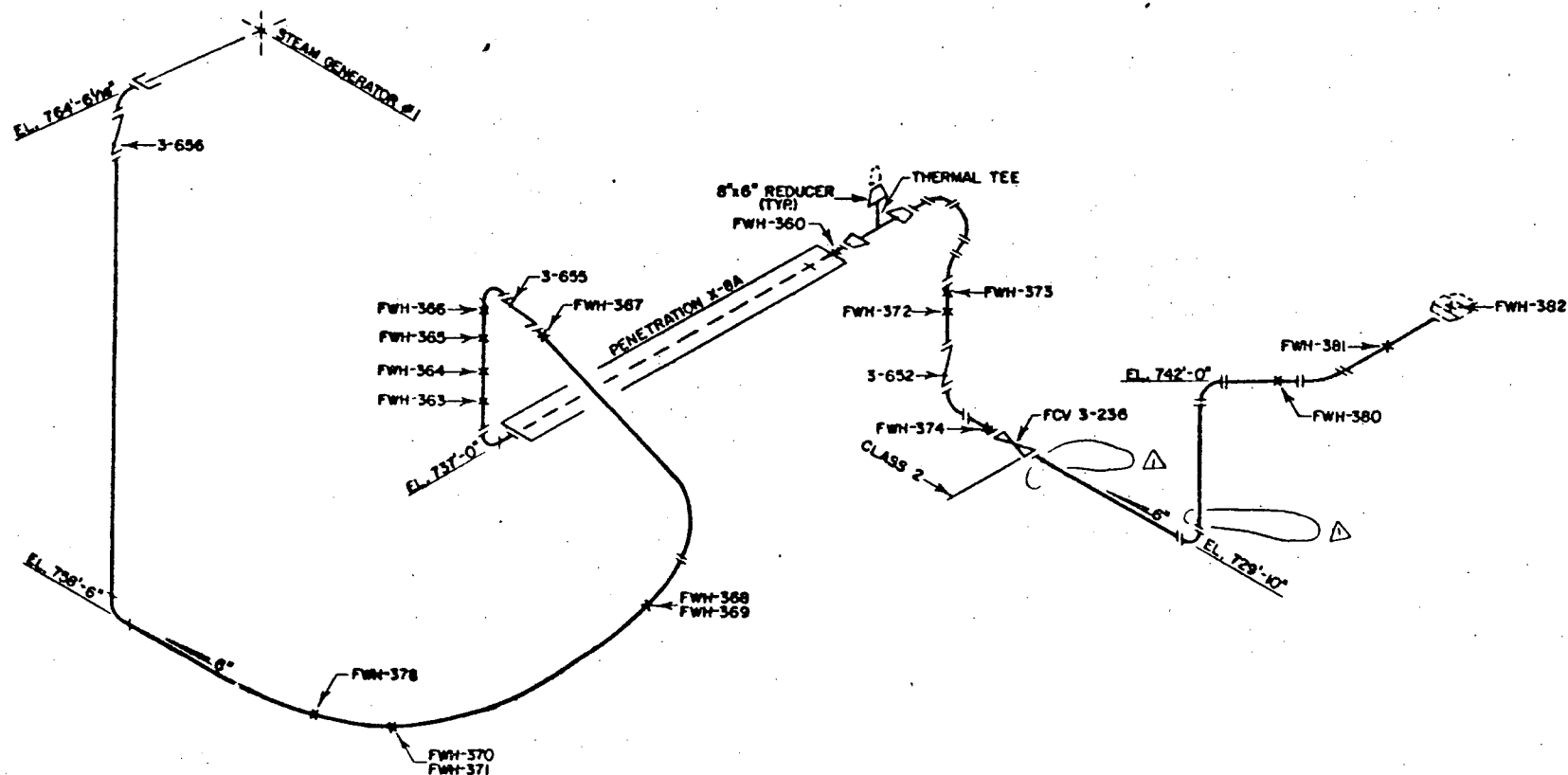
REFERENCE DRAWINGS
E-2879 IC-3
47W401-211
CLASS 2



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Revision 13

NO.	DATE	REVISIONS	OK'D APP
1	6-13-84	DELETE HANGERS	3/8/75
TENNESSEE VALLEY AUTHORITY DIVISION OF NUCLEAR POWER WATTS BAR NUCLEAR PLANT UNIT #1 FEEDWATER SYSTEM HANGER LOCATIONS			
BY	DATE	BY	DATE
NTS		NTS	4-9-82
SI		SI	4-9-82
SI-0062-C		SI-0062-C	

REFERENCE DRAWINGS
47W401-212
CLASS 2



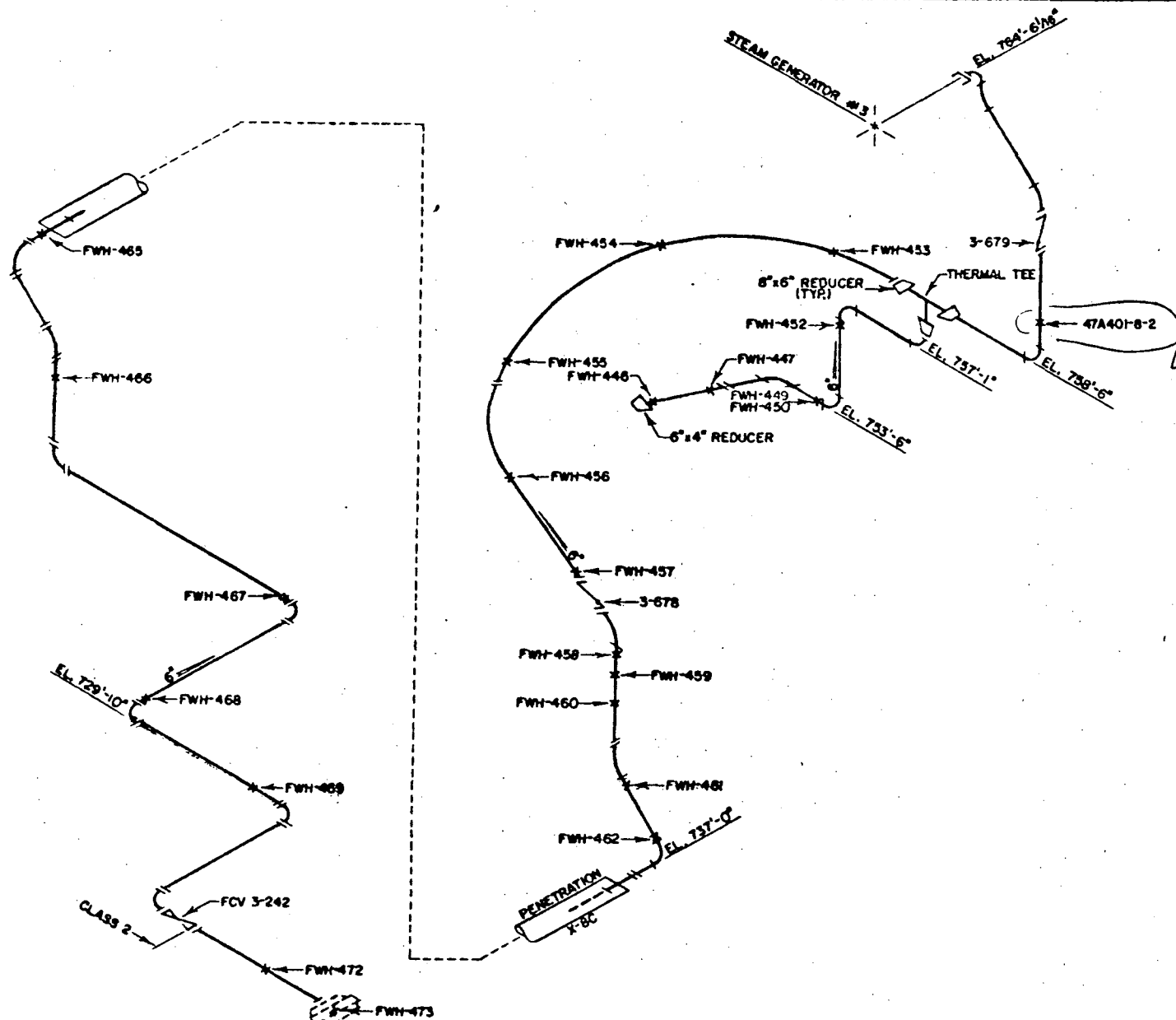
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NO.	DATE	REVISIONS	EXD APP
1	6-1-87	DELETED HANGERS	145 172
TENNESSEE VALLEY AUTHORITY			
DIVISION OF NUCLEAR POWER			
WATTS BAR NUCLEAR PLANT			
UNIT #1			
FEEDWATER SYSTEM			
HANGER LOCATIONS			
DESIGN	3/73	BY	W. S. S.
REVISION	10/73	BY	S. C. S.
APPROVAL		DATE	10-0062-C

REFERENCE DRAWINGS

47W401-216
47W427-218
CLASS 2

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NO.	DATE	REVISIONS	BY	CHKD/APP
1	6-13-84	ADD HANGER FWH-454	NR	DTZ
TERRACE VALLEY AUTHORITY DIVISION OF NUCLEAR POWER				
WATTS BAR NUCLEAR PLANT UNIT #1 FEEDWATER SYSTEM HANGER LOCATIONS				
CLASS	DATE	BY	CHKD	APP
CLASS 2	6-13-84	NR	DTZ	DTZ
				IS-0062-C

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
264 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 13 CH-M-2758-C	Westinghouse	115E013

TABLE E (Continued)
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.
68-580	3	Yes	No	No	No	No	SH 1 of 2 ISI-0005-C	Velan	E73-035R
62-638	3	Yes	No	No	No	No	Sh 1 of 2 ISI-0005-C	Westinghouse	934D183
62-640	3	Yes	No	No	No	No	Sh 1 of 2 ISI-0005-C	Westinghouse	934D183
62-659	3	Yes	No	No	No	No	Sh 1 of 2 ISI-0005-C	Westinghouse	934D183
270 62-660	3	Yes	No	No	No	No	Sh 1 of 2 ISI-0005-C	Westinghouse	934D183
62-661	2	No	No	No	No	No	Sh 2 of 2 ISI-0005-C	Kerotest	TVD-D-9911-(2)
68-513	2	No	No	No	No	No	Sh 7 of 11 ISI-0017-C	Kerotest	TVD-D-9909X03-(1)
68-514	3	Yes	No	No	No	No	Sh 4 of 11 ISI-0017-C	Westinghouse	115E021
68-515	2	No	No	No	No	No	Sh 8 of 11 ISI-0017-C	Kerotest	TVD-D-9909X03-(1)
68-516	2	No	No	No	No	No	Sh 8 of 11 ISI-0017-C	Kerotest	TVD-D-9909X03-(1)
68-519	3	Yes	No	No	No	No	Sh 3 of 11 ISI-0017-C	Westinghouse	115E021

TABLE F (Continued)
Class 2 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 Body Welds	Integrally Welded Supports	Support Components	Reference Drawing No.	Vendor	Vendor Dwg. No.
FCV-63-72	18	No	No	No	No	CH-M-2636-C	Westinghouse	115E615
FCV-63-73	18	No	No	No	No	CH-M-2636-C	Westinghouse	115E615
FCV-63-172	12	No	No	No	No	CH-M-2636-C	Westinghouse	1167E81
63-502	12	No	No	No	No	CH-M-2636-C	Westinghouse	5061D45
FCV-74-3	14	No	No	No	No	CH-M-2636-C	Westinghouse	115E007
FCV-74-16	8	No	No	No	No	CH-M-2636-C	Fisher	F-42433
FCV-74-21	14	No	No	No	No	CH-M-2636-C	Westinghouse	115E007
FCV-74-28	8	No	No	No	No	CH-M-2636-C	Fisher	F-42433
FCV-74-32	8	No	No	No	No	CH-M-2636-C	Fisher	F-42433
FCV-74-33	8	No	No	No	No	CH-M-2636-C	Westinghouse	1167E82
FCV-74-35	8	No	No	No	No	CH-M-2636-C	Westinghouse	1167E82
FCV-1-4	32	No	No	No	No	CH-M-2669-C	Atwood Morrill	13824
FCV-1-11	32	No	No	No	No	CH-M-2669-C	Atwood Morrill	13824
FCV-1-22	32	No	No	No	No	CH-M-2669-C	Atwood Morrill	13824
FCV-1-29	32	No	No	No	No	CH-M-2669-C	Atwood Morrill	13824
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

