WATTS BAR NUCLEAR PLANT

SURVEILLANCE INSTRUCTION

SI-4.4.10.1

PRESERVICE BASELINE INSPECTION
AND INSERVICE INSPECTION PROGRAM FOR
TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT

UNITS 1 AND 2

Prepared By G. L. Belew

Submitted By E. R. Ennis
Supervisor

PORC Review 10-25-78
Date

Approved By
Superintendent

Date Approved 10-25-78

| | |
|---|---|
| 1C | Plant Master File |
| | Superintendent |
| 1U | Assistant Superintendent |
| 1U | Maintenance Supervisor |
| 1C | Results Supervisor |
| 1C | Operations Supervisor |
| 1C | Quality Assurance Supervisor |
| 1C | Health Physicist |
| | Administrative Supervisor |
| | Chemical Laboratory |
| | Instrument Shop |
| 1C | Shift Engineer's Office |
| 1U | Unit Control Room |
| | Health Physics Laboratory |
| | Chief Storekeeper |
| 1C | Mechanical Engineer |
| | Reactor Engineer |
| | Chemical Engineer |
| | Instrument Engineer |
| 3U | Chief, Nuclear Generation Branch |
| 1C | Assistant Maintenance Supervisor |
| | DPP Central Office File |
| 1C | Supervisor, Metallurgy and NDT Section, [illegible] |
| 1U | NRC |
| 1C | P PROD Training Center |
| 1C | PPMB Plant Representative |
| 2C | Industrial Engineer |

| Rev. No. | Date | Revised Pages |
|---|---|---|
| 0 | 10/25/78 | All |
| 1 | [illegible] | 37, 38, 39, 43, 44, 58, 58a, 58b |
| 2 | 1-24-79 | 4, 37, 38, 39, 43, 44, 58, 58a-38c |
| 3 | 3/19/79 | 19, 25, 41, 45, ~~59-1 through 59-7~~ |
| 4 | 4/11/79 | 2a and punchlist |
| 5 | 4/30/79 | 2a, 4,10,19,20,25, 38,41,43,44,45,59-1 through 59-7 |
| 6 | 5/22/79 | 60 |
| 7 | 6/12/79 | Pgs.20,23, 25, 43 & 59-1 thru 59-13 |

The last page of this instruction is number 60

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In appendix A, Table A lists the pipe size, number of welds, scheduled inspections, and type of examinations

3.4.3 Pressure-Retaining Bolting

Any class A pressure-retaining bolting 2 inches in diameter and larger shall be visually and ultrasonically examined. Class A bolting less than 2 inches shall be visually examined.

3.4.4 Integrally-Welded Supports and Support Components

Class A integrally-welded supports shall be ultrasonically examined for the preservice baseline and during the ISI intervals. Support components shall be visually examined for the baseline and during the ISI interval.

Unless a condition exists which should merit a detail record of the condition, only a checkoff sheet record will be maintained verifying visual inspection of supports and hangers.

3.5 Reactor Coolant Pumps (4)

3.5.1 Pressure Retaining Bolting

The main flange on each pump includes 24 bolts
* (4-1/2 inches in diameter). The lower seal housing on each pump includes twelve (12) socket head cap screws (2" in diameter).

Each bolt will be visually and ultrasonically examined for the preservice baseline and during the ISI intervals. A surface examination shall be performed when the bolting is removed.

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

3.5.2 Support Components

Each pump has three bolted support components. Each support component shall be visually examined during the preservice baseline and inservice inspection interval.

4.1.2 Steam Generator Secondary Nozzles

There is one feedwater nozzle (16-inch I.D.), one auxiliary feedwater nozzle (6-inch I.D.), one main steam nozzle (32-inch I.D.), and two manway pads (16-inch I.D.) per steam generator. Five nozzle (manway)-to-vessel welds will be ultrasonically examined for the preservice baseline and during the four inspection intervals. A total of two nozzles will be inspected during the first inservice inspection interval (see appendix A, Table B).

Nozzles are fabricated of SA-508, class 2, steel.

4.1.3 Pressure Retaining Bolting

Bolting on two manway covers on the secondary side shall be visually examined for the preservice baseline and during each inservice inspection interval (see appendix A, Table B). A total of four bolts shall be ultrasonically examined for the preservice baseline and four intervals. One bolt shall be examined for the first inspection interval. Each manway has 20 bolts (1-1/4 inches diameter).

The bolts are fabricated to SA-133, Gr. B7.

4.2 RHR Heat Exchangers (2)

4.2.1 Circumferential Seam Welds

There are two circumferential welds on the tube side of each heat exchanger, totaling approximately 20 feet for each heat exchanger. A total of 6 feet of the two welds will be ultrasonically examined from the O.D. for the preservice baseline and during the 4 intervals. Approximately 2 feet of the welds will be inspected for the first inservice inspection interval. The welds include the channel cylinder section to channel flange weld and the channel
* cylinder section to channel head weld. Channel weld map is included
* in Attachment 5.
The channel flange is fabricated from SS, SA-336-F8. The channel cylinder section and channel head are from SS, SA-240, TP-304.

Longitudinal weld joints in pipe fittings (tees, elbows, reducers, etc.) shall also be ultrasonically examined in accordance with IWC-1200 and IWC-2600.

In some cases, it may be impractical to inspect all welds from both sides or from either side; i.e., hanger interference, concrete or steel walls, or case stainless-steel valve and pump casing adjoining the weld(s). Where there is interference or problems from one direction only, consideration will be given to performing an angle beam examination for 2T+ (greater than two wall thicknesses from one edge of weld) from the accessible side of the weld in order or examine the entire weld cross section.

4.3.1.1 Residual Heat Removal and Safety Injection Piping (RHR, SI)

There are (later) class B circumferential welds subject to examination. Approximately ___ of these welds will be examined for RHR (later) during the first inspection interval and 143 welds during the four intervals and for the preservice baseline.

Approximately 64 longitudinal seam welds will be examined during the four intervals and for the preservice baseline.

Each system is entirely stainless steel. In Appendix A, Table B lists the weld size, number of welds, scheduled
* inspections, and types of examinations. Weld maps are in-
* cluded in Attachment 4.

4.3.1.2 Main Steam

* There are 119 class B circumferential welds subject to
* examination. Approximately 22 welds will be examined for the preservice baseline and during the 4 intervals. Approximately _____ of these welds will be examined during the first inservice inspection interval.

The entire system is carbon steel.

In appendix A, Table B lists weld size, number of welds, scheduled inspections,
* and type of examinations. Weld maps are included in
* Attachment 6.

TVA intends to terminate main steam class B on each main steam loop after the MSIV (FCV 1-4, 1-11, 1-22, 1-29) for baseline and ISI purposes. This is consistant with Regulatory Guide 1.26.

TABLE B

Watts Bar Inservice Inspection Program - Class "B" Components

| Component | 40-Year Sample | Sample Tested | Method of Inspection | Quantity Inspected 40 Month | 80 Month | 120 Month | Examination Category From Table IWC-2600, Section XI | Reference Drawing Number and Remarks | Procedure Number |
|---|---|---|---|---|---|---|---|---|---|
| C. Piping | | | | | | | | | |
| 1. Residual heat removal system | | | | | | | | | |
| Circumferential welds | | | | | | | | | |
| 18" SS | 1 | | UT | | | | | CH-M-2636-C | WB-UT-1 |
| 14" SS | 48 | | UT | | | | | CH-M-2636-C | WB-UT-1 |
| 12" SS | 21 | | UT | | | | C-F | CH-M-2636-C | WB-UT-1 |
| 10" SS | 4 | | UT | | | | | CH-M-2636-C | WB-UT-1 |
| 8" SS | 72 | | UT | | | | C-F | CH-M-2636-C | WB-UT-1 |
| * Longitudinal Seam Welds | 64 | | UT | | | | C-F | CH-M-2636-C | WB-UT-1 |
| 2. Safety Injection System | | | | | | | | | |
| Circumfrential Welds | | | | | | | | From OD | |
| 8" SS | | | UT | | | | C-F | | WB-UT-1 |
| 6" SS | | | UT | | | | C-F | | WB-UT-1 |
| 3. Main Steam | | | | | | | | | |
| Circumferential welds | | | | | | | | From O.D. | |
| 36" CS | 15 | | UT | | | | C-G | CH-M-2669-C | WB-UT-1 |
| 30" CS | 2 | | UT | | | | C-G | CH-M-2669-C | WB-UT-1 |
| 24" CS | 3 | | UT | | | | C-G | CH-M-2669-C | WB-UT-1 |
| 6" CS | 2 | | UT | | | | C-G | CH-M-2669-C | WB-UT-1 |
| 4. Feedwater | | | | | | | | | |
| Circumferential welds | | | | | | | | From O.D. | |
| 18" CS | | | UT | | | | C-G | | WB-UT-1 |
| 16" CS | | | UT | | | | C-G | | WB-UT-1 |

