COMANCHE PEAK STEAM ELECTRIC STATION
UNIT NO. 1

PRESERVICE INSPECTION PROGRAM
for
Class 1, 2 and 3 Components

TABLE OF CONTENTS

INTRODUCTION

1. General Plant Description

The Comanche Peak Station is a dual unit plant having Westinghouse pressurized water reactors each with an electrical output of 1150 MWe.

The station is located in North Texas in Somervell county, approximately forty-five miles south of Fort Worth.

2. Purpose

The purpose of this program is to outline details for planning and performing the preservice (baseline data) inspection of the Comanche Peak Station. The program has been organized to fulfill the requirements of the ASME Boiler and Pressure Vessel Code, Section XI, rules for Inservice Inspection of Nuclear Power Plant Components.

3. Scope

This program defines the inspection requirements for the preservice baseline inspection. The program defines the requirements for the following areas:

a. Non-Destructive Examination
b. Hydrostatic Testing
c. Pump Examination
d. Valve Examination
e. Component Support Examination

4. Preservice/Baseline Inspection Program

Baseline data to support the PSI program will be compiled in accordance with the 1980 Edition of Section XI to the ASME Code.

Baseline data/preservice inspections will be performed during the construction and start-up phases of the station, utilizing the Westinghouse preservice inspection procedures and the functional and pre-operational test procedures. The specific procedures and example of same are listed in the applicable sections of this plan.

5. Control

This plan, in conjunction with CP-EP-11.1 (Preservice Inspection procedure), has been prepared as the controlling documents governing the preservice/baseline data inspection activities at the Comanche Peak Station.

6. Support Programs

All supporting programs and/or documentations referenced herein are maintained at the station.

Should certain ASME Section XI Code requirements be discovered to be impractical due to unforeseen reasons during the process of performing inspections or test, relief will be requested from the NRC in accordance with 10 CFR 50.55a(g)5 at that time.

7. Non-Destructive Testing for Preservice Inspection and Testing Programs

The preservice inspection of Class 1 and 2 components will be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code 1980 Edition. Class 3 components will be

performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code 1980 Edition up to and including the Winter 1980 Addenda.

Components will be examined in accordance with ASME Section XI, Subsection IWA, IWB, IWC, IWD and IWF.

All piping has been reviewed by TUSI against the NRC's Quality Groups A, B and C which corresponds respectively to ASME Section III, Class 1, 2 and 3.

All Class 1, 2 and 3 systems and components have been reviewed by TUSI against the respective ASME, Section XI, Subsection IWB-1220 and IWC-1220 and IWD-1220 exemption criteria.

Class 3 systems and components, and exempt Class 1 and 2 components require only a visual examination during pressure testing in accordance with IWA-5000. The scoped flow drawing Subsection of this section are used during the visual examinations to aid in the location and position of any component which have recordable discrepancies during the test.

Determination of ASME Section XI, Code categories for Class 1 and 2 components.

a. All Class 1 and 2 components have been categorized in accordance with ASME Section XI Table IWB-2500-1, IWC-2500-1, IWD-2500-1 and IWF-2500-1&2. These generated tables are included.

Construction stress analysis calculations are used in determing the high stress points in the Class II systems weld selection as required by Table IWC-2500-1 Examination Category C-F.

Examination of supporting components are in accordance with IWF-2500-1 and 2500-2 of the 1980 Edition of the ASME Boiler and Pressure Vessel Code to the extent practical with the access provided and the limitations of component geometry.

8. Relief Requests

When examination requirements of an ASME Code Class 1, 2 or 3 component or a suppo: t component is determined impractical to accomplish in accordance with respective ASME Section XI IWA-2000, IWB-2000, IWC-2000, IWD-2000 or IWF-2000, a specific written relief request from the ASME Code requirement shall be sumitted to the NRC pursuant to 10 CFR Part 50, Section 50.55a(g)(6). Known relief from ASME Code Section XI requirements are included in the Request for Relief Section of the Preservice Inspection Plan. If other code requirements cannot be accomplished during actual preservice inspection, additional relief requests will be submitted for approval to the NRC.

Each written relief request contains, as a minimum the following information.

a. Identification of component(s) for which relief is requested.
b. ASME Code Class.
c. The specific ASME Code requirements that cannot be accomplished.
d. Justification(s) for relief request.
e. Alternate examination to be performed in lieu of ASME Code requirement(s).
f. None of the relief requests have been determined to impact the safety of the plant.

All records and reports are prepared in accordance with ASME, Section XI, IWA-6000.

9. Exemptions

The following is a summary of the exemptions applicable to the Comanche Peak Unit #1 Station:

a) Component connections, piping and associated valves of 1 in. nominal pipe size and smaller, except for steam generator tubing, are exempted from examination by IWB-1220(b).

b) Reactor vessel head connections and associated piping, 2 inch nominal pipe size and smaller made inaccessible by control rod drive penetrations are exempt from examination by IWB-1220(c).

c) Portions of the containment spray system not required to operate or perform a system function, but remain flooded under static conditions at a pressure of at least 80% of the pressure that the component or system would be subjected to when required to operate are exempted by IWC-1220(a). Portions of the containment spray system not required to operate above a pressure of 275 psig or above a temperature of 200°F are exempted from examination by IWC-1220(b).

d) Component connections (including nozzles in vessels and pumps), piping and associated valves, and vessels and their attachments that are 4 inch nominal pipe size and smaller are exempt by IWC-1220(c).

Examples of nozzles that are exempted from examination by IWC-1220(c) are the following:

1) Excess Letdown Heat Exchanger Nozzles to Shell
2) Seal Water Heat Exchanger Nozzles to Shell
3) Horizontal Letdown Heat Exchanger Nozzles to Shell
4) Regenerative Heat Exchanger Nozzles to Shell

5) Letdown Reheat Heat Exchanger Nozzles to Shell

6) Volume Control Tank Nozzles to Shell

7) Reactor Coolant Filter Nozzles to Shell

8) Seal Water Return Filter Nozzles to Shell

e) Integral attachments of supports and restraints to components that are 4 inch nominal pipe size and smaller within the system boundaries of Examination Categories D-A, D-B and D-C of Table IWD-2500-1 are exempted by IWD-1220.1 from the VT-3 visual examination except for the auxiliary feedwater system which is included in the program for examination.

Integral attachments of supports and restraints to components exceeding 4 inch nominal pipe size are exempted from the visual examination VT-3 of table IWD-2500-1 provided that both of the criteria described by IWD-1220.2 (a) and (b) are met.

f) The accumulator tanks during normal plant operating conditions are not required to operate or perform a system function, but do remain flooded under static conditions at a pressure of at least 80% of the pressure that they would be subjected to when required to operate, therefore, are exempt by IWC-1220(a).

10. System Boundaries

Section XI Code Boundaries and Examination requirements are defined in the color coded flow diagram section of the preservice inspection program.

11. Augmented Preservice Inspection

Approximately 10% of the welds in the High Pressure Safety Injection system piping, (including welds normally exempted by IWC-1220(c)) are included as part of an augmented inspection program.

12. Steam Generator Tube Examinations

Preservice Inspection of steam generator tubes will be performed in accordance with ASME Code Section XI 1980 Edition in order to comply with NRC Regulatory Guide 1.83.

Preservice Inspection involves an examination of the full length of each tube in each Steam Generator by Eddy Current techniques prior to service to establish a baseline condition of the tubing and verification by the ANII that all requirements have been met.

This examination will be performed after the field hydrostatic test and prior to initial power operation using the equipment, and techniques expected to be used during subsequent inservice inspections.

13. Unit 2

Although this program has been provided specifically for Unit 1 and common equipment for Unit 2, the methods and procedures to be used on Unit 2 will be identical to those identified in the Unit 1 program. A Unit 2 specific program will be provided prior to performance of Unit 2 preservice inspection.

TEXAS UTILITIES SERVICES

Comanche Peak Nuclear Power Plant Unit #1

Preservice Examination Program
Class I Systems and Components

All items listed below are to be examined, as indicated, in accordance with the requirements of the 1980 Edition Section XI of the ASME Boiler and Pressure Vessel Code to the extent practical with the access provided and the limitations of component geometry.

PROGRAM ITEM	IWB-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
		REACTOR VESSEL				
	B1.10	Shell Welds				
1	B1.11	Circumferential Welds 2, 3 & 4	52	--	--	1-1100
2	B1.12	Longitudinal Welds 6, 7, 8, 9, 10, 11, 12, 13 & 14	52	--	--	1-1100
	B1.20	Head Welds				
3	B1.21	Circumferential Weld 5	52	--	--	1-1100
4	B1.21	Circumferential Weld 2	47	--	--	1-1300
5	B1.22	Meridional Welds 15, 16, 17 & 18	47	--	--	1-1100
6	B1.22	Meridional Welds 3, 4, 5 & 6	47	--	--	1-1300
7	B1.30	Flange to Vessel Weld 1	52	--	--	1-1100
8	B1.40	Closure Head to Flange Weld 1	47	70	--	1-1300
	B1.50	Repair Welds				
9	B1.51	Beltline Region	(1)	--	--	1-1100
10	B3.10	Outlet nozzle to Vessel Welds 19, 22, 23 and 26	52	--	--	1-1100
11	B3.10	Inlet nozzle to Vessel Welds 20, 21, 24 and 25	52	--	--	1-1100

PROGRAM ITEM	IWB-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
12	B3.20	Outlet Nozzle Inside Radius Section	Done in conjuction with B3.10			1-1100
13	B3.20	Inlet Nozzle Inside Radius Section	Done in conjuction with B3.10			1-1100
14	B4.10	Partial Penetration Welds	--	--	(2)	--
15	B4.11	Vessel Nozzles	--	--	(2)	--
16	B4.12	Control Rod Drive Nozzles	--	--	(2)	--
17	B4.13	Instrumentation Nozzles	--	--	(2)	--
18	B5.10	Outlet Nozzle to Safe End Weld 1(DM)	52/ 206	11	--	1-4100
19	B5.10	Outlet Nozzle to Safe End Weld 1(DM)	52/ 206	11	--	1-4200
20	B5.10	Outlet Nozzle to Safe End Weld 1(DM)	52/ 206	11	--	1-4300
21	B5.10	Outlet Nozzle to Safe End Weld 1(DM)	52/ 206	11	--	1-4400
22	B5.10	Inlet Nozzle to Safe End Weld 16(DM)	52/ 206	11	--	1-4100
23	B5.10	Inlet Nozzle to Safe End Weld 16(DM)	52/ 206	11	--	1-4200
24	B5.10	Inlet Nozzle to Safe End Weld 16(DM)	52/ 206	11	--	1-4300
25	B5.10	Inlet Nozzle to Safe End Weld 16(DM)	52/ 206	11	--	1-4400
26	B6.10	Closure Head Nuts 1 thru 54	--	70	--	1-1400
27	B6.20	Closure Head Studs, in place	(10)	--	--	--
28	B6.30	Closure Head Studs, (when removed) 1 thru 54	15	70	--	1-1400
29	B6.40	Threads in Flange 1 thru 54	52	--	--	1-1100
30	B6.50	Closure Head Washers 1 thru 54	--	--	8	1-1400
31	B7.10	Conoseal Bolting Assemblies 75, 76, 77 & 78	--	--	8	1-1300

PROGRAM ITEM	IWB-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
32	B8.10	Integrally Welded Attachments	Done in conjunction with B3.10			1-1100
33	B13.10	Vessel Interior	--	--	8	1-1200
34	B13.30	Core Support Structures	--	--	8	1-1200
35	B14.10	Control Rod Drive Mechanisms Welds 50 thru 54; 56, 58, 60 and 62 thru 78	--	11	--	1-1300
36	B15.10	Pressure Retaining Boundary	--	--	(3)	--
37	B15.11	Pressure Retaining Boundary	--	--	(2)	--
		PRESSURIZER				
	B2.10	Shell to head Welds				
38	B2.11	Circumferential Welds 1 thru 5	47	--	--	1-2100
39	B2.12	Longitudinal Welds 6 thru 9	47	--	--	1-2100
	B2.20	Head Welds				
40	B2.21	Circumferential Welds	(10)	--	--	1-2100
41	B2.22	Meridional Welds	(10)	--	--	1-2100
42	B3.30	Nozzle to Vessel Welds 11 thru 16	47	--	--	1-2100
43	B3.40	Nozzle Inside Radius Section for Welds 11 thru 16	(4)	--	8	1-2100
44	B4.20	Heater Penetration Welds	--	--	(2)	--
45	B5.20	14" Pressurizer Surge Nozzle to safe end Weld 8(DM)	206	11	--	1-4500
46	B5.20	6" Pressurizer Safety Nozzle to safe end welds 1(DM), 12(DM) & 24(DM)	206	11	--	1-4501
47	B5.20	6" Pressurizer Safety Relief Nozzle to safe end Weld 1(DM)	206	11	--	1-4502
48	B5.20	4" Pressurizer Spray Nozzle to safe end Weld 27(DM)	206	11	--	1-4503
49	B6.60	Bolts and Studs in place	(7)	--	--	1-2100

PROGRAM ITEM	IWB-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
50	B6.70	Bolts and Studs, when removed	(7)	(7)	--	1-2100
51	B6.80	Bolting	--	--	(7)	1-2100
52	B7.20	Manway Bolts B1 thru B16	--	--	8	1-2100
53	B8.20	Integrally Welded Support Skirt Weld 10	--	70	--	1-2100
54	B15.20	Pressure Retaining Boundary	--	--	(3)	--
55	B15.21	Pressure Retaining Boundary	--	--	(2)	--
		STEAM GENERATORS 1, 2, 3 & 4				
	B2.30	Head Welds				
56	B2.31	Circumferential Welds	(9)	--	--	1-3100
57	B2.32	Meridional Welds	(9)	--	--	1-3100
58	B2.40	Channel Head to Tubesheet Welds 1-1, 2-1, 3-1, and 4-1	47	--	--	1-3100
59	B3.50	Nozzle to Vessel Welds	(9)	--	--	1-3100
60	B3.60	Nozzle Inside Radius Section 1A, 1B, 2A, 2B, 3A, 3B, 4A & 4B	(4)	--	8	1-3100
61	B5.30	Nozzle to Safe End Welds 5(DM) & 6(DM)	206	11	--	1-4100
62	B5.30	Nozzle to Safe End Welds 5(DM) & 6(DM)	206	11	--	1-4200
63	B5.30	Nozzle to Safe End Welds 5(DM) & 6(DM)	206	11	--	1-4300
64	B5.30	Nozzle to Safe End Welds 5(DM) & 6(DM)	206	11	--	1-4400
65	B6.90	Bolts and Studs in place	(7)	--	--	1-3100
66	B6.100	Bolts and Studs, when removed	(7)	(7)	--	1-3100
67	B6.110	Bolting	--	--	(7)	1-3100

PROGRAM ITEM	IWB-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
68	B7.30	Manway Bolting 1-B1 thru 1-B32, 2-B1 thru 2-B32, 3-B1 thru 3-B32, and 4-B1 thru 4-B32	--	--	8	1-3100
69	B8.30	Integrally Welded Vessel Supports	--	(a)	--	1-3100
70	B15.30	Pressure Retaining Boundary	--	--	(3)	--
71	B15.31	Pressure Retaining Boundary	--	--	(2)	--
72	B16.10	Steam Generator Tubing in Straight Tube Design	(5)	--	--	--
73	B16.20	Steam Generator Tubing in U-Tube Design	(5)	--	--	--
		PIPING				
74	B5.50	Safe End Welds	(9)	(9)	--	--
75	B6.150	Bolts and Studs in place	(7)	--	--	--
76	B6.160	Bolts and Studs, when removed	(7)	(7)	--	--
77	B6.170	Bolting	--	--	(7)	--
78	B7.50	Bolts, Studs and Nuts	--	--	8	1-4700
	B9.10	Pressure Retaining Welds Nominal Pipe - Size greater than or equal to 4 inches				
79	B9.11	Circumferential Welds	206	11	--	1-4100 to 1-4600
80	B9.12	Longitudinal Welds	206	11	--	1-4100 to 1-4600
	B9.20	Pressure Retaining Welds Nominal Pipe Size less than 4 inches				
81	B9.21	Circumferential Welds	--	11	--	1-4100 to 1-4600
82	B9.22	Longitudinal Welds	--	11	--	1-4100 to 1-4600
	B9.30	Branch Pipe Connection Welds				

PROGRAM ITEM	IWB-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
83	B9.31	Nominal Pipe Size Greater than 2 inches	206	11	--	1-4100 to 1-4600
84	B9.32	Nominal Pipe Size less than or equal to 2 inches	--	11	--	1-4100 to 1-4600
85	B9.40	Socket Welds	--	11	--	1-4100 to 1-4600
86	B10.10	Integrally Welded Attachments	--	11	--	1-4100 to 1-4600
87	B15.50	Pressure Retaining Boundary	--	--	(3)	--
88	B15.51	Pressure Retaining Boundary	--	--	(2)	--
		REACTOR COOLANT PUMPS 1, 2, 3 & 4				
89	B6.180	Main Flange Bolting 1-B1 thru 1-B24; 2-B1 thru 2-B24; 3-B1 thru 3-B24 and 4-B1 thru 4-B24	(6)	(6)	--	1-5100
90	B6.190	Main Flange Bolting when removed 1-B1 thru 1-B24; 2B1 thru 2-B24; 3-B1 thru 3-B24 and 4-B1 thru 4-B24	15	--	--	1-5100
91	B6.200	Main Flange Bolting 1-B1 thru 1-B24; 2-B1 thru 2-B24; 3-B1 thru 3-B24 and 4-B1 thru 4-B24	--	--	(6)	1-5100
92	B7.60	No. 1 Seal Housing Bolting 1-B1 thru 1-B12; 2-B1 thru 2-B12; 3-B1 thru 3-B12 and 4-B1 thru 4-B12	--	--	8	1-5100
93	B10.20	Integrally Welded Attachments	--	(9)	--	1-5100
94	B12.10	Pump Casing Welds 1, 2, 3 & 4	(6)	--	--	1-5100
95	B12.20	Pump Casing 1, 2, 3 & 4	--	--	(6)	1-5100
96	B15.60	Pressure Retaining Boundary	--	--	(3)	--
97	B15.61	Pressure Retaining Boundary	--	--	(2)	--

PROGRAM ITEM	IWB-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
		VALVES				
98	B6.210	Bolts and Studs in place	(7)	--	--	--
99	B6.220	Bolts and Studs, when removed	(7)	(7)	--	--
100	B6.230	Bolting	--	--	8	1-6300
101	B7.70	Bolts, Studs and Nuts	--	--	8	1-6300
102	B10.30	Integrally Welded Attachments	--	(9)	--	--
103	B12.30	Valve Body Welds	--	(9)	--	--
104	B12.40	Valve Bodies exceeding 4 inch Nominal pipe size	--	--	(6)	1-6200
105	B15.70	Pressure Retaining Boundary	--	--	(3)	--
106	B15.71	Pressure Retaining Boundary	--	--	(2)	--

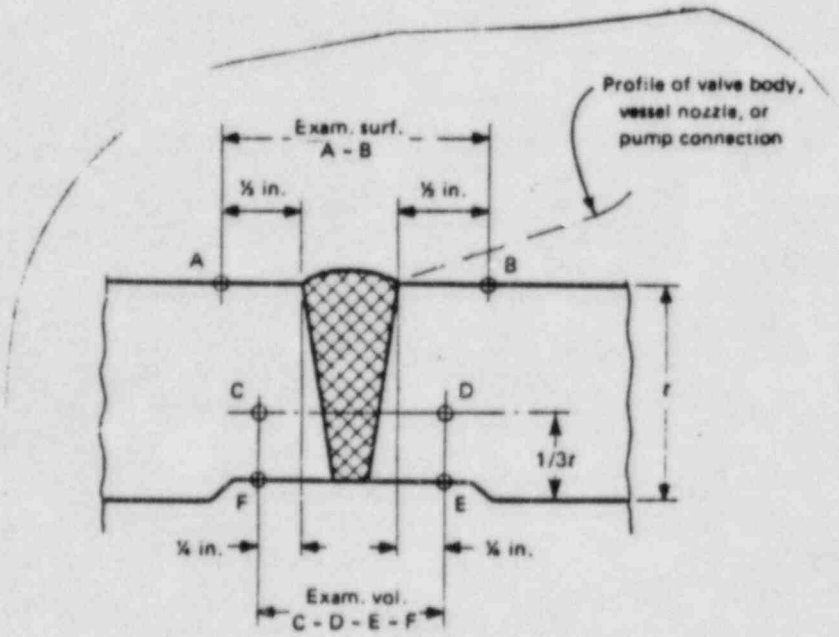
FORM 46446

FIGURE-1

BUTT WELDS

(a) SURFACE EXAMINATION- ALL WELDS

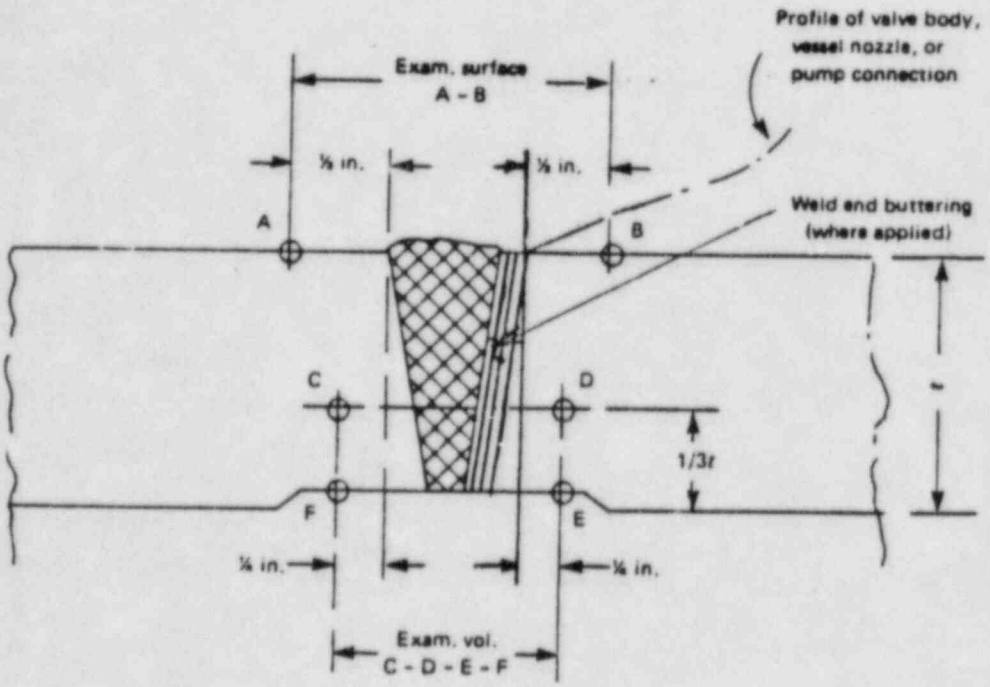
(b) VOLUMETRIC EXAMINATION- NOMINAL PIPE WALL THICKNESS GREATER THAN ½"



FORM 46446

FIGURE-2

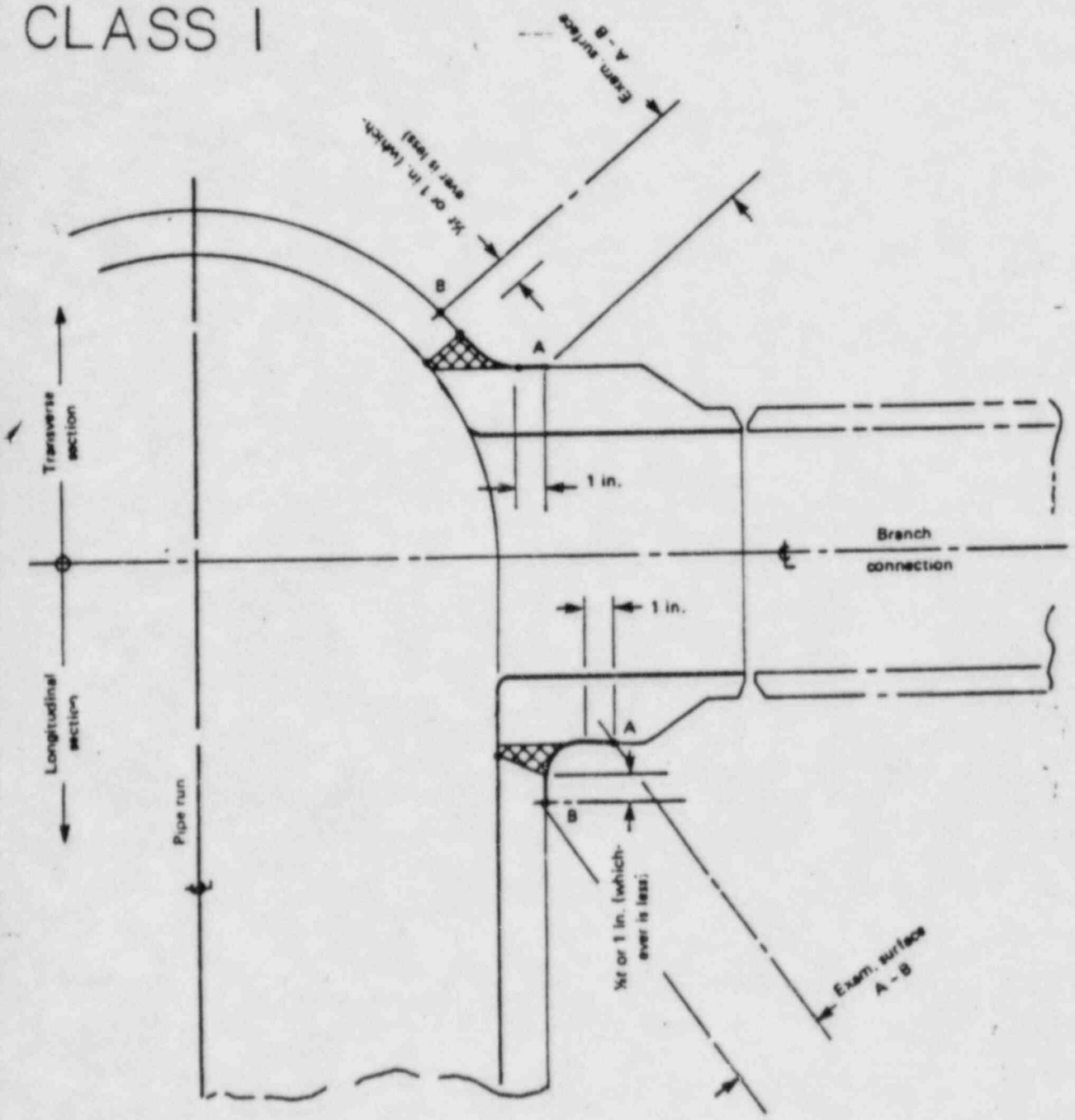
DISSIMILAR METAL WELDS



FORM 46446

FIGURE-3

BRANCH CONNECTIONS 6" & LARGER CLASS 1



FORM 46446

FIGURE-4

BRANCH CONNECTIONS NPS 4" & SMALLER

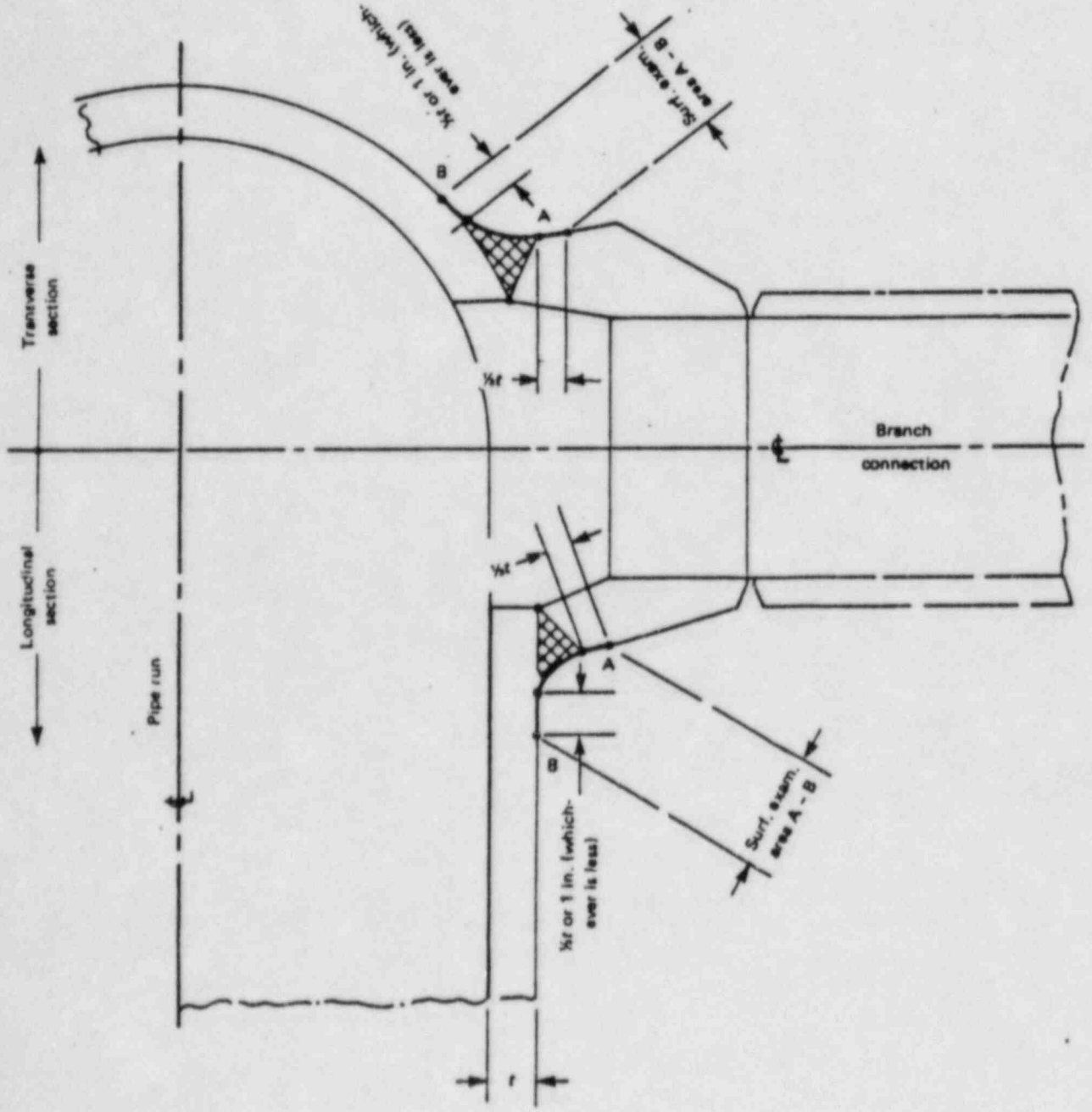
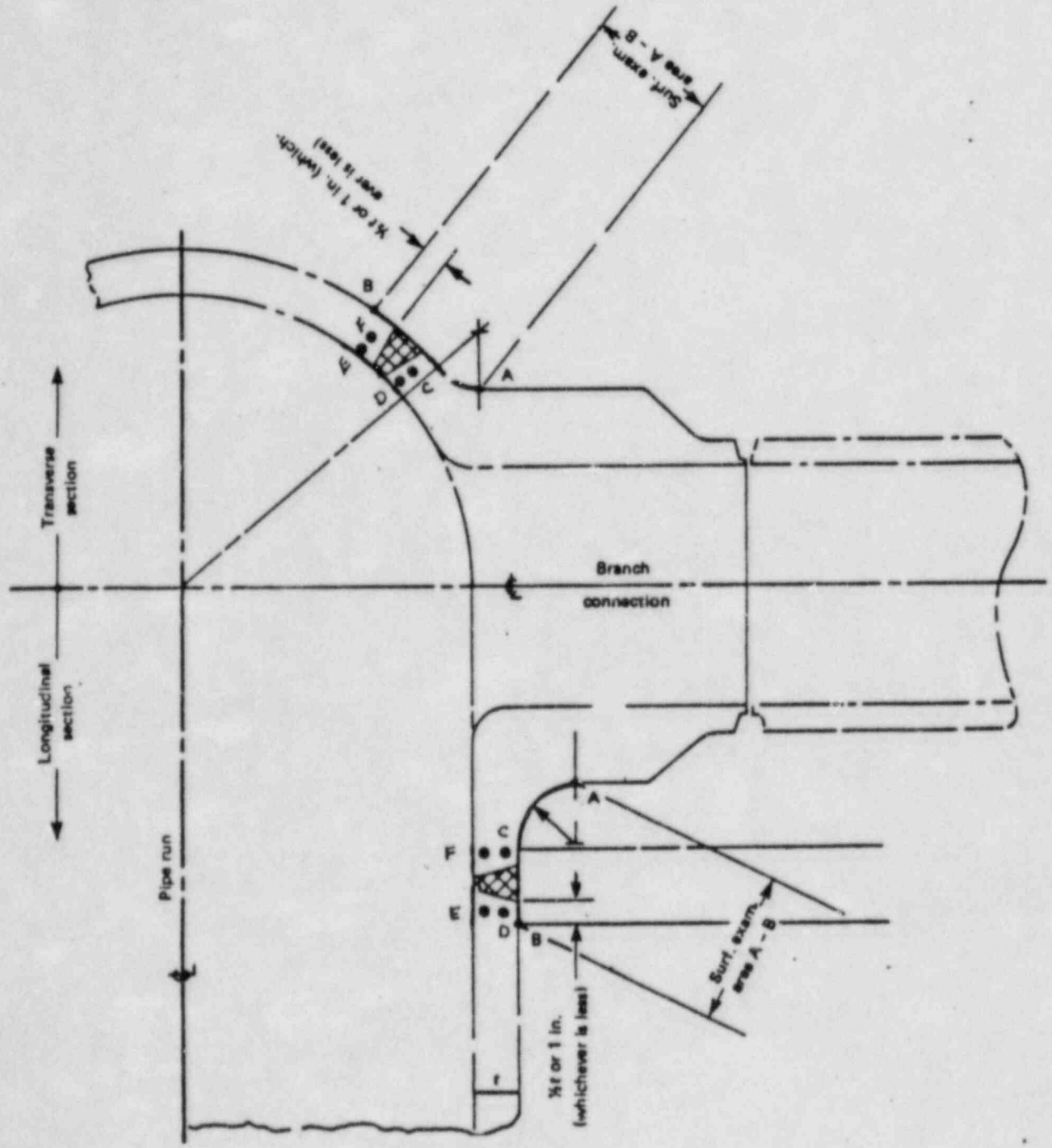


FIGURE-5

BRANCH CONNECTION CLASS 1



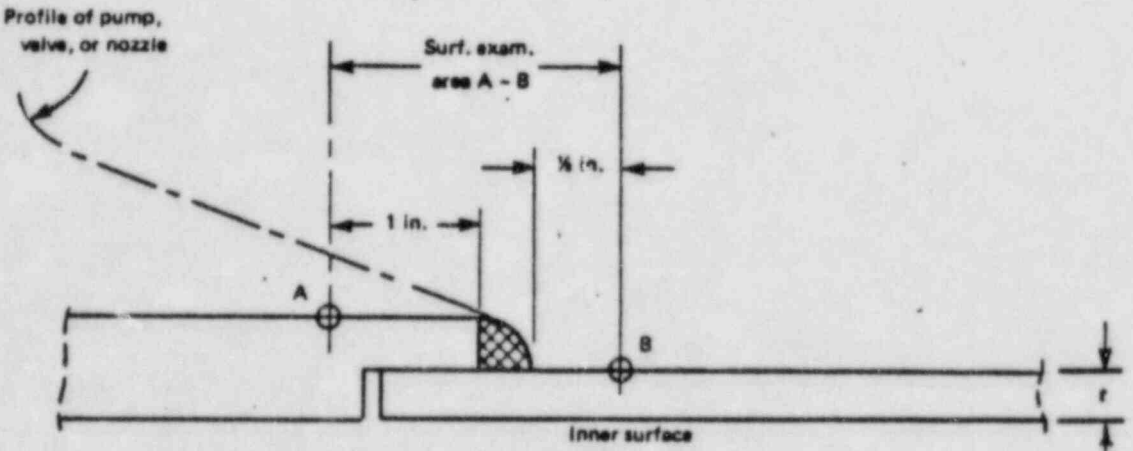
NOTE: Examination volumes C - D - E - F are defined per Fig. # 1

FORM 45446

FORM 46446

FIGURE-6

SOCKET WELDS



NOTE: t is the nominal pipe wall thickness.

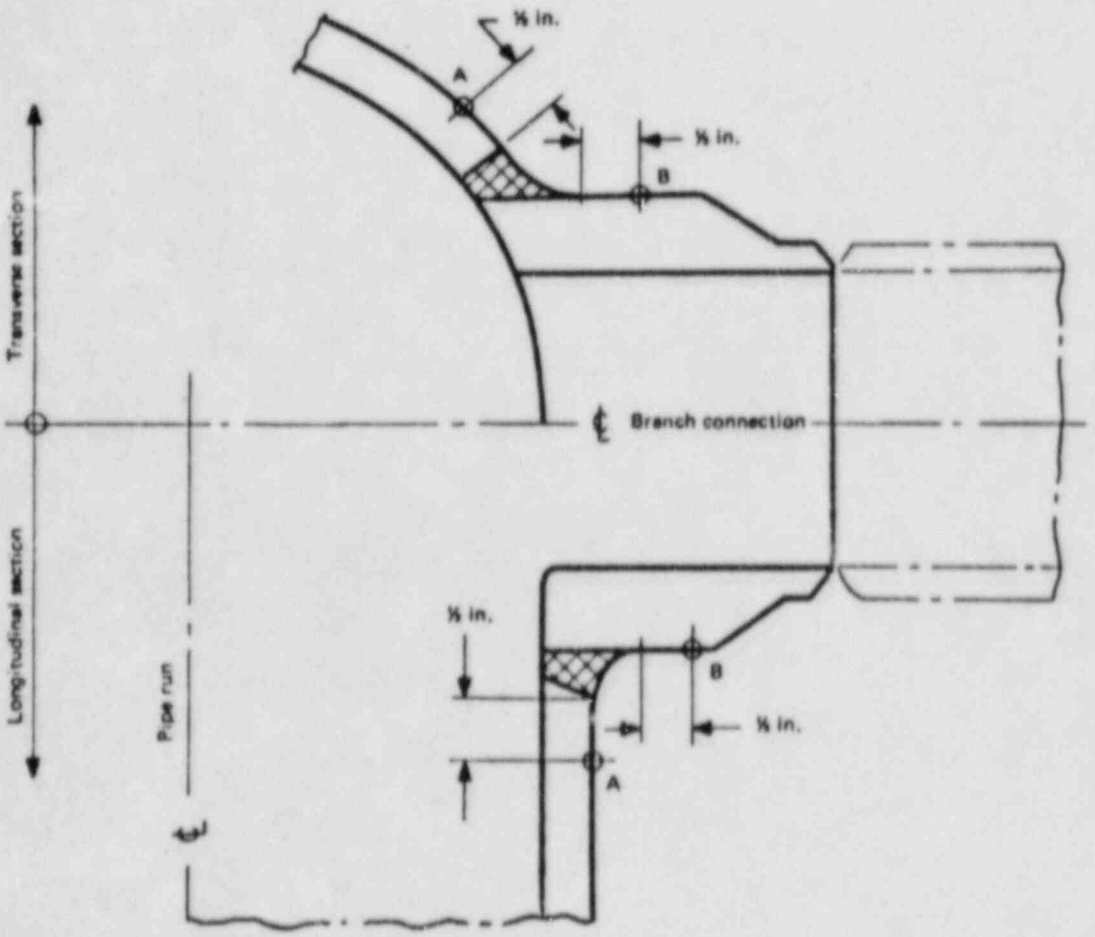
(c) Socket Welded Piping

FORM 48445

FIGURE-7

BRANCH CONNECTIONS CLASS 2

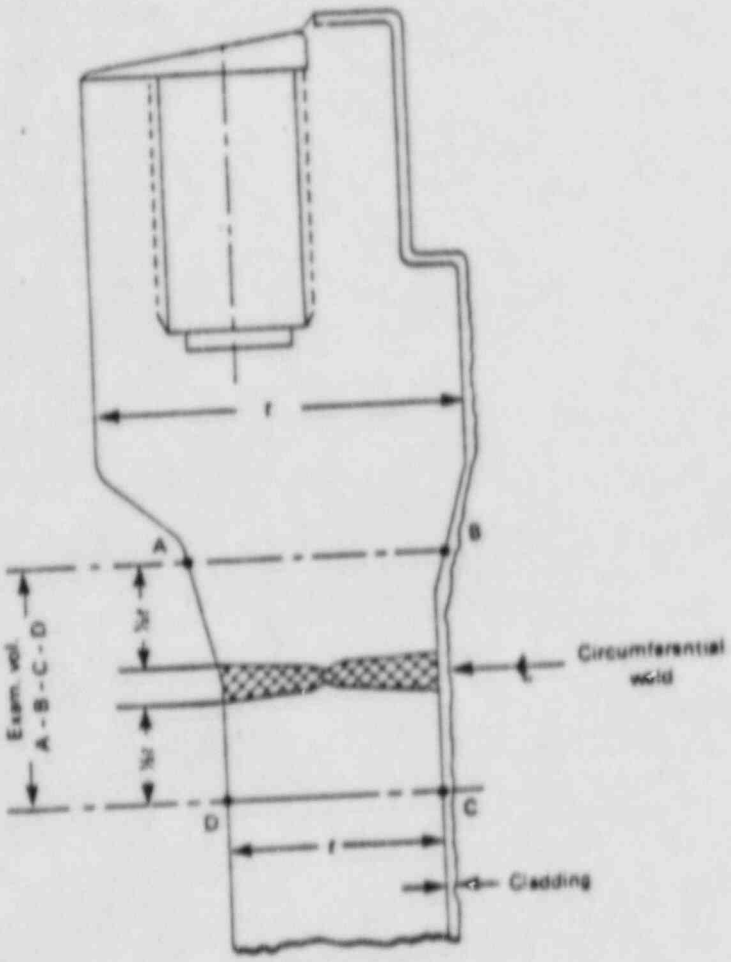
Examination Surface A - B Around Branch Connection



FORM 45445

FIGURE-8

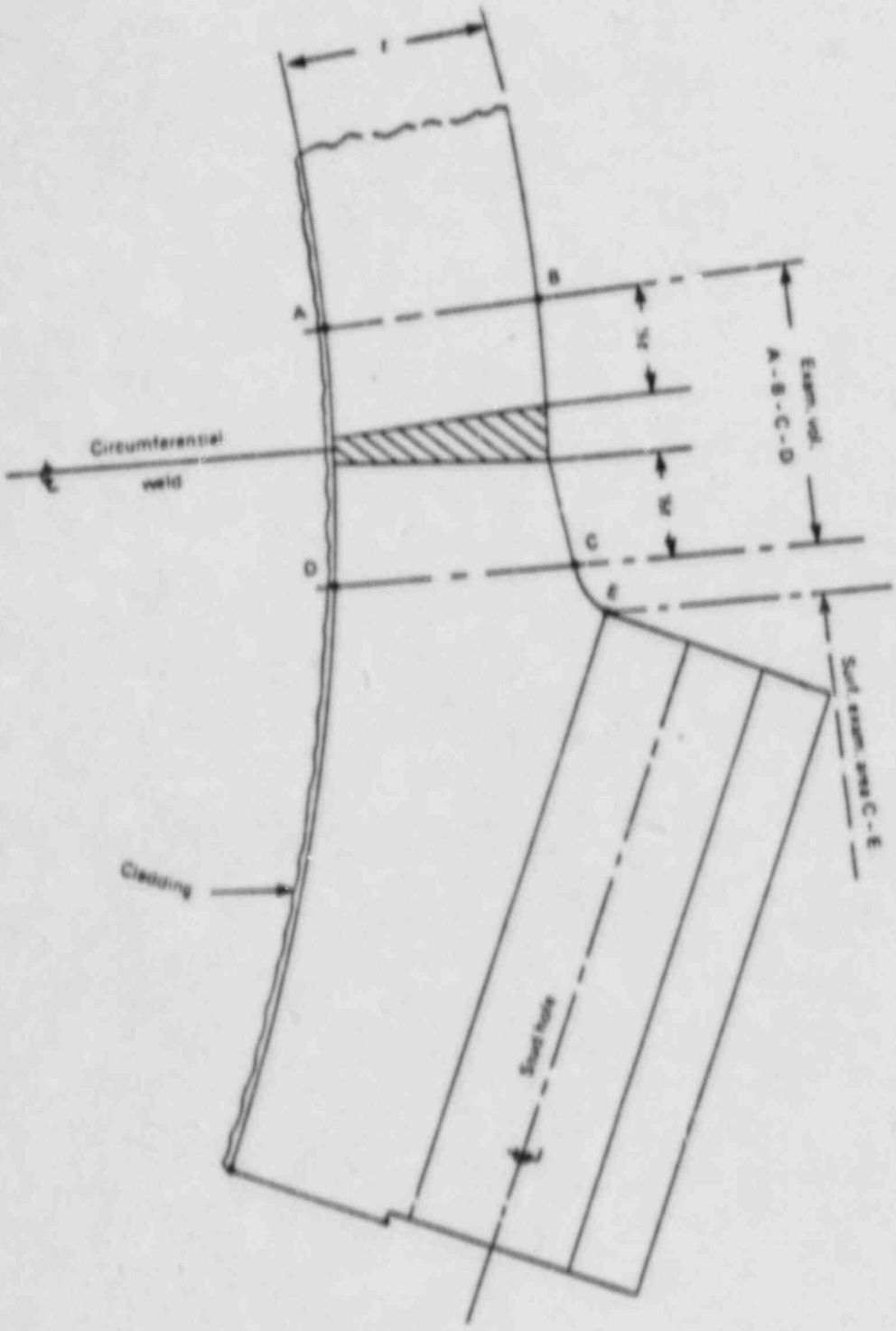
SHELL TO FLANGE WELD



FORM 45685

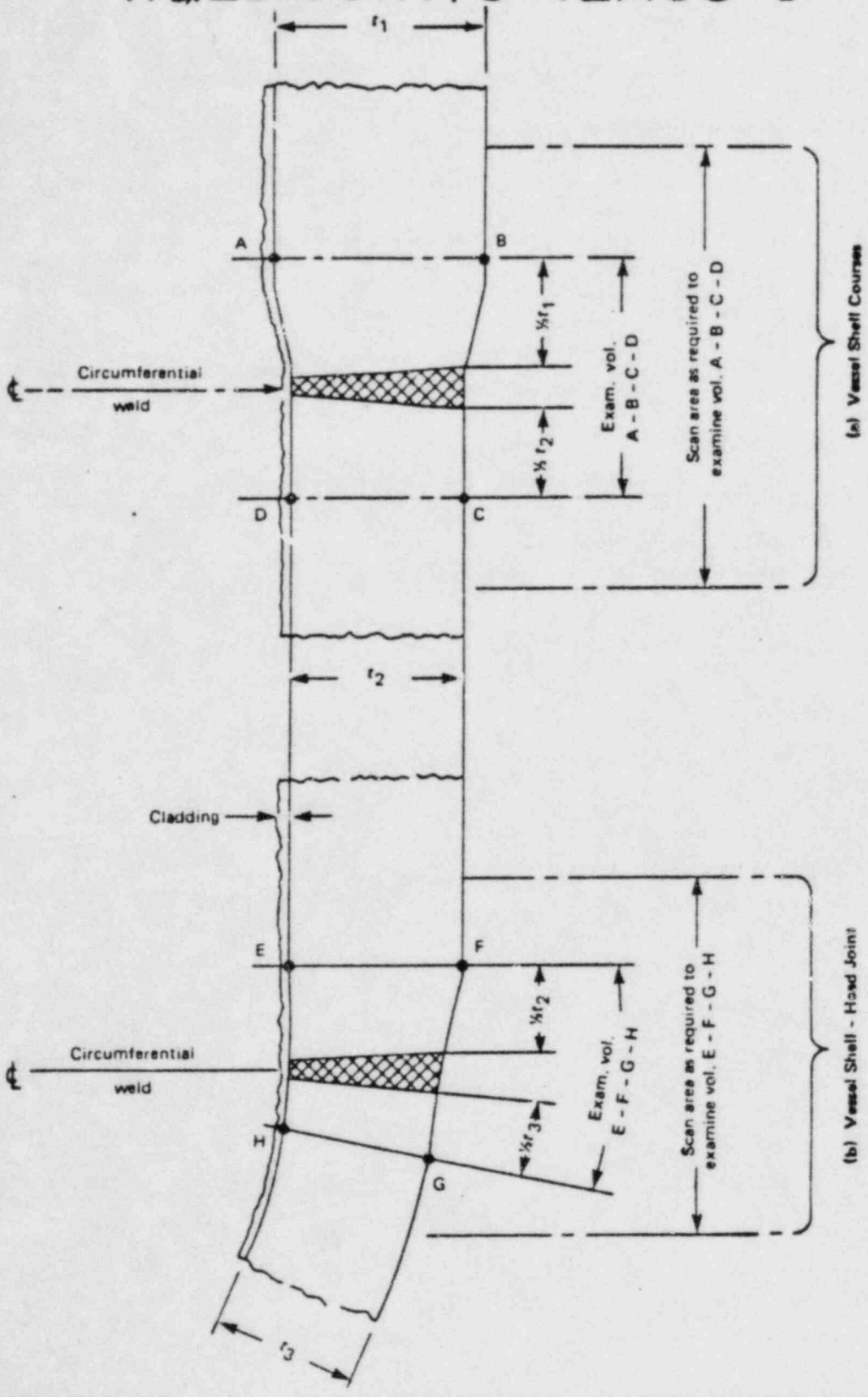
FIGURE-9

HEAD TO FLANGE WELD



FORM 48446

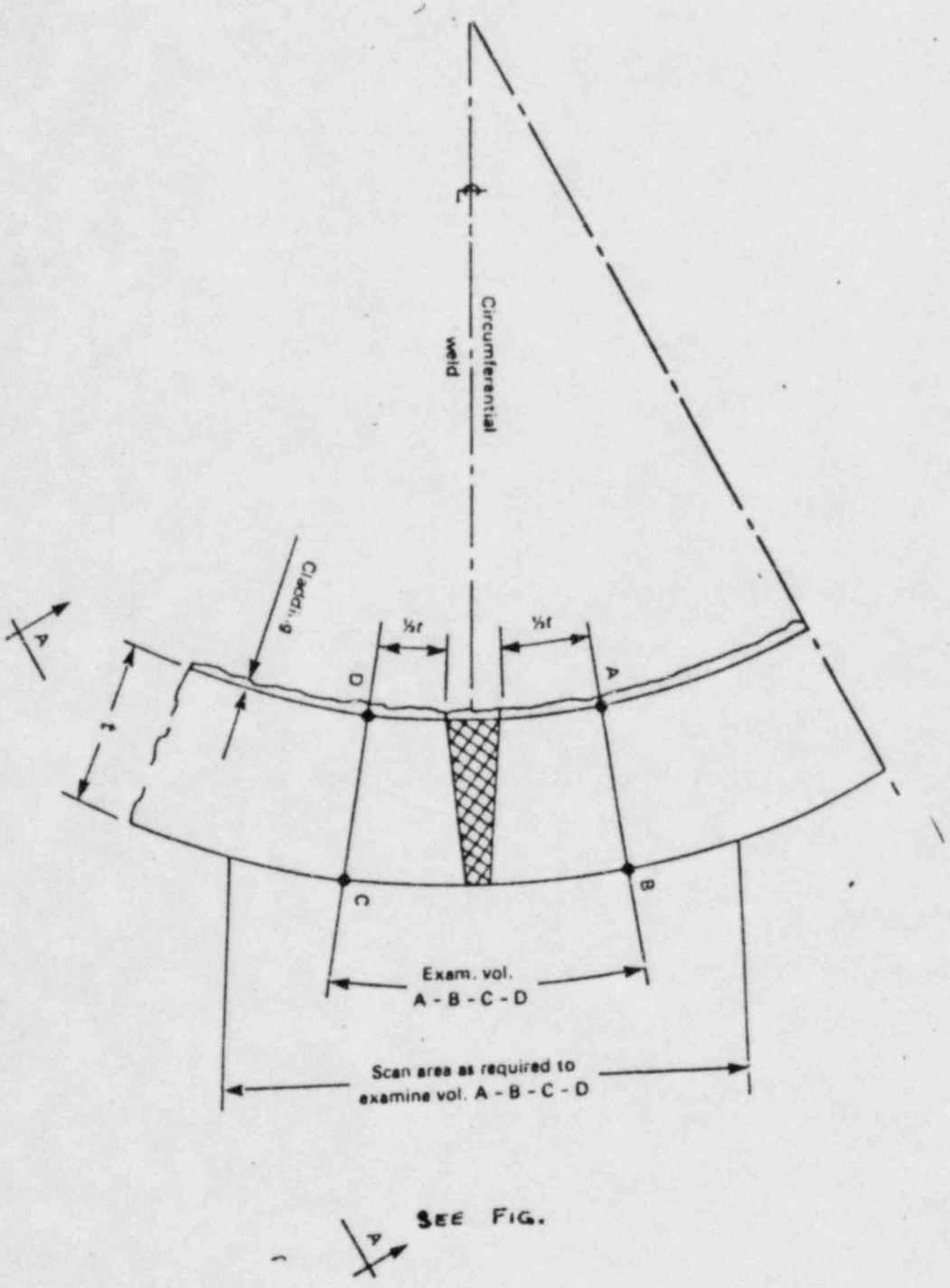
FIGURE-10
VESSEL SHELL CIRCUMFERENTIAL WELD JOINTS CLASS-I



FORM 46446

FIGURE - 11

VESSEL SHELL LONGITUDINAL WELDS CLASS 1

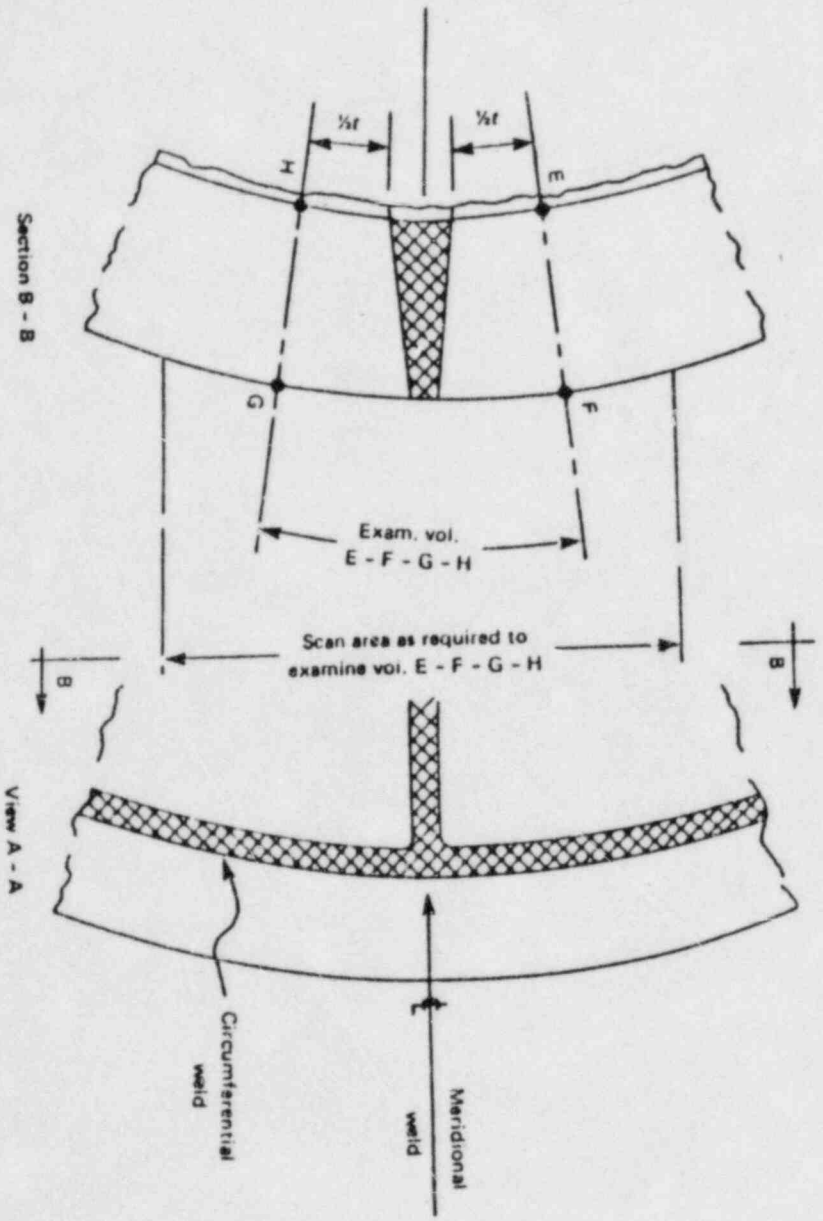


SEE FIG.

FORM 46445

FIGURE-12

VESSEL SHELL LONGITUDINAL WELDS CLASS 1

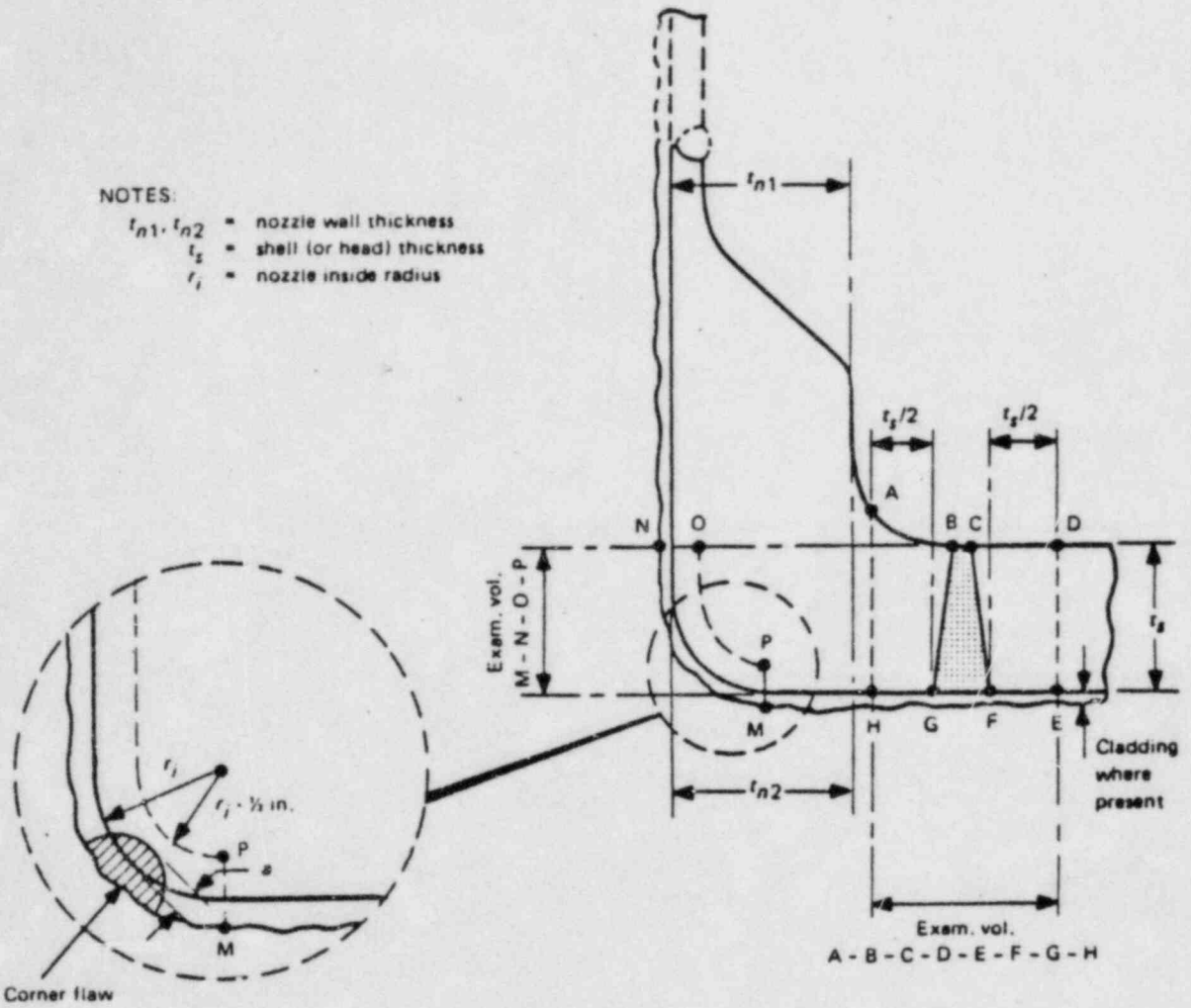


FORM 46446

FIGURE- 13

NOZZLE TO VESSEL WELDS

NOTES:
t_{n1}, t_{n2} = nozzle wall thickness
t_s = shell (or head) thickness
r_i = nozzle inside radius



EXAMINATION REGION[1]	EXAMINATION VOLUME[2]
Shell (or head) adjoining region	C-D-E-F
Attachment weld region	B-C-F-G
Nozzle cylinder region	A-B-G-H
Nozzle inside corner region	M-N-O-P

NOTES:
(1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.
(2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

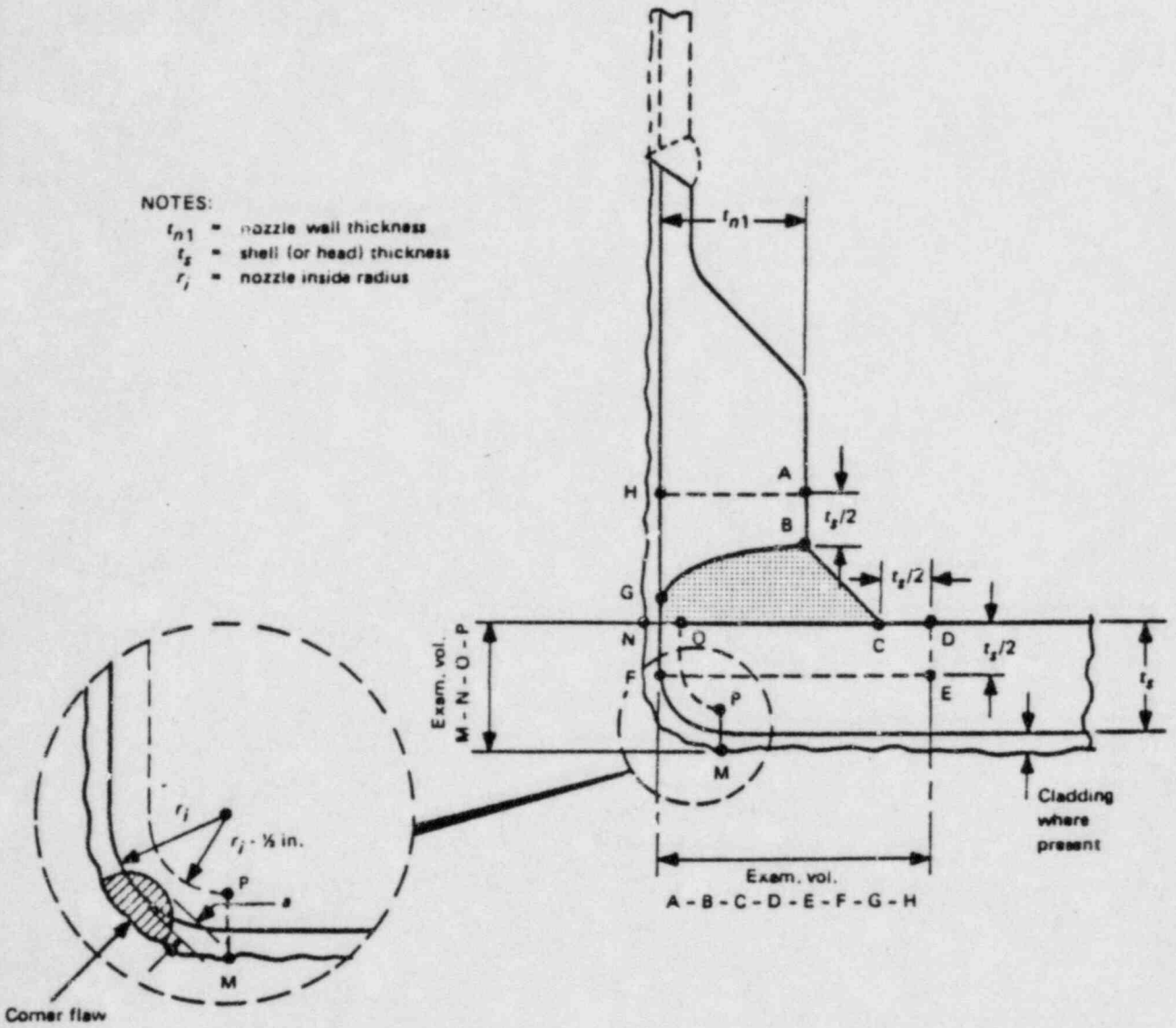
FORM 46446

FIGURE-14

NOZZLE TO VESSEL WELDS

NOTES:

t_{n1} = nozzle wall thickness
t_s = shell (or head) thickness
r_i = nozzle inside radius



EXAMINATION REGION[1]	EXAMINATION VOLUME[2]
Shell (or head) adjoining region	C-D-E-F-G
Attachment weld region	B-C-G
Nozzle cylinder region	A-B-G-H
Nozzle inside corner region	M-N-O-P

NOTES:

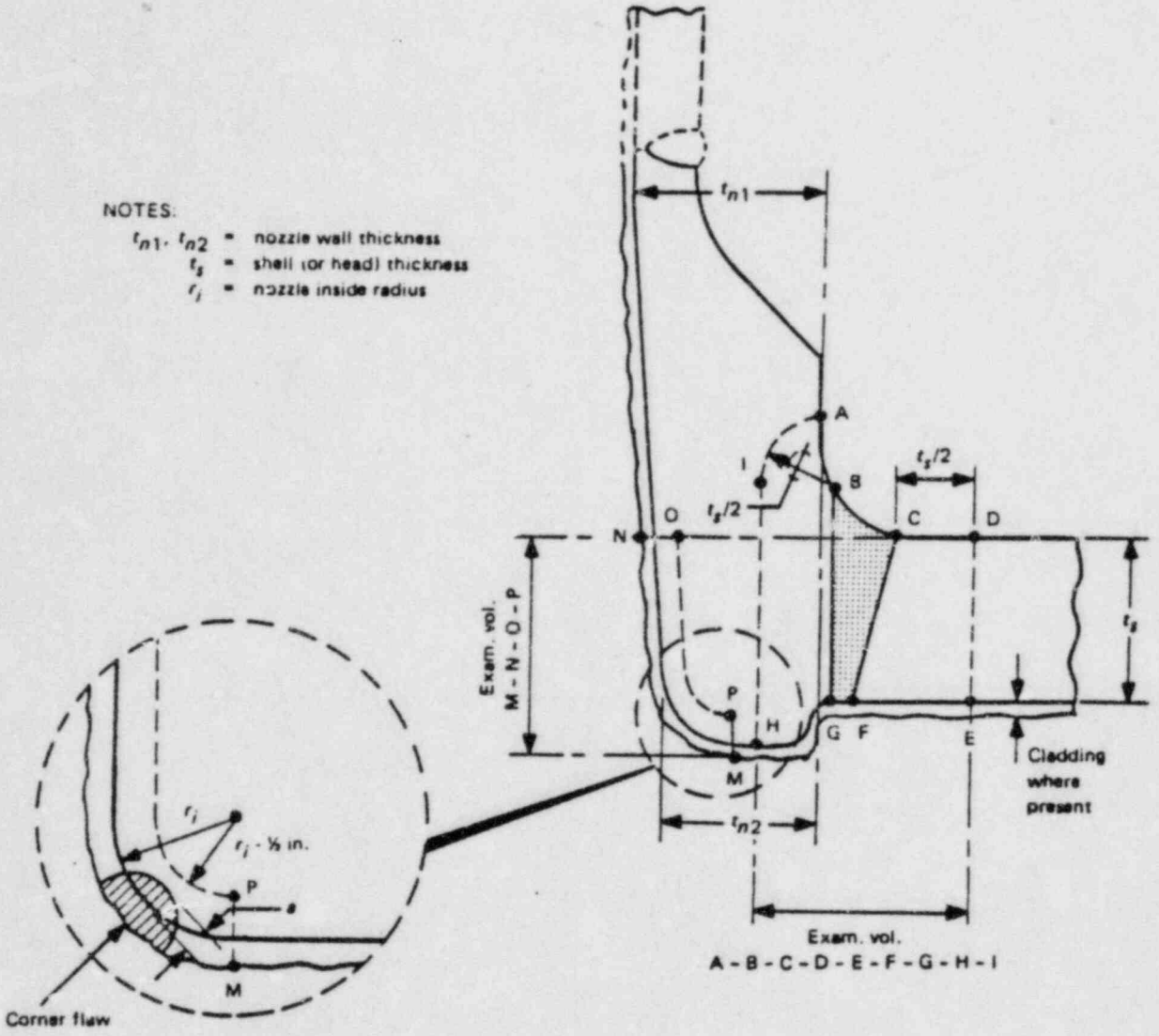
(1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.
(2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FORM 46446

FIGURE-15

NOZZLE TO VESSEL WELDS

NOTES:
t_{n1}, t_{n2} = nozzle wall thickness
t_s = shell (or head) thickness
r_i = nozzle inside radius

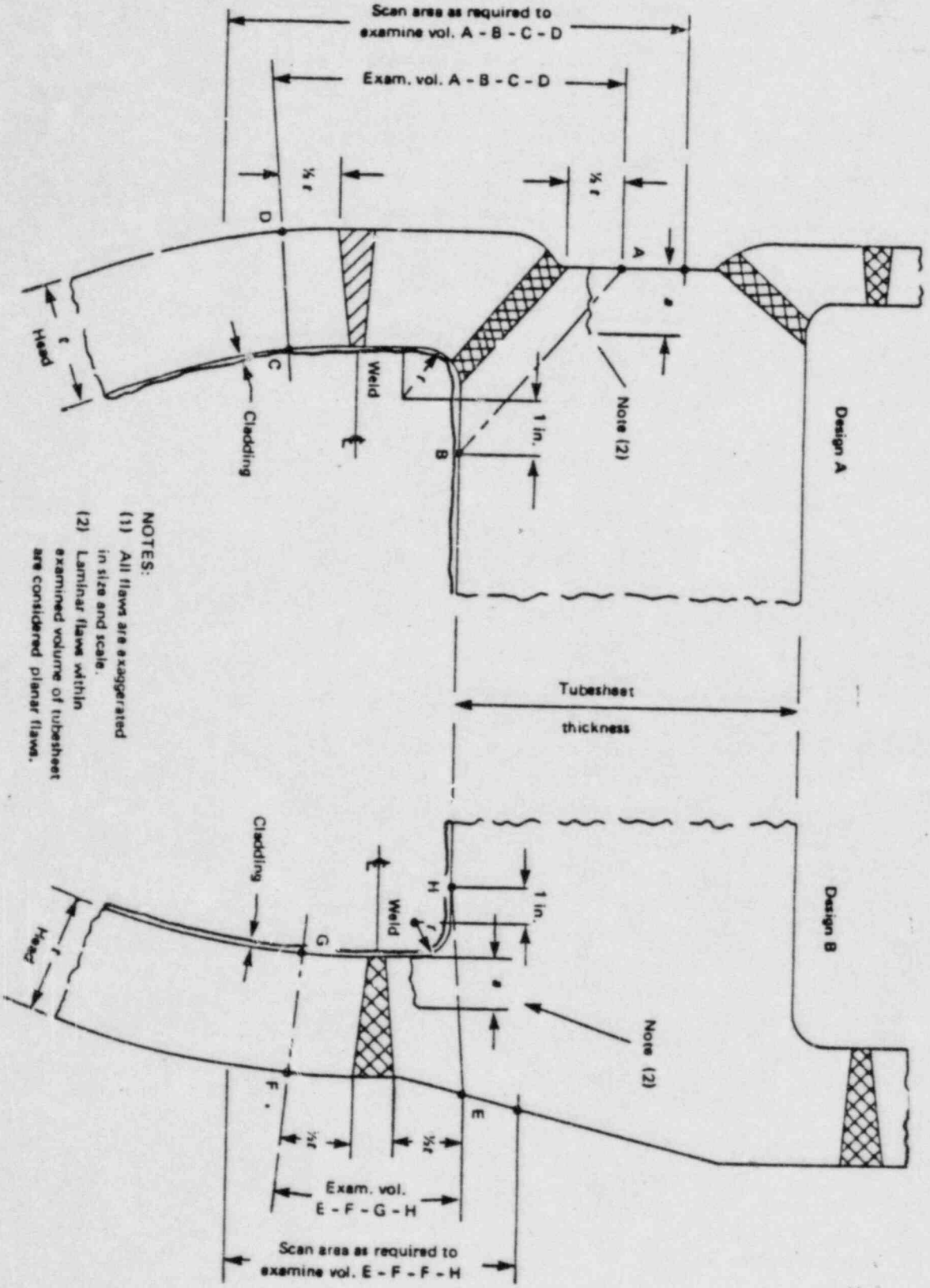


EXAMINATION REGION[1]	EXAMINATION VOLUME[2]
Shell (or head) adjoining region	C-D-E-F
Attachment weld region	B-C-F-G
Nozzle cylinder region	A-B-G-H-I
Nozzle inside corner region	M-N-O-P

NOTES:
(1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.
(2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FORM 48446

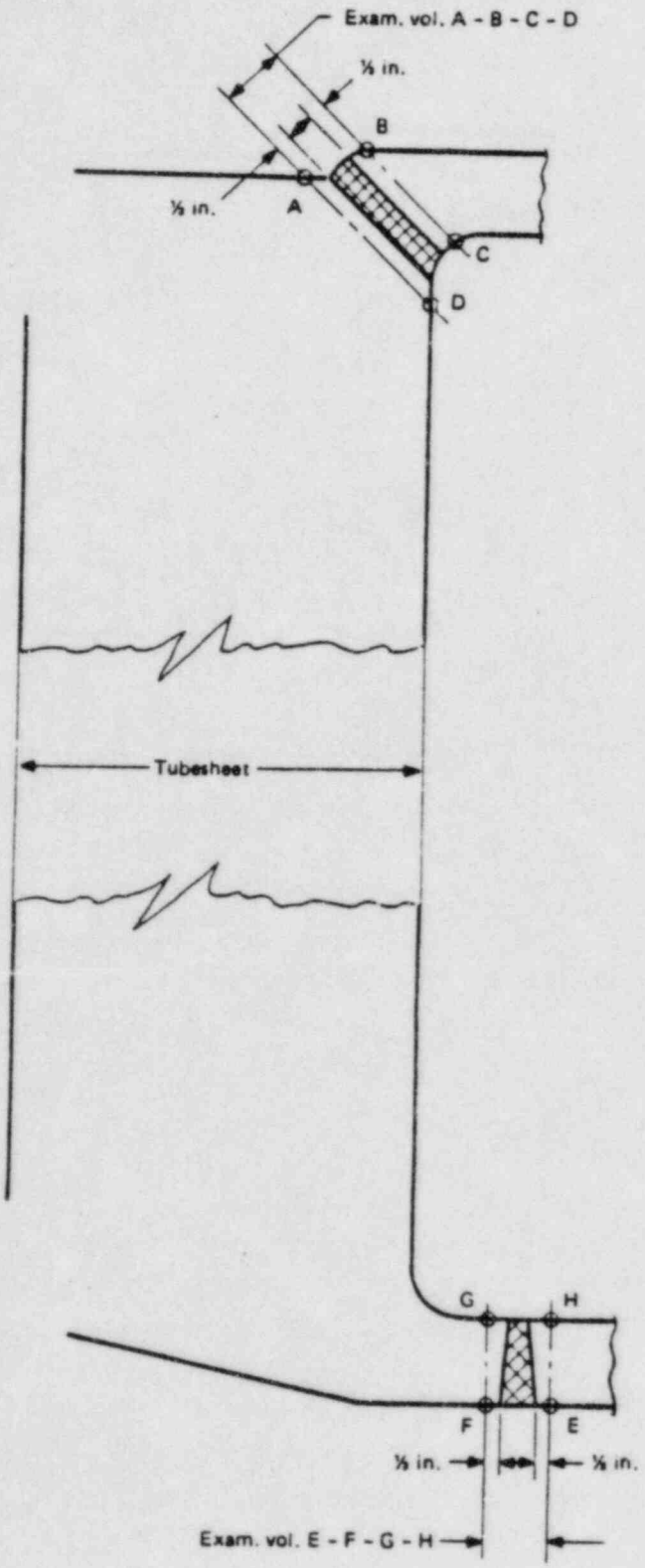
TUBESHEET CLASS-1 FIGURE-16



FORM 46446

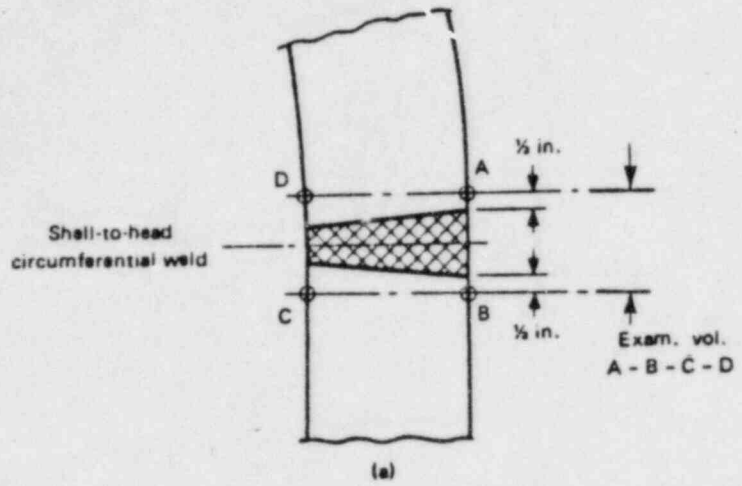
FIGURE-17

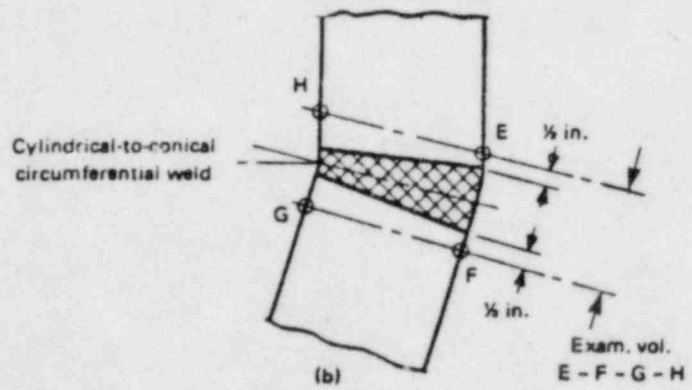
TUBESHEET CLASS II

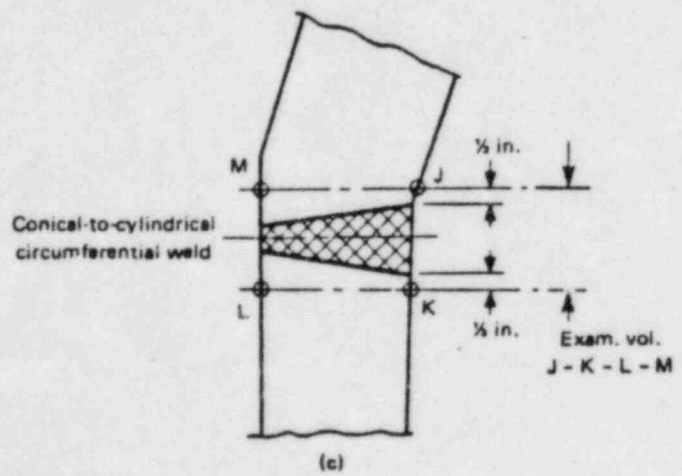


FORM 45445

FIGURE-18
VESSEL SHELL CIRCUMFERENTIAL WELD JOINTS CLASS-II



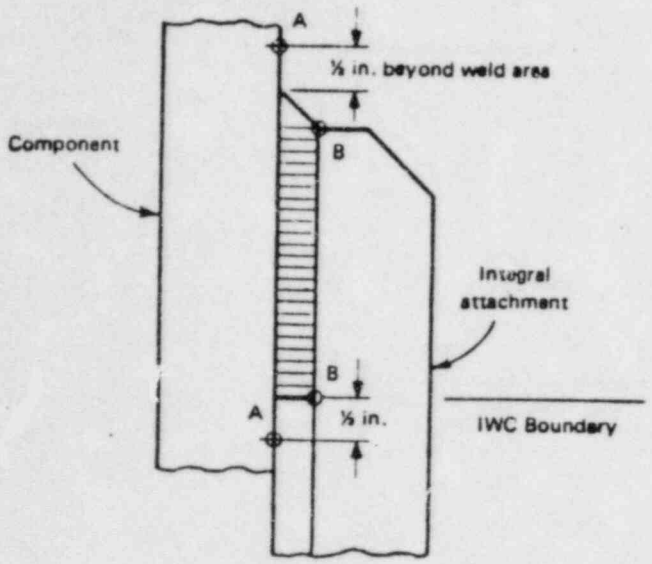




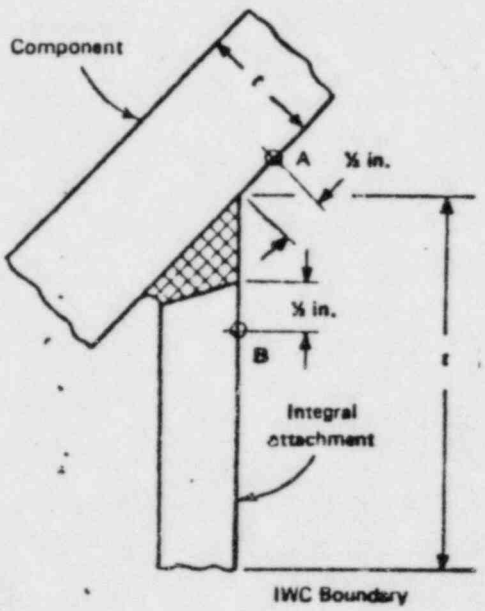
FORM 46446

FIGURE-19

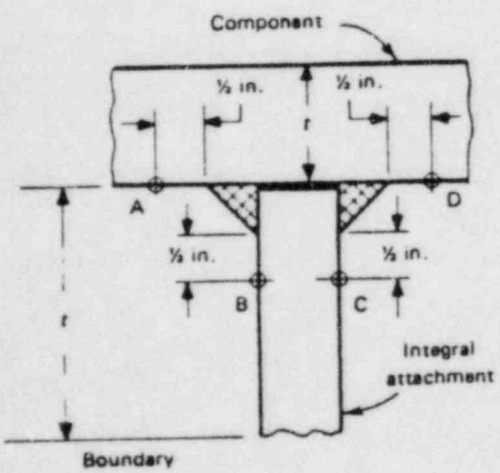
INTEGRALLY WELDED ATTACHMENTS CLASS I & II



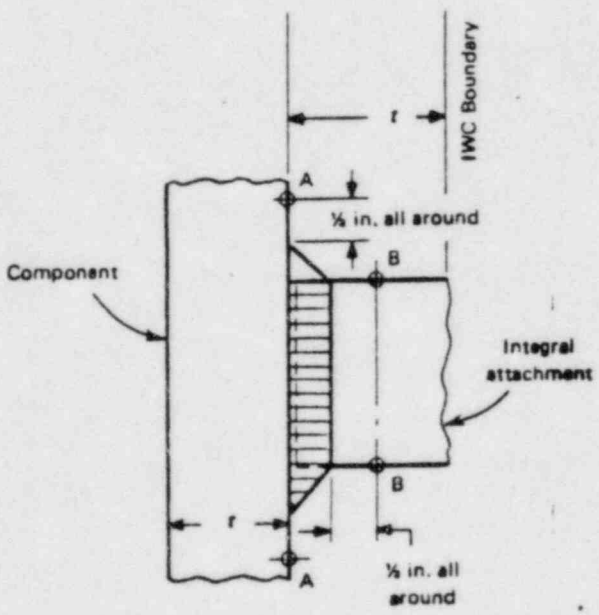
(d) Examination surfaces A - B



(c) Examination surfaces A - B



(a) Examination surfaces A - B and C - D

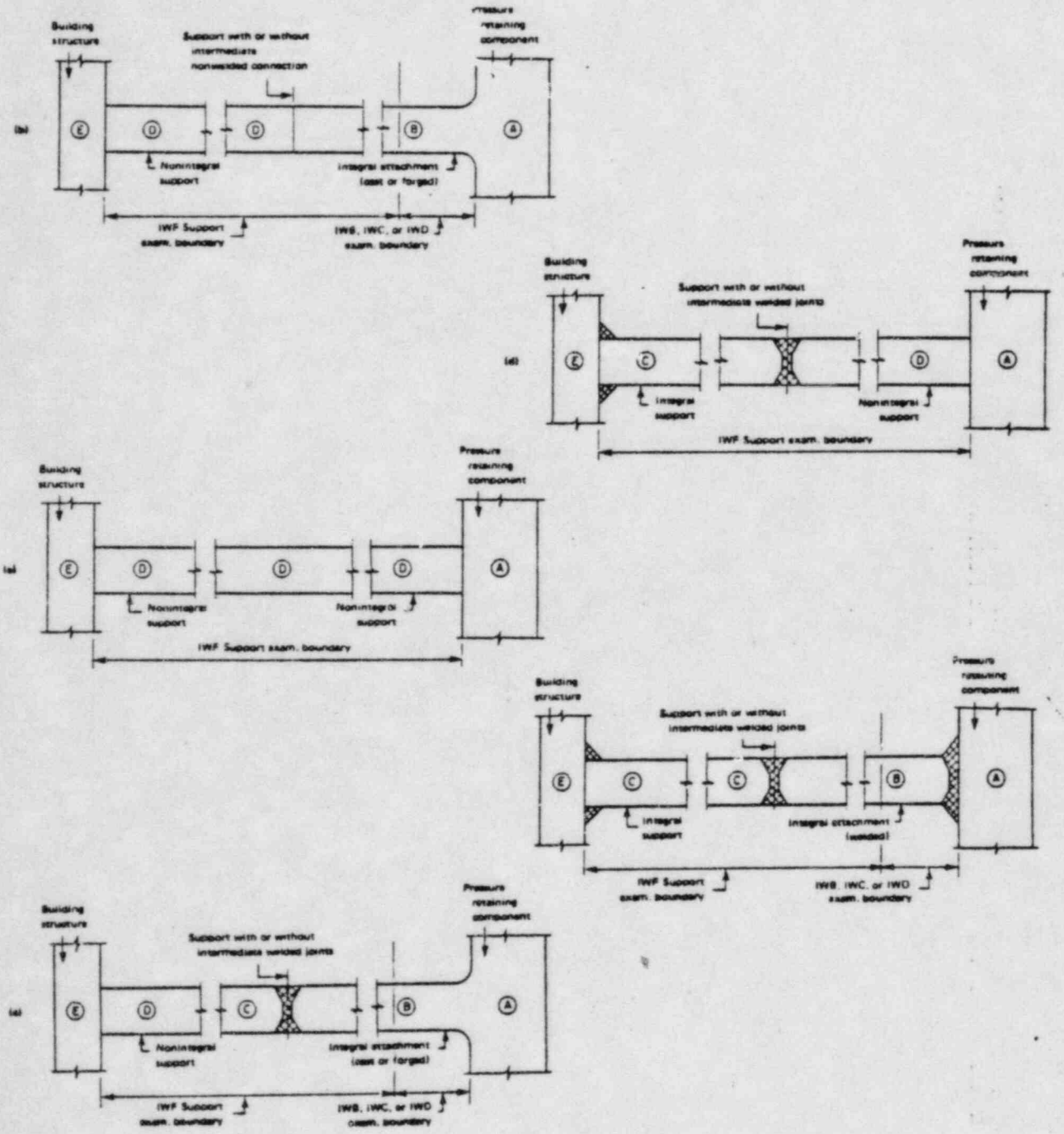


(b) Examination surfaces A - B

FORM 46446

FIGURE-20

SUPPORTS



TEXAS UTILITIES SERVICES

Comanche Peak Nuclear Power Plant Unit #1

Preservice Examination Program
Class II Systems and Components

All items listed below are to be examined, as indicated, in accordance with the requirements of the 1980 Edition Section XI of the ASME Boiler and Pressure Vessel Code to the extent practical with the access provided and the limitations of component geometry.