TABLE G (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 1 SUPPORTS

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System Dwg. No. Table
 RC ISI-0010-C IWB

Support No.	Sheet No.	Pipe Size	Support Type				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
RCH-189	8	2			X		No	VT-3,4	YES	
RCH-190	8	2	X				No	VT-3	Yes	
RCH-191	8	2	X				No	VT-3	Yes	
RCH-205	8	2	X				No	VT-3	Yes	
RCH-206	8	2	X				No	VT-3	Yes	
288 RCH-207	8	2		X			No	VT-3,4	Yes	
RCH-208	8	2		X			No	VT-3,4	Yes	
RCH-209	8	2	X				No	VT-3	Yes	
RCH-210	8	2		X			No	VT-3,4	Yes	
RCH-215	8	2		X			No	VT-3,4	Yes	
RCH-247	9	2	X				No	VT-3	Yes	
RCH-248	9	2	X				No	VT-3	Yes	
RCH-250	9	2		X			No	VT-3,4	Yes	
RCH-258	9	2	X				No	VT-3	Yes	
RCH-259	9	2	X				No	VT-3	Yes	
RCH-260	9	2		X			No	VT-3,4	Yes	

TABLE G (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 1 SUPPORTS

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System Dwg. No. Table
 RHR ISI-0020-C IWB

Support No.	Sheet No.	Pipe Size	Support Type				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
SIH-370	7	8	X				No	VT-3	Yes	
SIH-340	8	8		X			No	VT-3,4	Yes	
SIH-341	8	8	X				No	VT-3	Yes	
SIH-342	8	8			X		No	VT-3	Yes	
SIH-343	8	8	X				No	VT-3	Yes	
SIH-344	8	8		X			No	VT-3,4	Yes	
SIH-345	8	8	X				No	VT-3	Yes	
SIH-346	8	8	X				No	VT-3	Yes	
SIH-596	8	2		X			No	VT-3,4	Yes	
SIH-597	8	8	X				No	VT-3	Yes	
SIH-598	8	8		X			No	VT-3,4	Yes	
SIH-602	8	8	X				No	VT-3	No	
SIH-388	7	2	X				No	VT-3	Yes	
SIH-387	7	2	X				No	VT-3	Yes	

TABLE G (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORYASME CLASS 1 SUPPORTS

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System Dwg. No. Table
 RC ISI-0124-C-1 IWB

Support No.	Sheet No.	Pipe Size	<u>Support Type</u>				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
RCH-1	1	14"			X		No	VT-3,4	Yes	
RCH-2	1	14"		X			No	VT-3,4	Yes	
RCH-3	1	14"		X			No	VT-3,4	Yes	
RCH-4	1	14"		X			No	VT-3,4	Yes	
RCH-5	1	14"			X		No	VT-3,4	Yes	
RCH-6	1	14"		X			No	VT-3,4	Yes	

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TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System	Dwg. No.	Table	Support Type					Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks	
MS	ISI-0011-C	IWC	Support No.	Sheet No.	Pipe Size	Restraint	Snubber					Spring
MSH-383	3	32					X			Yes 1" lug	VT-3,4. ST	Yes
MSH-384	3	32						X		No	VT-3,4	Yes
MSH-385	3	32	X							No	VT-3	Yes
MSH-386	3	32						X		No	VT-3,4	Yes
MSH-387	3	32					X			No	VT-3,4	Yes
MSH-388	3	32	X							No	VT-3	Yes
MSH-389	3	32					X	X		No	VT-3,4	Yes
MSH-391	3	32					X			No	VT-3,4	Yes
MSH-392	3	32					X			No	VT-3,4	Yes
MSH-394	3	32	X							No	VT-3	Yes
MSH-420	4	32					X			No	VT-3,4	Yes
MSH-421	4	32					X			No	VT-3,4	Yes
MSH-422	4	32						X		Yes 1" lug	VT-3,4, ST	Yes
MSH-423	4	32					X			Yes 1" lug	VT-3,4, ST	Yes
MSH-424	4	32	X							No	VT-3	Yes
MSH-425	4	32						X		No	VT-3,4	Yes

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 MS ISI-0011-C IWC

Support No.	Sheet No.	Pipe Size	<u>Support Type</u>				Integrally-Welded Attachment Size	<u>Examinations</u>		Remarks
			Restraint	Snubber	Spring	Anchor		Required	Bolting	
MSH-426	4	32	X				No	VT-3	Yes	
MSH-427	4	32			X		No	VT-3,4	Yes	
MSH-428	4	32		X			No	VT-3,4	Yes	
MSH-429	4	32		X			No	VT-3,4	Yes	
MSH-430	4	32		X			No	VT-3,4	Yes	
MSH-431	4	32			X		No	VT-3,4	Yes	
MSH-432	4	32	X				No	VT-3	Yes	
MSH-434	4	32		X			No	VT-3,4	Yes	
MSH-435	4	32		X			No	VT-3,4	Yes	
MSH-437	4	32	X				No	VT-3	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORYASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 RHR ISI-0020-C IWC

Support No.	Sheet No.	Pipe Size	<u>Support Type</u>				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
SIH-R170	3	14	X				No	VT-3	Yes	
SIH-R171	3	14	X				No	VT-3	Yes	
SIH-R173	3	14		X			No	VT-3,4	Yes	
SIH-R174	3	14		X			No	VT-3,4	Yes	
SIH-R175	3	14		X			No	VT-3,4	Yes	
SIH-R285	3	14	X				No	VT-3	Yes	
SIH-R286	3	14	X				No	VT-3	Yes	
RHRH-R37	4	8		X			No	VT-3,4	Yes	
RHRH-V38	4	8	X				No	VT-3	Yes	
RHRH-R39	4	8	X				No	VT-3	Yes	
RHRH-R86	4	8	X				No	VT-3	Yes	
RHRH-V87	4	8			X		No	VT-3	Yes	
RHRH-R88	4	8		X			No	VT-3,4	Yes	
RHRH-R89	4	8		X			No	VT-3,4	Yes	
RHRH-V90	4	8			X		No	VT-3	Yes	
RHRH-R91	4	8	X				No	VT-3	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 RHR ISI-0020-C IWC

Support No.	Sheet No.	Pipe Size	Support Type				Integrally-Welded Attachment Size	Examinations		Remarks
			Restraint	Snubber	Spring	Anchor		Required	Bolting	
RHRH-R32	6	12	X				No	VT-3	Yes	
RHRH-R33	6	12	X				No	VT-3	Yes	
RHRH-R34	6	12		X			No	VT-3,4	Yes	
RHRH-R35	6	12	X				No	VT-3	Yes	
RHRH-R36	6	8		X			No	VT-3,4	Yes	
325 47A432-1-1A	6	12	X				No	VT-3	Yes	
47A432-1-1B	6	12	X				No	VT-3	YES	
SIH-363	7	12	X				No	VT-3	Yes	
SIH-371	7	8	X				No	VT-3	Yes	
SIH-372	7	8	X				No	VT-3	Yes	
SIH-373	7	8	X				No	VT-3	Yes	
SIH-374	7	8	X				No	VT-3	Yes	
SIH-375	7	8	X				No	VT-3	Yes	
SIH-376	7	8	X				No	VT-3	Yes	
SIH-377	7	8	X				No	VT-3	Yes	
SIH-378	7	8	X				No	VT-3	Yes	
SIH-379	7	8	X				No	VT-3	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORYASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 RHR ISI-0020-C IWC

Support No.	Sheet No.	Pipe Size	<u>Support Type</u>				Integrally-Welded Attachment Size	<u>Examinations</u>		Remarks
			Restraint	Snubber	Spring	Anchor		Required	Bolting	
SIH-589	8	8		X			No	VT-3,4	Yes	
SIH-590	8	8		X			No	VT-3,4	Yes	
SIH-591	8	8		X			No	VT-3,4	Yes	
SIH-592	8	8		X			No	VT-3,4	Yes	
SIH-593	8	8		X			No	VT-3,4	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 FW ISI-0062-C IWC

Support No.	Sheet No.	Pipe Size	Support Type				Integrally-Welded Attachment Size	Examinations		Remarks
			Restraint	Snubber	Spring	Anchor		Required	Bolting	
FWH-200	1	16		X			No	VT-3,4	Yes	
FWH-201	1	16		X			No	VT-3,4	Yes	
FWH-202	1	16	X				No	VT-3	Yes	
FWH-203	1	16	X				No	VT-3	Yes	
FWH-204	1	16	X				No	VT-3	Yes	
FWH-205	1	16		X			No	VT-3,4	Yes	
FWH-206	1	16	X				No	VT-3	Yes	
FWH-208	1	16	X				No	VT-3	Yes	
FWH-209	1	18	X				No	VT-3	Yes	
FWH-240	2	16		X			No	VT-3,4	Yes	
FWH-241	2	16		X			No	VT-3,4	Yes	
FWH-242	2	16	X				No	VT-3	Yes	
FWH-243	2	16	X				No	VT-3	Yes	
FWH-244	2	16		X			No	VT-3,4	Yes	
FWH-245	2	16	X				No	VT-3	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System		Dwg. No.	Table		Support Type				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
Support No.	Sheet No.	Pipe Size	Restraint	Snubber	Spring	Anchor						
FW		ISI-0062-C	IWC									
FWH-246	2	16	X					No	VT-3	Yes		
FWH-247	2	16	X					No	VT-3	Yes		
FWH-248	2	16		X				No	VT-3	Yes		
FWH-249	2	18	X					No	VT-3	Yes		
FWH-280	3	16		X				No	VT-3,4	Yes		
FWH-281	3	16		X				No	VT-3,4	Yes		
FWH-282	3	16	X					No	VT-3	Yes		
FWH-283	3	16		X				No	VT-3,4	Yes		
FWH-284	3	16	X					No	VT-3	Yes		
FWH-285	3	16		X				No	VT-3,4	Yes		
FWH-286	3	16	X					No	VT-3	Yes		
FWH-287	3	16		X				No	VT-3,4	Yes		
FWH-288	3	16	X					No	VT-3	Yes		
FWH-289	3	16		X				No	VT-3,4	Yes		
FWH-290	3	16	X					No	VT-3	No		
FWH-291	3	18	X					No	VT-3	Yes		

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 FW ISI-0062-C IWC

Support No.	Sheet No.	Pipe Size	Support Type				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
FWH-320	4	16		X			No	VT-3,4	Yes	
FWH-321	4	16		X			No	VT-3,4	Yes	
FWH-322	4	16	X				No	VT-3	Yes	
FWH-323	4	16		X			No	VT-3,4	Yes	
FWH-324	4	16	X				No	VT-3	Yes	
FWH-325	4	16	X				No	VT-3	Yes	
FWH-327	4	16	X				No	VT-3	Yes	
FWH-328	4	16		X			No	VT-3,4	Yes	
FWH-329	4	16	X				No	VT-3	Yes	
FWH-331	4	18	X				No	VT-3	Yes	
FWH-332	4	18	X				No	VT-3	Yes	
FWH-360	5	6	X				No	VT-3	Yes	
FWH-363	5	6	X				No	VT-3	Yes	
FWH-364	5	6	X				No	VT-3	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 FW ISI-0062-C IWC

Support No.	Sheet No.	Pipe Size	<u>Support Type</u>				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
FWH-365	5	6	X				No	VT-3	Yes	
FWH-366	5	6	X				No	VT-3	Yes	
FWH-367	5	6	X				No	VT-3	Yes	
FWH-368	5	6	X				No	VT-3	Yes	
FWH-369	5	6	X				No	VT-3	Yes	
FWH-370	5	6		X			No	VT-3,4	Yes	
FWH-371	5	6		X			No	VT-3,4	Yes	
FWH-372	5	6	X				No	VT-3	Yes	
FWH-373	5	6		X			No	VT-3,4	Yes	
FWH-374	5	6		X			No	VT-3,4	Yes	
FWH-378	5	6			X		No	VT-3,4	Yes	
FWH-380	5	6	X				No	VT-3	Yes	
FWH-381	5	6	X				No	VT-3	Yes	
FWH-382	5	6	X				No	VT-3	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 FW ISI-0062-C IWC