WBNP
SI-4.4.10.1
Attachment 4
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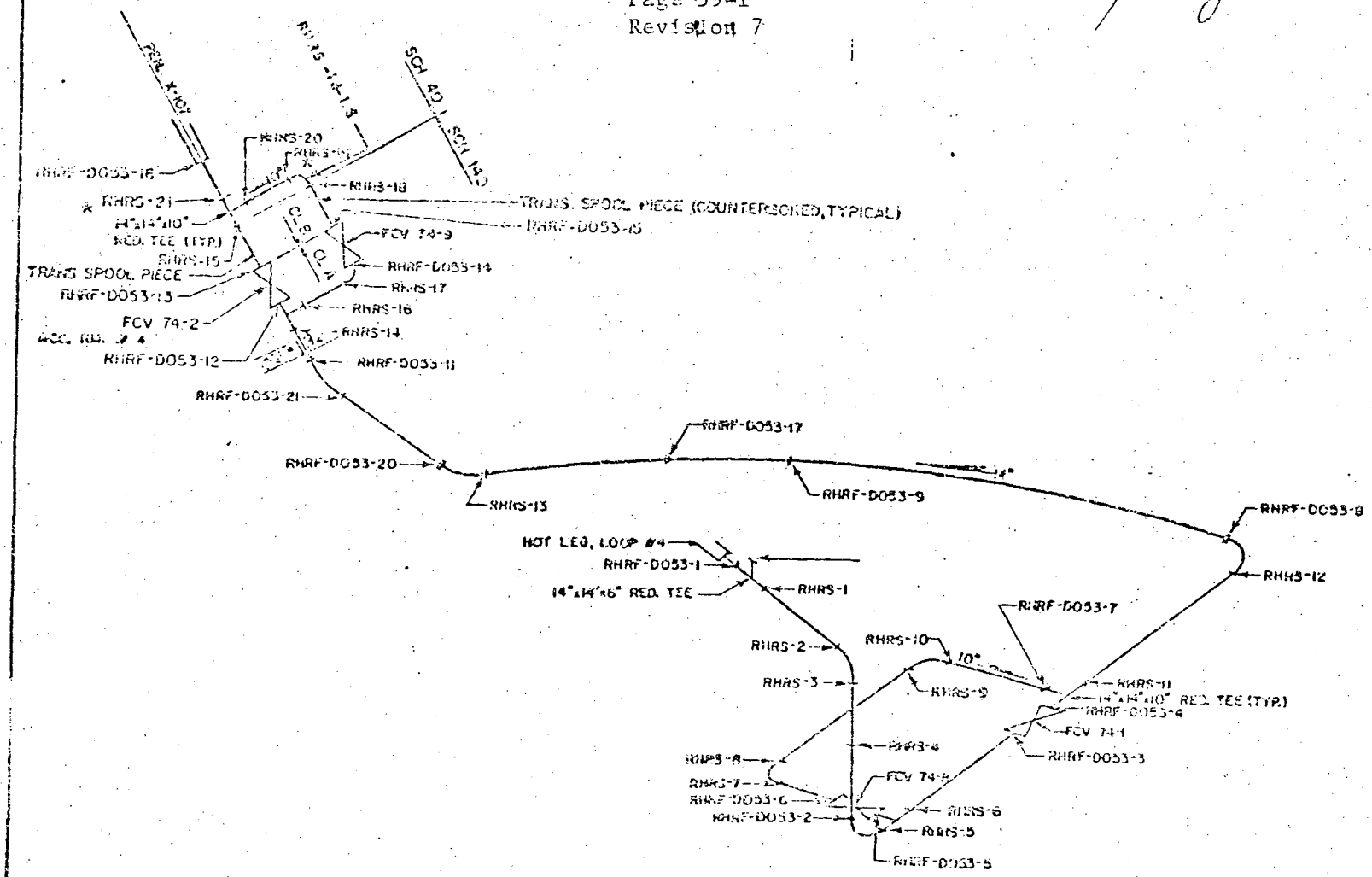
Revision 7

For Rodney Daniel, PPMB

By [signature] Date 6/8/79

CONT. ON SHEET 2 OF 7




CLASS A
PIPE
14" & 10" SCH. 140, SA-358 [illegible]
FITTINGS
14" & 10" SCH. 140, SA-403 [illegible]

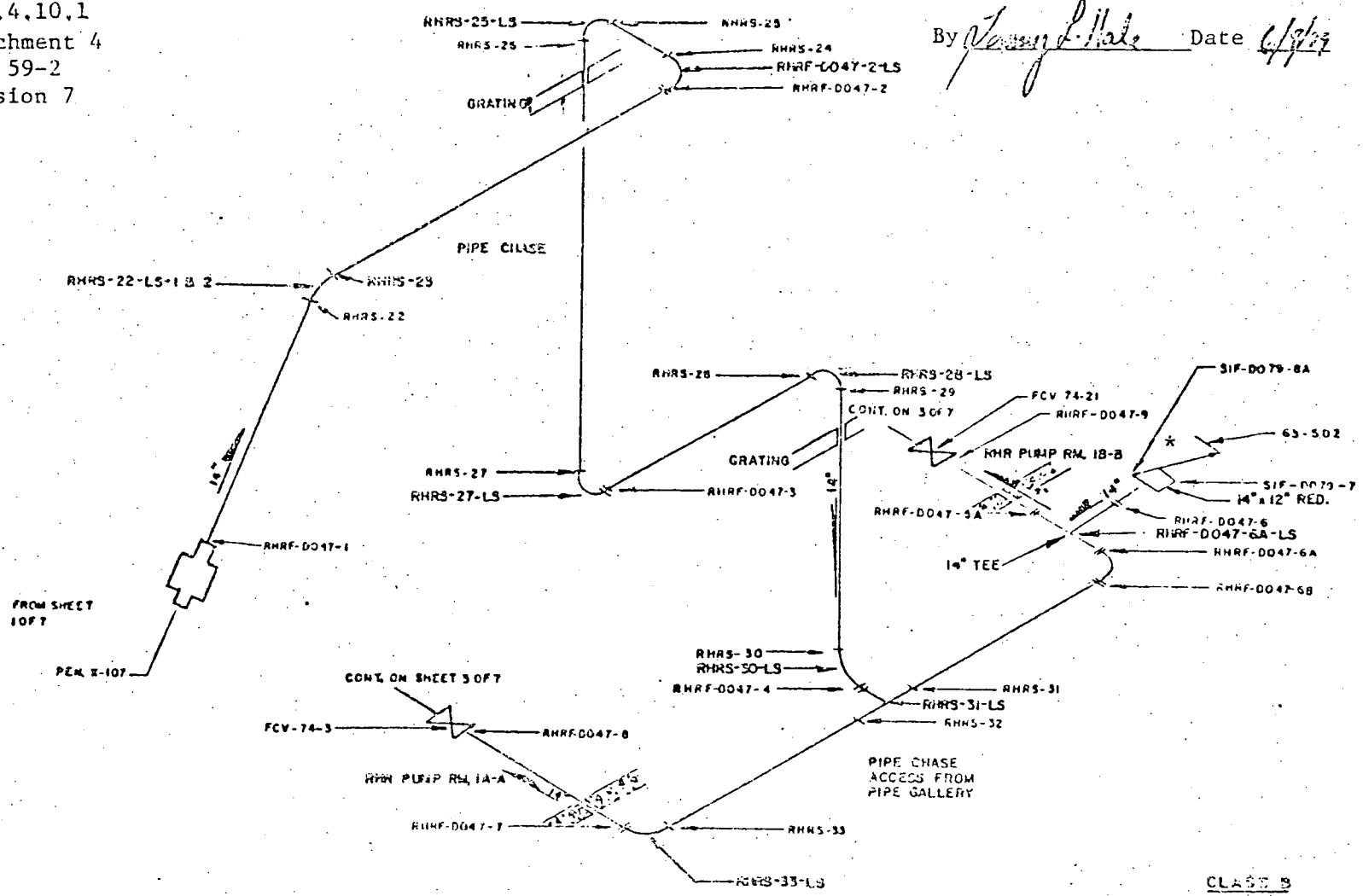
CLASS B
PIPE
14" SCH. 40, SA-358 CL. 1 TP 304 [illegible]
10" SCH. 40S, SA-312 TP 304 [illegible]
FITTINGS
14" SCH. 40, SA-403 WP 304 [illegible]
10" SCH. 40S, SA-403 WP 304 [illegible]
TRANSITION SPOOL PIECES
14" SCH. 140, SA-358 CL. 1 TP 304 [illegible]
10" SCH. 140, SA-312 TP 304 [illegible]