PROGRAM ITEM	IWC-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE			SKETCH REFERENCE
			VOL	SURF	VIS	
		Steam Generators				
107	C1.10	Circumferential Shell Weld 3-3	47	--	--	2-1100
108	C1.10	Circumferential Shell Weld 3-5	47	--	--	2-1100
109	C1.10	Circumferential Shell Weld 3-6	47	--	--	2-1100
110	C1.20	Circumferential Head Weld 3-8	47	--	--	2-1100
111	C1.30	Tubesheet to Shell Weld 3-2	47	--	--	2-1100
112	C2.10	Nozzle in Vessel Welds less than or equal to 1/2 inch nominal thickness	--	(7)	--	2-1100
	C2.20	Nozzles in Vessel Welds greater than 1/2" nominal thickness				
113	C2.21	Nozzle to Shell Weld 3-9	47	70	--	2-1100
114	C2.21	Nozzle to Shell Weld 3-10	47	70	--	2-1100
115	C2.21	Nozzle to Head Weld 3-11	47	70	00	2-1100
116	C2.22	Nozzle Inside Radius section	(4)	--	8	2-1100
117	C2.22	Nozzle Inside Radius section	(4)	--	8	2-1100
118	C3.10	Integrally Welded Attachments	--	(9)	--	2-1100
119	C4.10	Bolts and Studs	(7)	--	--	2-1100

PROGRAM ITEM	IWC-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
120	C7.10	Pressure Retaining Components	--	--	(2)	--
121	C7.11	Pressure Retaining Components	--	--	(2)	--
		EXCESS LETDOWN HEAT EXCHANGER				
122	C1.10	Circumferential Shell Welds	(9)	--	--	2-1110
123	C1.20	Circumferential Head Weld 1	206	--	--	2-1110
124	C1.30	Tubesheet to Shell Welds	(9)	--	--	2-1110
125	C2.10	Nozzles in Vessel Welds	--	(7)	--	2-1110
	C2.20	Nozzle in Vessel Welds				
126	C2.21	Nozzle to Shell Welds	(7)	(7)	--	2-1110
127	C2.22	Nozzle inside radius section	(7)	--	--	2-1110
128	C3.10	Integrally Welded Attachments	--	(9)	--	2-1110
129	C4.10	Bolts and Studs	(7)	--	--	2-1110
130	C7.10	Pressure Retaining Components	--	--	(2)	2-1110
131	C7.11	Pressure Retaining Components	--	--	(2)	2-1110
		RESIDUAL HEAT EXCHANGERS				
132	C1.10	Circumferential Shell Weld 1-1	206	--	--	2-1120
133	C1.20	Circumferential Shell Weld 1-2	206	--	--	2-1120
134	C1.30	Tubesheet to Shell Welds	(9)	--	--	2-1120
135	C2.10	Nozzle in Vessel Welds	--	(7)	--	2-1120
	C2.20	Nozzle in Vessel Welds greater than 1/2" nominal thickness				
136	C2.21	Nozzle to Shell Welds 1-3 and 1-4	206	11	--	2-1120
137	C2.22	Nozzle inside radius section	(7)	--	--	2-1120
138	C3.10	Integrally Weld Supports 1-1WS & 1-2WS	--	11	--	2-1120
139	C4.10	Bolts and Studs	(7)	--	--	2-1120

PROGRAM ITEM	IWC-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE			SKETCH REFERENCE
			VOL	SURF	VIS	
140	C7.10	Pressure Retaining Components	--	--	(2)	2-1120
141	C7.11	Pressure Retaining Components	--	--	(2)	2-1120
		Seal Water Heat Exchanger				
142	C1.10	Circumferential Shell Weld 2	(8)	11	--	2-1130
143	C1.20	Circumferential Head Weld 1	(8)	11	--	2-1130
144	C1.30	Tubesheet to Shell Welds	(9)	--	--	2-1130
145	C2.10	Nozzle in Vessel Welds	--	(7)	--	2-1130
	C2.20	Nozzle in Vessel Welds				
146	C2.21	Nozzle to Shell Welds	(7)	(7)	--	2-1130
147	C2.22	Nozzle Inside Radius Section	(7)	--	--	2-1130
148	C3.10	Integrally Welded Attachments	--	(9)	--	2-1130
149	C4.10	Bolts and Studs	(7)	--	--	2-1130
150	C7.10	Pressure Retaining Components	--	--	(2)	2-1130
151	C7.11	Pressure Retaining Components	--	--	(2)	2-1130
		Horizontal Letdown Heat Exchanger				
152	C1.10	Circumferential Shell Welds	(9)	--	--	2-1140
153	C1.20	Circumferential Head Weld 1	206	--	--	2-1140
154	C1.30	Tubesheet to Shell Welds	(9)	--	--	2-1140
155	C2.10	Nozzle in Vessel Welds	--	(7)	--	2-1140
	C2.20	Nozzle in Vessel Welds				
156	C2.21	Nozzle to Shell Welds	(7)	(7)	--	2-1140
157	C2.22	Nozzle Inside Radius Section	(7)	--	--	2-1140
158	C3.10	Integrally Welded Supports	--	(9)	--	2-1140
159	C4.10	Bolts and Studs	(7)	--	--	2-1140

PROGRAM ITEM	IWC-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE			SKETCH REFERENCE
			VOL	SURF	VIS	
160	C7.10	Pressure Retaining Components	--	--	(2)	2-1140
161	C7.11	Pressure Retaining Components	--	--	(2)	2-1140
		Regenerative Heat Exchanger				
162	C1.10	Circumferential Shell Welds 3, 4, 5, 6, 7 & 8	206	--	--	2-1150
163	C1.20	Circumferential Head Welds 1 & 2	206	--	--	2-1150
164	C1.30	Tubesheet to Shell Welds	(9)	--	--	2-1150
165	C2.10	Nozzle in Vessel Welds	--	(7)	--	2-1150
	C2.20	Nozzle in Vessel Welds				
166	C2.21	Nozzle to Shell Welds	(7)	(7)	--	2-1150
167	C2.22	Nozzle Inside Radius Section	(7)	--	--	2-1150
168	C3.10	Integrally Welded Supports	--	(9)	--	2-1150
169	C4.10	Bolts and Studs	(9)	--	--	2-1150
170	C7.10	Pressure Retaining Components	--	--	(2)	2-1150
171	C7.11	Pressure Retaining Components	--	--	(2)	2-1150
		Letdown Reheat Heat Exchanger				
172	C1.10	Circumferential Shell Weld 2	(8)	11	--	2-1160
173	C1.20	Circumferential Head Weld 1	(8)	11	--	2-1160
174	C1.30	Tubesheet to Shell Welds	(9)	--	--	2-1160
175	C2.10	Nozzle in Vessel Welds	--	(7)	--	2-1160
	C2.20	Nozzle in Vessel Welds				
176	C2.21	Nozzle to Shell Welds	(7)	(7)	--	2-1160
177	C2.22	Nozzle Inside Radius Section	(7)	--	--	2-1160
178	C3.10	Integrally Welded Supports	--	(9)	--	2-1160
179	C4.10	Bolts and Studs	(7)	--	--	2-1160

PROGRAM ITEM	IWC-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
180	C7.10	Pressure Retaining Components	--	--	(2)	2-1160
181	C7.11	Pressure Retaining Components	--	--	(2)	2-1160
		Volume Control Tank				
182	C1.10	Circumferential Shell Welds	(9)	--	--	2-1200
183	C1.20	Circumferential Head Welds 1 & 2	206	--	--	2-1200
184	C1.30	Tubesheet to Shell Welds	(9)	--	--	2-1200
185	C2.10	Nozzle in Vessel Welds	--	(7)	--	2-1200
	C2.20	Nozzle in Vessel Welds				
186	C2.21	Nozzle to Shell Welds	(7)	(7)	--	2-1200
187	C2.22	Nozzle Inside Radius Section	(7)	--	--	2-1200
188	C3.10	Integrally Welded Support 1WS	--	11	--	2-1200
189	C4.10	Bolts and Studs	(7)	--	--	2-1200
190	C7.10	Pressure Retaining Components	--	--	(2)	2-1200
191	C7.11	Pressure Retaining Components	--	--	(2)	2-1200
		Reactor Coolant Filter				
192	C1.10	Circumferential Shell Weld 2	(8)	11	--	2-1300
193	C1.20	Circumferential Head Weld 1	(8)	11	--	2-1300
194	C1.30	Tubesheet to Shell Welds	(9)	--	--	2-1300
195	C2.10	Nozzle in Vessel Welds	--	(7)	--	2-1300
	C2.20	Nozzle in Vessel Welds				
196	C2.21	Nozzle to Shell Welds	(7)	(7)	--	2-1300
197	C2.22	Nozzle Inside Radius Section	(7)	--	--	2-1300
198	C3.10	Integrally Welded Supports 1WS, 2WS, 3WS & 4WS	--	11	--	2-1300
199	C4.10	Bolts and Studs	(7)	--	--	2-1300
200	C7.10	Pressure Retaining Components	--	--	(2)	2-1300

PROGRAM ITEM	IWC-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
201	C7.11	Pressure Retaining Components	--	--	(2)	2-1300
		Seal Water Return Filter				
202	C1.10	Circumferential Shell Weld 2	(8)	11	--	2-1310
203	C1.20	Circumferential Head Weld 1	(8)	--	--	2-1310
204	C1.30	Tubesheet to Shell Welds	(9)	--	--	2-1310
205	C2.10	Nozzle on Vessel Welds	--	(7)	--	2-1310
	C2.20	Nozzle in Vessel Welds				
206	C2.21	Nozzle to Shell Welds	(7)	(7)	--	2-1310
207	C2.22	Nozzle Inside Radius Section	(7)	--	--	2-1310
208	C3.10	Integrally Welded Supports 1WS, 2WS, 3WS & 4WS	--	11	--	2-1310
209	C4.10	Bolts and Studs	(7)	--	--	2-1310
210	C7.10	Pressure Retaining Components	--	--	(2)	2-1310
211	C7.11	Pressure Retaining Components	--	--	(2)	2-1310
		Piping (See Appendix A)				
212	C3.40	Integrally Welded Attachments	--	11/ 70	--	2-2710
213	C4.20	Bolts and Studs	(7)	--	--	--
	C5.10	Pressure Retaining Welds in Piping less than or equal to 1/2 inch nominal Wall Thickness				
214	C5.11	Circumferential Welds	--	11/ 70	--	2-2100 to 2-2568
215	C5.12	Longitudinal Welds	--	11/ 70	--	2-2100 to 2-2568
	C5.20	Pressure Retaining Welds in Piping greater than 1/2 inch nominal Wall Thickness				
216	C5.21	Circumferential Welds	206	11/ 70	--	2-2100 to 2-2568

PROGRAM ITEM	IWC-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
217	C5.22	Longitudinal Welds	206	11/ 70	--	2-2100 to 2-2568
	C5.30	Pipe Branch Connections				
218	C5.31	Circumferential Welds	--	11/ 70	--	2-2100 to 2-2568
219	C5.32	Longitudinal Welds	--	11/ 70	--	2-2100 to 2-2568
220	C7.20	Pressure Retaining Components	--	--	(2)	--
221	C7.21	Pressure Retaining Components	--	--	(2)	--
		Residual Heal Removal Pumps 1 & 2				
222	C3.70	Integrally Welded Attachments 1-1WS, 1-2WS, 1-3WS, 2-1WS, 2-2WS & 2-3WS	--	11	--	2-3100
223	C4.30	Bolts and Studs	(7)	--	--	2-3100
224	C6.10	Pump Casing Welds	--	(9)	--	2-3100
225	C7.30	Pressure Retaining Components	--	--	(2)	2-3100
226	C7.31	Pressure Retaining Components	--	--	(2)	2-3100
		Centrifugal Charging Pumps 1 & 2				
227	C3.70	Integrally Welded Supports 1-1WS, 1-2WS, 1-3WS, 1-4WS, 2-1WS, 2-2WS, 2-3WS, & 2-4WS	--	11	--	2-3100
228	C4.30	Bolts and Studs	(7)	--	--	2-3110
229	C6.10	Pump Casing Welds	--	(9)	--	2-3110
230	C7.30	Pressure Retaining Components	--	--	(2)	2-3110
231	C7.31	Pressure Retaining Components	--	--	(2)	2-3110
		Positive Displacement Pump 1				
232	C3.70	Integrally Welded Supports	--	(9)	--	2-3120
233	C4.30	Bolts and Studs	(7)	--	--	2-3120

PROGRAM ITEM	IWC-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE VOL	SURF	VIS	SKETCH REFERENCE
234	C6.10	Pump Casing Welds	--	(9)	--	2-3120
235	C7.30	Pressure Retaining Components	--	--	(8)	2-3120
236	C7.31	Pressure Retaining Components	--	--	(2)	2-3120
		Safety Injection Pumps 1 & 2				
237	C3.70	Integrally Welded Supports	--	(9)	--	2-3140
238	C4.30	Bolting 1-B1 thru 1-B32 and 2-B1 thru 2-B32	15	--	--	2-3140
239	C6.10	Pump Casing Welds	--	(9)	--	2-3140
240	C7.30	Pressure Retaining Components	--	--	(2)	2-3140
241	C7.31	Pressure Retaining Components	--	--	(2)	2-3140
		Valves				
242	C3.100	Integrally Welded Attachments	--	(9)	--	--
243	C4.40	Bolts and Studs	(7)	--	--	2-4100
244	C6.20	Valve Body Welds	--	70	--	2-4110
245	C7.40	Pressure Retaining Components	--	--	(2)	--
246	C7.41	Pressure Retaining Components	--	--	(2)	--

WESTINGHOUSE ELECTRIC CORPORATION

A P P E N D I X - A

The following is a list of Class 2 pipe welds selected for examination during the preservice examination conducted at the Comanche Peak Nuclear Power Station.

Sketch No.	Weld/Area	Sketch No.	Weld/Area	Sketch No.	Weld/Area
2-2100	1	2-2200	1	2-2300	24
	7		3		33
	13		12		35
	15		14		47L
	23BC		17BC		61L
	24		23		63L
	26		25		66L
	30		29	2-2301	1
	31		32		23
	37		37L		26
	40L		42L		27
	43L		43L		28
	44L		44L	2-2302	1
	47L		46L		9
2-2101	1	2-2201	1		10
	2		27		12
	12		30		13
	15		31		16
	16		32		17
	17	2-2202	1		27
2-2102	1		5		34
	3		9		35
	4		12		61
	10		18		62
	12		27		63
	17		32		64
	27		33		68
	34		34		69
	35		35		75
	44		36		82
	45		37		88
	46		38		89
	50		39	2-2400	1
	51		63		6
	52		64		13
	53		68		17
	55		69		26
	56		70		41L
	57		79		45L
	62		80		47L
	63		88		50L
	64		89	2-2401	1
	65	2-2300	1		4
	71		3		10
	72		21		13

Sketch No.	Weld/Area	Sketch No.	Weld/Area	Sketch No.	Weld/Area
2-2401	14	2-2501	38	2-2522	11
	15		45		12
2-2402	1		46L		14
	5		47L	2-2523	1DM
	12		48L		2
	13		50L		6
	23		51L		7
	24		52L		14
	25		53L	2-2524	1DM
	26		54L		2
	27		55L		6
	34	2-2520	1		8
	35		16	2-2525	1DM
	50		17		8
	51		18		9
	56BC		19	2-2530	1
	57		21		4
	61		22		5
	64		24		24
	71		34		29
	72		35		30
2-2500	1		36		38
	3		37		39L
	11		60		40L
	12		67L		41L
	13		68L	2-2531	1
	17		69L		2
	22		70L		19
	25		71L		20L
	26		72L	2-2532	2
	33		73L		3
	35		74L		10
	36		75L		11
	45		76L		19
	46	2-2521	1		20
	47L		24		21
	48L		33		34
	49L		34		35
	50L		39		43L
	51L		49		44L
	52L		50		45L
	53L		51		46L
	54L		52		47L
2-2501	3		57		48L
	10		63	2-2533	1
	11		64		3
	12		65		4
	20		66L		5
	25		67L		7
	26		68L	2-2534	1
	30		69L		3
	31		70L		8
	33		71L		14
	34	2-2522	1DM		21
	37		2		22

Sketch No.	Weld/Area	Sketch No.	Weld/Area	Sketch No.	Weld/Area
2-2535	1	2-2541	49	2-2564	40
	12		50		41
	14		55		42
	17		56		45
2-2536	4		64		46
	5	2-2542	1		49
	6		6	2-2565	20
	7		12		21
	8		13		30
	9		18		37
	10		19	2-2566	2
2-2537	4		28		3
	5	2-2550	4		17
	6		5		35
	7		11		36
	8		15		43
	9		19		44
	10		29		76
2-2540	10		30	2-2567	19
	13		33		50
	14		38		51
	15		39L	2-2568	6
	16		40L		7
	17		41L		24
	27		42L		30
	28		43L		31
	29		44L		32
	30		45L		
	42		46L		
	43		47L		
	44	2-2551	1		
	45		3		
	64		17L		
	--	2-2560	9		
	--		10		
	67L		20		
	68L		34		
	69L	2-2561	10		
	70L		11		
	71L		12		
	72L		36		
	73L	2-2562	3		
	74L		4		
	75L		20		
2-2541	1		26		
	7		27		
	11	2-2563	2		
	15		3		
	26		4		
	30		5		
	36		6		
	37		21		
	46		27		
	48		28		

Richard B. Weber
(Signature)

TUSI PSI Coordinator
(Title)

9/9/82
(Date)

NOTES FOR CLASS 1 AND 2 COMPONENTS

(1) Examine 100% during preservice inspection in conjunction with Item B1.10.

(2) Examined by other than Westinghouse Inspection Services during system hydrostatic tests.

(3) Examined after refueling outages only.

(4) Relief requested-no method of volumetric examination feasible at this time. Visual examination done as substitute.

(5) Examined by other than Westinghouse Inspection Services.

(6) Examined by other than Westinghouse Inspection Services--shop examination to be used for baseline information.

(7) Component items do not meet code requirement size for examination in this category.

(8) Ultrasonic examination not feasible due to material thickness. Surface examination done as substitute.

(9) There are no items in this category for this component.

(10) Reactor Vessel Studs are normally removed for examination.

TEXAS UTILITIES SERVICES

Comanche Peak Nuclear Power Plant Unit #1

Preservice Examination Program for
Class III Systems and Components

All items listed below are to be examined as indicated, in accordance with the requirements of the 1980 Edition up to and including the 1980 Winter Addenda of the ASME Boiler and Pressure Vessel Code to the extent practical with the access provided and the limitations of component geometry.

Examination Category D-A

Systems in Support of Reactor Shutdown Function

PROGRAM ITEM	IWD-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE	SKETCH REFERENCE
		CVCS		
1	D1.10	Excess Letdown Heat Exchanger (Shell Side)	VT-2 Note (3)	2323-MI-0253
2	D1.10	Seal Water Heat Exchanger (Shell Side)	VT-2 Note (3)	2323-MI-0255
3	D1.10	Letdown Heat Exchanger (Shell Side)	VT-2 Note (3)	2323-MI-0254
4	D1.10	Boric Acid Tanks 1 and 2	VT-2 Note (3)	2323-MI-0257
5	D1.10	Boric Acid Transfer Pumps 1 and 2	VT-2 Note (3)	2323-MI-0257
6	D1.10	Boric Acid Filter No. 1	VT-2 Note (3)	2323-MI-0257
7	D1.10	Piping	VT-2 Note (2) and Note (3)	2323-MI-0255 & 0257
		Demin. & Reactor Make-up Water		
8	D1.10	Reactor Make-up Water Pumps 1 and 2	VT-2 Note (3)	2323-MI-0241
9	D1.10	Piping	VT-2 Notes (2) & (3)	2323-MI-0241

PROGRAM ITEM	IWD-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE	SKETCH REFERENCE
10	D1.20	Integral Attachments Component Supports and Restraints	VT-3 Note (1)	2323-MI-0241 and -0257
11	D1.30	Integral Attachments Mechanical and Hydraulic Snubbers	VT-3 Note (1)	2323-MI-0241 and -0257
12	D1.40	Integral Attachments Spring Type Supports	VT-3 Note (1)	2323-MI-0241 and -0257
13	D1.50	Integral Attachment Constant Load Type Supports	VT-3 Note (1)	2323-MI-0241 and -0257
14	D1.60	Integral Attachments Shock Absorbers	VT-3 Note (1)	2323-MI-0241 and -0257
		Examination Category D-B		
		Systems in Support of ECCS, Containment Heat Removal, Atmosphere Clean-up and Residual Heat Removal		
		RHR		
15	D2.10	RHR Heat Exchangers 1 & 2 (Shell Side)	VT-2 Note (3)	2323-MI-0260
		CCW		
16	D2.10	Component Cooling Water Surge Tank	VT-2 Note (3)	2323-MI-0229
17	D2.10	Component Cooling Water Pumps 1 and 2	VT-2 Note (3)	2323-MI-0229
18	D2.10	Component Cooling Water Heat Exchangers 1 and 2	VT-2 Note (3)	2323-MI-0229
19	D2.10	Containment Spray Pump Seal Coolers 1, 2, 3 and 4	VT-2 Note (3)	2323-MI-0229
20	D2.10	RHR Pump Seal Cooler 1 and 2	VT-2 Note (3)	2323-MI-0229
21	D2.10	Seal Water Coolers 1 and 2	VT-2 Note (3)	2323-MI-0230

PROGRAM ITEM	IWD-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE	SKETCH REFERENCE
22	D2.10	Lube Oil Cooler and Hydraulic Coupling Oil Cooler	VT-2 Note (3)	2323-MI-0230
23	D2.10	Catalytic Recombiner Heat Exchangers 1 and 2	VT-2 Note (3)	2323-MI-0230
24	D2.10	Upper Bearing Lube Oil Coolers 1, 2, 3 and 4	VT-2 Note (3)	2323-MI-0231
25	D2.10	Lower Bearing Lube Oil Coolers 1, 2, 3 & 4	VT-2 Note (3)	2323-MI-0231
26	D2.10	Motor Air Coolers 1 thru 3	VT-2 Note (3)	2323-MI-0231
27	D2.10	Thermal Barrier Coolers 1 thru 4	VT-2 Note (3)	2323-MI-0231
28	D2.10	Piping	VT-2 Note (2) and (3)	2323-MI-0229, -0230 and -0231
		Containment Spray		
29	D2.10	Containment Spray Heat Exchangers 1 and 2 (Shell Side)	VT-2 Note (3)	2323-MI-0232
		Service Water		
30	D2.10	Strainer Packages 1 and 2	VT-2 Note (3)	2323-MI-0233
31	D2.10	Service Water Pumps 1 and 2	VT-2 Note (3)	2323-MI-0233
32	D2.10	SIS Pump Lube Oil Coolers 1 and 2	VT-2 Note (3)	2323-MI-0234
33	D2.10	Charging Pump #1 Gear Oil Cooler	VT-2 Note (3)	2323-MI-0234
34	D2.10	Charging Pump #2 Gear Oil Cooler	VT-2 Note (3)	2323-MI-0234
35	D2.10	Charging Pump #1 Lube Oil Cooler	VT-2 Note (3)	2323-MI-0234
36	D2.10	Charging Pump #2 Lube Oil Cooler	VT-2 Note (3)	2323-MI-0234

PROGRAM ITEM	IWD-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE	SKETCH REFERENCE
37	D2.10	Piping	VT-2 Note (2) and (3)	2323-MI-0233 and -0234
		Auxiliary Feedwater System		
38	D2.10	Motor Driven Auxiliary Feedwater Pumps A and B	VT-2 Note (3)	2323-MI-0206
39	D2.10	Turbine Driven Auxiliary Feedwater Pump	VT-2 Note (3)	2323-MI-0206
40	D2.10	Piping	VT-2 Note (2) and (3)	2323-MI-0206
41	D2.20	Integral Attachments Components Supports and Restraints in RHR, SIS, CCW, CT, and SW systems	VT-3 Note (1)	N/A
42	D2.30	Integral Attachments Mechanical and Hydraulic Snubbers in RHR, SIS, CCW, CT and SW systems	VT-3 Note (1)	N/A
43	D2.40	Integral Attachments Spring Type Supports in RHR, SIS, CCW, CT and SW systems	VT-3 Note (1)	N/A
44	D2.50	Integral Attachments Constant Load Type Supports in RHR, SIS, CCW, CT and SW systems	VT-3 Note (1)	N/A
45	D2.60	Integral Attachments Shock Absorbers in RHR, SIS, CCW, CT and SW systems	VT-3 Note (1)	N/A
46	D2.20	Integral Attachments Component Supports and Restraints Pumps 1, 2, 3 and Piping	VT-3 as applicable	BRHL's
47	D2.30	Integral Attachments Hydraulic Snubbers Pumps 1, 2, 3 and Piping	VT-3 as applicable	BRHL's
48	D2.40	Integral Attachments Spring Type Supports Pumps 1, 2, 3 and Piping	VT-3 as applicable	BRHL's

PROGRAM ITEM	IWD-2500-1 REFERENCE	AREA TO BE EXAMINED	EXAMINATION PROCEDURE	SKETCH REFERENCE
49	D2.50	Integral Attachments Constant Load Type Support Pumps 1, 2, & 3 and Piping	VT-3 as applicable	BRHL's
50	D2.60	Integral Attachments Shock Absorbers Pumps 1, 2 & 3 and Piping	VT-3 as applicable	BRHL's
		Examination Category D-C		
		Systems in Support of RHR from Spent Fuel Storage Pool		
51	D3.10	Spent Fuel Pool H.X. 1 & 2	VT-2 Note (3)	2323-MI-0235
52	D3.10	Spent Fuel Pool Cooling Water Pumps 1 and 2	VT-2 Note (3)	2323-MI-0235
53	D3.10	Piping	VT-2 Note (2) and (3)	2323-MI-0235
54	D3.20	Integral Attachments Component Supports and Restraints	VT-3 Note (1) and (4)	2323-MI-0235
55	D3.30	Integral Attachments Mechanical and Hydraulic Snubbers	VT-3 Note (1) and (4)	2323-MI-0235
56	D3.40	Integral Attachments Spring Type Supports	VT-3 Note (1) and (4)	2323-MI-0235
57	D3.50	Integral Attachments Constant Load Type Support	VT-3 Note (1) and (4)	2323-MI-0235
58	D3.60	Integral Attachments Shock Absorbers	VT-3 Note (1)	2323-MI-0235

NOTES FOR CLASS 3 COMPONENTS

(1) VT-3 D1.20 through D1.60 Category D-A and VT-3 D3.20 through D3.60 Category D-C apply to Integral attachments of supports and restraints to components that are greater than 4 in. nominal pipe size. VT-3 D2.20 through D2.60 Category D-B apply to Integral attachments of supports and restraints to components that are greater than 4 in. nominal pipe size with the exception of the Auxiliary Feedwater System.

Integral attachments of supports and restraints to components that are 4 in. nominal pipe size and smaller are exempt from examination by IWD-1220.1.

(2) Hydro boundaries are as shown on the referenced flow diagrams.

(3) Relief request attached.

(4) VT-3 D3.20 through D3.60 Category D-C are exempt by IWD-1220.2 (a) and (b).

TEXAS UTILITIES SERVICES

Comanche Peak Nuclear Power Plant Unit #1

Preservice Examination Program for
Class I, II, & III Systems and Components

All items listed below are to be examined as indicated in accordance with the requirements of the 1980 Edition of the ASME Boiler and Pressure Vessel Code to the extent practical with the access provided and the limitations of component geometry. All examinations shall be performed following the initiation of hot fuctional tests.

Program Item	IWF-2500-1 Reference	Component Examination Area	Method	Procedure	Class	Sketch Reference	
1	N/A	Reactor Vessel	VT-3	Ref. Class I Program Item B8.10	1	1-1100	
2	F-A	Pressurizer	VT-3	ISI-8 and QI-QAP-11.1-28	1	1-2100 and B&R Records	Ref. IWA-6330
3	F-B	Steam Generators 1, 2, 3, & 4 (Tube Side)	VT-3	ISI-8 and QI-QAP-11.1-28	1	1-3100 and B&R Records	Ref. IWA-6330
4	F-B & F-C	RC Pumps 1, 2, 3 & 4	VT-3 VT-4	ISI-8 Note: 1 & 3 and QI-QAP-11.1-28	1	1-5100 and B&R Records	Ref. IWA-6330
5	FA, FB & FC	Piping & Valves	VT-3 VT-4	ISI-8 Note: 1 & 3 and QI-QAP-11.1-28	1	1-4800 and B&R Records	Ref. IWA-6330
6	F-B & F-C	Steam Generators 1, 2, 3 & 4	VT-3 VT-4	ISI-8 Note: 1 & 3 and QI-QAP-11.1-28	2	2-1100 and B&R Records	Ref. IWA-6330

Program Item	IWF-2500-1 Reference	Component Examination Area	Method	Procedure	Class	Sketch Reference	
7	F-A	Excess Letdown Heat Exchanger (Shell Side)	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-1110 and B&R Records	Ref. IWA-6330
8	F-A	Residual Heat Exgr. 1 and 2 (Tube Side)	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-1120 and B&R Records	Ref. IWA-6330
9	N/A	Seal Water Heat Exchgr. (Tube Side)	VT-3	N/A	2	2-1130	
10	F-A	Horizontal Letdown Heat Exchanger (Shell Side)	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-1140 and B&R Records	Ref. IWA-6330
11	F-A & F-B	Regenerative Heat Exchgr.	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-1150 and B&R Records	Ref. IWA-6330
12	F-A	Letdown Reheat Heat Exchanger	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-1160 and B&R Records	Ref. IWA-6330
13	F-A	Volume Control Tank	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-1200 and B&R Records	Ref. IWA-6330
14	F-B	Reactor Coolant Filter	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-1300 and B&R Records	Ref. IWA-6330
15	F-B	Seal Water Return Filter	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-1310 and B&R Records	Ref. IWA-6330
16	F-B	RHR Pumps 1 and 2	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-3100 and B&R Records	Ref. IWA-6330
17	F-B	Centrifugal Charging Pumps 1 & 2	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-3110 and B&R Records	Ref. IWA-6330
18	F-B	Positive Displacement Charging Pump 1	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-3120 and B&R Records	Ref. IWA-6330

Program Item	IWF-2500-1 Reference	Component Examination Area	Method	Procedure	Class	Sketch Reference	
19	F-B	Safety Injection Pumps 1 & 2	VT-3	ISI-8 & QI-QAP-11.1-28	2	2-3140 and B&R Records	Ref. IWA-6330
20	F-A, F-B & F-C	Piping & Valves	VT-3 VT-4	ISI-8 Note 1 & 3 & QI-QAP-11.1-28	2	2-2700 and B&R Records	Ref. IWA-6330
21	F-A	Excess Letdown Heat Exchgr. (Shell Side)	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
22	F-A	Seal Water Heat Exchgr. (Shell Side)	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
23	F-A & F-B	Boric Acid Tanks 1 & 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
24	F-B	Boric Acid Transfer Pumps 1 & 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
25	F-B	Boric Acid Filter No. 1	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
26	F-B	Reactor Make-up Water Pumps 1 & 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
27	F-A, F-B	RHR Heat Exchangers 1 and 2 (Shell Side)	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
28	F-A, F-B	Component Cooling Water Surge Tank	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
29	F-B	Component Cooling Water Pumps 1 and 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
30	F-A, F-B	Component Cooling Water Heat Exchangers 1 and 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330

Program Item	IWF-2500-1 Reference	Component Examination Area	Method	Procedure	Class	Sketch Reference	
31	F-A, F-B	Containment Spray Pump Seal Coolers 1, 2, 3 & 4	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
32	F-A, F-B	RHR Pump Seal Coolers 1 and 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
33	F-A, F-B	Seal Water Coolers 1 & 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
34	F-A, F-B	Lube Oil Cooler and Hydraulic Coupling Oil Cooler	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
35	F-A, F-B	Catalytic Recombiner Heat Exchgrs. 1 and 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
36	F-A, F-B	Upper Bearing Lube Oil Coolers 1, 2, 3 & 4	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
37	F-A, F-B	Lower Bearing Lube Oil Coolers 1, 2, 3 & 4	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
38	F-A, F-B	Motor Air Coolers 1 through 8	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
39	F-A, F-B	Thermal Barrier Coolers 1 through 4	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
40	F-A, F-B	Containment Spray Heat Exchangers 1 and 2 (Shell Side)	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
41	F-A, F-B	Strainer Packages	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330

Program Item	IWF-2500-1 Reference	Component Examination Area	Method	Procedure	Class	Sketch Reference	
42	F-B	Service Water Pumps 1 and 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
43	F-A, F-B	SIS Pump Lube Oil Coolers 1 & 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
44	F-A, F-B	Charging Pump #1 Gear Oil Cooler	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
45	F-A, F-B	Charging Pump #2 Gear Oil Cooler	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
46	F-A, F-B	Charging Pump #1 Lube Oil Cooler	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
47	F-A, F-B	Charging Pump # 2 Lube Oil Cooler	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
48	F-B	Motor Driven Auxiliary Feedwater Pumps A&B	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
49	F-B	Turbine Driven Auxiliary Feedwater Pump	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
50	F-A, F-B	Spent Fuel Pool Heat Exchanger 1 and 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
51	F-B	Spent Fuel Pool Cooling Water Pumps 1 and 2	VT-3	QI-QAP-11.1-28	3	B&R Records	Ref. IWA-6330
52	F-A, F-B and F-C	Piping and Valves	VT-3 VT-4	QI-QAP-11.1-28 Note 1 & 3	3	B&R Records	Ref. IWA-6330

NOTES

1) The Manufacturers records will be used to satisfy the pre-service tests required by IWF-5200.

2) Only IWA-2213 (a) will be performed by Westinghouse.

IWA-2213 (b) and (c) will be performed as required by B&R Q.C. and records maintained in accordance with IWA-6330.

3) B&R Q.C. Construction Records will be used to satisfy the IWA-2214 (a) and (b) VT-4 requirement and records maintained in accordance with IWA-6330.

4) Snubber Preservice Inspection (Ref. TUGCO Procedure ME-10 for Pre-requisite Testing)

A pre-service examination should be made on all snubbers listed in tables 3.7-4a and 3.7-4b of Standard Technical Specifications 3/4.7.9. This examination should be made after snubber installation, but not more than six months prior to initial system pre-operational testing, and should as a minimum verify the following:

(1) There are no visible signs of damage or impaired operability as a result of storage, handling, or installation.

(2) The snubber location, orientation, position setting, and configuration (attachments, extensions, etc.) are according to design drawings and specifications.

(3) Snubbers are not seized, frozen or jammed.

(4) Adequate swing clearance is provided to allow snubber movement.

(5) If applicable, fluid is to the recommended level and is not leaking from the snubber system.

(6) Structural connections such as pins, fasteners and other connecting hardware such as lock nuts, tabs, wire, cotter pins are installed correctly.

If the period between the initial pre-service examination and initial system pre-operational test exceeds six months due to unexpected situations, re-examination of items 1, 4, and 5 shall be performed. Snubbers which are installed incorrectly or otherwise fail to meet the above requirements must be repaired or replaced and re-examined in accordance with the above criteria.

Pre-Operational Testing (Ref. TUGCO Procedure PT-55-11 for Pre-Operational Testing.

(a) During initial system heatup and cooldown, at specified temperature intervals for any system which attains operating temperature, verify the snubber expected thermal movement.

(b) For those systems which do not attain operating temperature, verify via observation and/or calculation that the snubber will accomodate the projected thermal movement.

(c) Verify the snubber swing clearance at specified heatup and cooldown intervals. Any discrepancies or inconsistencies shall be evaluated for cause and corrected prior to proceeding to the next specified interval.

The above described operability program for snubbers should be included and documented by the pre-service inspection and pre-operational test programs.

The pre-service inspection must be a prerequisite for the pre-operational testing of snubber thermal motion. This test program should be specified in Chapter 14 of the FSAR.

RELIEF REQUEST B-1

Component: Pump Casings & Valve Bodies >4" Code Class: 1
Category B-L-2 & B-M-2

Examination Requirements:

VT-3 Pump Casings & Valve Bodies exceeding 4 inch nominal pipe size.

Basis for Relief:

The casings and bodies were visually inspected as part of the manufacturing process, but the inspections were not documented in accordance with Section XI requirements. Liquid Penetrant examination was also performed on the components. Disassembly of Pumps and Valves at this time would not be practical.

Alternative Examination:

Manufacturer records will be used in the as recorded condition.

RELIEF REQUEST B-2

Component: Safety Injection System Piping Code Class: 1

Examination Requirements:

Table IWB-2500-1 requires volumetric and surface examination of circumferential butt welds $\geq$ 4 in. diameter for 1/3t and 1/4 in. beyond the edges of the weld crown (volumetric).

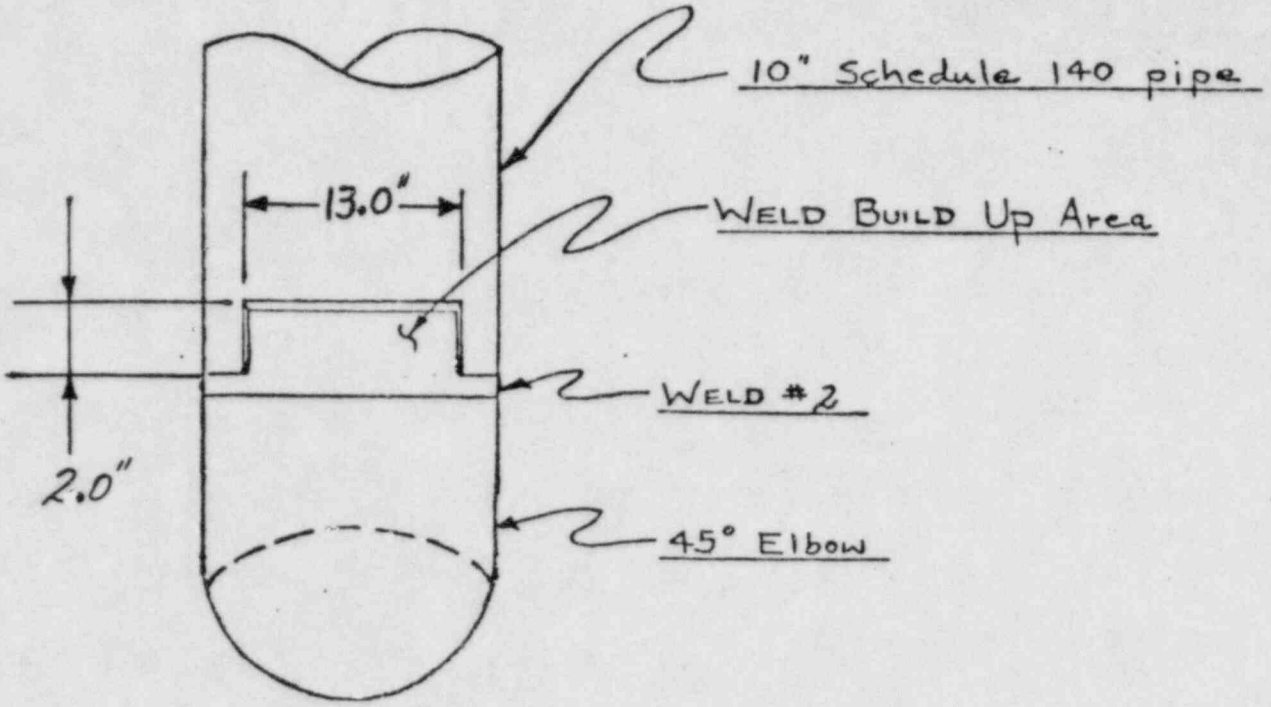
Basis for Relief:

Loop #2 of the Safety Injection System Accumulator Discharge Piping (See attached drawing) has a weld build up area which obstructs a portion of the volumetric inspection requirement. The weld buildup is a repair to correct a minimum wall deficiency.

Alternative Examination:

Surface examination will be performed as required by Table IWB-2500-1 and Volumetric examination will be performed to the maximum extent practicable.

Loop #2 S.I.S. Accumulator Discharge — Ref. WISO TBX-1-4201



COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNIT 1
SAFETY INJECTION PIPING WELD BUILDUP INTERFERENCE
FIGURE B-2

RELIEF REQUEST B-3

Component: Pressurizer Seismic Support Lugs Code Class: 1

Examination Requirements:

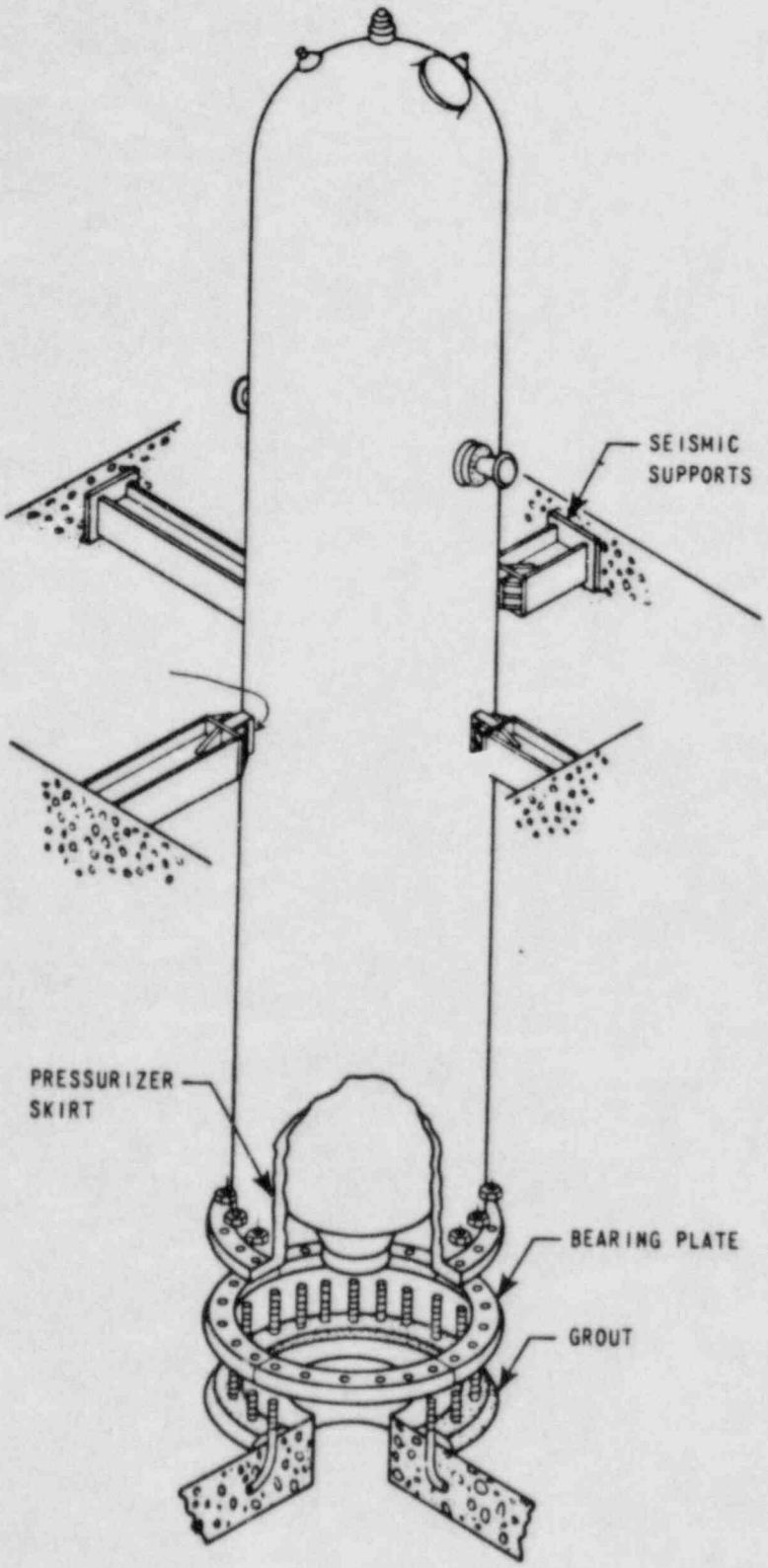
Table IWB-2500-1 Integrally welded attachments for Vessels Category B-H Volumetric or Surface as applicable.

Basis for Relief:

The lugs of the seismic supports that are welded to the pressurizer shell do not carry any load nor are they in contact with the building structure. (See Figure B-3)

Alternative Examination:

VT-3 examinations will be performed as required by Article IWF on the remaining portion of the seismic support.



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNIT 1

TYPICAL PRESSURIZER SUPPORTS

FIGURE B-3

RELIEF REQUEST B-4

Component: Steam Generator Code Class: 1

Examination Requirements:

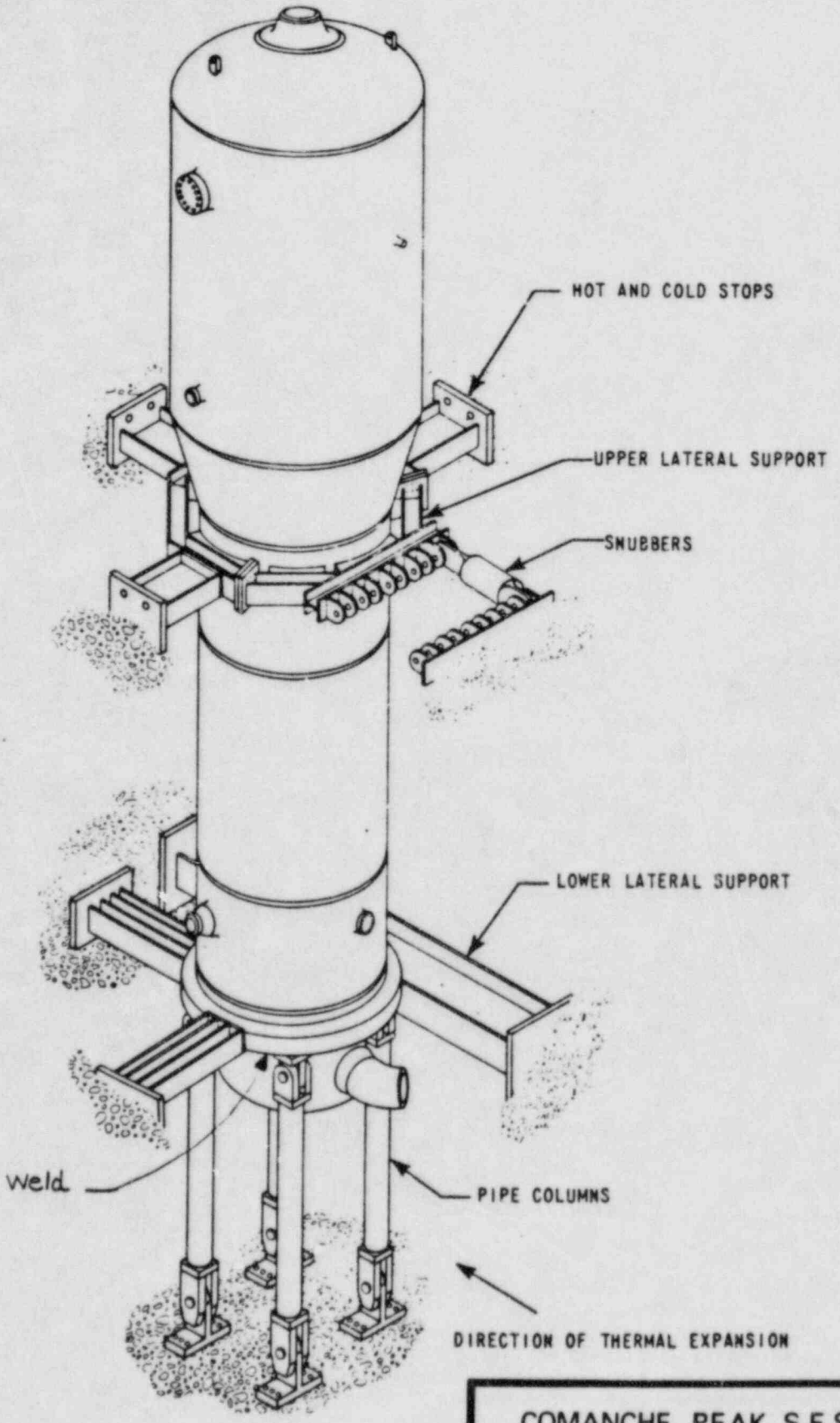
100% Volumetric on the full length of the channel head to tube-sheet.

Basis for Relief:

Support feet extending down from the tube-sheet forging to the pipe support columns are not removable and obstruct portions of the weld at four locations around the vessel. (See Figure B-4)

Alternative Examination:

The location of the support feet obstructions will be documented as limitations on the Ultrasonic Examination report form and the extent of examinations recorded.



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNIT 1

TYPICAL STEAM GENERATOR SUPPORTS

FIGURE B-4

RELIEF REQUEST B-5

Component: Reactor Vessel CODE CLASS: 1

Examination Requirement:

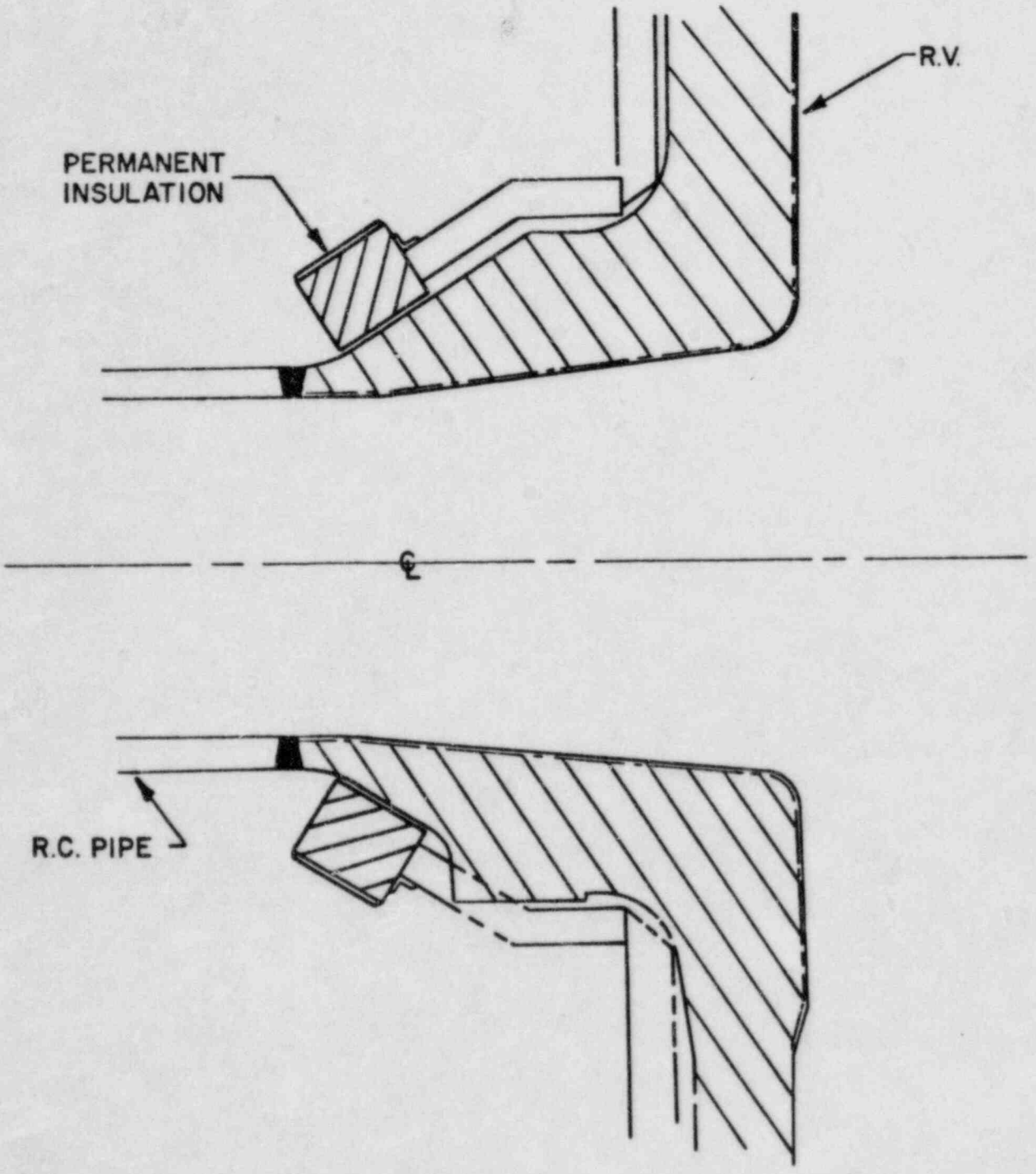
Tables IWB-2500-1 Category B-J requires volumetric and surface examination of the nozzle to safe end weld and adjacent base metal, 1/3T thickness and 1/4" on either side of the weld for volumetric and 1/2 inch either side of the weld for surface examination.

Basis for Relief:

The design of the permanent insulation around the nozzle prevents surface examinations being performed on the base metal on the nozzle side of the weld to the extent required by IWB-2500-1 Category B-J and Figure IWB-2500-8. The nozzle configuration is shown in Figure B-5.

Alternative Examination:

The weld and required amount of base metal on each side of the weld will be ultrasonically examined from inside the nozzle utilizing remotely operated tooling. Additionally, the weld, base metal on the pipe side, and base metal on the nozzle side to the extent practical will be examined by ultrasonic and surface techniques from the outside surface.



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNIT 1

NOZZLE TO SAFE END
WELD ACCESS

FIGURE B-5

RELIEF REQUEST B-6

Component: Reactor Vessel CODE CLASS: 1

Examination Requirement:

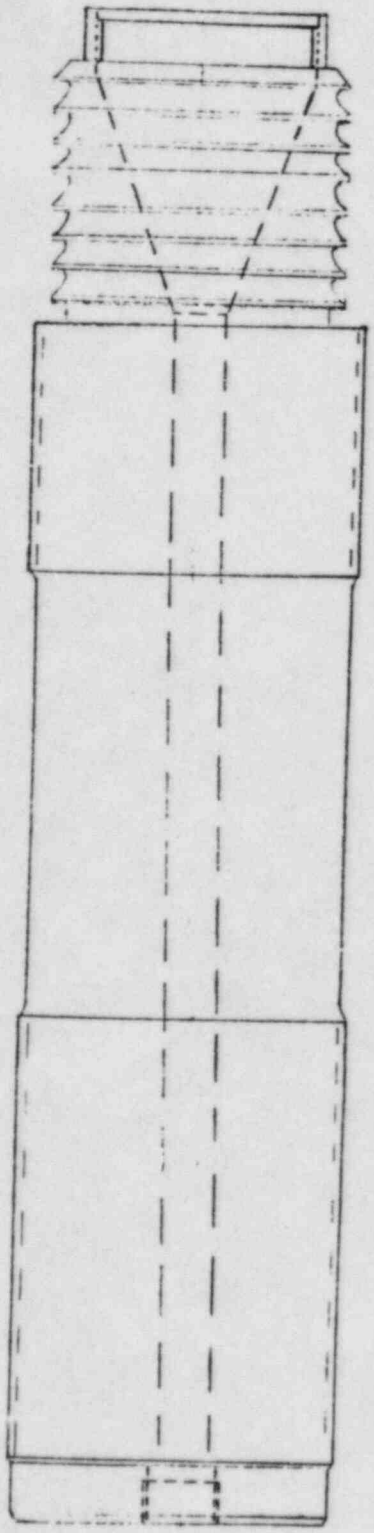
Item B6.30 of Table IWB-2500-1 Category B-G-1 requires a volumetric and surface examination of the reactor vessel head studs when removed.

Basis for Relief:

Due to the inherent geometry of threaded fasteners and signal interference from threads, volumetric examinations do not provide meaning results. (See Figure B-6) Ultrasonic tests will not provide the needed information on axial running defects in nuts. These are the only defects that would reduce the components ability to perform its intended function.

Alternative Examination:

The required surface examination will be performed. Volumetric examination will be performed to the maximum extent practical.



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNIT 1

REACTOR VESSEL STUD

FIGURE B-6

RELIEF REQUEST B-7

Component: Pressurizer

CODE CLASS: 1

Examination Requirement:

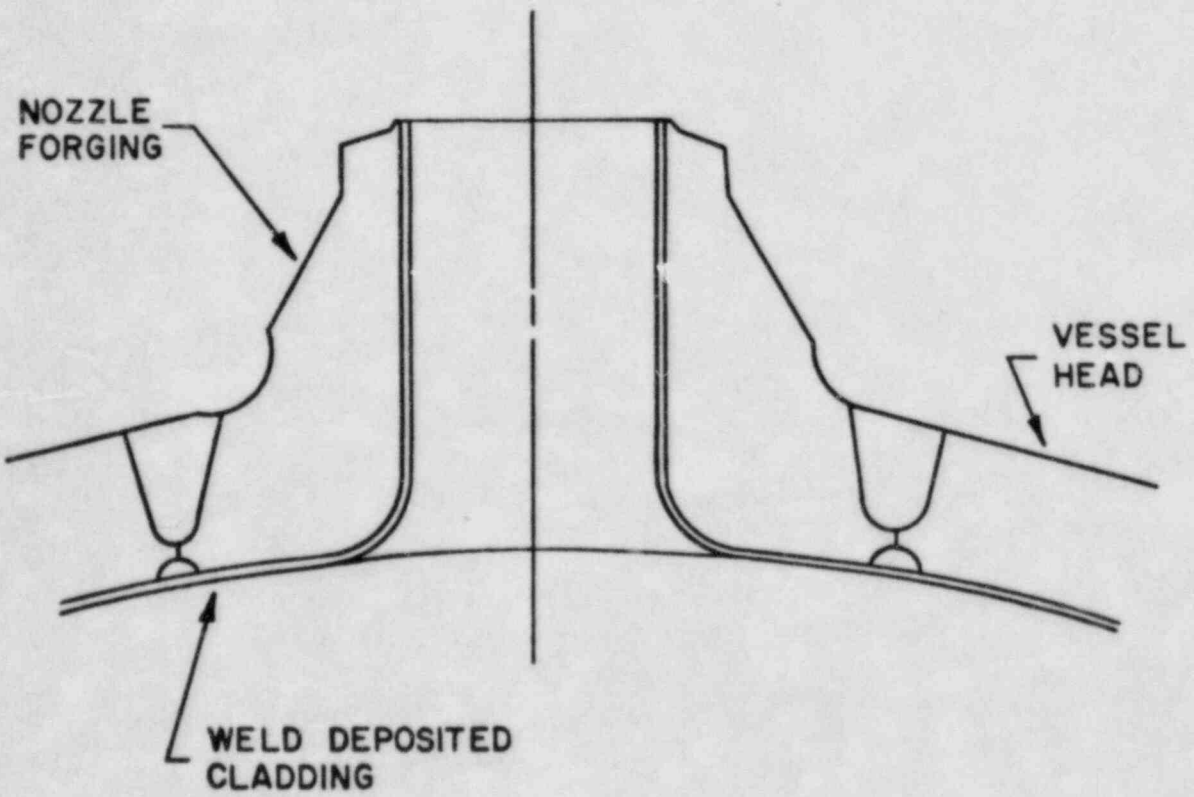
Table IWB-2500-1 Category B-D requires volumetric examination of the nozzle to vessel welds and adjacent base metal and the nozzle inside corner region (Ref. Figure-13).

Basis for Relief:

The geometric configuration of the nozzle prevents ultrasonic examinations from being performed from the nozzle side of the weld to the extent required by Figure IWB-2500-7. Examinations will be performed from both the weld and shell surfaces. The nozzle configuration is shown in Figure B-7.

Alternative Examination:

One hundred percent of the weld, the heat affected zone and the required amount of base metal on the shell side of the weld will be examined. Base metal on the nozzle side of the weld will be examined to the extent practical.



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
UNIT 1

TYPICAL NOZZLE TO
VESSEL WELD CONFIGURATION

FIGURE B-7

RELIEF REQUEST B-8

Component: Pressurizer B5.20
Steam Generators B5.30

CODE CLASS: 1

Examination Requirement:

Table IWB-2500-1 Category B-F requires a volumetric and surface examination of the nozzle to safe end welds, including 1/3 wall thickness for volumetric examination.

Basis for Relief:

The geometric configuration of the nozzle prevents ultrasonic examinations from being performed on the base metal on the nozzle side of the weld to the extent required by Figure IWB-2500-8.

Alternative Examination:

One hundred percent of the weld volume up to 1/3T and the required amount of base metal on the pipe side of the weld will be examined. The base metal on the nozzle side of the weld will be examined to the extent practical. Surface examinations will be performed on essentially 100 percent of the required area.

RELIEF REQUEST B-9

Component: Reactor Vessel Code Class: 1

Examination Requirements:

100% of the pressure retaining welds in class I components volumetrically examined to the requirements of the code in effect at the time of examination.

Basis for Relief:

The Reactor Vessel bottom head to shell weld was examined to the requirements of the 1974 ASME Code Sec. XI up to and including the summer 1975 Addenda prior to installation. The weld is now inaccessible for manual ultrasonic testing from the O.D. surface.

Alternative Examination:

The Reactor Vessel will be examined volumetrically from the I.D. surface using remotely operated equipment. The existing data will be utilized to supplement the limited volumetric examination coverage at the internals radial support lugs with the remote "tool".

RELIEF REQUEST B-10

Component: Piping Systems CODE CLASS: 1

Examination Requirement:

Table IWB-2500-1 Category B-J requires volumetric examination of branch pipe connection welds exceeding 2 inches diameter.

Basis for Relief:

The configuration of the pipe branch connections prevents meaningful volumetric examination of the welds and heat affected zones. Practical alternative techniques to volumetrically examining the entire areas of these welds which would produce meaningful results are not presently available.

Alternative Examination:

A volumetric examination will be performed on butt welded branch connections only. A surface examination will be performed as required.

RELIEF REQUEST B-11

Component: Reactor Vessel, Inner and Outer Seal Monitoring Tube Penetration Welds

CODE CLASS: 1

Examination Requirement:

The reactor vessel, is a Quality Group 1 Component which is part of the pressure-retaining boundary for the Reactor Coolant System. The closure head is sealed to the vessel by two O-ring seals. The vessel flange has two penetrations for closure head seal leakage monitoring. The inner monitoring tube detects leakage across the outer O-ring seal. Each of these tubes are connected by a partial penetration weld on the vessel flange gasket seal surface which is weld overlaid with 5/32 in. thick stainless steel. These welds are outside the pressure boundary for normal operation and will only be pressurized if the closure head seals leak. The monitoring tubes are 1-inch nominal pipe size.

Basis for Relief:

Table IWB-2500-1 Category B-E and B-P (vessel penetrations) requires visual examination of these welds during hydrostatic testing. Paragraph IWB-1220 exempts these components based on the size of the tubing, but again imposes a requirement for visual examination during hydrostatic pressure testing. Ultrasonic, surface, or visual examination of the welds cannot be performed due to the geometric configuration and inaccessibility due to weld overlap. Hydrostatic pressure testing of the welds is not feasible due to their location outside of the pressure retaining O-ring seal of the vessel flange. These welds will only be pressurized in the event of loss of integrity of the seals. Failure of both the O-ring seal and the tube welds is considered unlikely. Loss of coolant due to complete severance of a monitoring tube can be made up by normal charging methods.

Alternative Examination:

None

RELIEF REQUEST B-12

Component: Pressurizer

Code Class: 1

Examination Requirements:

100% of the pressure retaining welds in class I components volumetrically examined to the requirements of the code in effect at the time of examination.

Basis for Relief:

The pressurizer shell welds were examined to the requirements of the 1974 ASME Code Sec. XI up to and including the summer 1975 Addenda. No reportable indications were noted at that time. Insulation support rings and insulation are now installed. Re-examination to the requirements of the 1980 Edition requires complete removal of all insulation and insulation support rings.

Note: Pressurizer shell welds no not require examination inservice.

Alternative Examination:

Existing data will be utilized as the base-line pre-service examination in lieu of re-inspection to 1980 edition of Section XI.

RELIEF REQUEST B-13

CODE CLASS 1 and 2

Subject:

Recording Straight Beam and Angle Beam Data from Planar Reflectors

Examination Requirement:

Section XI 1980 Edition Subparagraph IWA 2232(b) referencing Section XI Appendix III; and Subparagraph IWA-2232(c), referencing Section V Article 5, requires that all reflectors that produce a response greater than 50% of the reference level shall be recorded. Subparagraph IWA-2232(a), referencing Section V Article 4; requires that all reflectors that produce a response equal to or greater than 50% of the reference level shall be recorded.

Basis for Relief:

It is recognized throughout the NDE industry and by the following applicable code; Section V Article 4, Para. T-451.1, that all ultrasonic reflectors are not valid flaw indications. Reflectors determined to be weld root geometry, weld to base metal interface, or any type of geometry, can not be classified as a valid flaw and should not be compared with the allowable indication standards. Geometric indications will not be considered recordable.

Alternative Examination:

None

RELIEF REQUEST C-1

Component: Letdown Heat Exchanger
Excess Letdown Heat Exchanger
Regenerative Heat Exchanger
Vertical Residual Heat Exchangers

CODE CLASS: 2

Examination Requirement:

Tables IWC-2500-1 require volumetric examination of pressure vessel head and shell circumferential welds including one half inch of base metal on either side of the weld.

Basis for Relief:

The geometric configuration of the flange on head to flange welds, prevents volumetric examination from being performed on the base metal on the flange side of the weld to the full extent required by Figure IWC-2500-1.

The design of the support members on the above heat exchangers prevents volumetric examination of the base metal adjacent to the support member to the extent required.

Alternative Examination:

100 percent of the weld volume and as much of the base metal on either side of the weld as is practical will be volumetrically examined.

RELIEF REQUEST C-2

Component: Reactor Coolant Filter
Seal Water Return Filter
Seal Water Heat Exchanger
Letdown Reheat Heat Exchanger

CODE CLASS: 2

Examination Requirement:

Table IWC-2500-1 requires volumetric examination of pressure vessel shell and head circumferential welds including one half inch of base metal on either side of the weld.

Basis for Relief:

The thickness of the material utilized for the construction of these components (0.187 inches) is such that meaningful results can not be expected with ultrasonic examination.

Alternative Examination:

These welds will be examined using surface and visual techniques.

RELIEF REQUEST C-3

Component: Main Steam Pipe Support Code Class: 2

Examination Requirements:

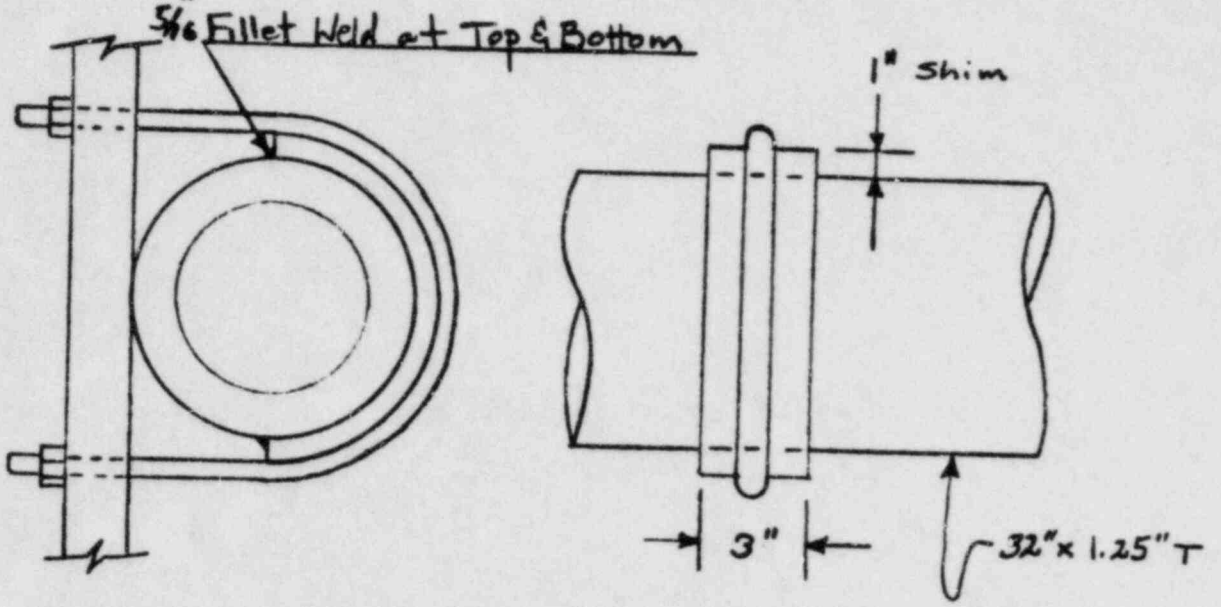
Table IWC-2500-1 requires surface examination of integrally welded attachments 3/4 inch thickness and greater.

Basis for Relief:

The integrally welded attachments shown in the attached figure C-3 are used as shims for the U-bolt rather than as a supporting element for the pipe. These shims are fillet welded in two places (top and bottom) to maintain the position of the shim.

Alternative Examination:

VT-3 will be performed as required by Subsection IWF.



COMANCHE PEAK S.E.S.

UNIT 1

WELDED SUPPORT SHIMS

FIGURE C-3

RELIEF REQUEST D-1

Component: (1) Systems in support of Reactor Shutdown Function Code Class III Examination Category D-A Item D1.10

Code Class: 3

(2) Systems in support of Emergency Core Cooling, Containment Heat Removal, Atmoshpere Cleanup, and Reactor Residual Heat Removal. Examination Category D-B Item D2.10.

(3) System in support of Residual Heat Removal from Spent Fuel Storage Pool Examination Category D-C Item D3.10.

Examination Requirement:

Table IWD-2500-1 requires a system hydrostatic test accompanied with a VT-2 and/or System pressure test accompanied with VT-2.

Basis For Relief:

Section XI 1981 Winter Addenda deletes this requirement from Preservice Inspection (IWD-2100 revised). This requirement is redundant to the section III hydrostatic test requirement.