Support No.	Sheet No.	Pipe Size	Support Type				Integrally-Welded Attachment Size	Examinations		Remarks
			Restraint	Snubber	Spring	Anchor		Required	Bolting	
FWH-480	8	6		X			No	VT-3,4	Yes	
FWH-481	8	6		X			No	VT-3,4	Yes	
FWH-482	8	6	X				No	VT-3	Yes	
FWH-483	8	6			X		No	VT-3,4	Yes	
FWH-484	8	6	X				No	VT-3	Yes	
FWH-485	8	6			X		No	VT-3,4	Yes	
FWH-486	8	6	X				No	VT-3	Yes	
FWH-487	8	6		X			No	VT-3,4	Yes	
FWH-488	8	6	X				No	VT-3	Yes	
FWH-489	8	6	X				No	VT-3	Yes	
FWH-490	8	6	X				No	VT-3	No	
FWH-491	8	6	X				No	VT-3	Yes	
FWH-492	8	6	X				No	VT-3	Yes	
FWH-493	8	6	X				No	VT-3	Yes	
FWH-494	8	6		X			No	VT-3,4	Yes	
FWH-495	8	6	X				No	VT-3	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 FW ISI-0062-C IWC

Support No.	Sheet No.	Pipe Size	<u>Support Type</u>				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
FWH-496	8	6	X				No	VT-3	Yes	
FWH-497	8	6		X			No	VT-3,4	Yes	
FWH-498	8	6	X				No	VT-3	Yes	
FWH-499	8	6	X				No	VT-3	Yes	
FWH-500	8	6	X				No	VT-3	Yes	
FWH-502	8	6	X				No	VT-3	Yes	
FWH-503	8	6	X				No	VT-3	Yes	
FWH-504	8	6	X				No	VT-3	Yes	
FWH-407	6	6	X				No	VT-3	Yes	
FWH-408	6	6			X		No	VT-3,4	Yes	
FWH-409	6	6		X			No	VT-3,4	Yes	
FWH-410	6	6		X			No	VT-3,4	Yes	
FWH-411	6	6	X				No	VT-3	Yes	
FWH-412	6	6	X				No	VT-3	Yes	
FWH-416	6	6	X				No	VT-3	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 FW ISI-0062-C IWC

Support No.	Sheet No.	Pipe Size	Support Type				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
FWH-417	6	6	X				No	VT-3	Yes	
FWH-418	6	6	X				No	VT-3	Yes	
FWH-421	6	6	X				No	VT-3	Yes	
FWH-422	6	6	X				No	VT-3	Yes	
FWH-423	6	6		X			No	VT-3,4	Yes	
FWH-424	6	6	X				No	VT-3	Yes	
FWH-425	6	6	X				No	VT-3	Yes	
FWH-426	6	6		X			No	VT-3,4	Yes	
FWH-428	6	6	X				No	VT-3	Yes	
FWH-429	6	6				X	No	VT-3	Yes	
47A401-8-1	6	6		X			No	VT-3,4	Yes	
FWH-403	6	6	X				No	VT-3	Yes	
FWH-405	6	6		X			No	VT-3,4	Yes	
FWH-406	6	6	X				No	VT-3	Yes	
47A401-8-2	7	6		X			No	VT-3,4	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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System Dwg. No. Table
 FW ISI-0062-C IWC

Support No.	Sheet No.	Pipe Size	Support Type				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
47A427-6-1	6	6		X			No	VT-3,4	Yes	
FWH-446	7	6	X				No	VT-3	Yes	
FWH-447	7	6			X		No	VT-3,4	Yes	
FWH-449	7	6		X			No	VT-3,4	Yes	
FWH-450	7	6		X			No	VT-3,4	Yes	
FWH-452	7	6	X				No	VT-3	Yes	
FWH-453	7	6		X			No	VT-3,4	Yes	
FWH-454	7	6	X				No	VT-3	Yes	
FWH-455	7	6		X			No	VT-3,4	Yes	
FWH-456	7	6	X				No	VT-3	Yes	
FWH-457	7	6	X				No	VT-3	Yes	
FWH-458	7	6	X				No	VT-3	Yes	
FWH-459	7	6	X				No	VT-3	Yes	
FWH-460	7	6	X				No	VT-3	Yes	
FWH-461	7	6	X				No	VT-3	Yes	
FWH-462	7	6	X				No	VT-3	Yes	

TABLE H (CONTINUED)

COMPONENTS SUBJECT TO EXAMINATION CATEGORY

ASME CLASS 2 SUPPORTS

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<u>System</u>	<u>Dwg. No.</u>	<u>Table</u>
FW	ISI-0062-C	IWC

Support No.	Sheet No.	Pipe Size	Support Type				Integrally-Welded Attachment Size	Examinations Required	Bolting	Remarks
			Restraint	Snubber	Spring	Anchor				
FWH-465	7	6	X				No	VT-3	Yes	
FWH-466	7	6		X			No	VT-3,4	Yes	
FWH-467	7	6	X				No	VT-3	Yes	
FWH-468	7	6		X			No	VT-3,4	Yes	
FWH-469	7	6	X				No	VT-3	Yes	
FWH-472	7	6	X				No	VT-3	Yes	
FWH-473	7	6				X	No	VT-3	Yes	

DATA SHEET 1 (cont'd)

EXAMINATION SECTION

NDE STAFF REPRESENTATIVE

DATE

Class 2 Components (Continued)

SIP

7.12.4

PDP

7.13.4

Valves

7.14.1

7.14.3

7.14.4

Class 3 Components

8.1

8.2

All examinations required by the referenced sections of this data sheet have been performed and acceptance criteria has been satisfied.

QE NDE Section Representative

Date

Reviewed By:

Supervisor, NDE Section

Date

Reviewed By:

Supervisor, ISI Programs Section

Date

Approved by:

Supervisor, Inservice Inspection Group

Date

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., removable 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

Weld Number ¹	Code Category ²	Drawing Number	Physical Configuration ³	Scan ⁴ /Limitation ⁵	Remarks ⁶
SIF-D091-4	BJ	CHM-2758-C 9 of 13	E/V	3/5:00-8:00 4/No scan from valve	ELL introdos prevents coupling from 5:00-8:00 (Note 7)
SIF-D090-5	BJ	CHM-2758-C 8 of 13	V/T	3/No scan 4/No scan	No examination due to component geometry (Note 7)
SIF-D089-6	BJ	CHM-2758-C 7 of 13	V/T	3/No scan 4/No scan	No examination due to component geometry (Note 7)
714 SIF-D091-6	BJ	CHM-2758-C 9 of 13	V/T	3/No scan 4/No scan	No examination due to component geometry (Note 7)
UHIF-D043-6	BJ	ISI-0004-C 4 of 5	V/F	3/No scan 4/No scan	No examination due to component geometry (Note 7)
UHIF-D043-5	BJ	ISI-0004-C 4 of 5	V/F	3/No scan 4/No scan	No examination due to component geometry (Note 7)

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number ¹	Code Category ²	Drawing Number	Physical Configuration ³	Scan ⁴ /Limitation ⁵	Remarks ⁶
SIF-D090-6	BJ	CHM-2758-C 8 of 13	P/V	3/No Scan 4/2:00-5:00	No examination due to component geometry (Note 7)
RCF-D234-3	BJ	ISI-0017-C 4 of 11	E/V	3/No scan 4/5:00-7:00	ELL introdoses prevents coupling from 5:00-7:00 (Note 8)
RCF-D236-4	BJ	ISI-0017-C 5 of 11	E/V	3/5:00-7:00 4/No scan	ELL introdoses prevents coupling from 5:00-7:00 (Note 8)
RCF-D232-2	BJ	ISI-0017-C 1 of 11	V/R	3/No scan 4/No scan 5/No base metal exam 6/No base metal exam	No examination due to component geometry (Note 8)
MSF-D001-1	CG	CHM-2669-C 1 of 4	E/N	3/No scan 4/ 1/2 VEE path exam	No examination due to component geometry
MSF-D006-15	CG	CHM-2669-C 4 of 4	V/F	3/No scan 4/No scan	No examination due to component geometry
FWF-D372-8	CG	CHM-2671-C 6 of 8	R/R	3/No scan 4/No scan	No examination due to component geometry
UHS-66	CF	ISI-0004-C 5 of 5	P/F	3/No scan 4/12:00-3:00	No examination due to component geometry
RHRF-D047-4	CF	CHM-2636-C 2 of 8	E/T	4/2:00-4:00, 8:00-10:00	No examination due to component geometry
RHRS-132	CF	CHM-2636-C 6 of 8	E/E	3/4:00-8:00 4/12:00-5:00	ELL introdoses prevents coupling from 4:00-5:00

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number ¹	Code Category ²	Drawing Number	Physical Configuration ³	Scan ⁴ /Limitation ⁵	Remarks ⁶
RHRS-102	CF	CHM-2636-C 6 of 8	E/T	3/5:00-7:00 4/6:00-9:00	ELL introdoses prevent coupling from 6:00-7:00
RHRF-D051-12LS	CF	CHM-2636-C 6 of 8	E	9/No scan 10/No scan	ELL introdoses prevents ultrasonic coupling
RHRS-132-LS	CF	CHM-2636-C 6 of 8	E	9/No scan 10/No scan	ELL introdoses prevents ultrasonic coupling
SIS-40-LS	CF	CHM-2758-C 3 of 13	E	9/No scan 10/No scan	ELL introdoses prevents ultrasonic coupling
SIF-D080-1-LS	CF	CHM-2758-C 2 of 13	E	9/No scan 10/No scan	ELL introdoses prevents ultrasonic coupling
FWF-D001-6	CG	CHM-2671-C 1 of 8	E/V	3/11:00-1:00, 2:00-4:00, 5:00-7:00 4/No scan 5/See scan 3 limits 6/See scan 3 limits	No examination due to component geometry and permanent support
FWS-41	CG	CHM-2671-C 4 of 8	R/P	4/3:00-5:00 5/3:00-5:00 6/3:00-5:00	No examination due to permanent support
UHIF-D039-17	CF	ISI-0004-C 5 of 5	P/ Penetra- tion	No scans	ND examination due to weld covered by guard pipe
MSS-61A-LS	CG	CHM-2669-C 4 of 4	P	All/Limited by 10%	Limited examinations due to pipe support

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number ¹	Code Category ²	Drawing Number	Physical Configuration ³	Scan ⁴ /Limitation ⁵	Remarks ⁶
MSS-61B-LS	CG	CHM-2669-C 4 of 4	P	All/Limited by 10%	Limited examinations due to pipe support
MSE-D006-10 (R-501L)	CG	CHM-2669 4 of 4	P/V	15/Limited	Limited examination due to component geometry
RCS-106	B-J	ISI-0017-C 6 of 11	F/P	3/No scan 4/7:00 to 11:00	No examination due to component geometry. Limited due to permanent pipe restraint. (Note 8)
RHRF-D055-10	C-F	CHM-2636-C 8 of 8	E/V	3/9:00 4/No scan	No examination due to component geometry. Limited due to gamma plug.
SIF-D088-9	CF	CHM-2758-C 6 of 14	E/P	All/6:00	Limited examination due to thermocouple.