SEE DWGS
CR-90 E-2570-10-03 [illegible]

WBNP
SI-4.4.10.1
Attachment 4
Page 59-2
Revision 7

For Rodney Daniel, PPMB

By [signature] Date 6/9/87




CLASS B

PIPE
14" SCH 40 SA 358 CL1 TP 304

FITTINGS
14 & 12 SCH 40 SA-403 WP 304

REF. DWGS.

DRAWG E-2979-IC-47 R0

DRAWG E-2979-IC-79 R3

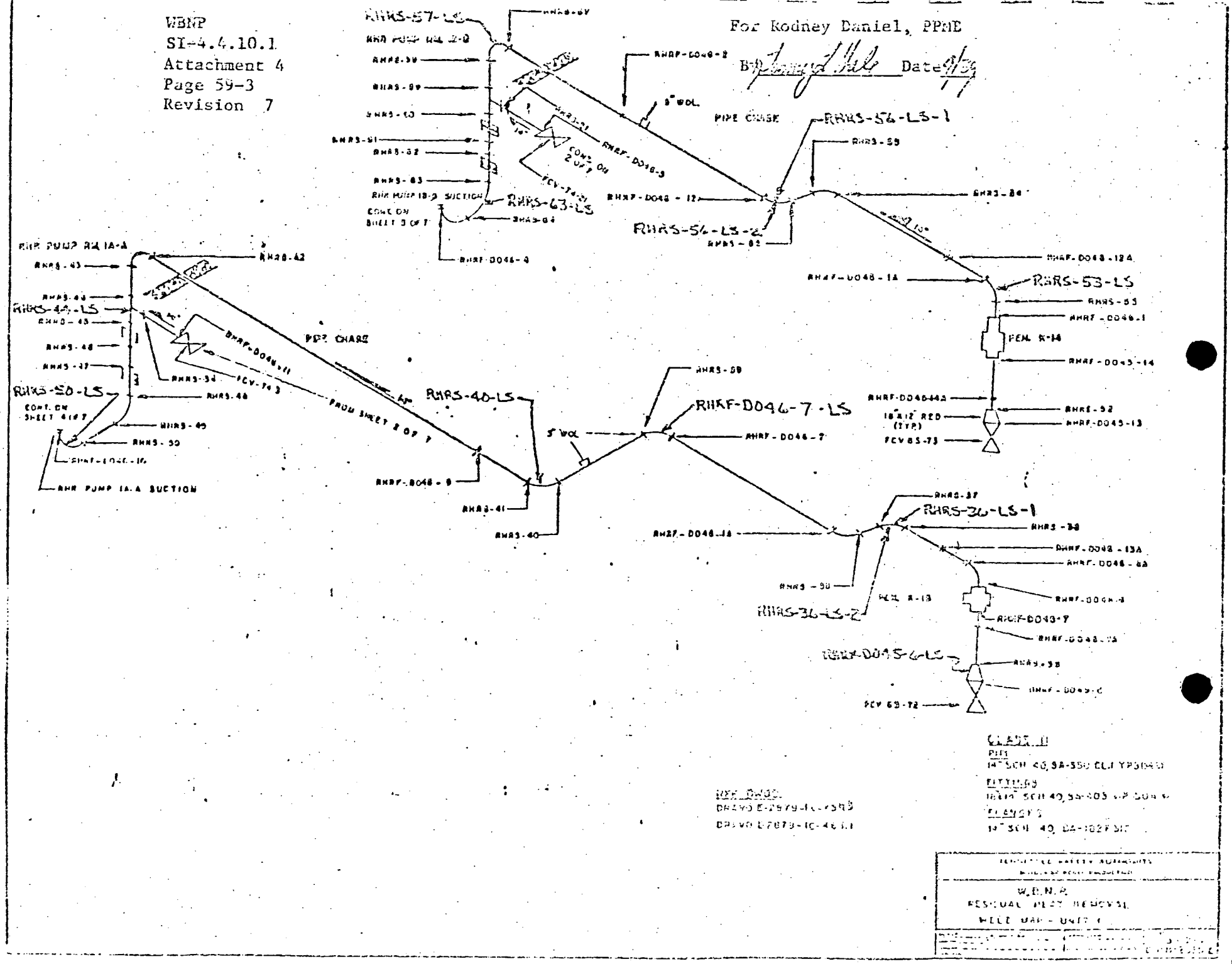
TENNESSEE VALLEY AUTHORITY
DIVISION OF NUCLEAR POWER

W.B.N.P.
RESIDUAL HEAT REMOVAL
WELD MAP - UNIT 1

WBNP
SI-4.4.10.1
Attachment 4
Page 59-3
Revision 7

For Rodney Daniel, PPME

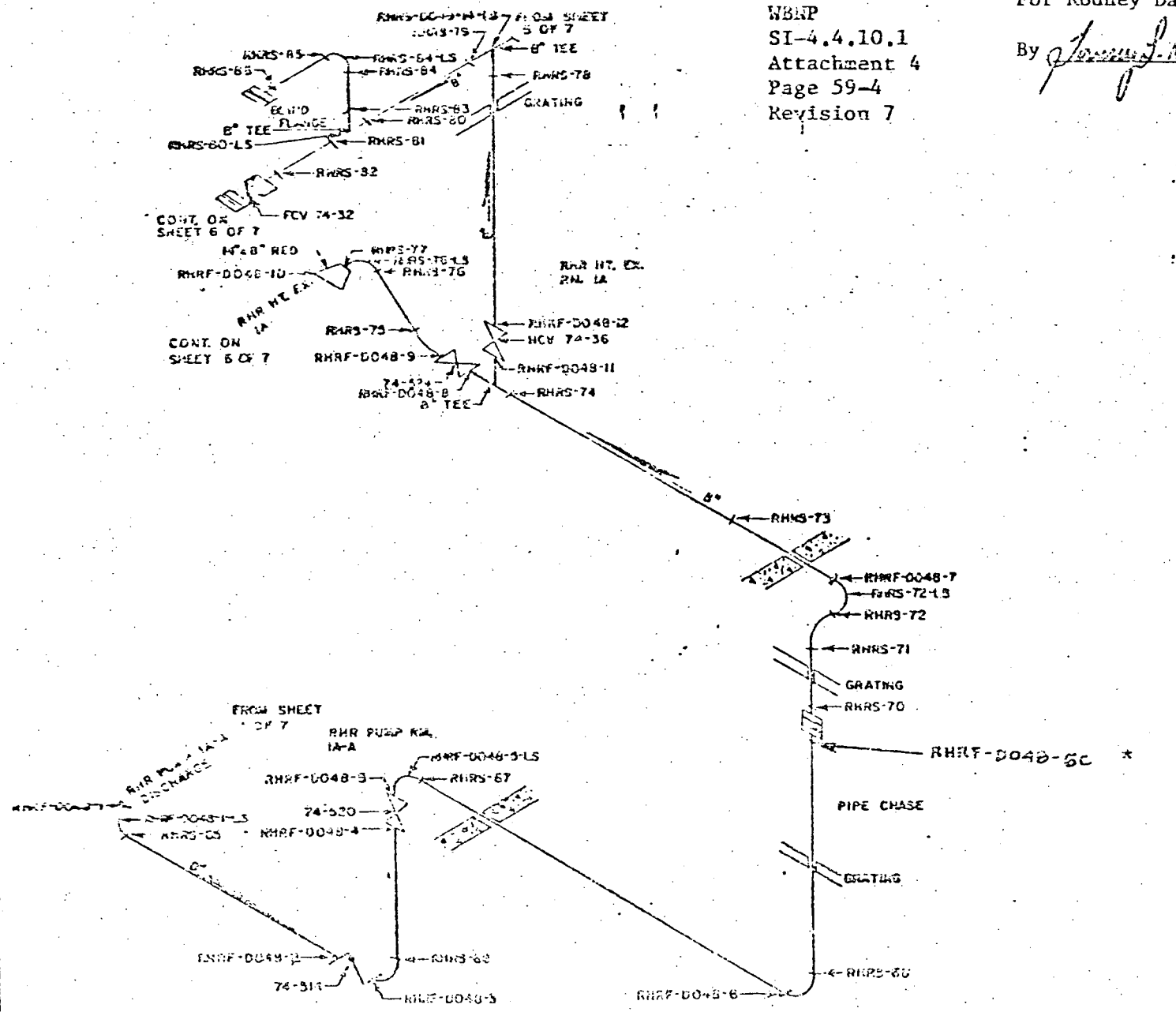
By [signature] Date 9/39



WBNP
SI-4.4.10.1
Attachment 4
Page 59-4
Revision 7

For Rodney Daniel, PPMB