Alternative Examination:

None

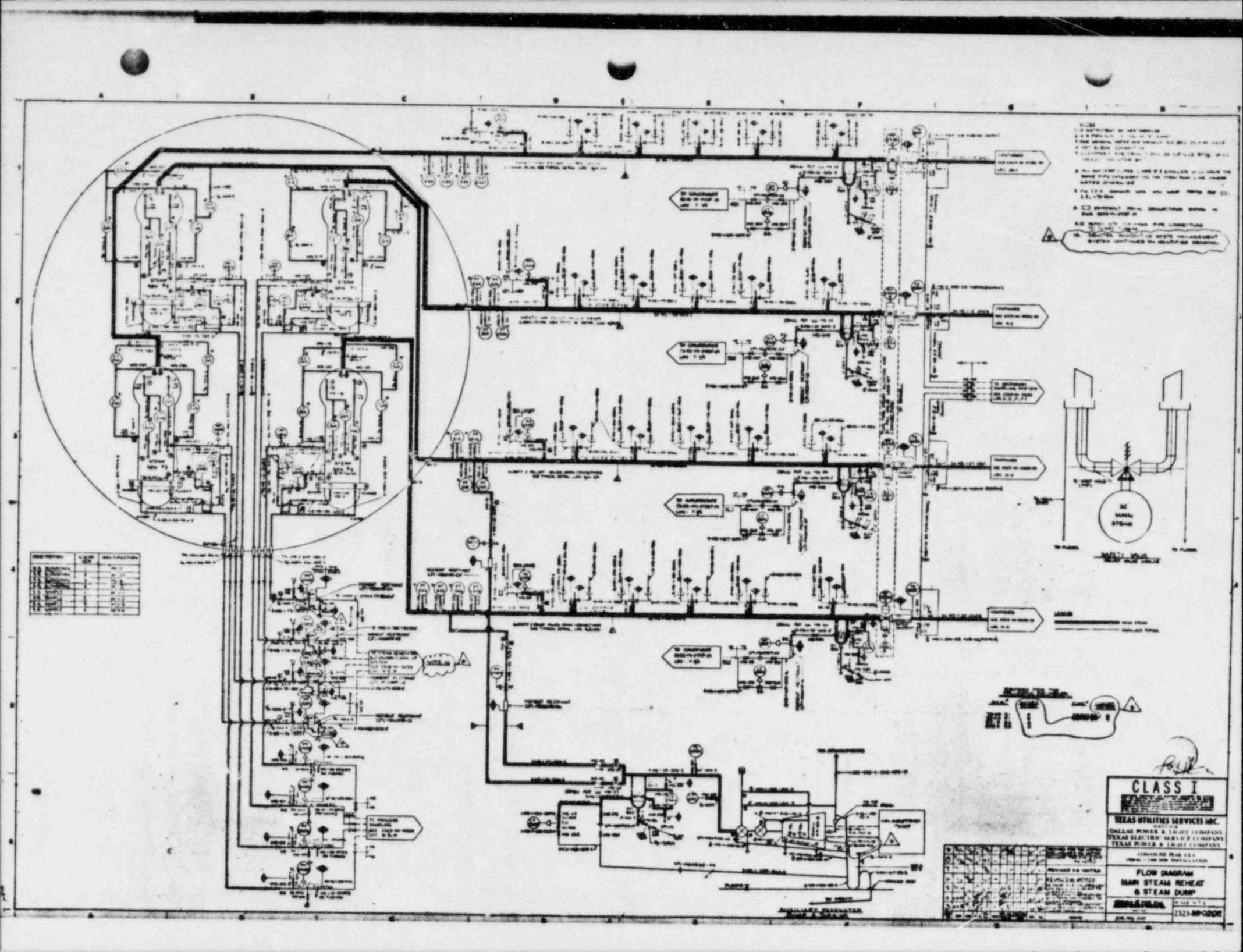
COLOR CODED FLOW DIAGRAMS

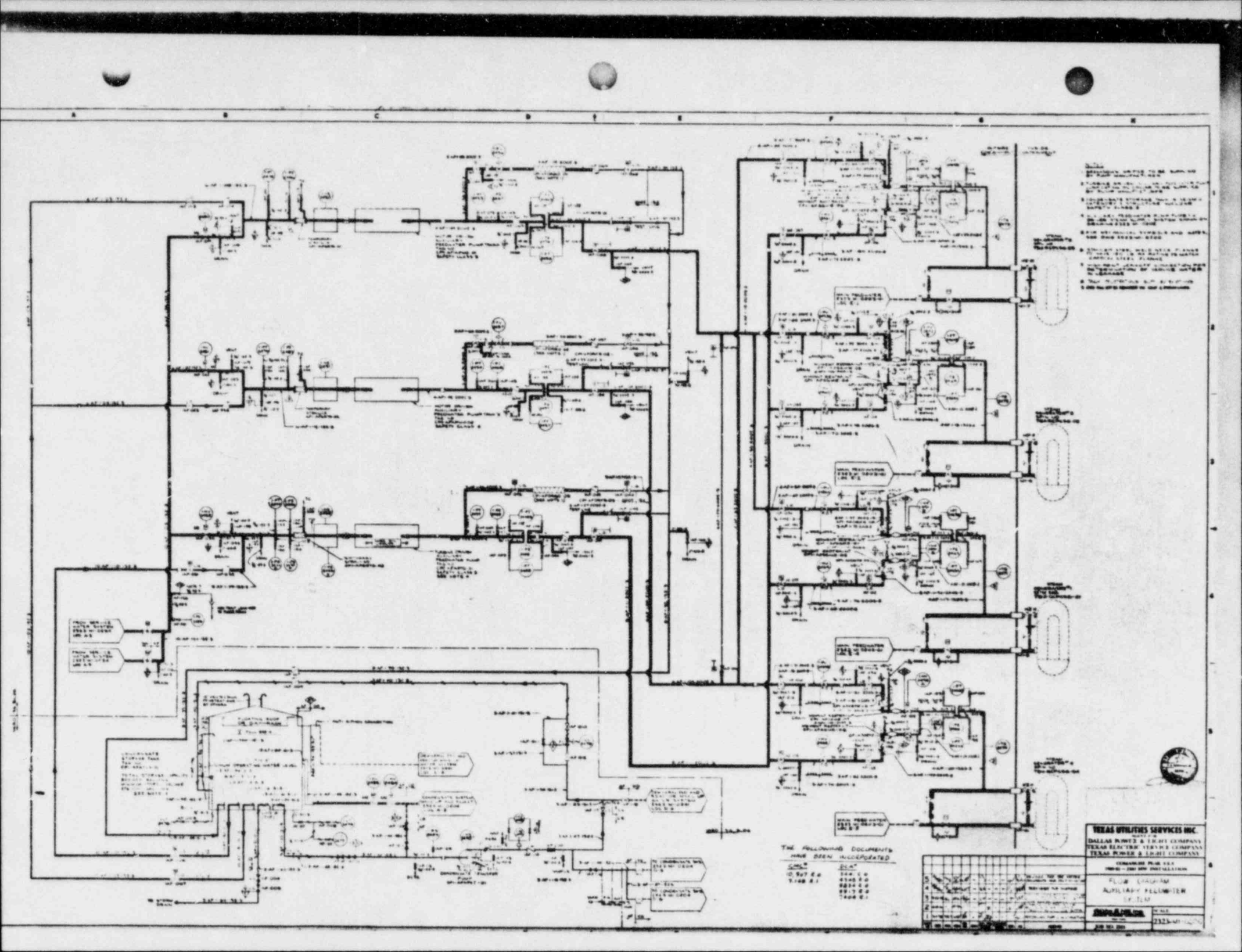
The attached flow diagrams are color coded to define the Class I, II & III system boundaries subject to Section XI Examinations. The following is a brief description of the color legend.

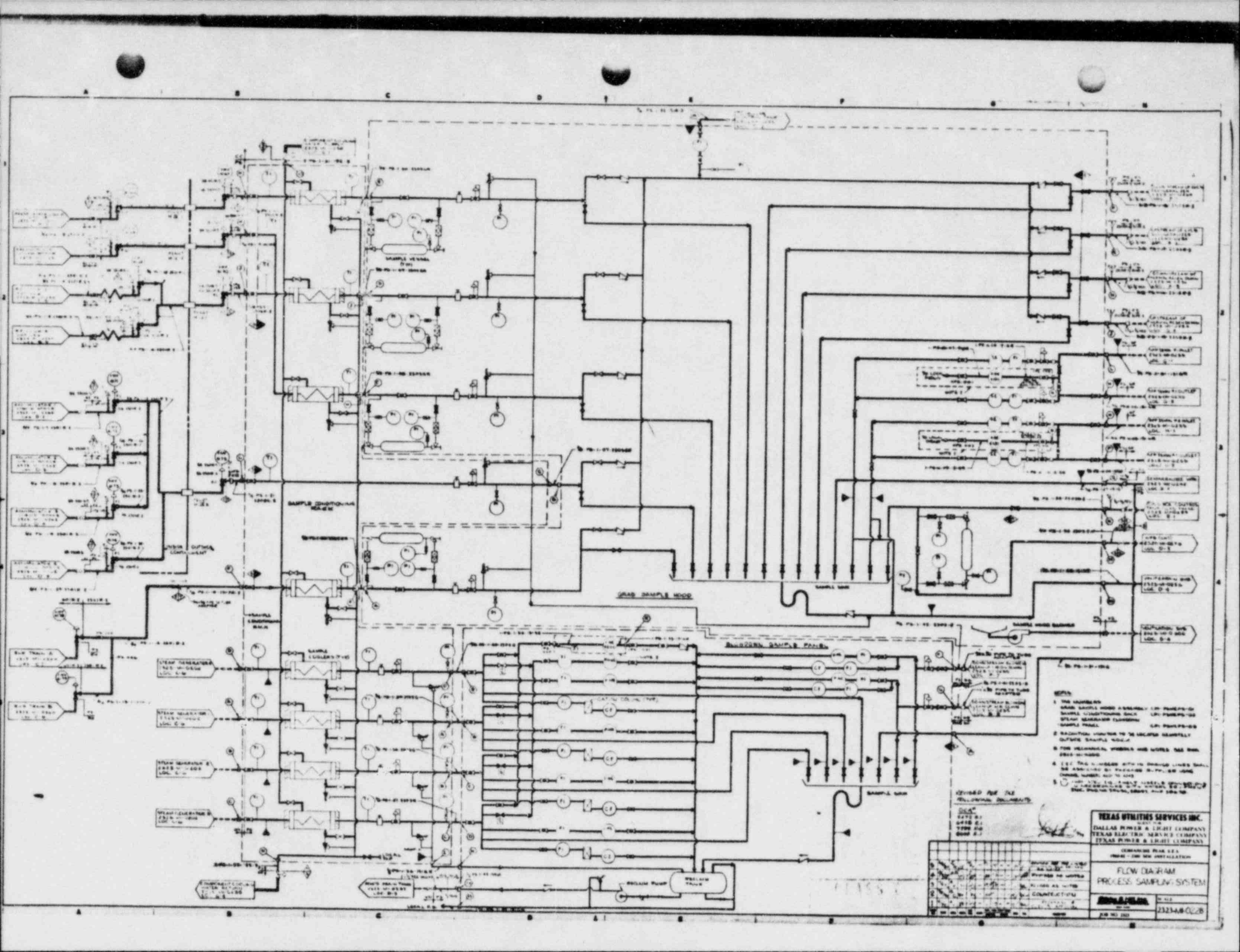
Red	Class I Butt Welds $\geq$ 4" diameter subject to Volumetric and Surface Examinations.
Red & Blue	Class I Butt Welds < 4" diameter subject to surface examinations.
Blue	Class I Socket Welds subject to Surface Examination.
Yellow	Class I & II Systems subject to visual examination only during hydrostatic test.
Green	Class II Butt Welds < 1/2" T subject to surface examination.
Green & Red	Class II Butt Welds $\geq$ 1/2" T subject to surface and volumetric examination.
Green & Yellow	Class II High Pressure Safety Injection Augmented Program subject to surface and/or volumetric examination as required.
Purple	Class III systems subject to visual examinations.

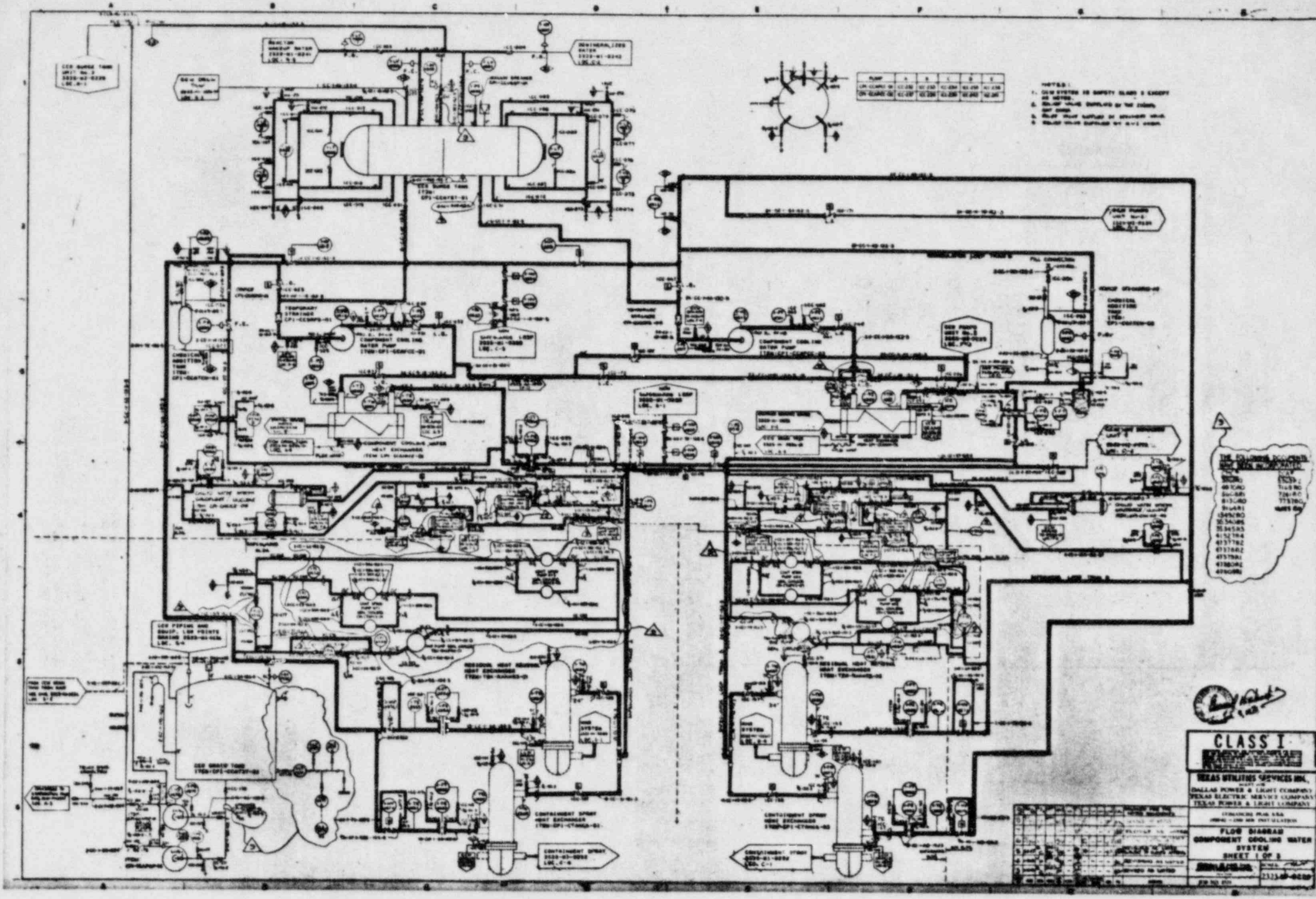
COLOR CODED FLOW DIAGRAM LIST

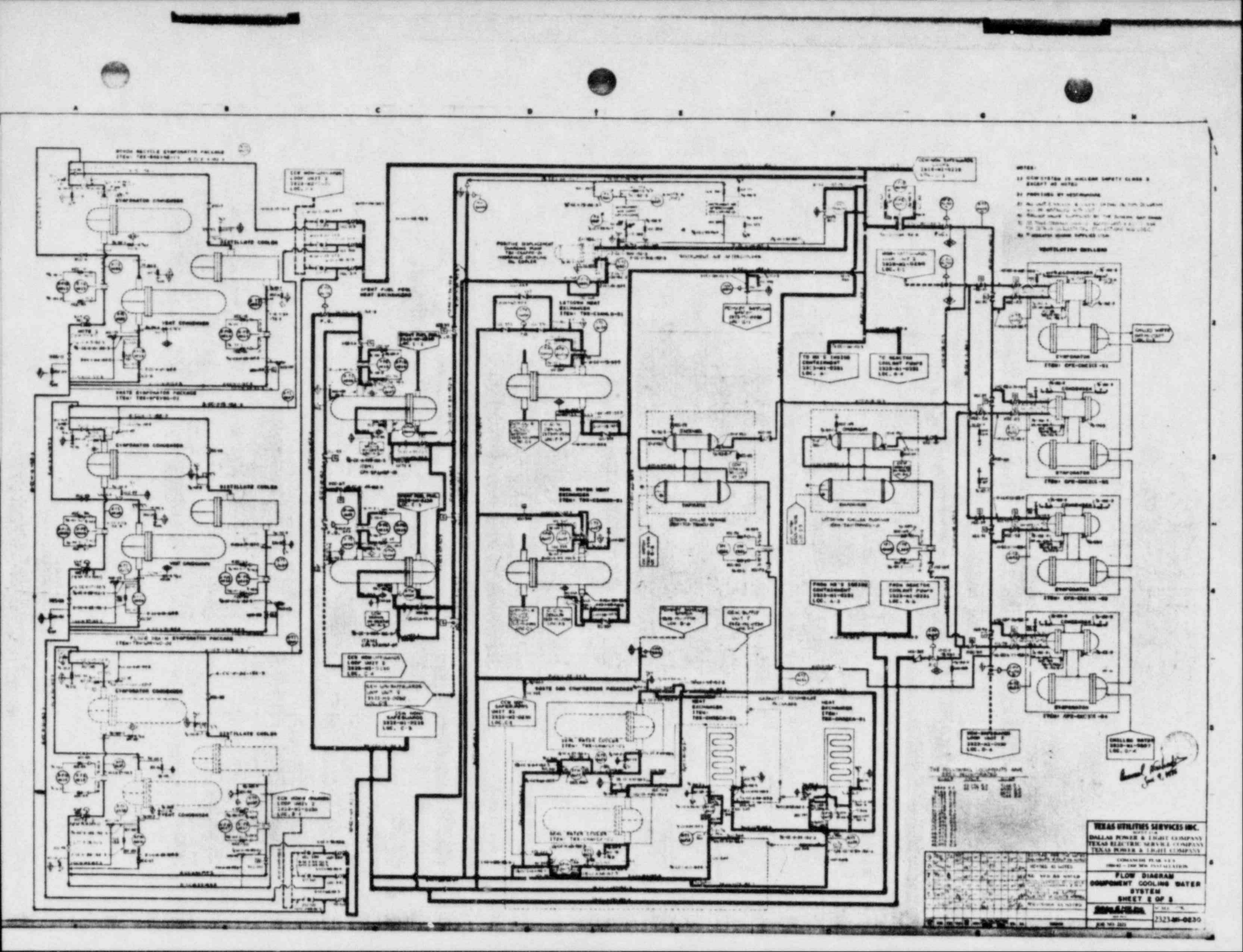
2323-M1-0202	Main Steam Reheat and Steam Dump
2323-M1-0206	Auxiliary Feedwater System
2323-M1-0228	Process Sampling System
2323-M1-0229	Component Cooling Water System (Sheet 1)
2323-M1-0230	Component Cooling Water System (Sheet 2)
2323-M1-0231	Component Cooling Water System (Sheet 3)
2323-M1-0232	Containment Spray System
2323-M1-0233	Station Service Water (Sheet 1)
2323-M1-0234	Station Service Water (Sheet 2)
2323-M1-0235	Spent Fuel Pool Cooling and Cleanup System
2323-M1-0240	Demineralized and Reactor Makeup Water System
2323-M1-0250	Reactor Coolant System (Sheet 1)
2323-M1-0251	Reactor Coolant System (Sheet 2)
2323-M1-0253	Chemical and Volume Control System (Sheet 1)
2323-M1-0254	Chemical and Volume Control System (Sheet 2)
2323-M1-0255	Chemical and Volume Control System (Sheet 3)
2323-M1-0256	Chemical and Volume Control System (Sheet 4)
2323-M1-0257	Chemical and Volume Control System (Common)
2323-M1-0260	Residual Heat Removal System
2323-M1-0261	Safety Injection System (Sheet 1)
2323-M1-0262	Safety Injection System (Sheet 2)
2323-M1-0263	Safety Injection System (Sheet 3)


CLASS I
TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY
COMANCHE PEAK S.E.S.
UNITS 1 AND 2 NSSS INSTALLATION
FLOW DIAGRAM
MAIN STEAM REHEAT
& STEAM DUMP
2323-MP-0208


TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY
FLOW DIAGRAM
AUXILIARY FEEDWATER
SYSTEM
THE FOLLOWING DOCUMENTS
HAVE BEEN INCORPORATED


GRAB SAMPLE HOOD
BUILDING SAMPLE PANEL
TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY
FLOW DIAGRAM
PROCESS SAMPLING SYSTEM


CLASS I
TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY
FLOW DIAGRAM
COMPONENT COOLING WATER
SYSTEM
SHEET 1 OF 2



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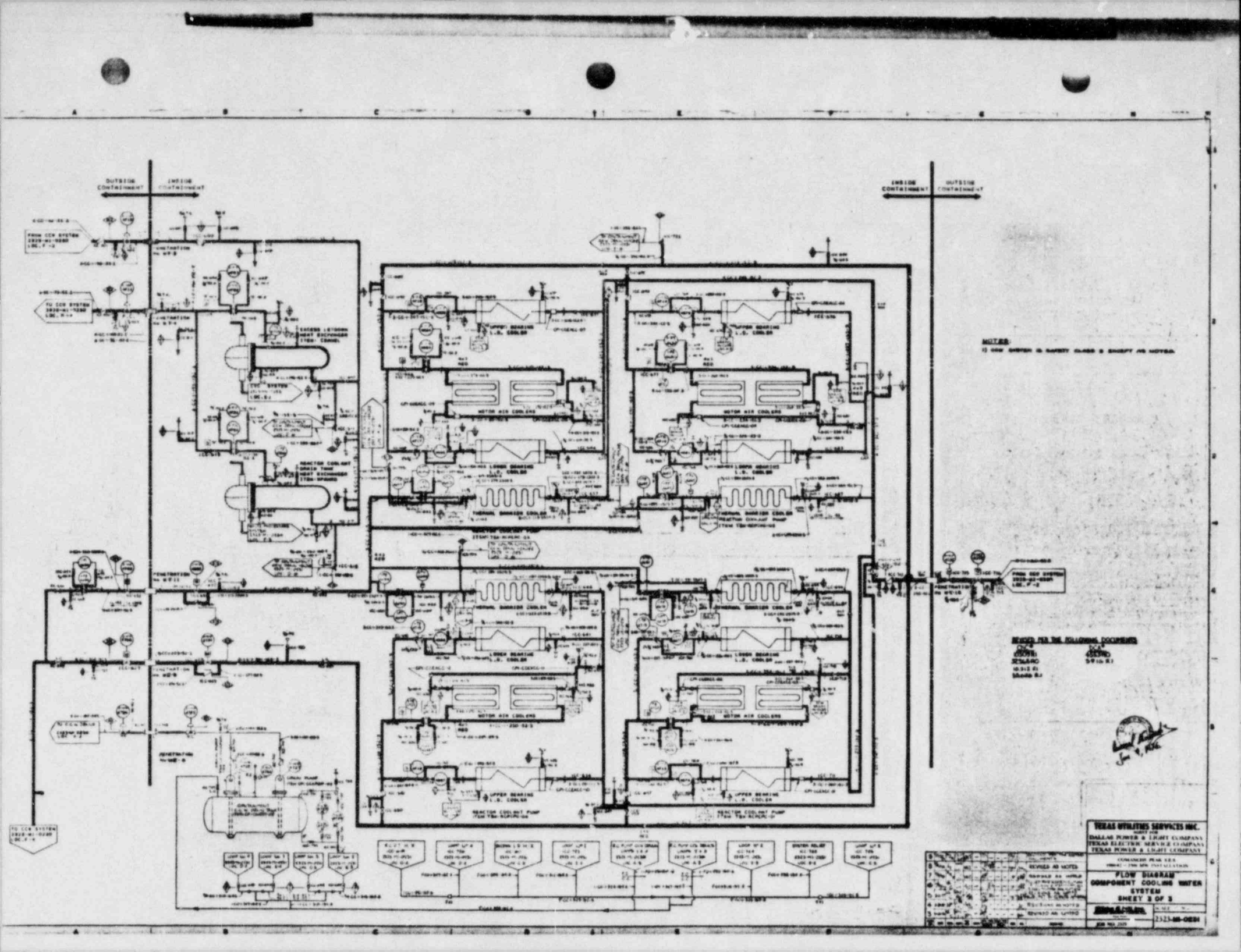
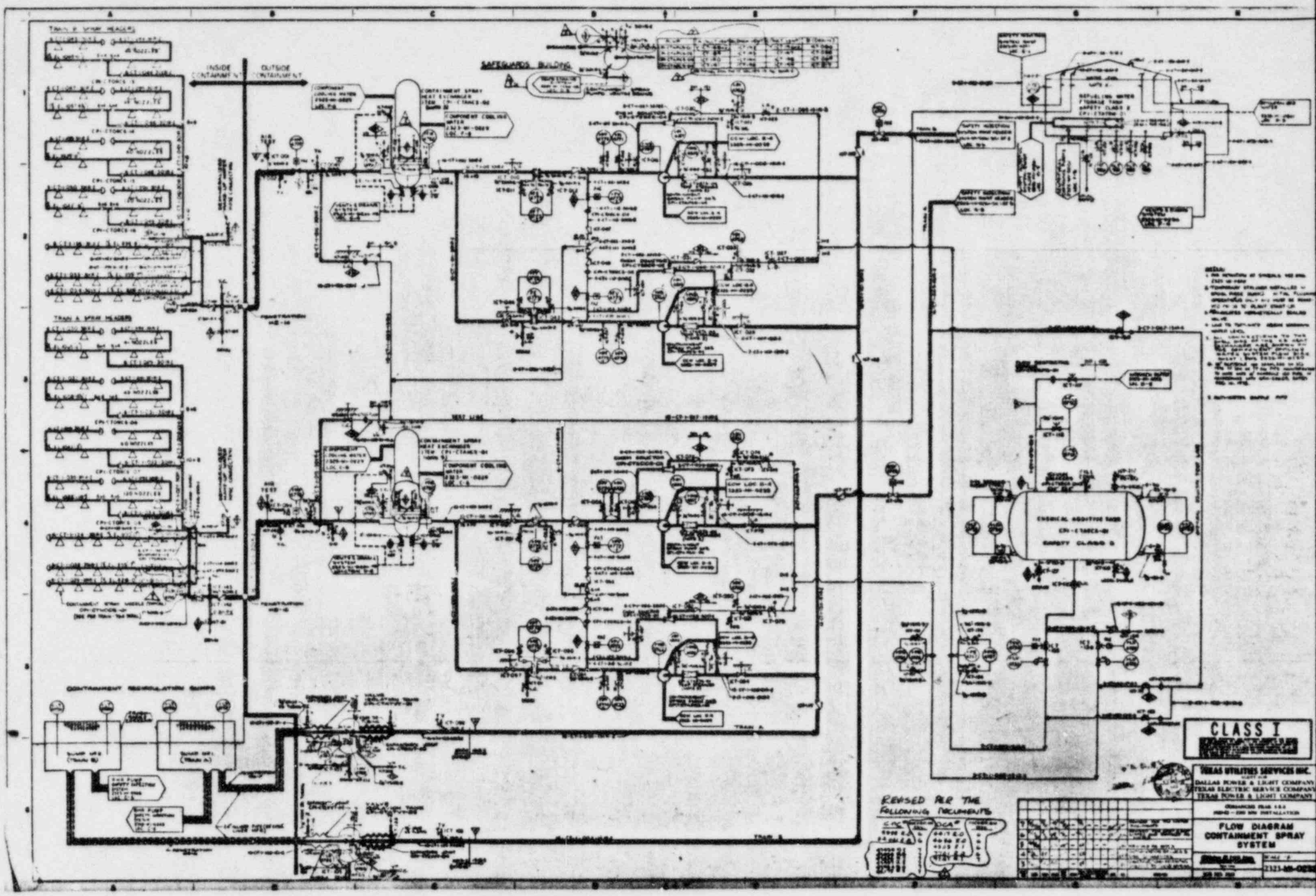
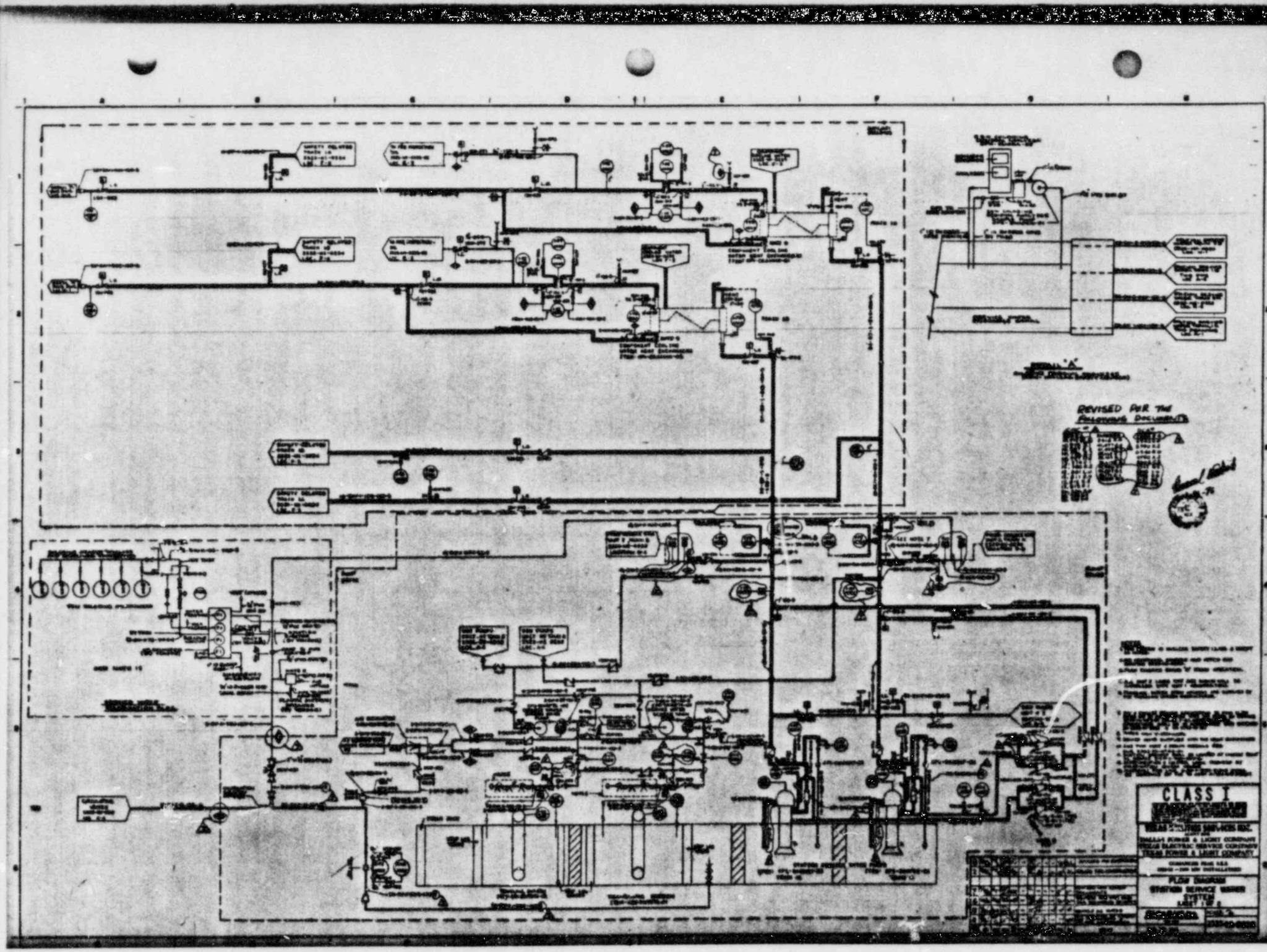
COMANCHE PEAK S.E.S.
UNITS 1 AND 2 INSTALLATION

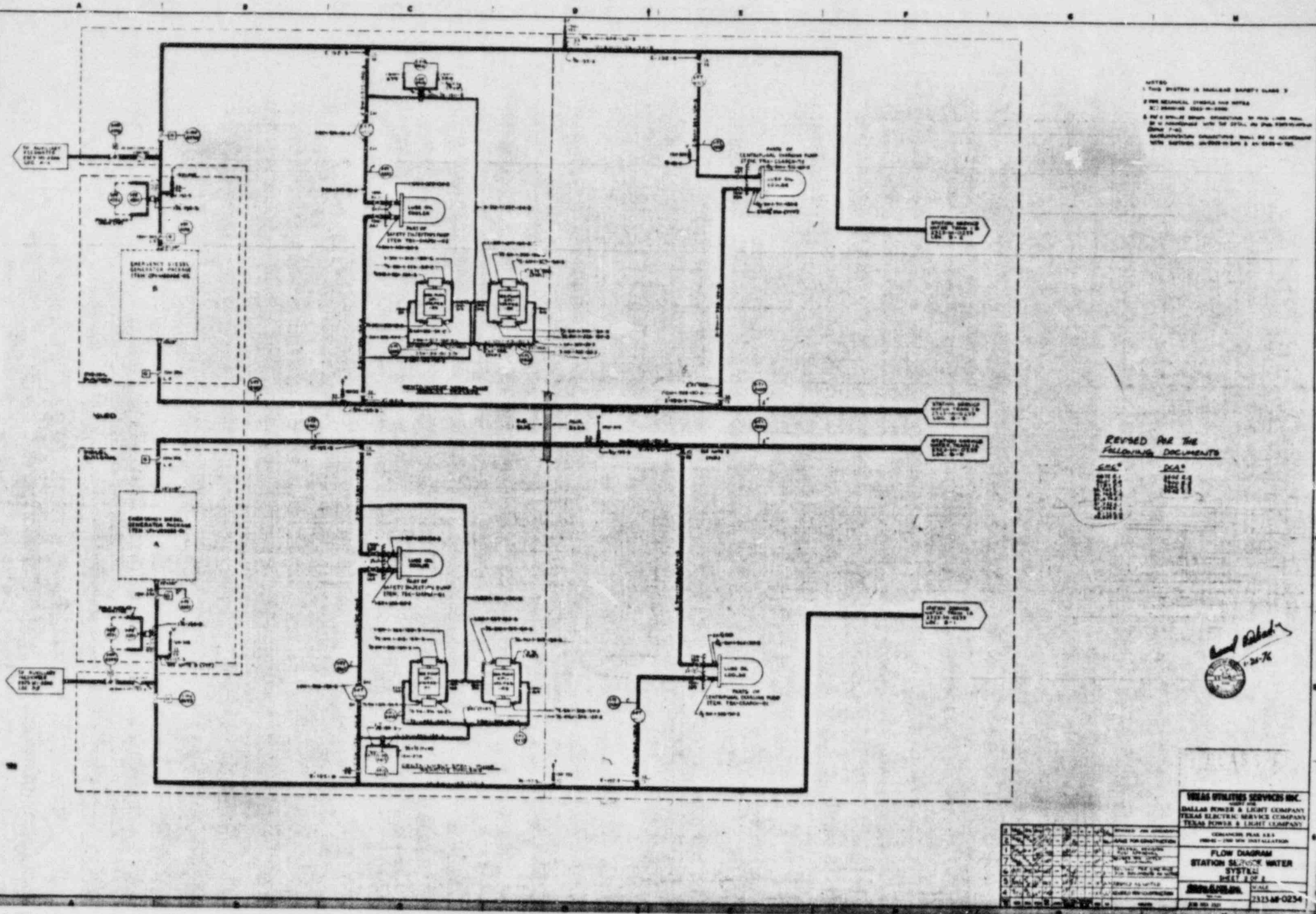
FLOW DIAGRAM
COMPONENT COOLING WATER
SYSTEM
SHEET 2 OF 2

2323-M1-0230


OUTSIDE CONTAINMENT
INSIDE CONTAINMENT
INSIDE CONTAINMENT
OUTSIDE CONTAINMENT
NOTES:
REVISED PER THE FOLLOWING DOCUMENTS
TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY
FLOW DIAGRAM
COMPONENT COOLING WATER
SYSTEM
SHEET 3 OF 3
2323-M5-0031


INSIDE CONTAINMENT
OUTSIDE CONTAINMENT
SAFEGUARDS BUILDING
TRAIN A SPRAY HEADERS
CHEMICAL ADDITIVE TANK
CLASS I
REVISED PER THE FOLLOWING DOCUMENTS
TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY
FLOW DIAGRAM CONTAINMENT SPRAY SYSTEM


REVISED PER THE FOLLOWING DOCUMENTS
CLASS I
FLOW DIAGRAM
STATION SERVICE WATER
SYSTEM



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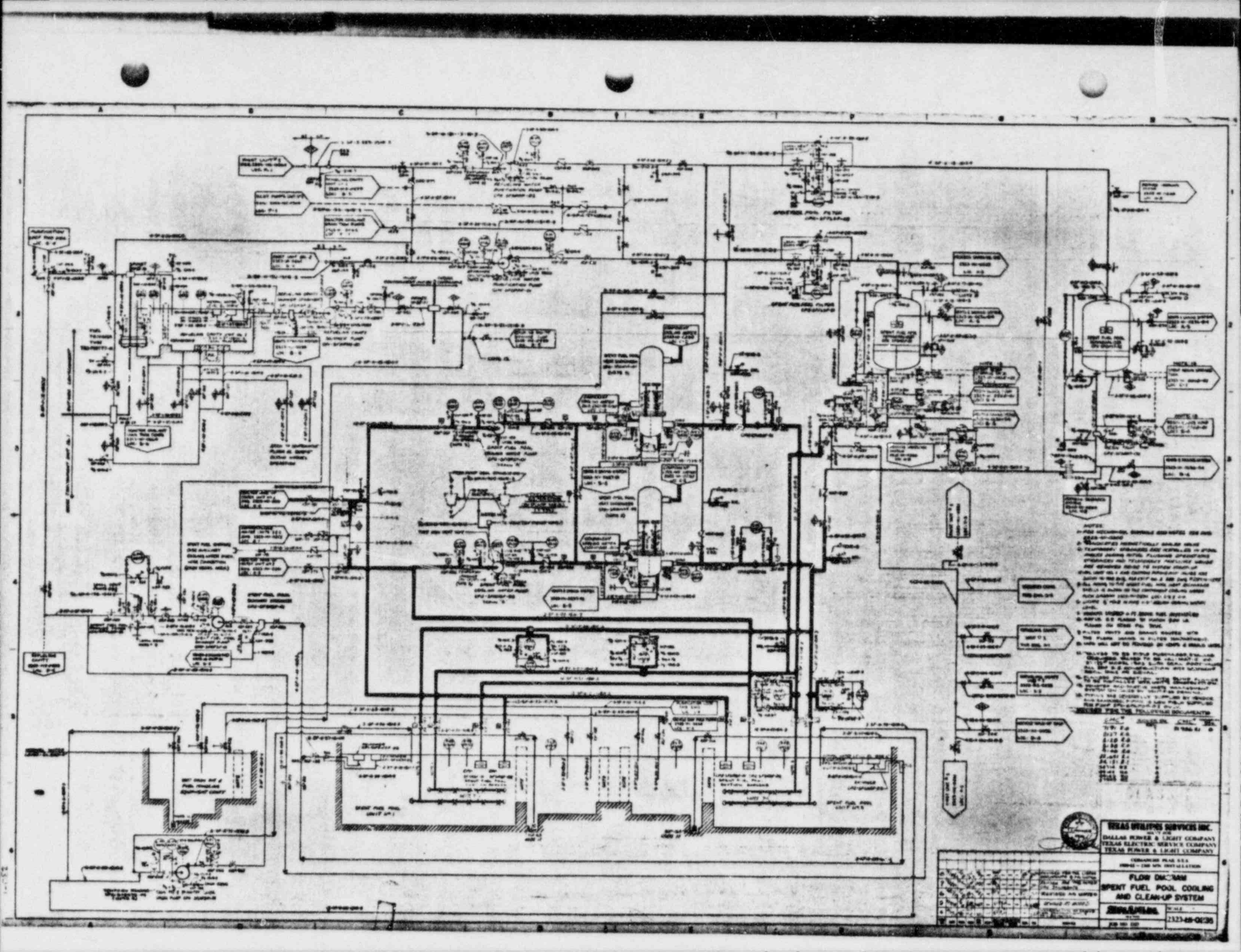
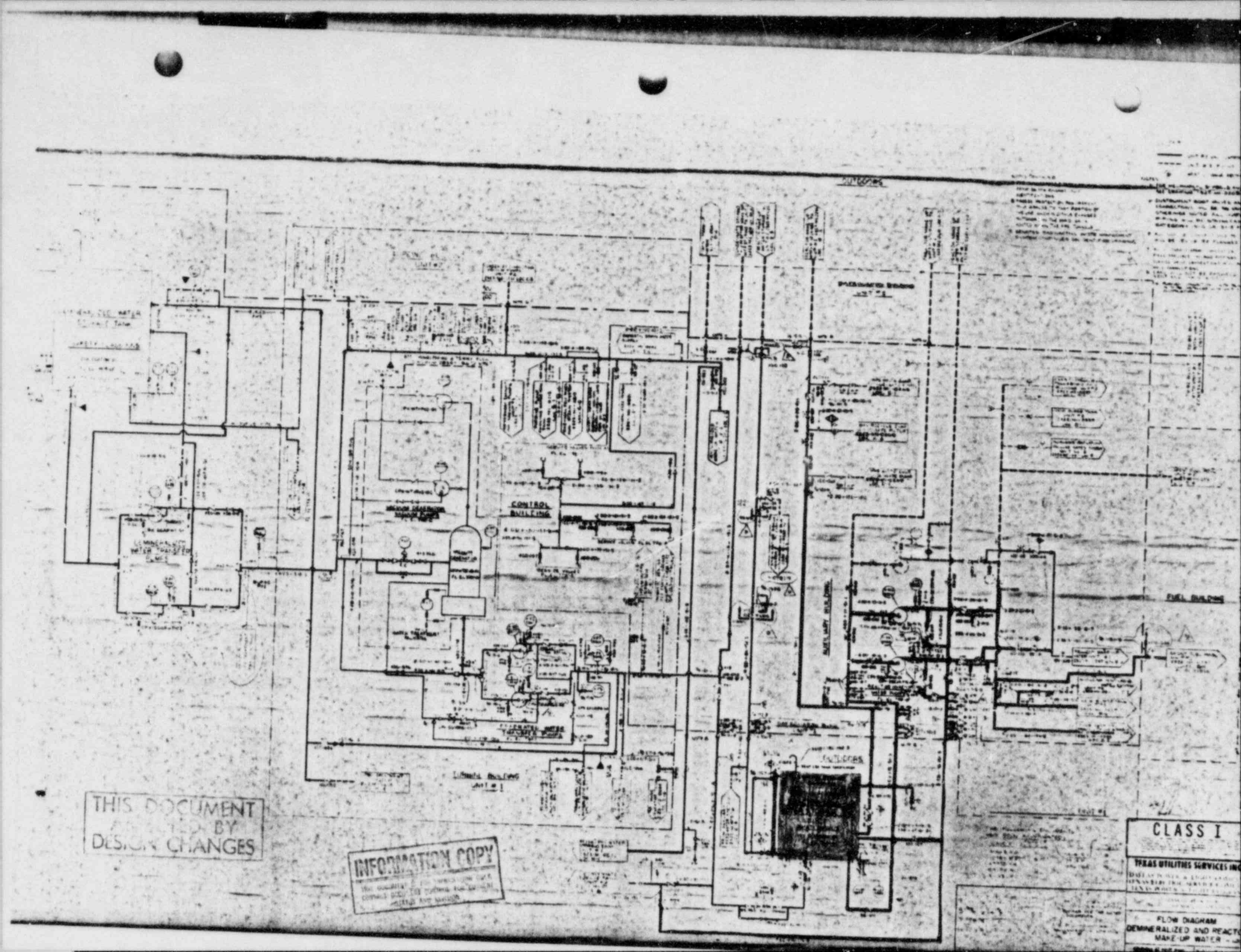
COMANCHE PEAK S.E.S.

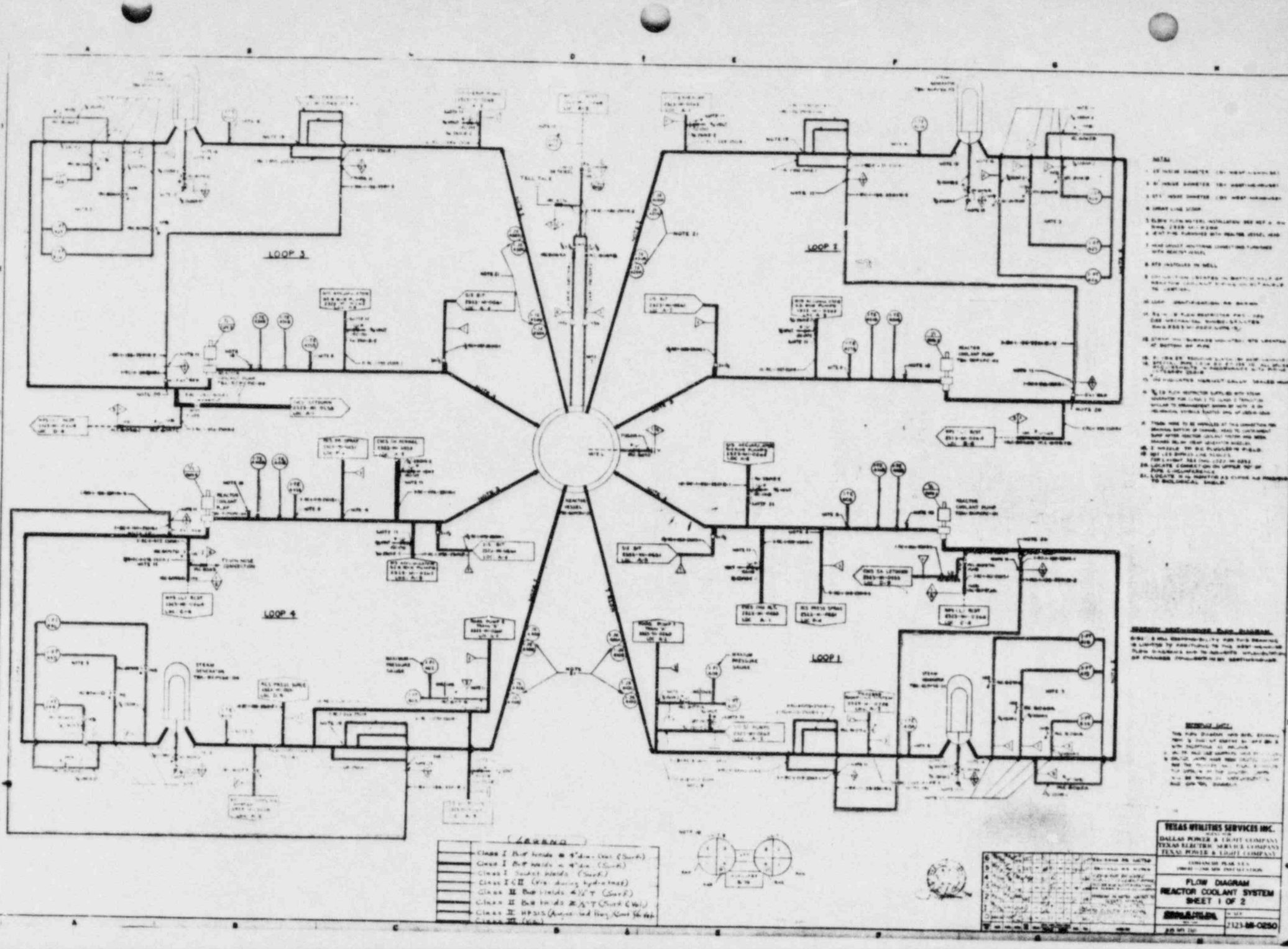
FLOW DIAGRAM
STATION SERVICE WATER SYSTEM
SHEET 2 OF 2

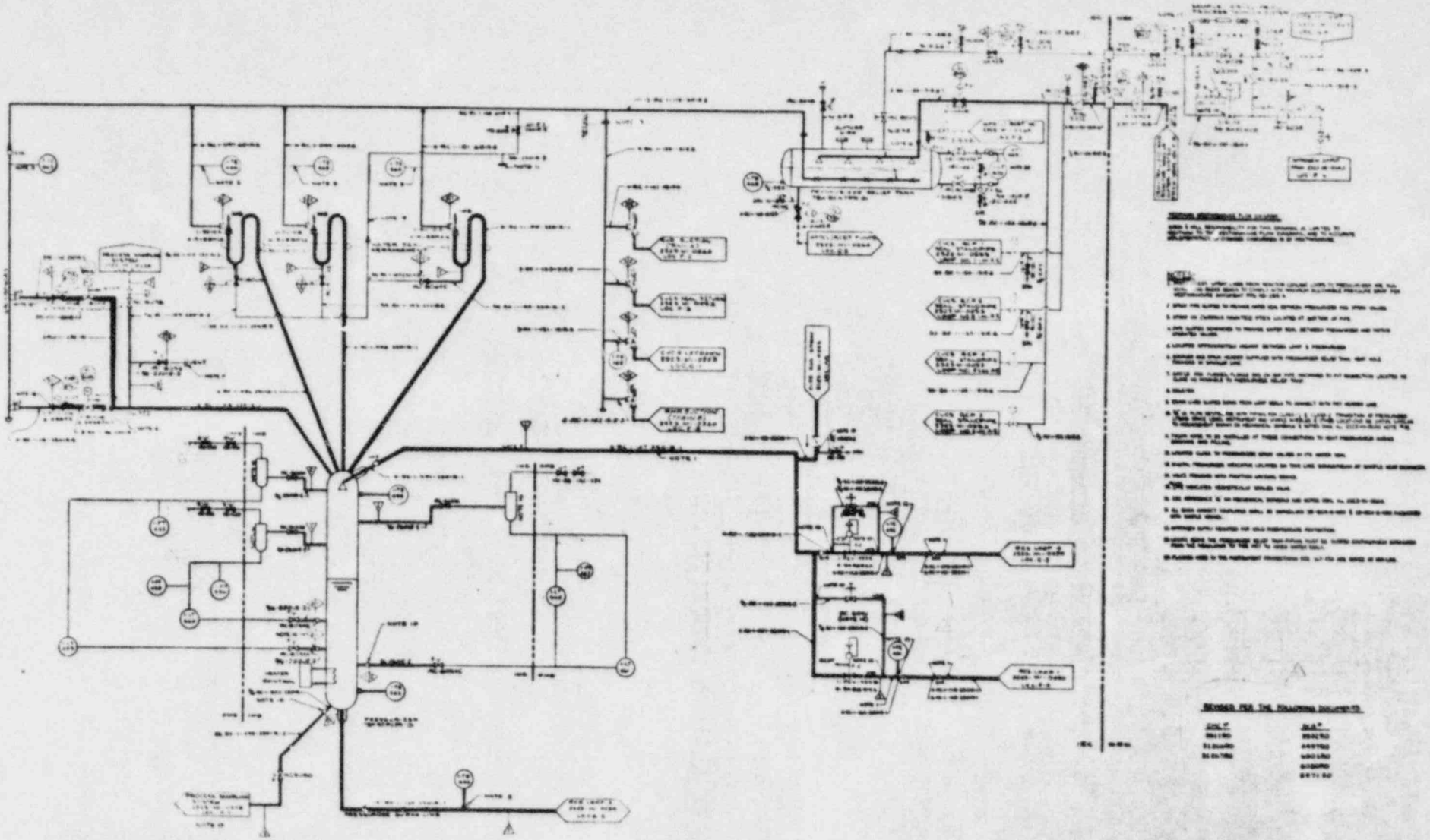
SCALE

2323-M0-0234


TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY
FLOW DIAGRAM
SPENT FUEL POOL COOLING
AND CLEAN-UP SYSTEM
2323-G9-00136


CONTROL BUILDING
FUEL BUILDING
THIS DOCUMENT BY DESIGN CHANGES
INFORMATION COPY
CLASS I
TEXAS UTILITIES SERVICES INC
FLOW DIAGRAM
DEMINERALIZED AND REACT
MAKE-UP WATER


LOOP 3
LOOP 2
LOOP 4
LOOP 1
LEGEND
TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY
FLOW DIAGRAM
REACTOR COOLANT SYSTEM
SHEET 1 OF 2
2323-88-0250



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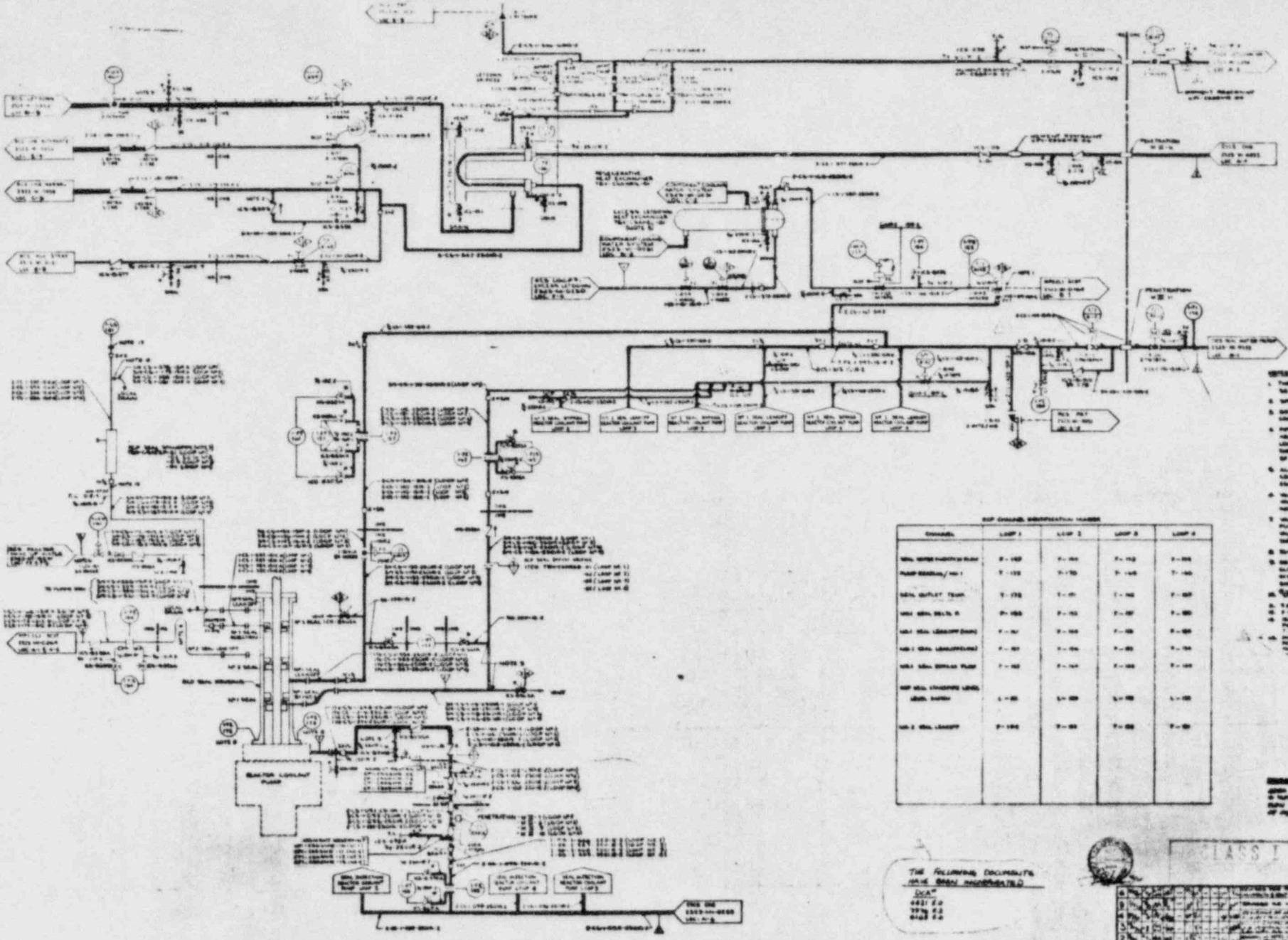
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

FLOW DIAGRAM
REACTOR COOLANT SYSTEM
SHEET 2 OF 2

NONE

2323-M-0251



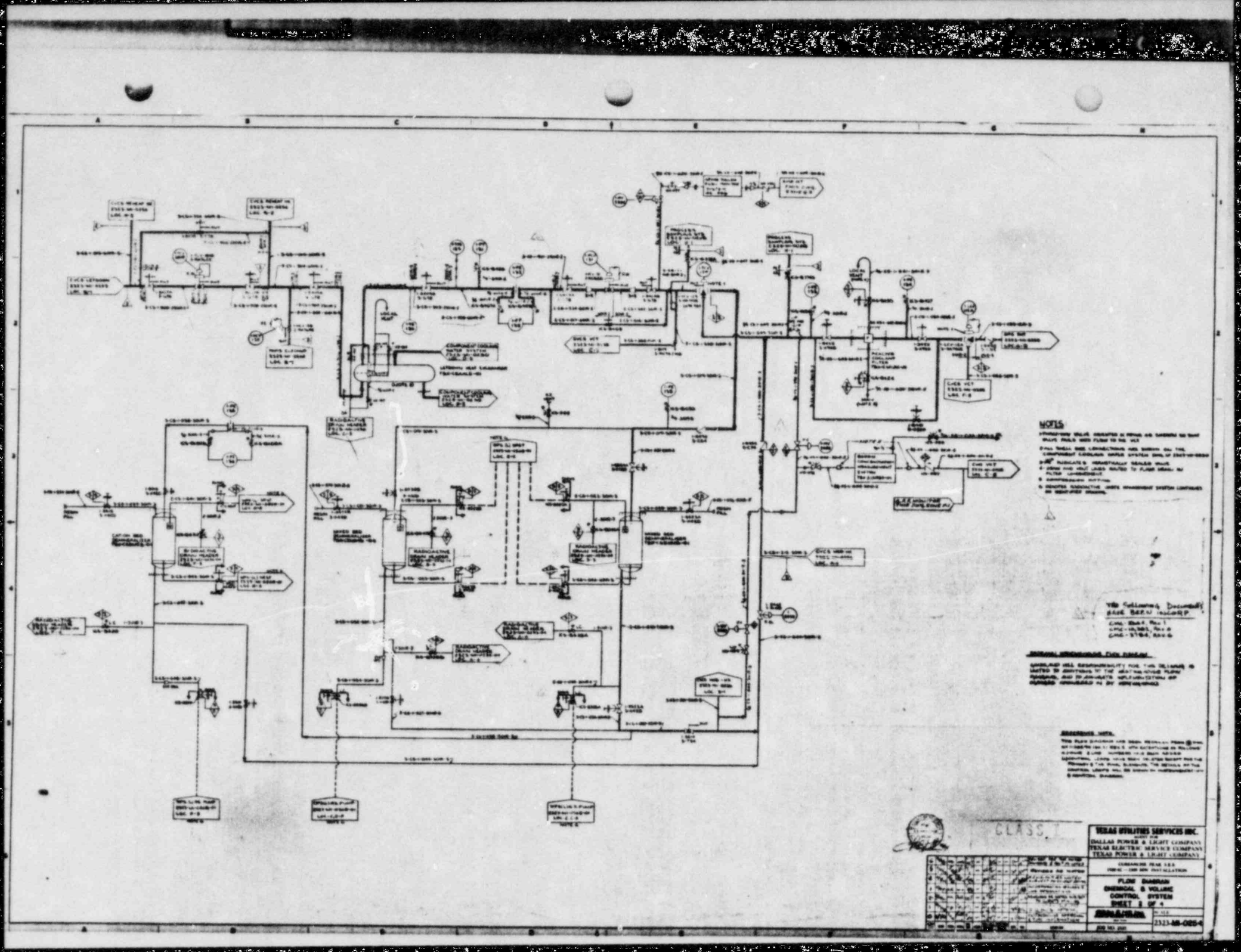
CHANNEL	LOOP 1	LOOP 2	LOOP 3	LOOP 4

THE FOLLOWING DOCUMENTS HAVE BEEN INCORPORATED

DCA#

CLASS 1

TEXAS UTILITIES SERVICES INC.	
DALLAS POWER & LIGHT COMPANY TEXAS ELECTRIC SERVICE COMPANY TEXAS POWER & LIGHT COMPANY	
COMANCHE PEAK S.E.S. 1150 MW INSTALLATION	
FLOW DIAGRAM CHEMICAL & VOLUME CONTROL SYSTEM SHEET 1 OF 4	
	2323-M-0053



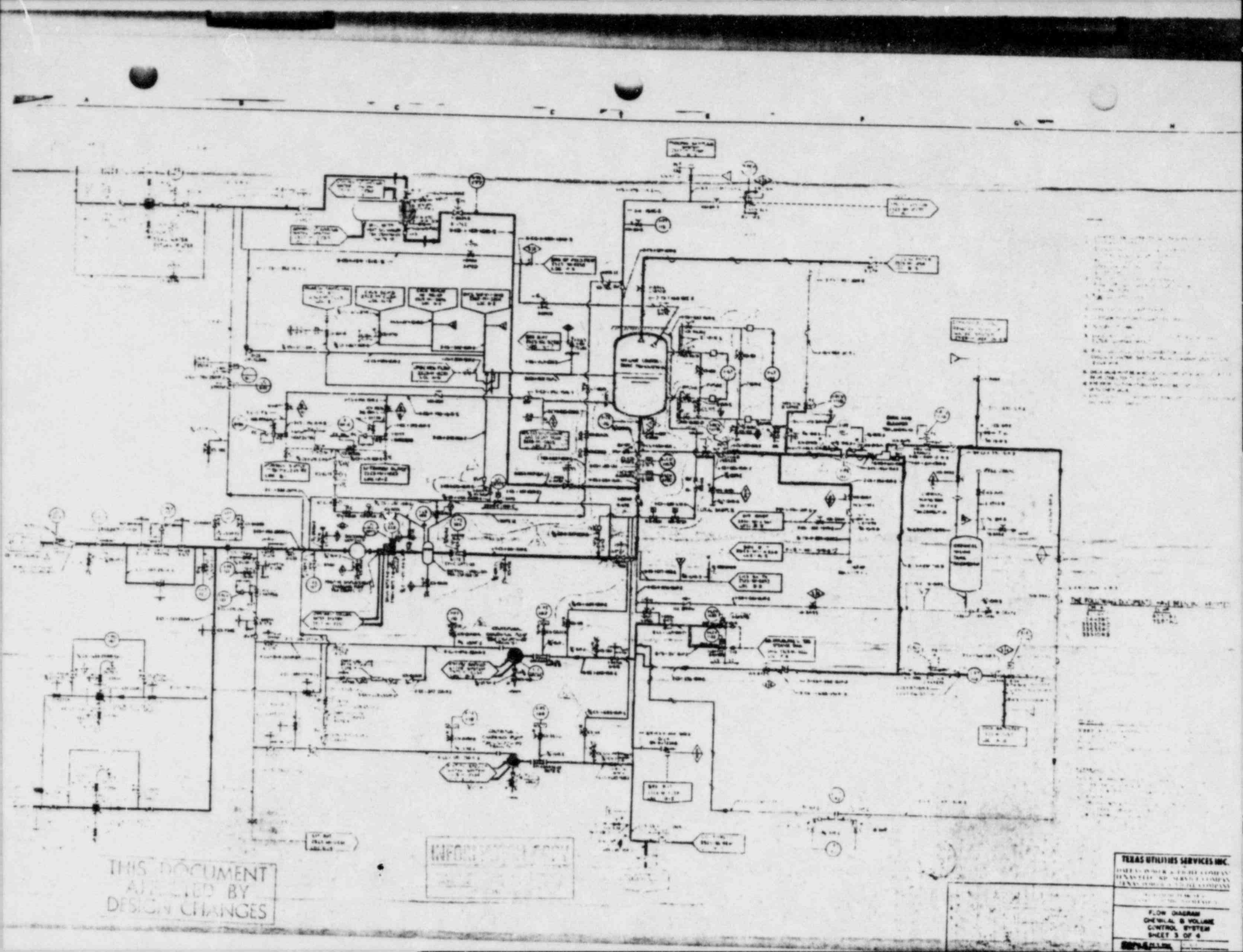
NOTES

CLASS 1

TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

FLOW DIAGRAM
CHEMICAL & VOLUME CONTROL SYSTEM
SHEET 2 OF 4

2323-48-0254

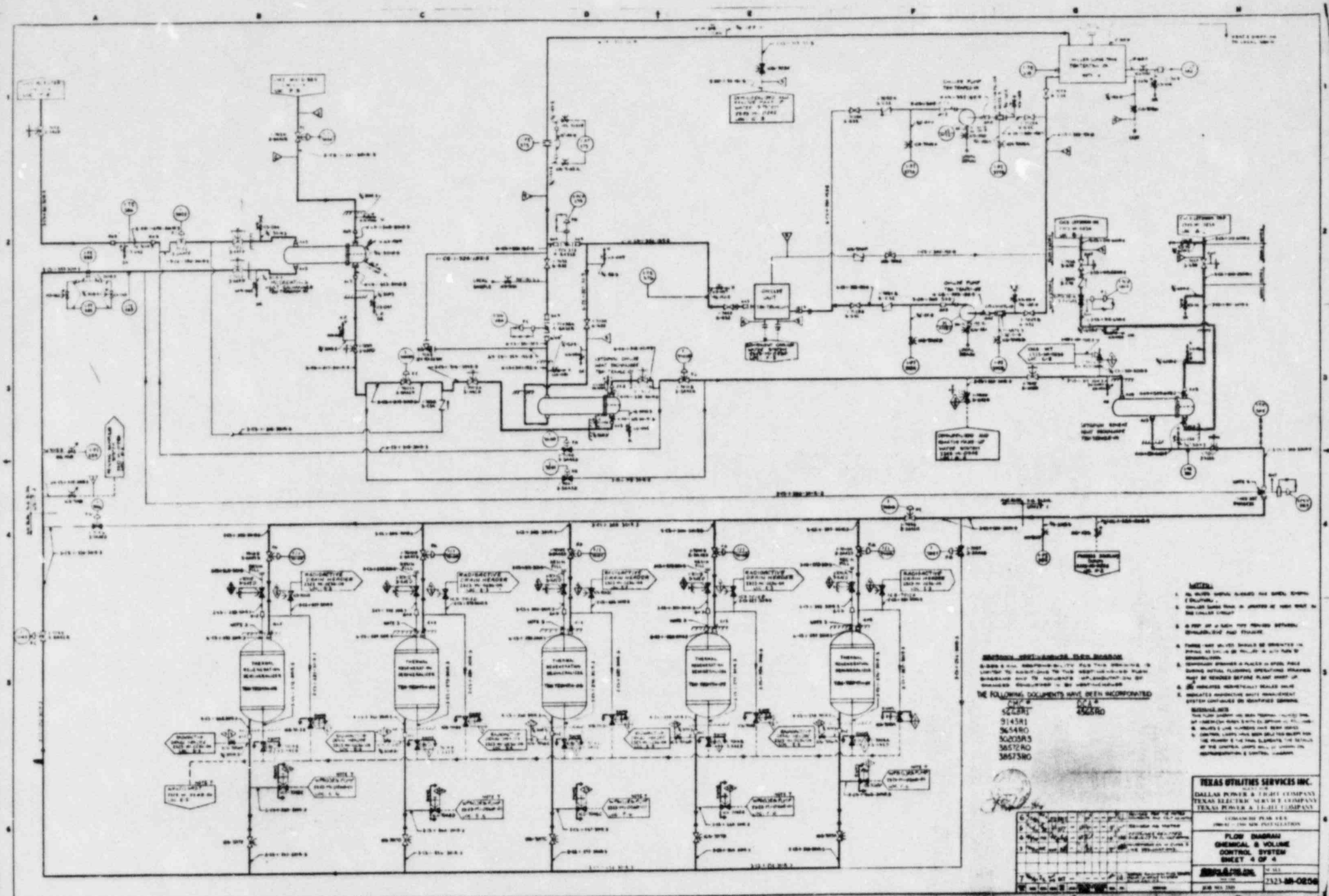


THIS DOCUMENT
AFFECTED BY
DESIGN CHANGES

INFORMATION ONLY

TEXAS UTILITIES SERVICES INC.

FLOW DIAGRAM
CHEMICAL & VOLUME
CONTROL SYSTEM
SHEET 3 OF 4



THE FOLLOWING DOCUMENTS HAVE BEEN INCORPORATED

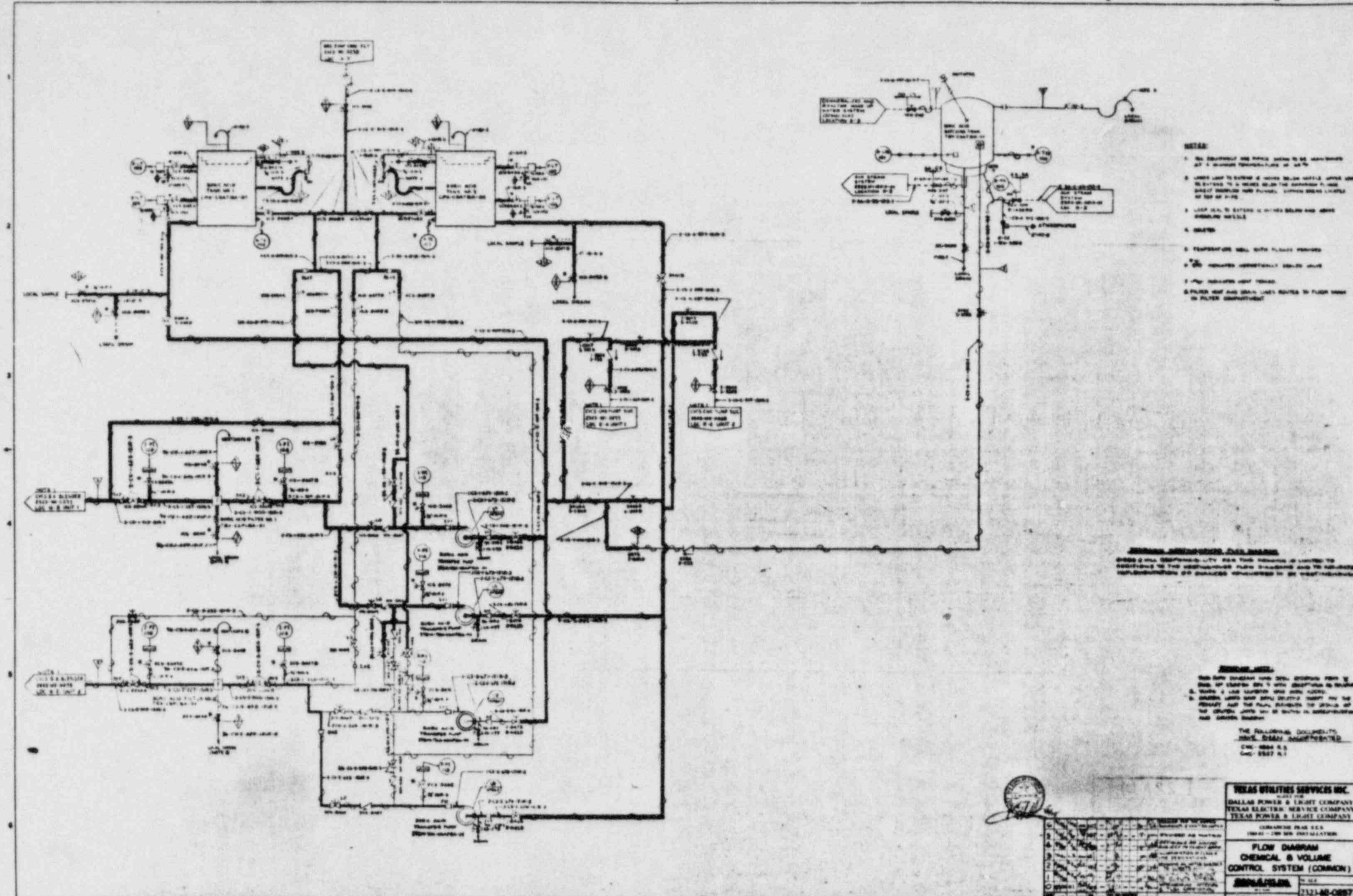
SCHEM.	DCA #
9145R1	45280
9654R0	
9620SR3	
3657R0	
3657SR0	

TEXAS UTILITIES SERVICES INC.

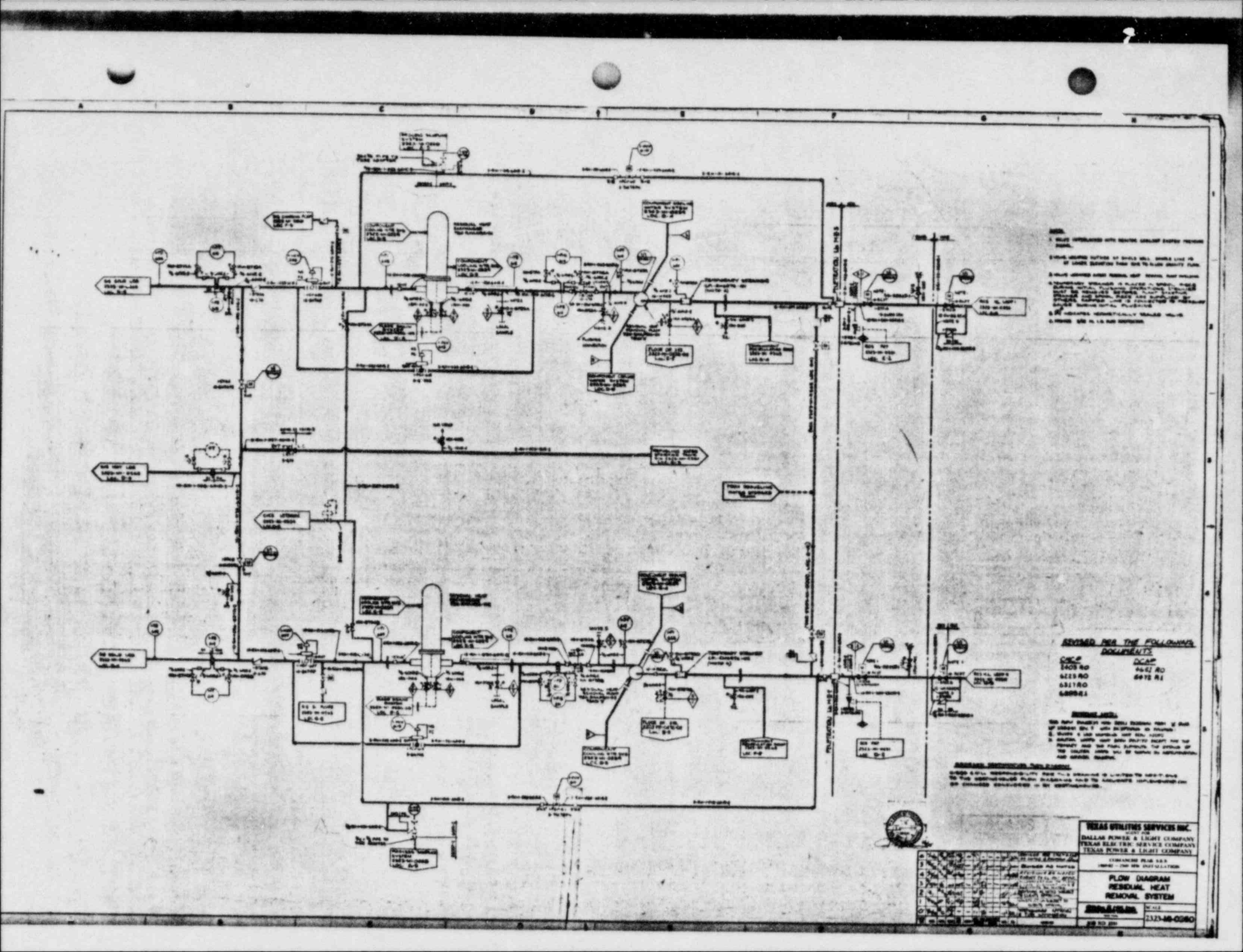
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

FLOW DIAGRAM
CHEMICAL & VOLUME
CONTROL SYSTEM
SHEET 4 OF 4

2323-M8-0256



TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY
FLOW DIAGRAM
CHEMICAL & VOLUME
CONTROL SYSTEM (COMMON)
2323-M2-0257



REVISED PER THE FOLLOWING DOCUMENTS:

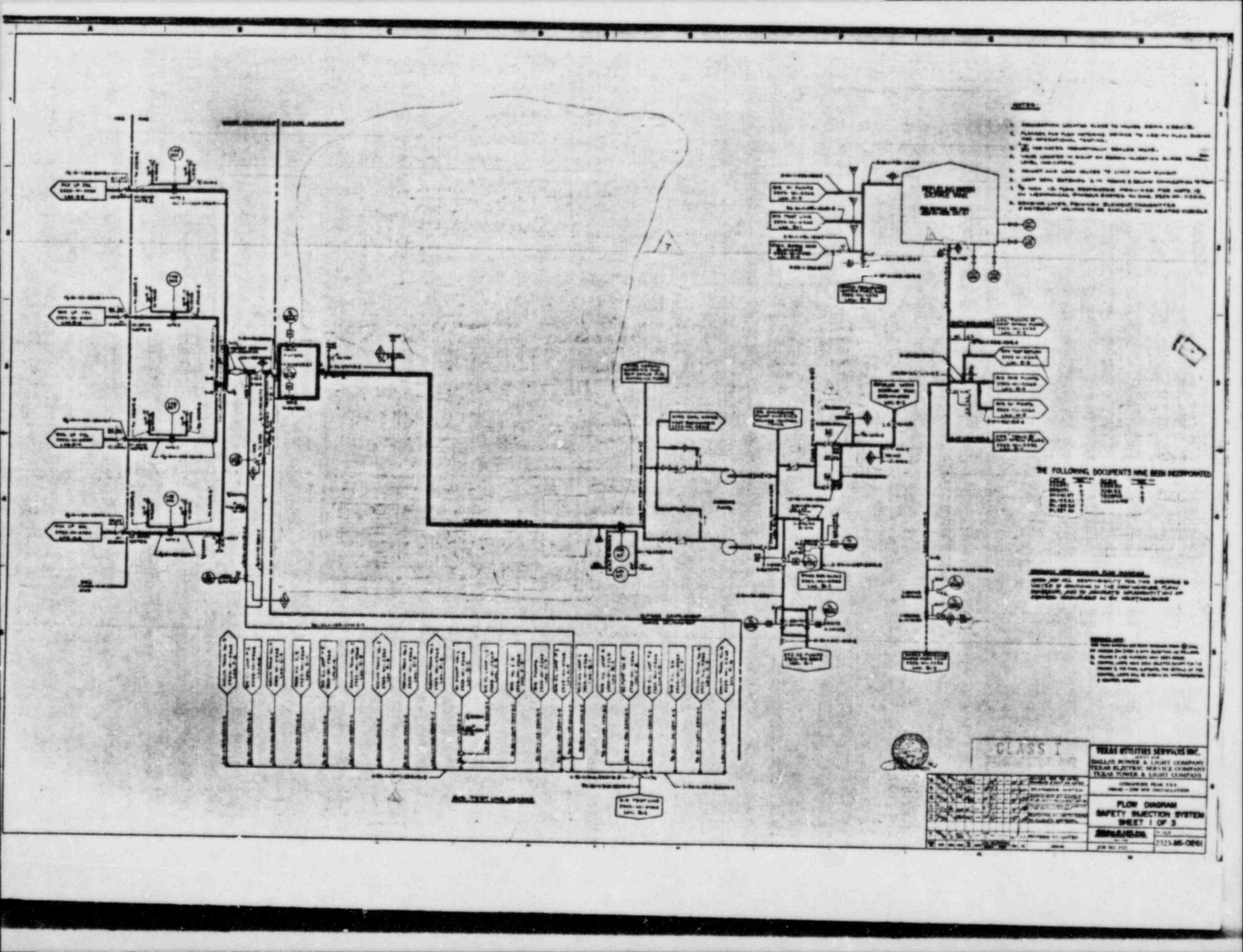
CAC#	DCA#
7405 R0	9612 R0
6223 R0	8972 R1
6321 R0	
6409 R1	

TEXAS UTILITIES SERVICES INC.
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

COMANCHE PEAK S.E.S.

FLOW DIAGRAM
RESIDUAL HEAT
REMOVAL SYSTEM

2323-M-0260



CLASS I

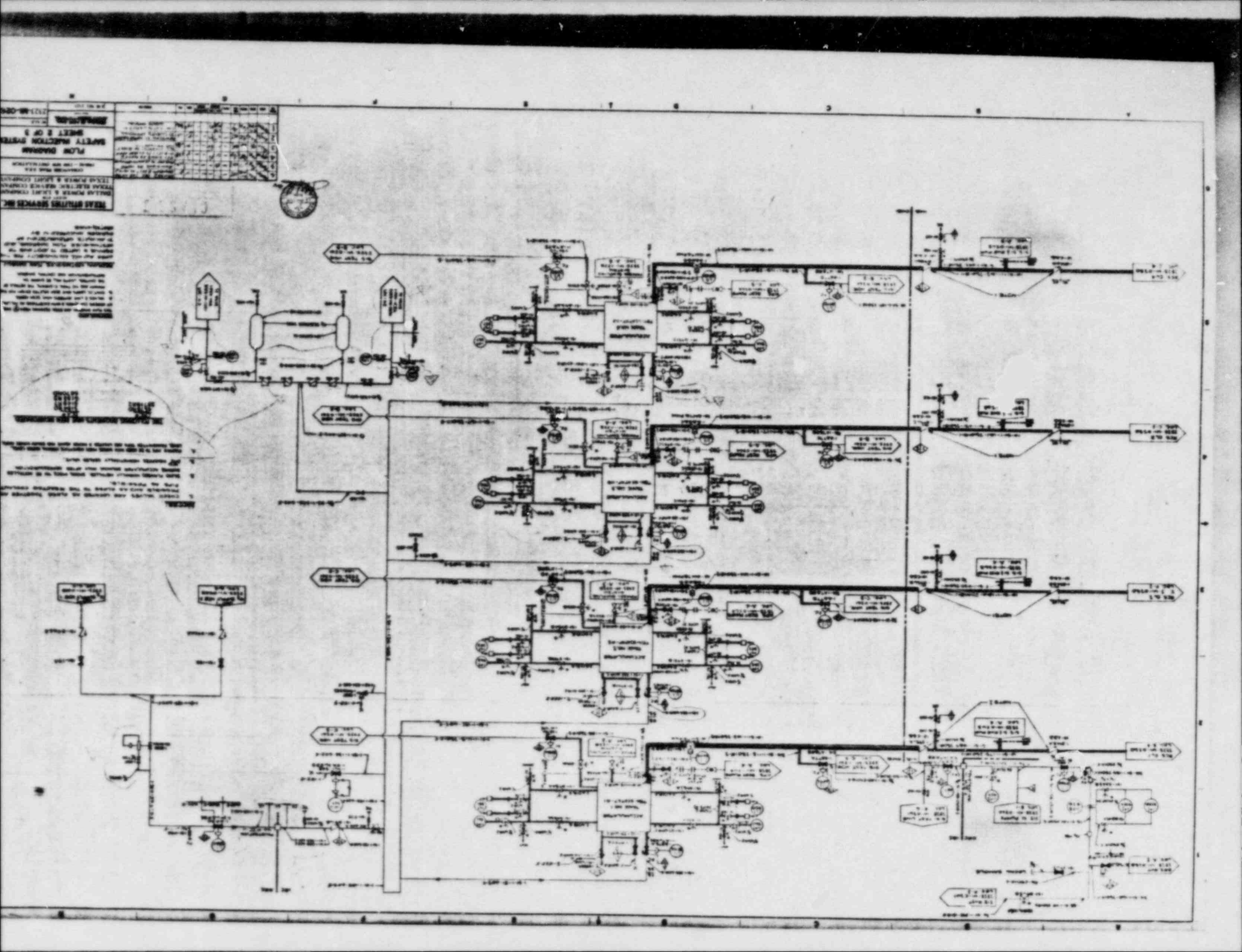
TEXAS UTILITIES SERVICES INC.