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number ¹	Code Category ²	Drawing Number	Physical Configuration ³	Scan ⁴ /Limitation ⁵	Remarks ⁶
MSF-D001-1	CG	CHM-2669 1 of 4	N/E	3/No scan 4/3:00	No examination due to component geometry. Limited examination due to 1½" branch connection.
RHRF-D049-4	CF	CHM-2636-C 5 of 8	P/E	4/No scan 3/12:00	No examination due to component geometry. Limited examination due to 2" branch connection.
417a SIF-B-T059-2B	BJ	CHM-2758-C 11 of 13	P/F	4, 5, 6/No scan	No examination due to flange bolting and configuration (Note 8)
MSS-8	CG	CHM-2669-C 1 of 4	E/P	3, 4, 5, 6/6:00	Limited examination due to pipe support.
SIF-B-T059-2A	BJ	CHM-2758-C 11 of 13	F/P	4, 5, 6/No scan	No examination due to flange bolting and configuration (Note 8)
RCS-1-4	B-J	CHM-2547-B 1 of 2	E/P	4/Limited base metal/limited	Limited examination due to elbow geometry (Note 9)
RCS-2-4	B-J	CHM-2547-B 1 of 2	E/P	4/Limited base metal/limited	Limited examination due to elbow geometry (Note 9)
RCS-3-4	B-J	CHM-2547-B 1 of 2	E/P	4/Limited base metal/limited	Limited examination due to elbow geometry (Note 9)
RCS-4-4	B-J	CHM-2547-B 1 of 2	E/P	4/Limited base metal/limited	Limited examination due to elbow geometry (Note 9)
RCF-D1-2	B-F	CHM-2547-B 1 of 2	E/N	4/No scan	No examination due to nozzle geometry (Note 9)

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number ¹	Code Category ²	Drawing Number	Physical Configuration ³	Scan ⁴ /Limitation ⁵	Remarks ⁶
RCF-D5-2	B-F	CHM-2547-B 1 of 2	E/N	4/No scan	No examination due to nozzle geometry (Note 9)
RCF-D2-2	B-F	CHM-2547-B 1 of 2	E/N	4/No scan	No examination due to nozzle geometry (Note 9)
RCF-D4-2	B-F	CHM-2547-B 1 of 2	E/N	4/No scan	No examination due to nozzle geometry (Note 9)
FCF-F4-1	B-F	CHM-2547-BR2 1 of 2	N/E	3/No scan	No examination due to nozzle geometry (Note 9)
RCF-F3-1	B-F	CHM-2547-BR2 1 of 2	N/E	3/No scan	No examination due to nozzle geometry (Note 9)
RCF-F2-1	B-F	CHM-2547-BR2 1 of 2	N/E	3/No scan	No examination due to nozzle geometry (Note 9)
RCS-1-5	B-J	CHM-2547-BR2 1 of 2	Branch Connections	3/Limited	Limited examination due to branch connection configuration (Note 9)
RCS-2-5	B-J	CHM-2547-BR2 1 of 2	Branch Connections	3/Limited	Limited examination due to branch connection configuration (Note 9)
RCS-3-5	B-J	CHM-2547-BR2 1 of 2	Branch Connections	3/Limited	Limited examination due to branch connection configuration (Note 9)
RCS-4-5	B-J	CHM-2547-BR2 1 of 2	Branch Connections	3/Limited	Limited examination due to branch connection configuration (Note 9)

REQUEST FOR RELIEF ISI-4 (Continued)

Weld Number ¹	Code Category ²	Drawing Number	Physical Configuration ³	Scan ⁴ /Limitation ⁵	Remarks ⁶
RCS-4-6	B-J	CHM-2547-BR2 1 of 2	Branch Connec- tions	4/No scan	No examination due to branch connection configuration (Note 9)
RCS-P-1	B-J	CHM-2547-BR2 1 of 2	Branch Connec- tions	4/No scan	No examination due to branch connection configuration (Note 9)

* 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 = ELL, T = TEE, R = Reducer; F = Flange and N = Nozzle.
 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 condition.
 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. Because of the attenuation resulting from inherent coarse grain structure in cast stainless steel the examination is limited to the $\frac{1}{2}$ V technique. Also physical restrictions prevent the exam from both sides of the weld.

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REQUEST FOR RELIEF ISI-7 HAS BEEN WITHDRAWN

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 twenty 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 accesible areas. This will exceed the twenty percent examination requirements.

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REQUEST FOR RELIEF ISI-12 HAS BEEN WITHDRAWN

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 ISI-4.

REQUEST FOR RELIEF ISI-14

Components: Residual Heat Removal Heat Exchanger

Class: ASME Class 2 (TVA Safety Class B)

Inspection Requirement: Volumetric examination of at least twenty percent of each circumferential butt well at structural discontinuities in examination category C-A. This examination shall be uniformly distributed among three areas around the vessel circumference.

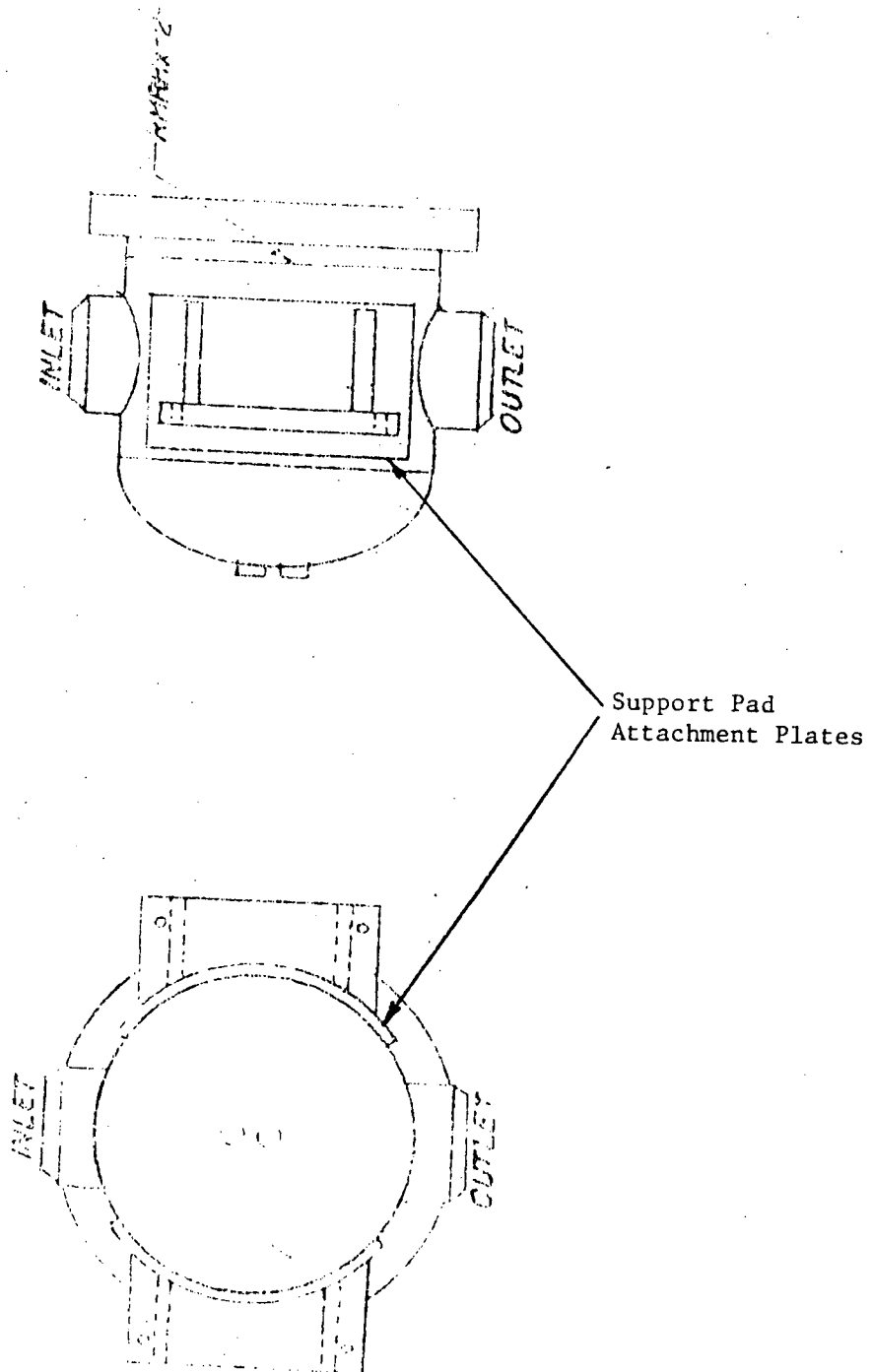
Basis for Relief: Approximately eighteen percent of weld, RHRHX-2-1A, can be examined due to residual heat removal heat exchanger inlet and outlet nozzle, and the residual heat removal heat exchanger support pad attachment plates. See attached drawing.

The weld had a shop radiographic examination performed in accordance with ASME Section III.

Alternate Inspection: The circumferential weld shall be volumetrically examined in all accessible areas.

WATTS BAR NUCLEAR PLANT
RESIDUAL HEAT REMOVAL
HEAT EXCHANGER

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REQUEST FOR RELIEF ISI-15

Components: Residual Heat Removal Heat Exchanger

Class: ASME Class 2 (TVA Safety Class B)

Inspection Requirement: Volumetric examination shall cover hundred percent of the nozzle-to-vessel attachment weld in examination category C-B.

Basis for Relief: Limited examination due to residual heat removal heat exchanger nozzle geometry, and residual heat removal heat exchanger support pad attachment plates. See welds listed below and attached drawing.

Each weld has a shop radiographic examination performed in accordance with ASME III.

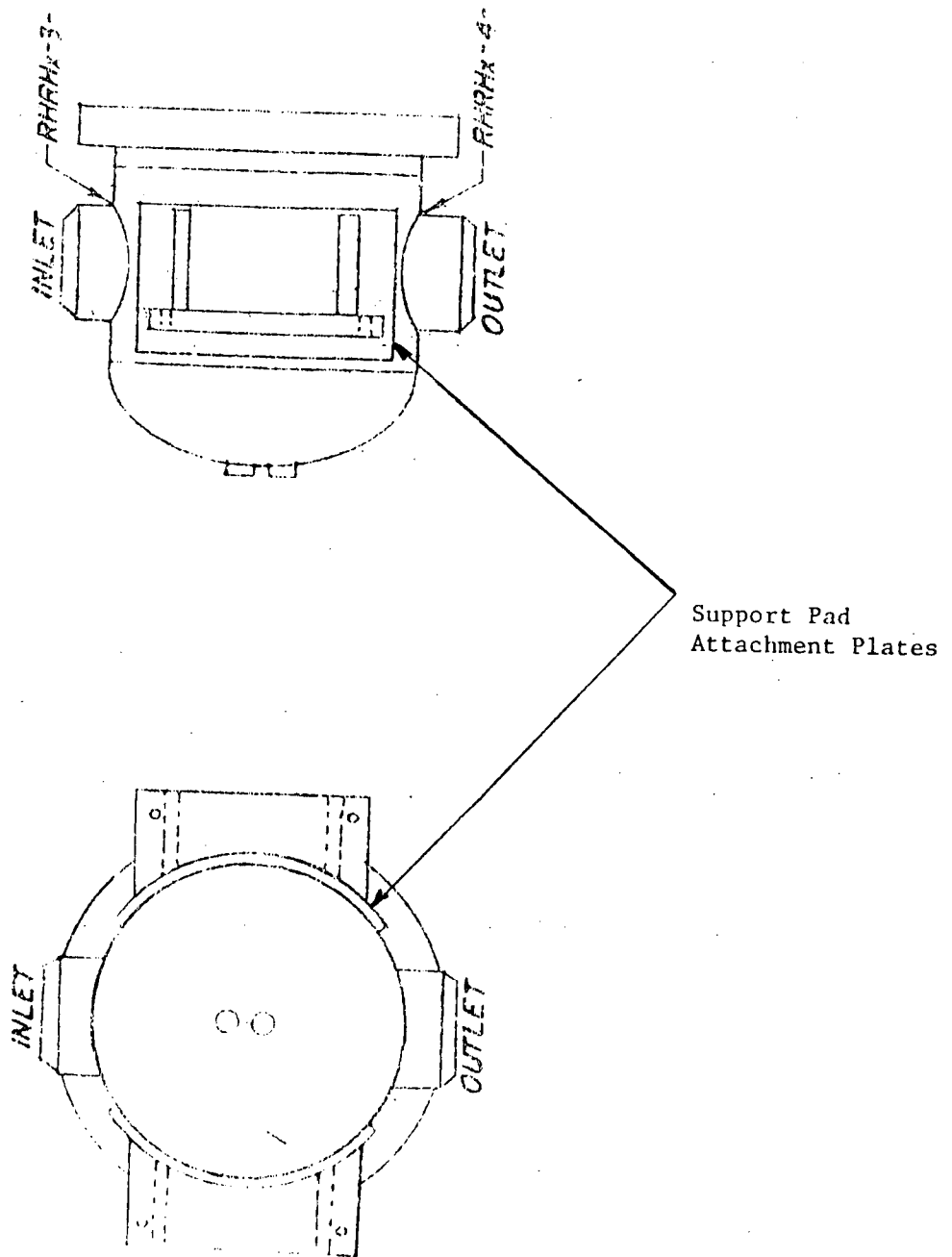
WELD	SCAN/LIMITATION
RHRHX-4-1A	No scan 4/scan 3 limited 60° to 120° and 240° to 300°
RHRHX-3-1B	No scan 4/scan 3 limited 60° to 120° and 240° to 300°

NOTE: Scan 3 and 4 are perpendicular to circumferential welds.

Alternate Inspection: The nozzle-to-vessel attachment welds shall be volumetrically examined in all accessible areas.