By [signature] Date 6/7/87




REF DWGS
DWG/D E-2079-10-46 R4

CLASS B
PIPE
8" SCH. 40S, SA-312 TP 304 W/O
FITTINGS
8" SCH. 40S, SA-403 WP 304 W/O
14" SCH. 40 & 8" SCH. 40S SEA. SA-403 WP 304 W/O
FLANGES
8" SCH. 40S, SA-182 F304

TENNESSEE VALLEY AUTHORITY
WBNP
RESIDUAL HEAT REMOVAL
WELD MAP
SHEET 1

WBNP
SI-4.4.10.1
Attachment 4
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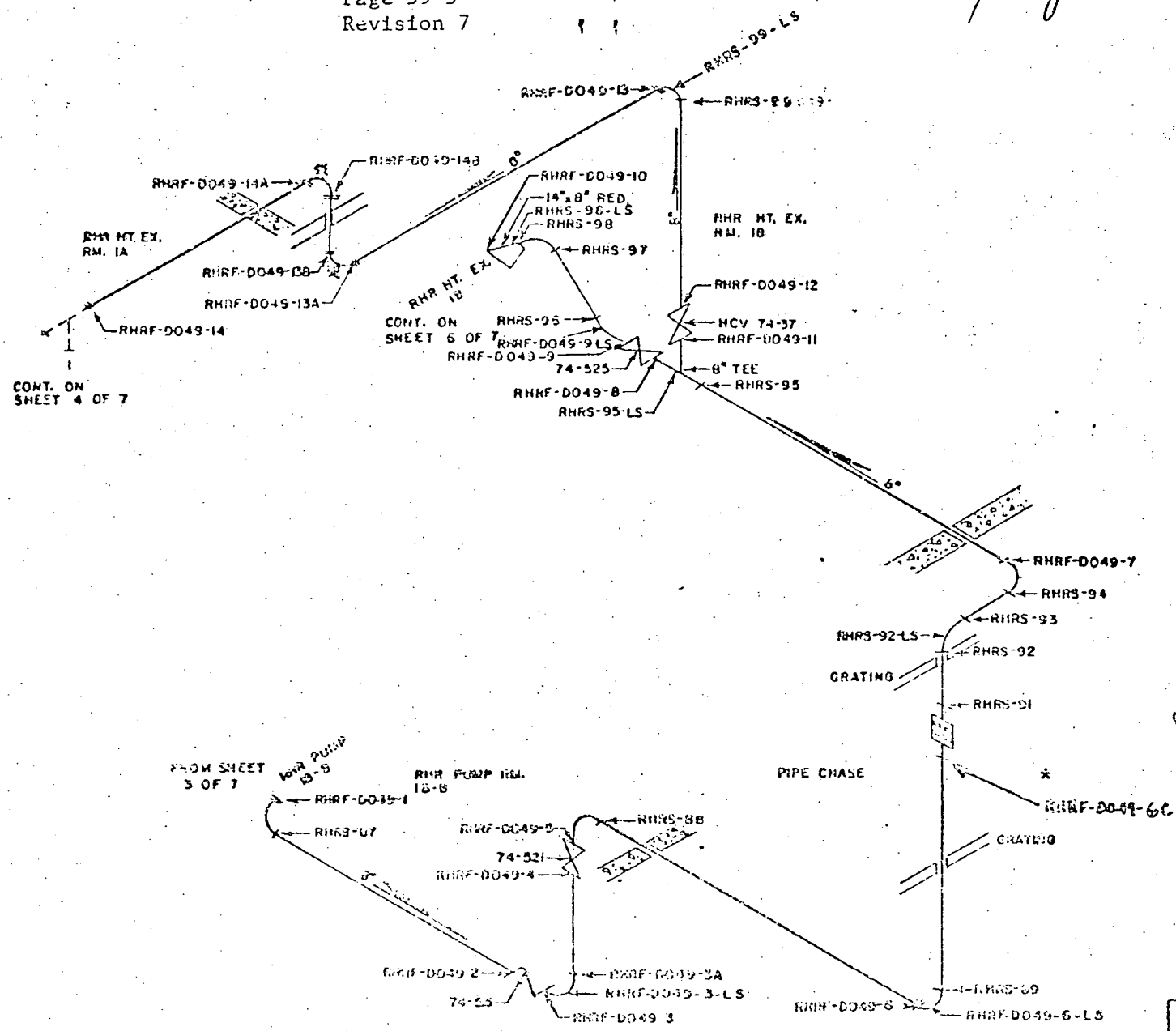
Revision 7

For Rodney Daniel, PPMB

By [illegible] Date 6/8/79




CLASS B
PIPE
8" SCH. 40S, SA-312 TP 304 W/S
FITTINGS
8" SCH. 40S, SA-403 WP 304 S W/S
14" SCH. 40 x 8" SCH. 40S RED., SA-403 WP 304 W90/S
FLANGE
8" SCH. 40S, SA-182 F 316