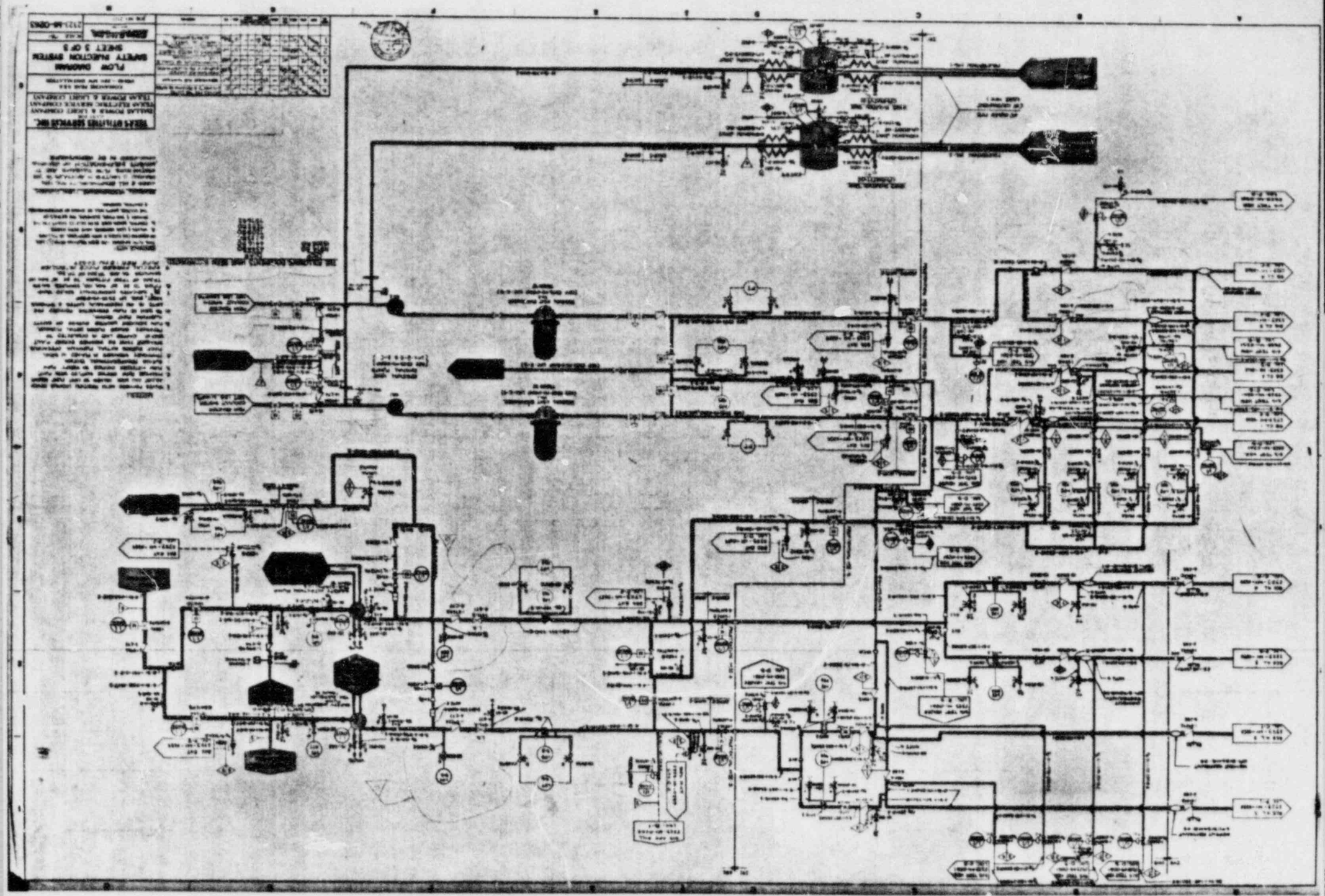
DALLAS POWER & LIGHT COMPANY
TEXAS ELECTRIC SERVICE COMPANY
TEXAS POWER & LIGHT COMPANY

COMANCHE PEAK S.E.S.
UNITS 1 AND 2

FLOW DIAGRAM
SAFETY INJECTION SYSTEM
SHEET 1 OF 3

2323-M5-0261





PSI WELD REFERENCE INDEX

PSI FILE	CODE CLASS	SYSTEM	DESCRIPTION	FLOW DWG	B&R BRP-ISO
TBX-1-4100	1	RC	Reactor Coolant Loop 1	2323-M1-0250	RC-1-520-001
TBX-1-4101	1	RH	RHR Take-off Loop 1	2323-M1-0260	RC-1-RB-05 RH-1-RB-01
TBX-1-4102	1	SI	Accumulator Discharge to Loop 1	2323-M1-0262	SI-1-RB-37
TBX-1-4103	1	SI	SIS/RHR Return to Loop 1	2323-M1-0263	SI-1-RB-56 SI-1-RB-08
TBX-1-4104	1	SI	SIS to Loop 1	2323-M1-0263	RC-1-RB-05 SI-1-RB-14
TBX-1-4105	1	CS	Alternate Charging to Loop 1	2323-M1-0253	CS-1-RB-26
TBX-1-4106	1	RC	Blank RTD Return to Loop 1	2323-M1-0250	RC-1-RB-31
TBX-1-4107	1	SI	HPSIS to Loop 1 Cold Leg	2323-M1-0261	SI-1-RB-20 SI-1-RB-21
TBX-1-4108	1	SI	SIS to Loop 1 Hot Leg	2323-M1-0263	SI-1-RB-14 SI-1-RB-15
TBX-1-4109	1	WP	Drain Line from Loop 1	2323-M1-0250	RC-1-RB-10
TBX-1-4110	1	RC	Cold Leg RTD Blank Take-off Loop 1	2323-M1-0250	RC-1-520-001
TBX-1-4111	1	CS	Seal Injection to Loop 1 RC Pump	2323-M1-0253	CS-1-RB-37A CS-1-RB-37B
TBX-1-4200	1	RC	Reactor Coolant Loop 2	2323-M1-0250	RC-1-520-001
TBX-4201	1	SI	Accumulator Discharge to Loop 2	2323-M1-0262	SI-1-RB-59
TBX-1-4202	1	SI	SIS/RHR Return to Loop 2	2323-M1-0263	SI-1-RB-54 SI-1-RB-23B

ISI FILE	CODE CLASS	SYSTEM	DESCRIPTION	FLOW DWG	B&R BRP-ISO
TBX-1-4203	1	SI	SIS to Loop 2	2323-M1-0263	SI-1-RB-006 SI-1-RB-016
TBX-1-4204	1	RC	Blank RTD Return to Loop 2	2323-M1-0250	RC-1-RB-33
TBX-1-4205	1	SI	HPSIS to Loop 2 Cold Leg	2323-M1-0261	SI-1-RB-014 SI-1-RB-025
TBX-1-4206	1	WP	Drain Line from Loop 2	2323-M1-0250	WP-1-RB-005A
TBX-1-4207	1	RC	Cold Leg RTD Blank from Loop 2	2323-M1-0250	RC-1-520-001
TBX-1-4208	1	CS	Seal Injection to Loop 2 RC Pump	2323-M1-0253	CS-1-RB-031B
TBX-1-4300	1	RC	Reactor Coolant Loop 3	2323-M1-0250	RC-1-520-001
TBX-1-4301	1	SI	Accumulator Discharge to Loop 3	2323-M1-0262	SI-1-RB-60
TBX-1-4302	1	SI	SIS/RHR Return to Loop 3	2323-M1-0263	SI-1-RB-42 SI-1-RB-53
TBX-1-4303	1	SI	SIS to Loop 3 Hot Leg	2323-M1-0263	SI-1-RB-006 SI-1-RB-17
TBX-1-4304	1	CS	Ledown from Loop 3	2323-M1-0250	RC-1-RB-08 CS-1-RB-38A CS-1-RB-38B
TBX-1-4305	1	RC	Blank RTD Return to Loop 3	2323-M1-0250	RC-1-RB-32
TBX-1-4306	1	SI	HPSIS to Loop 3 Cold Leg	2323-M1-0261	SI-1-RB-26 SI-1-RB-27 SI-1-RB-43 SI-1-RB-44
TBX-1-4307	1	WP	Drain from Loop 3	2323-M1-0250	RC-1-RB-008
TBX-1-4308	1	RC	Blank RTD Take-off froom Loop 3 Cold Leg	2323-M1-0250	RC-1-520-001

ISI FILE	CODE CLASS	SYSTEM	DESCRIPTION	FLOW DWG	B&R BRP-ISO
TBX-1-4309	1	CS	Seal Injection to Loop 3 RC Pump	2323-M1-0253	CS-1-RB-001
TBX-1-4400	1	RC	Reactor Coolant Loop 4	2323-M1-0250	RC-1-520-001
TBX-1-4401	1	RH	RHR Take-off Loop 4	2323-M1-0260	RC-1-RB-006 RH-1-RB-002
TBX-1-4402	1	SI	Accumulator Discharge to Loop 4	2323-M1-0262	SI-1-RB-38B
TBX-1-4403	1	SI	SIS/RHR Return to Loop 4	2323-M1-0263	SI-1-RB-08 SI-1-RB-33 SI-1-RB-38B
TBX-1-4404	1	SI	SIS to Loop 4 Hot Leg	2323-M1-0263	RC-1-RB-06 SI-1-RB-13 SI-1-RB-15
TBX-1-4405	1	CS	Normal Charging to Loop 4	2323-M1-0253	CS-1-RB-023
TBX-1-4406	1	RC	Blank RTD Return to Loop 4	2323-M1-0250	RC-1-RB-30
TBX-1-4407	1	SI	HPSIS to Loop 4 Cold Leg	2323-M1-0261	SI-1-RB-21 SI-1-RB-22
TBX-1-4408	1	WP	Drain from Loop 4	2323-M1-0250	WP-1-RB-03
TBX-1-4409	1	RC	Blank RTD Take-off froom Loop 4 Cold Leg	2323-M1-0250	RC-1-520-001
TBX-1-4410	1	CS	Seal Injection to Loop 4 RC Pump	2323-M1-0253	CS-1-RB-03
TBX-1-4500	1	RC	Pressurizer Surge to/from Loop 4	2323-M1-0251	RC-1-RB-026
TBX-1-4501	1	RC	Pressurizer Safety Relief	2323-M1-0251	RC-1-RB-28A RC-1-RB-28B
TBX-1-4502	1	RC	Pressurizer Pressure Relief	2323-M1-0251	RC-1-RB-15 RC-1-RB-28A
TBX-1-4503	1	RC	Pressurizer Spray	2323-M1-0251	RC-1-RB-16 RC-1-RB-17 RC-1-RB-20

ISI FILE	CODE CLASS	SYSTEM	DESCRIPTION	FLOW DWG	B&R BRP-ISO
TBX-1-4504	1	RC	Pressurizer Spray	2323-M1-0251	RC-1-RB-18 RC-1-RB-21 RC-1-RB-22
TBX-1-4505	1	RC	Pressurizer Auxiliary Spray	2323-M1-0251	RC-1-RB-16 CS-1-RB-27 CS-1-RB-28 CS-1-RB-29
TBX-1-4600	1	SI	HPSIS Loop 1, 2, 3 and 4	2323-M1-0261	SI-1-RB-021
TBX-2-2100	2	MS	Main Steam froom Loop 1 Stm. Gen.	2323-M1-0202	MS-1-RB-02
TBX-2-2101	2	FW	Feedwater to Loop 1 Steam Gen.	2323-M1-0206	FW-1-RB-002 FW-1-SB-019
TBX-2-2102	2	FW	Auxiliary Feedwater to Loop 1 Stm. Gen.	2323-M1-0206	FW-1-RB-05A FW-1-RB-05B FW-1-SB-33
TBX-2-2200	2	MS	Main Steam from Loop 2 Stm. Gen.	2323-M1-0202	MS-1-RB-04 MS-1-SB-04 MS-1-SB-045
TBX-2-2201	2	FW	Feedwater to Loop 2 Stm. Gen.	2323-M1-0206	FW-1-RB-004 FW-1-SB-18
TBX-2-2202	2	FW	Auxiliary Feedwater to Loop 2 Steam Gen.	2323-M1-0206	FW-1-RB-06 FW-1-RB-09 FW-1-RB-06A FW-1-RB-06B FW-1-SB-031
TBX-2-2300	2	MS	Main Steam from Loop 3 Steam Gen.	2323-M1-0202	MS-1-RB-03 MS-1-SB-19
TBX-2-2301	2	FW	Feedwater to Loop 3 Steam Generator	2323-M1-0206	FW-1-RB-03 FW-1-SB-17
TBX-2-2302	2	FW	Auxiliary Feedwater to Loop 3 Stm. Gen.	2323-M1-0206	FW-1-RB-07 FW-1-RB-10 FW-1-SB-029
TBX-2-2400	2	MS	Main Steam from Loop 4 Stm. Gen.	2323-M1-0202	MS-1-RB-01 MS-1-SB-17
TBX-2-2401	2	FW	Feedwater to Loop 4 Steam Generator	2323-M1-0206	FW-1-RB-001 FW-1-SB-20

ISI FILE	CODE CLASS	SYSTEM	DESCRIPTION	FLOW DWG	B&R BRP-ISO
TBX-2-2404	2	FW	Auxiliary Feedwater to Loop 4 Stm. Gen.	2323-M1-0206	FW-1-RB-8A FW-1-RB-8B FW-1-SB-35
TBX-2-2500	2	RH	RHR from 8701A to RHR Pump and Valves 8958A and 8811A to Valve Isolation Tank	2323-M1-0263	RH-1-RB-001 RH-1-SB-002 RH-1-SB-015 SI-1-SB-19 SI-1-SB-006 SI-1-RB-062
TBX-2-2501	2	RH	RHR from 8701B to RHR Pump and Valves 8958B and 8811B at Valve Isolation Tank	2323-M1-0263	RH-1-SB-004 RH-1-SB-005 SI-1-SB-007 SI-1-RB-061
TBX-2-2520	2	RH	RHR from RHR Pump to Valves 8730A and 8969A	2323-M1-0263	RH-1-SB-09 RH-1-SB-016 SI-1-SB-050 CS-1-SB-009 RH-1-SB-001 RH-1-SB-17 SI-1-SB-003
TBX-2-2521	2	RH	RHR from RHR Pump to Valves 8730B and 8969B	2323-M1-0263	RH-1-SB-007 RH-1-SB-010 SI-1-SB-031 RH-1-SB-006 RH-1-SB-003
TBX-2-2522	2	SI	Accumulator Discharge from Accumulator 1 to Valve 8956A	2323-M1-0262	SI-1-RB-37
TBX-2-2523	2	SI	Accumulator Discharge from Accumulator 2 to Valve 8956B	2323-M1-0262	SI-1-RB-39
TBX-2-2524	2	SI	Accumulator Discharge from Accumulator 3 to Valve 8956C	2323-M1-0262	SI-1-RB-40
TBX-2-2525	2	SI	Accumulator Discharge from Accumulator 4 to Valve 8956D	2323-M1-0262	SI-1-RB-38A

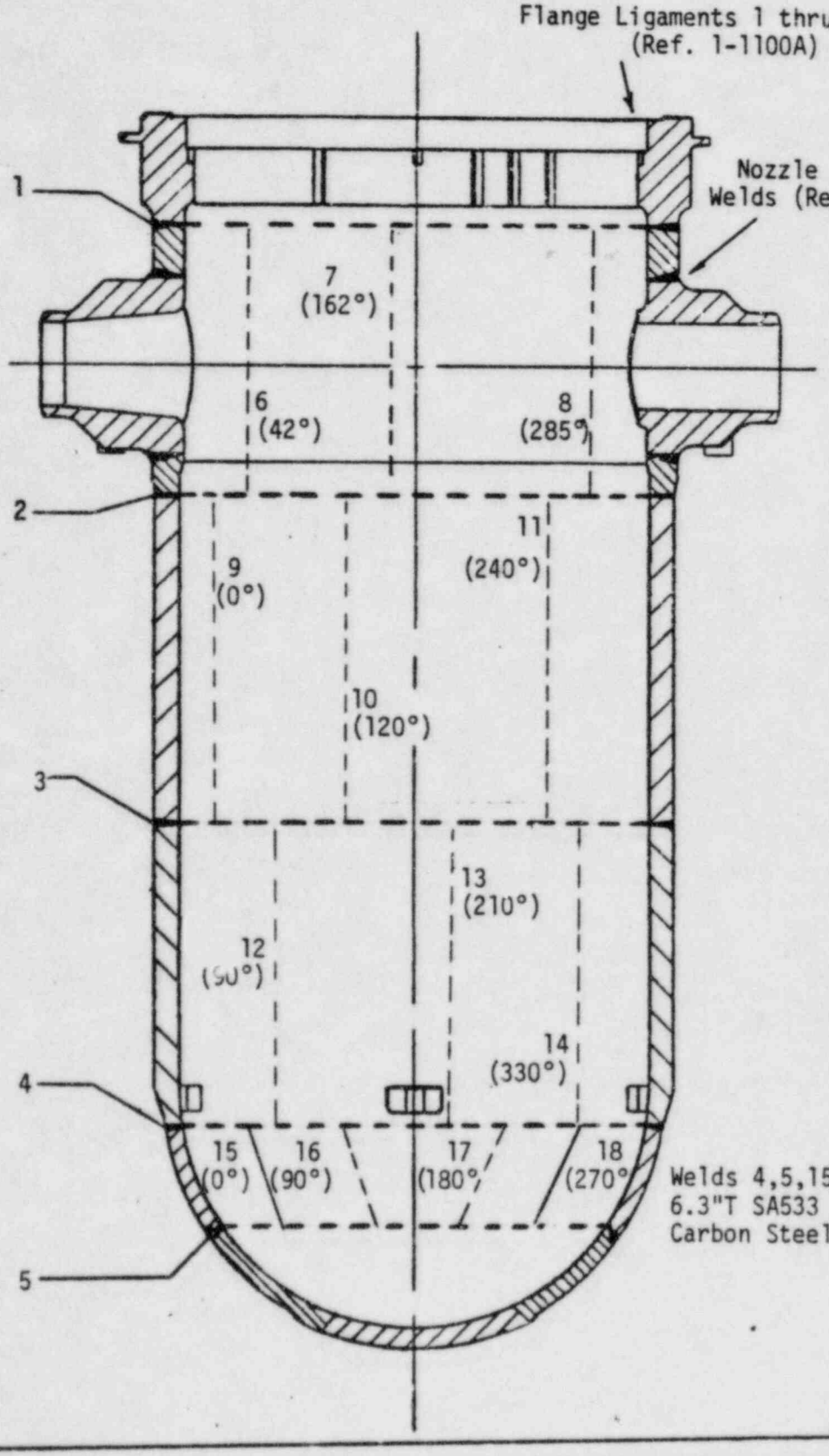
ISI FILE	CODE CLASS	SYSTEM	DESCRIPTION	FLOW DWG	B&R BRP-ISO
TBX-2-2530	2	RH/SI	From Line 10"-RH-1-026 to Penetration M-III-23	2323-M1-0263	SI-1-SB-002 RH-1-SB-08
TBX-2-2531	2	RH/SI	From Valve 8730B to Penetration M-II-5	2323-M1-0263	SI-1-SB-033 RH-1-SB-007 RH-1-SB-008
TBX-2-2532	2	RH/SI	From Valve 8730A to Line 10"-SI-1-093, Valve 8717 and Penetration M-II-4	2323-M1-0263	RH-1-SB-019 SI-1-SB-09 RH-1-SB-09 SI-1-SB-03
TBX-2-2533	2	SI	To Valves 8818A and B from Penetration M-II-4	2323-M1-0263	SI-1-RB-055 SI-1-RB-056
TBX-2-2534	2	SI	To Valves 8818C and D from Penetration M-II-8	2323-M1-0263	SI-1-RB-053 SI-1-RB-052 SI-1-RB-033 SI-1-SB-033
TBX-2-2535	2	SI	From Penetration M-III-23 to Valves 8841A and B	2323-M1-0263	SI-1-RB-01 SI-1-RB-16 SI-1-RB-17 SI-1-SB-02
TBX-2-2540	2	CS	Valve LCV-112D and E to Valve 8969A	2323-M1-0255	CS-1-AB-02 CS-1-AB-03 CS-1-SB-01 CS-1-SB-02 CS-1-SB-09 SI-1-SB-050
TBX-2-2541	2	SI	Safety Injection Pump 1-1 to Valves 8807A and B to Valve 8806 and 8x6" Reducer	2323-M1-0263	SI-1-SB-001 SI-1-SB-004 SI-1-SB-010 SI-1-SB-009
TBX-2-2542	2	SI	Safety Injection 1-2 to Valve 8969B Valve 8923B and 8x6" reducer	2323-M1-0263	SI-1-SB-008 SI-1-SB-004 SI-1-SB-031
TBX-2-2550	2	CS	Charging Pump Suction Line 8-CS-1-063 to Charging Pumps 1 and 2	2323-M1-0255	CS-1-AB-002 CS-1-AB-003

ISI FILE	CODE CLASS	SYSTEM	DESCRIPTION	FLOW DWG	B&R BRP-ISO
TBX-2-2551	2	SI	From Charging Pump Suction Line 8"-CS-1-063 to Valves 8807A and B	2323-M1-0261	CS-1-SB-09 SI-1-SB-10 SI-1-SB-050
TBX-2-2560	2	SI	HPSIS from Valves 8905B and C to Penetration M-III-3	2323-M1-0263	SI-1-RB-006
TBX-2-2561	2	SI	HPSIS from Penetration M-III-3 to Valves 8821A and 8921A	2323-M1-0263	SI-1-SB-013 SI-1-SB-012 SI-1-SB-014
TBX-2-2562	2	SI	HPSIS from Safety Injection Pump 1-1 to Valves 8919A and 8922A	2323-M1-0263	SI-1-SB-001 SI-1-SB-023B
TBX-2-2563	2	SI	HPSIS from Safety Injection Pump 1-2 to Valve 8819B and Orifice IFE-922	2323-M1-0263	SI-1-SB-014 SI-1-SB-015 SI-1-SB-023A
TBX-2-2564	2	SI	HPSIS from Orifice IFE-917 to Valve 8815	2323-M1-0261	SI-1-AB-004 SI-1-SB-037 SI-1-SB-053 SI-1-SB-036A SI-1-SB-036B SI-1-RB-021
TBX-2-2565	2	SI	HPSIS from Valve 8919A and B to Valve 8813	2323-M1-0263	SI-1-SB-022 SI-1-SB-023A SI-1-SB-23B
TBX-2-2566	2	SI	HPSIS from Valve 8819A, B, C and D to Valve 8835	2323-M1-0263	SI-1-RB-005 SI-1-RB-007 SI-1-RB-008 SI-1-RB-023A SI-1-RB-23B SI-1-RB-042 SI-1-SB-018
TBX-2-2567	2	SI	HPSIS from Valve 8835 to Valves 8821A and B to Line 4"-SI-1-039	2323-M1-0263	SI-1-SB-017 SI-1-SB-018
TBX-2-2568	2	SI	HPSIS Valves 8905A and D to Orifice IFE-922	2323-M1-0263	SI-1-SB-016 SI-1-SB-025 SI-1-SB-015

Illustrative Only

TBX-1-1100

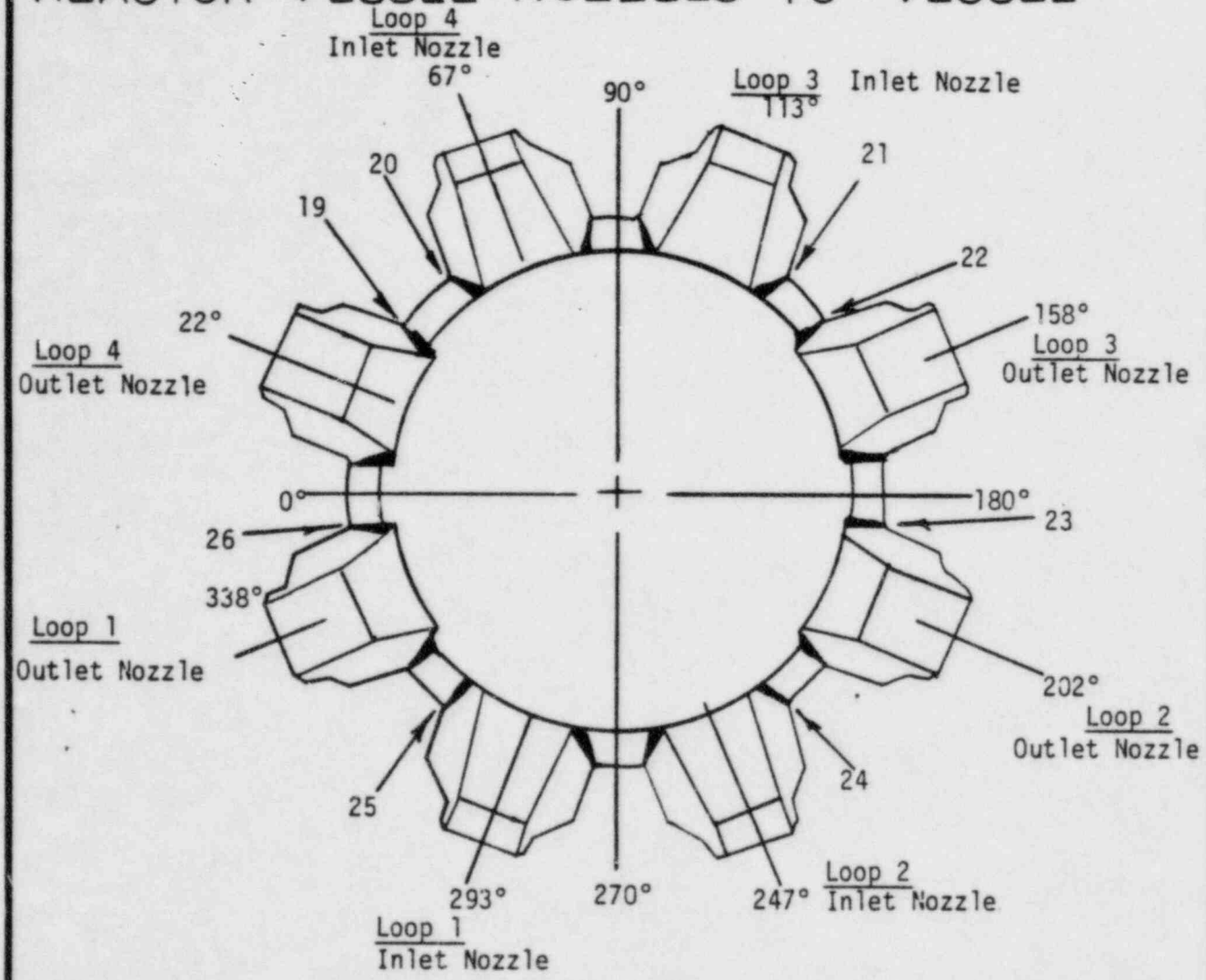
REACTOR VESSEL



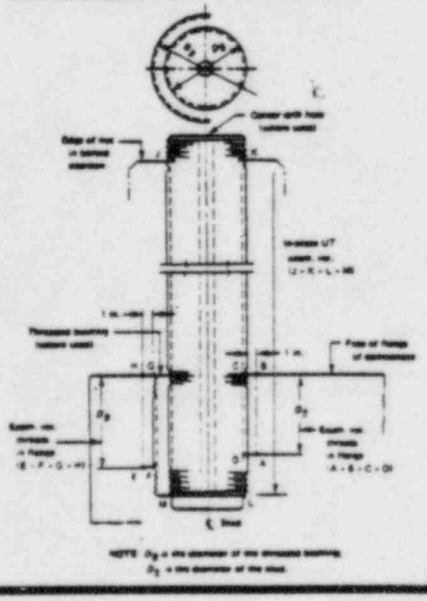
ILLUSTRATIVE ONLY

TBX-I-I100A

REACTOR VESSEL NOZZLES TO VESSEL



Flange Ligaments



TBX-1-1200

INTERNALS

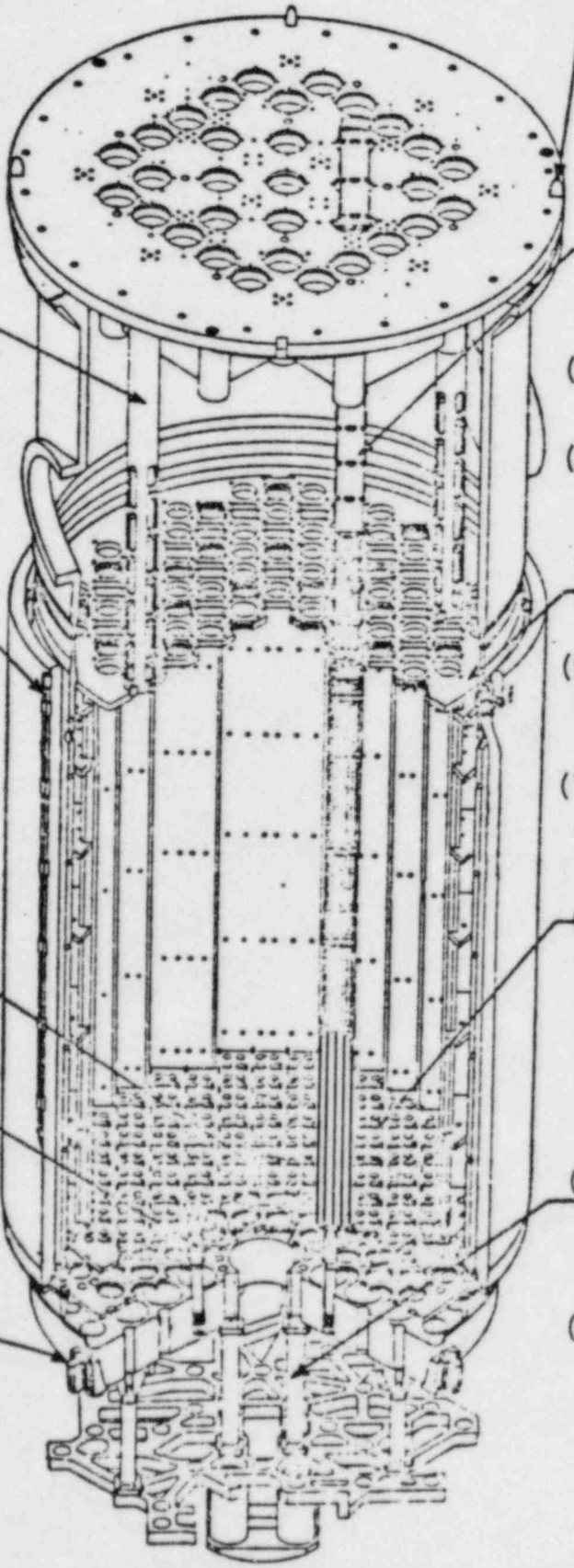
1. Head and Vessel Alginment Pin
2. Alignment Keyway Upper Support Plate
3. Upper Support Column
4. Control Rod Guide Tube
5. Core Barrel Outlet Nozzle/Vessel Interface Surface
6. Upper Core Plate Alignment Keyway
7. Core Barrel Mid-Plate Girth Weld
8. Upper Core Plate
9. Upper Internals Alignment Key In Core Barrel
10. Irradiation Specimen Guides
11. Guide Tube Attachment to Upper Core Plate
12. Baffle Bolting
13. Lower Core Plate
14. Lower Core Plate Fuel Assembly Alignment Pins
15. Access Plate
16. Lower Core Support Columns and Instrument Guides and Attachments
17. Core Support Column
18. Thermal Shield Flexure
19. Radial Support
20. Lower Support Column
21. Secondary Core Support Assembly

Items 1 thru 21 reference TBX-1-1200A

Illustrative Only

TBX-1-1200A

R.V. UPPER AND LOWER INTERNALS



(1) HEAD AND VESSEL ALIGNMENT PIN

(2) ALIGNMENT KEYWAY UPPER SUPPORT PLATE

CONTROL ROD GUIDE TUBE (4)

(3) UPPER SUPPORT COLUMN

(5) CORE BARREL OUTLET NOZZLE VESSEL INTERFACE SURFACE

(6) UPPER CORE PLATE ALIGNMENT KEYWAY

(7) CORE BARREL MID-PLATE GIRTH WELD

(8) UPPER CORE PLATE

(10) IRRADIATION SPECIMEN GUIDES

(9) UPPER INTERNALS ALIGNMENT KEY IN CORE BARREL

(14) LOWER CORE PLATE FUEL ASSEMBLY ALIGNMENT PINS

(11) GUIDE TUBE ATTACHMENT TO UPPER CORE PLATE

(13) LOWER CORE PLATE

(15) ACCESS PLATE

BAFFLE BOLTING (12)

(17) CORE SUPPORT COLUMN

(16) LOWER CORE SUPPORT COLUMNS AND INSTRUMENT GUIDES AND ATTACHMENTS

(20) LOWER SUPPORT COLUMN

(18) THERMAL SHIELD FLEXURE

(21) SECONDARY CORE SUPPORT ASSEMBLY

(19) RADIAL SUPPORT

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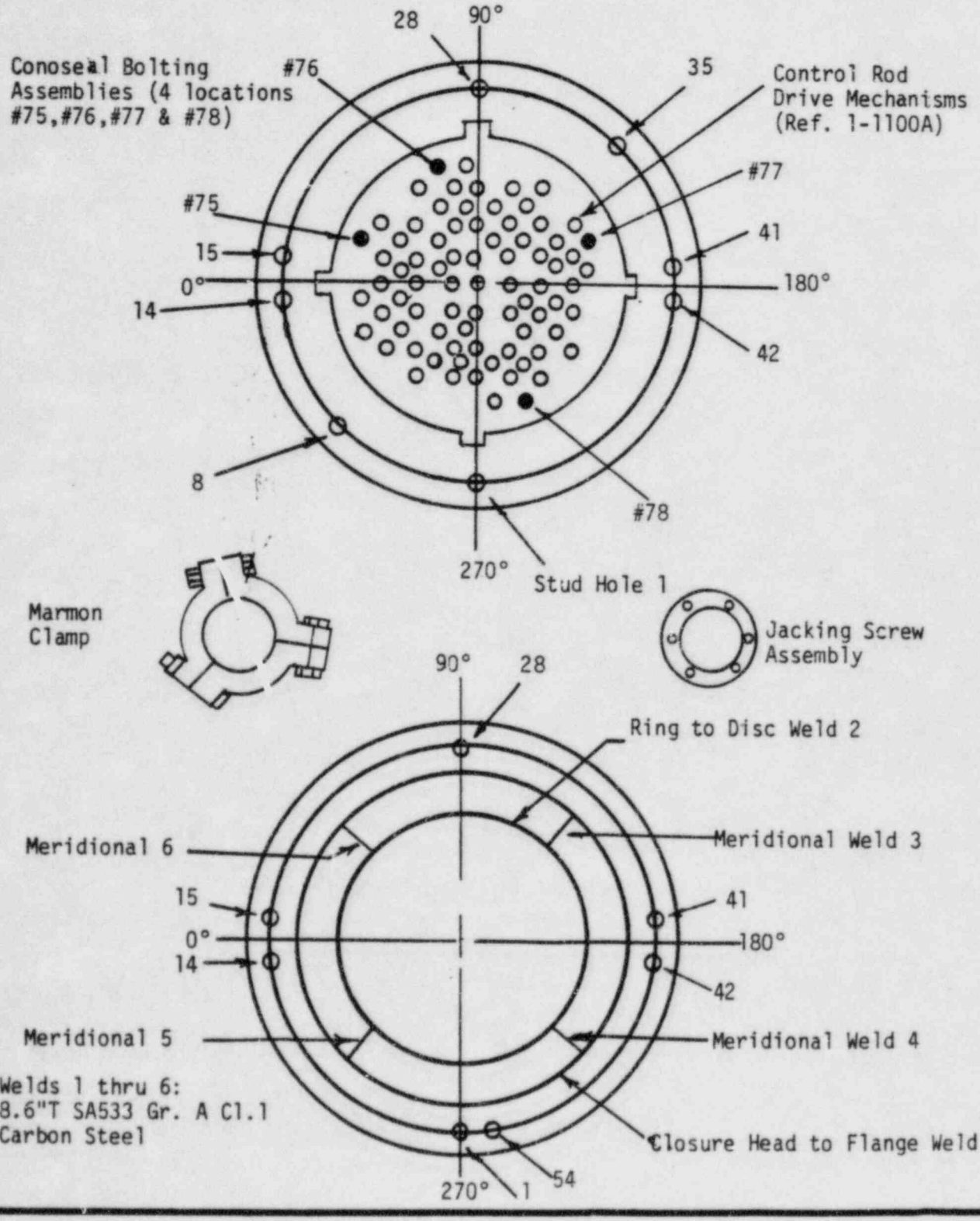
TBX-I-1300

REACTOR VESSEL CLOSURE HEAD



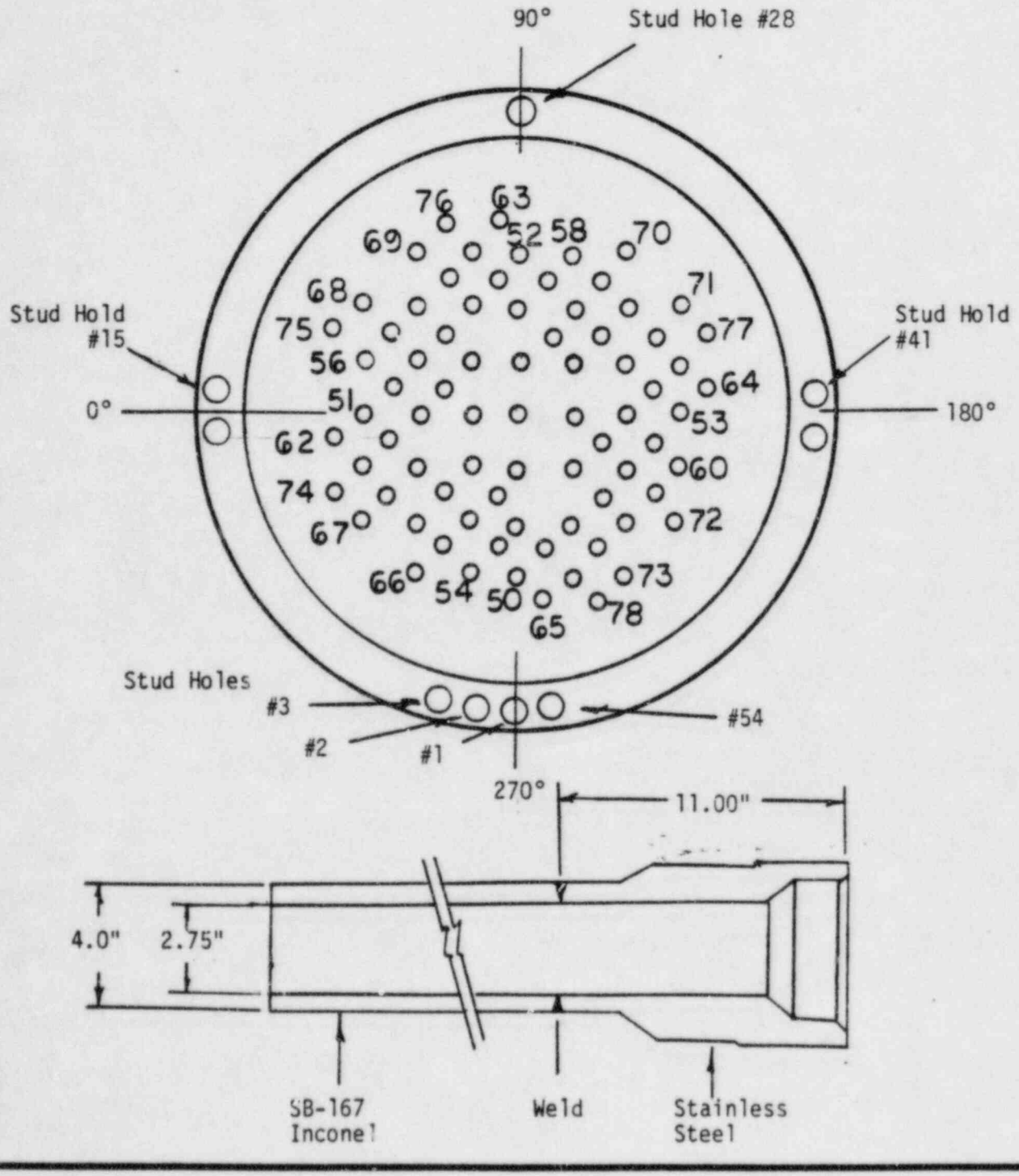
Illustrative Only

TBX-I-1300A

FORM 46146

CONTROL ROD DRIVE MECHANISMS

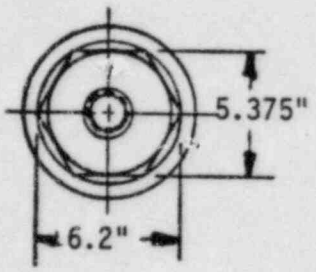
#50 thru #54
#56, 58, 60;
#62 thru 78

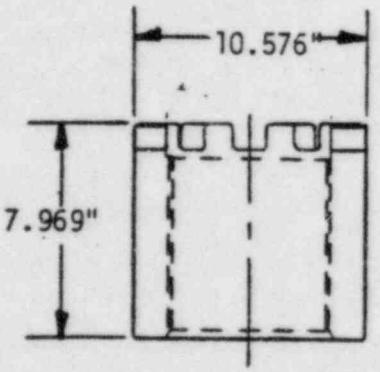


Illustrative Only

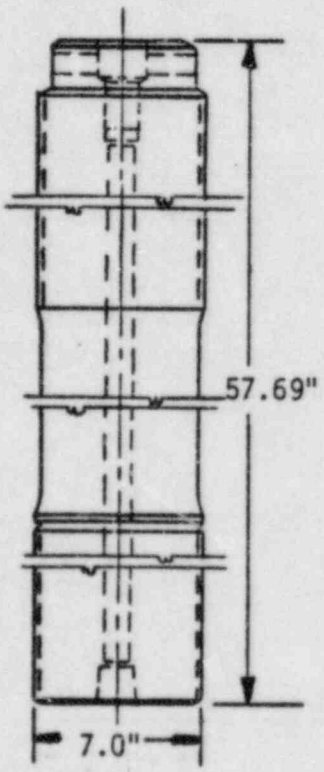
TBX-I-1400

STUDS, NUTS AND WASHERS

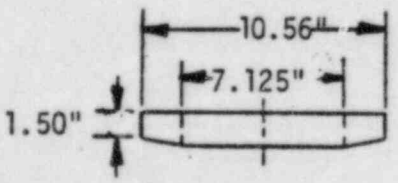




NUT



STUD



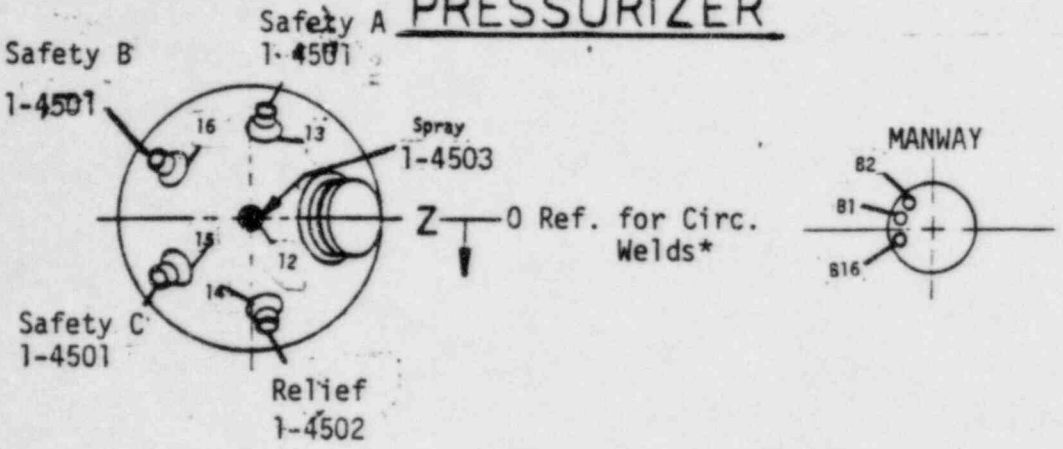
CONVEX WASHER

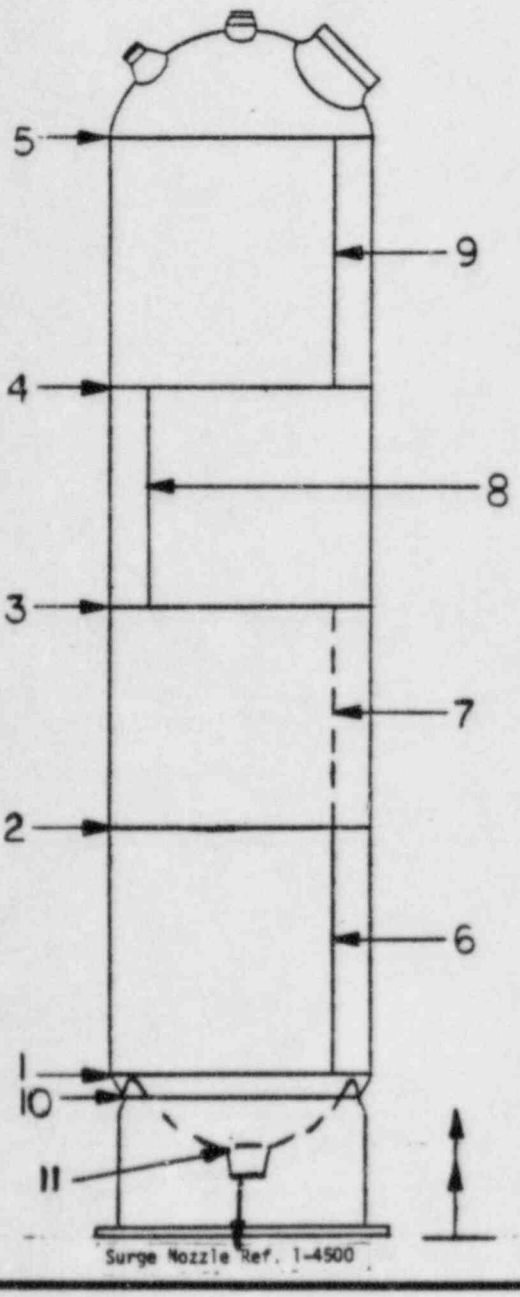
54 Studs: A540GR. B24
54 Nuts: A540GR. B24
54 Washers: A540GR. B24

ILLUSTRATIVE ONLY

TBX-I-2100

PRESSURIZER





REF. FOR LOCATING
CIRC. WELDS

LONGITUDINAL AND CIRCUMFERENTIAL
WELD LOCATION

Weld No.

1. 55.75"
2. 137.06" From Weld 1
3. 128.69" From Weld 2
4. 128.69" From Weld 3
5. 137.06" From Weld 4
6. 23.34" From Z Axis
7. 269.76" From Z Axis (-18.51)
8. 107.06" From Z Axis
9. 24.15" From Z Axis
10. 37.00"

*0" for vertical welds at centerline intersect of weld above.

Material: Shell - SA533 Gr. A Class II
92.4" Diameter - 4.0"T

Support Skirt: SA 516 Gr. 70 - 1.5"T
Head: SA 533 Gr. A Class II - 2.0"T
Manway: 16-1.875" Diameter Bolts

*0" for circ. welds at centerline intersect of above vertical weld.

Note: Welds #11 thru #16 are nozzle to vessel welds.

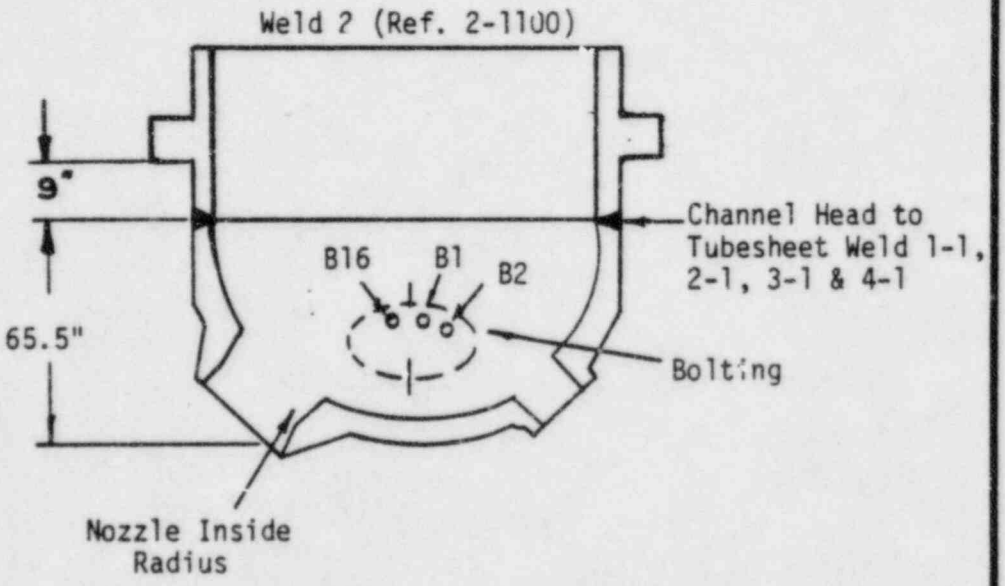
FORM 46446

Illustrative Only

TBX-1-3100

STEAM GENERATORS 1,2,3&4

Material: 5.45"T SA508 Class 2 Carbon Steel
Diameter: 135.38" Circumference: 426.09"
Bolting: 2 manways each generator - 16 Bolts - 1.88" Diameter

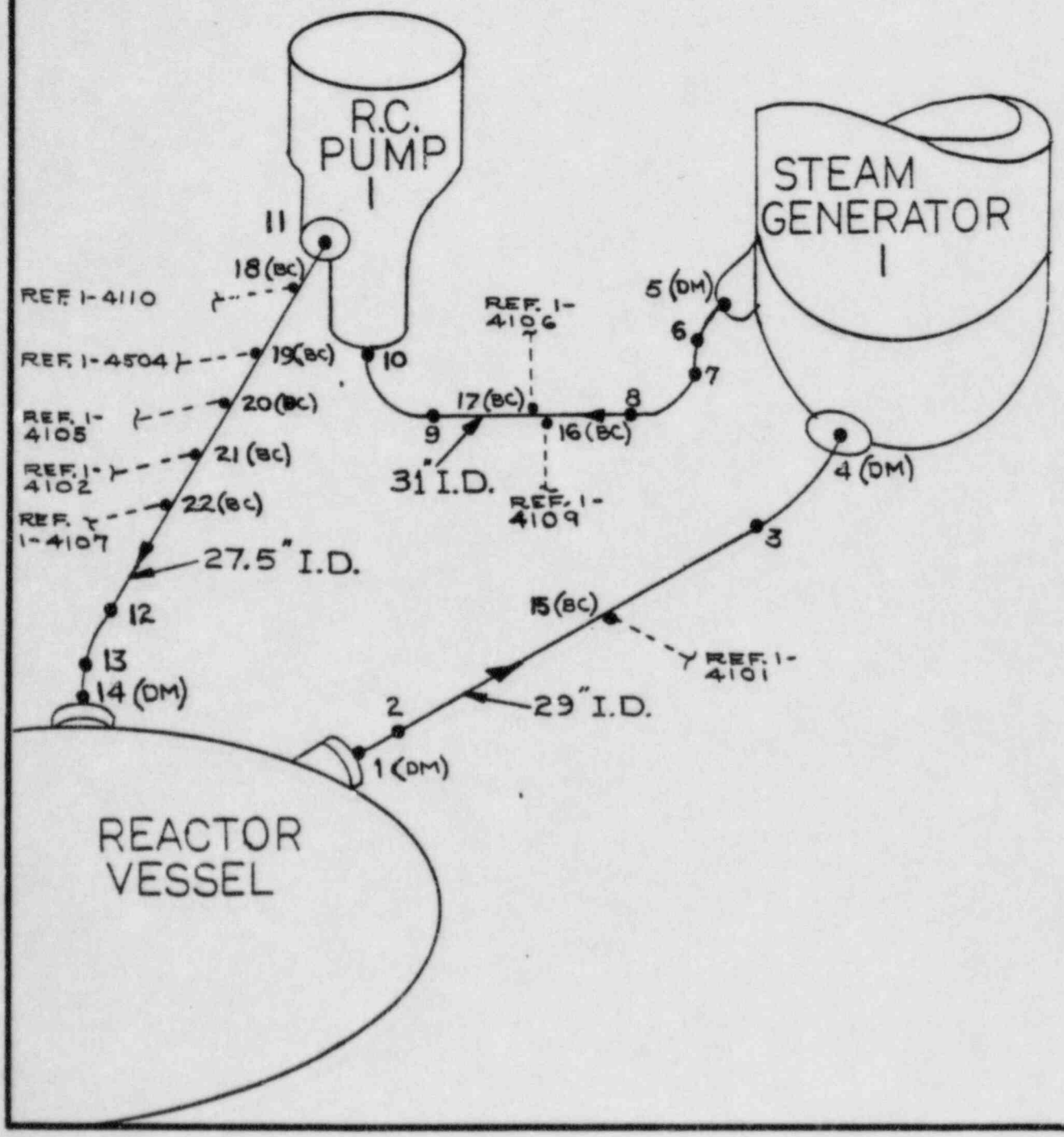


Steam Generator	Weld	Manway	Bolting	Nozzle Inside Radius
1	1-1	Hotside	1-B1 to 1-B16	1A
		Coldside	1-B17 to 1-B32	1B
2	2-1	Hotside	2-B1 to 2-B16	2A
		Coldside	2-B17 to 2-B32	2B
3	3-1	Hotside	3-B1 to 3-B16	3A
		Coldside	3-B17 to 3-B32	3B
4	4-1	Hotside	4-B1 to 4-B16	4A
		Coldside	4-B17 to 4-B32	4B

WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4100

LOOP 1 REACTOR COOLANT PIPE

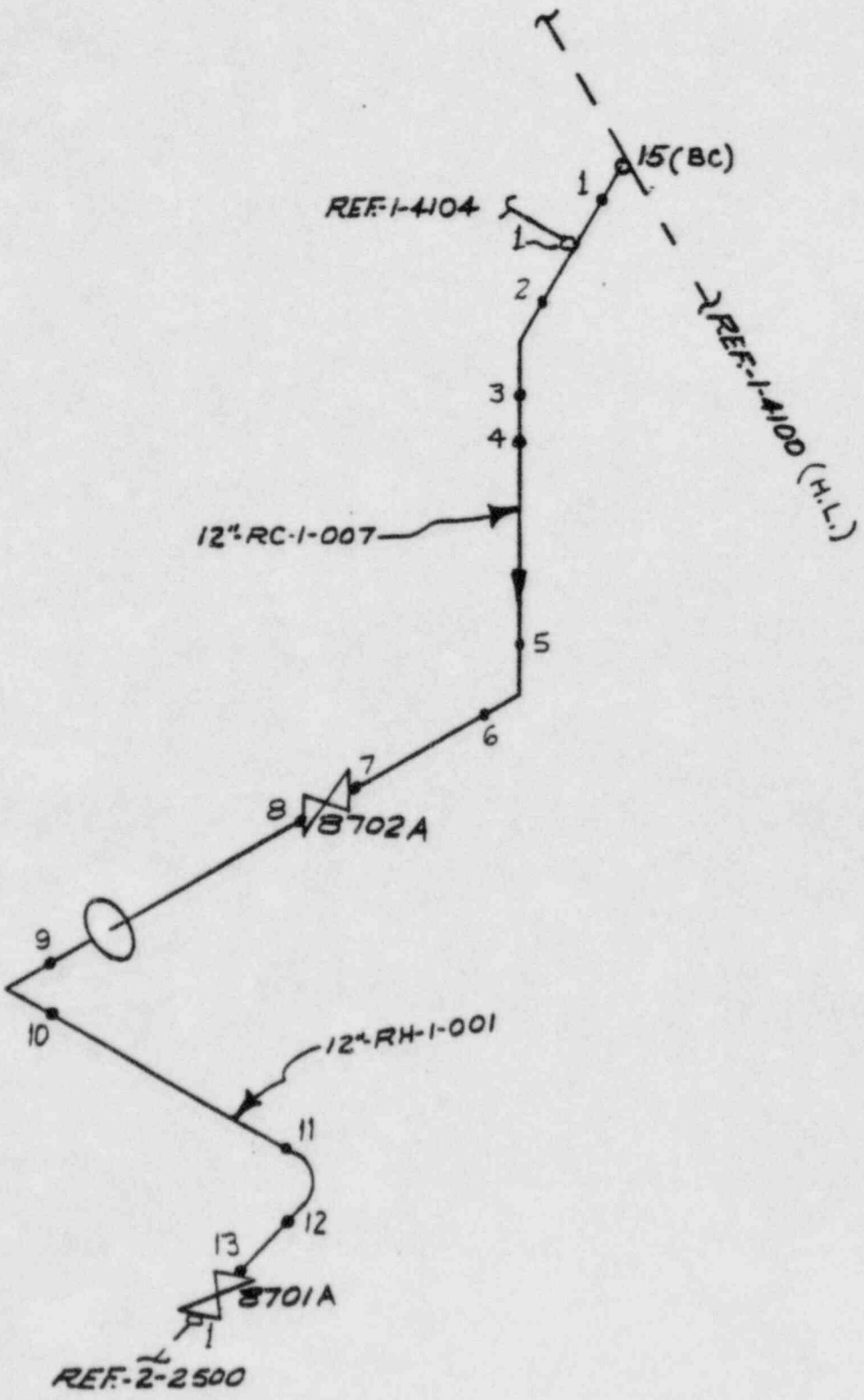


WESTINGHOUSE ELECTRIC CORPORATION

TBX-I-4101

RHR TAKE-OFF

12" Sch. 140 1.125"T SS

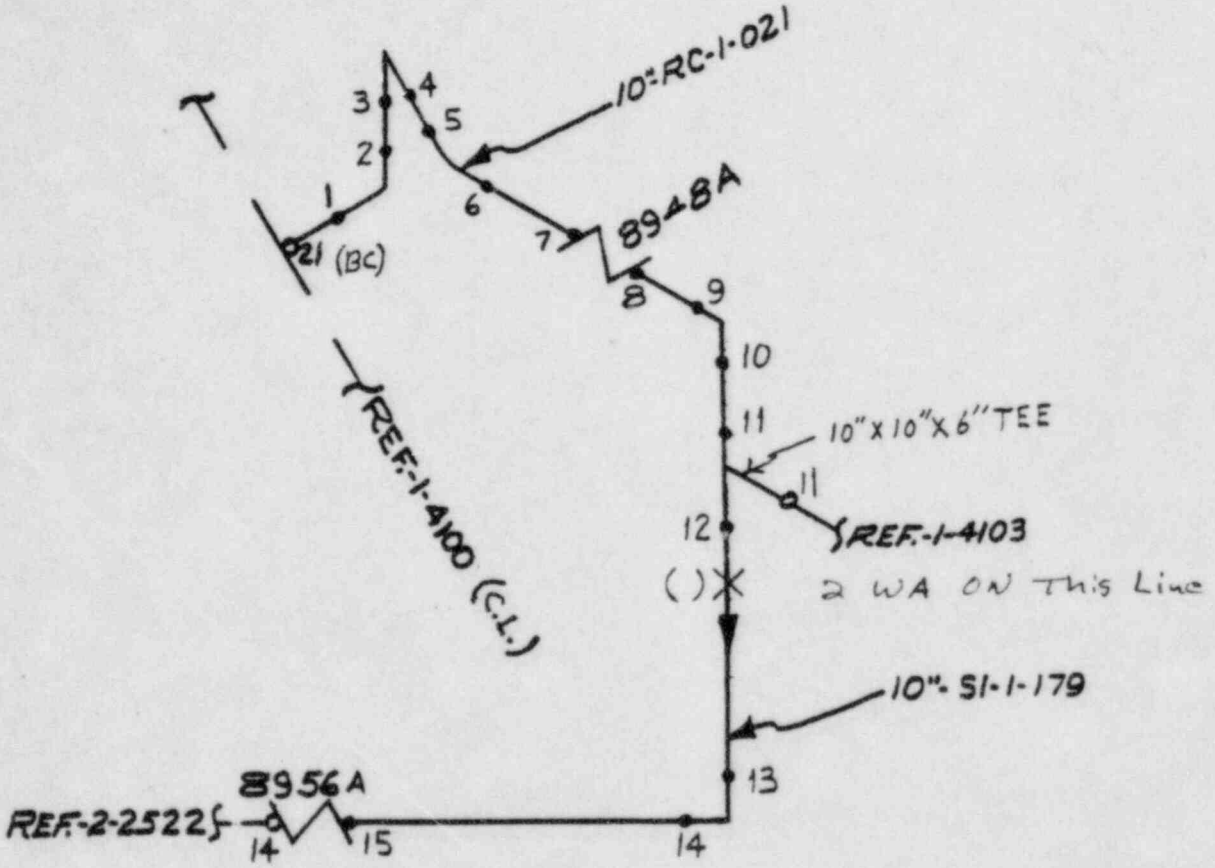


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4102

ACCUMULATOR DISCHARGE

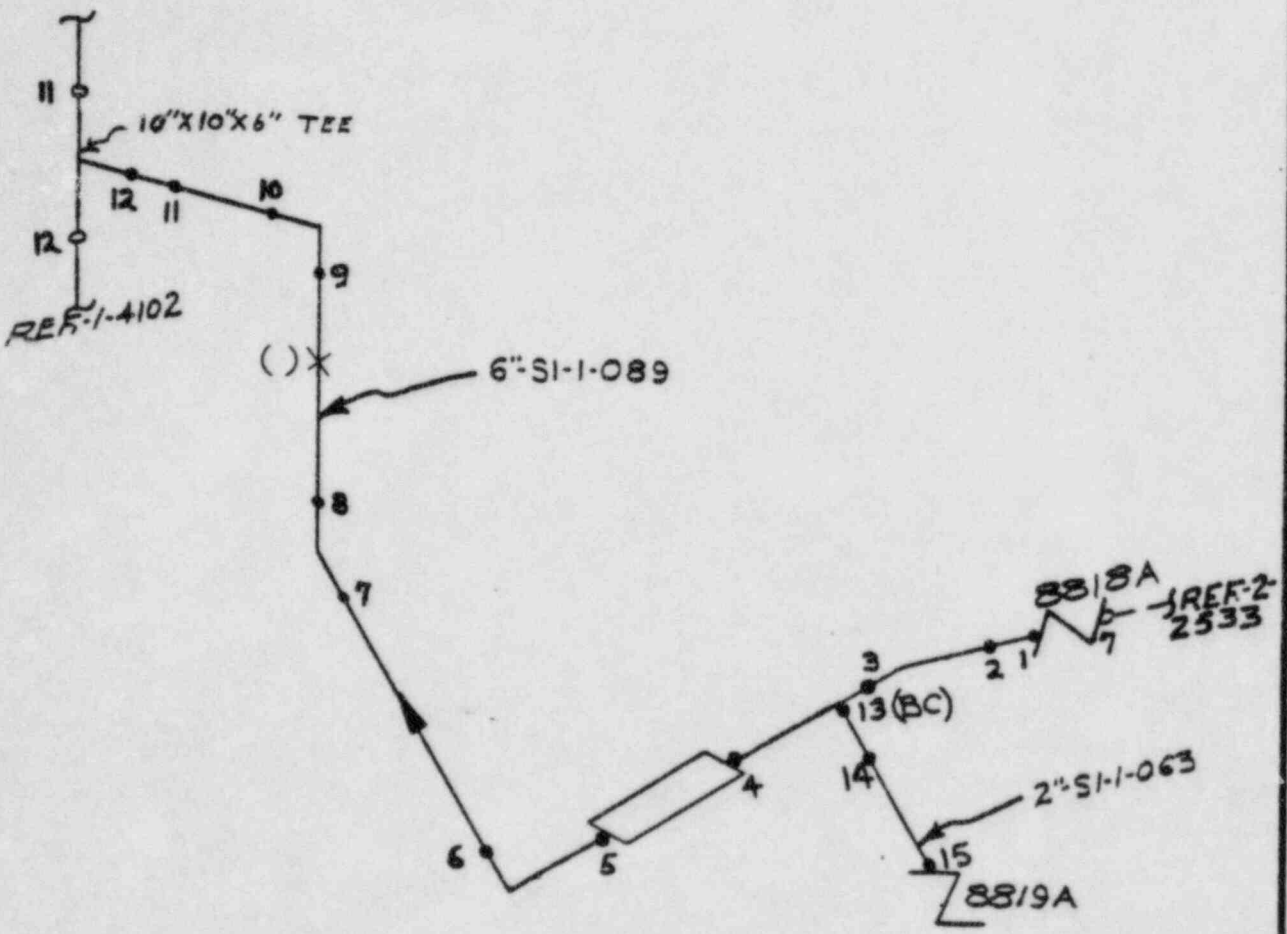
10" Sch. 140 1.00"T SS



TBX-1-4103

6" Sch. 160 .719"T SS
2" Sch. 160 .344"T SS

SIS

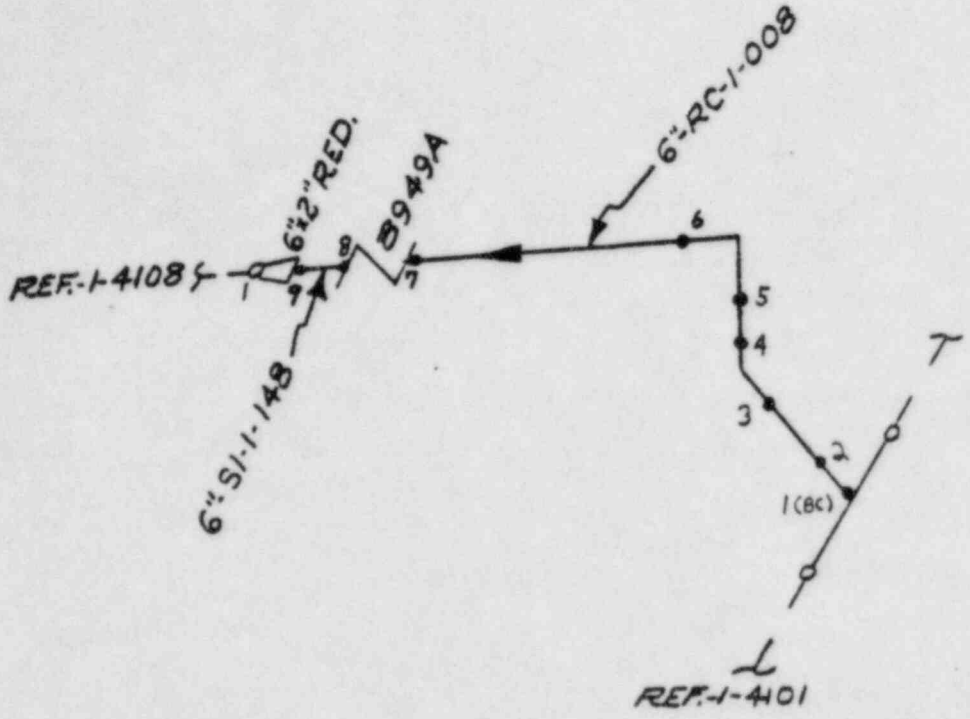


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4104

6" Sch. 160 .719"T SS

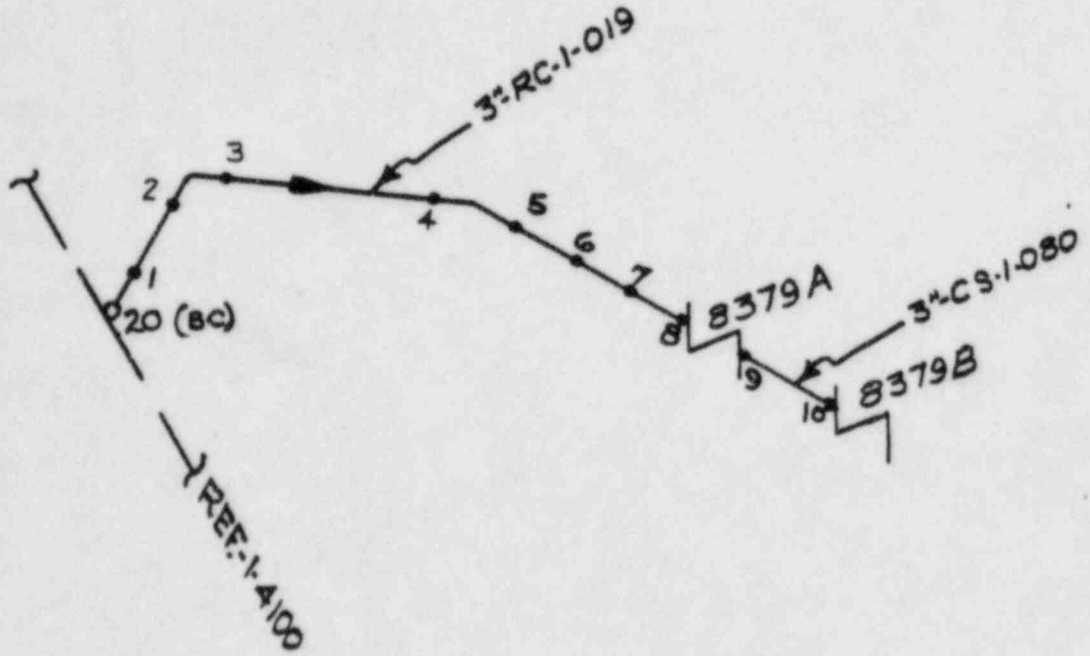
SIS



TBX-1-4105

CHARGING (ALTERNATE)

3" Sch. 160 .438"T SS

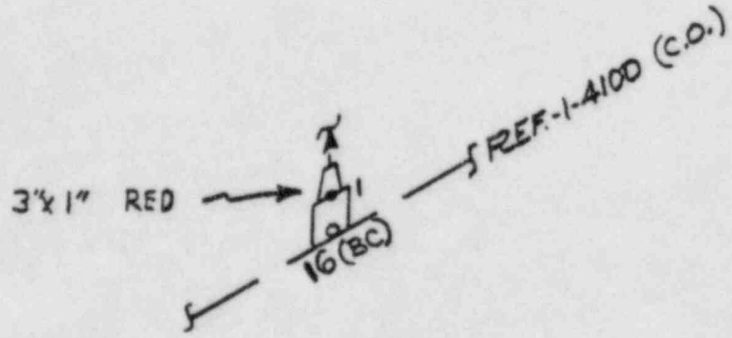


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4106

R.T.D. RETURN

3" Sch. 160 .438"T SS



FORM 464

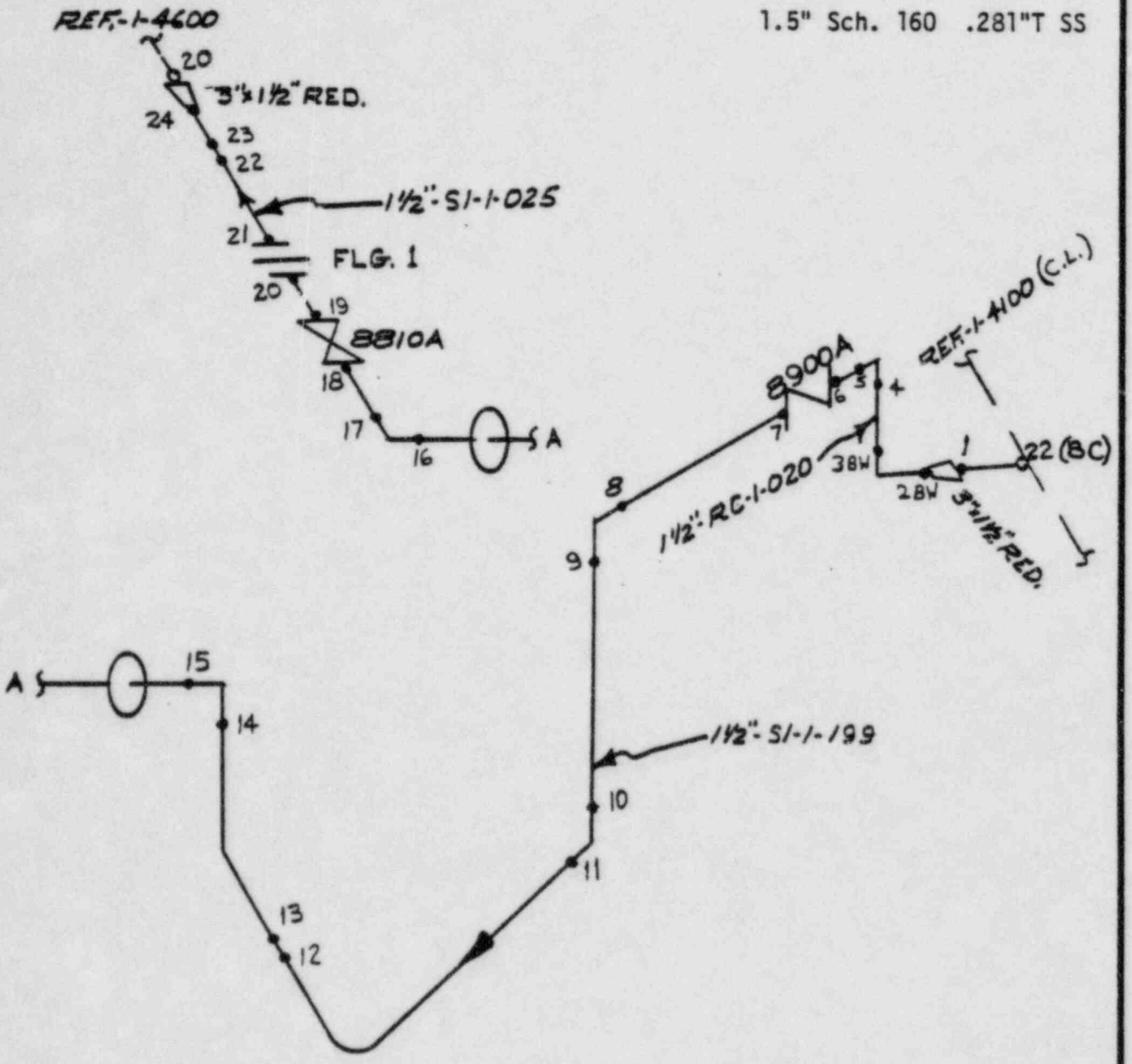
WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4107

SIS

3" Sch. 160 .438"T SS

1.5" Sch. 160 .281"T SS

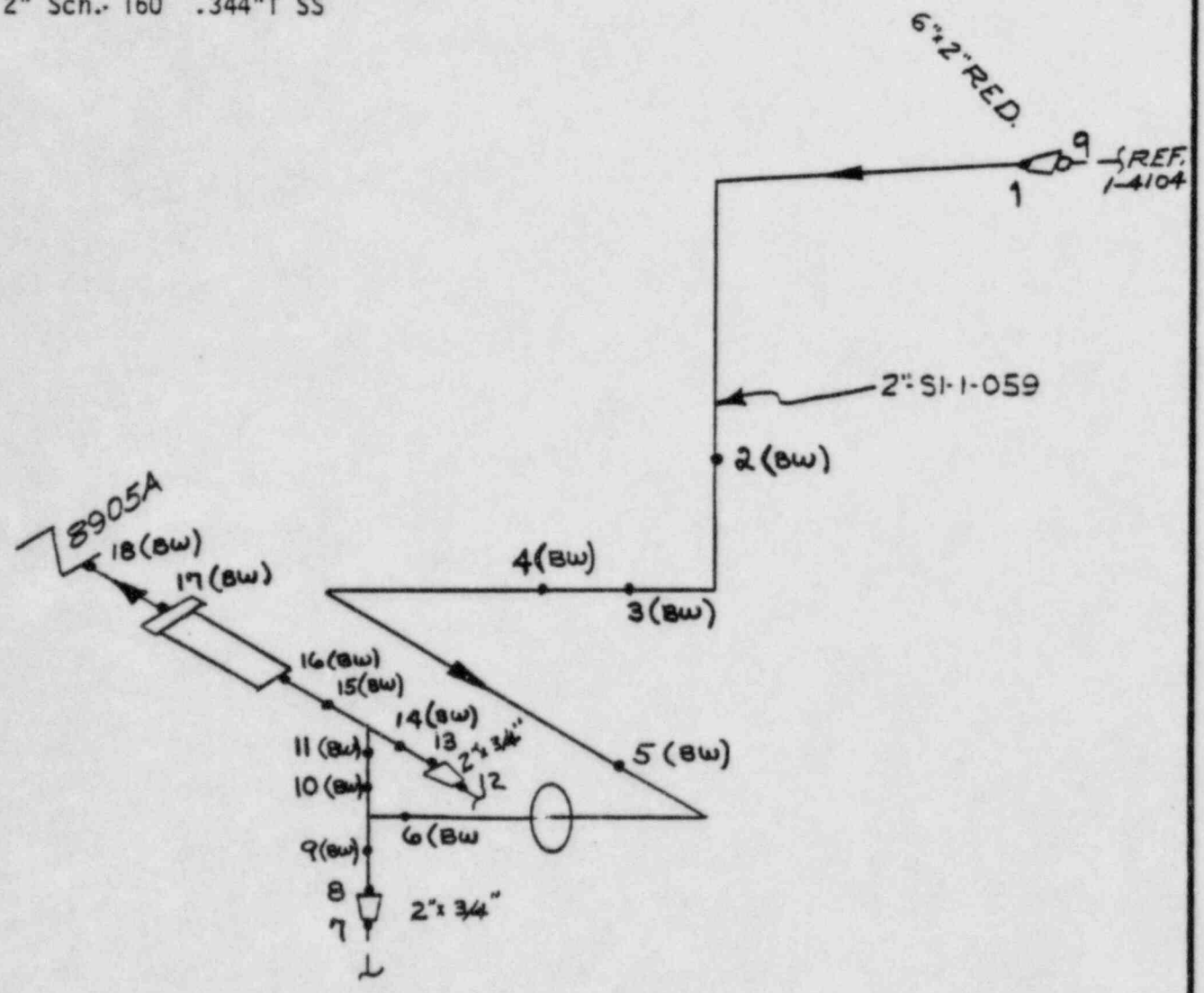


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4108

SIS

2" Sch.- 160 .344"T SS

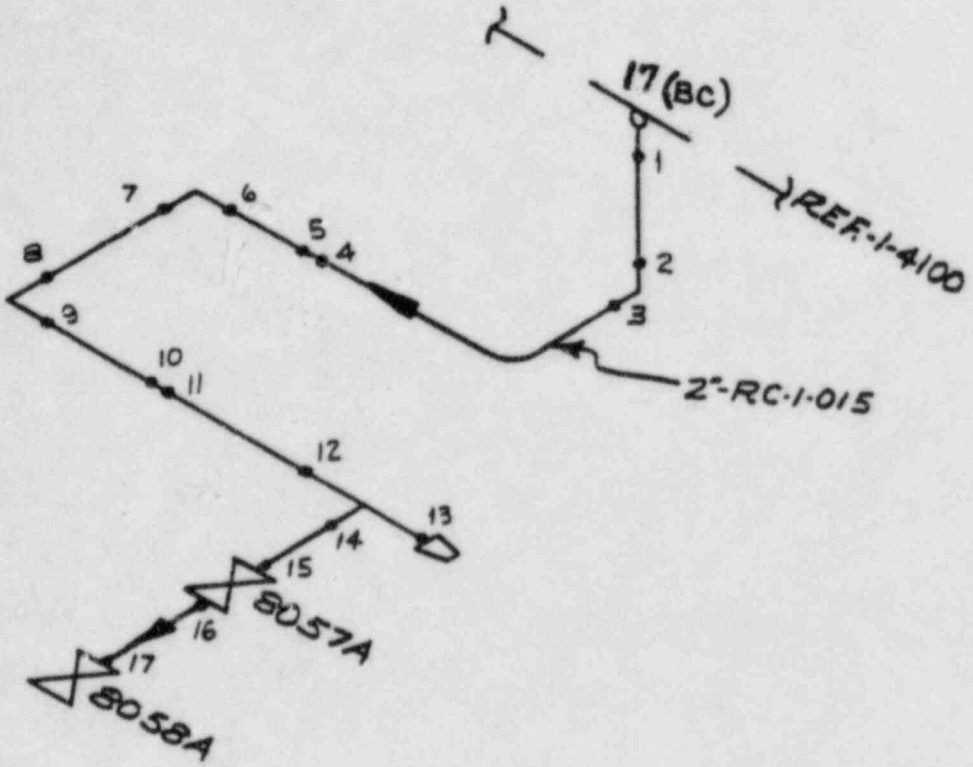


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4109

DRAIN LINE

2" Sch. 160 .344"T SS

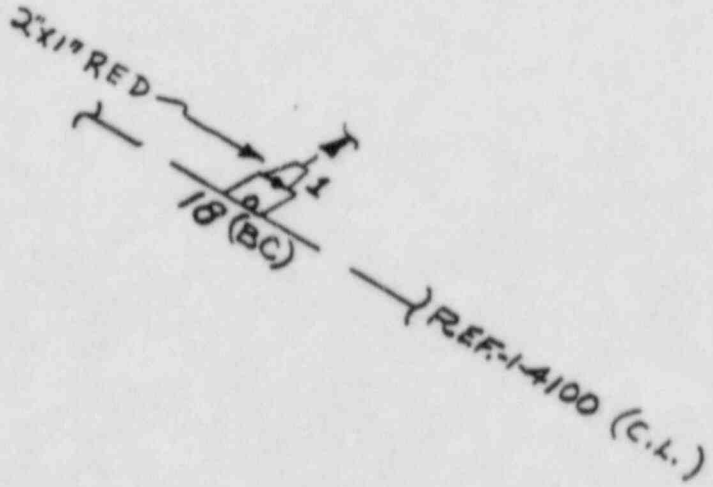


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4110

R.T.D.