WATTS BAR NUCLEAR PLANT
RESIDUAL HEAT REMOVAL
HEAT EXCHANGER

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NATIONAL BOARD NUMBERS

SYSTEM: 001-MAIN STEAM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-FCV-01-011	Atwood-Morrill	1-13824	N/A
N/A	Dravo 01C-SV-11	10051	N/A
N/A	Dravo 01C-SV-24	10052	N/A
N/A	Dravo 01C-SV-37	10053	N/A
N/A	Dravo 01C-SV-50	10054	N/A
1-FCV-01-004	Atwood-Morrill	2-13824	N/A
1-FCV-01-029	Atwood-Morrill	3-13824	N/A
1-FCV-01-022	Atwood-Morrill	4-13824	N/A
N/A	Dravo 01A-MS-001	6833	N/A
N/A	Dravo 01A-MS-002	6834	N/A
N/A	Dravo 01A-MS-003	6835	N/A
N/A	Dravo 01A-MS-004	6836	N/A
N/A	Dravo 01A-MS-007	6837	N/A
N/A	Dravo 01A-MS-015	6839	N/A
N/A	Dravo 01A-MS-016	6840	N/A
N/A	Dravo 01A-MS-017	6841	N/A
N/A	Dravo 01A-MS-018	6842	N/A
N/A	Dravo 01A-MS-032	6844	N/A
N/A	Dravo 01A-MS-033	6845	N/A
N/A	Dravo 01A-MS-034	6846	N/A
N/A	Dravo 01A-MS-035	6847	N/A
N/A	Dravo 01A-MS-036	6848	N/A
N/A	Dravo 01A-MS-050	6850	N/A
N/A	Dravo 01A-MS-051	6851	N/A
N/A	Dravo 01A-MS-052	6852	N/A
N/A	Dravo 01A-MS-053	6853	N/A
N/A	Dravo 01A-MS-152	6855	N/A
N/A	Dravo 01A-MS-153	6856	N/A
N/A	Dravo 01A-MS-154	6857	N/A
N/A	Dravo 01A-MS-155	6858	N/A
1-PCV-01-005	Copes-Vulcan	7520-95337-1-1	776
1-PCV-01-012	Copes-Vulcan	7520-95337-1-2	777
1-PCV-01-023	Copes-Vulcan	7520-95337-1-3	779
1-PCV-01-030	Copes-Vulcan	7520-95337-1-4	780
N/A	Dravo 01A-MS-005	8781	N/A
N/A	Dravo 01A-MS-006	8782	N/A
N/A	Dravo 01A-MS-019	8783	N/A
N/A	Dravo 01A-MS-020	8784	N/A
N/A	Dravo 01A-MS-037	8785	N/A
N/A	Dravo 01A-MS-038	8786	N/A
N/A	Dravo 01A-MS-054	8787	N/A
N/A	Dravo 01A-MS-056	8788	N/A
N/A	Dravo 01A-MS-057	8789	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 001-MAIN STEAM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-SFV-01-526	Dresser	BS06215	N/A
1-SFV-01-516	Dresser	BS06217	N/A
1-SFV-01-531	Dresser	BS06218	N/A
1-SFV-01-525	Dresser	BS06223	N/A
1-SFV-01-515	Dresser	BS06225	N/A
1-SFV-01-530	Dresser	BS06226	N/A
1-SFV-01-524	Dresser	BS06231	N/A
1-SFV-01-514	Dresser	BS06233	N/A
1-SFV-01-529	Dresser	BS06234	N/A
1-SFV-01-523	Dresser	BS06239	N/A
1-SFV-01-513	Dresser	BS06241	N/A
1-SFV-01-528	Dresser	BS06242	N/A
1-SFV-01-522	Dresser	BS06247	N/A
1-SFV-01-517	Dresser	BS06248	N/A
1-SFV-01-512	Dresser	BS06249	N/A
1-SFV-01-527	Dresser	BS06250	N/A
1-SFV-01-521	Dresser	BS06216	N/A
1-SFV-01-520	Dresser	BS06224	N/A
1-SFV-01-519	Dresser	BS06232	N/A
1-SFV-01-518	Dresser	BS06240	N/A
1-RIS-01-619	Walworth	D66147	1508
1-RIS-01-620	Walworth	D66211	1565
1-RIS-01-622	Walworth	D66227	1581
1-RIS-01-621	Walworth	D66447	1708

NATIONAL BOARD NUMBERS

SYSTEM: 003-FEEDWATER

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
N/A	Dravo 03A-FW-030	11075	N/A
N/A	Dravo 03A-FW-031	11076	N/A
N/A	Dravo 03A-FW-036	14945	N/A
N/A	Dravo 03A-FW-037	14946	N/A
N/A	Dravo 03A-FW-038	14947	N/A
N/A	Dravo 03A-FW-039	14948	N/A
N/A	Dravo 03A-FW-044	14953	N/A
N/A	Dravo 03A-FW-045	14954	N/A
N/A	Dravo 03A-FW-046	14955	N/A
N/A	Dravo 03A-FW-047	14956	N/A
N/A	Dravo 03A-FW-048	14957	N/A
N/A	Dravo 03A-FW-049	14958	N/A
N/A	Dravo 03A-FW-054	14963	N/A
N/A	Dravo 03A-FW-055	14964	N/A
N/A	Dravo 03A-FW-056	14965	N/A
N/A	Dravo 03A-FW-057	14966	N/A
N/A	Dravo 03A-FW-058	14967	N/A
N/A	Dravo 03A-FW-059	14968	N/A
N/A	Dravo 03A-FW-065	14974	N/A
N/A	Dravo 03A-FW-066	14975	N/A
N/A	Dravo 03A-FW-067	14976	N/A
N/A	Dravo 03A-FW-068	14977	N/A
N/A	Dravo 03B-AF-177	14982	N/A
N/A	Dravo 03B-AF-178	14983	N/A
N/A	Dravo 03B-AF-180	14984	N/A
N/A	Dravo 03B-AF-181	14985	N/A
N/A	Dravo 03B-AF-176	15591	N/A
1-CKV-03-645	Borg-Warner	26305	Later
1-CKV-03-655	Borg-Warner	26310	Later
1-CKV-03-652	Borg-Warner	26311	N/A
1-CKV-03-669	Borg-Warner	26312	Later
1-CKV-03-638	Borg-Warner	26313	Later
1-CKV-03-656	Borg-Warner	26317	Later
1-CKV-03-679	Borg-Warner	26318	Later
1-CKV-03-670	Borg-Warner	26320	N/A
1-CKV-03-644	Borg-Warner	26321	Later
1-CKV-03-678	Borg-Warner	26322	Later
N/A	Dravo 03A-FW-001	6859	N/A
N/A	Dravo 03A-FW-003	6861	N/A
N/A	Dravo 03A-FW-005	6863	N/A
N/A	Dravo 03A-FW-006	6864	N/A
N/A	Dravo 03A-FW-007	6865	N/A
N/A	Dravo 03A-FW-008	6866	N/A
N/A	Dravo 03A-FW-010	6868	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 003-FEEDWATER

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
N/A	Dravo 03A-FW-012	6870	N/A
N/A	Dravo 03A-FW-013	6871	N/A
N/A	Dravo 03A-FW-015	6873	N/A
N/A	Dravo 03A-FW-016	6874	N/A
N/A	Dravo 03A-FW-017	6875	N/A
N/A	Dravo 03A-FW-018	6876	N/A
N/A	Dravo 03A-FW-020	6878	N/A
N/A	Dravo 03A-FW-021	6879	N/A
N/A	Dravo 03A-FW-022	6880	N/A
N/A	Dravo 03A-FW-023	6881	N/A
N/A	Dravo 03A-FW-024	6882	N/A
N/A	Dravo 03A-FW-025	6883	N/A
N/A	Dravo 03A-FW-026	8570	N/A
N/A	Dravo 03A-FW-027	8571	N/A
N/A	Dravo 03A-FW-028	8572	N/A
N/A	Dravo 03A-FW-029	8573	N/A
1-FCV-03-236	Leslie	D17543-3CEX	N/A
1-FCV-03-239	Leslie	D17543-3CEZ	N/A
1-FCV-03-242	Leslie	D17543-3CFB	N/A
1-FCV-03-245	Leslie	D17543-3CFC	N/A
1-FCV-03-087	Walworth	D66290	1642
1-FCV-03-033	Walworth	D66291	1643
1-FCV-03-047	Walworth	D66292	1644
1-FCV-03-100	Walworth	D66293	1645
1-CKV-03-510	Walworth	D66295	1647
1-CKV-03-511	Walworth	D66296	1648
1-CKV-03-509	Walworth	D66297	1649
1-CKV-03-508	Walworth	D66451	1712
N/A	Dravo 03B-AF-179	J12560	Later

NATIONAL BOARD NUMBERS

SYSTEM: 062-CHEMICAL & VOLUME CONTROL SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-CKV-62-659	Westinghouse	03CS882S710031	W-10328
1-CKV-62-660	Westinghouse	03CS882S710034	W-10331
1-CKV-62-638	Westinghouse	03CS882S710035	W-10332
1-CKV-62-640	Westinghouse	03CS882S710033	W-10330
1-DRV-68-580	Velan	1678	N/A
1-HTX-62-120	Joseph Oat	2247-2A11	856
1-HTX-62-122	Atlas Mfg.	3142	2520
1-HTX-62-121	Atlas Mfg.	3151	2529
1-HTX-62-01/01A	Atlas Mfg.	3159	2537
1-DEMN-62-01/01A	Lamco Ind.	407	138
1-DEMN-62-01/01B	Lamco Ind.	408	139
1-DEMN-62-02/1A	Lamco Ind.	412	143
1-TANK-62-05/1A	Lamco Ind.	450	181
1-FCV-62-84	Fisher	5697030	2116
1-FCV-62-70	Fisher	5737615	2463
1-FCV-62-69	Fisher	5737616	2464
N/A	Dravo 62A-CVC-144	7390	N/A
N/A	Dravo 62A-CVC-145	7391	N/A
N/A	Dravo 62A-CVC-146	7392	N/A
N/A	Dravo 62A-CVC-147	7393	Later
N/A	Dravo 62A-CVC-148	7394	Later
N/A	Dravo 62A-CVC-149	7395	N/A
N/A	Dravo 62A-CVC-151	7396	N/A
N/A	Dravo 62A-CVC-152	7397	N/A
N/A	Dravo 62A-CVC-153	7398	N/A
N/A	Dravo 62A-CVC-154	7399	N/A
N/A	Dravo 62A-CVC-155	7400	Later
N/A	Dravo 62A-CVC-156	7401	N/A
N/A	Dravo 62A-CVC-157	7402	N/A
N/A	Dravo 62A-CVC-158	7403	N/A
N/A	Dravo 62A-CVC-159	7404	N/A
N/A	Dravo 62A-CVC-160	7405	N/A
N/A	Dravo 62A-CVC-161	7406	N/A
N/A	Dravo 62A-CVC-162	7407	N/A
N/A	Dravo 62A-CVC-163	7408	Later
N/A	Dravo 62A-CVC-164	7404	Later
N/A	Dravo 62A-CVC-171	7416	N/A
N/A	Dravo 62A-CVC-172	7417	N/A
N/A	Dravo 62A-CVC-173	7418	N/A
N/A	Dravo 62A-CVC-174	7419	N/A
N/A	Dravo 62A-CVC-175	7420	N/A
N/A	Dravo 62A-CVC-150	9507	N/A
N/A	Dravo 62A-CVC-176	9508	Later