REF. DWGS.
DRAWO E-2679-IC-49 R5

TENNESSEE VALLEY AUTHORITY
DIVISION OF POWER PRODUCTION
WBNP
RESIDUAL HEAT REMOVAL
WELD MAP
UNIT 1

WBNP
SI-4.4.10.1
Attachment 4
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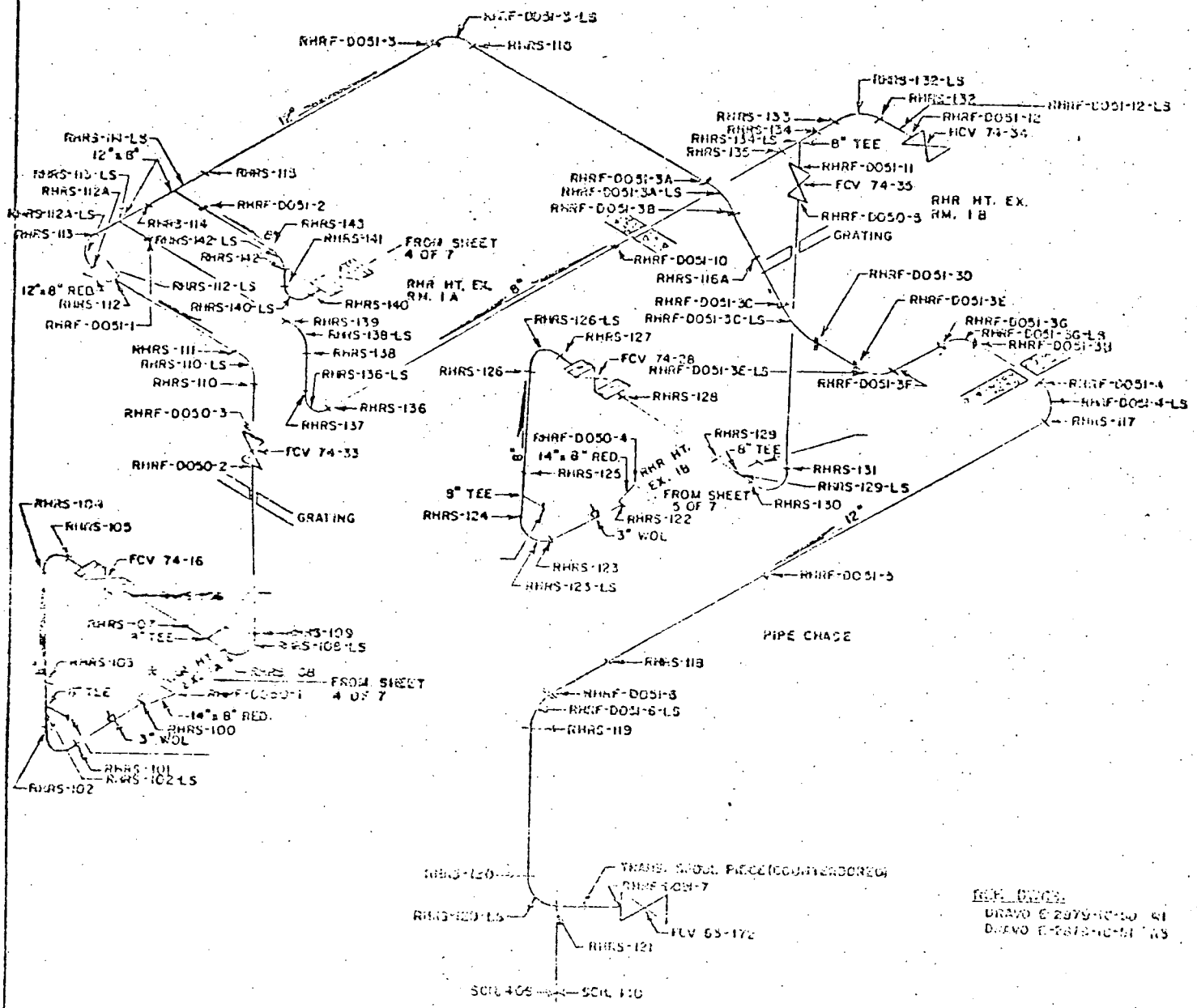
Revision 7

For Rodney Daniel, PPMB

By [illegible] Date 6/4/87



WBNP
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Attachment 4
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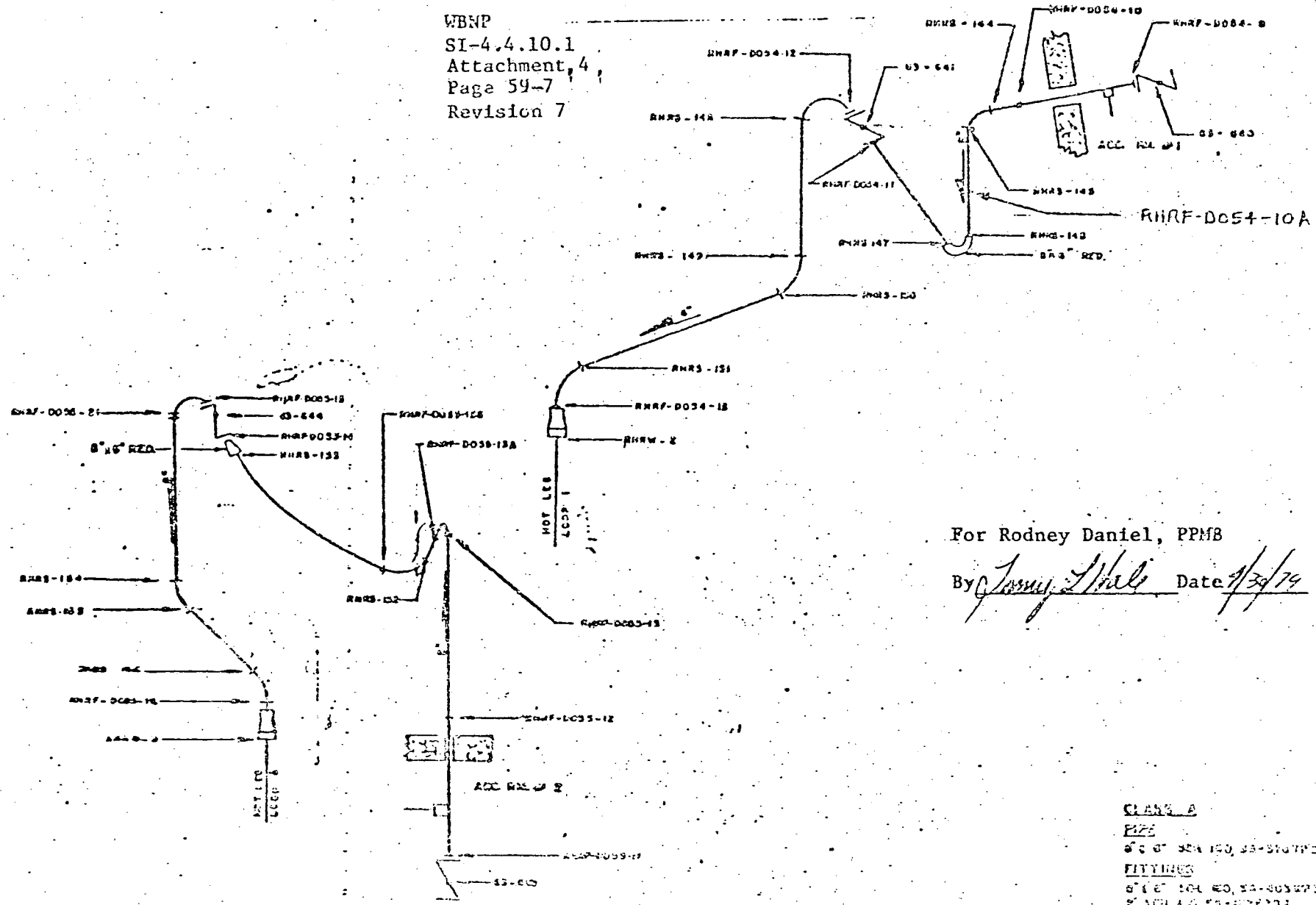



For Rodney Daniel, PPMB

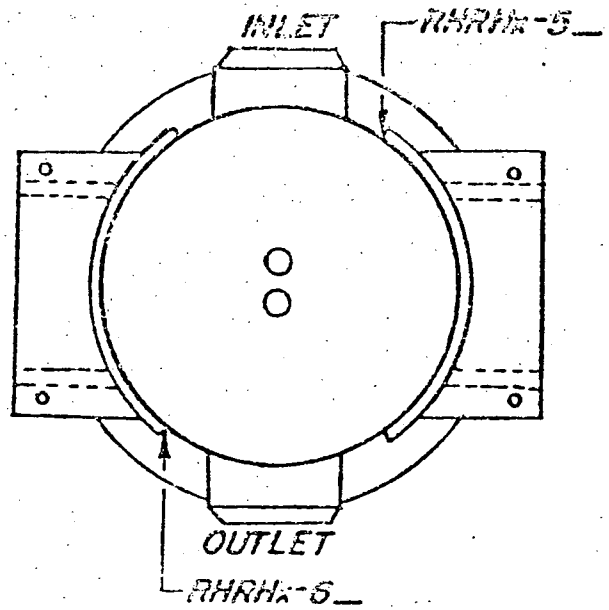
By Tommy L. Hale Date 9/30/79

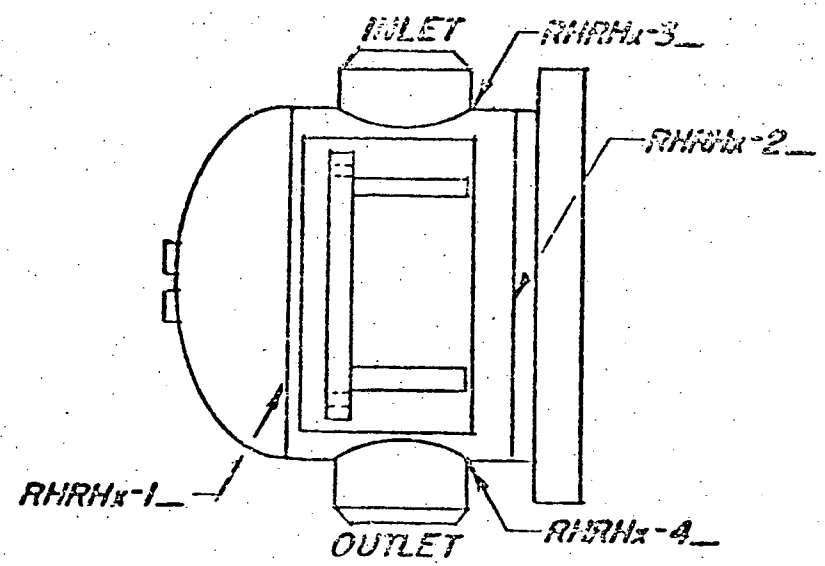
TVA 6690-A (PP-2-60)