2" Sch. 160 .344"T SS

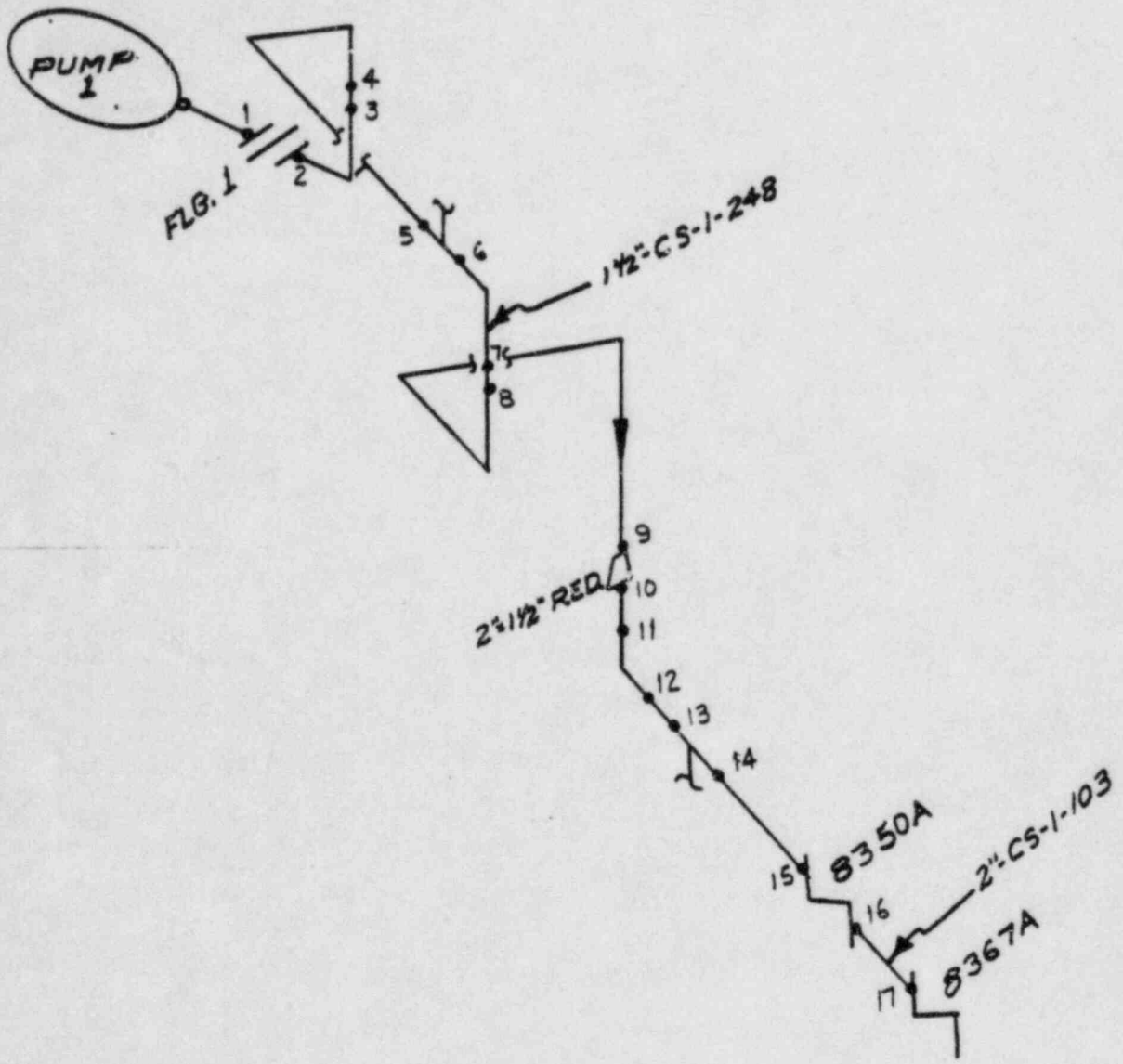


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4111

SEAL INJECTION

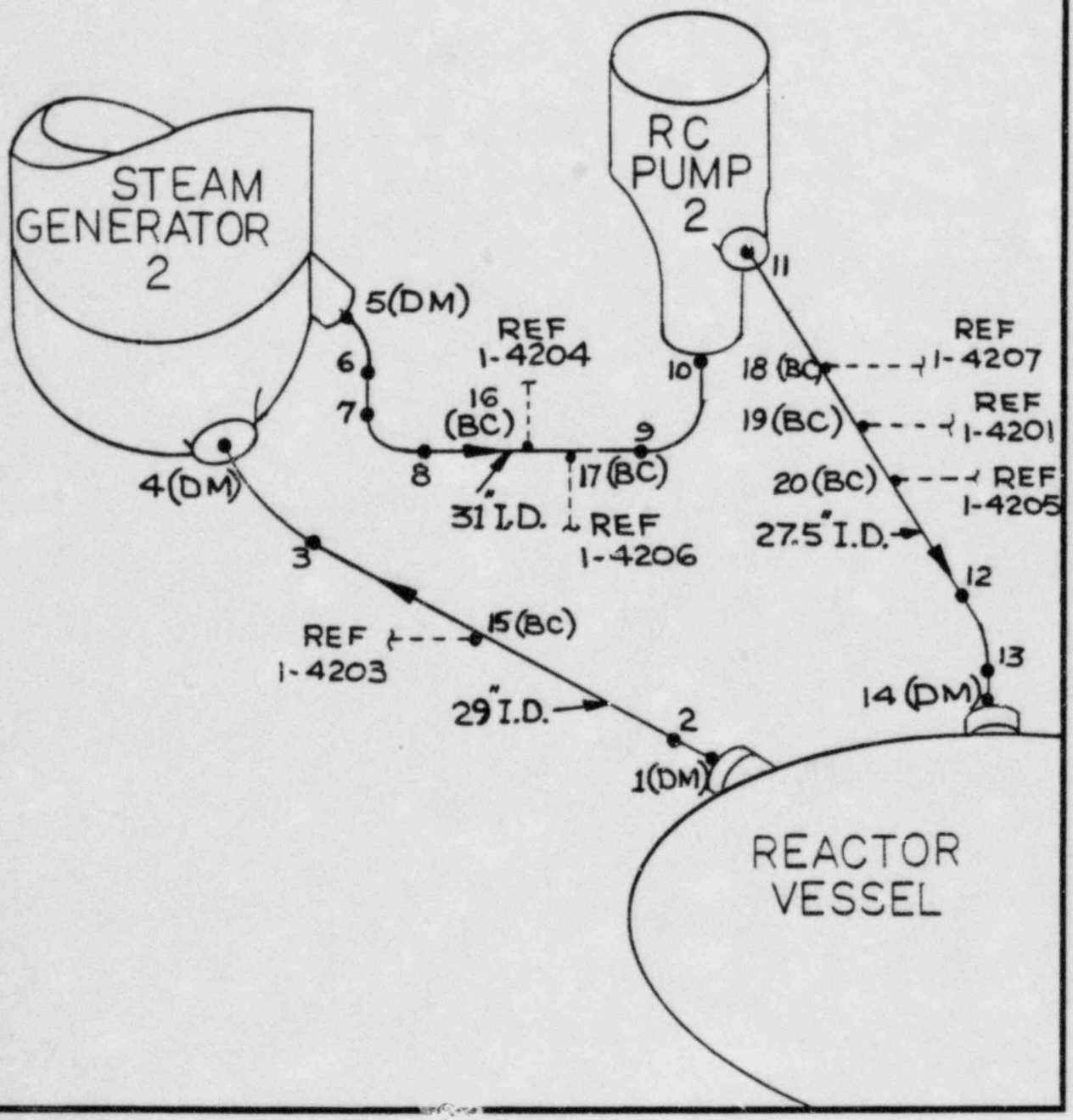
2" Sch. 160 .344"T SS (BW)
1.5" Sch. 160 .281"T SS (BW)



WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4200

LOOP 2 REACTOR COOLANT PIPE

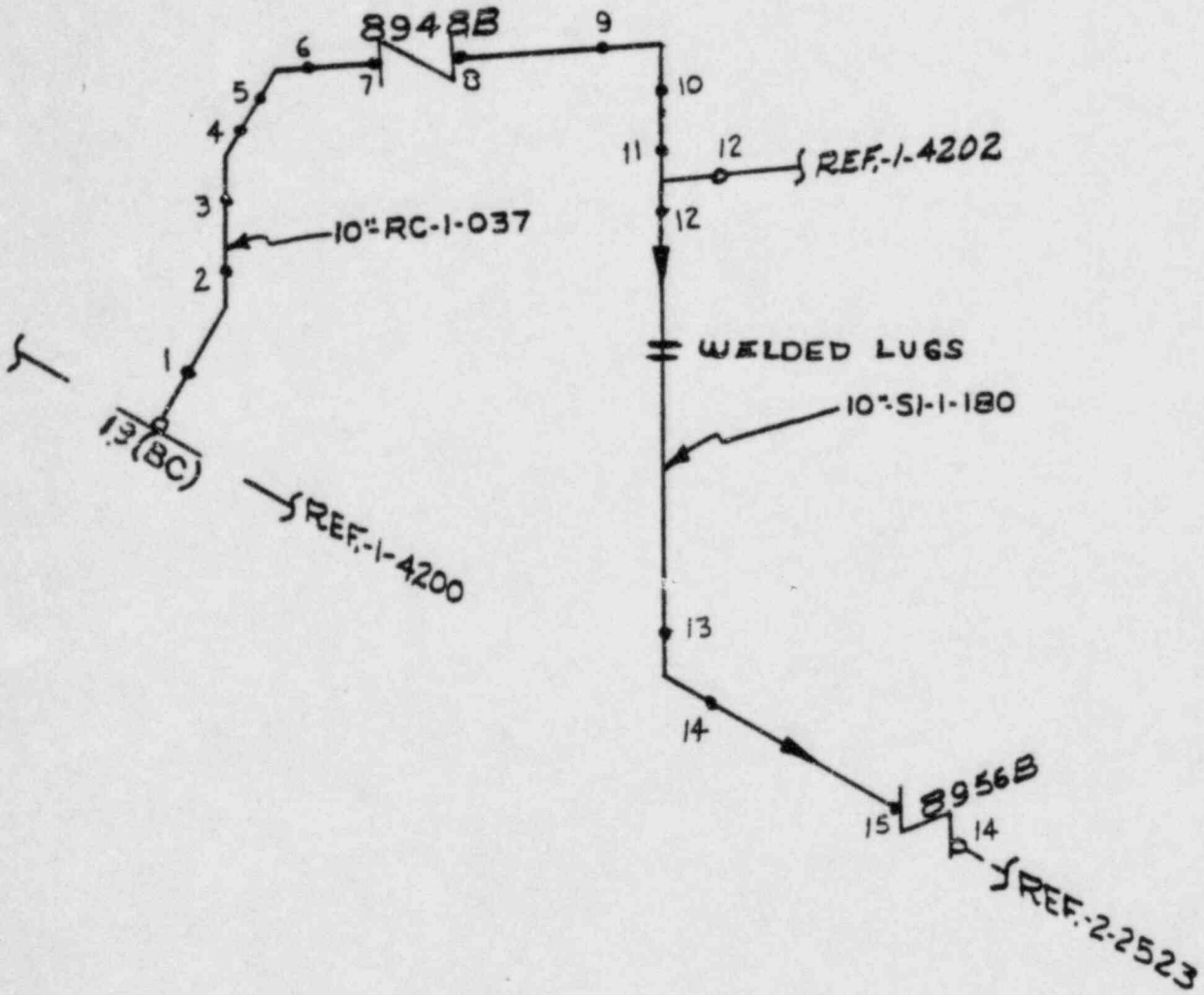


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4201

ACCUMULATOR DISCHARGE

10" Sch. 140 1.00"T SS



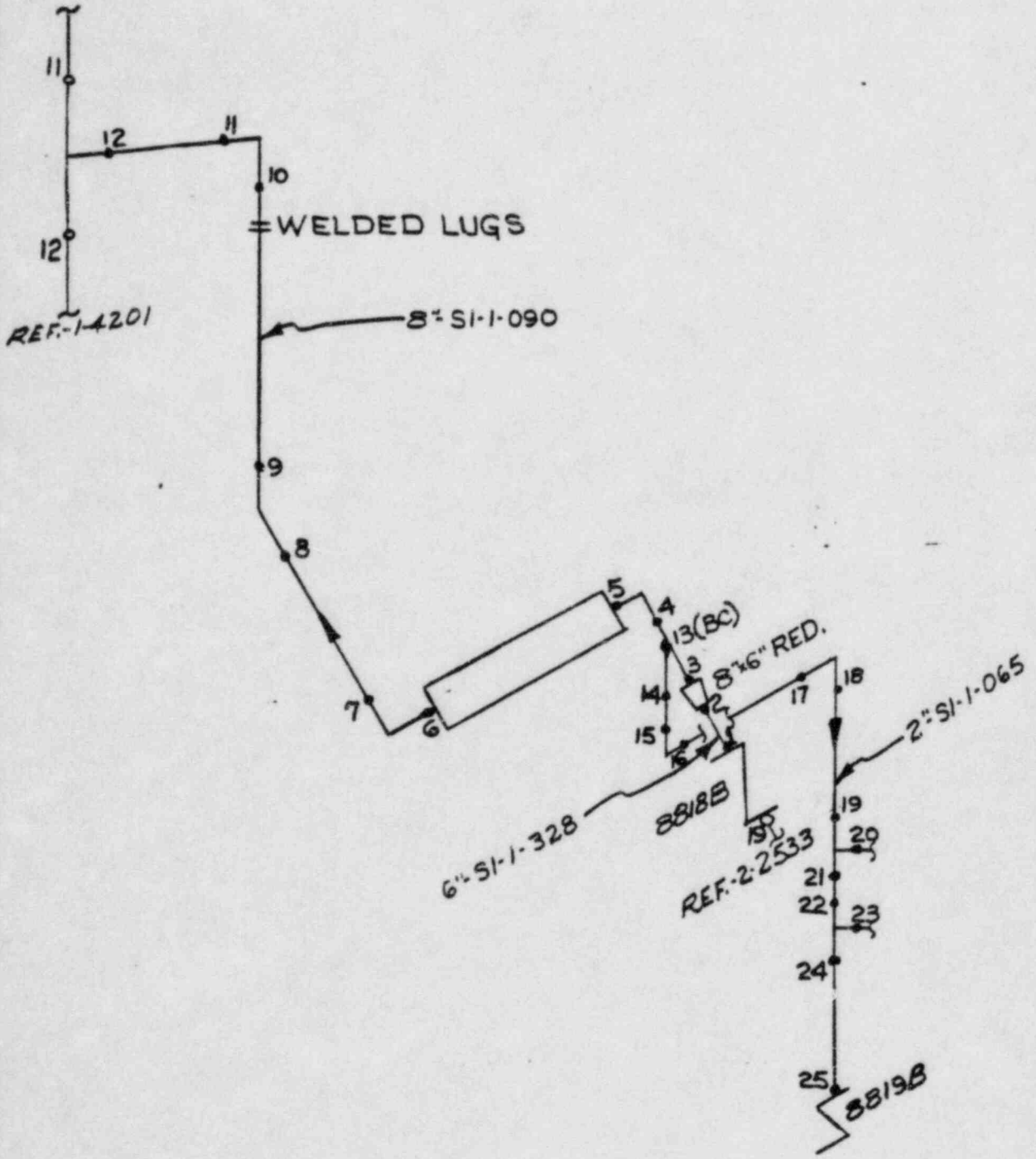
WESTINGHOUSE ELECTRIC CORPORATION

FORM 46448

8" Sch. 160 .906"T SS
6" Sch. 160 .719"T SS
2" Sch. 160 .344"T SS

SIS

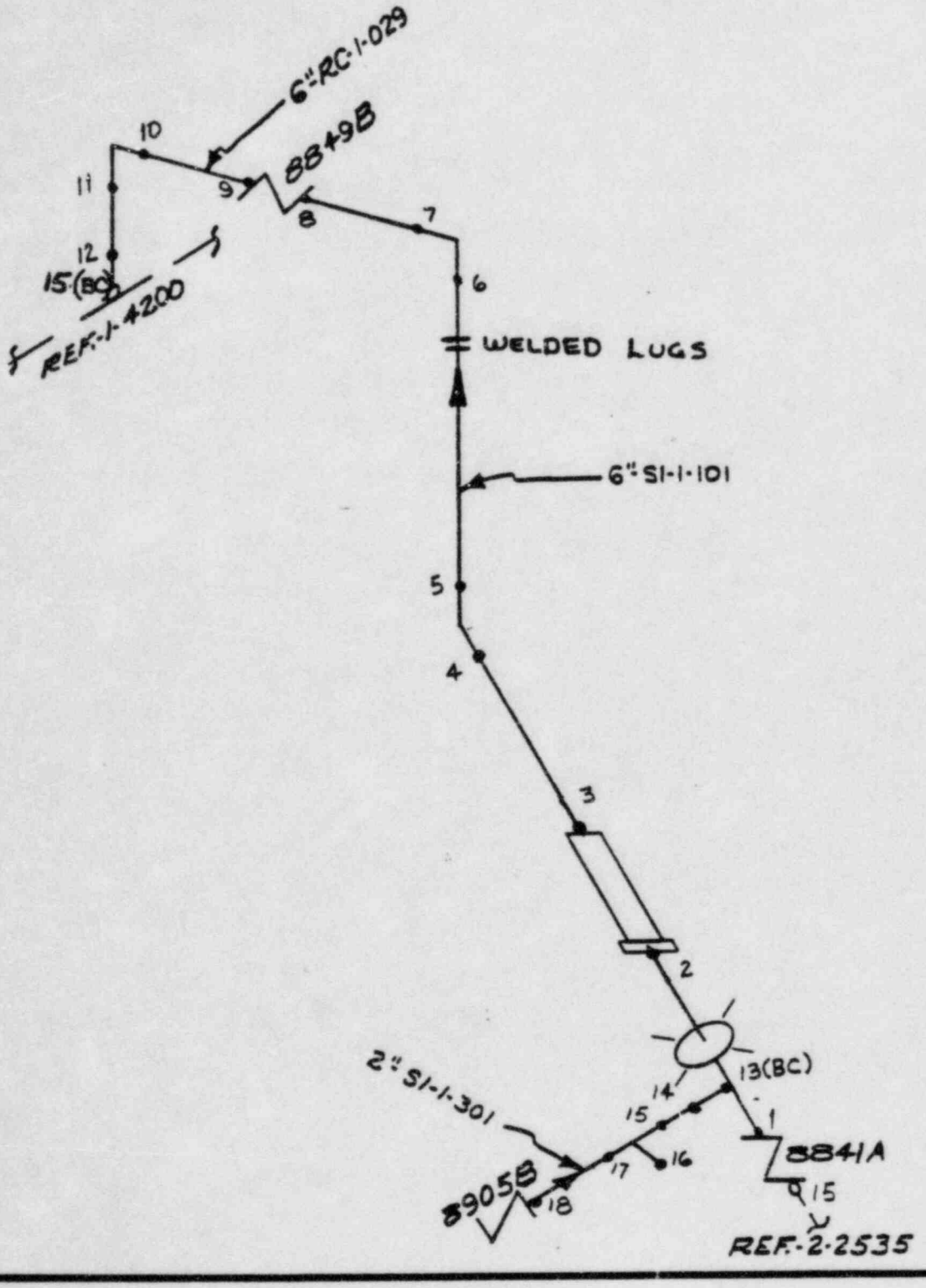
TBX-1-4202



TBX-1-4203

SIS

6" Sch. 160 .719"T SS
2" Sch. 160 .344"T SS

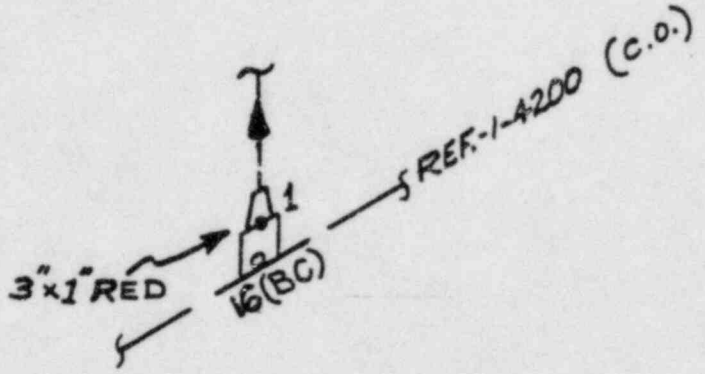


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4204

R.T.D. RETURN

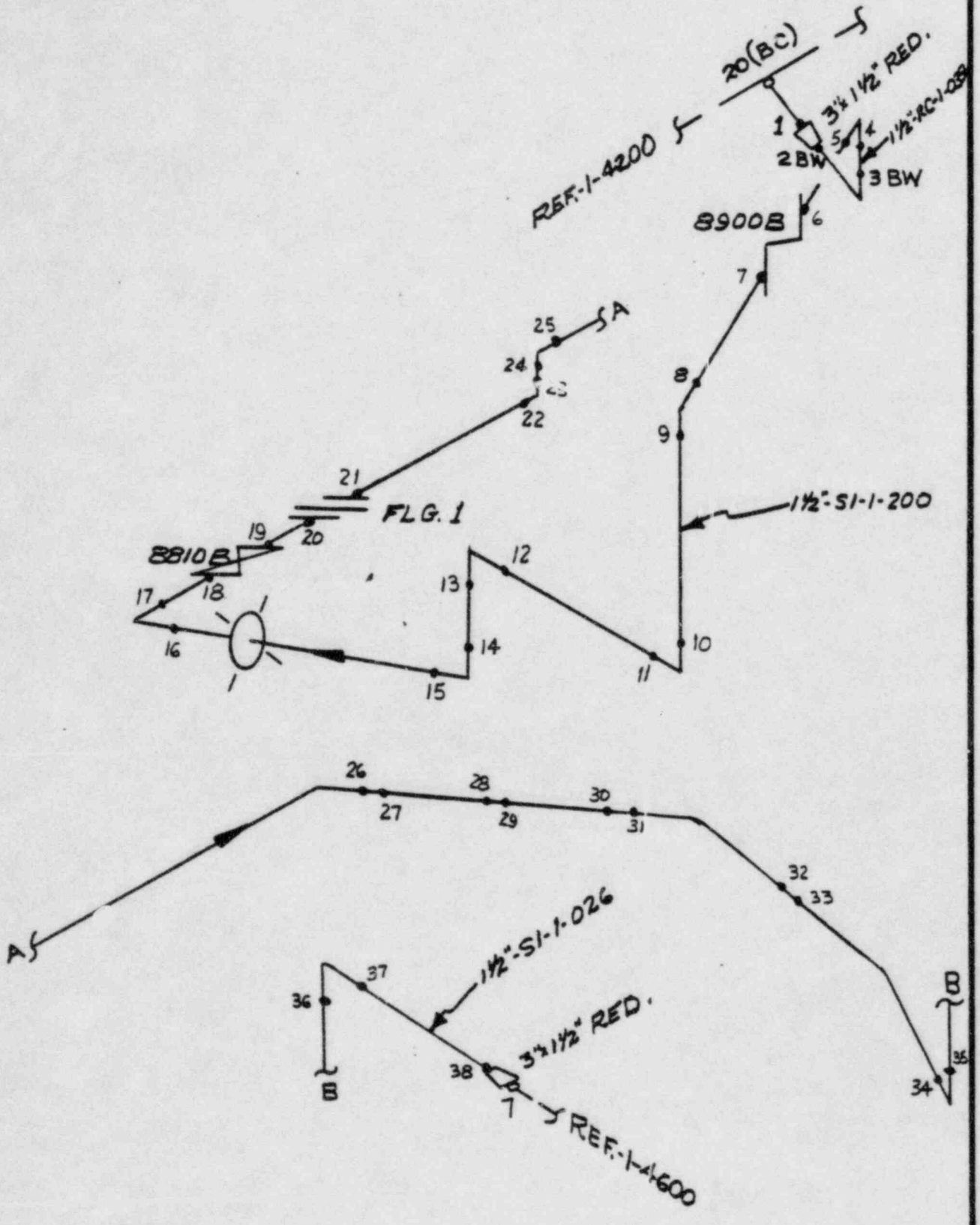
3" Sch. 160 .438"T SS



TBX-1-4205

3" Sch. 160 .438"T SS
1.5" Sch. 160 .281"T SS

SIS



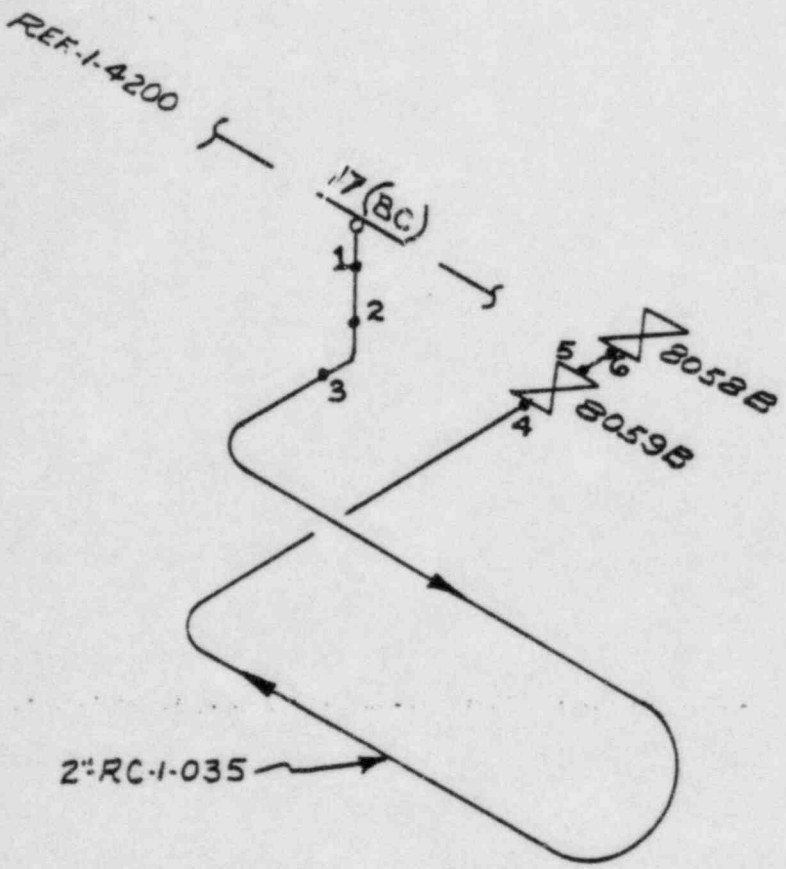
WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4206

DRAIN LINE

2" Sch. 160 .344"T SS

FORM 46446

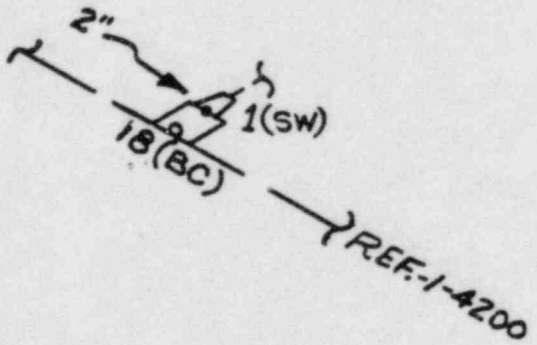


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4207

R.T.D.

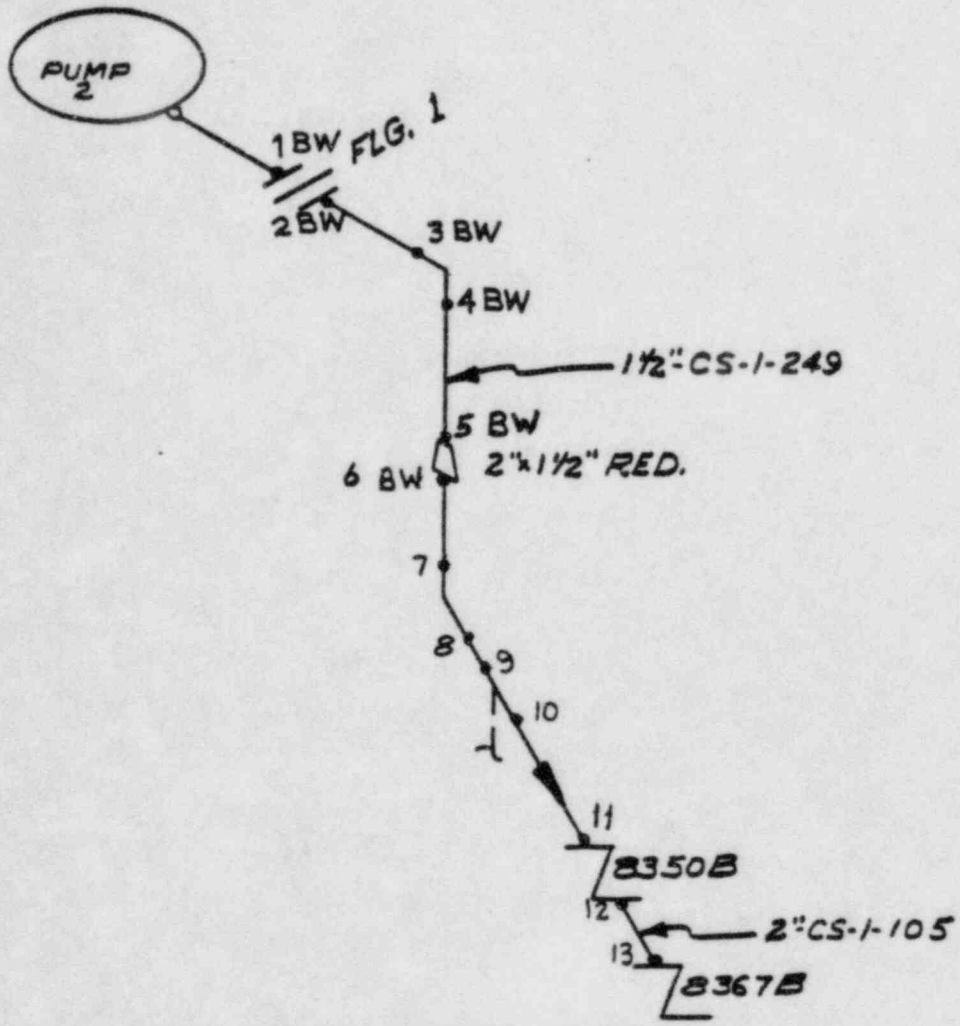
2" Sch. 160 .344"T SS



TBX-1-4208

SEAL INJECTION

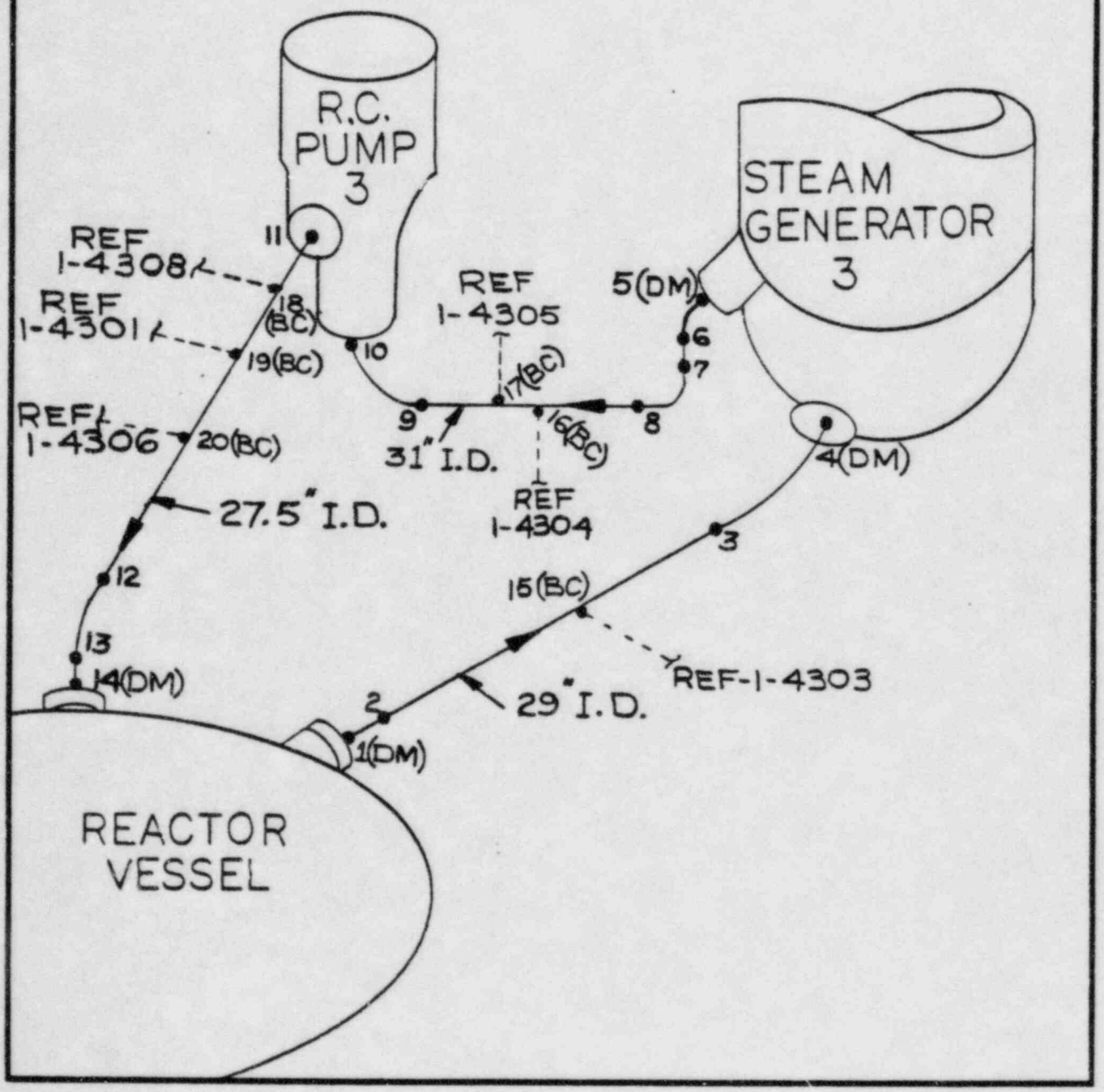
2" Sch. 160 .344"T SS
1.5" Sch. 160 .281"T SS



FORM 46446

TBX-1-4300

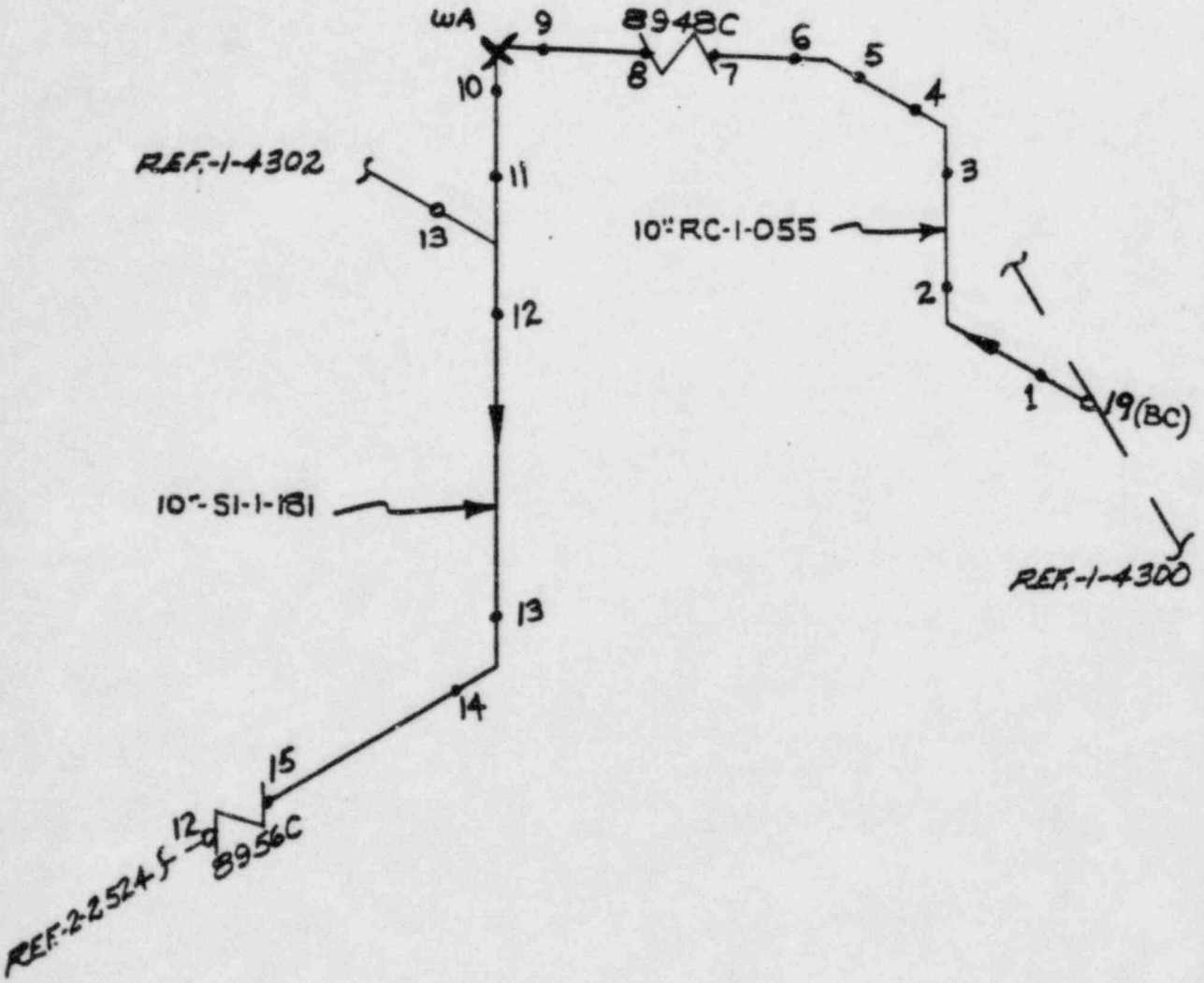
LOOP 3 REACTOR COOLANT PIPE



TBX-1-4301

ACCUMULATOR DISCHARGE

10" Sch. 140 1.00"T SS

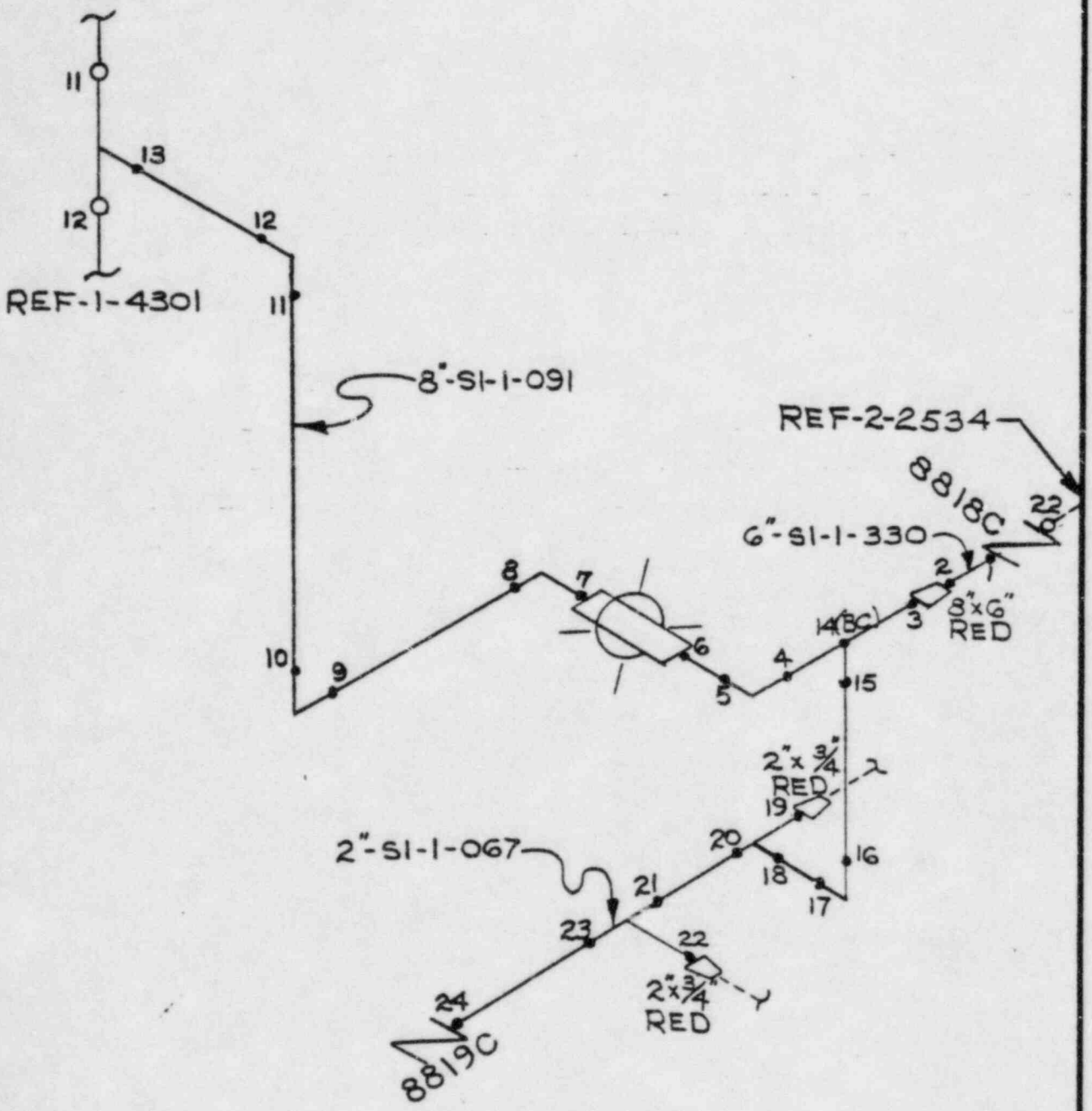


FORM 46446

TBX-1-4302

8" Sch. 160	.906"T SS
6" Sch. 160	.719"T SS
2" Sch. 160	.344"T SS

SIS

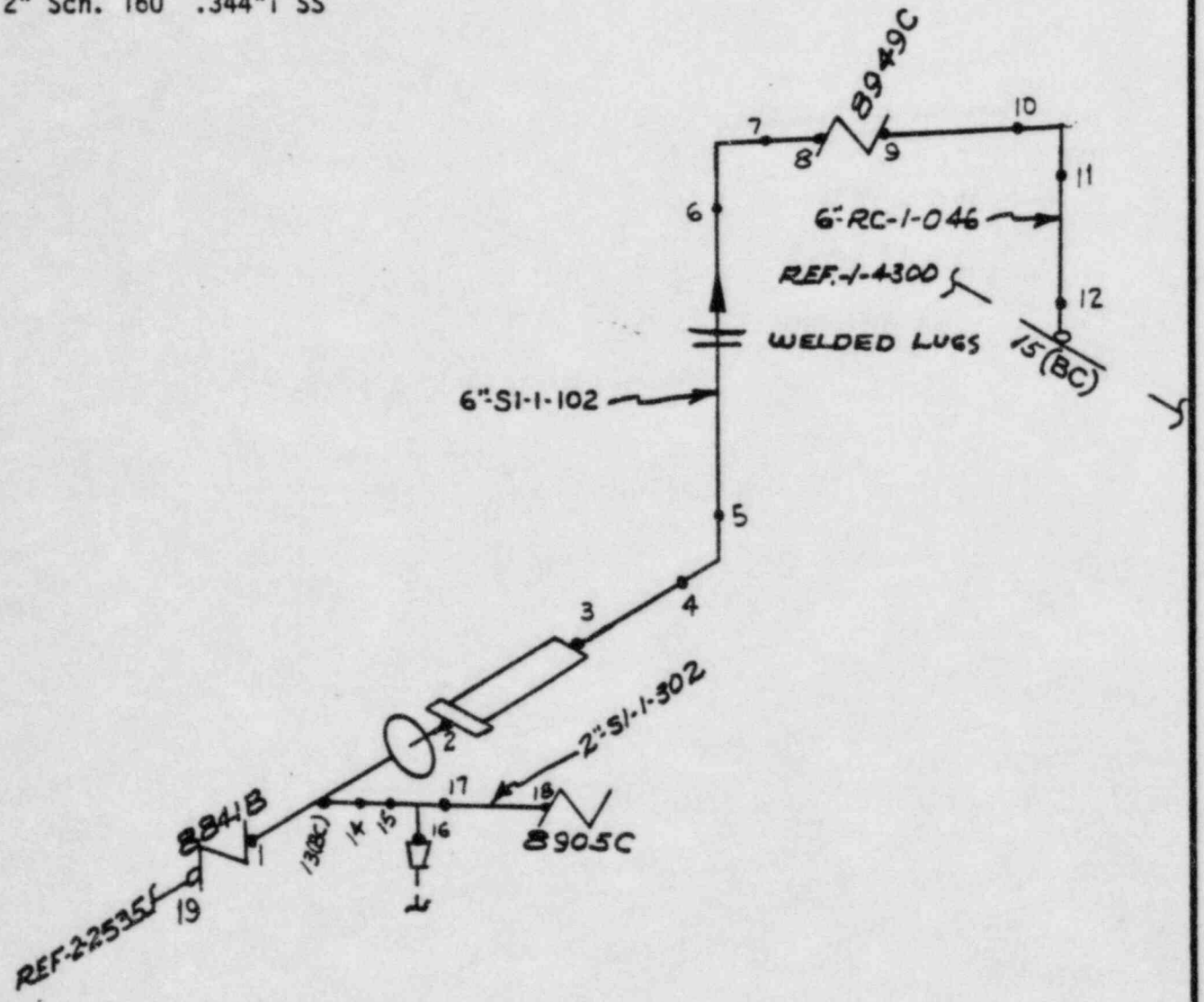


TBX-1-4303

SIS

6" Sch. 160 .719"T SS

2" Sch. 160 .344"T SS

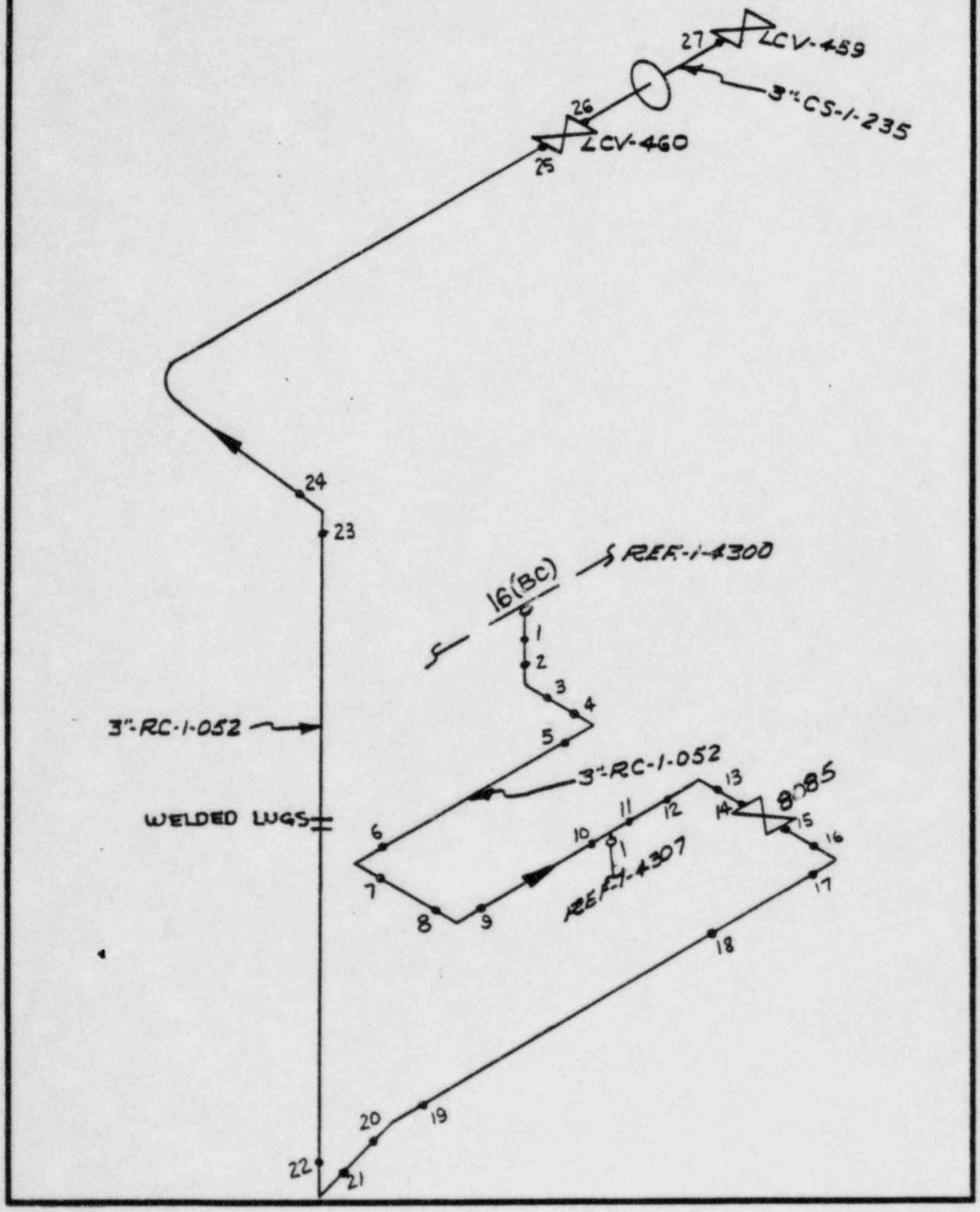


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4304

LETDOWN

3" Sch. 160 .438"T SS

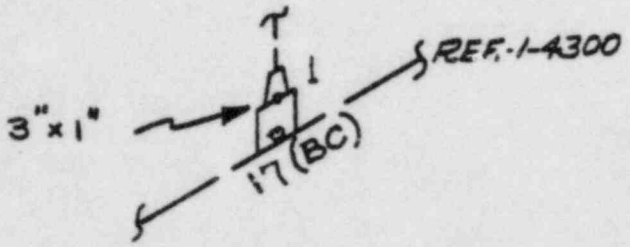


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4305

R.T.D. RETURN

3" Sch. 160 .438"T SS



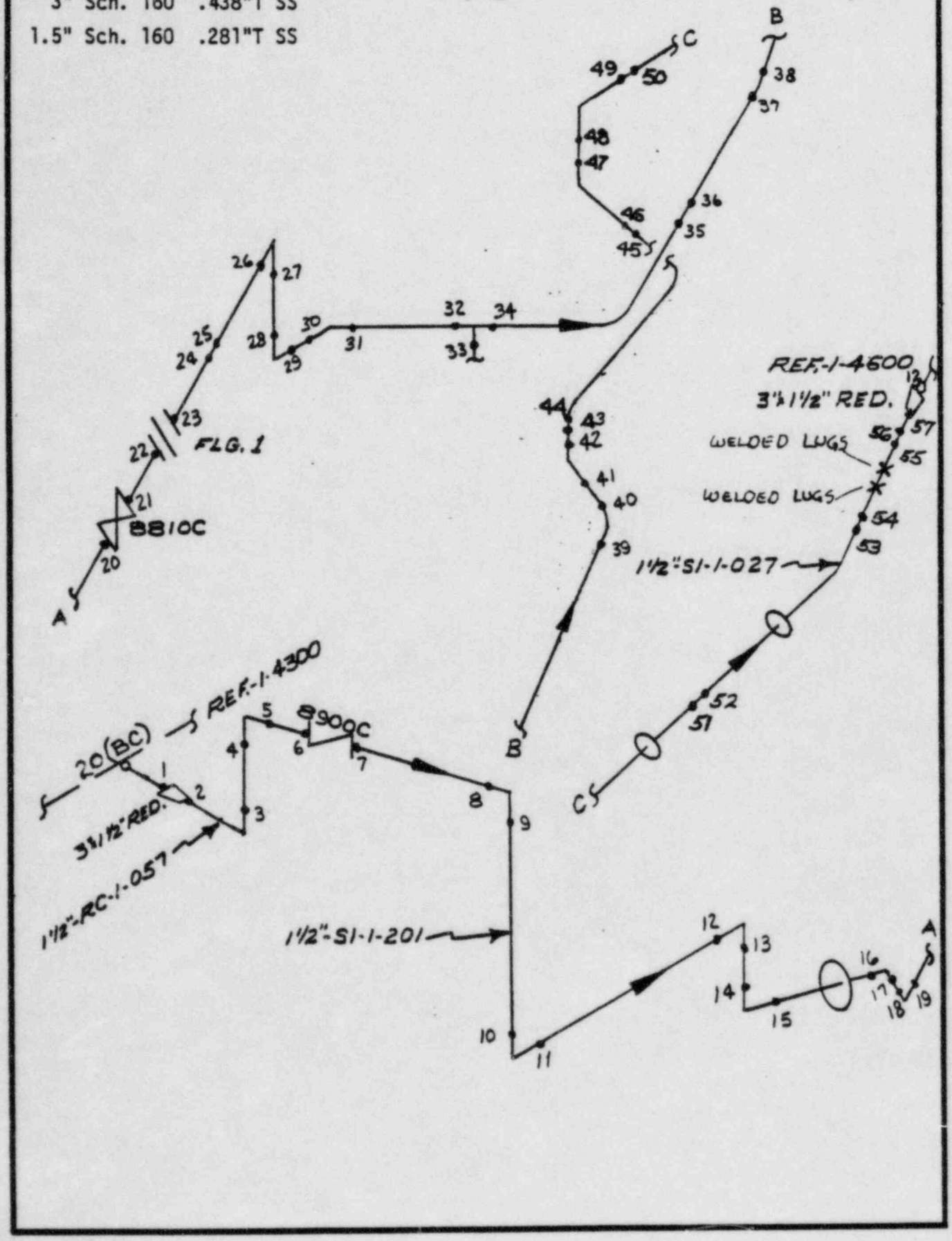
WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4306

SIS

3" Sch. 160 .438"T SS

1.5" Sch. 160 .281"T SS

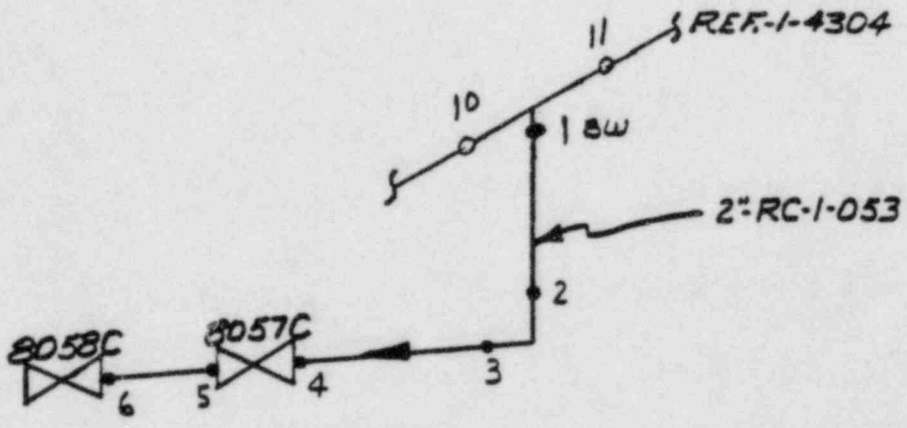


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4307

DRAIN LINE

2" Sch. 160 .344"T SS

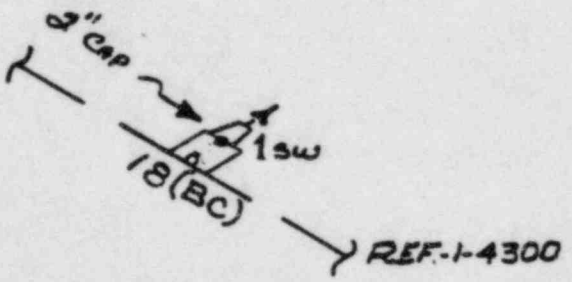


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4308

RTD

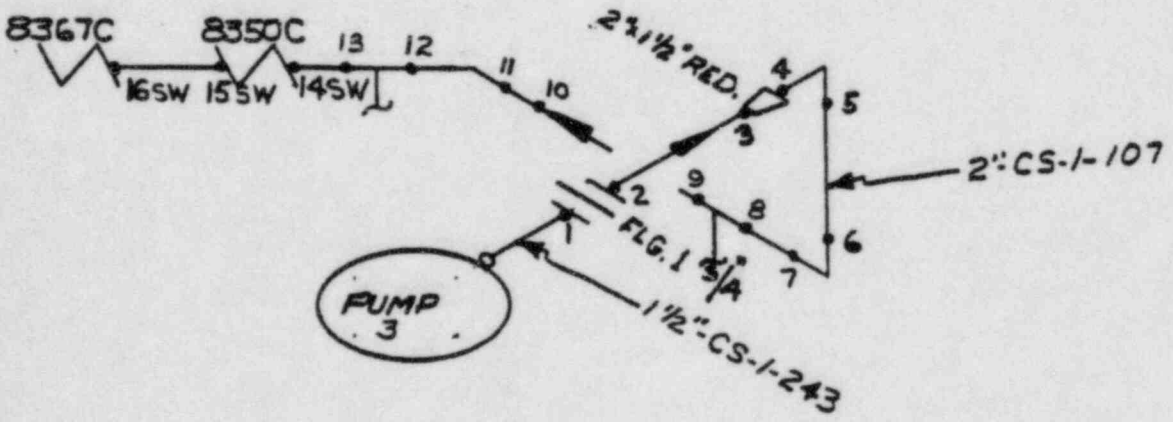
2" Sch. 160 .344"T SS



TBX-1-4309

SEAL INJECTION

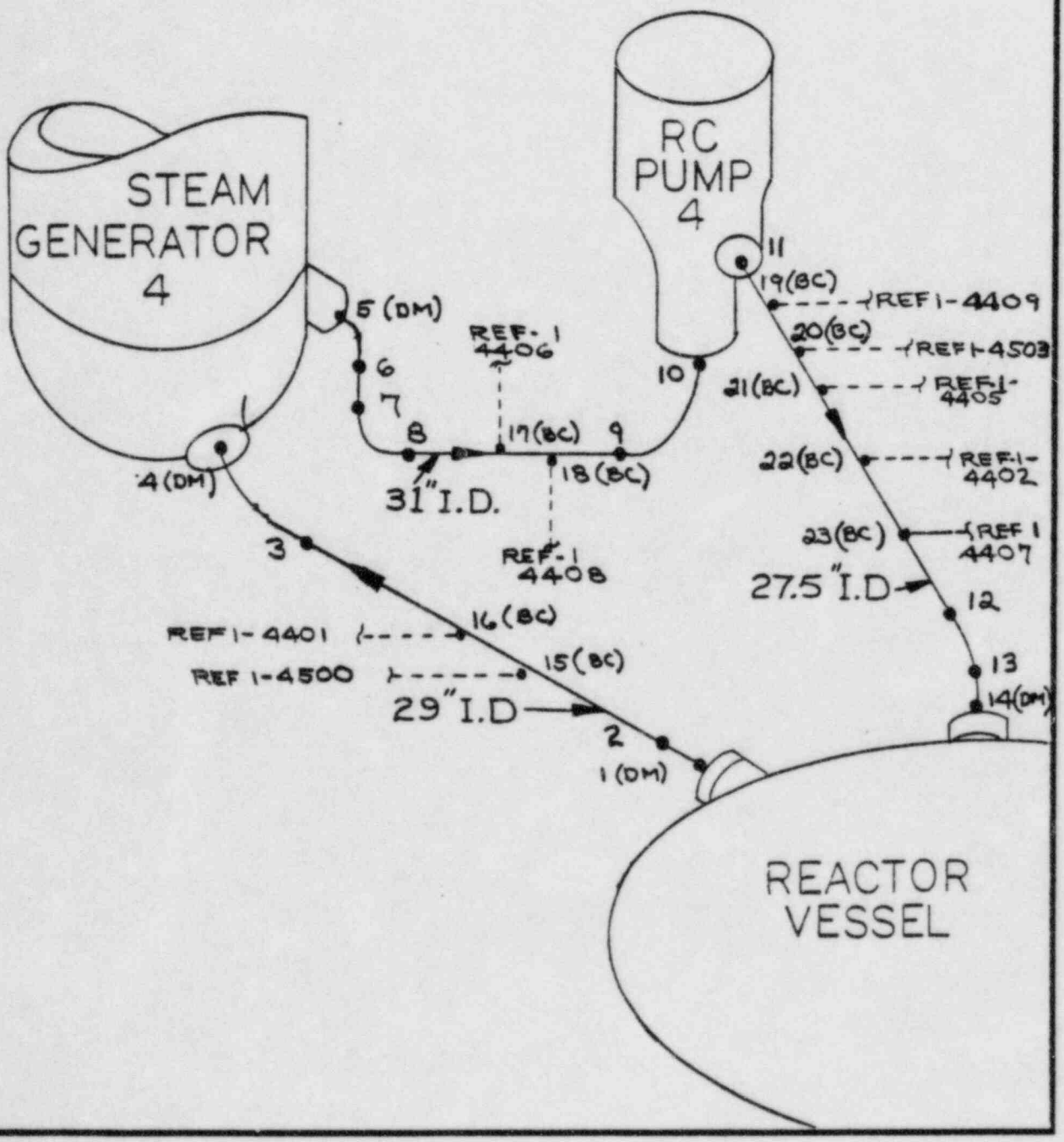
2" Sch. 160 .344"T SS
1.5" Sch. 160 .281"T SS



WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4400

LOOP 4 REACTOR COOLANT PIPE

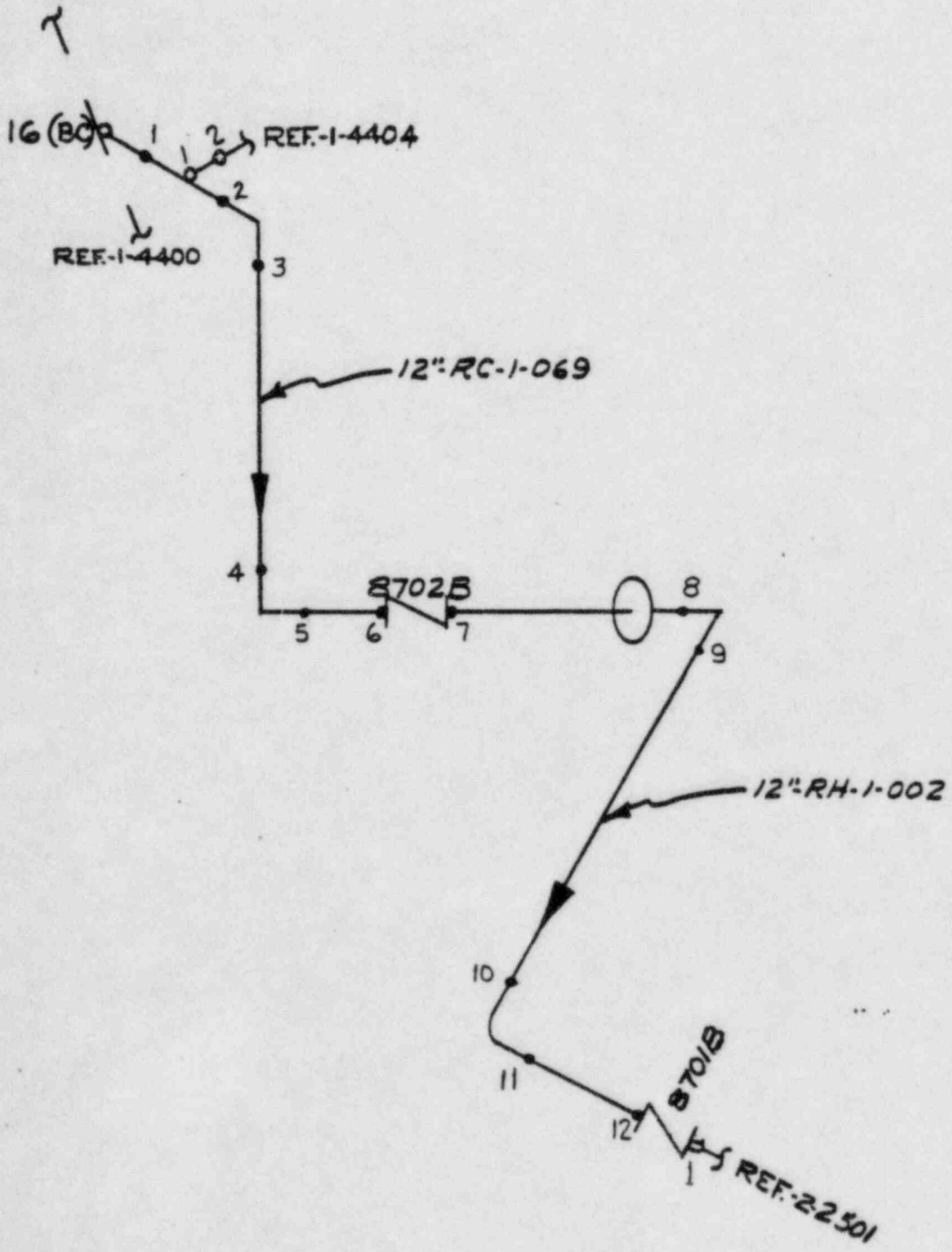


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4401

RHR TAKE-OFF

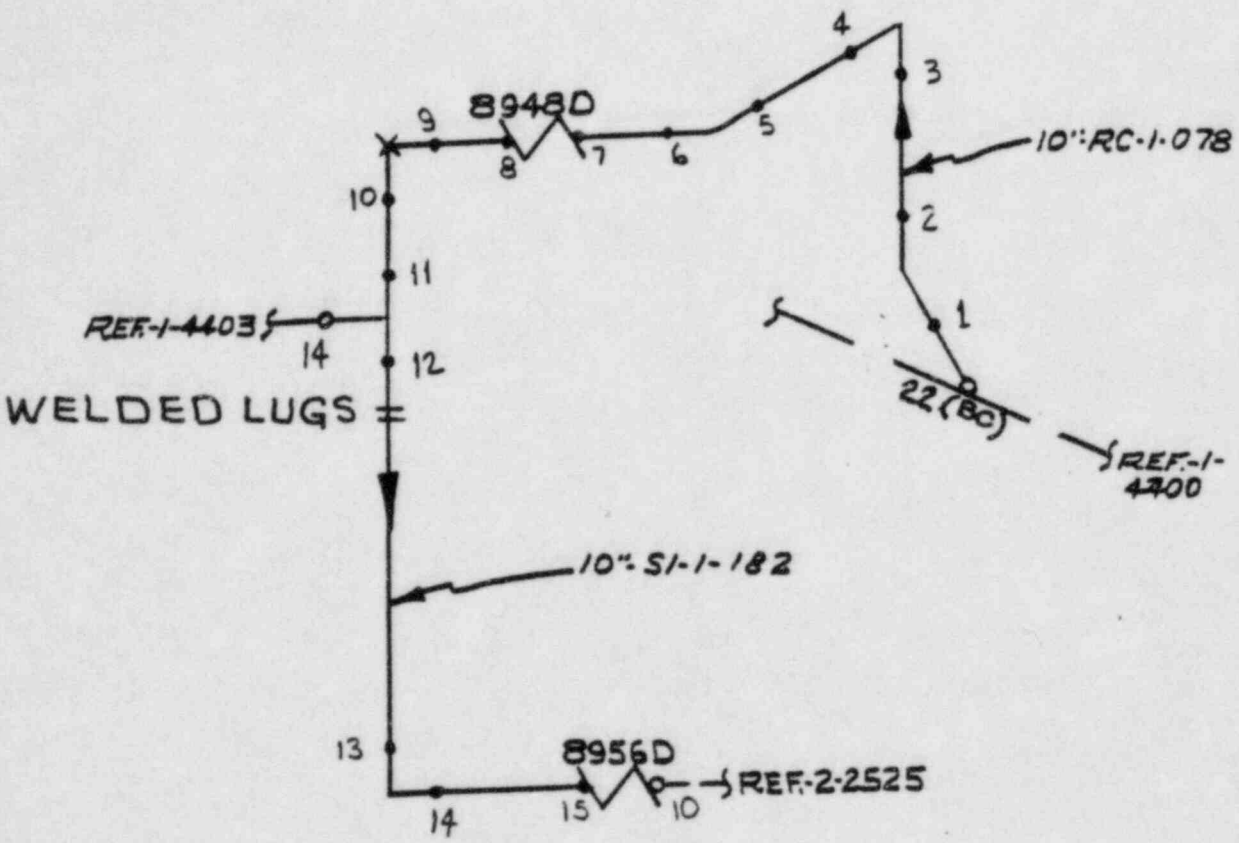
12" Sch. 140 1.125"T SS



TBX-1-4402

ACCUMULATOR DISCHARGE

10" Sch. 140 1.00"T SS



WESTINGHOUSE ELECTRIC CORPORATION

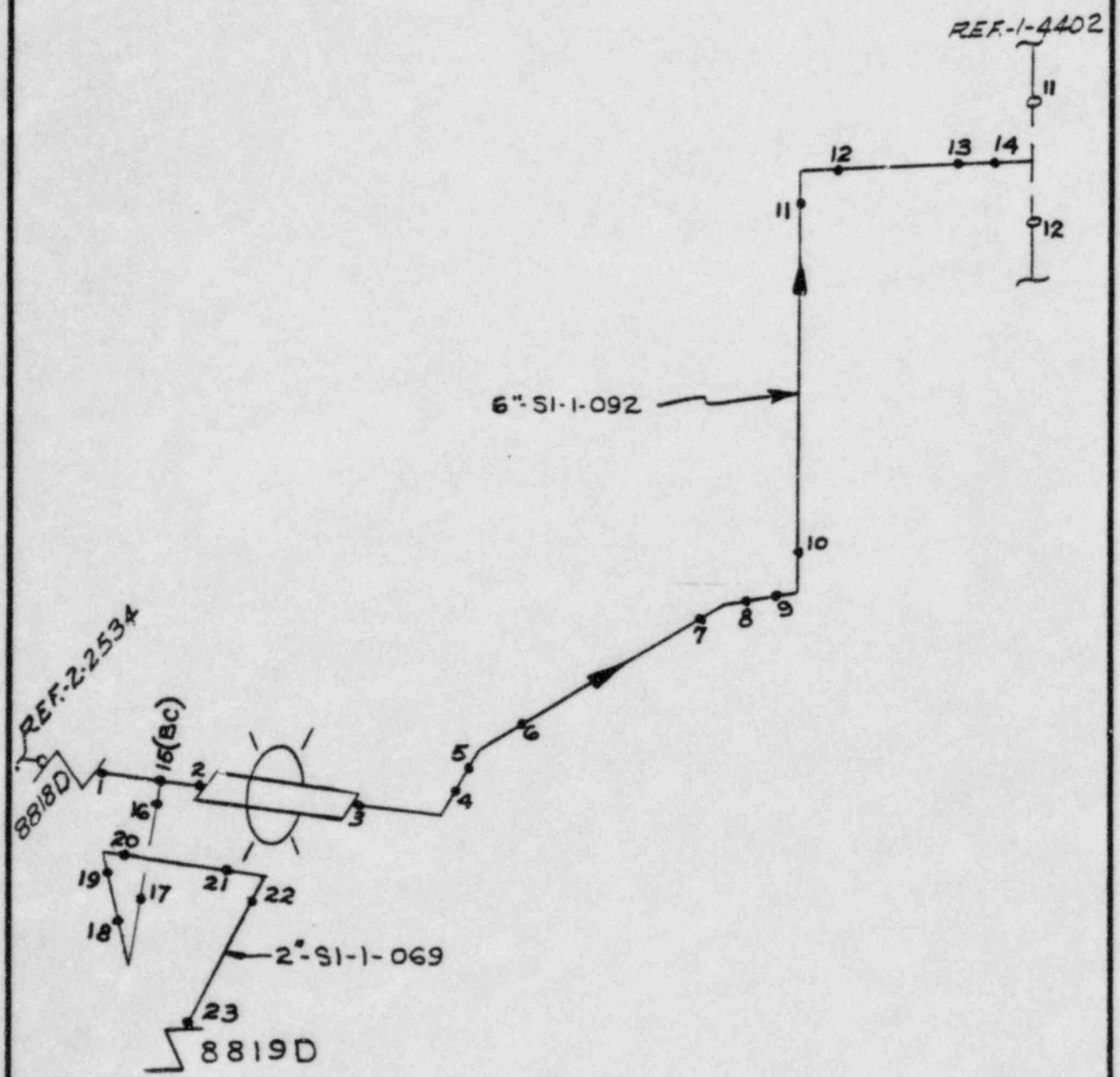
FORM 46446

TBX-I-4403

SIS

6" Sch. 160 .719"T SS

2" Sch. 160 .344"T SS

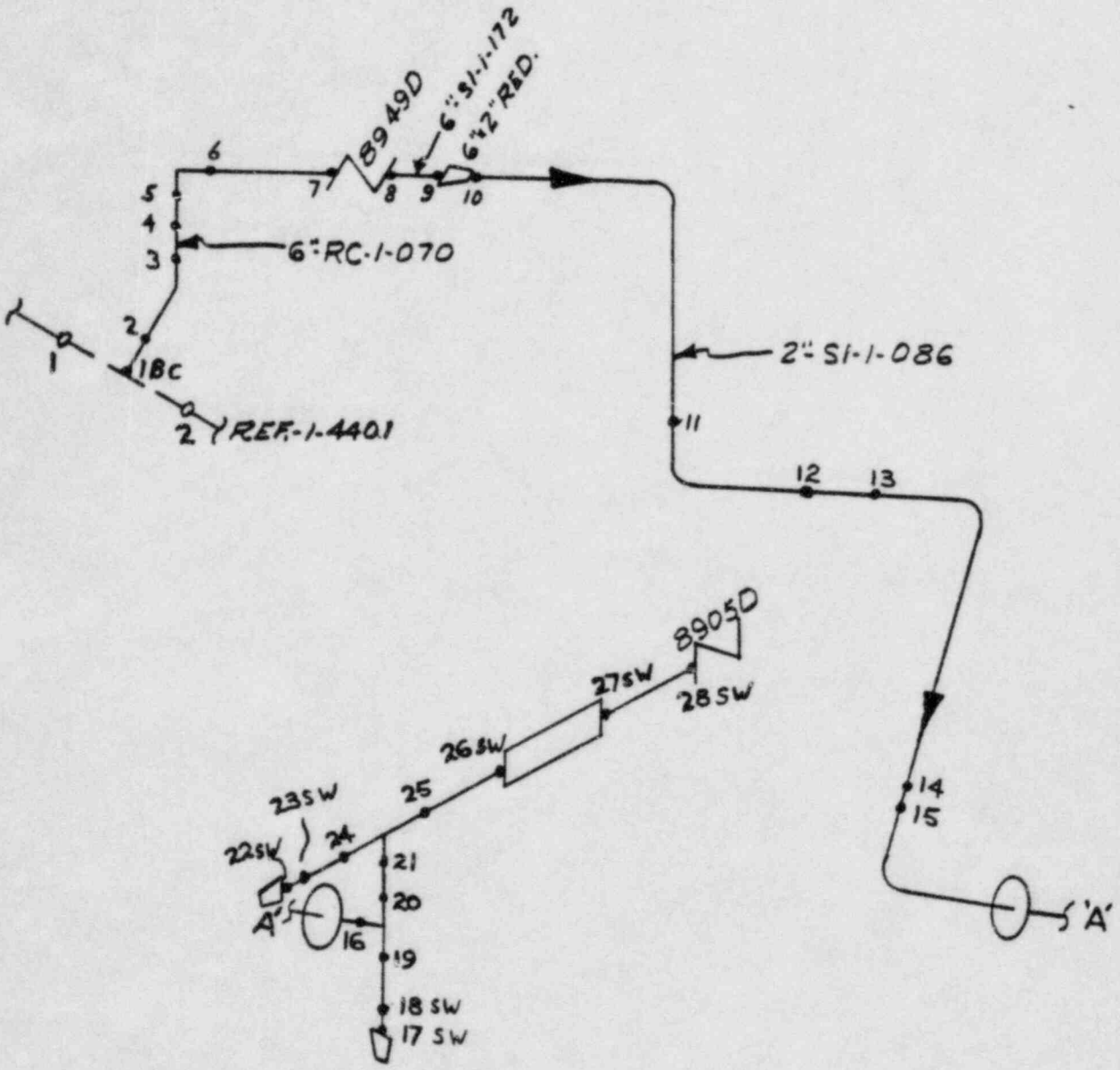


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4404

6" Sch. 160 .719"T SS
2" Sch. 160 .344"T SS

SIS



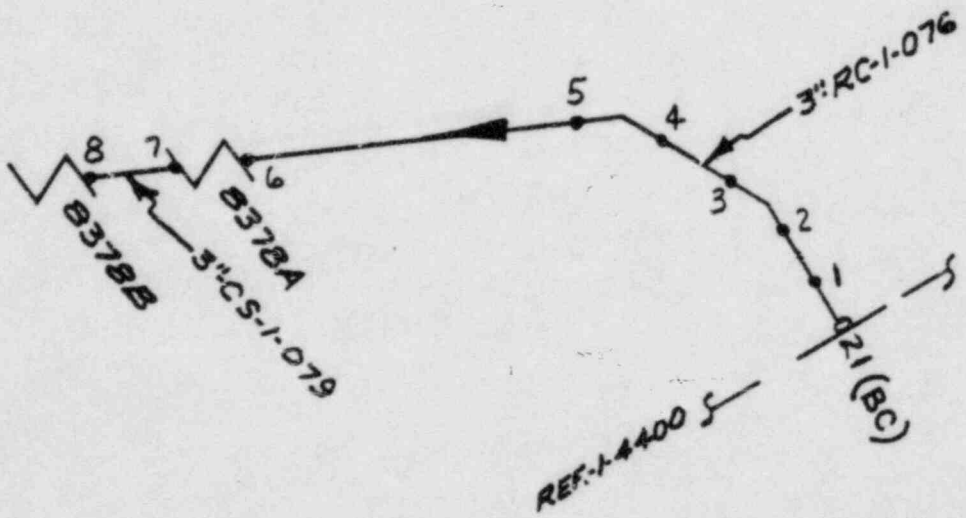
FORM 46446

WESTINGHOUSE ELECTRIC CORPORATION

TBX-I-4405

CHARGING (NORMAL)