NATIONAL BOARD NUMBERS

SYSTEM: 062-CHEMICAL & VOLUME CONTROL SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
N/A	Dravo 62A-CVC-177	9509	N/A
N/A	Dravo 62A-CVC-178	9510	N/A
1-ISV-62-567	Kerotest	JS2-19	N/A
1-ISV-62-564	Kerotest	JS2-2	N/A
1-ISV-62-565	Kerotest	JS2-21	N/A
1-ISV-62-566	Kerotest	JS2-9	N/A
1-CKV-62-562	Kerotest	MA6-11	N/A
1-CKV-62-576	Kerotest	MA6-13	N/A
1-CKV-62-563	Kerotest	MA6-14	N/A
1-CKV-62-578	Kerotest	MA6-22	N/A
1-CKV-62-661	Kerotest	MA6-24	N/A
1-CKV-62-561	Kerotest	MA6-4	N/A
1-CKV-62-560	Kerotest	MA6-6	N/A
1-CKV-62-577	Kerotest	MA6-7	N/A
1-CKV-62-579	Kerotest	MA8-11	N/A
1-PMP-62-230A	Gould Pumps	N717B672-1	87
1-PMP-62-232B	Gould Pumps	N717B672-2	88
N/A	TVA 1-62-5-10-003	N/A	N/A
N/A	TVA-1-62-5-10-004	N/A	N/A
N/A	TVA-1-62-5-10-007	N/A	N/A
N/A	TVA 1-62-5-15-017	N/A	N/A
N/A	TVA-1-62-5-15-018	N/A	N/A
N/A	TVA-1-62-5-15-035	N/A	N/A
N/A	TVA 1-62-5-15-036	N/A	N/A
N/A	TVA-1-62-5-15-037	N/A	N/A
N/A	TVA-1-62-5-15-038	N/A	N/A
N/A	TVA-1-62-5-15-039	N/A	N/A
N/A	TVA-1-62-5-16-001	N/A	N/A
N/A	TVA-1-62-5-16-002	N/A	N/A
N/A	TVA-1-62-5-16-003	N/A	N/A
N/A	TVA-1-62-5-16-030	N/A	N/A
N/A	TVA-1-62-5-16-031	N/A	N/A
N/A	TVA-1-62-5-16-032	N/A	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 063-SAFETY INJECTION SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
N/A	Dravo 63-SI-116	10299	N/A
N/A	Dravo 63-SI-117	10300	N/A
N/A	Dravo 63-SI-118	10301	N/A
N/A	Dravo 63-SI-119	10302	N/A
N/A	Dravo 63-SI-120	10303	N/A
N/A	Dravo 63-SI-121	10304	N/A
N/A	Dravo 63-SI-122	10305	N/A
N/A	Dravo 63-SI-123	10306	N/A
N/A	Dravo 63-SI-124	10307	N/A
N/A	Dravo 63-SI-125	10308	N/A
N/A	Dravo 63-SI-126	10309	N/A
N/A	Dravo 63-SI-127	10310	N/A
N/A	Dravo 63-SI-128	10311	N/A
N/A	Dravo 63-SI-129	10312	N/A
N/A	Dravo 63-SI-130	10313	N/A
N/A	Dravo 63-SI-131	10314	N/A
N/A	Dravo 63-SI-132	10315	N/A
N/A	Dravo 63-SI-133	10316	N/A
N/A	Dravo 63-SI-134	10317	N/A
N/A	Dravo 63-SI-135	10318	N/A
N/A	Dravo 63-SI-136	10319	N/A
N/A	Dravo 63-SI-137	10320	N/A
N/A	Dravo 63-SI-138	10321	N/A
N/A	Dravo 63-SI-139	10322	N/A
N/A	Dravo 63-SI-140	10323	N/A
N/A	Dravo 63-SI-141	10324	N/A
N/A	Dravo 63-SI-153	10327	N/A
N/A	Dravo 63-SI-154	10328	N/A
N/A	Dravo 63-SI-155	10329	N/A
N/A	Dravo 63-SI-156	10330	N/A
N/A	Dravo 63-SI-157	10331	N/A
N/A	Dravo 63-SI-158	10332	N/A
N/A	Dravo 63-SI-159	10333	N/A
N/A	Dravo 63-SI-143	10366	N/A
N/A	Dravo 63-SI-144	10367	N/A
N/A	Dravo 63-SI-145	10368	N/A
N/A	Dravo 63-SI-146	10369	N/A
N/A	Dravo 63-SI-147	10370	N/A
N/A	Dravo 63-SI-148	10371	N/A
N/A	Dravo 63-SI-149	10372	N/A
N/A	Dravo 63-SI-151	10374	N/A
N/A	Dravo 63-SI-161	10376	N/A
N/A	Dravo 63-SI-162	10377	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 063-SAFETY INJECTION SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
N/A	Dravo 63-SI-163	10378	N/A
N/A	Dravo 63-SI-164	10379	N/A
N/A	Dravo 63-SI-165	10380	N/A
N/A	Dravo 63-SI-166	10381	N/A
N/A	Dravo 63-SI-167	10382	N/A
N/A	Dravo 63-SI-168	10383	N/A
N/A	Dravo 63-SI-169	10384	N/A
N/A	Dravo 63-SI-170	10385	N/A
N/A	Dravo 63-SI-171	10386	N/A
N/A	Dravo 63-SI-172	10387	N/A
N/A	Dravo 63-SI-175	10390	N/A
N/A	Dravo 63-SI-176	10391	N/A
N/A	Dravo 63-SI-177	10392	N/A
N/A	Dravo 63-SI-178	10393	N/A
N/A	Dravo 63-SI-179	10394	N/A
N/A	Dravo 63-SI-180	10395	N/A
N/A	Dravo 63-SI-181	10396	N/A
N/A	Dravo 63-SI-182	10397	N/A
N/A	Dravo 63-SI-183	10398	N/A
N/A	Dravo 63-SI-215	10778	N/A
N/A	Dravo 63-SI-216	10779	N/A
N/A	Dravo 63-SI-217	10780	N/A
1-63-CKV-623	Westinghouse	10CS880000011	Later
1-63-CKV-624	Westinghouse	10CS880000014	Later
1-63-CKV-562	Westinghouse	10CS880000015	Later
1-63-CKV-625	Westinghouse	10CS880000016	W10443
1-63-CKV-622	Westinghouse	10CS880000020	W11118
1-63-CKV-563	Westinghouse	10CS880000021	W11119
1-63-CKV-561	Westinghouse	10CS880000022	W11120
1-63-CKV-560	Westinghouse	10CS880000023	W11121
1-63-FCV-118	Westinghouse	10GM88FNNH001	W10991
1-63-FCV-98	Westinghouse	10GM88FNNH002	W11253
1-63-FCV-80	Westinghouse	10GM88FNNH003	W11254
1-63-FCV-67	Westinghouse	10GM88FNNH004	W11902
N/A	Dravo 63-SI-219	11524	N/A
N/A	Dravo 63-SI-220	11525	N/A
N/A	Dravo 63-SI-221	11526	N/A
1-63-CKV-502	Westinghouse	12CS84000001	W11112
N/A	Dravo 63-SI-250	13919	N/A
N/A	Dravo 63-SI-251	13920	N/A
N/A	Dravo 63-SI-252	13921	N/A
N/A	Dravo 63-SI-253	13922	N/A
1-63-FCV-1	Westinghouse	14GM84FEB0001	W11954

NATIONAL BOARD NUMBERS

SYSTEM: 063-SAFETY INJECTION SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-63-THV-582	Borg-Warner	25042	N/A
1-63-THV-584	Borg-Warner	25043	N/A
1-63-THV-585	Borg-Warner	25587	N/A
1-63-THV-583	Borg-Warner	25590	N/A
Accum. #1	Delta Southern	33007-74-1	3548
Accum. #2	Delta Southern	33007-74-2	3549
Accum. #3	Delta Southern	33007-74-3	3550
Accum. #4	Delta Southern	33007-74-4	3551
1-63-CKV-581	Westinghouse	3CS880000036	W-10333
SI PMP 1A-A	Pacific Pumps	49351	108
SI PMP 1B-B	Pacific Pumps	49352	109
1-63-CKV-559	Westinghouse	6CS8800000090	W10407
1-63-CKV-635	Westinghouse	6CS8800000052	W10358
1-63-CKV-632	Westinghouse	6CS8800000053	W10359
1-63-CKV-633	Westinghouse	6CS8800000054	W10360
1-63-CKV-634	Westinghouse	6CS8800000088	W10405
1-63-CKV-558	Westinghouse	6CS8800000089	W10406
N/A	Dravo 63-SI-37	7580	N/A
N/A	Dravo 63-SI-38	7581	N/A
N/A	Dravo 63-SI-39	7582	N/A
N/A	Dravo 63-SI-40	7583	N/A
N/A	Dravo 63-SI-41	7584	N/A
N/A	Dravo 63-SI-42	7585	N/A
N/A	Dravo 63-SI-43	7586	N/A
N/A	Dravo 63-SI-44	7587	N/A
N/A	Dravo 63-SI-45	7588	N/A
N/A	Dravo 63-SI-56	7599	N/A
N/A	Dravo 63-SI-57	7600	N/A
N/A	Dravo 63-SI-58	7601	N/A
N/A	Dravo 63-SI-59	7602	N/A
N/A	Dravo 63-SI-60	7603	N/A
N/A	Dravo 63-SI-61	7604	N/A
N/A	Dravo 63-SI-62	7605	N/A
N/A	Dravo 63-SI-63	7606	N/A
N/A	Dravo 63-SI-64	7607	N/A
N/A	Dravo 63-SI-65	7608	N/A
N/A	Dravo 63-SI-66	7609	N/A
N/A	Dravo 63-SI-67	7610	N/A
N/A	Dravo 63-SI-68	7611	N/A
N/A	Dravo 63-SI-69	7612	N/A
N/A	Dravo 63-SI-70	7613	N/A
N/A	Dravo 63-SI-71	7614	N/A
N/A	Dravo 63-SI-75	7618	N/A
N/A	Dravo 63-SI-76	7619	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 063-SAFETY INJECTION SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
N/A	Dravo 63-SI-77	7620	N/A
N/A	Dravo 63-SI-78	7621	N/A
N/A	Dravo 63-SI-79	7622	N/A
N/A	Dravo 63-SI-80	7623	N/A
N/A	Dravo 63-SI-81	7624	N/A
N/A	Dravo 63-SI-82	7625	N/A
N/A	Dravo 63-SI-83	7626	N/A
1-63-FCV-8	Westinghouse	8GM84FEB0003	Later
1-63-FCV-11	Westinghouse	8GM84FEB0004	W10932
1-63-FCV-94	Westinghouse	8GM88FNB0002	W10855
1-63-FCV-93	Westinghouse	8GM88FNSB0001	W10854
1-63-TV-513	Kerotest	HR36-22	N/A
1-63-CKV-588	Kerotest	LA1-11	N/A
1-63-CKV-586	Kerotest	LA1-20	Later
1-63-CKV-589	Kerotest	LA1-24	Later
1-63-CKV-587	Kerotest	LA1-7	N/A
1-63-CKV-549	Kerotest	LA5-12	N/A
1-63-CKV-543	Kerotest	LA514	N/A
1-63-CKV-553	Kerotest	LA5-15	N/A
1-63-CKV-547	Kerotest	LA5-2	N/A
1-63-CKV-555	Kerotest	LA5-23	N/A
1-63-CKV-551	Kerotest	LA5-24	N/A
1-63-CKV-545	Kerotest	LA5-5	N/A
1-63-CKV-557	Kerotest	LA5-9	N/A
N/A	TVA 1-63-S-04-07	N/A	N/A
N/A	TVA 1-63-S-04-08	N/A	N/A
N/A	TVA 1-63-S-04-19	N/A	N/A
N/A	TVA 1-63-S-04-19A	N/A	N/A
N/A	TVA 1-63-S-04-19B	N/A	N/A
N/A	TVA 1-63-S-04-20A	N/A	N/A
N/A	TVA 1-63-S-04-21	N/A	N/A
N/A	TVA 1-63-S-04-22	N/A	N/A
N/A	TVA 1-63-S-05-05	N/A	N/A
N/A	TVA 1-63-S-05-06	N/A	N/A
N/A	TVA 1-63-S-05-07	N/A	N/A
N/A	TVA 1-63-S-05-08	N/A	N/A
N/A	TVA 1-63-S-05-09	N/A	N/A
N/A	TVA 1-63-S-05-16	N/A	N/A
N/A	TVA 1-63-S-06-01	N/A	N/A
N/A	TVA 1-63-S-06-02	N/A	N/A
N/A	TVA 1-63-S-06-03	N/A	N/A
N/A	TVA 1-63-S-06-04	N/A	N/A
N/A	TVA 1-63-S-06-05	N/A	N/A
N/A	TVA 1-63-S-06-06	N/A	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 063-SAFETY INJECTION SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
N/A	TVA 1-63-S-06-07	N/A	N/A
N/A	TVA 1-63-S-06-12	N/A	N/A
N/A	TVA 1-63-S-06-13	N/A	N/A
N/A	TVA 1-63-S-09-12	N/A	N/A
N/A	TVA 1-63-S-09-24	N/A	N/A
N/A	TVA 1-63-S-09-26	N/A	N/A
N/A	TVA 1-63-S-09-27	N/A	N/A
N/A	TVA 1-63-S-09-28	N/A	N/A
N/A	TVA 1-63-S-09-29	N/A	N/A
N/A	TVA 1-63-S-09-30	N/A	N/A
N/A	TVA 1-63-S-09-31	N/A	N/A
N/A	TVA 1-63-S-09-32	N/A	N/A
N/A	TVA 1-63-S-09-33	N/A	N/A
1-63-FCV-72	Westinghouse	18GM84FEH001	W17878
1-63-FCV-73	Westinghouse	18GM84FEH002	W17879
1-63-FCV-172	Westinghouse	12GM88SEH003	Later
1-63-FCV-640	Westinghouse	8CS880000017	W10417
1-63-FCV-641	Westinghouse	6CS880000092	W10409
1-63-FCV-643	Westinghouse	8CS880000003	W10410
1-63-FCV-644	Westinghouse	6CS880000091	W10408