WENP
SI-4.4.10.1
Attachment 5
Page 59-8
Revision 7

For Rodney Daniel, PPMB

By [illegible] Date 6/8/79




NOTE: PLACE HEAT EXCHANGER NUMBERS AT END OF WELD NUMBER

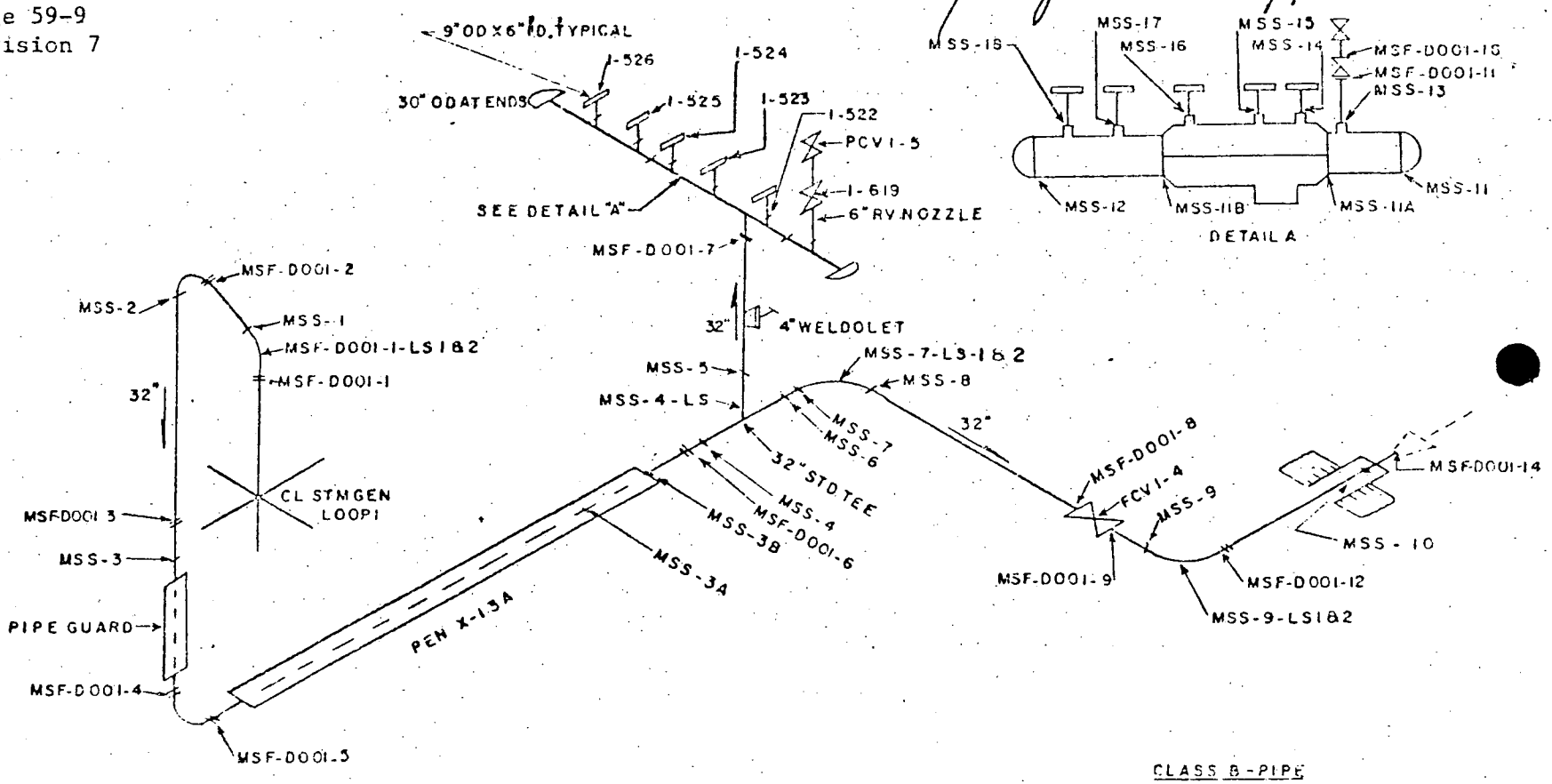
TENNESSEE VALLEY AUTHORITY
DIVISION C POWER PRODUCTION

WATTS BAR NUCLEAR PLANT
UNIT 1
RESIDUAL HEAT REMOVAL
HEAT EXCHANGER
CHANNEL WELDS

SCALE: NTS
DRAWN: NEW
TRACED
CHECKED

For Rodney Daniel, PPMB

By [illegible] Date [illegible]




CLASS B - PIPE

32" X 1.175" NCF 70 CL-PLATE

30" X 1.109" MW, SA-106 B

6" XXS SMLS, SA-106B

FITTINGS

32" X 1.175" BW, SA-234 WPB-W

30" X 1.109" MW, SA-234 WPB

FLANGES

9" OD X 6" ID, SA-105

REF DWG

DRAWO E-2878 IC-1

E-2880 IC-203

TVA 47W331-1

NOTE:

LS INDICATES

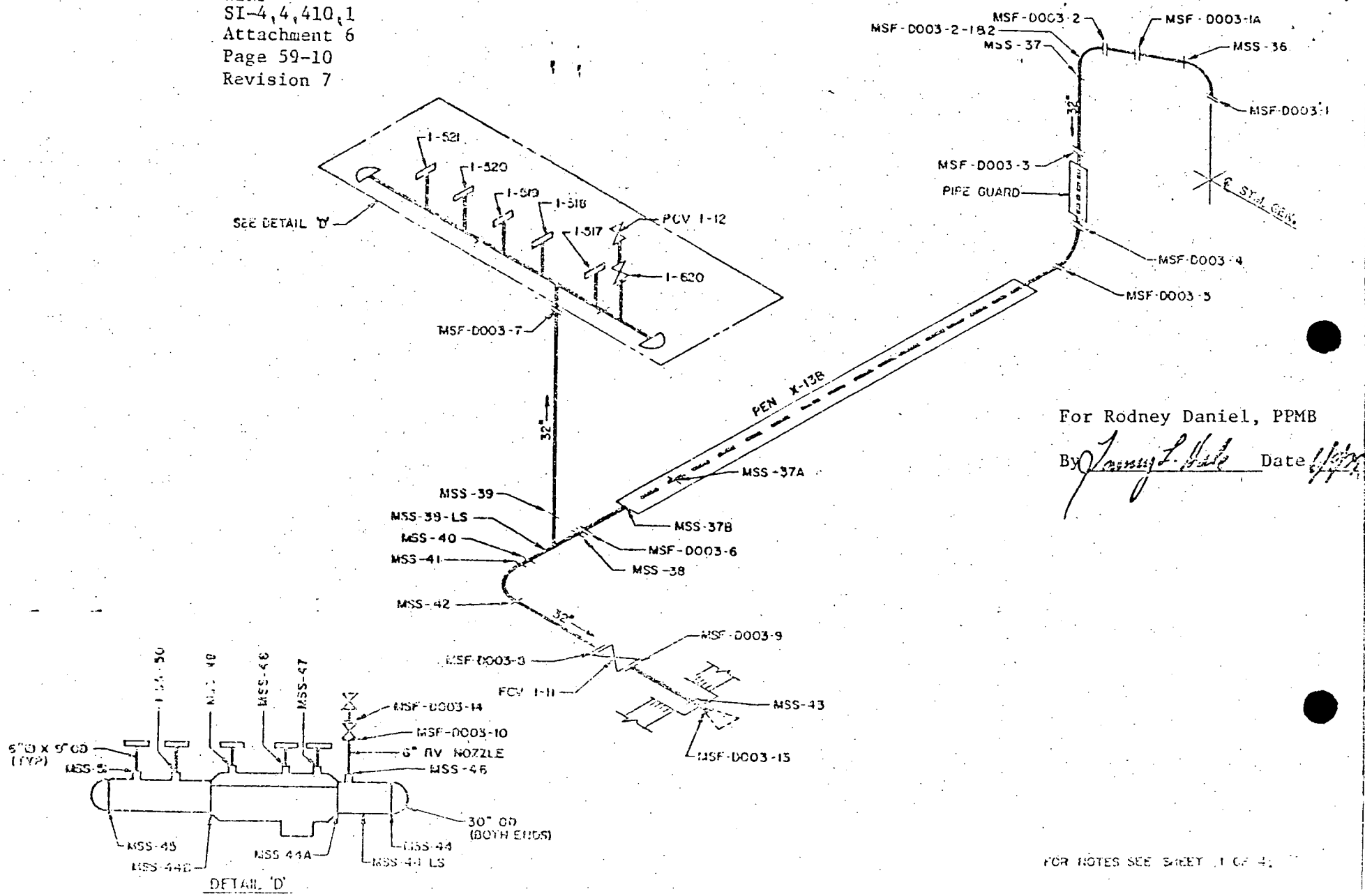
LONGITUDINAL SEAM WELD

TENNESSEE VALLEY AUTHORITY

WBNP

MAIN STEAM WELD MAP

UNIT 1 LOOP I




For Rodney Daniel, PPMB

By [signature] Date [illegible]

FOR NOTES SEE SHEET 1 OF 4.

REF. DRAWING:

DRAWO E-2878 IC-3
E-2880 IC-205
TVA 47W351-1

TENNESSEE VALLEY AUTHORITY
DIVISION OF POWER PRODUCTION

WBNP
MAIN STEAM WELD MAP
UNIT 1 LOOP 2

WBNP
SI-4.4.10.1
Attachment 6
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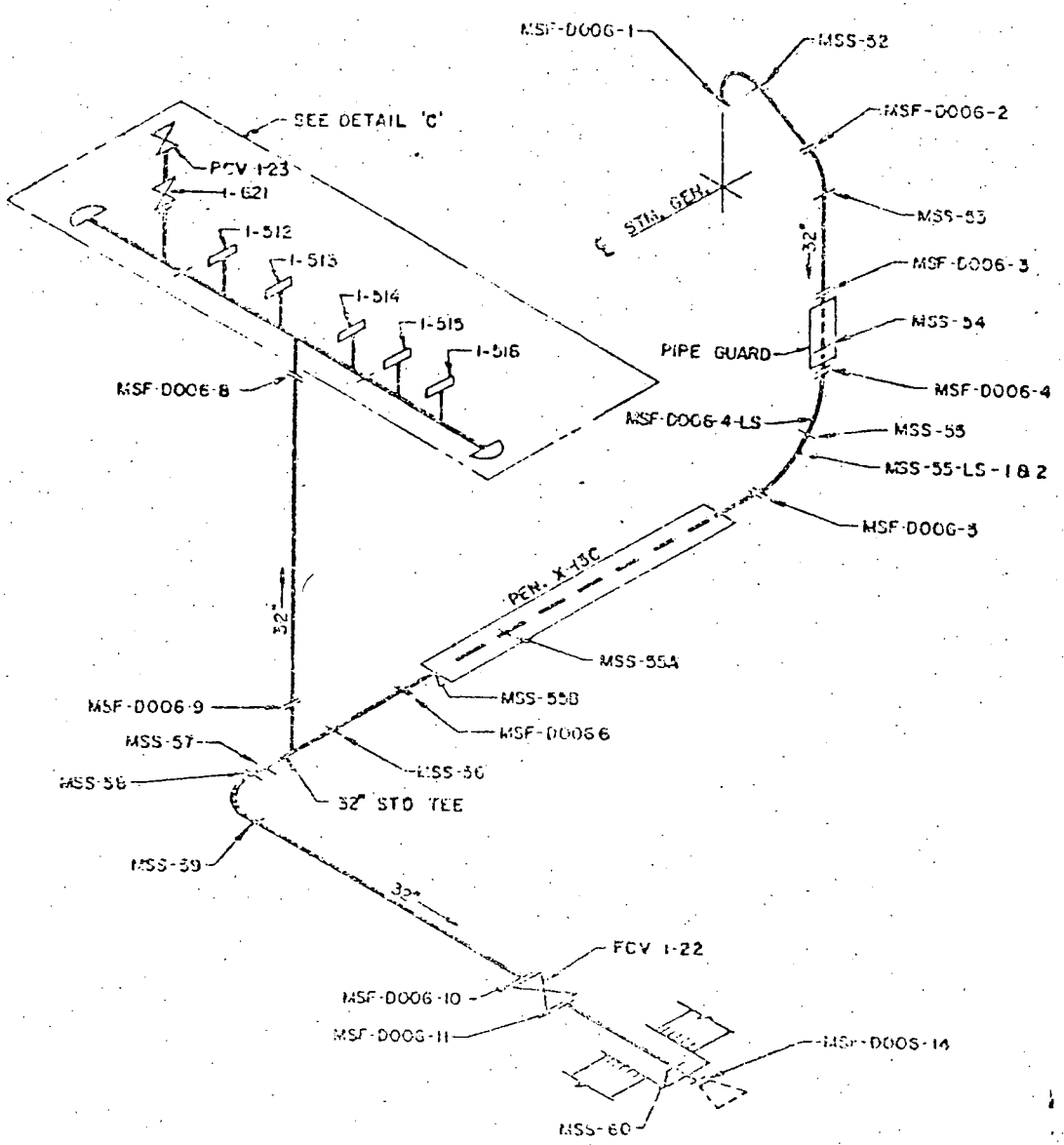
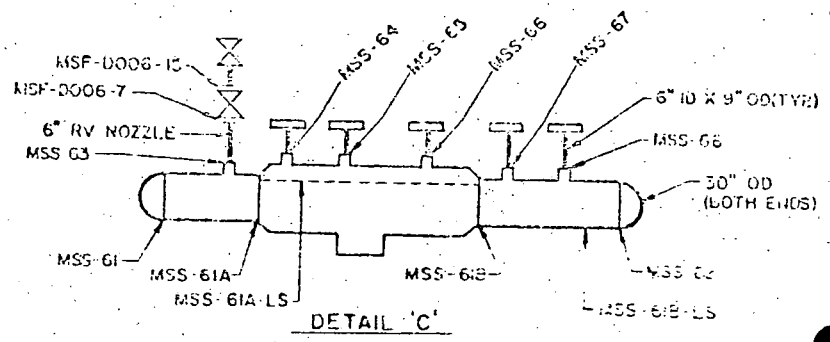
For Rodney Daniel, PPMB

By [illegible] Date 6/7/89




FOR NOTES SEE SHEET 1 OF 4.