3" Sch. 160 .438"T SS

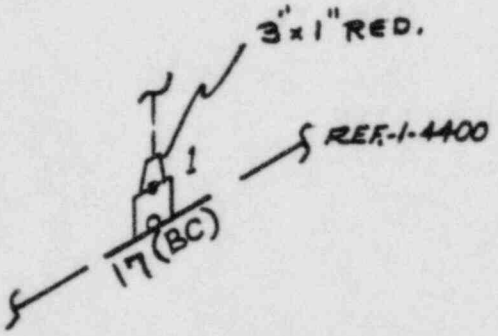


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4406

R.T.D. RETURN

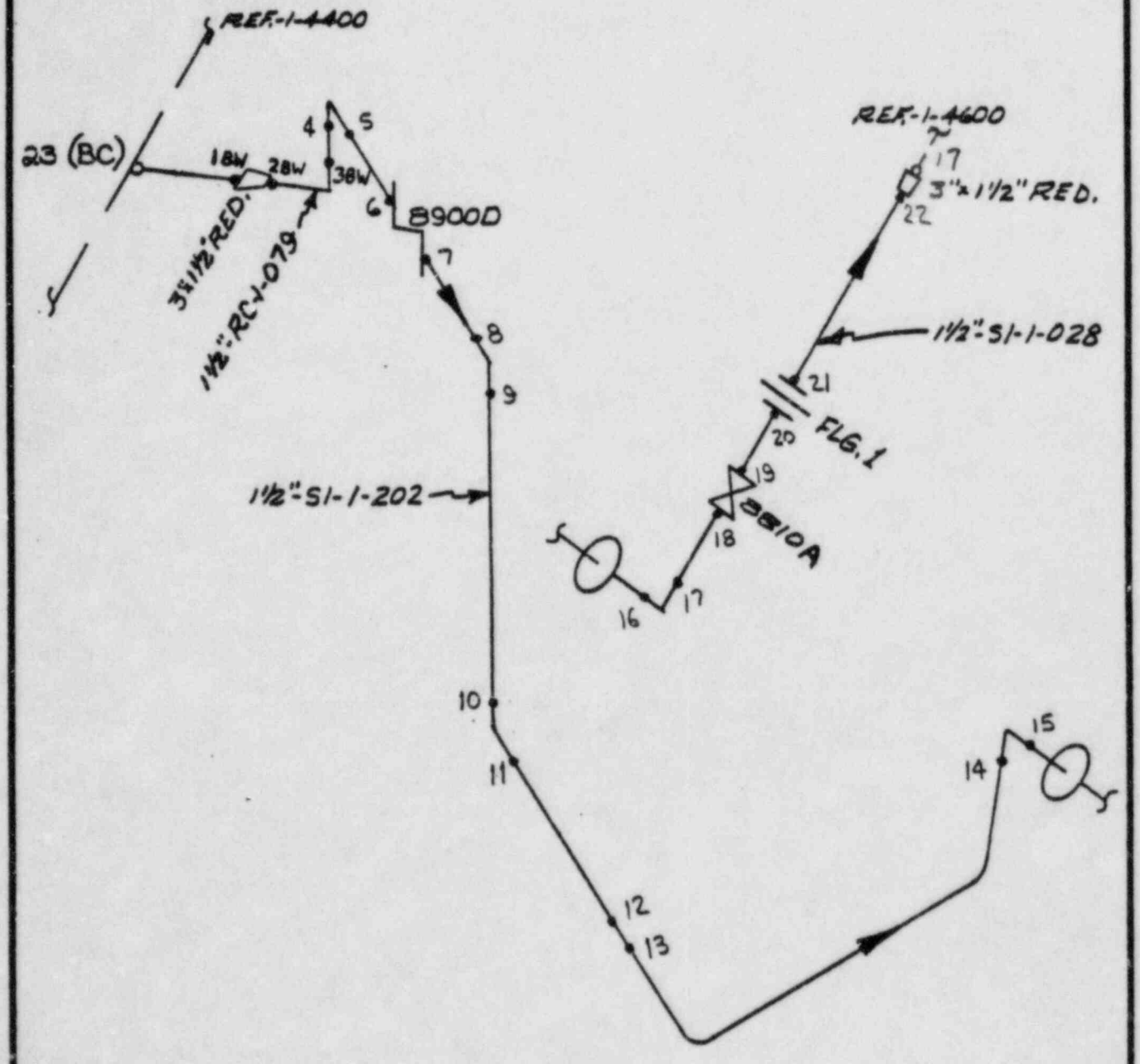
3" Sch. 160 .438"T SS



TBX-I-4407

SIS

3" Sch. 160 .438"T SS
1.5" Sch. 160 .281"T SS

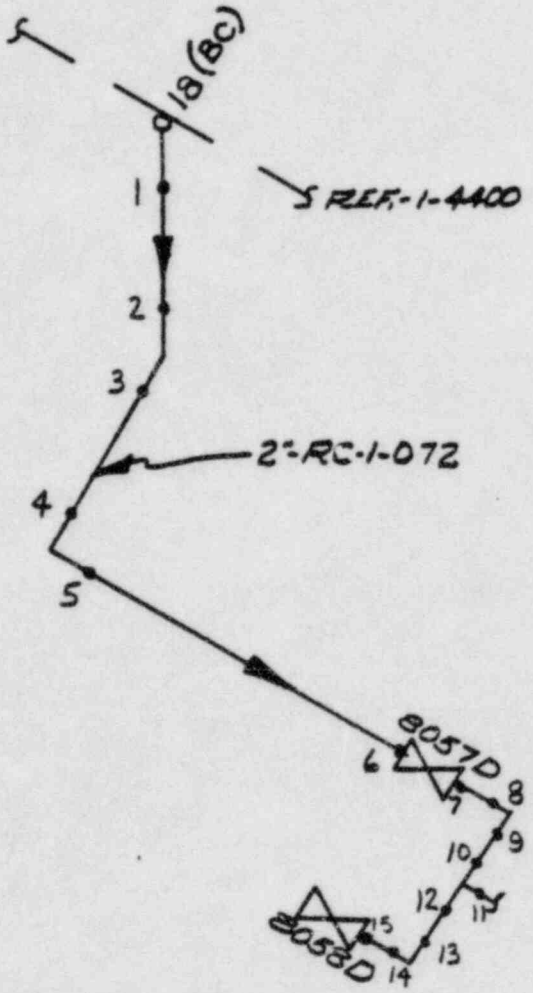


WESTINGHOUSE ELECTRIC CORPORATION

TBX-I-4408

DRAIN LINE

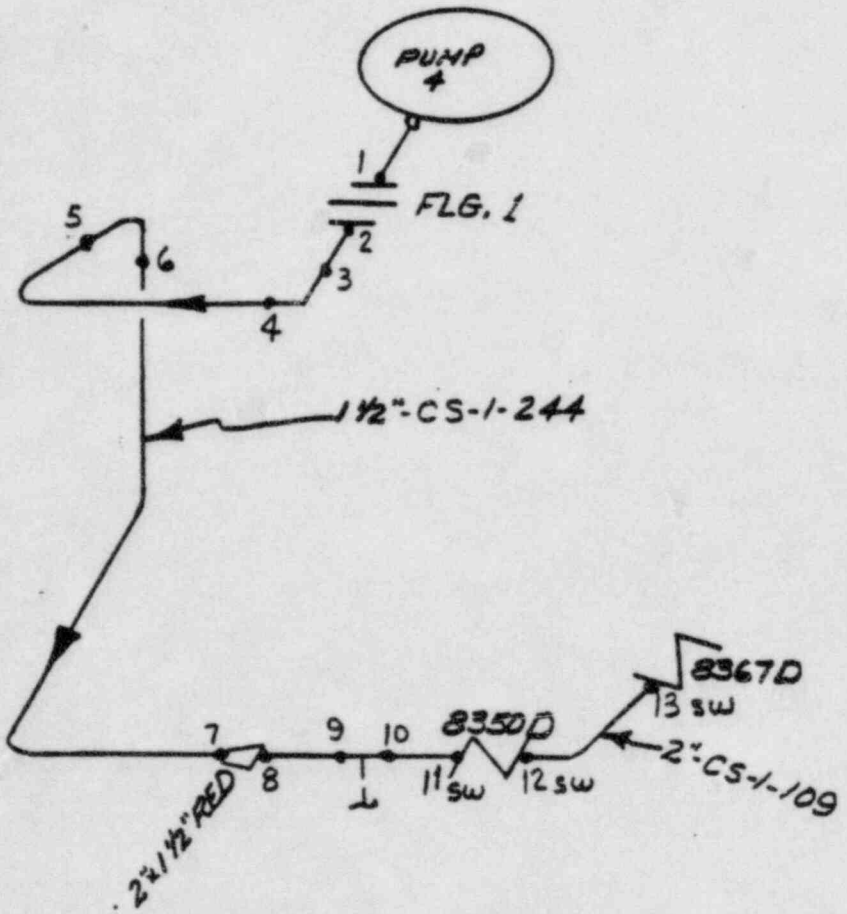
2" Sch. 160 .344"T SS



TBX-1-4410

SEAL INJECTION

2" Sch. 160 .344"T SS
1.5" Sch. 160 .281"T SS

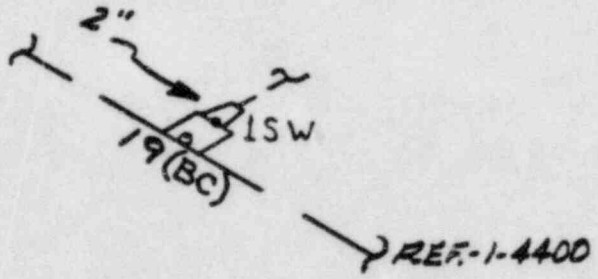


WESTINGHOUSE ELECTRIC CORPORATION

TBX-I-4409

RTD

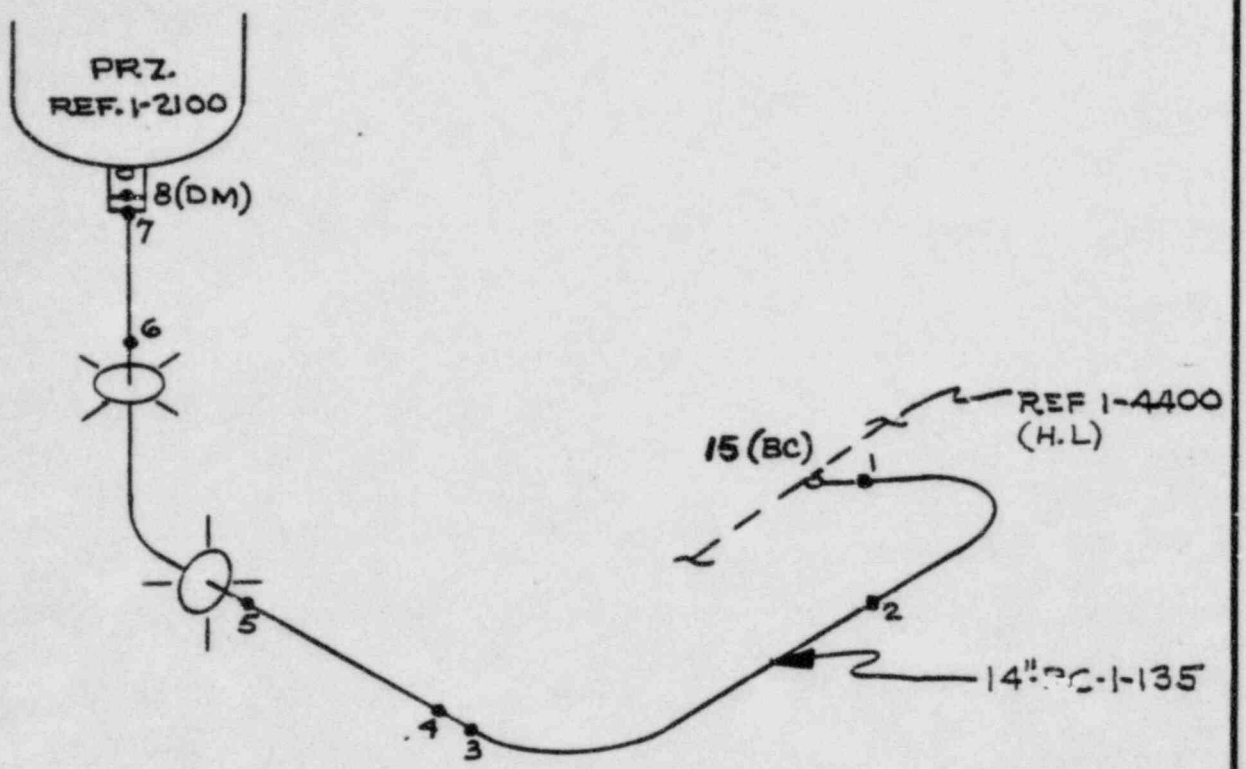
2" Sch. 160 .344"T SS



TBX-1-4500

PRESSURIZER SURGE

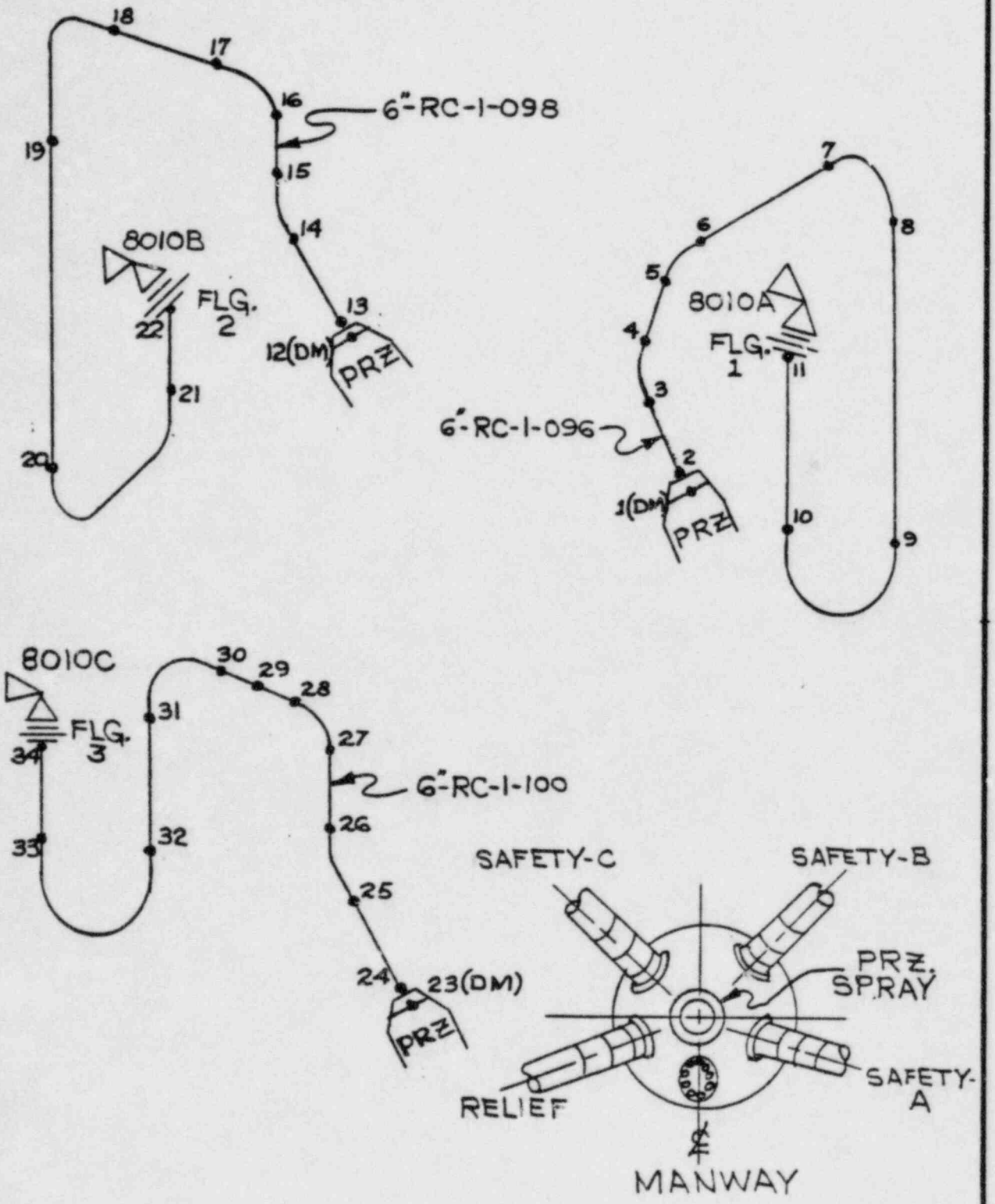
14" Sch. 140 1.250"T SS



TBX-1-4501

6" Sch. 160
.719"T SS

PRESSURIZER SAFETY LINES



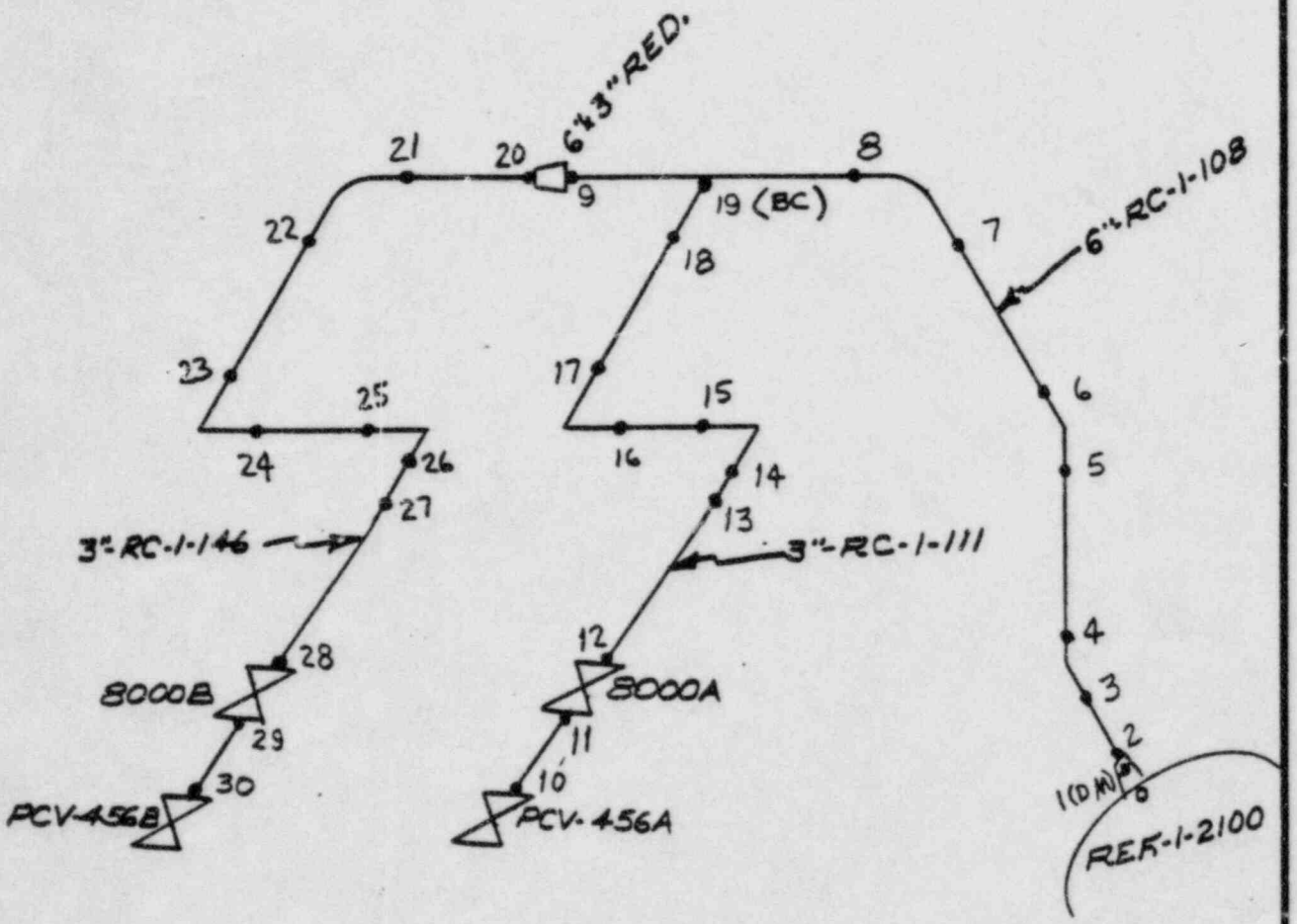
WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4502

SAFETY RELIEF

6" Sch. 160 .719"T SS

3" Sch. 160 .438"T SS



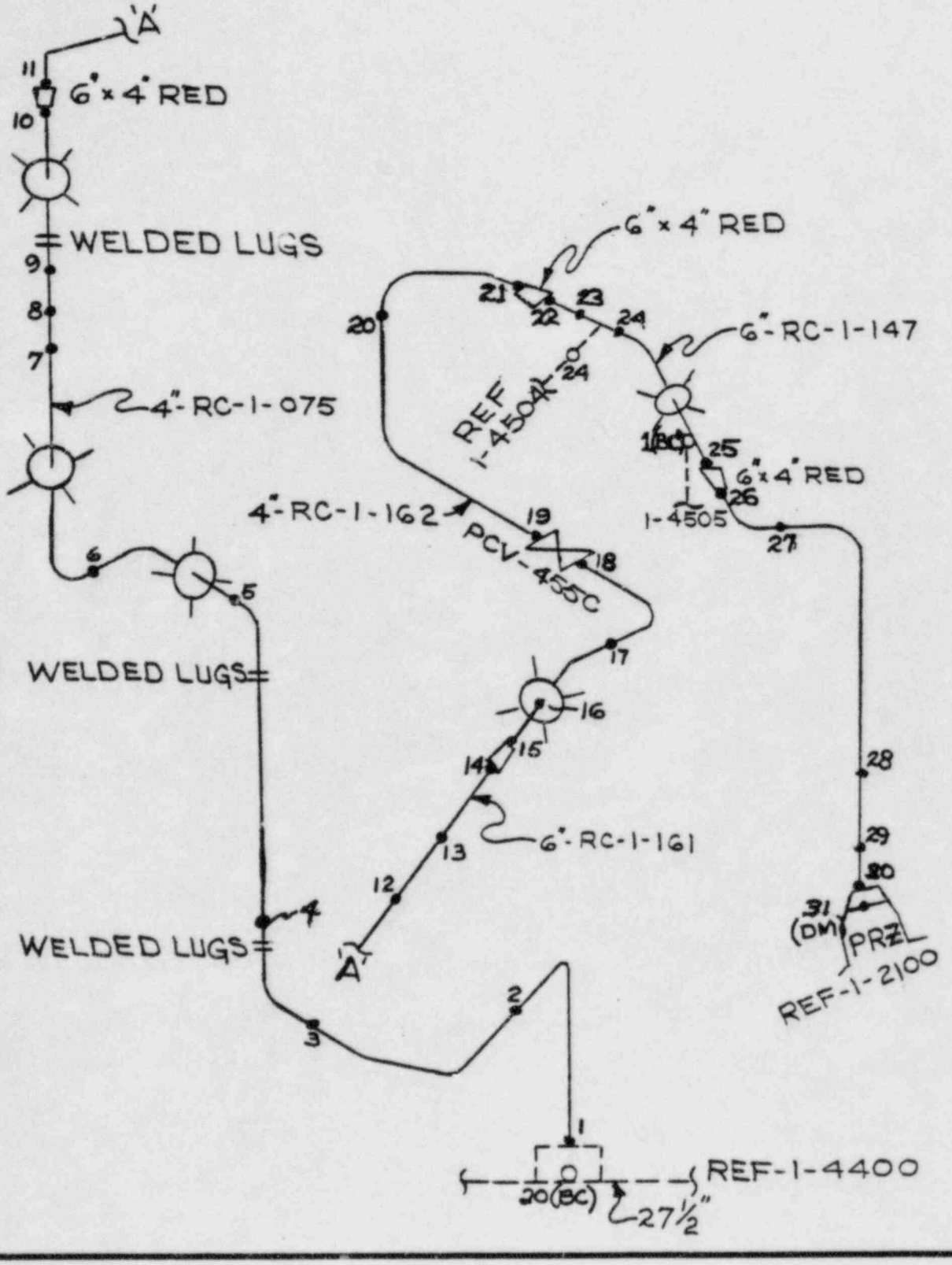
WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4503

PRESSURIZER SPRAY

6" Sch. 160 .719"T SS

4" Sch. 160 .531"T SS

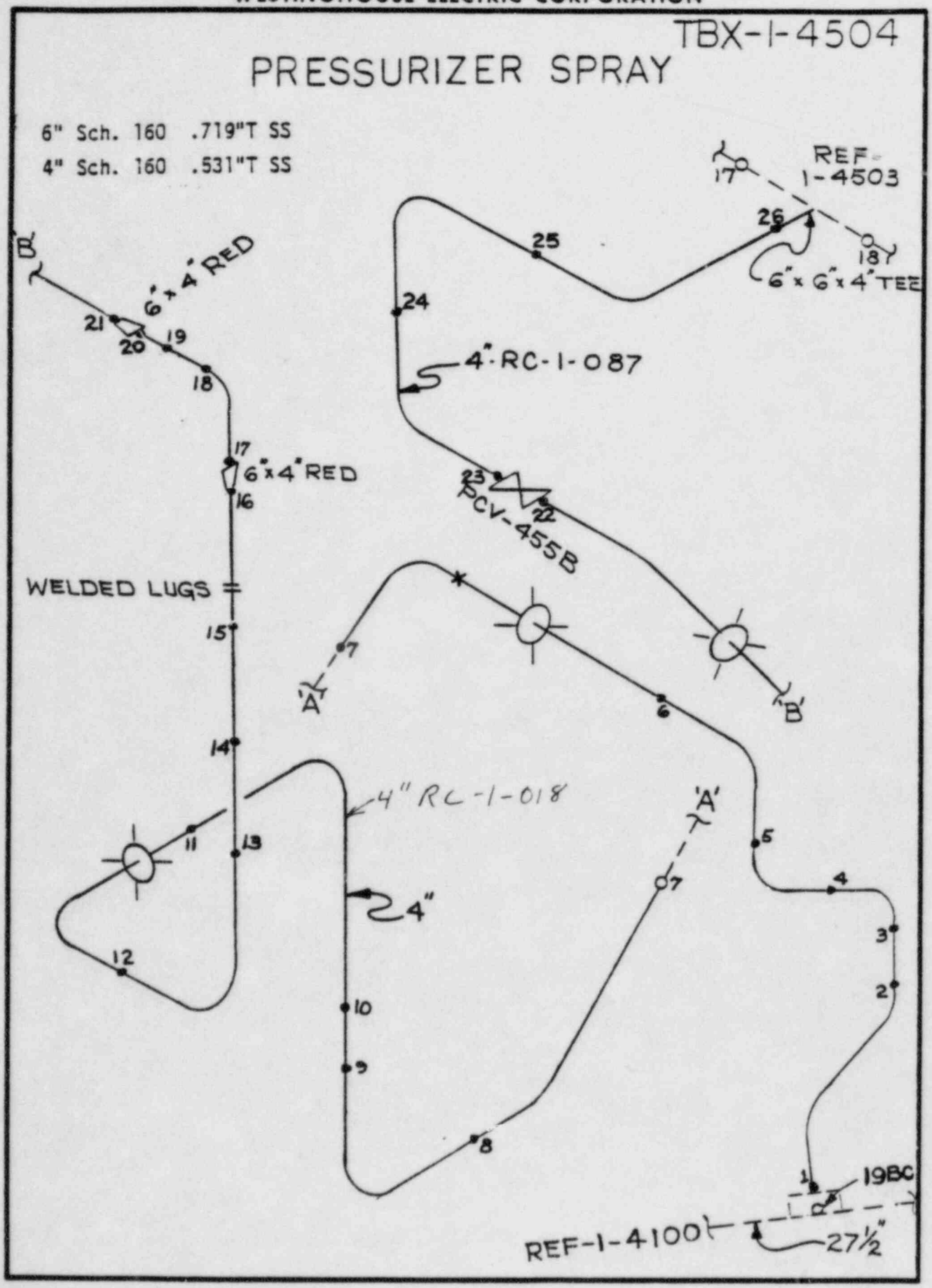


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4504

PRESSURIZER SPRAY

6" Sch. 160 .719"T SS
4" Sch. 160 .531"T SS

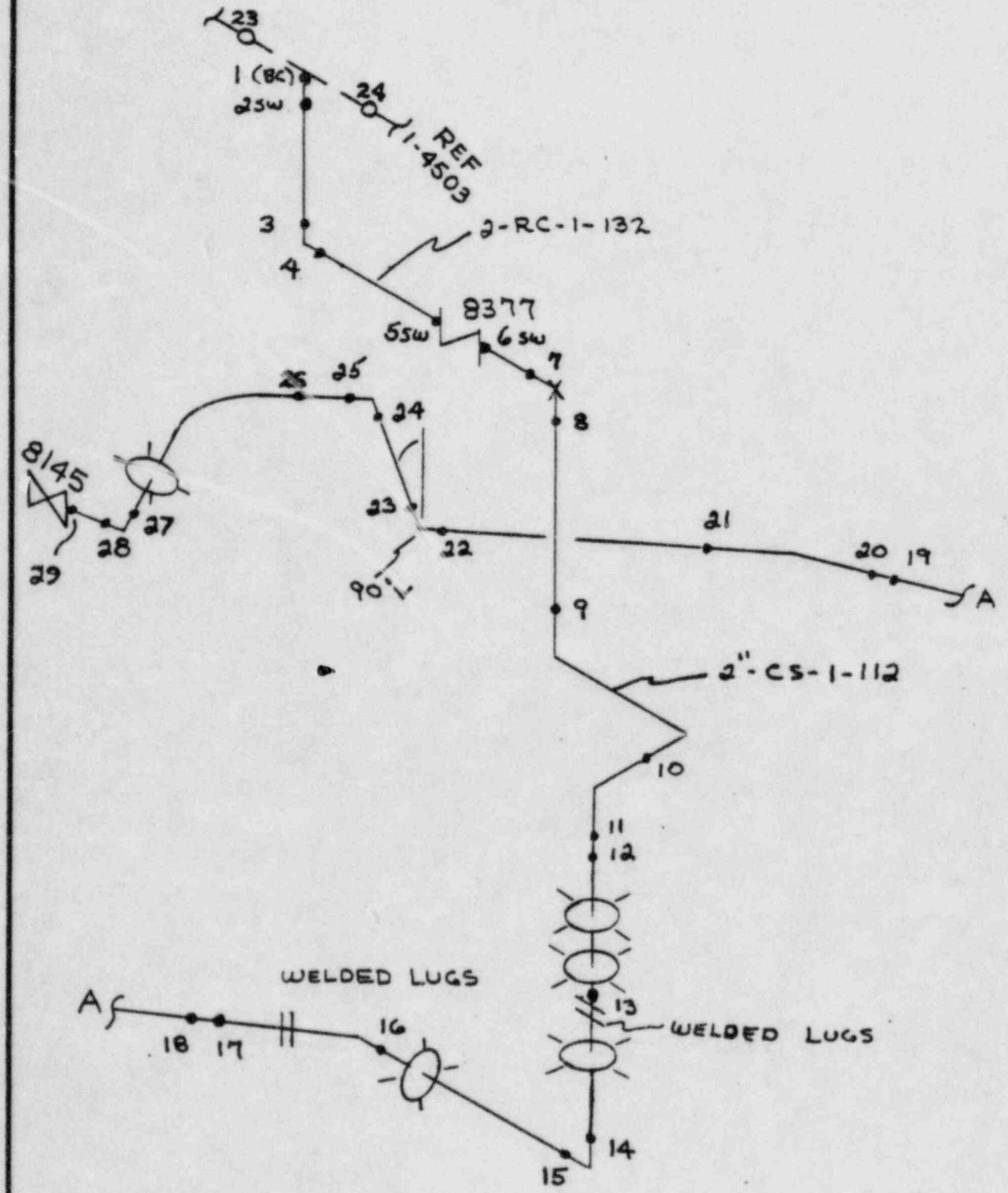


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4505

AUXILIARY SPRAY

2" Sch. 160 .344"T SS

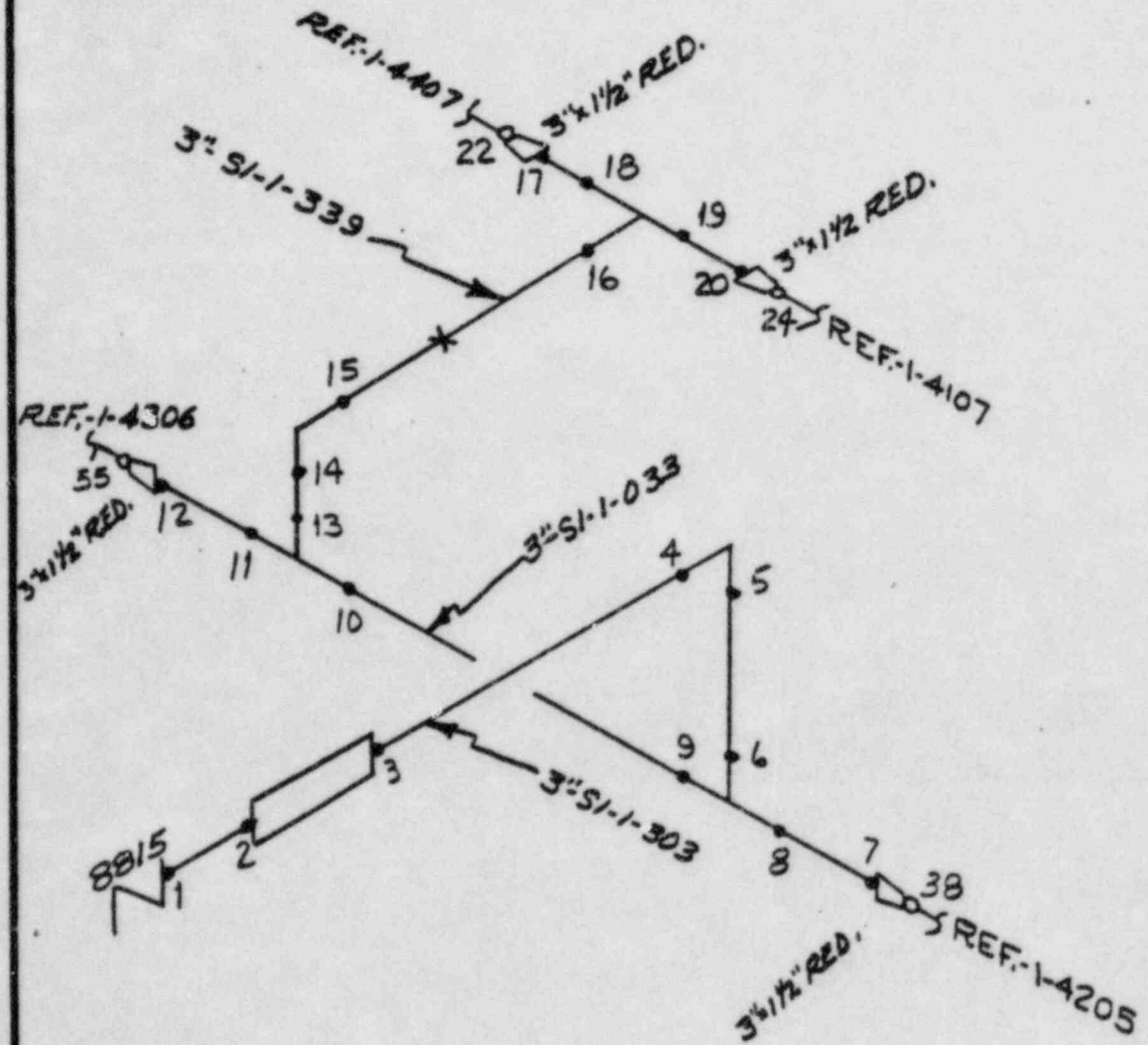


WESTINGHOUSE ELECTRIC CORPORATION

TBX-1-4600

SIS

3" Sch. 160 .438"T SS



PRESSURE RETAINING BOLTING

ITEM NO.	ISO	IDENTIFICATION	TOTAL STUDS & NUTS
1	1-4107	Flange 1	
2	1-4111	Flange 1	
3	1-4205	Flange 1	
4	1-4208	Flange 1	
5	1-4306	Flange 1	
6	1-4309	Flange 1	
7	1-4407	Flange 1	
8	1-4410	Flange 1	
9	1-4501	Flange 1	
10	1-4501	Flange 2	
11	1-4501	Flange 3	

PIPING SUPPORTS AND HANGERS

ITEM	ISO	IDENTIFICATION

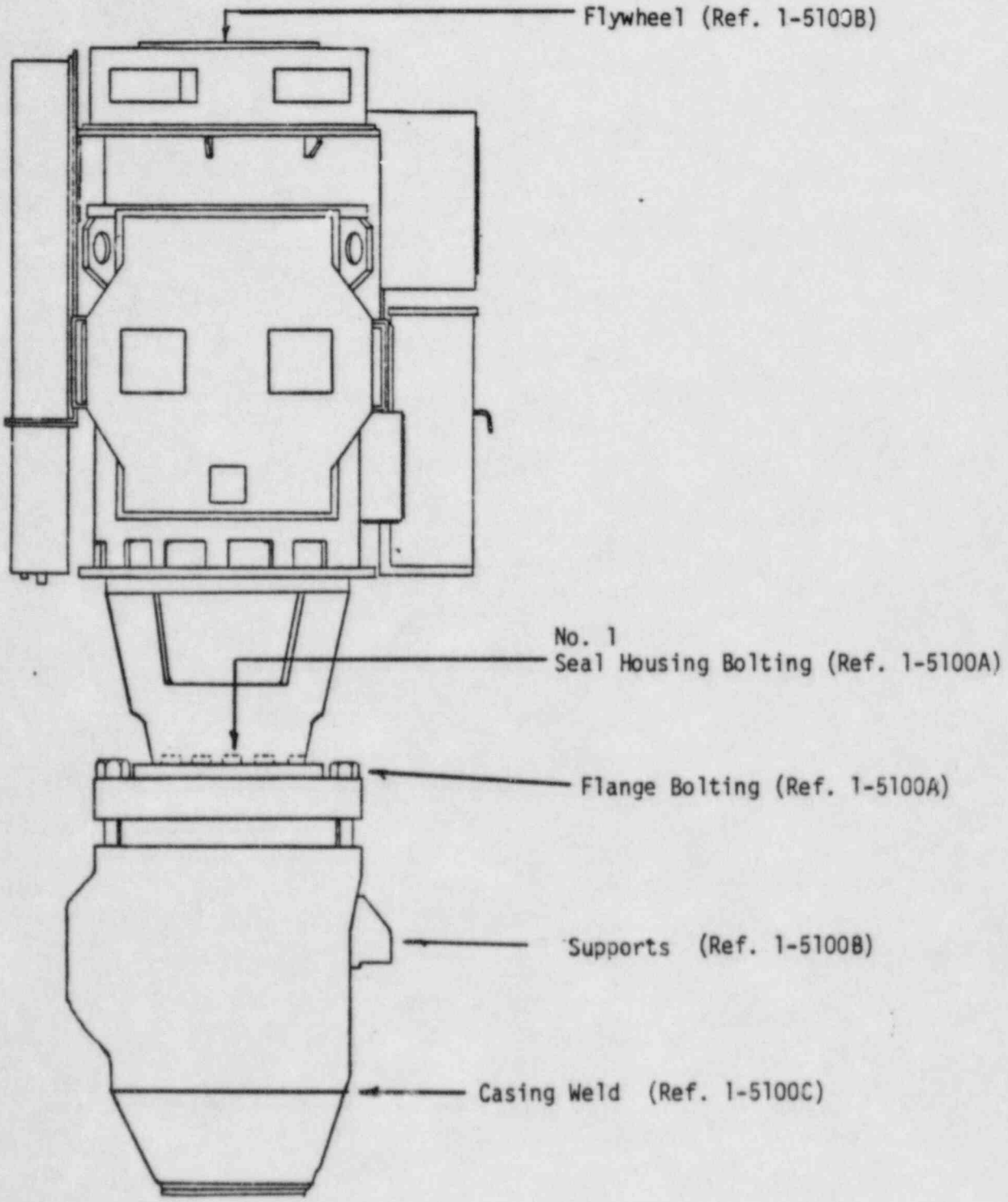
PIPING INTEGRALLY WELDED SUPPORTS

ITEM	ISO	IDENTIFICATION

Illustrative Only

TBX-1-5100

R.C. PUMP 1,2,3&4



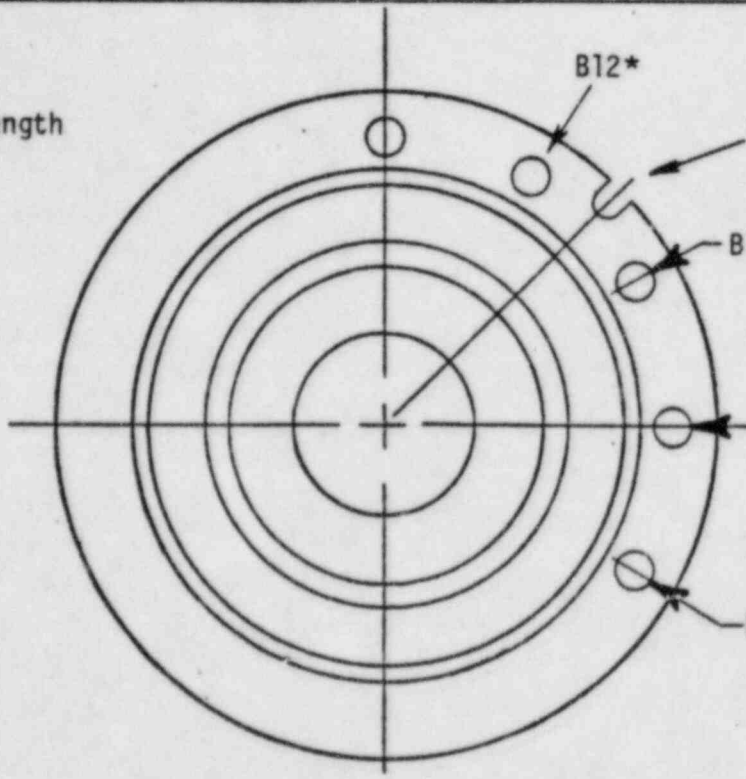
Illustrative Only

TBX-1-5100A

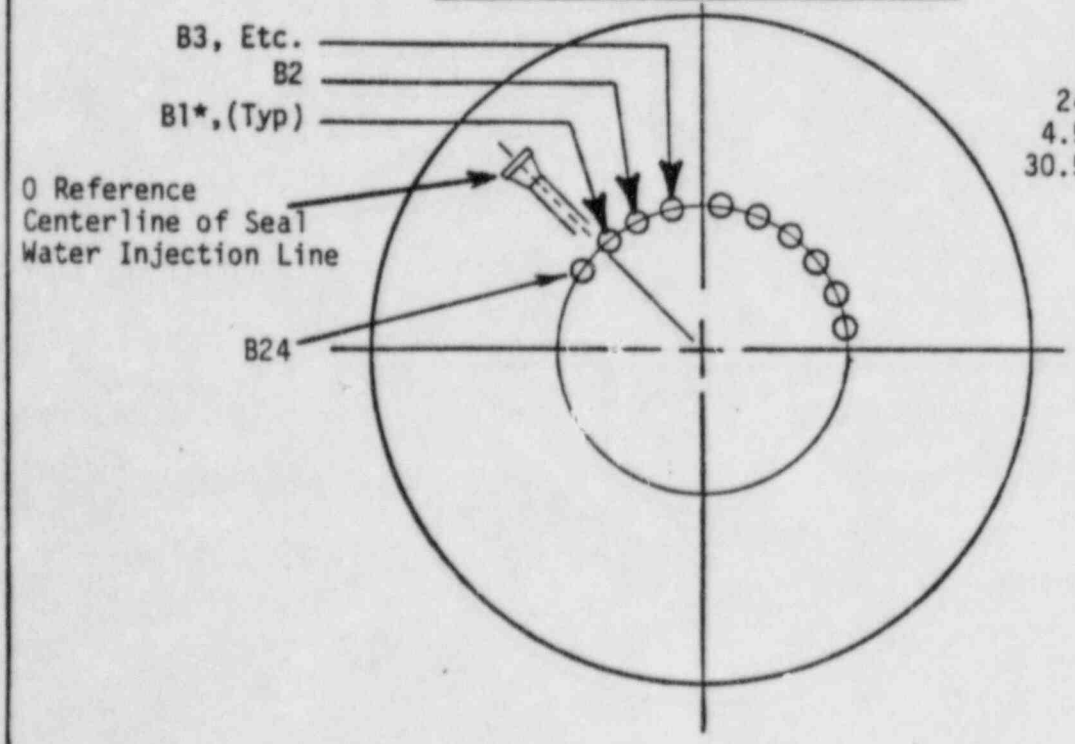
R.C. PUMP BOLTING

NO.1 SEAL HOUSING BOLTING

12 Bolts
2" Diameter 8" Length



FLANGE BOLTING

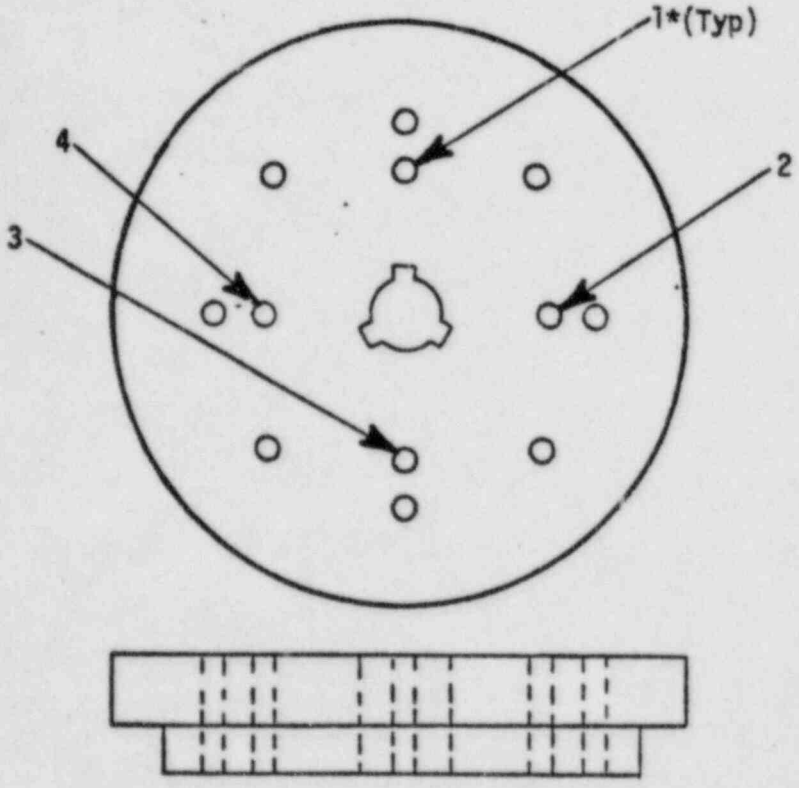


*Pump designation precedes bolt identification

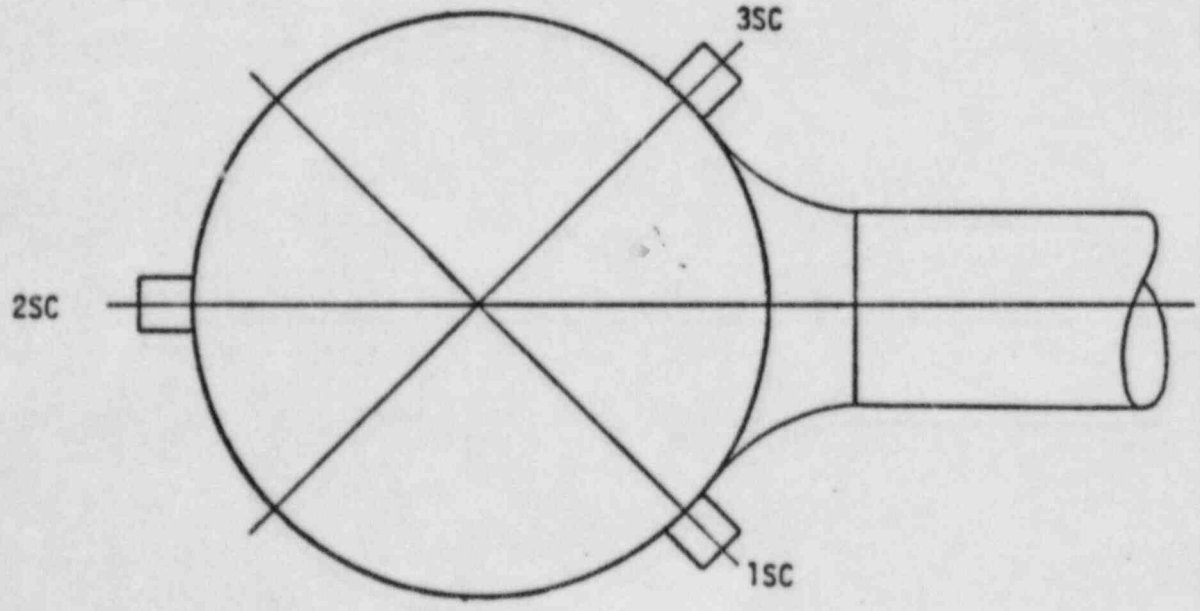
ILLUSTRATIVE ONLY

TBX-I-5100B

FLYWHEEL



R.C. PUMP SUPPORTS

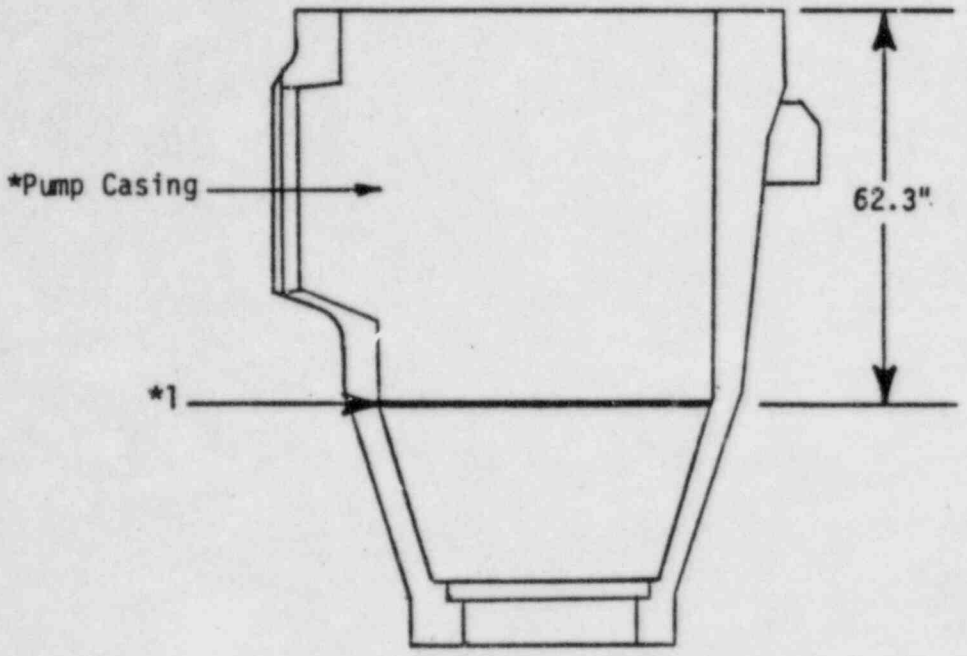


*Pump designation precedes item identification

Illustrative Only

TBX-I-5100C

PUMP CASING WELD



*Pump designation precedes item identification

VALVE BODIES

ITEM NO.	ISO	SIZE	VALVE NO.	MANUFACTURE
1	1-4101	12"	8702A	Westinghouse
2	1-4101	12"	8701A	Westinghouse
3	1-4102	10"	8948A	Westinghouse
4	1-4102	10"	8956A	Westinghouse
5	1-4103	6"	8818A	Westinghouse
6	1-4104	6"	8949A	Westinghouse
7	1-4201	10"	8948B	Westinghouse
8	1-4201	10"	8956B	Westinghouse
9	1-4202	6"	8818B	Westinghouse
10	1-4203	6"	8849B	Westinghouse
11	1-4203	6"	8841A	Westinghouse
12	1-4301	10"	8948C	Westinghouse
13	1-4301	10"	8956C	Westinghouse
14	1-4302	6"	8818C	Westinghouse
15	1-4303	6"	8949C	Westinghouse
16	1-4303	6"	8841B	Westinghouse
17	1-4401	12"	8702B	Westinghouse
18	1-4401	12"	8701B	Westinghouse
19	1-4402	10"	8948D	Westinghouse
20	1-4402	10"	8956D	Westinghouse
21	1-4403	6'	8818D	Westinghouse
22	1-4404	6"	8949D	Westinghouse
23	1-4501	6"	8010A	Crosby
24	1-4501	6"	8010B	Crosby
25	1-4501	6"	8010C	Crosby

VALVE BONNET BOLTING

ITEM	ISO	SIZE	VALVE NO.	TOTAL STUDS & NUTS
1	1-4101	12"	8702A	
2	1-4101	12"	8701A	
3	1-4102	10"	8948A	
4	1-4102	10"	8956A	
5	1-4103	6"	8818A	
6	1-4103	2"	8819A	
7	1-4104	6"	8949A	
8	1-4105	3"	8379A	
9	1-4105	3"	8379B	
10	1-4107	1 1/2"	8900A	
11	1-4107	1 1/2"	8810A	
12	1-4108	2"	8905A	
13	1-4109	2"	8057A	
14	1-4109	2"	8058A	
15	1-4111	2"	8350A	
16	1-4111	2"	8367A	
17	1-4201	10"	8948B	
18	1-4201	10"	8956B	
19	1-4202	6"	8818B	
20	1-4202	2"	8819B	
21	1-4203	6"	8849B	
22	1-4203	6"	8841A	
23	1-4203	2"	8905B	
24	1-4205	1 1/2"	8900B	
25	1-4205	1 1/2"	8810B	
26	1-4206	2"	8057B	
27	1-4206	2"	8058B	
28	1-4208	2"	8350B	
29	1-4208	2"	8367B	
30	1-4301	10"	8948C	
31	1-4301	10"	8956C	
32	1-4302	6"	8818C	

VALVE BONNET BOLTING

ITEM	ISO	SIZE	VALVE NO.	TOTAL STUDS & NUTS
33	1-4302	2"	8819C	
34	1-4303	6"	8949C	
35	1-4303	6"	8841B	
36	1-4303	2"	8905C	
37	1-4304	3"	8085	
38	1-4304	3"	LCV 460	
39	1-4304	3"	LCV 459	
40	1-4306	1 1/2"	8900C	
41	1-4306	1 1/2"	8810C	
42	1-4307	2"	8057C	
43	1-4307	2"	8058C	
44	1-4309	2"	8350C	
45	1-4309	2"	8367C	
46	1-4401	12"	8702B	
47	1-4401	12"	8701B	
48	1-4402	10"	8948D	
49	1-4402	10"	8956D	
50	1-4403	6"	8818D	
51	1-4403	2"	8819D	
52	1-4404	6"	8949D	
53	1-4404	2"	8905D	
54	1-4405	3"	8378A	
55	1-4405	3"	8378B	
56	1-4407	1 1/2"	8900D	
57	1-4407	1 1/2"	8810D	
58	1-4408	2"	8057D	
59	1-4408	2"	8058D	
60	1-4410	2"	8350D	
61	1-4410	2"	8367D	
62	1-4501	6"	8010A	

VALVE BONNET BOLTING

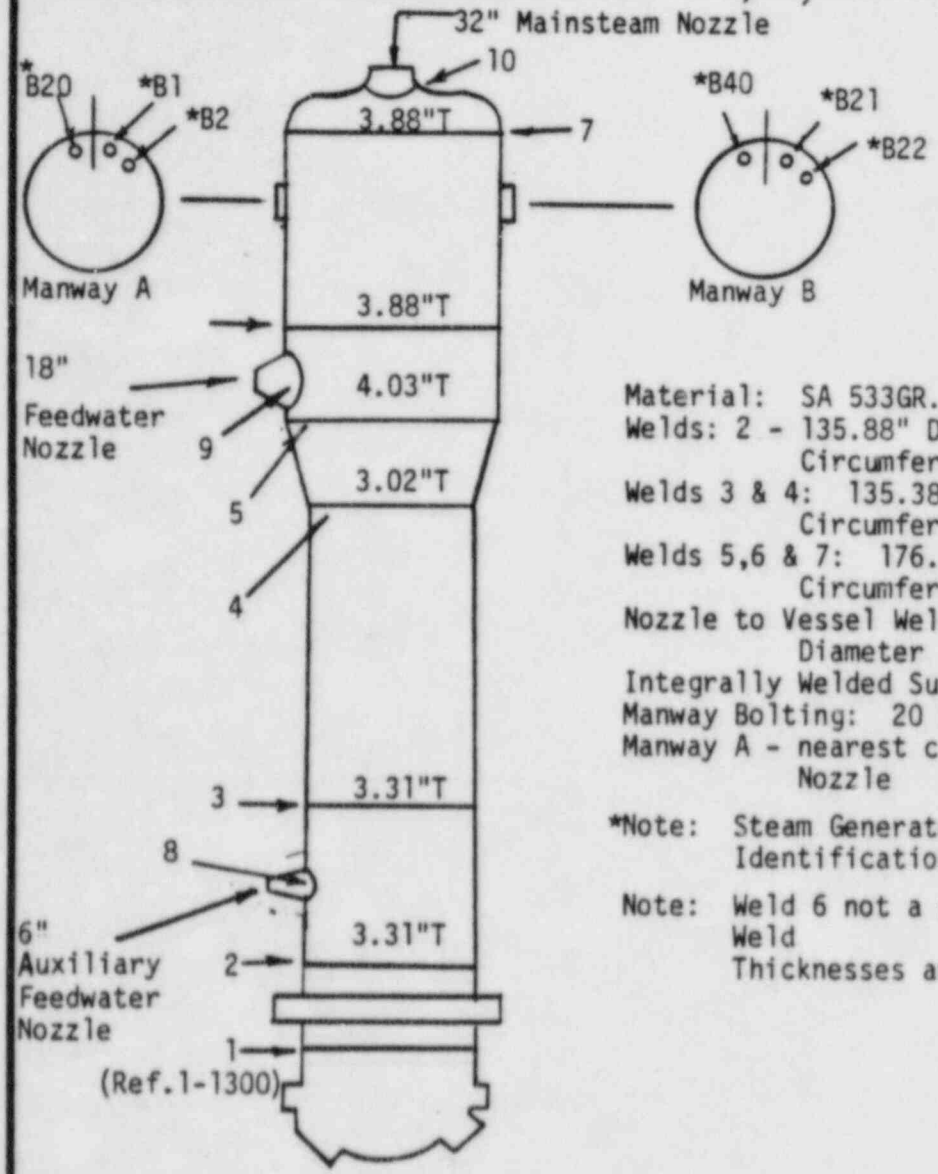
ITEM	ISO	SIZE	VALVE NO.	TOTAL STUDS & NUTS
63	1-4501	6"	8010B	
64	1-4501	6"	8010C	
65	1-4502	3"	8000A	
66	1-4502	3"	8000B	
67	1-4502	3"	PCV 456A	
68	1-4502	3"	PCV 456B	
69	1-4503	4"	PCV-455C	
70	1-4504	4"	PCV 455B	
71	1-4505	2"	8377	
72	1-4505	2"	8145	
73	1-4600	3"	8815	

Illustrative Only

TBX-2-1100

FORM 4844

STEAM GENERATORS 1,2,3&4



Material: SA 533GR.A Class 2 Carbon Steel
Welds: 2 - 135.88" Diameter; 427.88" Circumference
Welds 3 & 4: 135.38" Diameter; 425.30" Circumference
Welds 5,6 & 7: 176.14" Diameter; 553.36" Circumference
Nozzle to Vessel Welds: 32", 18" and 6" Diameter
Integrally Welded Supports: Not Applicable
Manway Bolting: 20 Bolts - 1.25" Diameter
Manway A - nearest clockwise 18" Feedwater Nozzle

*Note: Steam Generator number precedes item Identification

Note: Weld 6 not a structural discontinuity Weld
Thicknesses are in minimum inches

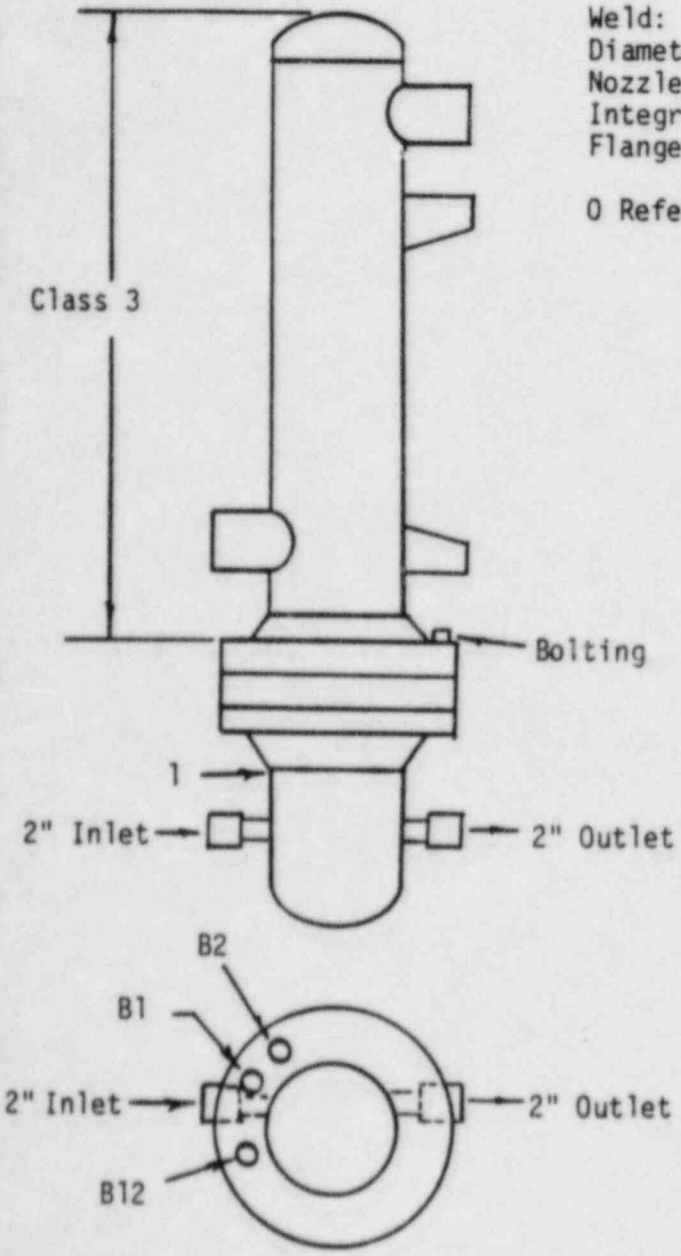
Steam Generator	Welds	Zero Reference	Manway	Bolts
1	1-2 & 1-3	Centerline of Auxiliary Feedwater Nozzle	A	B1-1 to B1-20
			B	B1-21 to B1-40
2	2-4	Centerline of Feedwater Nozzle	A	B2-1 to B2-20
	2-8	Centerline of Auxiliary Feedwater Nozzle	B	B2-21 to B2-40
3	3-5	Centerline of Feedwater Nozzle	A	B3-1 to B3-20
	3-9	Centerline of Feedwater Nozzle	B	B3-21 to B3-40
4	4-7	Centerline of Feedwater Nozzle	A	B4-1 to B4-20
	4-10	C-line of Feedwater Nozzle	B	B4-21 to B4-40

Illustrative Only

TBX-2-1110

FORM 484

EXCESS LETDOWN HEAT EXCHANGER



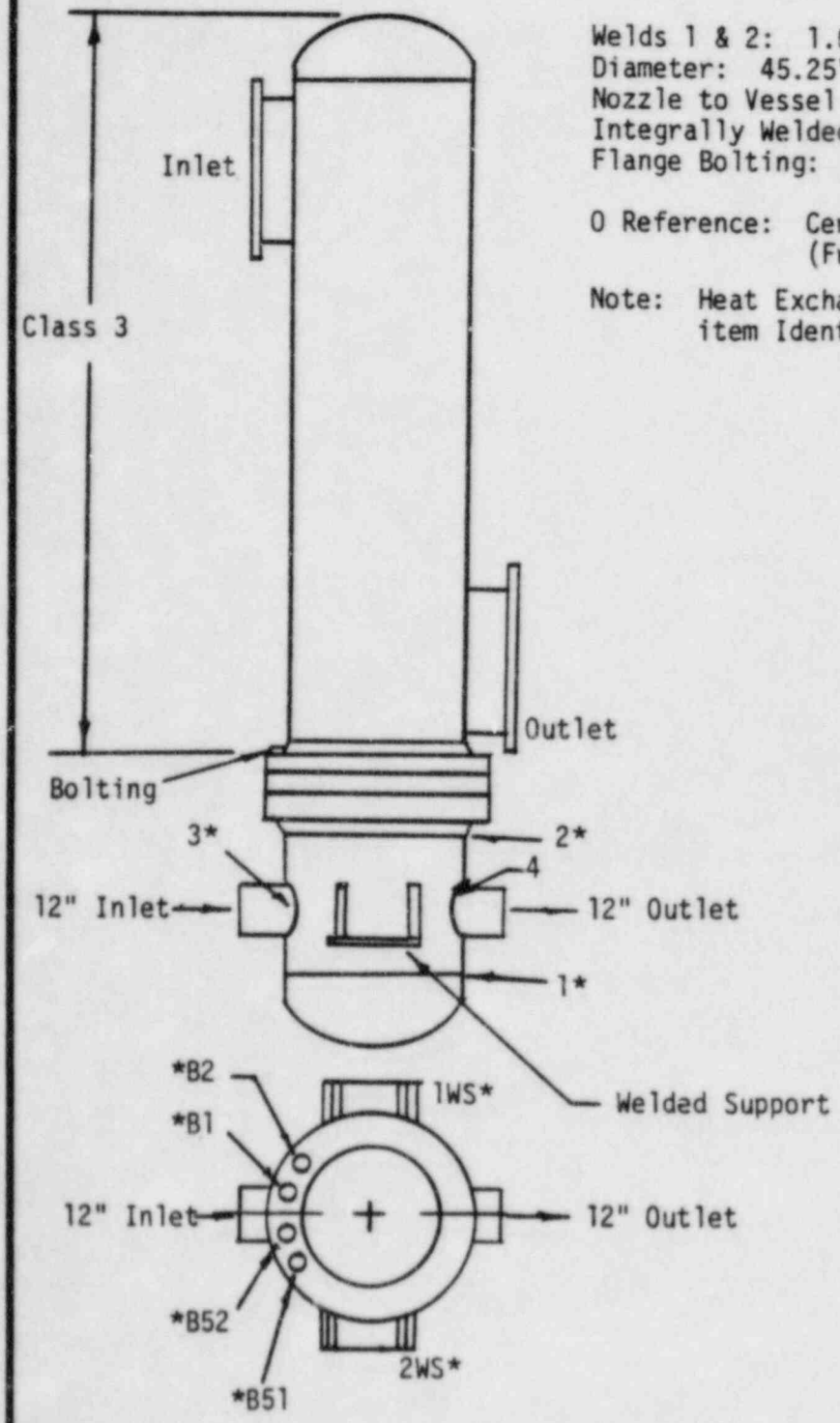
Weld: .750"T SA240 TP304SS
Diameter: 9.5"; Circumference: 29.85"
Nozzle to Vessel Welds: 2" Diameter
Integrally Welded Supports: Not Applicable
Flange Bolting: 12 - 1.625" Diameter
8" Length
0 Reference: Centerline of 2" Inlet Nozzle

Illustrative Only

TBX-2-1120

FORM 484

RESIDUAL HEAT EXCHANGERS 1 & 2



Welds 1 & 2: 1.00"T SA240 TP304SS
Diameter: 45.25"; Circumference: 142.08"
Nozzle to Vessel Welds: 12" Diameter
Integrally Welded Supports: 2
Flange Bolting: 52 - 1.375" Diameter
18.5" Length
O Reference: Centerline of 12" Inlet Nozzle
(From RHR Pump)

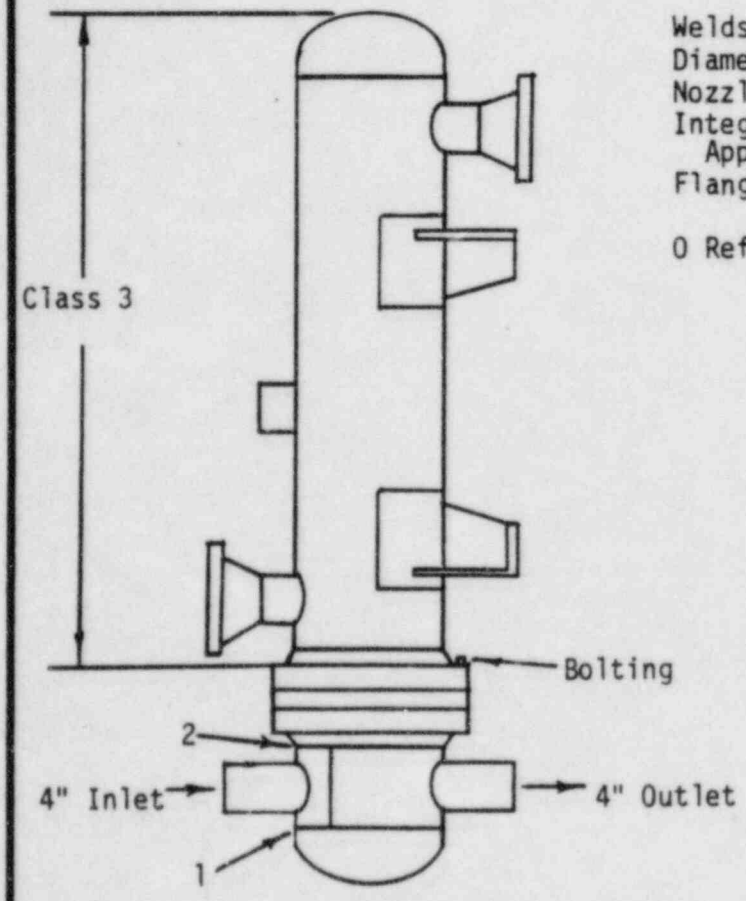
Note: Heat Exchanger designation precedes item Identification

Illustrative Only

TBX-2-1130

FORM 46

SEAL WATER HEAT EXCHANGER



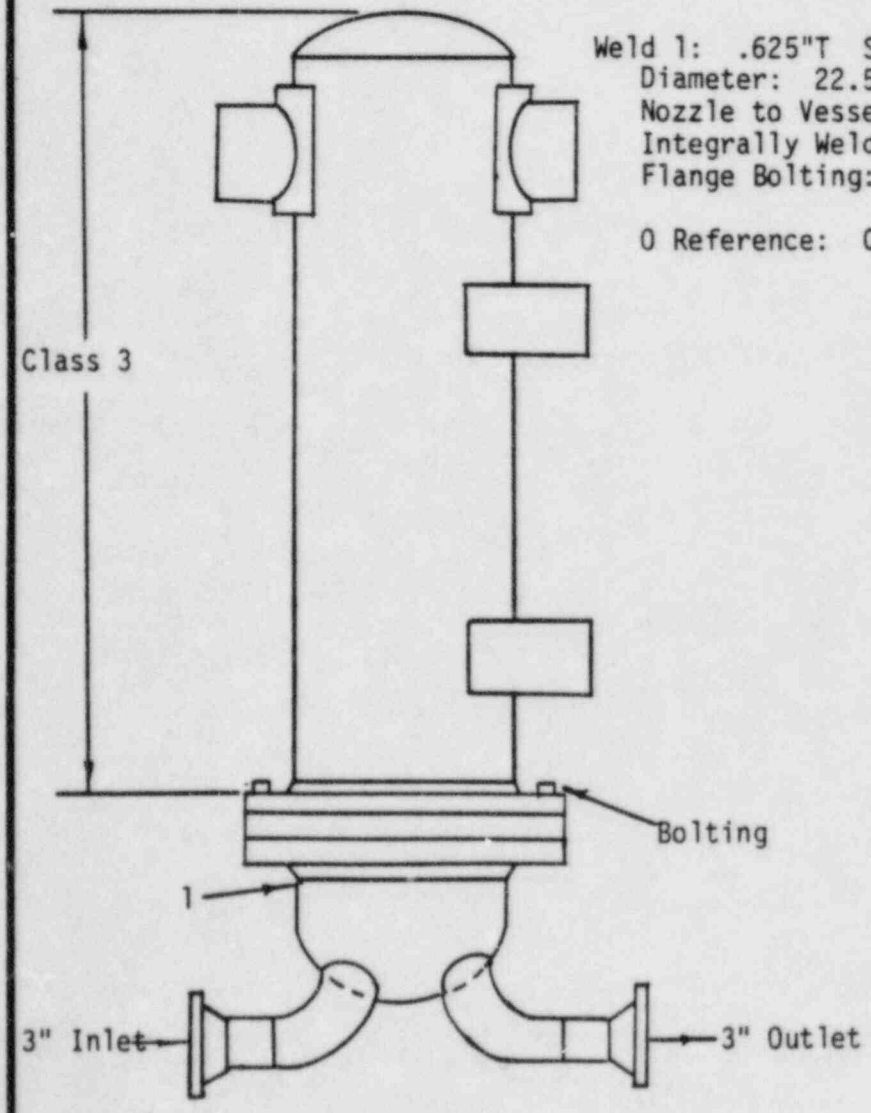
Welds 1 & 2: .1875"T SA240 TP 304SS
Diameter: 20.0" Circumference: 62.80"
Nozzle to Vessel Welds: 4" Diameter
Integrally Welded Supports: Not Applicable
Flange Bolting: 20 - .750" Diameter
7" Length
0 Reference: Centerline of 4" Inlet Nozzle

Illustrative Only

TBX-2-1140

FORM 46

HORIZONTAL LETDOWN HEAT EXCHANGER



Weld 1: .625"T SA240 TP304SS
Diameter: 22.50" Circumference: 70.65"
Nozzle to Vessel Welds: 3" Diameter
Integrally Welded Supports: Not Applicable
Flange Bolting: 28 - 1.00" Diameter
12" Length
0 Reference: Centerline of 3" Inlet Nozzle

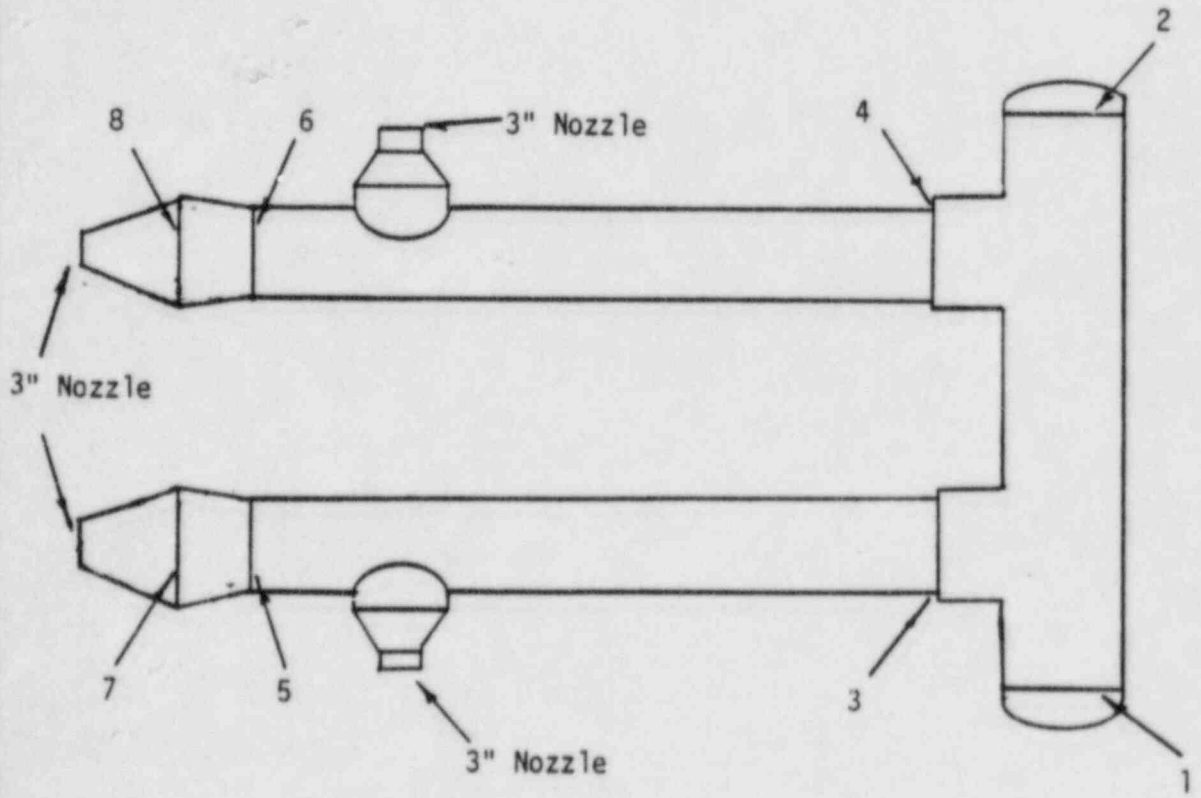
Illustrative Only

TBX-2-1150

FORM 464

REGENERATIVE HEAT EXCHANGER

Welds 1 & 2: 1.00"T SA240 TP304SS; Diameter: 10.75"; Circumference: 33.75"
Welds 3,4,5 & 6: .812"T SA240 TP304SS: Diameter: 8.625"; Circumference: 27.08"
Welds 7 & 8: 1.00"T SA240 TP304SS: Diameter: 10.75"; Circumference: 33.75"
Nozzle to Vessel Welds: 3" Diameter
Integrally Welded Supports: Not Applicable
Bolting: Not Applicable
0 Reference: Top Centerline of Weld



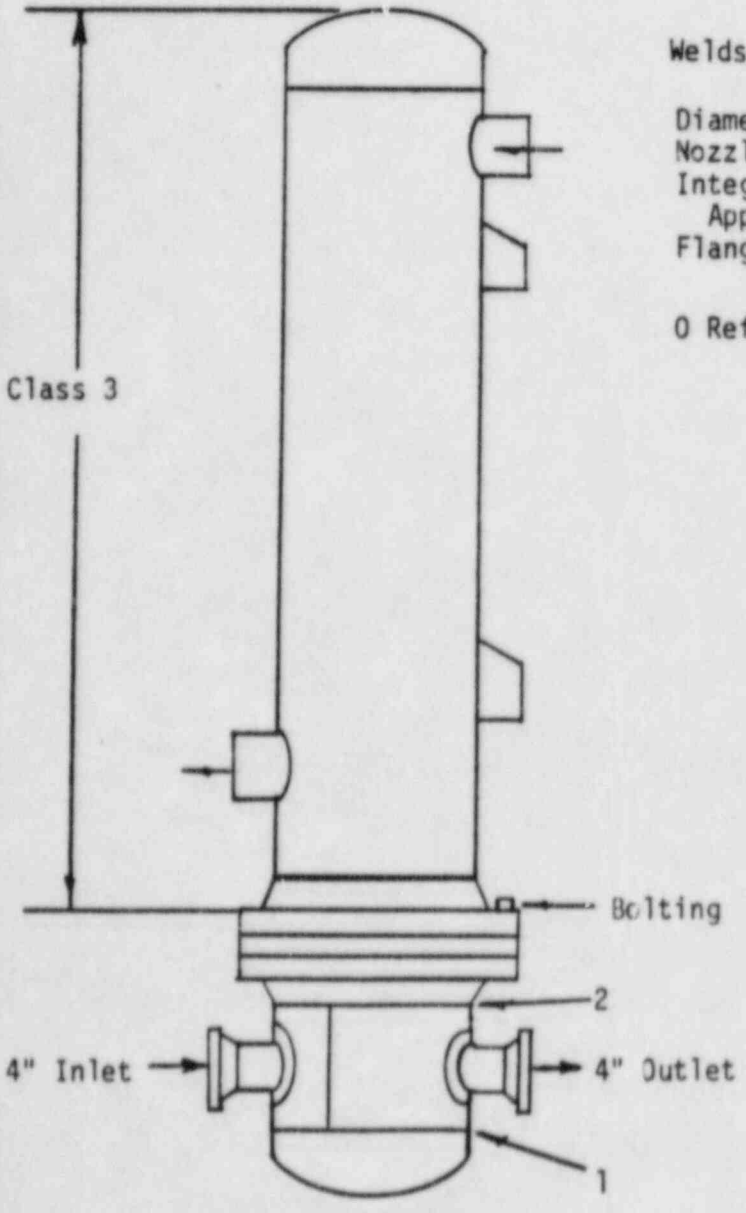
WESTINGHOUSE ELECTRIC CORPORATION

Illustrative Only

TBX-2-1160

FORM 484

LETDOWN REHEAT HEAT EXCHANGER



Welds 1 & 2: Head - .322"T Shell .T875"T
SA240 TP304SS
Diameter: 8.625"-Circumference: 27.08"
Nozzle to Vessel Welds: 4" Diameter
Integrally Welded Supports: Not Applicable
Flange Bolting: 12 - .625" Diameter
7" Length