NATIONAL BOARD NUMBERS

SYSTEM: 068-REACTOR COOLANT SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-068-SGEN-SG1	Westinghouse	1591	W10286
1-068-SGEN-SG2	Westinghouse	1592	W10287
1-068-SGEN-SG3	Westinghouse	1593	W10288
1-068-SGEN-SG4	Westinghouse	1594	W10289
1-068-PRES-PR	Westinghouse	1601	W10792
1-068-ISV-519	Westinghouse	3GH880000082	W10864
1-068-ISV-530	Westinghouse	3GH880000083	W10865
1-068-ISV-514	Westinghouse	3GH880000084	W10866
1-068-ISV-508	Westinghouse	3GH880000085	W10867
1-068-ISV-541	Westinghouse	3GH880000089	W10871
1-068-ISV-536	Westinghouse	3GH880000090	W10872
1-068-ISV-525	Westinghouse	3GH880000098	W10953
1-068-ISV-547	Westinghouse	3GH880000099	W10954
1-068-FCV-332	Westinghouse	3GH88FNNH02	W10877
1-068-FCV-333	Westinghouse	3GM88FNNH01	W10876
1-068-PCV-340B	Fisher	5909465	Later
1-068-PCV-340D	Fisher	5909466	Later
1-068-PCV-334	Fisher	5916726	N/A
1-068-PCV-340A	Fisher	5916727	N/A
1-068-PMP-8	ESCO (for W)	923	Later
1-068-PMP-31	ESCO (for W)	924	Later
1-068-PMP-50	ESCO (for W)	925	Later
1-068-PMP-73	ESCO (for W)	926	Later
N/A	Dravo 68-RC-04	9464	N/A
N/A	Dravo 68-RC-05	9465	N/A
N/A	Dravo 68-RC-06	9466	N/A
N/A	Dravo 68-RC-07	9467	N/A
N/A	Dravo 68-RC-08	9468	N/A
N/A	Dravo 68-RC-09	9469	N/A
N/A	Dravo 68-RC-10	9470	N/A
N/A	Dravo 68-RC-11	9471	N/A
N/A	Dravo 68-RC-12	9472	N/A
N/A	Dravo 68-RC-14	9474	N/A
N/A	Dravo 68-RC-15	9475	N/A
N/A	Dravo 68-RC-16	9476	N/A
N/A	Dravo 68-RC-17	9477	N/A
N/A	Dravo 68-RC-18	9478	N/A
N/A	Dravo 68-RC-19	9479	N/A
N/A	Dravo 68-RC-20	9480	N/A
N/A	Dravo 68-RC-21	9481	N/A
N/A	Dravo 68-RC-22	9482	N/A
N/A	Dravo 68-RC-23	9483	N/A
N/A	Dravo 68-RC-24	9484	N/A
N/A	Dravo 68-RC-25	9485	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 068-REACTOR COOLANT SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
N/A	Dravo 68-RC-27	9487	N/A
N/A	Dravo 68-RC-28	9488	N/A
N/A	Dravo 68-RC-29	9489	N/A
N/A	Dravo 68-RC-30	9490	N/A
N/A	Dravo 68-RC-31	9491	N/A
N/A	Dravo 68-RC-32	9492	N/A
N/A	Dravo 68-RC-33	9493	N/A
N/A	Dravo 68-RC-34	9494	N/A
N/A	Dravo 68-RC-35	9495	N/A
N/A	Dravo 68-RC-36	9496	N/A
1-68-ISV-515	Kerotest	DG-8-22	Later
1-68-DRV-582	Kerotest	HX-2-10	N/A
1-68-ISV-520	Kerotest	HX-2-11	N/A
1-68-ISV-535	Kerotest	HX-2-16	N/A
1-68-ISV-524	Kerotest	HX-2-2	N/A
1-68-DRV-553	Kerotest	HX-2-20	N/A
1-68-ISV-509	Kerotest	HX-2-3	N/A
1-68-DRV-550	Kerotest	HX-2-4	N/A
1-68-DRV-549	Kerotest	HX-2-5	N/A
1-68-ISV-513	Kerotest	HX-2-8	N/A
1-68-ISV-505	Kerotest	HX-7-14	N/A
1-68-ISV-526	Kerotest	HX-7-7	N/A
1-68-ISV-531	Kerotest	HX-7-8	N/A
1-68-ISV-542	Kerotest	HX-2-21	N/A
1-68-ISV-543	Kerotest	HX-7-11	N/A
1-68-ISV-537	Kerotest	HX-7-9	N/A
1-68-ISV-510	Kerotest	KP-2-20	N/A
1-68-ISV-521	Kerotest	KP-22-23	N/A
1-68-DRV-581	Kerotest	KP-26-19	N/A
1-68-DRV-554	Kerotest	KP-26-20	N/A
1-68-ISV-504	Kerotest	KP-4-24	N/A
1-68-ISV-532	Kerotest	KP-7-20	N/A
1-68-ISV-516	Kerotest	KP-7-9	N/A
1-68-DRV-558	Kerotest	KP-10-22	N/A
1-68-DRV-557	Kerotest	KP-22-24	N/A
1-68-ISV-546	Kerotest	KP-7-1	N/A
1-68-ISV-538	Kerotest	KP-7-12	N/A
1-68-ISV-527	Kerotest	MC-5-6	N/A
1-68-RFV-563	Crosby	N56964-06-0029	905
1-68-RFV-564	Crosby	N56964-06-0033	201
1-68-RFV-565	Crosby	N56964-06-0034	907
N/A	TVA 1-68-5-01-001	N/A	N/A
N/A	TVA 1-68-5-01-002	N/A	N/A
N/A	TVA 1-68-5-01-003	N/A	N/A

NATIONAL BOARD NUMBERS
 SYSTEM: 068-REACTOR COOLANT SYSTEM

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
N/A	TVA 1-68-5-01-004	N/A	N/A
N/A	TVA 1-68-5-02-004	N/A	N/A
N/A	TVA 1-68-5-02-005	N/A	N/A
N/A	TVA 1-68-5-02-006	N/A	N/A
N/A	TVA 1-68-5-02-007	N/A	N/A
N/A	TVA 1-68-5-02-011	N/A	N/A
N/A	TVA 1-68-5-02-012	N/A	N/A
N/A	TVA 1-68-5-02-013	N/A	N/A
N/A	TVA 1-68-5-02-014	N/A	N/A
N/A	TVA 1-68-5-02-020	N/A	N/A
N/A	TVA 1-68-5-02-021	N/A	N/A
N/A	TVA 1-68-5-02-022	N/A	N/A
N/A	TVA 1-68-5-02-024	N/A	N/A
N/A	TVA 1-68-5-02-028	N/A	N/A
N/A	TVA 1-68-5-02-029	N/A	N/A
N/A	TVA 1-68-5-02-030	N/A	N/A
N/A	TVA 1-68-5-02-032	N/A	N/A
N/A	TVA 1-68-5-02-036	N/A	N/A
N/A	TVA 1-68-5-02-037	N/A	N/A
N/A	TVA 1-68-5-02-038	N/A	N/A
N/A	TVA 1-68-5-02-039	N/A	N/A
N/A	TVA 1-68-5-02-043	N/A	N/A
N/A	TVA 1-68-5-02-044	N/A	N/A
N/A	TVA 1-68-5-02-045	N/A	N/A
N/A	TVA 1-68-5-02-050	N/A	N/A
N/A	TVA 1-68-5-02-051	N/A	N/A
N/A	TVA 1-68-5-02-052	N/A	N/A
N/A	TVA 1-68-5-02-053	N/A	N/A
N/A	TVA 1-68-5-02-057	N/A	N/A
N/A	TVA 1-68-5-02-058	N/A	N/A
N/A	TVA 1-68-5-02-059	N/A	N/A
N/A	TVA 1-68-5-02-060	N/A	N/A
N/A	TVA 1-68-5-03-002	N/A	N/A
N/A	TVA 1-68-5-03-004	N/A	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 072-CONTAINMENT SPRAY

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-72-FCV-040	Westinghouse	0800GM84FEB00B00S710005	W12192
1-72-FCV-041	Westinghouse	0800GM84FEB00B00S710005	W12193

NATIONAL BOARD NUMBERS

SYSTEM: 074-RESIDUAL HEAT REMOVAL

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-074-HTX-01/1A	Eng & Fab, Inc.	S-17811-A	1558
1-074-HTX-01/1B	Eng & Fab, Inc.	S-17811-B	1559
	Dravo 74-RHR-006	6736	N/A
	Dravo 74-RHR-007	6737	N/A
	Dravo 74-RHR-008	6738	N/A
	Dravo 74-RHR-009	6739	N/A
	Dravo 74-RHR-010	6740	N/A
	Dravo 74-RHR-011	6741	Nonpp-1
	Dravo 74-RHR-012	6742	N/A
	Dravo 74-RHR-013	6743	N/A
	Dravo 74-RHR-014	6744	N/A
	Dravo 74-RHR-015	6745	N/A
	Dravo 74-RHR-016	6746	N/A
	Dravo 74-RHR-017	6747	N/A
	Dravo 74-RHR-018	6748	N/A
	Dravo 74-RHR-019	6749	N/A
	Dravo 74-RHR-020	6750	N/A
	Dravo 74-RHR-021	6751	N/A
	Dravo 74-RHR-022	6752	N/A
	Dravo 74-RHR-023	6753	N/A
	Dravo 74-RHR-024	6754	N/A
	Dravo 74-RHR-025	6755	N/A
	Dravo 74-RHR-026	6756	N/A
	Dravo 74-RHR-027	6757	N/A
	Dravo 74-RHR-028	6758	N/A
	Dravo 74-RHR-029	6759	N/A
	Dravo 74-RHR-030	6760	N/A
	Dravo 74-RHR-031	6761	N/A
	Dravo 74-RHR-032	6762	N/A
	Dravo 74-RHR-033	6763	N/A
	Dravo 74-RHR-034	6764	N/A
	Dravo 74-RHR-035	6765	N/A
	Dravo 74-RHR-036	6766	N/A
	Dravo 74-RHR-037	6767	N/A
	Dravo 74-RHR-038	6768	N/A
	Dravo 74-RHR-039	6769	N/A
	Dravo 74-RHR-040	6770	N/A
	Dravo 74-RHR-041	6771	N/A
	Dravo 74-RHR-042	6772	N/A
	Dravo 74-RHR-043	6773	N/A
	Dravo 74-RHR-044	6774	N/A
	Dravo 74-RHR-045	6775	N/A
	Dravo 74-RHR-046	6776	N/A
	Dravo 74-RHR-047	6777	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 074-RESIDUAL HEAT REMOVAL