REF. DRAWING:
DRAWO E-2878 IC-6
E-2880 IC-206
TVA 47W331-1

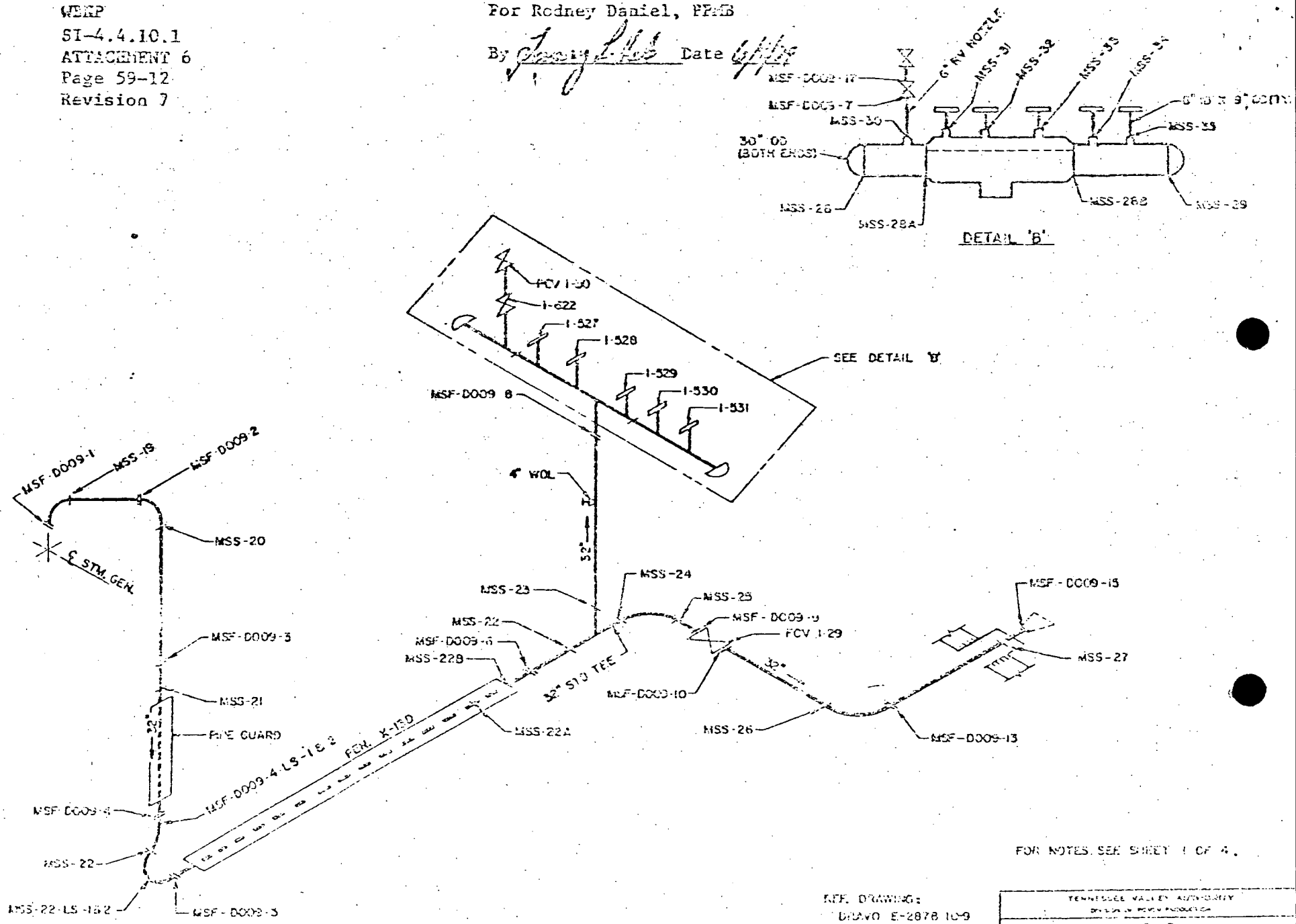
TENNESSEE VALLEY AUTHORITY
DIVISION OF POWER PRODUCTION

WBNP
MAIN STEAM WELD MAP
UNIT 1 LOOP 3

WBNP
SI-4.4.10.1
ATTACHMENT 6
Page 59-12
Revision 7

For Rodney Daniel, PPMB

By [illegible] Date [illegible]




FOR NOTES, SEE SHEET 1 OF 4.

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DRAWO E-2878 IC-9
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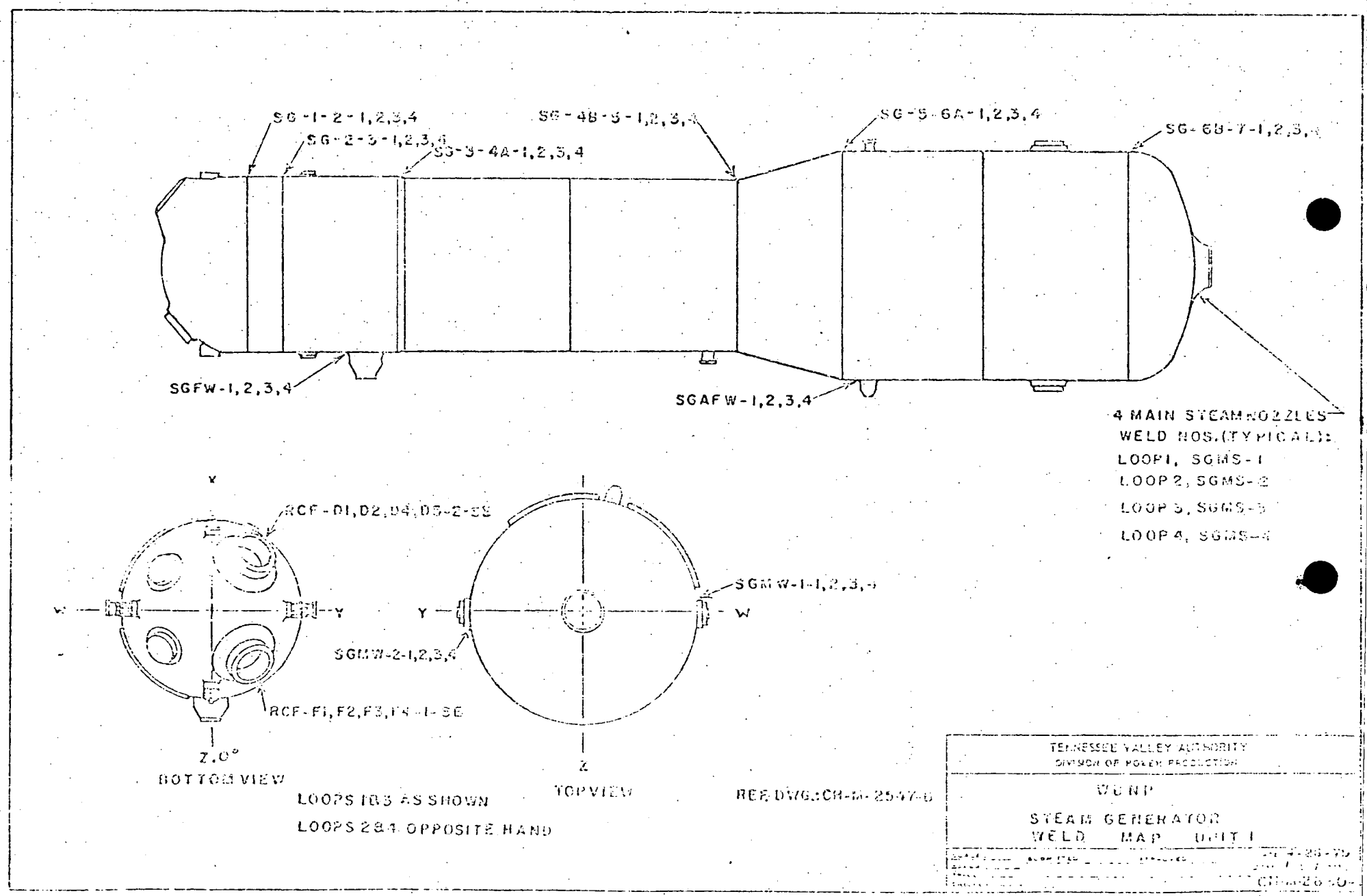
TVA 47W33H-1

TENNESSEE VALLEY AUTHORITY
DIVISION OF POWER PRODUCTION
WBNP
MAIN STEAM WELD MAP
UNIT 1 LOOP 4


SG-1-2-1,2,3,4
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SG-3-4A-1,2,3,4
SG-4B-5-1,2,3,4
SG-5-6A-1,2,3,4
SG-6B-7-1,2,3,4
SGFW-1,2,3,4
SGAFW-1,2,3,4
4 MAIN STEAM NOZZLES
WELD NOS.(TYPICAL):
LOOP1, SGMS-1
LOOP2, SGMS-2
LOOP3, SGMS-3
LOOP4, SGMS-4
X
RCF-D1,D2,D4,D5-2-SS
W
Y
RCF-F1,F2,F3,F4-1-SE
Z.0°
BOTTOM VIEW
SGMW-1-1,2,3,4
Y
W
SGMW-2-1,2,3,4
Z
TOP VIEW
LOOPS 1&3 AS SHOWN
LOOPS 2&4 OPPOSITE HAND
REF DWG.:CH-M-2547-0
TENNESSEE VALLEY AUTHORITY
DIVISION OF POWER PRODUCTION
WBNP
STEAM GENERATOR
WELD MAP UNIT 1