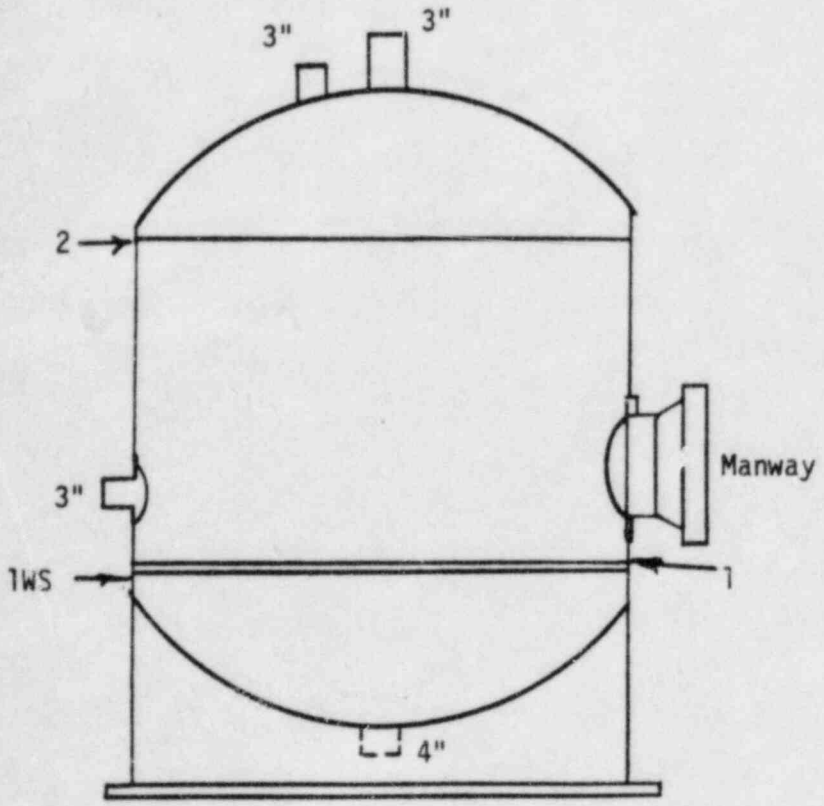
0 Reference: Centerline of 4" Inlet Nozzle

Illustrative Only

TBX-2-1200

VOLUME CONTROL TANK

Welds 1 & 2: Head .312"T; Shell .250"T SA240 TP304SS
Diameter: 90.0"; Circumference 282.6"
Nozzle to Vessel Welds: 4" & 3" Diameter
Integrally Welded Supports: Skirt Weld
Manway Bolting: 12 Bolts - 1.0" Diameter 4.5" Length
0 Reference: Centerline of Manway

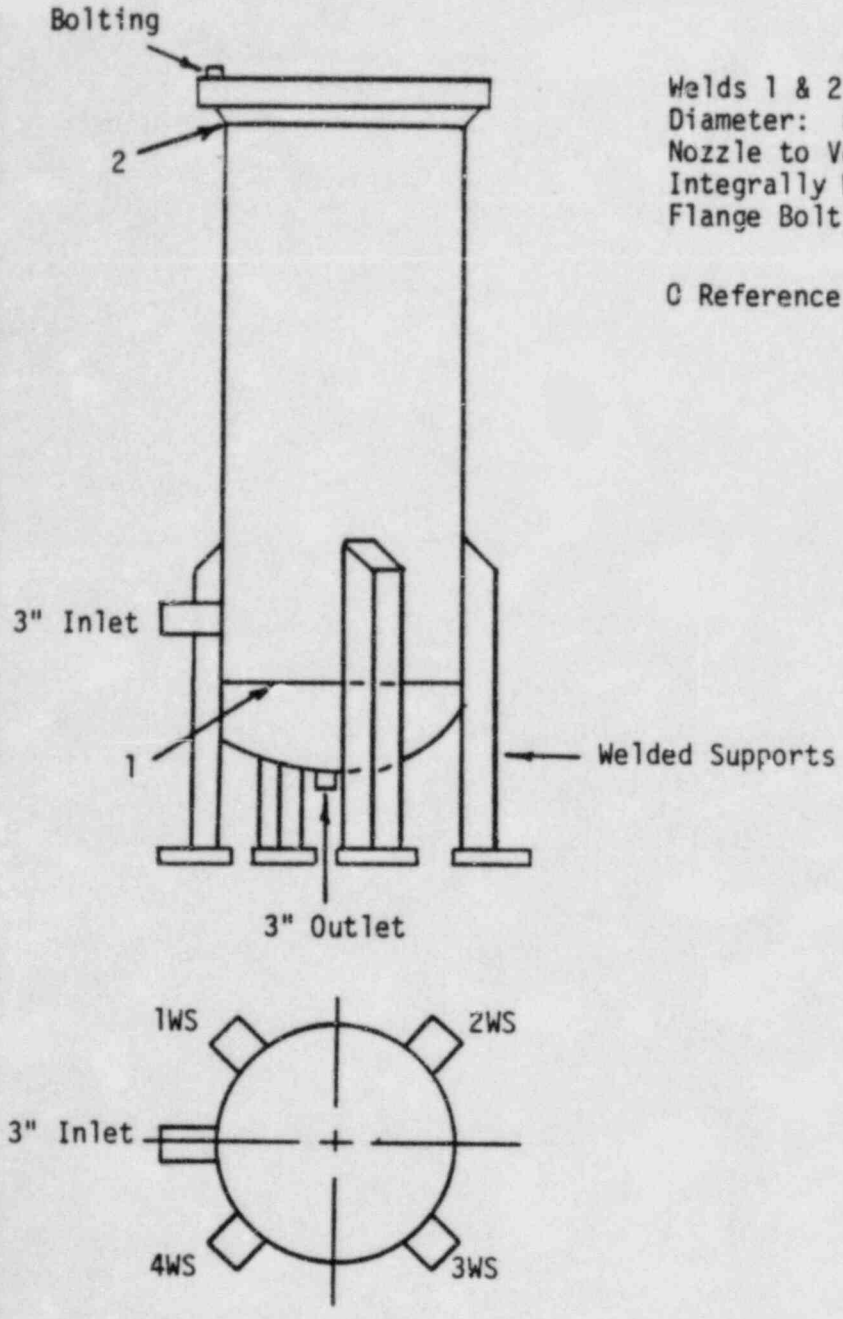


Illustrative Only

TBX-2-1300

FORM 46

REACTOR COOLANT FILTER



Welds 1 & 2: .1875"T SA240 TP304SS
Diameter: 8.625:; Circumference 27.08"
Nozzle to Vessel Welds: 3" Diameter
Integrally Welded Supports: 4
Flange Bolting: 3 - .75" Diameter
4" Length

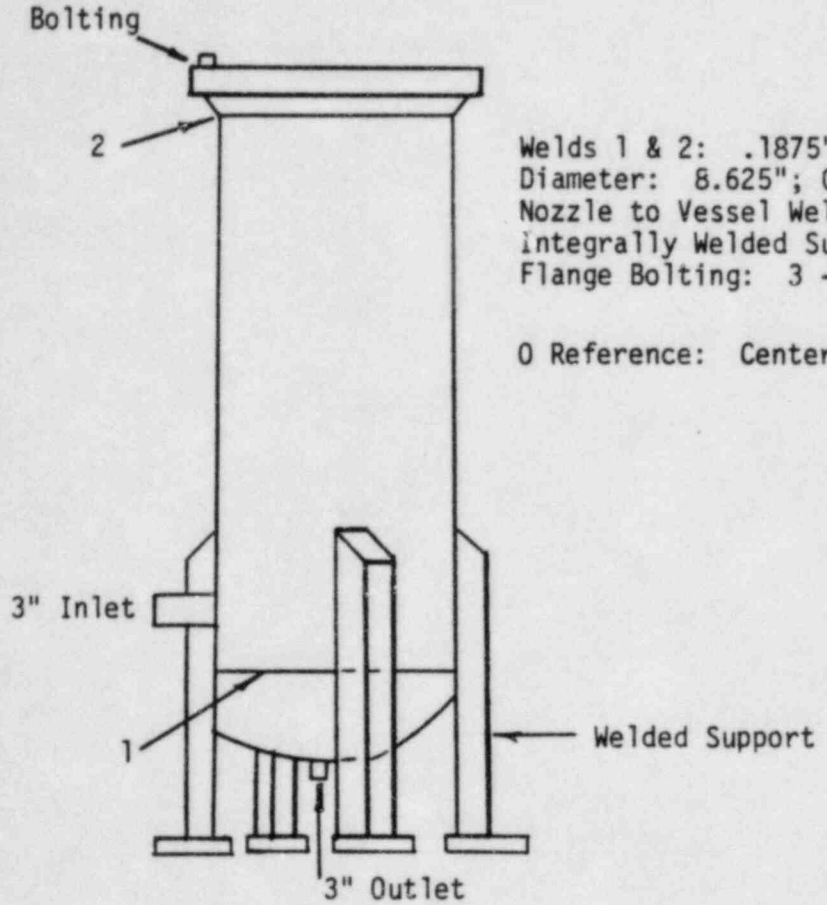
C Reference: Centerline of 3" Inlet Nozzle

Illustrative Only

TBX-2-1310

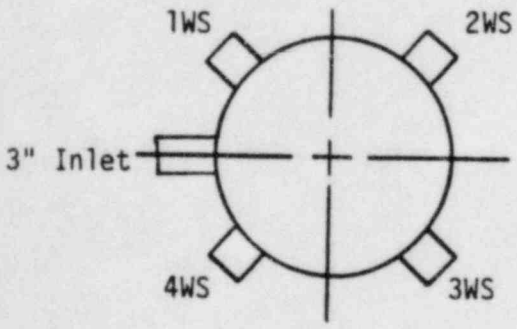
FORM 48

SEAL WATER RETURN FILTER



Welds 1 & 2: .1875"T SA240 TP304SS
Diameter: 8.625"; Circumference: 27.08"
Nozzle to Vessel Welds: 3" Diameter
Integrally Welded Supports: 4
Flange Bolting: 3 - .75" Diameter
4" Length

O Reference: Centerline of 3" Inlet

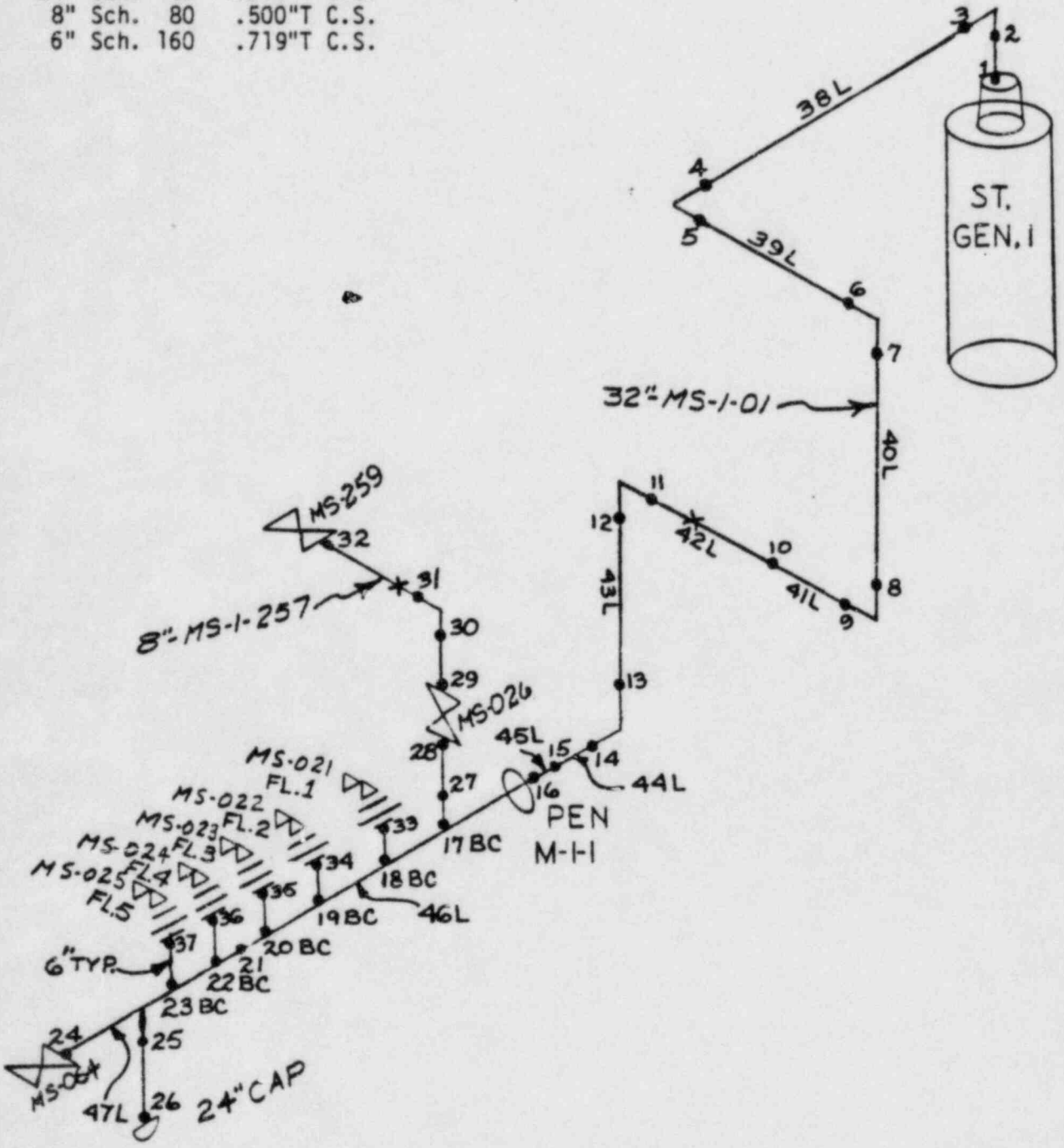


WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2100

MAINSTEAM

32" - 1.250"T Min. C.S.
24" Sch. 100 1.531"T C.S.
24" Sch. 80 1.219"T C.S.
8" Sch. 80 .500"T C.S.
6" Sch. 160 .719"T C.S.

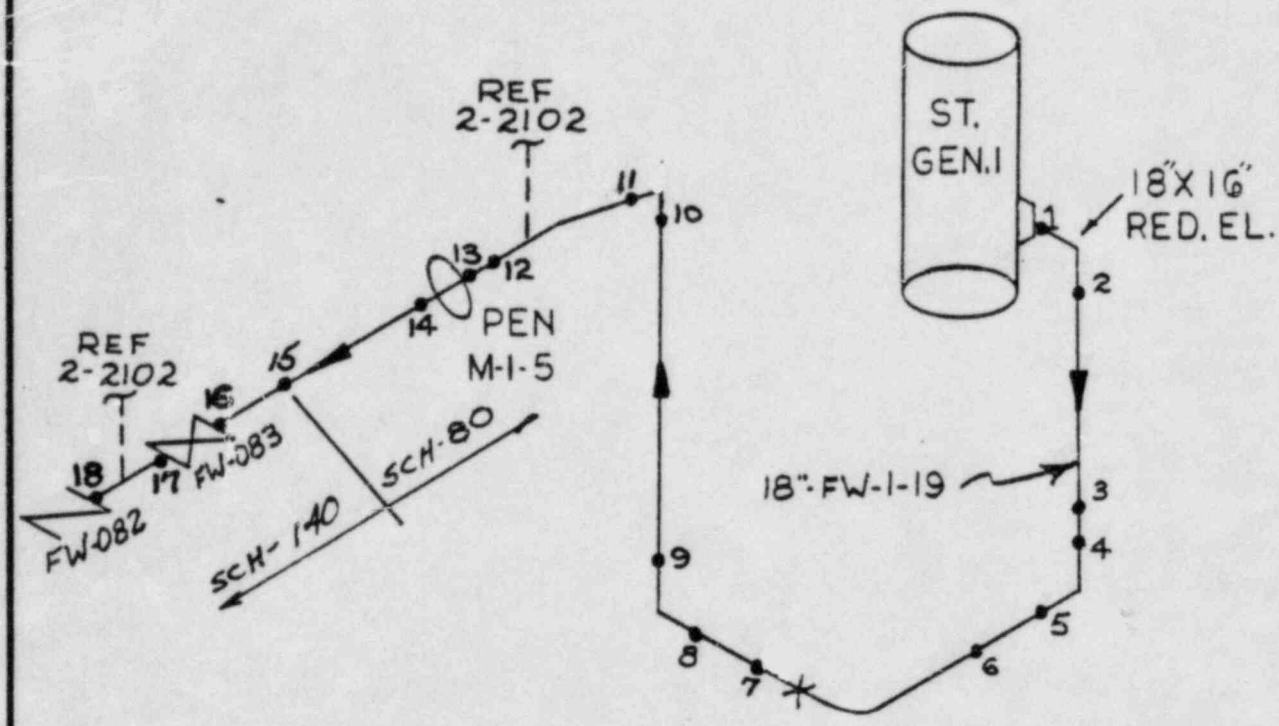


FORM 48448

TBX-2-2101

FEEDWATER

18" Sch. 80 .938"T C.S.
16" Sch. 80 .844"T C.S.

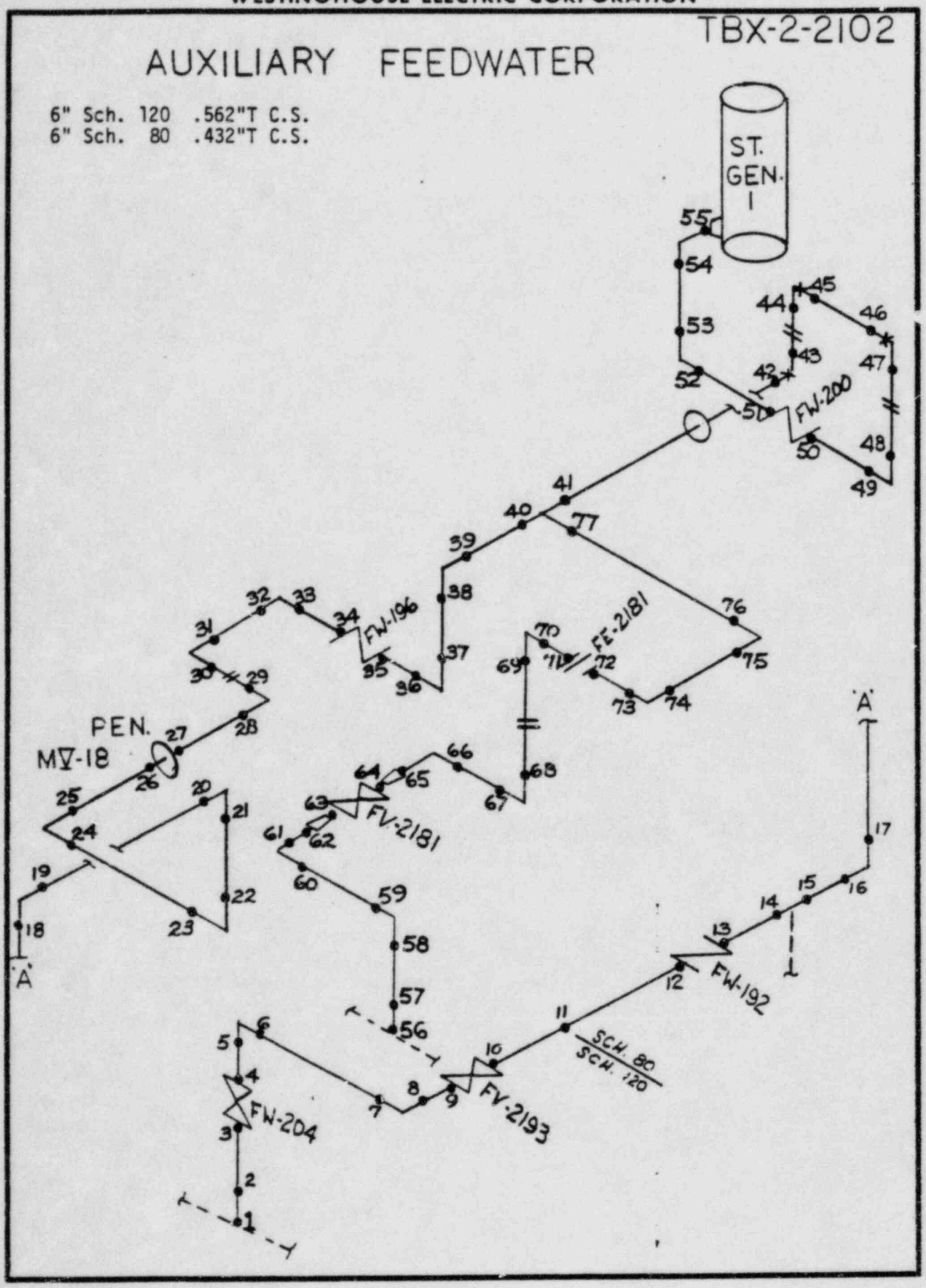


WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2102

AUXILIARY FEEDWATER

6" Sch. 120 .562"T C.S.
6" Sch. 80 .432"T C.S.



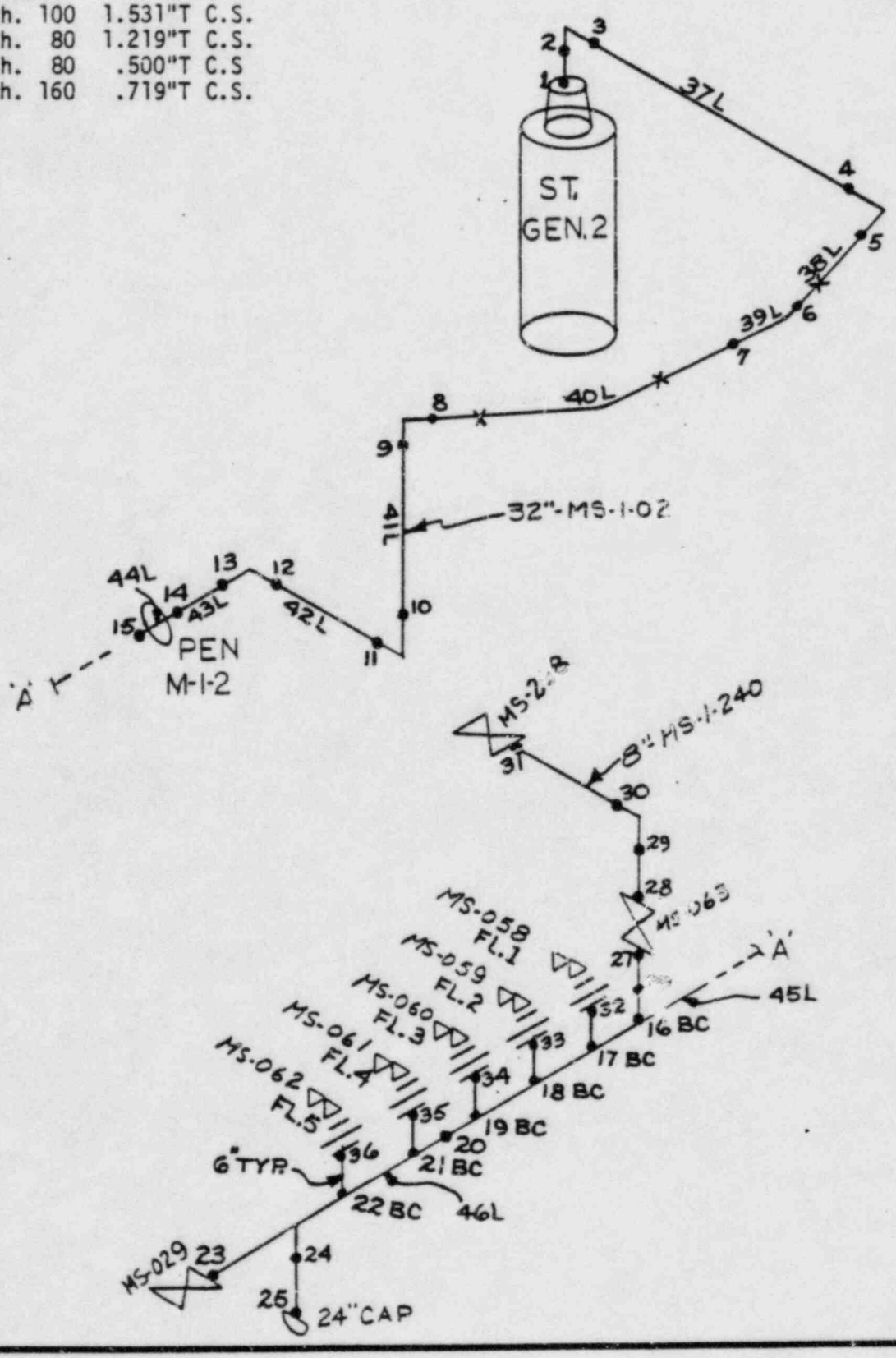
FORM 46445

TBX-2-2200

MAINSTEAM

FORM 46448

32" - 1.250"T Min. C.S.
24" Sch. 100 1.531"T C.S.
24" Sch. 80 1.219"T C.S.
8" Sch. 80 .500"T C.S
6" Sch. 160 .719"T C.S.



WESTINGHOUSE ELECTRIC CORPORATION 7-8-82

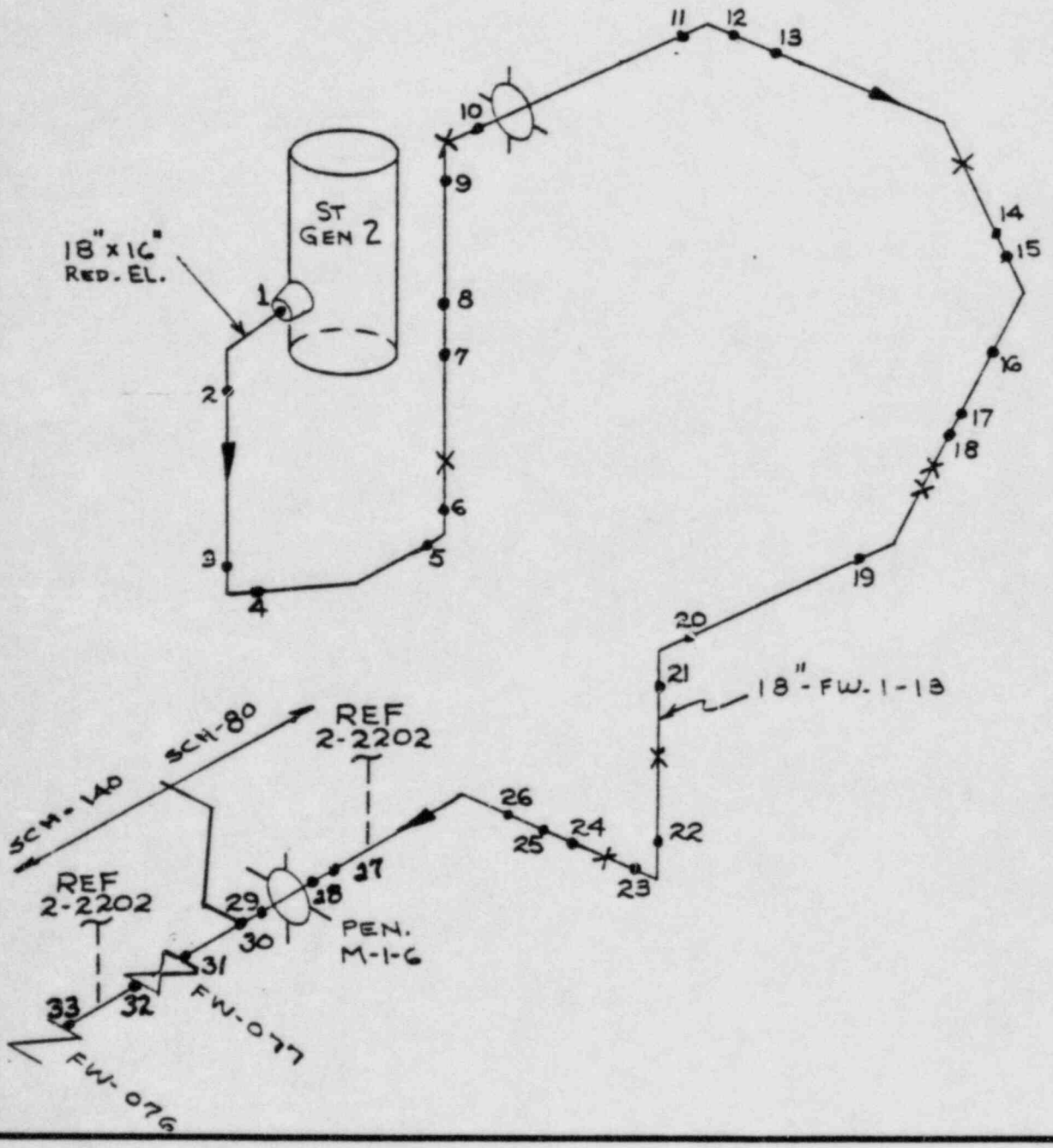
TBX-2-2201

FEEDWATER

18" Sch. 80 .938"T C.S.

16" Sch. 80 .844"T C.S.

FORM 46445

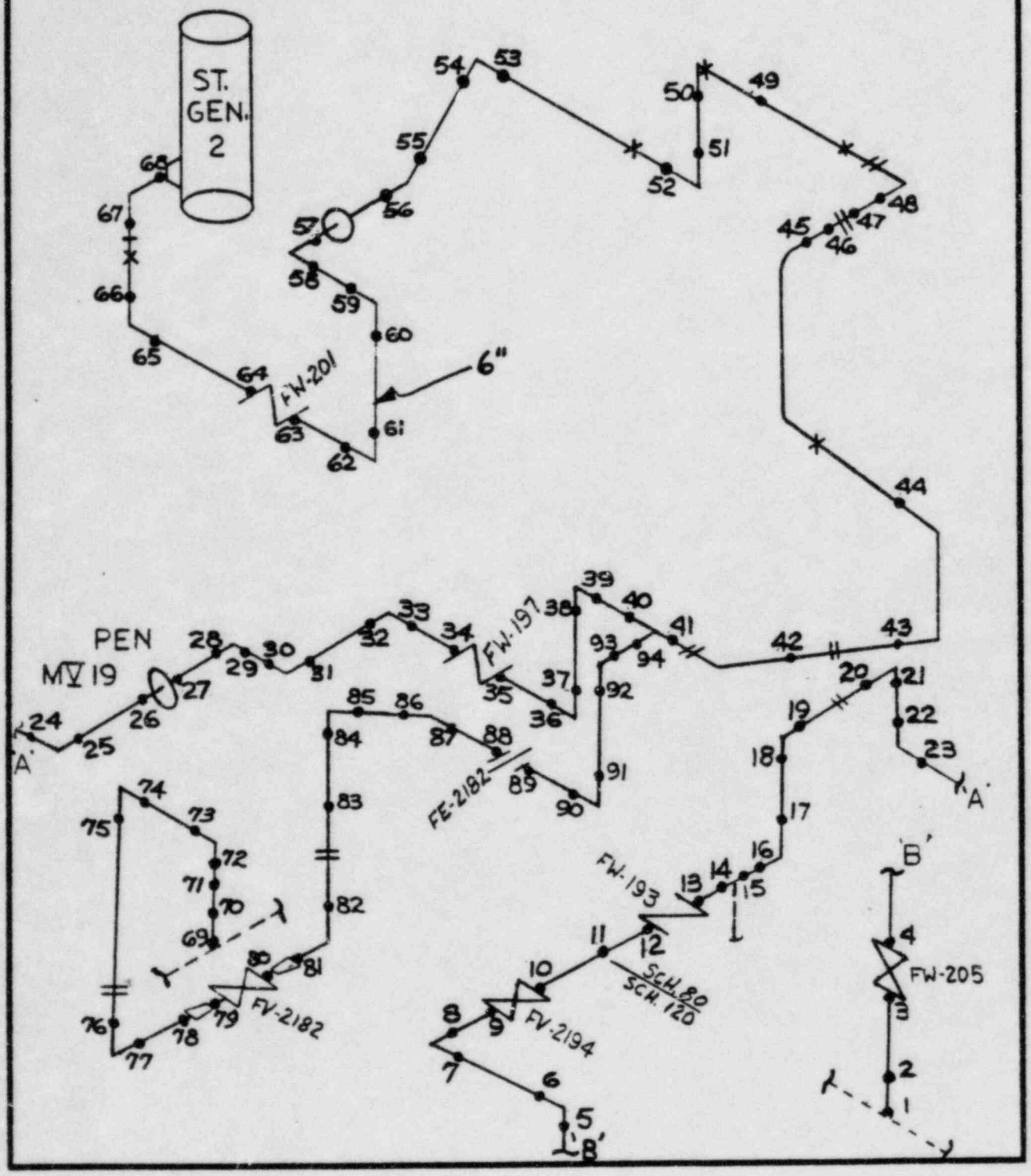


WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2202

AUXILIARY FEEDWATER

6" Sch. 120 .562"T C.S.
6" Sch. 80 .432"T C.S.



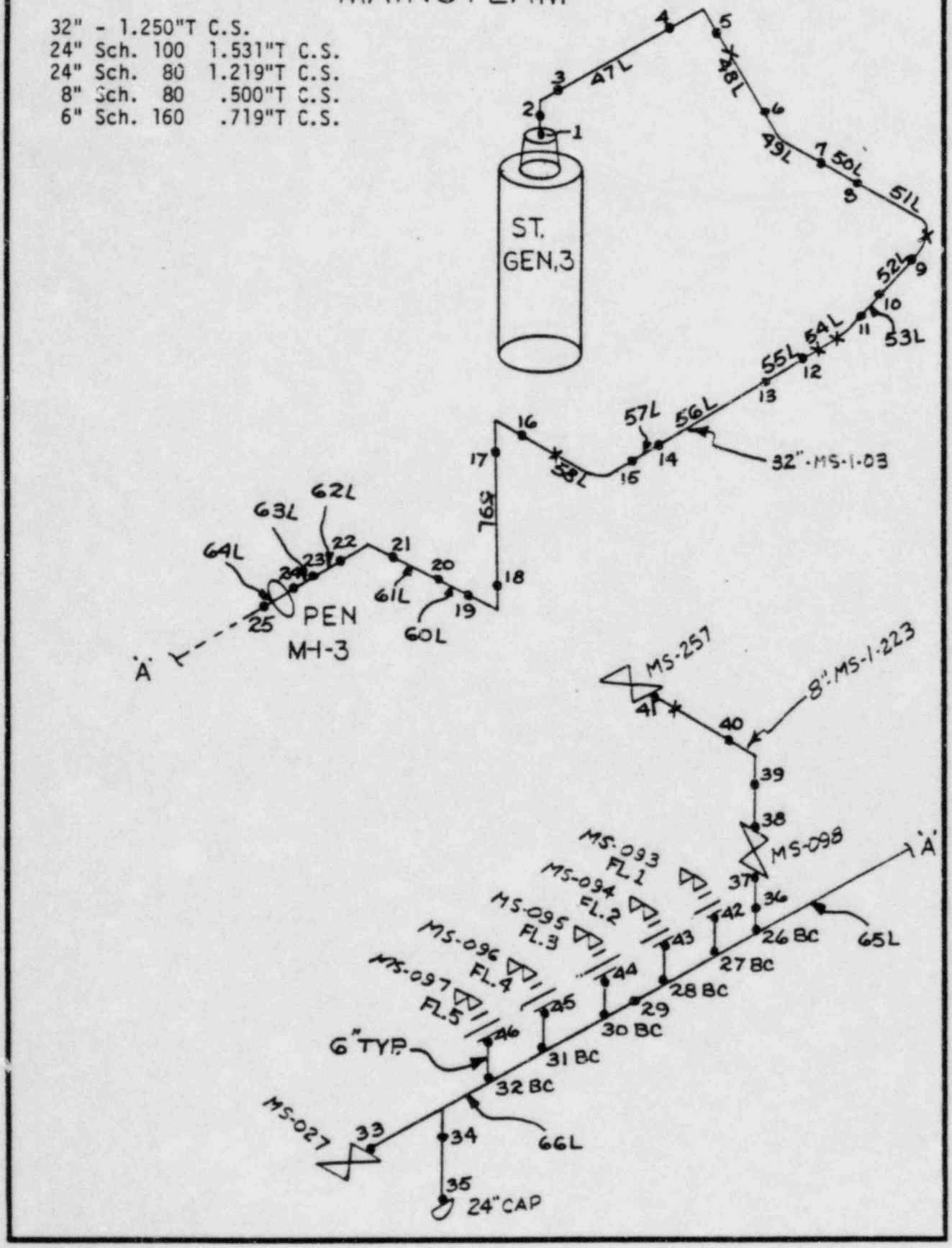
WESTINGHOUSE ELECTRIC CORPORATION

FORM 4R446

TBX-2-2300

MAINSTEAM

32" - 1.250"T C.S.
24" Sch. 100 1.531"T C.S.
24" Sch. 80 1.219"T C.S.
8" Sch. 80 .500"T C.S.
6" Sch. 160 .719"T C.S.

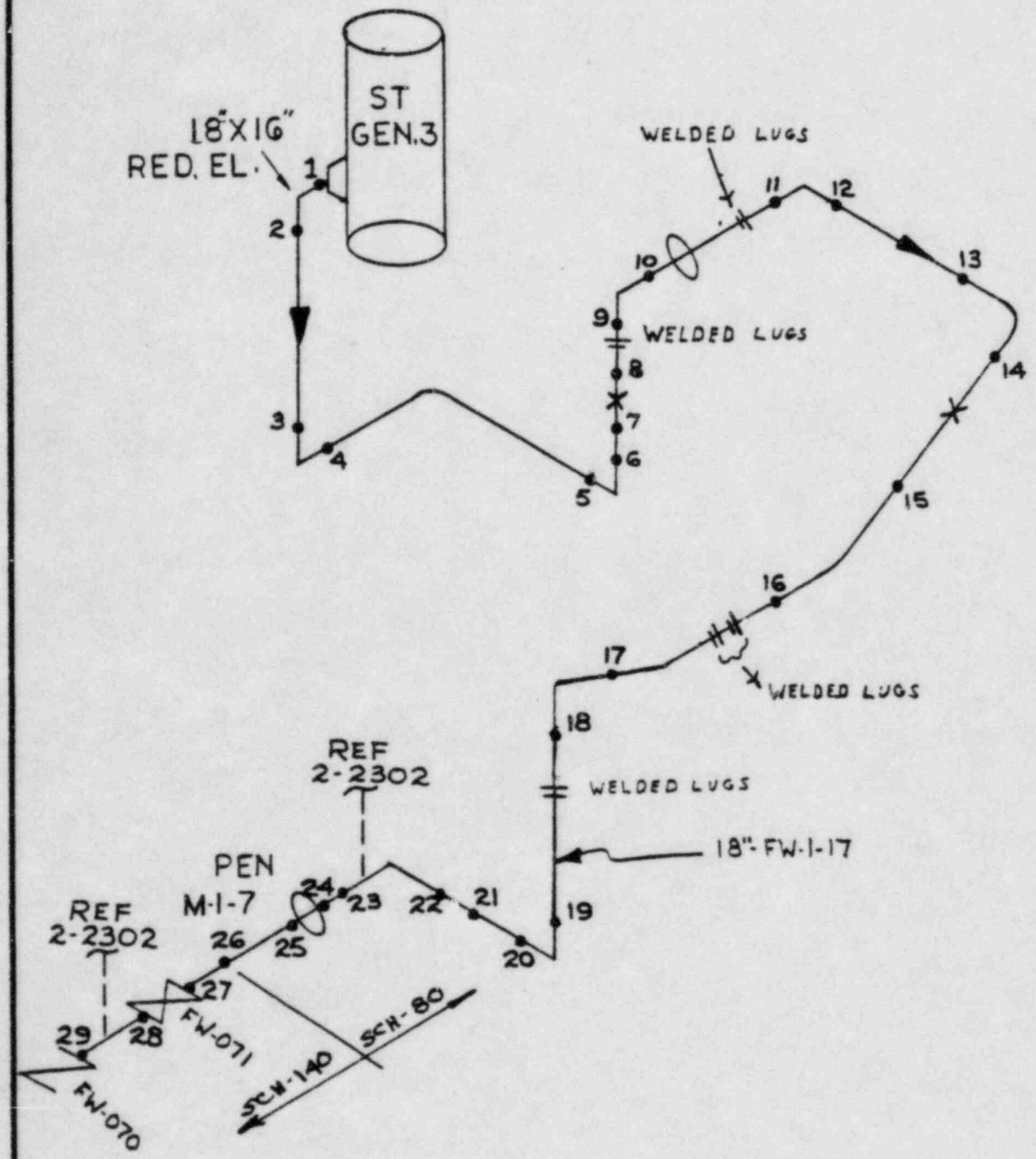


WESTINGHOUSE ELECTRIC CORPORATION 7-8-82

TBX-2-2301

FEEDWATER

18" Sch. 80 .938"T C.S.
16" Sch. 80 .844"T C.S.

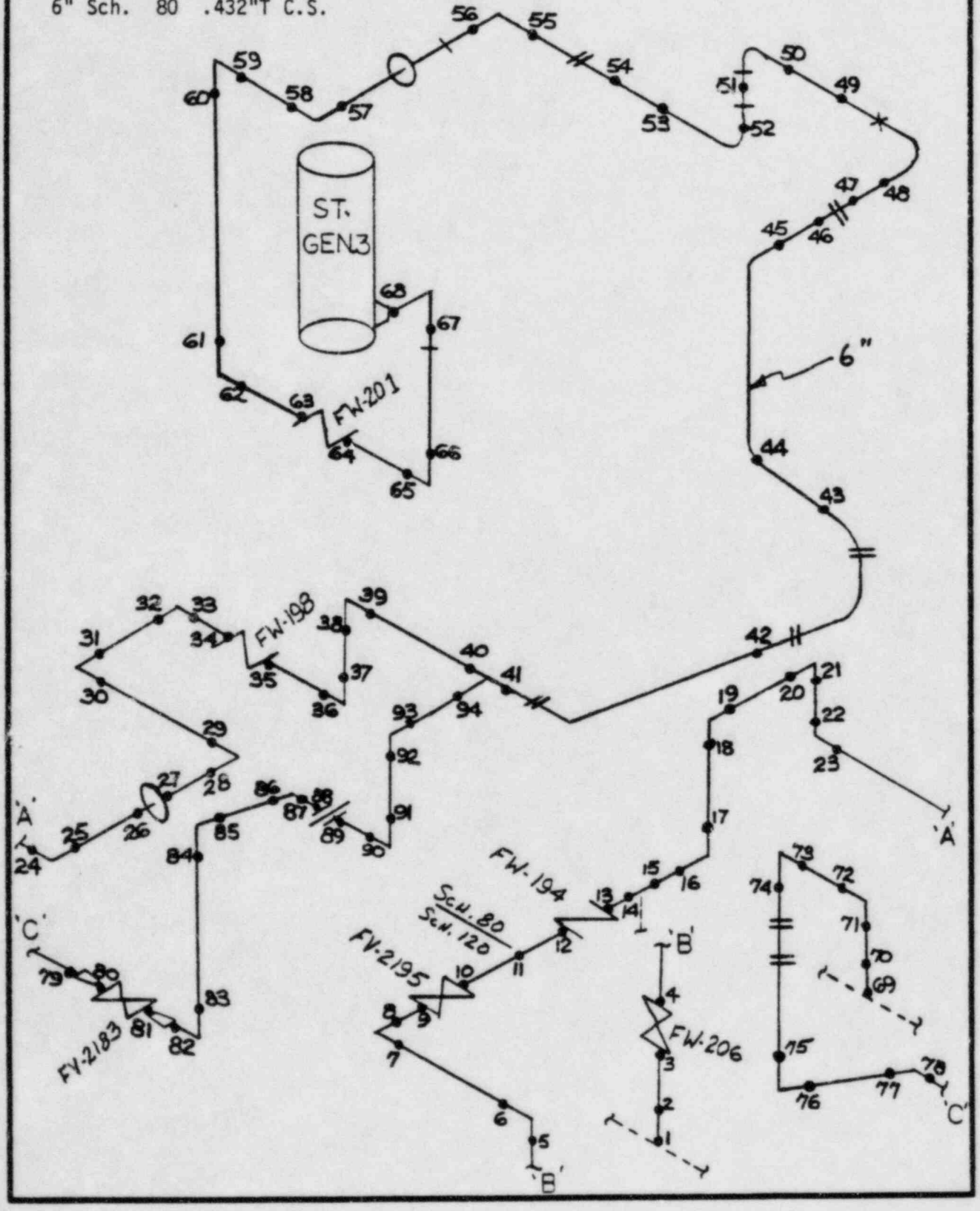


FORM 48446

TBX-2-2302

AUXILIARY FEEDWATER

6" Sch. 120 .562"T C.S.
6" Sch. 80 .432"T C.S.

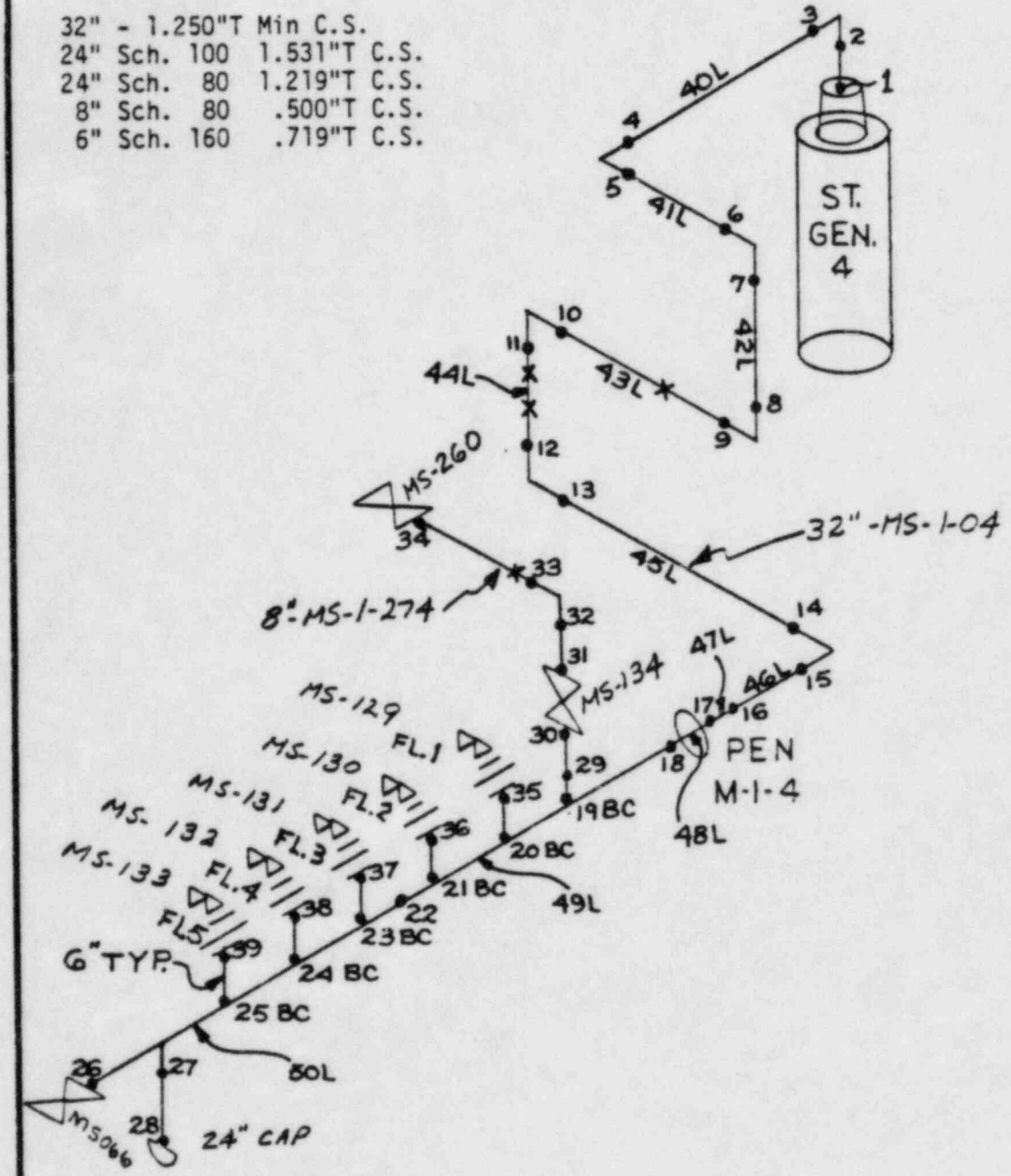


WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2400

MAINSTEAM

32" - 1.250"T Min C.S.
24" Sch. 100 1.531"T C.S.
24" Sch. 80 1.219"T C.S.
8" Sch. 80 .500"T C.S.
6" Sch. 160 .719"T C.S.



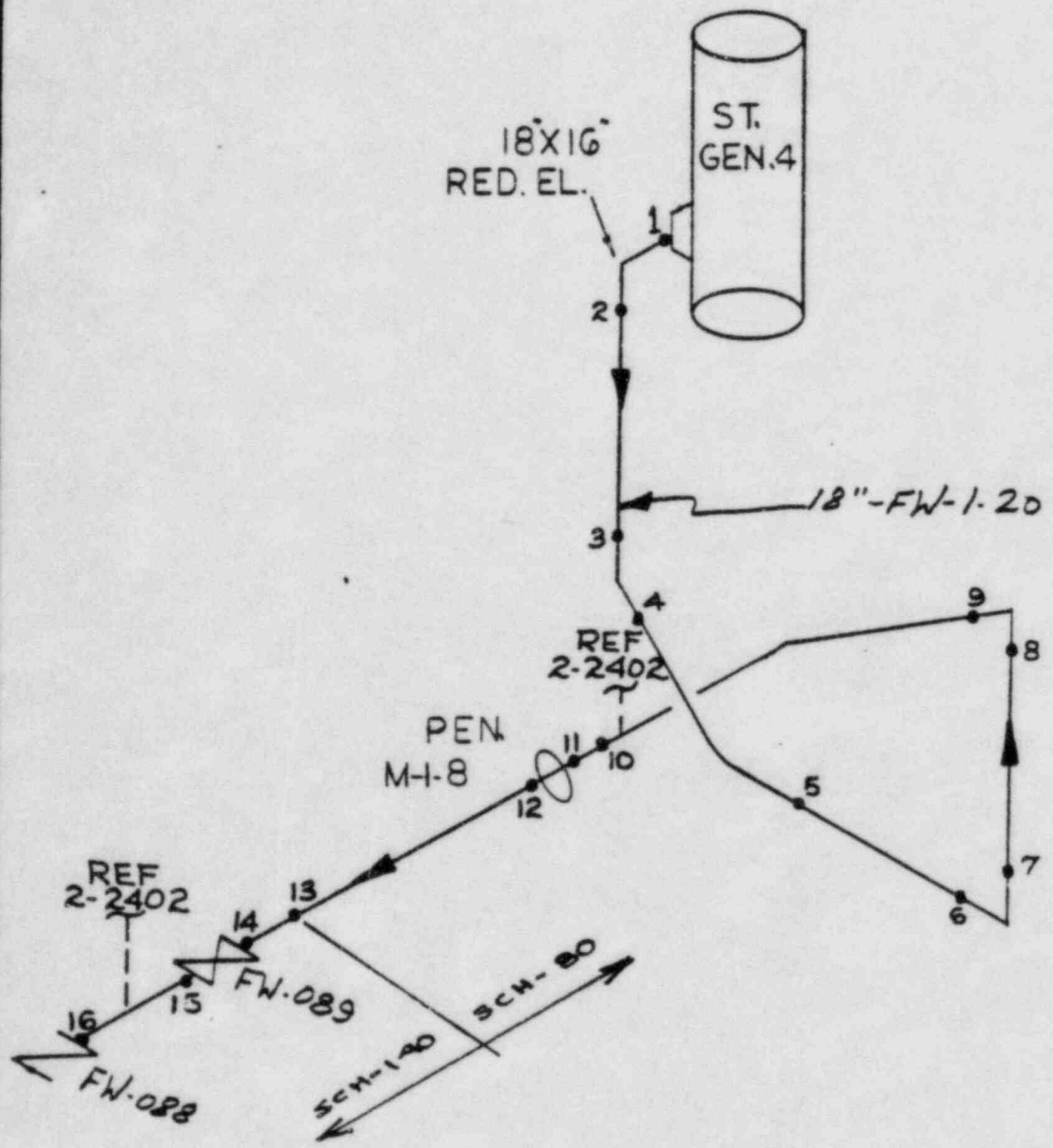
FORM 46446

WESTINGHOUSE ELECTRIC CORPORATION 7-8-82

TBX-2-2401

FEEDWATER

18" Sch. 80 .938"T C.S.
16" Sch. 80 .844"T C.S.



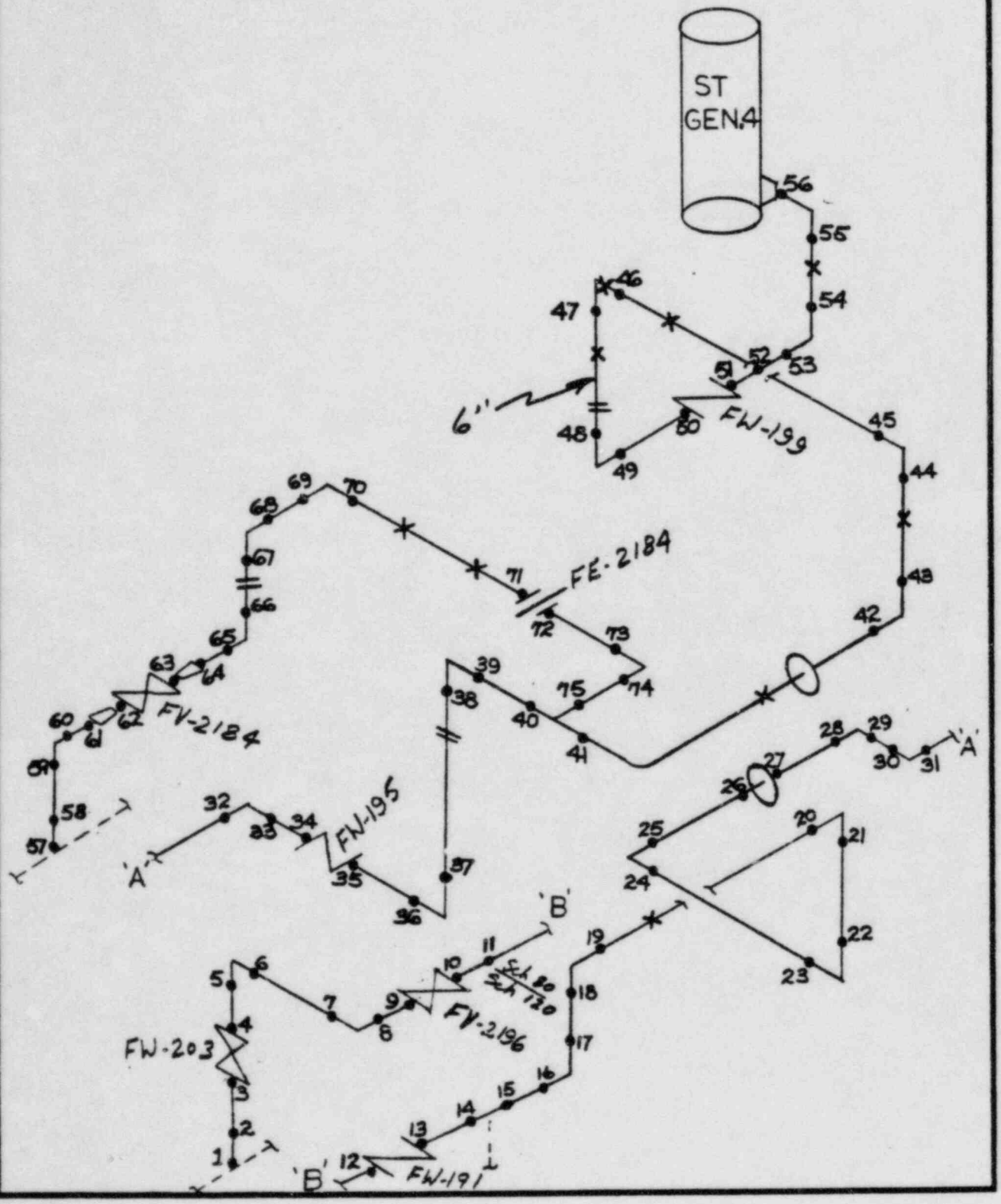
WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2402

AUXILIARY FEEDWATER

6" Sch. 120 .562"T C.S.

6" Sch. 80 .438"T C.S.

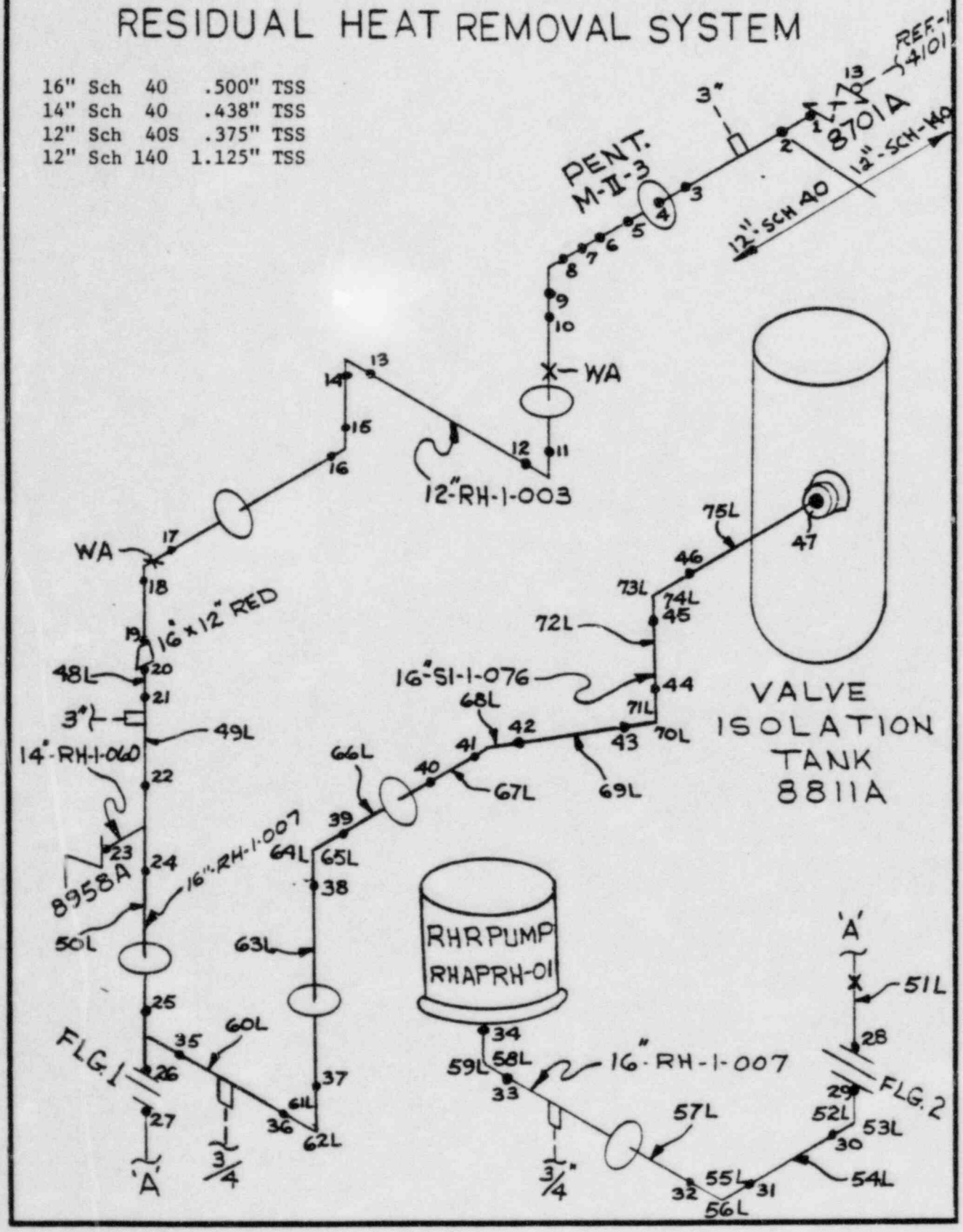


FORM 48448

TBX-2-2500

RESIDUAL HEAT REMOVAL SYSTEM

16"	Sch 40	.500" TSS
14"	Sch 40	.438" TSS
12"	Sch 40S	.375" TSS
12"	Sch 140	1.125" TSS

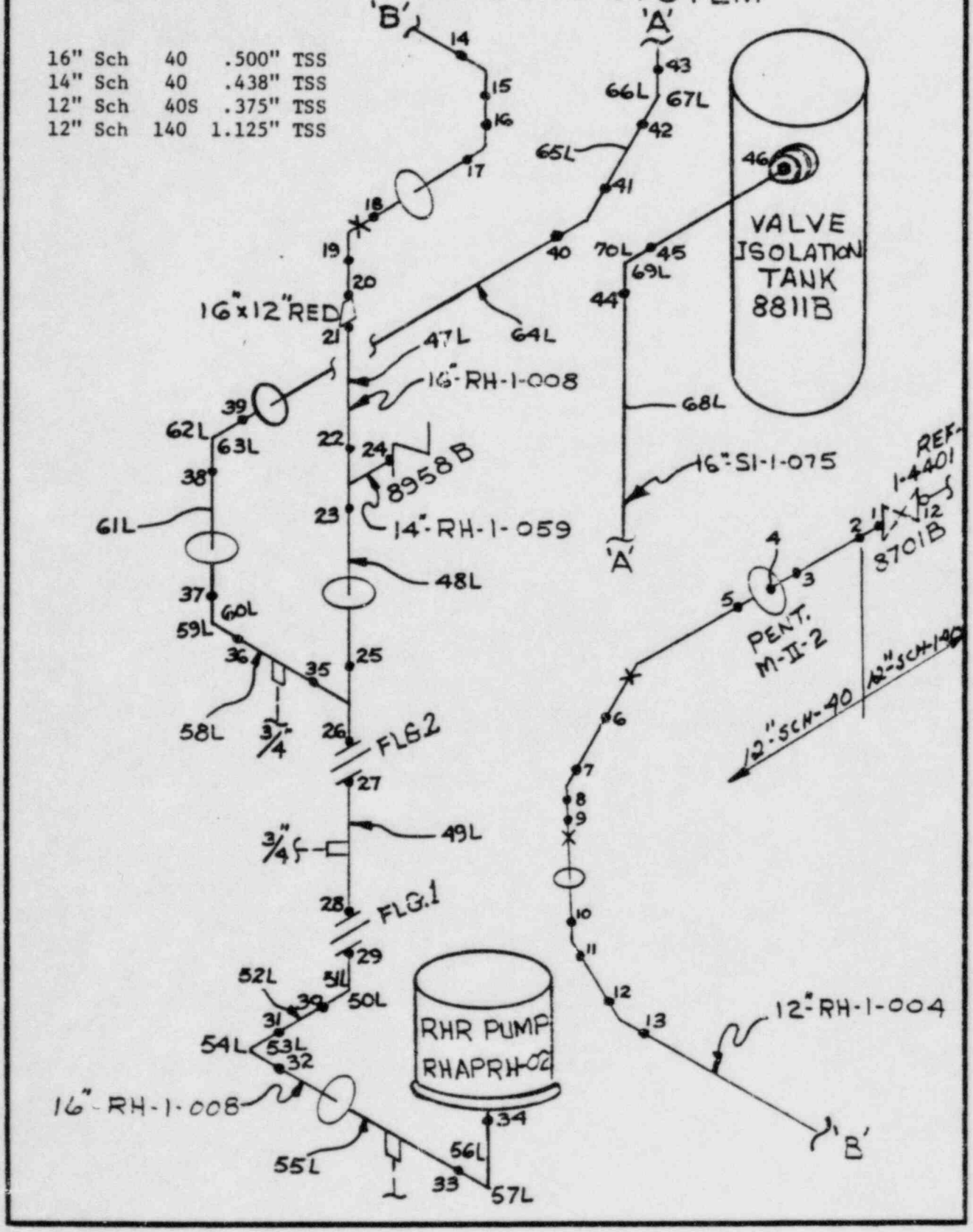


FORM 46446

TBX-2-2501

RESIDUAL HEAT REMOVAL SYSTEM

16" Sch	40	.500" TSS
14" Sch	40	.438" TSS
12" Sch	40S	.375" TSS
12" Sch	140	1.125" TSS

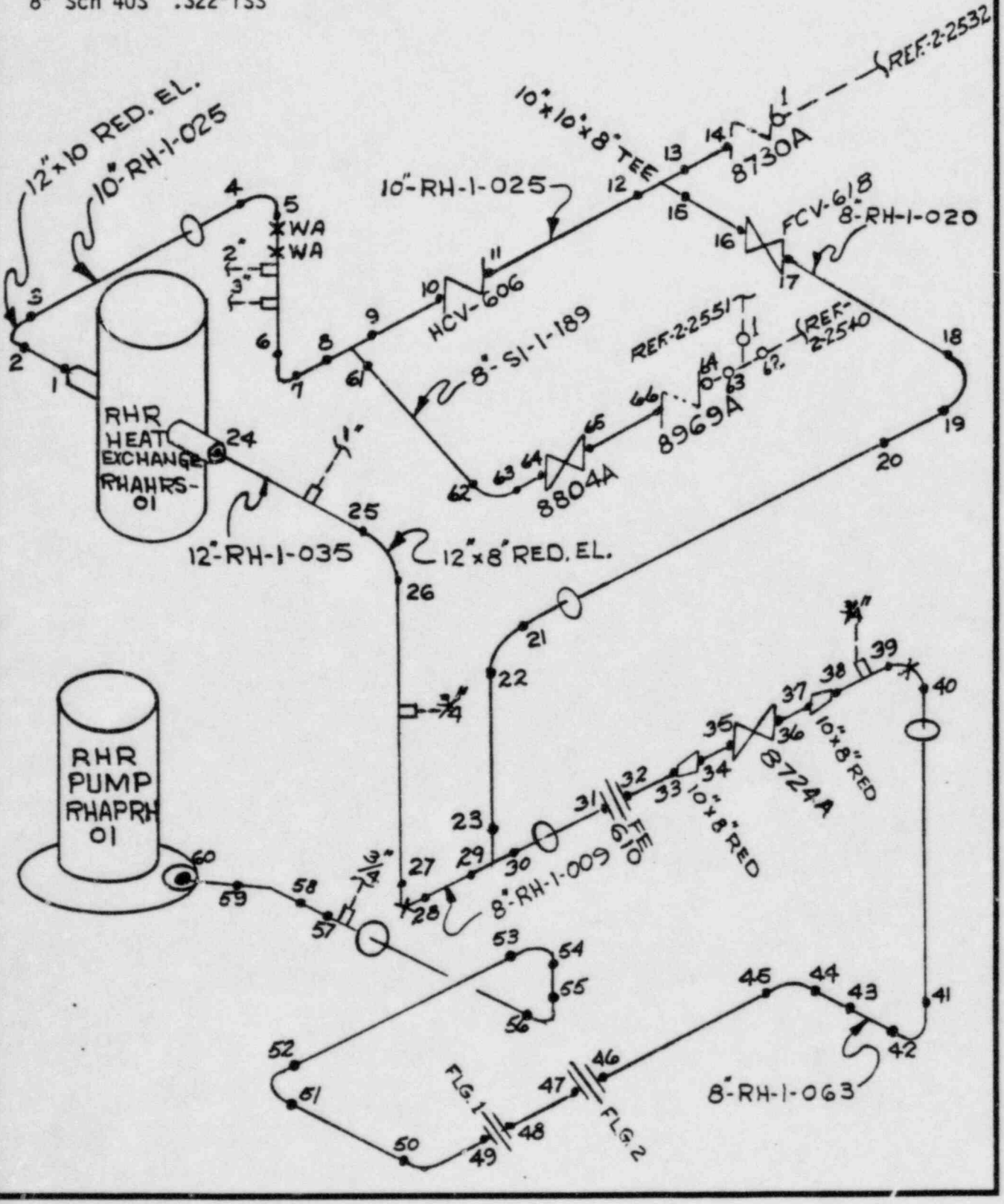


FORM 484

TBX-2-2520

RESIDUAL HEAT REMOVAL SYSTEM

12" Sch 40S .375"TSS
10" Sch 40S .365"TSS
8" Sch 40S .322"TSS

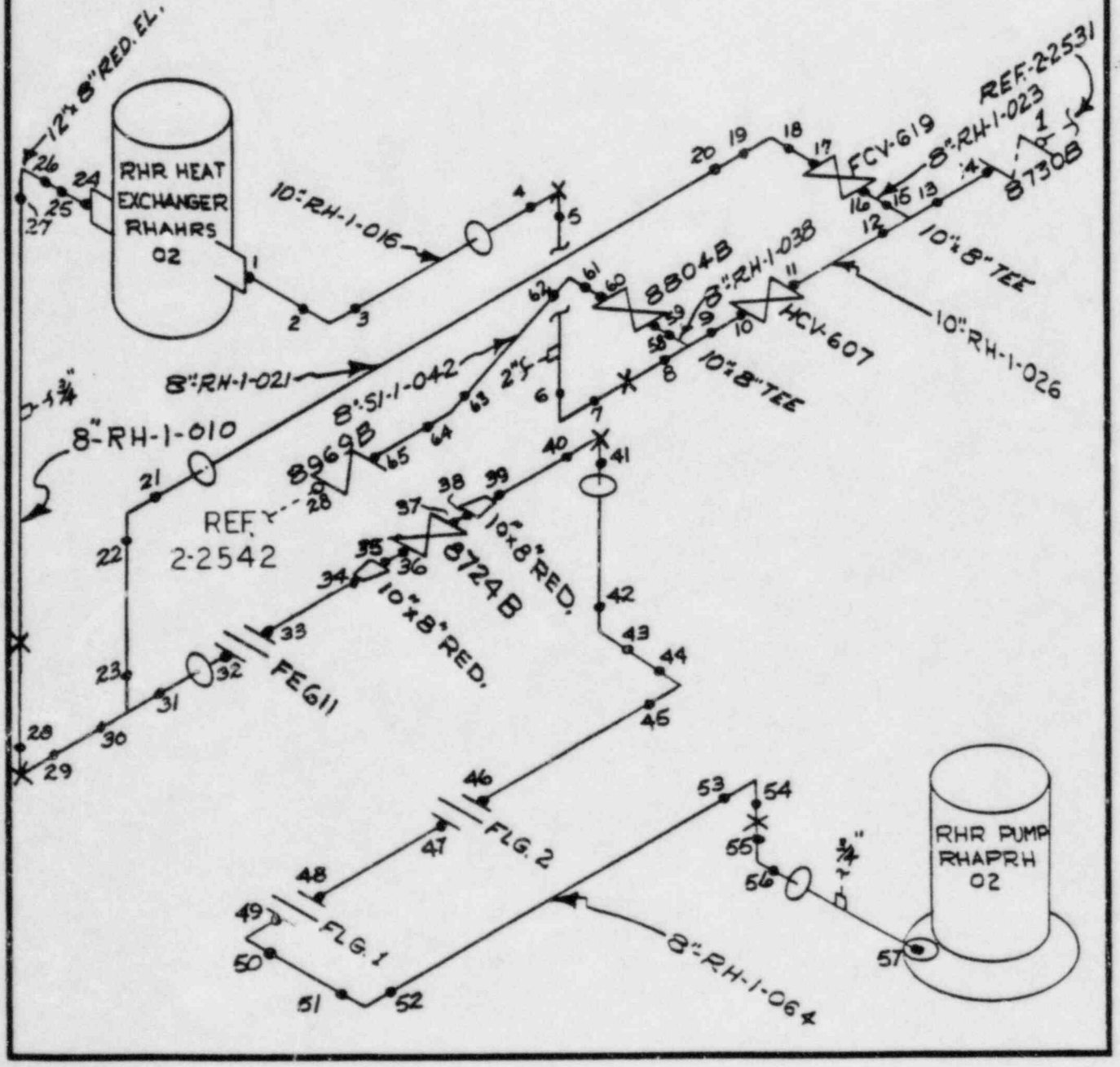


FORM 464

TBX-2-2521

RESIDUAL HEAT REMOVAL SYSTEM

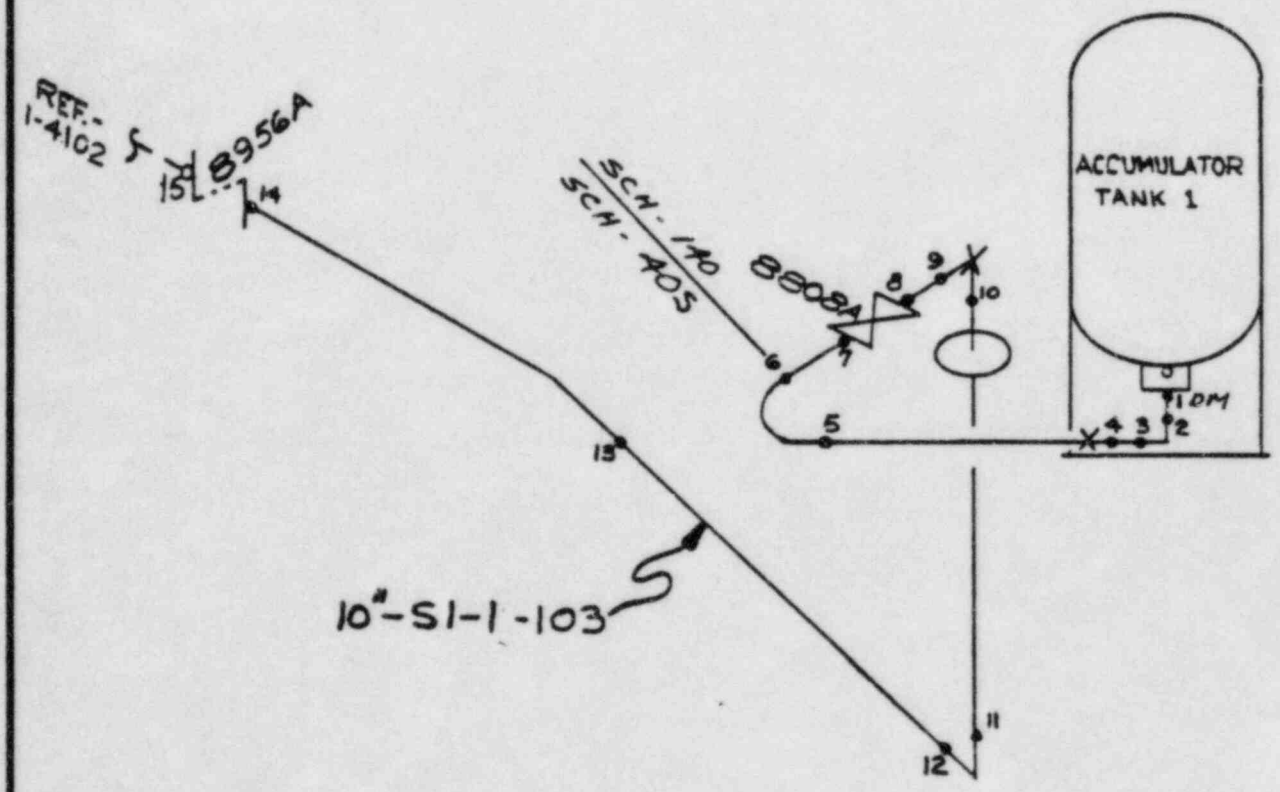
12" Sch 40S .375"TSS
10" Sch 40S .365"TSS
8" Sch 40S .322"TSS