TVA COMP. ID.	MANUFACTURER	S/N	NAT. BD. NO.
	Dravo 74-RHR-048	6778	N/A
	Dravo 74-RHR-049	6779	N/A
	Dravo 74-RHR-050	6780	N/A
	Dravo 74-RHR-051	6781	N/A
	Dravo 74-RHR-052	6782	N/A
	Dravo 74-RHR-053	6783	N/A
	Dravo 74-RHR-054	6784	N/A
	Dravo 74-RHR-055	6785	N/A
	Dravo 74-RHR-064	6794	N/A
	Dravo 74-RHR-065	6795	N/A
	Dravo 74-RHR-066	6796	N/A
	Dravo 74-RHR-067	6797	N/A
	Dravo 74-RHR-068	6798	N/A
	Dravo 74-RHR-069	6799	N/A
	Dravo 74-RHR-070	6800	N/A
	Dravo 74-RHR-071	6801	N/A
	Dravo 74-RHR-072	6802	N/A
	Dravo 74-RHR-073	6803	N/A
	Dravo 74-RHR-074	6804	N/A
	Dravo 74-RHR-075	6805	N/A
	Dravo 74-RHR-076	6806	N/A
	Dravo 74-RHR-077	6807	N/A
	Dravo 74-RHR-078	6808	N/A
	Dravo 74-RHR-079	6809	N/A
	Dravo 74-RHR-080	6810	N/A
	Dravo 74-RHR-081	6811	N/A
	Dravo 74-RHR-082	6812	N/A
	Dravo 74-RHR-083	6813	N/A
	Dravo 74-RHR-084	6814	N/A
	Dravo 74-RHR-085	6815	N/A
	Dravo 74-RHR-086	6816	N/A
	Dravo 74-RHR-087	6817	N/A
	Dravo 74-RHR-088	6818	N/A
	Dravo 74-RHR-089	6819	N/A
	Dravo 74-RHR-090	6820	N/A
	Dravo 74-RHR-091	6821	N/A
	Dravo 74-RHR-092	6822	N/A
	Dravo 74-RHR-093	6823	N/A
	Dravo 74-RHR-094	6824	N/A
	Dravo 74-RHR-095	6825	N/A
	Dravo 74-RHR-096	6826	N/A
	Dravo 74-RHR-097	6827	N/A
	Dravo 74-RHR-099	6829	Lost U1-Npp-1 (U-21S N/A)
	Dravo 74-RHR-102	6832	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 074-RESIDUAL HEAT REMOVAL

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-74-PMP-10-A	Ingersoll Rand	67470	78
1-74-PMP-20-B	Ingersoll Rand	67471	79
1-74-FCV-9	Westinghouse	10GM88SEH0003	W14312
1-74-FCV-8	Westinghouse	10GM88SEH0004	W14313
1-74-FCV-3	Westinghouse	14GM84FEH0001	W11192
1-74-FCV-21	Westinghouse	14GM84FEH0002	W11193
1-74-FCV-2	Westinghouse	14GM88SEH0001	W11959
1-74-FCV-1	Westinghouse	14GM88SEH0002	W11960
1-74-CKV-514	Westinghouse	8CS840000005	W10347
1-74-CKV-515	Westinghouse	8CS840000006	W10354
1-74-HCV-34	Westinghouse	8GH840000008	W10913
1-74-ISV-525	Westinghouse	8GH840000009	W10914
1-74-ISV-524	Westinghouse	8GH840000010	W10915
1-74-HCV-037	Westinghouse	8GH840000011	W10916
1-74-HCV-036	Westinghouse	8GH840000012	W10938
1-74-ISV-521	Westinghouse	8GH840000014	W10388
1-74-ISV-520	Westinghouse	8GH840000015	W10981
1-74-FCV-35	Westinghouse	8GM84FEB0001	W10929
1-74-FCV-33	Westinghouse	8GM84FEB0002	W10994
1-74-FCV-16	Westinghouse	BF207887	3390
1-74-FCV-32	Westinghouse	BF207888	3391
1-74-FCV-28	Westinghouse	BF207889	3392

NATIONAL BOARD NUMBERS

SYSTEM: 087-UPPER HEAT INJECTION

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-TANK-87-101	National Annealing	5835	2157
1-ACUM-87-102	Wyatt Div. USI	H-5223-N-72	4050
	Dravo 87-UHI-55	12526	N/A
	Dravo 87-UHI-56	12527	N/A
	Dravo 87-UHI-57	12528	N/A
	Dravo 87-UHI-58	12529	N/A
	Dravo 87-UHI-59	12530	N/A
	Dravo 87-UHI-60	12531	N/A
	Dravo 87-UHI-53	2635-10, 2635-2	No Npp-1
	Dravo 87-UHI-54	2635-10, 2635-2	No Npp-1
	Dravo 87-UHI-01	6916	N/A
	Dravo 87-UHI-02	6917	N/A
	Dravo 87-UHI-05	6918	N/A
	Dravo 87-UHI-06	6919	N/A
	Dravo 87-UHI-07	6920	N/A
	Dravo 87-UHI-08	6921	N/A
	Dravo 87-UHI-09	6922	N/A
	Dravo 87-UHI-10	6923	N/A
	Dravo 87-UHI-11	6924	N/A
	Dravo 87-UHI-12	6925	N/A
	Dravo 87-UHI-13	6926	N/A
	Dravo 87-UHI-14	6927	N/A
	Dravo 87-UHI-15	6928	N/A
	Dravo 87-UHI-16	6929	N/A
	Dravo 87-UHI-17	6930	N/A
	Dravo 87-UHI-18	6931	N/A
	Dravo 87-UHI-19	6932	N/A
	Dravo 87-UHI-20	6933	N/A
	Dravo 87-UHI-21	6934	N/A
	Dravo 87-UHI-22	6935	N/A
	Dravo 87-UHI-23	6936	N/A
	Dravo 87-UHI-24	6937	N/A
	Dravo 87-UHI-25	6938	N/A
	Dravo 87-UHI-26	6939	N/A
	Dravo 87-UHI-27	6940	N/A
	Dravo 87-UHI-28	6941	N/A
	Dravo 87-UHI-29	6942	N/A
	Dravo 87-UHI-30	6943	N/A
	Dravo 87-UHI-31	6944	N/A
	Dravo 87-UHI-32	6945	N/A
	Dravo 87-UHI-33	6946	N/A
	Dravo 87-UHI-34	6947	N/A
	Dravo 87-UHI-35	6989	N/A
	Dravo 87-UHI-36	6949	N/A

NATIONAL BOARD NUMBERS

SYSTEM: 087-UPPER HEAT INJECTION

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
	Dravo 87-UHI-37	6950	N/A
	Dravo 87-UHI-38	6951	N/A
	Dravo 87-UHI-39	6952	N/A
	Dravo 87-UHI-40	6953	N/A
	Dravo 87-UHI-41	6954	N/A
	Dravo 87-UHI-42	6955	N/A
	Dravo 87-UHI-43	6956	N/A
	Dravo 87-UHI-44	6957	N/A
	Dravo 87-UHI-03	7627	N/A
	Dravo 87-UHI-04	7628	N/A
	TVA 1-87-5-2-006	N/A	N/A
	TVA 1-87-5-2-007	N/A	N/A
	TVA 1-87-5-2-008	N/A	N/A
	TVA 1-87-5-2-009	N/A	N/A
1-CKV-87-563	Westinghouse	12CS880000042	W10859
1-CKV-87-562	Westinghouse	12CS880000043	W10860
1-FCV-87-07	Fisher	6498179	2432
1-FCV-87-08	Fisher	6498180	2433
1-CKV-87-558	Westinghouse	8CS880000013	W10412
1-CKV-87-561	Westinghouse	8CS880000014	W10414
1-CKV-87-559	Westinghouse	8CS880000015	W10415
1-CKV-87-560	Westinghouse	8CS880000016	W10416
1-FCV-87-21	Anchor Darling	E-5750-5-1	31
1-FCV-87-23	Anchor Darling	E-5750-5-2	32
1-FCV-87-22	Anchor Darling	E-5750-5-3	33
1-FCV-87-24	Anchor Darling	E-5750-5-4	34

NATIONAL BOARD NUMBERS

SYSTEM: 085-CONTROL ROD DRIVE MECH.

TVA COMP. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-085-W001-H8	Westinghouse	01-115E238G03	None Supplied
1-085-W001-E5	Westinghouse	01-934D129G01	None Supplied
1-085-W001-K6	Westinghouse	02-115E238G03	None Supplied
1-085-W001-E11	Westinghouse	02-934D129G01	None Supplied
1-085-W001-N5	Westinghouse	03-115E238G03	None Supplied
1-085-W001-L11	Westinghouse	03-934D129G01	None Supplied
1-085-W001-E13	Westinghouse	04-115E238G03	None Supplied
1-085-W001-L5	Westinghouse	04-934D129G01	None Supplied
1-085-W001-B10	Westinghouse	05-115E238G03	None Supplied
1-085-W001-B8	Westinghouse	06-115E238G03	None Supplied
1-085-W001-H2	Westinghouse	07-115E238G03	None Supplied
1-085-W001-E3	Westinghouse	08-115E238G03	None Supplied
1-085-W001-F2	Westinghouse	09-115E238G03	None Supplied
1-085-W001-D2	Westinghouse	10-115E238G03	None Supplied
1-085-W001-G3	Westinghouse	11-115E238G03	None Supplied
1-085-W001-B12	Westinghouse	12-115E238G03	None Supplied
1-085-W001-B6	Westinghouse	13-115E238G03	None Supplied
1-085-W001-M4	Westinghouse	14-115E238G03	None Supplied
1-085-W001-P10	Westinghouse	15-115E238G03	None Supplied
1-085-W001-N9	Westinghouse	16-115E238G03	None Supplied
1-085-W001-P8	Westinghouse	17-115E238G03	None Supplied
1-085-W001-N7	Westinghouse	18-115E238G03	None Supplied
1-085-W001-C5	Westinghouse	19-115E238G03	None Supplied
1-085-W001-F14	Westinghouse	20-115E238G03	None Supplied
1-085-W001-B4	Westinghouse	21-115E238G03	None Supplied
1-085-W001-G13	Westinghouse	22-115E238G03	None Supplied
1-085-W001-D4	Westinghouse	23-115E238G03	None Supplied
1-085-W001-P6	Westinghouse	24-115E238G03	None Supplied
1-085-W001-K14	Westinghouse	25-115E238G03	None Supplied
1-085-W001-F10	Westinghouse	26-115E238G03	None Supplied
1-085-W001-H10	Westinghouse	27-115E238G03	None Supplied
1-085-W001-K8	Westinghouse	28-115E238G03	None Supplied
1-085-W001-C7	Westinghouse	29-115E238G03	None Supplied
1-085-W001-P12	Westinghouse	30-115E238G03	None Supplied
1-085-W001-D14	Westinghouse	31-115E238G03	None Supplied
1-085-W001-H4	Westinghouse	32-115E238G03	None Supplied
1-085-W001-L13	Westinghouse	33-115E238G03	None Supplied
1-085-W001-D8	Westinghouse	34-115E238G03	None Supplied
1-085-W001-M14	Westinghouse	35-115E238G03	None Supplied
1-085-W001-N11	Westinghouse	36-115E238G03	None Supplied
1-085-W001-F6	Westinghouse	37-115E238G03	None Supplied
1-085-W001-K2	Westinghouse	38-115E238G03	None Supplied
1-085-W001-J3	Westinghouse	39-115E238G03	None Supplied
1-085-W001-M8	Westinghouse	40-115E238G03	None Supplied

NATIONAL BOARD NUMBERS

SYSTEM: 085-CONTROL ROD DRIVE MECH.

TVA COMPI. ID	MANUFACTURER	S/N	NAT. BD. NO.
1-085-W001-H12	Westinghouse	41-115E238G03	None Supplied
1-085-W001-D12	Westinghouse	42-115E238G03	None Supplied
1-085-W001-L3	Westinghouse	43-115E238G03	None Supplied
1-085-W001-H14	Westinghouse	44-115E238G03	None Supplied
1-085-W001-J13	Westinghouse	45-115E238G03	None Supplied
1-085-W001-K10	Westinghouse	46-115E238G03	None Supplied
1-085-W001-H6	Westinghouse	47-115E238G03	None Supplied
1-085-W001-P4	Westinghouse	48-115E238G03	None Supplied
1-085-W001-F8	Westinghouse	49-115E238G03	None Supplied
1-085-W001-C11	Westinghouse	50-115E238G03	None Supplied
1-085-W001-M12	Westinghouse	51-115E238G03	None Supplied
1-085-W001-M2	Westinghouse	52-115E238G03	None Supplied
1-085-W001-C9	Westinghouse	53-115E238G03	None Supplied
1-085-W001-E5A	Westinghouse	54-1168E80G01	None Supplied
1-085-W001-L5A	Westinghouse	55-1168E80G01	None Supplied
1-085-W001-L11A	Westinghouse	56-1168E80G01	None Supplied
1-085-W001-E11A	Westinghouse	57-1168E80G01	None Supplied
1-085-W001-M6	Royal	RA71-004	Later
1-085-W001-F12	Royal	RA72-070	Later
1-085-W001-M10	Royal	RA72-083	Later
1-085-W001-D10	Royal	RA73-108	Later
1-085-W001-D6	Royal	RA72-110	Later
1-085-W001-K4	Royal	RA72-111	Later
1-085-W001-F4	Royal	RA72-112	Later
1-085-W001-K12	Royal	RA72-113	Later