TBX-2-2522

ACCUMLATOR DISCHARGE

10" Sch 140 1.00"TSS
10" Sch 40S .365"TSS



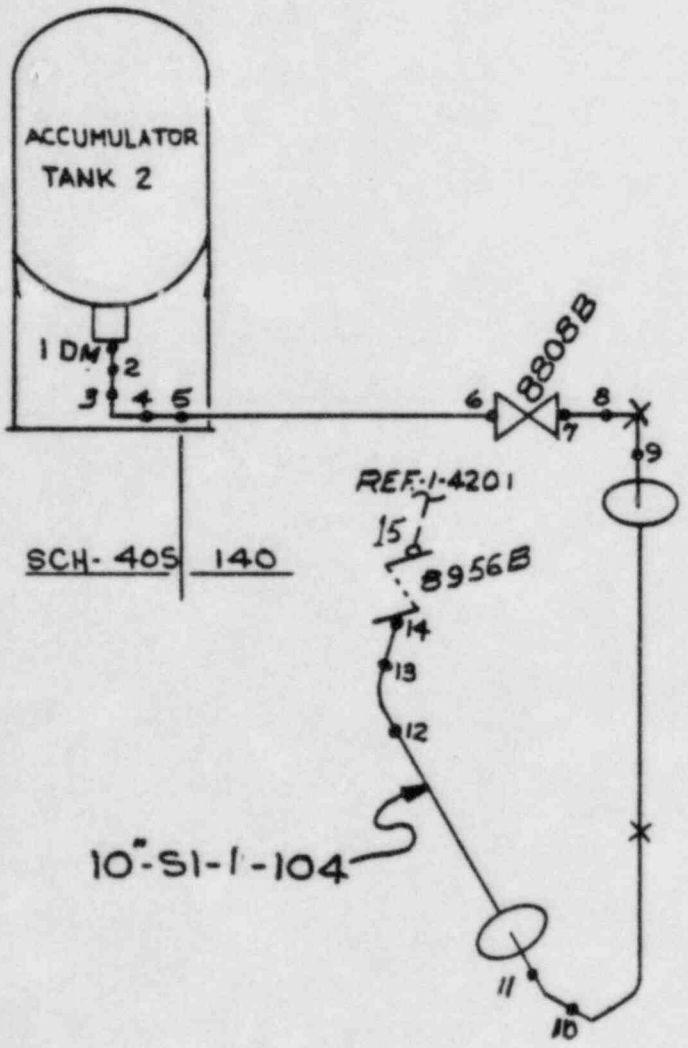
FORM 46446

TBX-2-2523

ACCUMLATOR DISCHARGE

10" Sch 140 1.00"TSS

10" Sch 40S .365"TSS

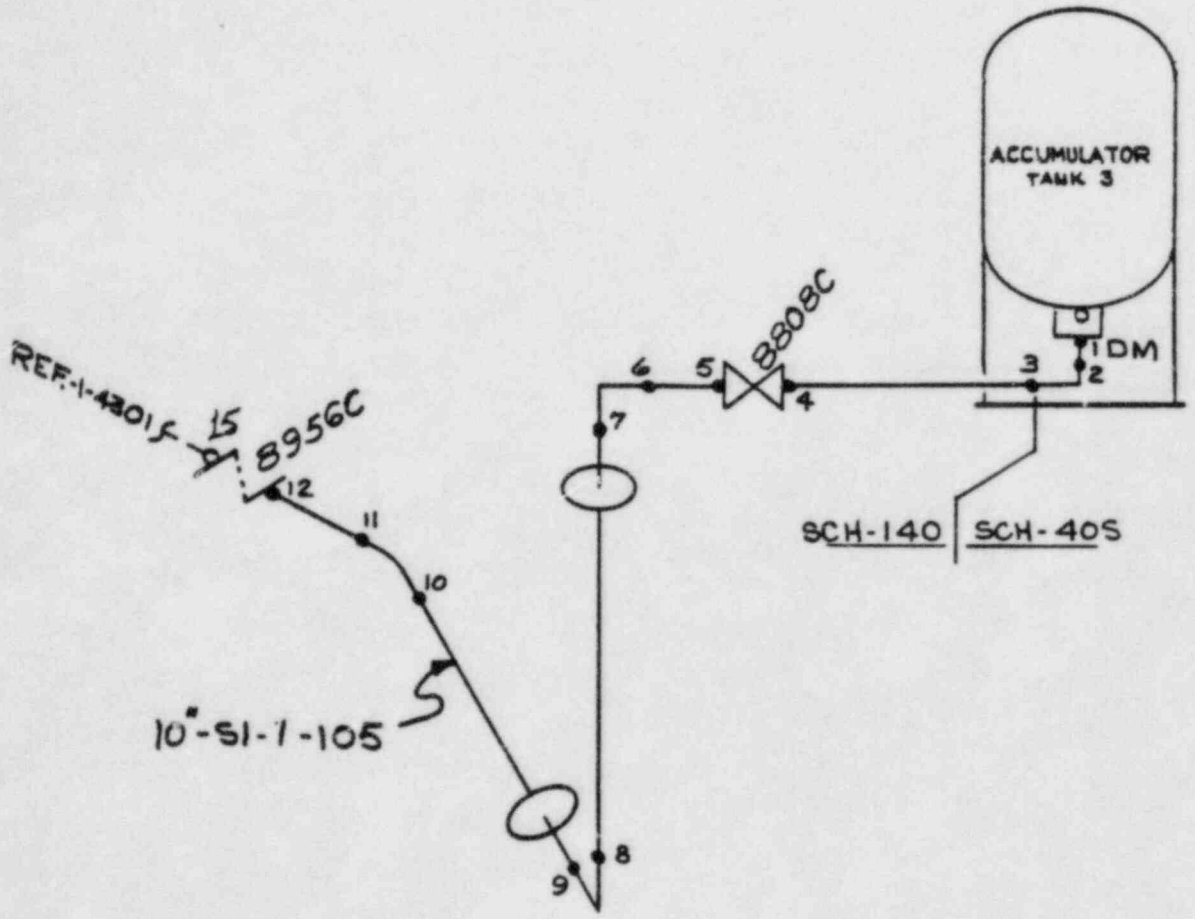


WESTINGHOUSE ELECTRIC CORPORATION 7-8-82

TBX-2-2524

ACCUMLATOR DISCHARGE

10" Sch 140 1.00"TSS
10" Sch 40S .365"TSS

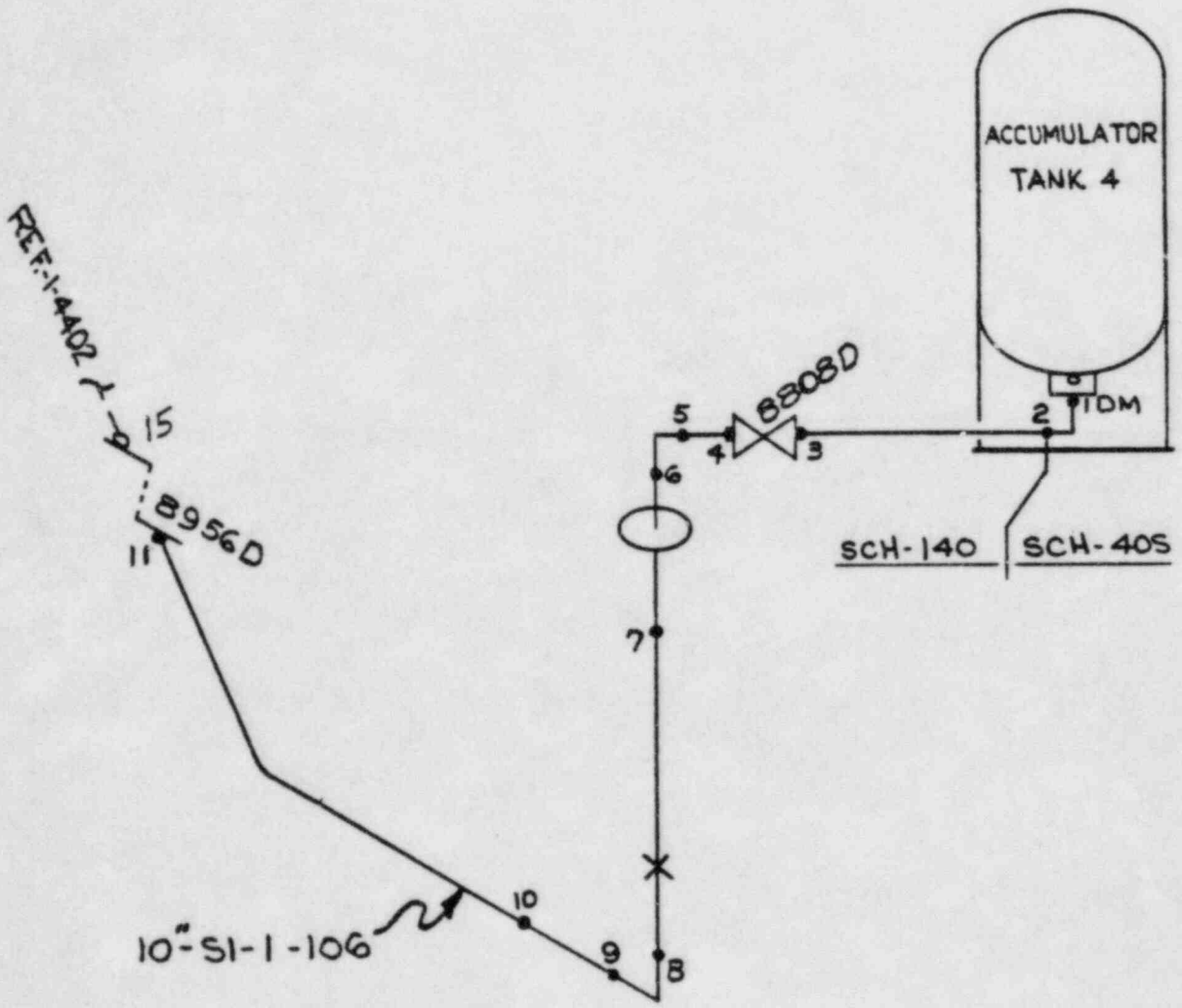


WESTINGHOUSE ELECTRIC CORPORATION 7-8-82

TBX-2-2525

ACCUMLATOR DISCHARGE

10" Sch 140 1.00"TSS
10" Sch 40S .365"TSS

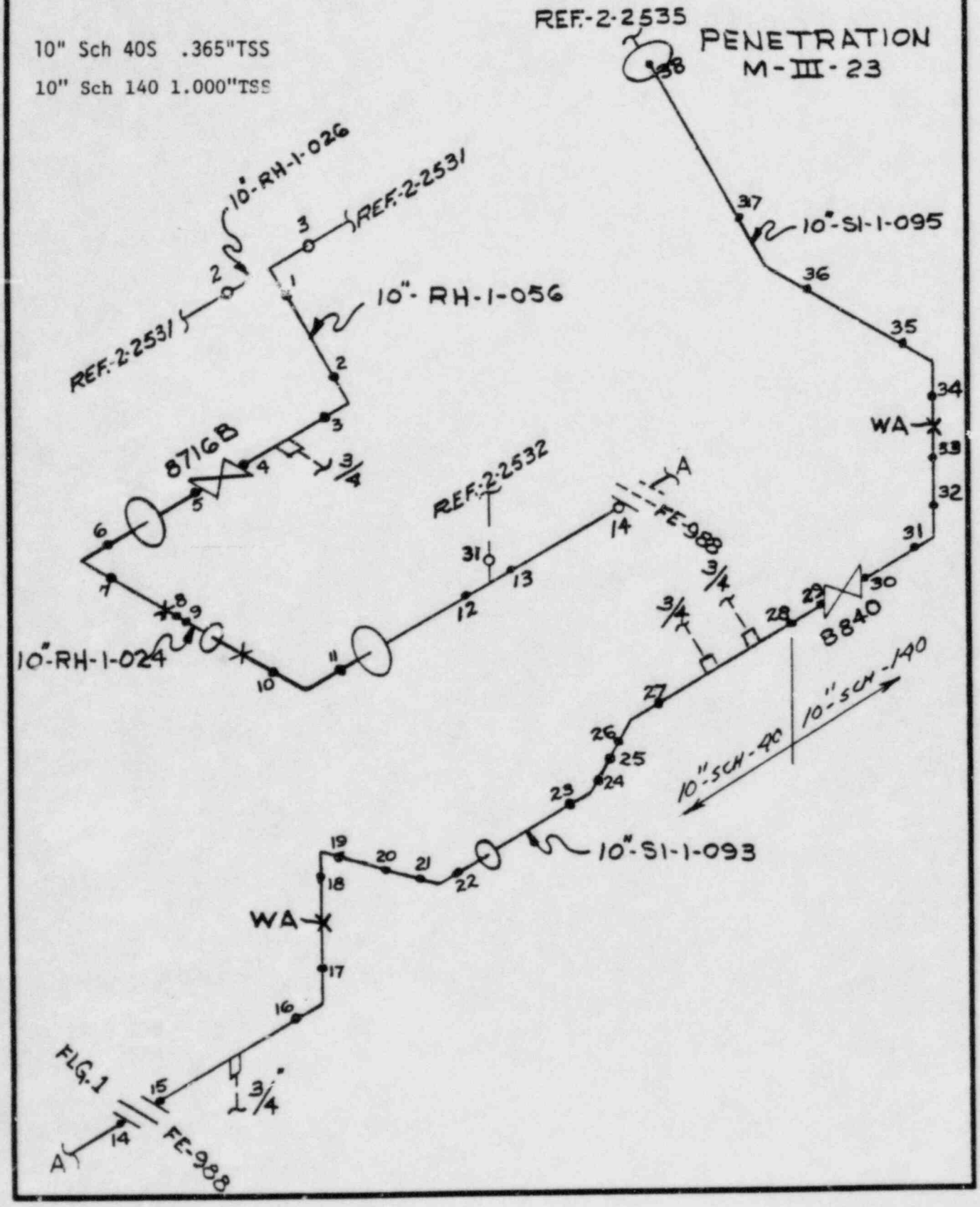


SAFETY INJECTION SYSTEM & RESIDUAL HEAT REMOVAL SYSTEM

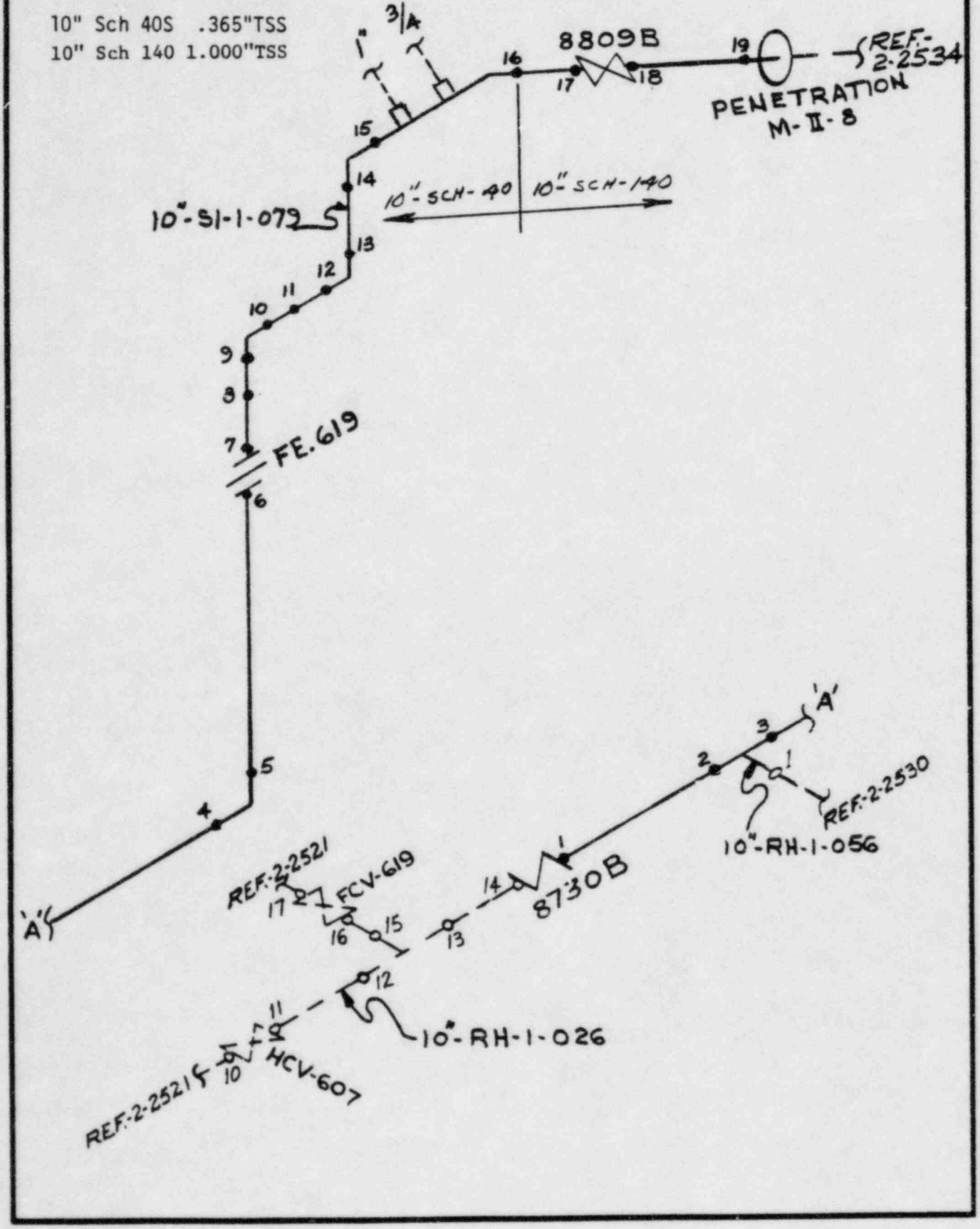
TBX-2-2530

10" Sch 40S .365"TSS

10" Sch 140 1.000"TSS



SAFETY INJECTION SYSTEM & TBX-2-2531 RESIDUAL HEAT REMOVAL SYSTEM

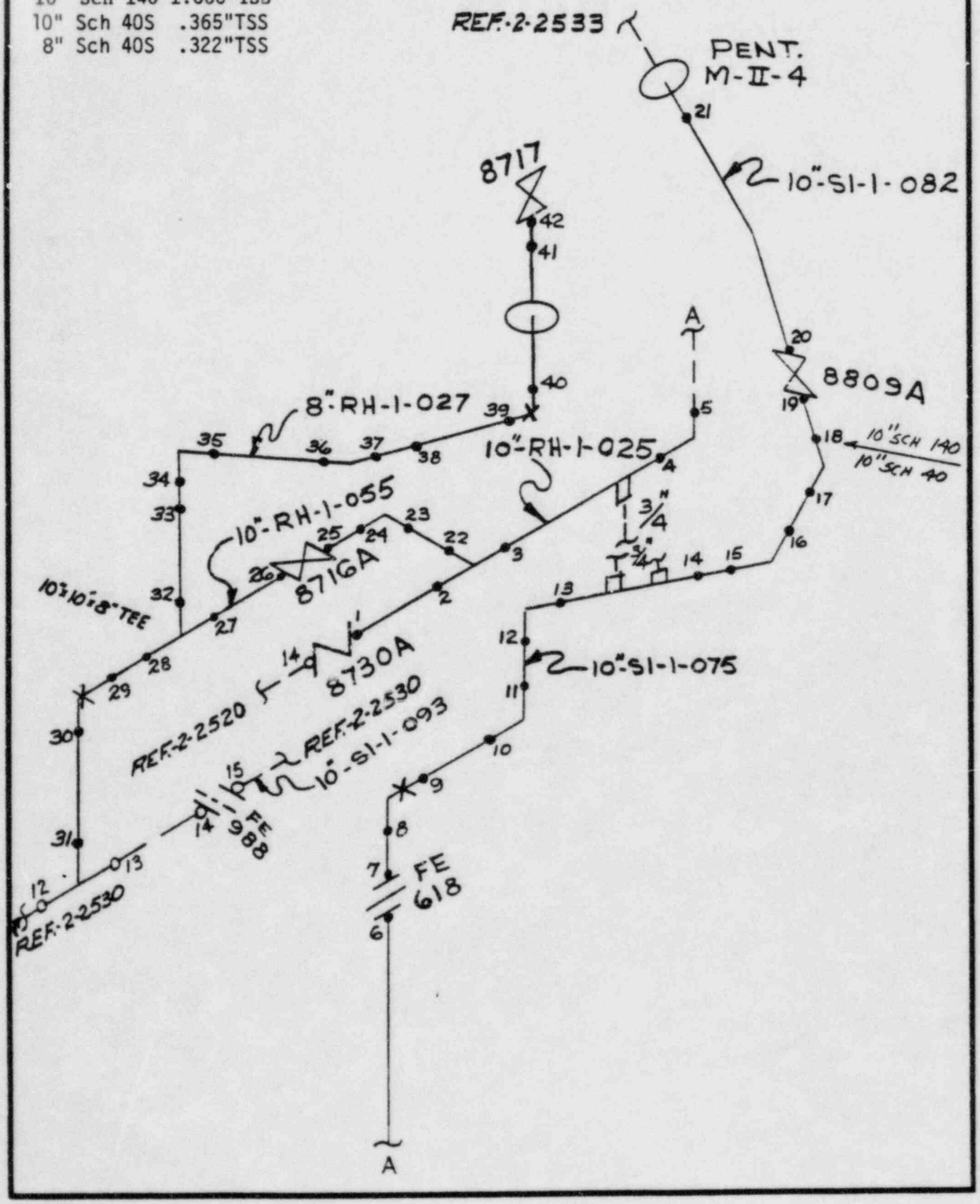


FORM 4644

SAFETY INJECTION SYSTEM & RESIDUAL HEAT REMOVAL SYSTEM

TBX-2-2532

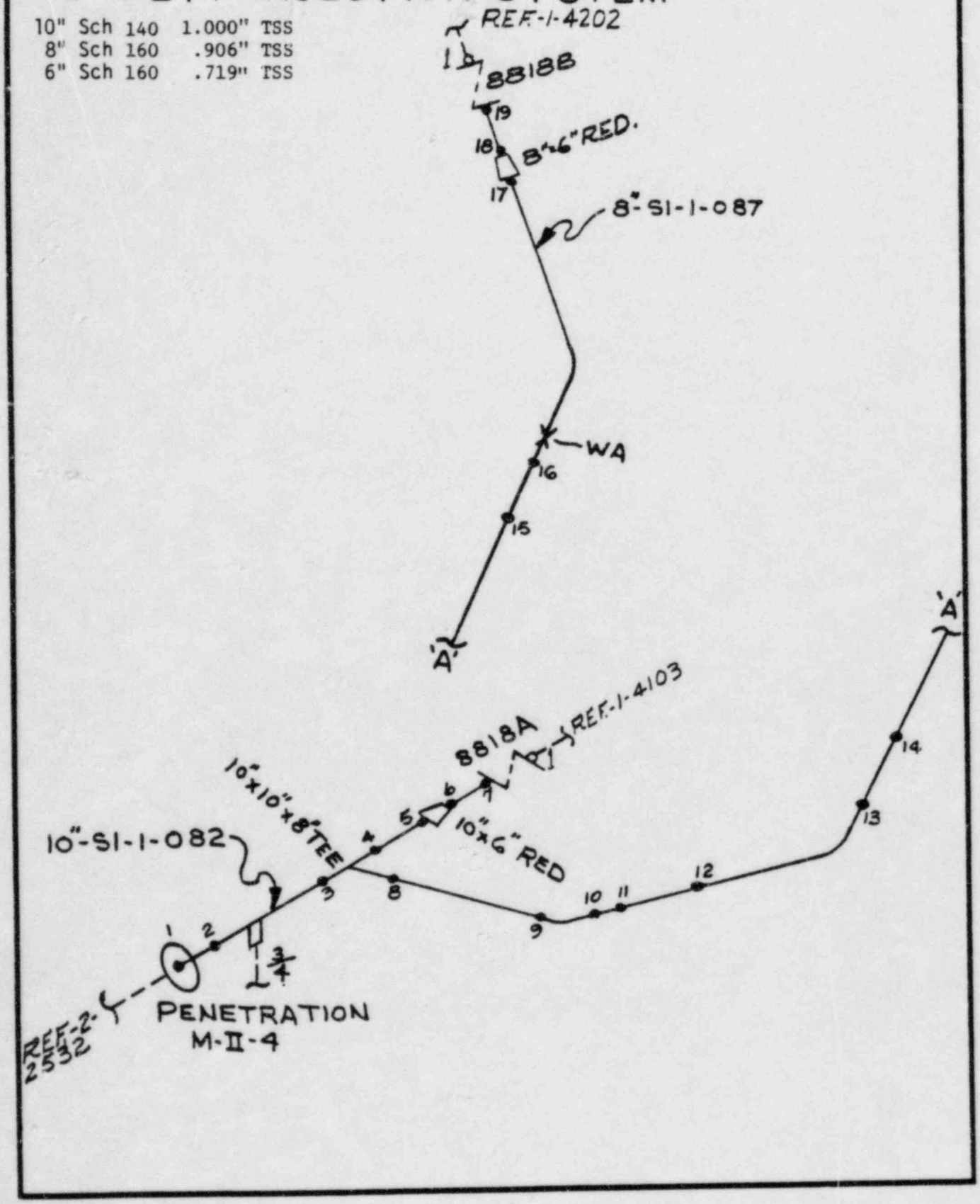
10" Sch 140 1.000"TSS
10" Sch 40S .365"TSS
8" Sch 40S .322"TSS



TBX-2-2533

SAFETY INJECTION SYSTEM

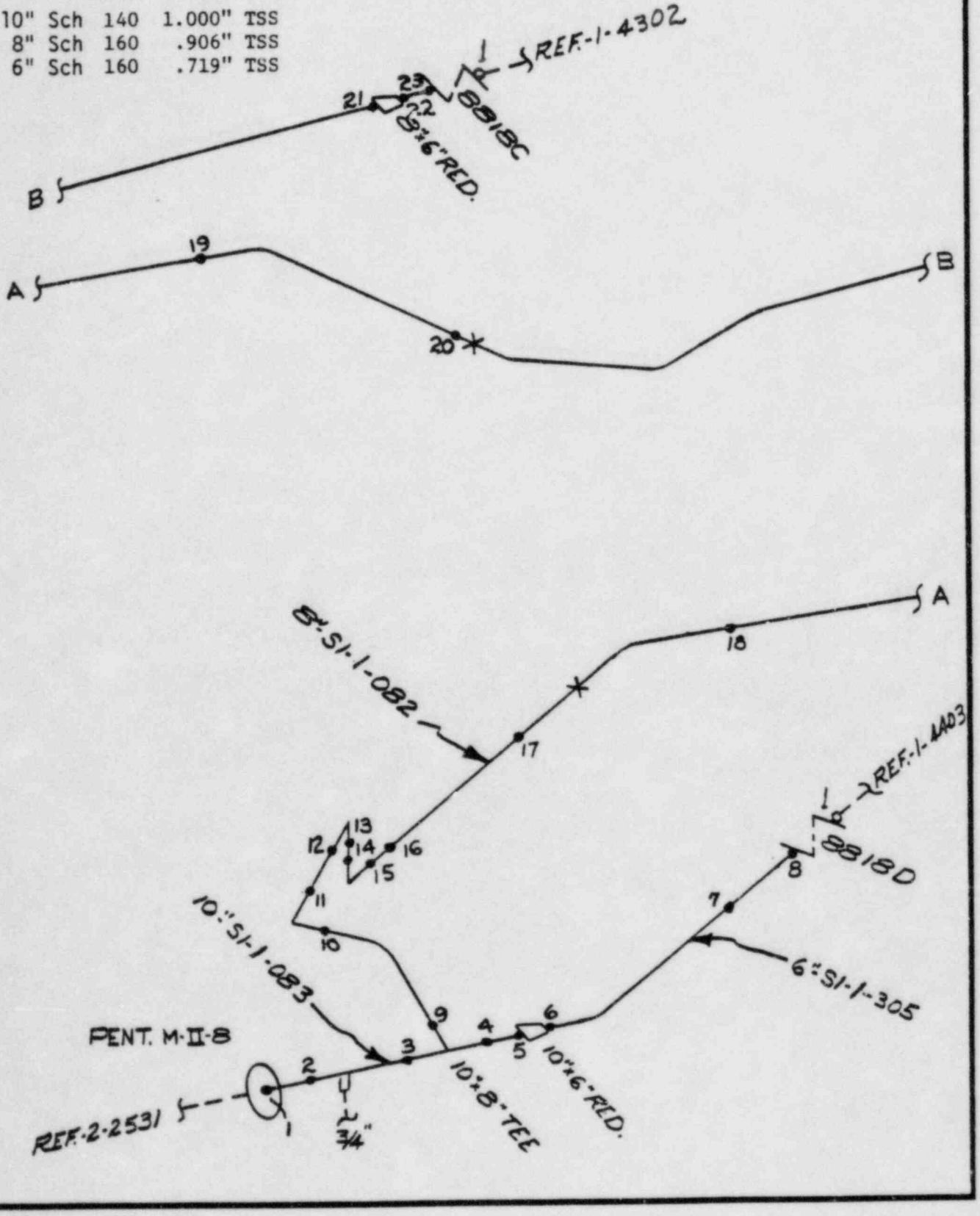
10" Sch 140 1.000" TSS
8" Sch 160 .906" TSS
6" Sch 160 .719" TSS



TBX-2-2534

SAFETY INJECTION SYSTEM

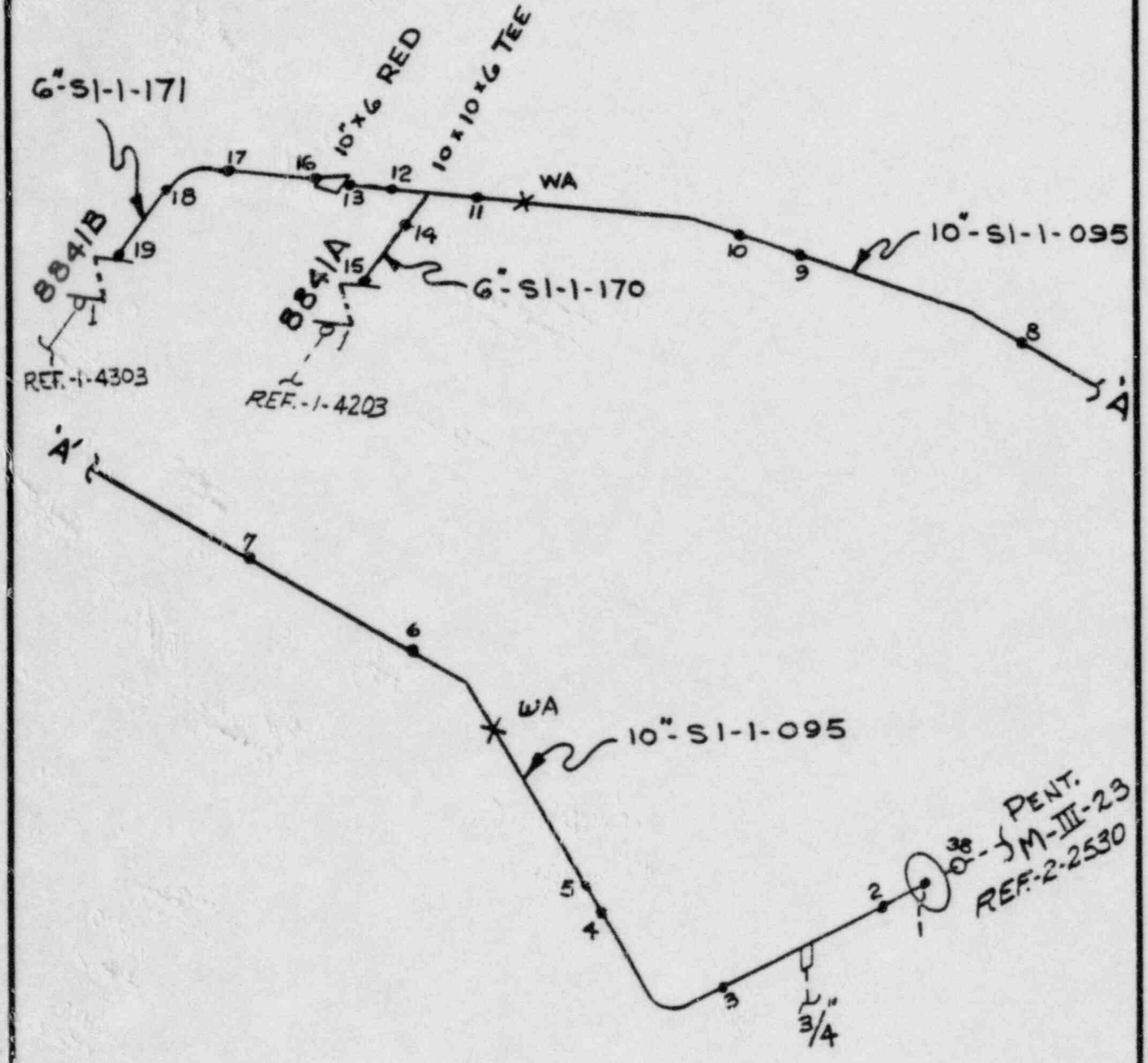
10" Sch 140 1.000" TSS
8" Sch 160 .906" TSS
6" Sch 160 .719" TSS



TBX-2-2535

SAFETY INJECTION SYSTEM

10" Sch 140 1.000"
6" Sch 160 .719"

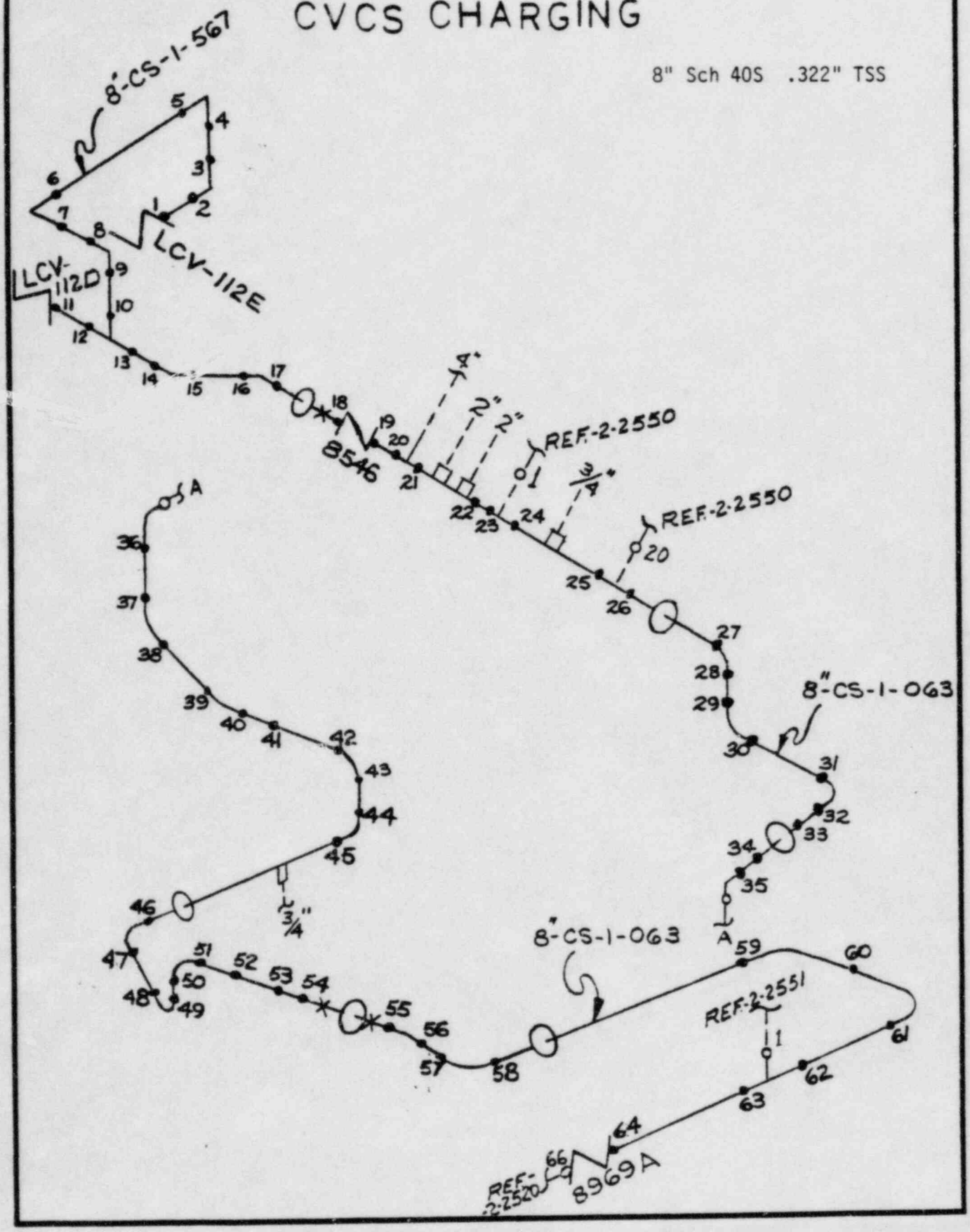


FORM 4644

TBX-2-2540

CVCS CHARGING

8" Sch 40S .322" TSS

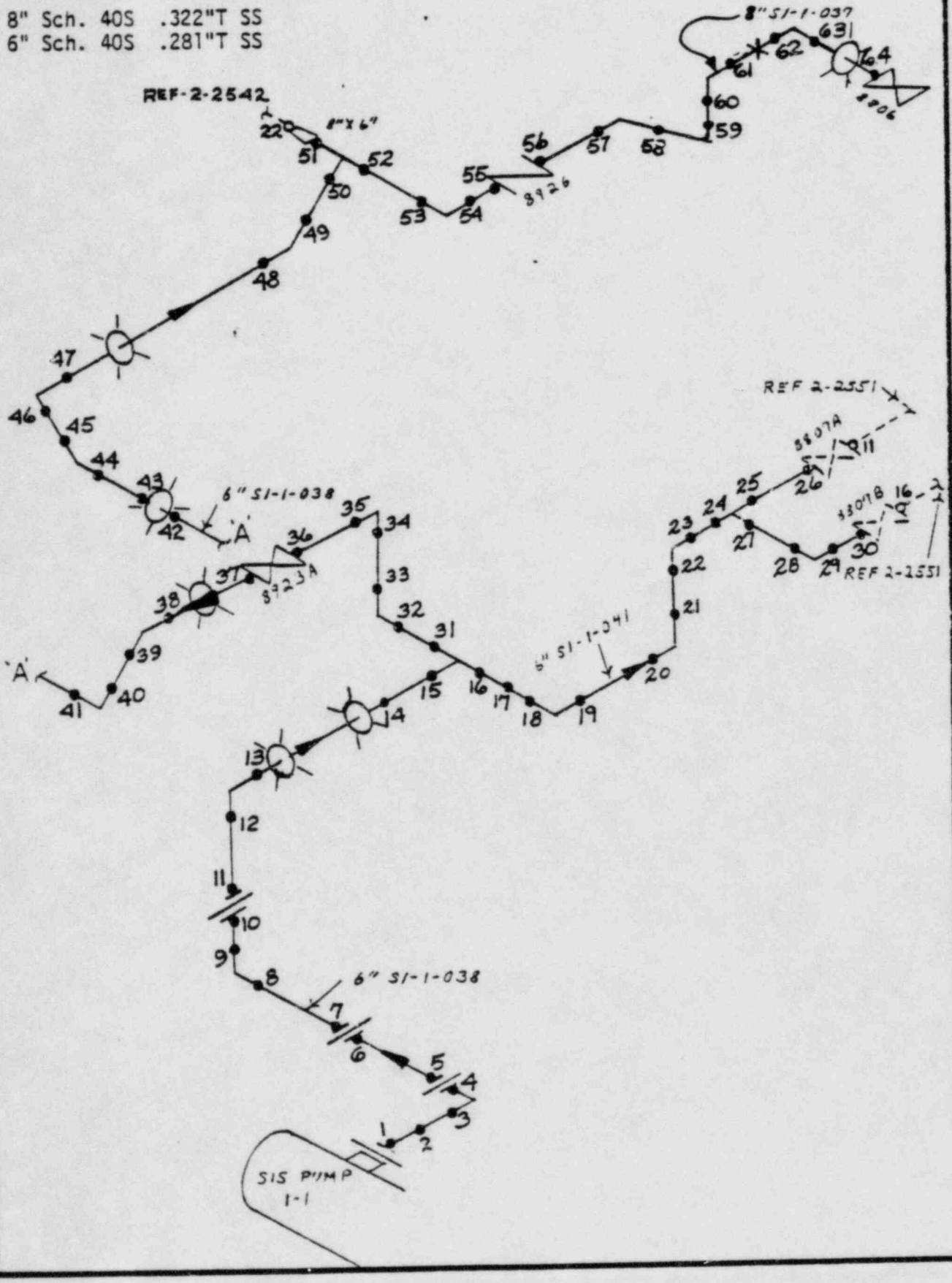


WESTINGHOUSE ELECTRIC CORPORATION 7-12-82

TBX-2-2541

SIS

8" Sch. 40S .322"T SS
6" Sch. 40S .281"T SS



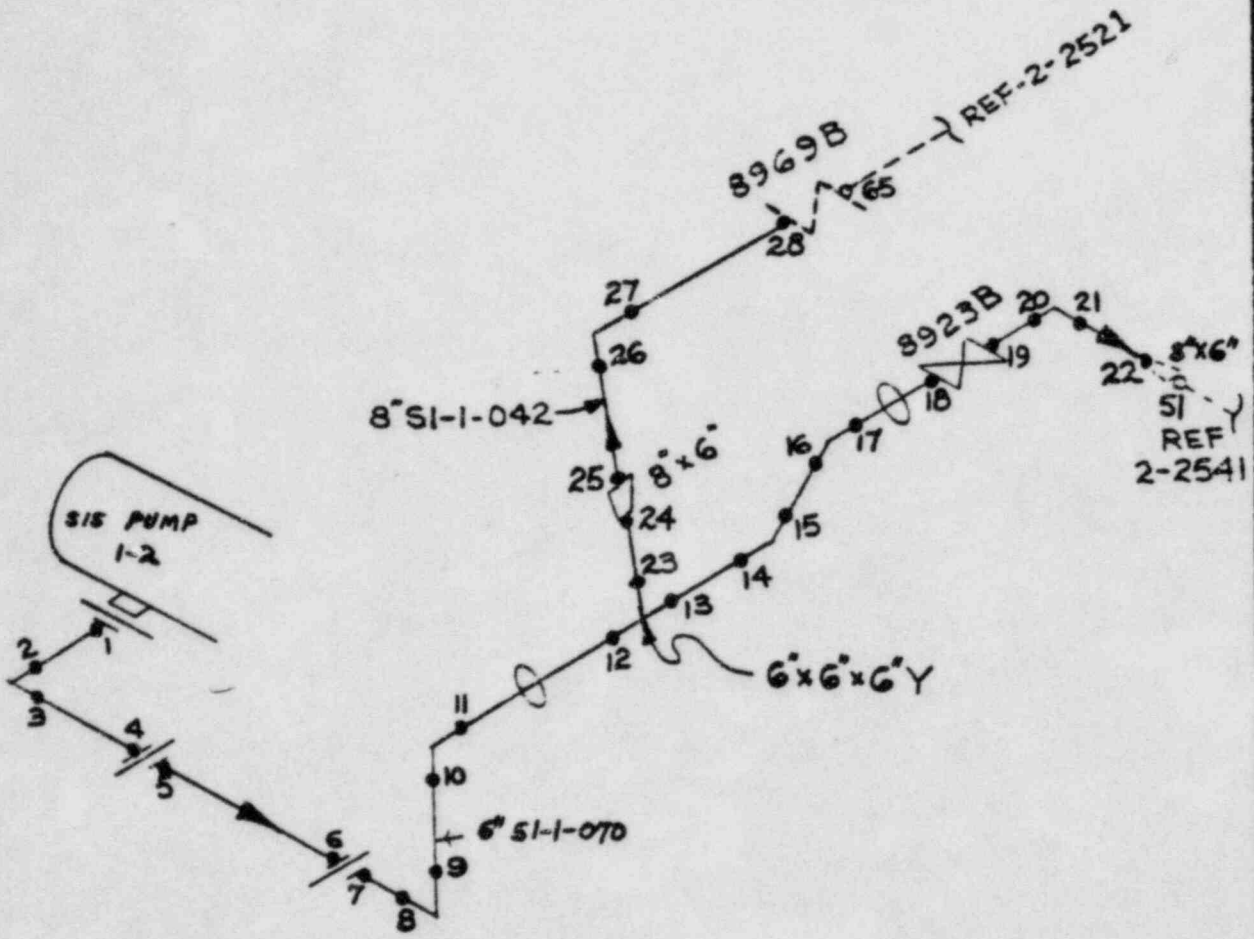
TBX-2-2542

FORM 46446

SIS

8" Sch. 40S .322"T S.S.

6" Sch. 40S .281"T S.S.

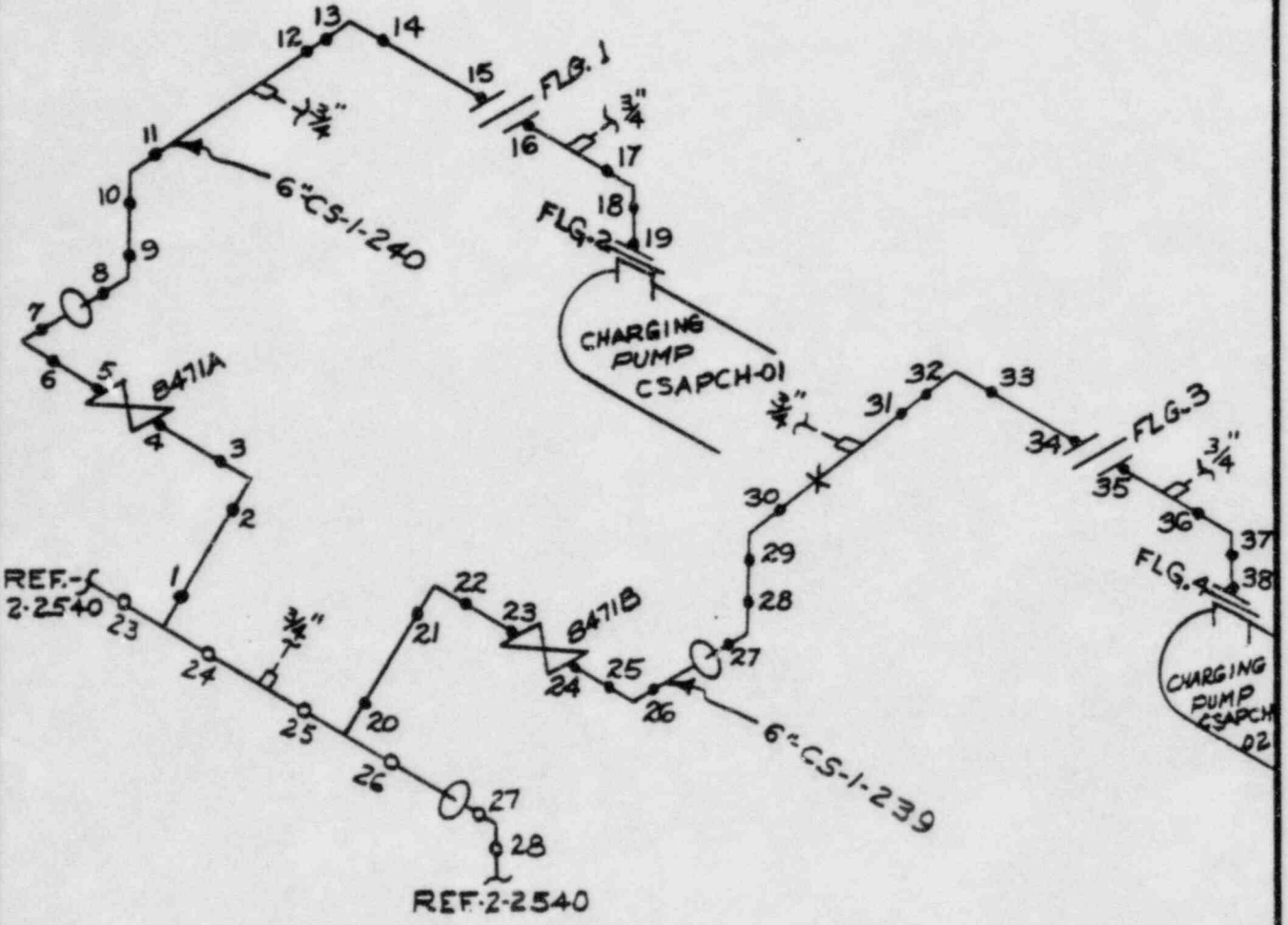


WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2550

CVCS CHARGING PUMPS

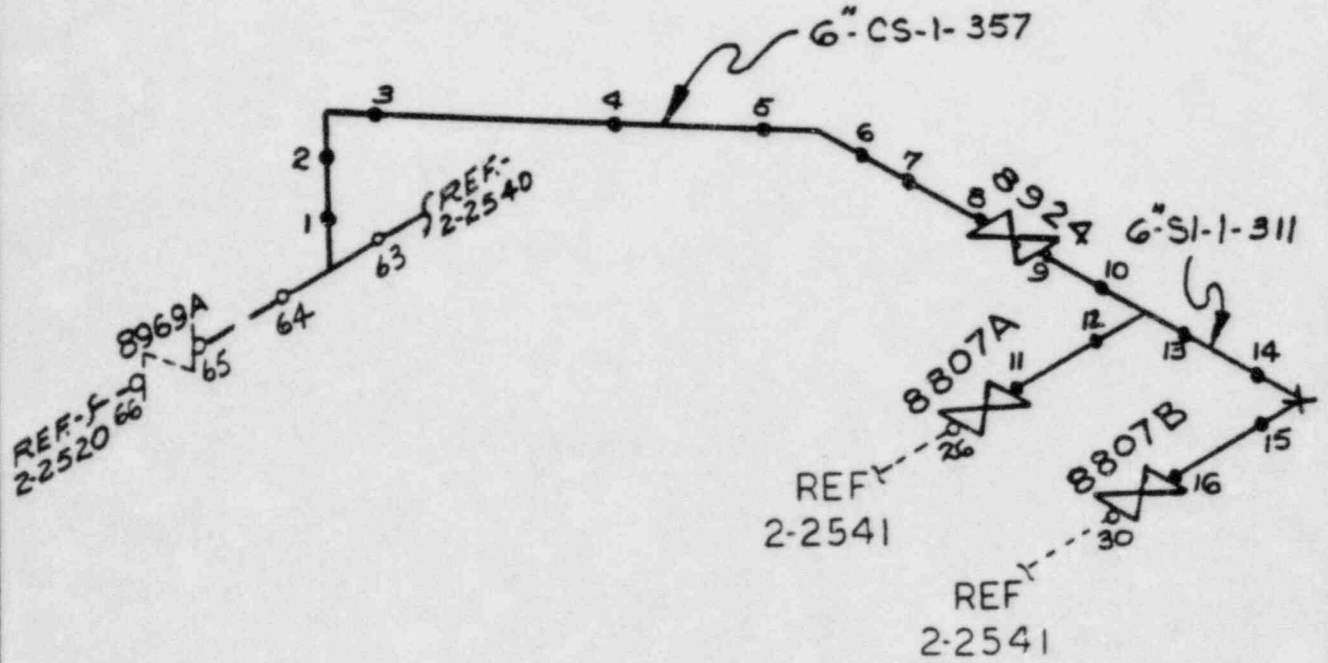
6" Sch 40S .281"TSS



TBX-2-2551

SAFETY INJECTION SYSTEM

6" Sch 40S .281"TSS



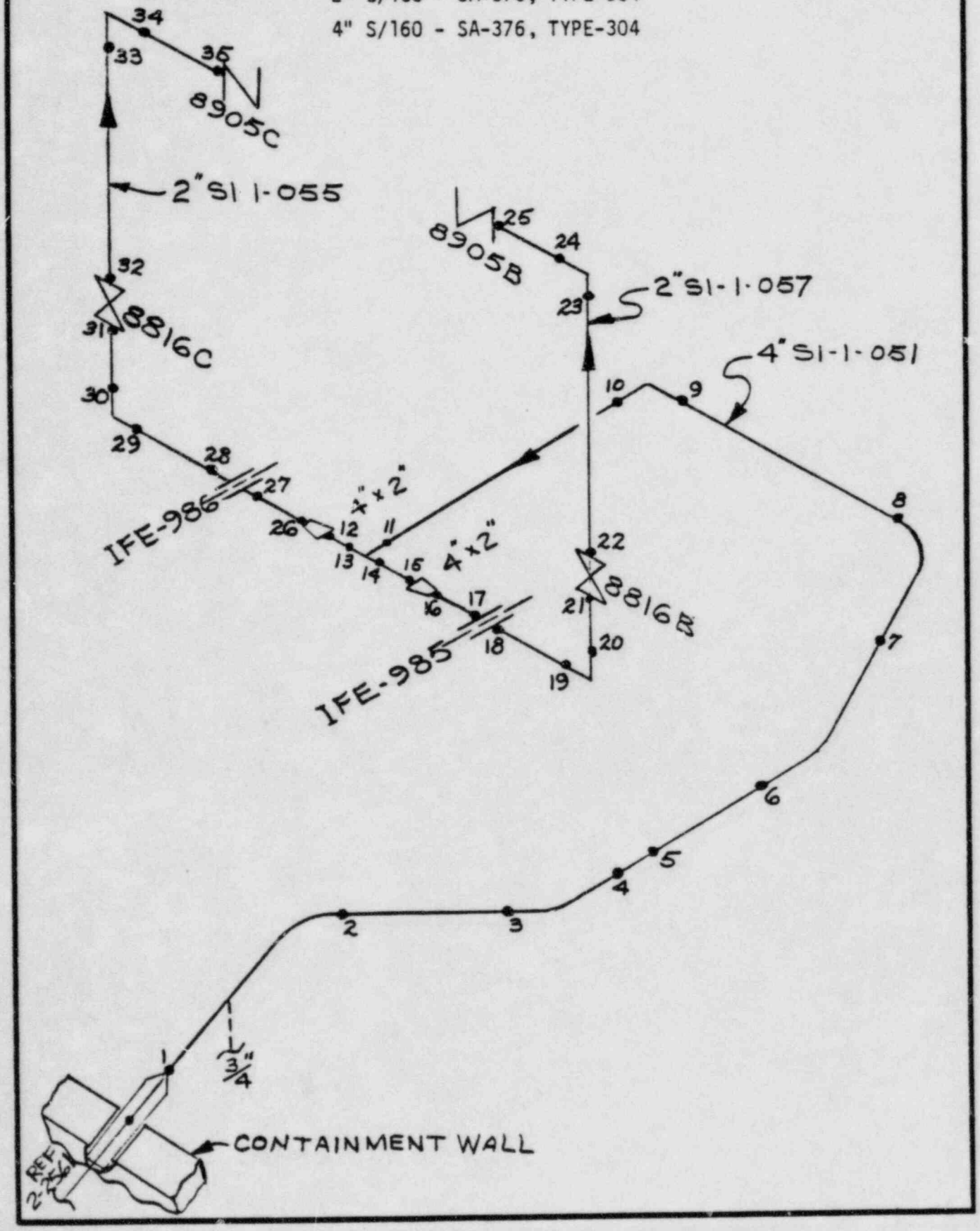
WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2560

HP SIS

2" S/160 - SA-376, TYPE-304

4" S/160 - SA-376, TYPE-304



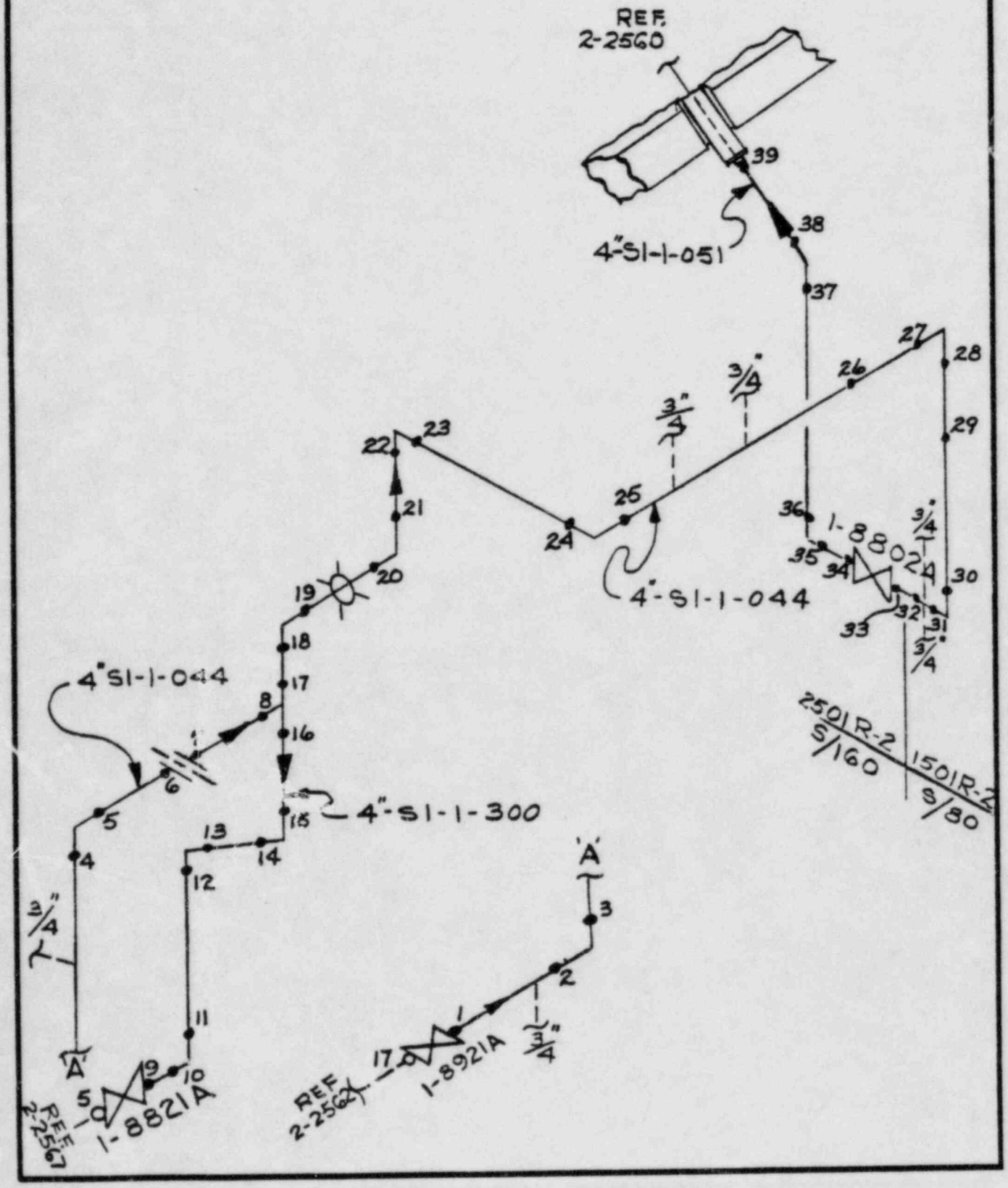
WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2561

HP SIS

4" S/80S SA-312 TYPE 304

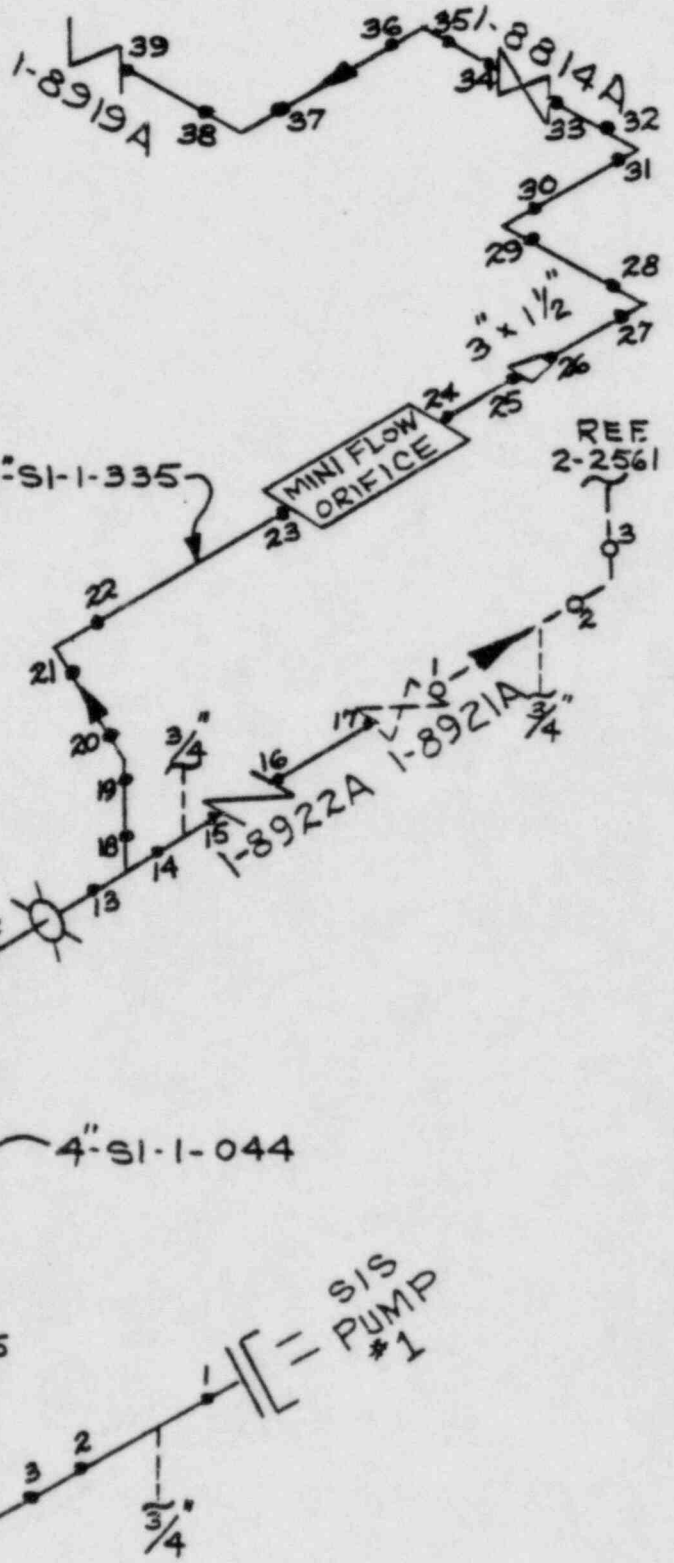
4" S/160 SA-376 TYPE 304



TBX-2-2562

HP SIS

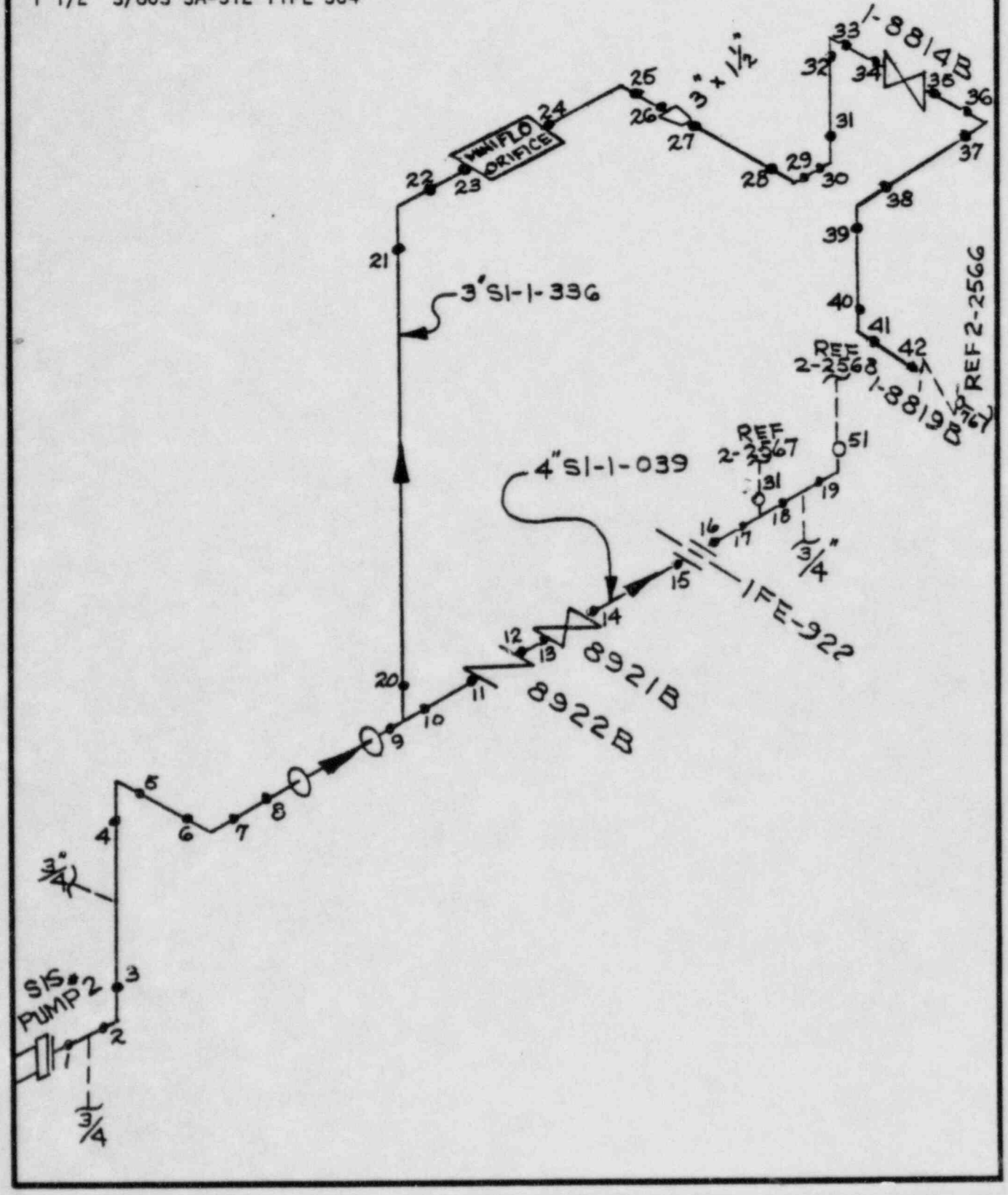
4" S/80S SA-312 TYPE 304
3" S/80S SA-312 TYPE 304
1 1/2" S/80S SA-312 TYPE 304



TBX-2-2563

HP SIS

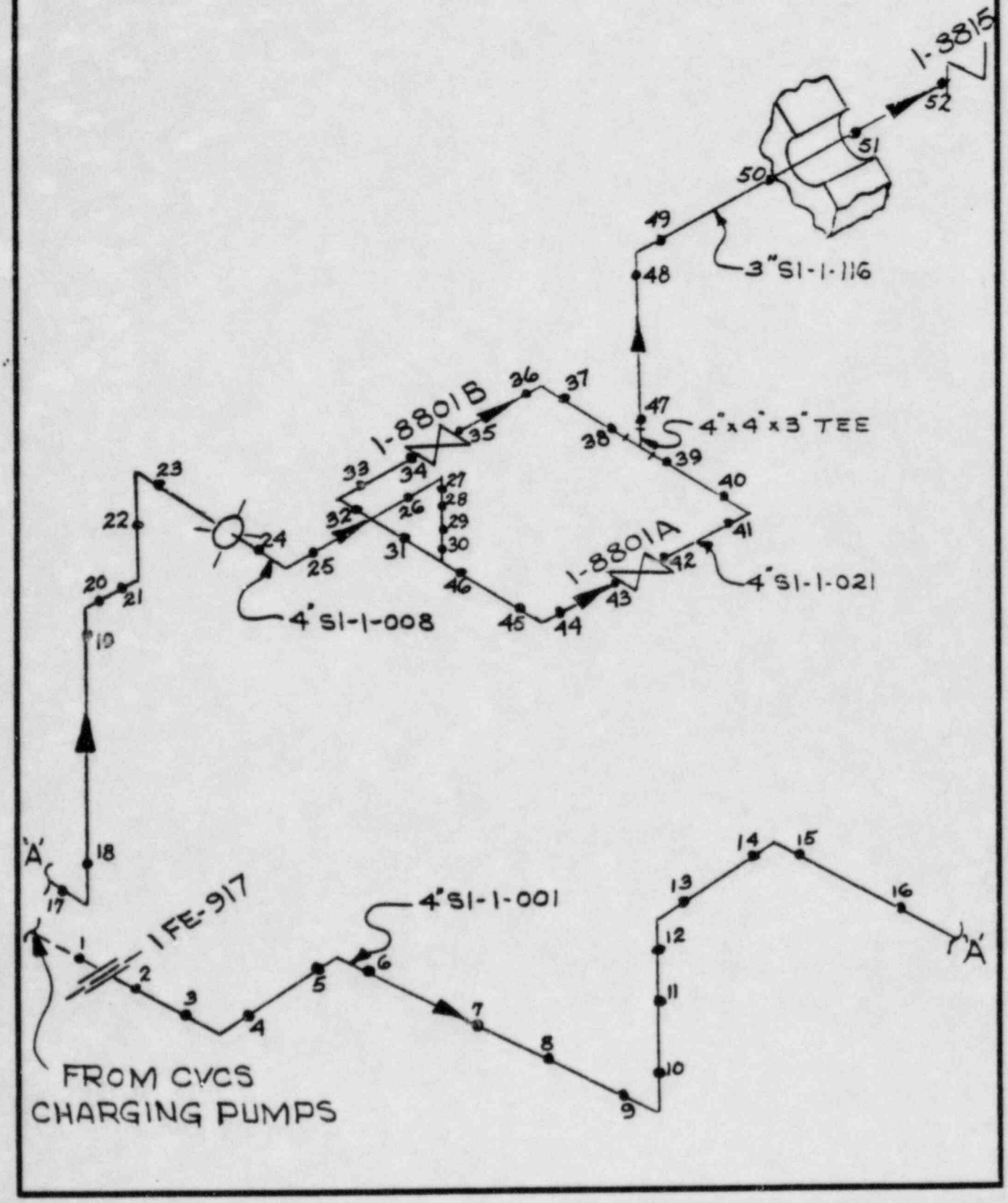
4" S/80S SA-312 TYPE 304
3" S/80S SA-312 TYPE 304
1 1/2" S/80S SA-312 TYPE 304



TBX-2-2564

HP SIS

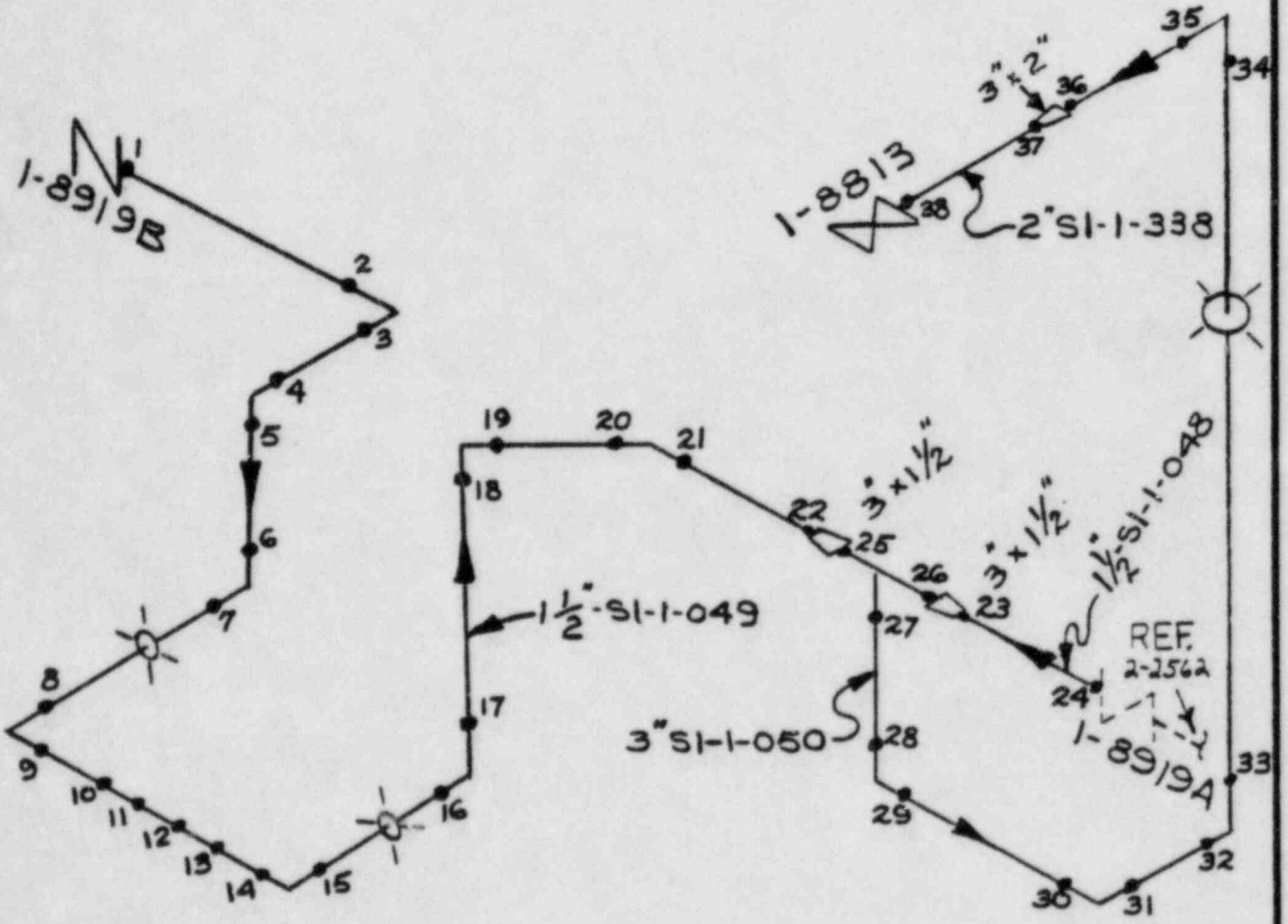
3" SS S/160 SA-376, TYPE 304
4" SS S/160 SA-376, TYPE 304



TBX-2-2565

HP SIS

3" SS-S/80S SA-312, TYPE 304
2" SS-S/80S SA-312, TYPE 304
1 1/2" SS-S/80S, SA 312, TYPE 304

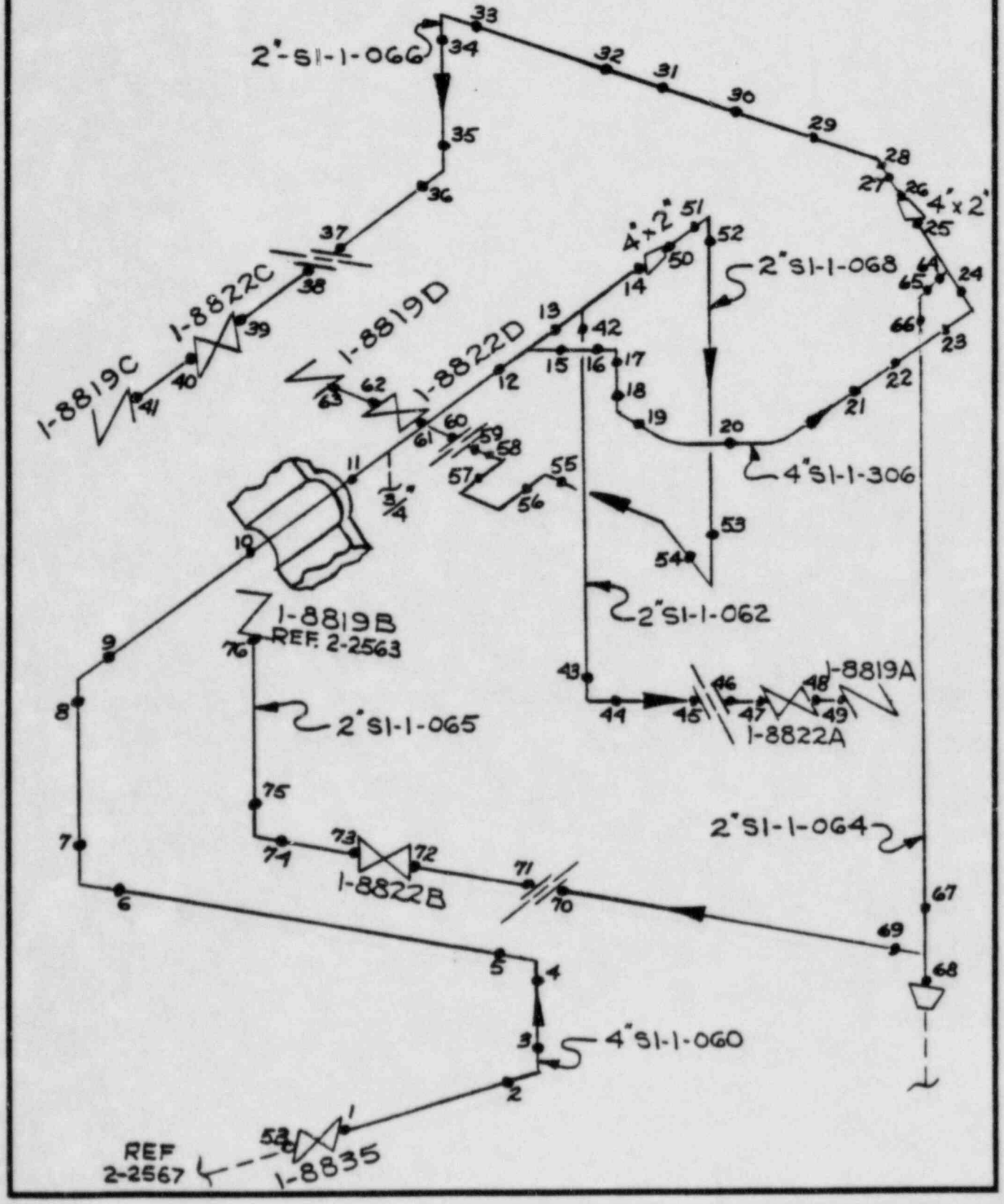


WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2566

HP SIS

4" S/160 SA-376, TYPE 304
2" S/160 SA-376, TYPE 304

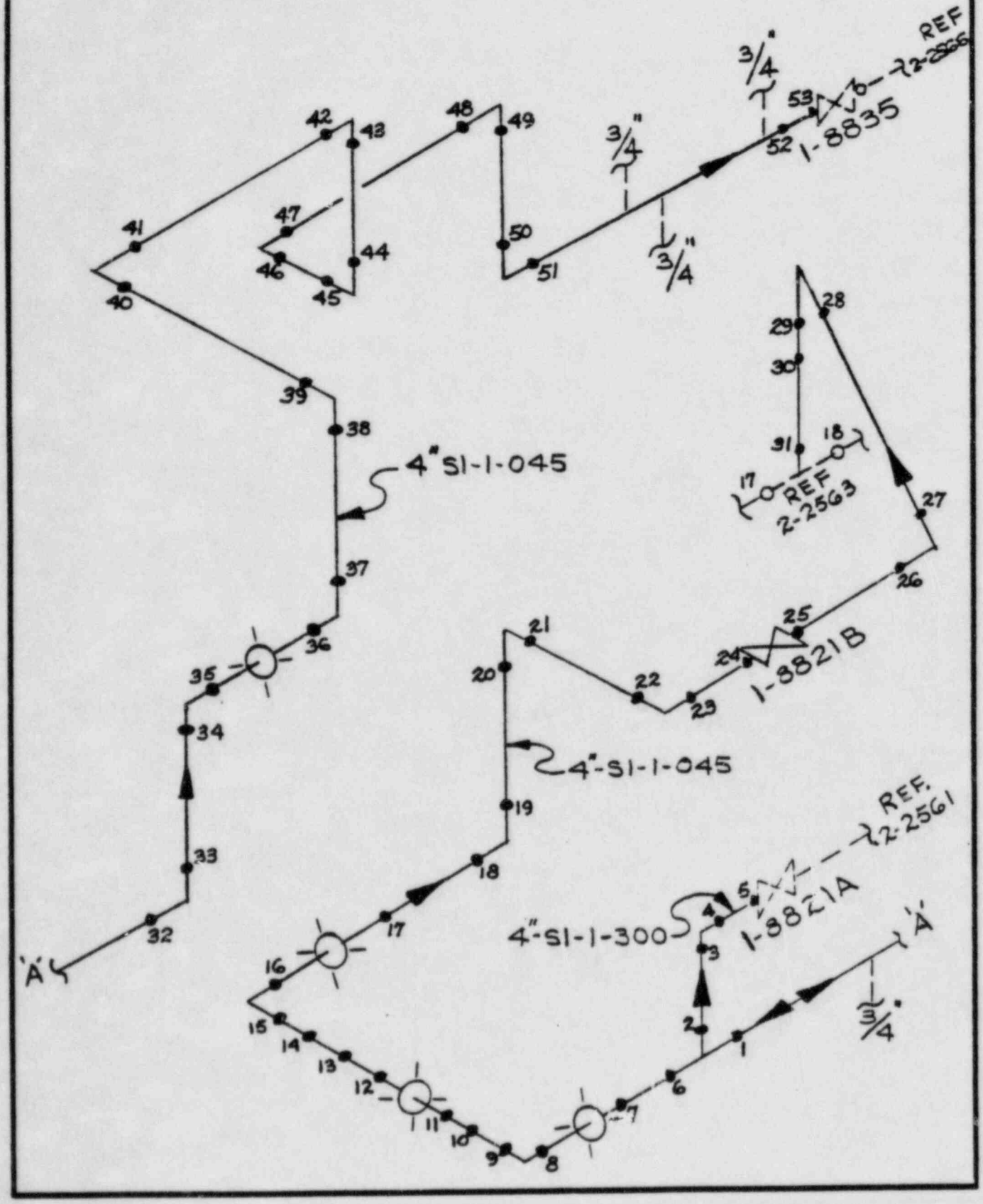


WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2567

HP SIS

4" SS-S/80S SA-312, TYPE 304

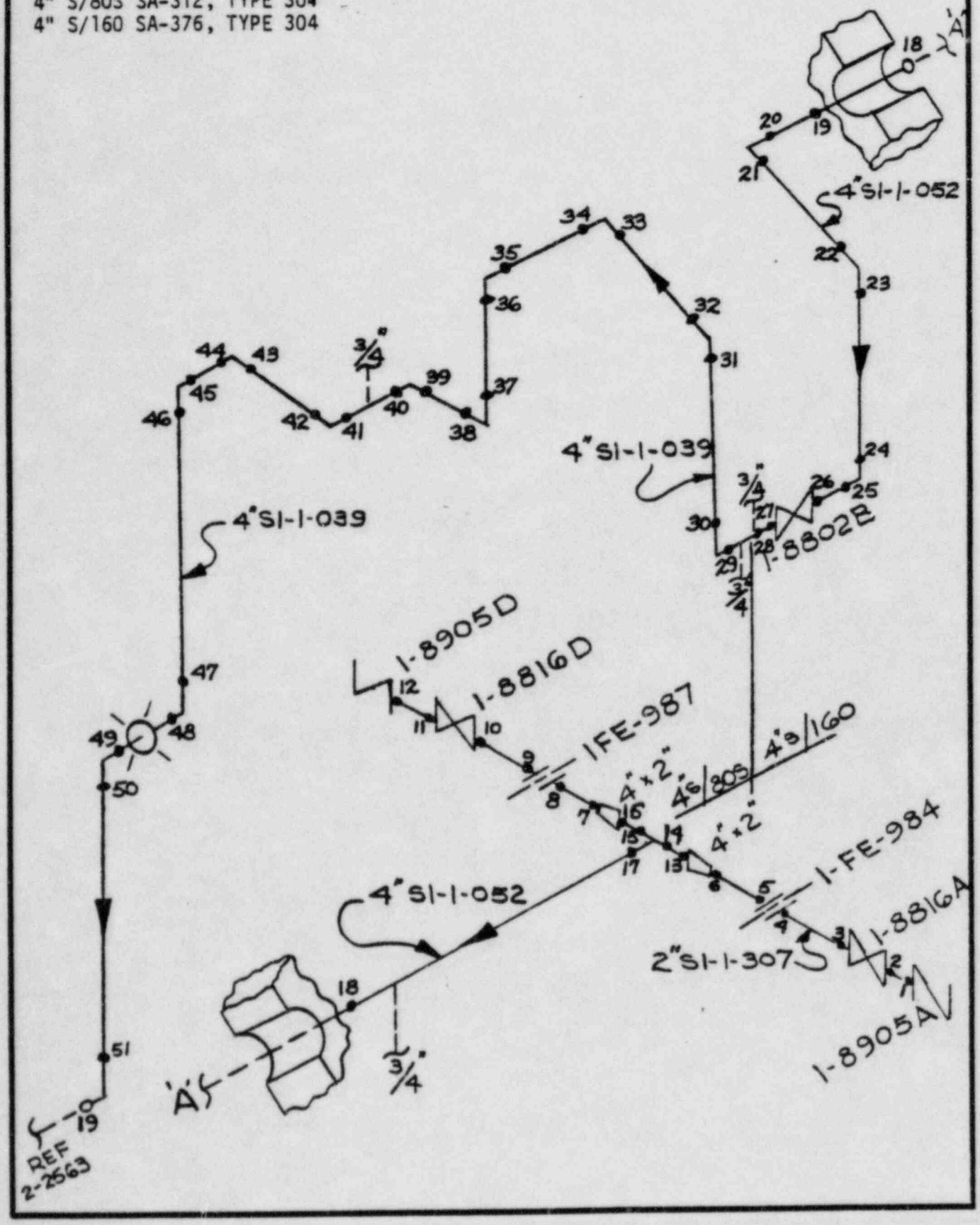


WESTINGHOUSE ELECTRIC CORPORATION

TBX-2-2568

HPSIS

4" S/80S SA-312, TYPE 304
4" S/160 SA-376, TYPE 304



PRESSURE RETAINING BOLTING

ITEM	ISO	IDENTIFICATION	TOTAL STUDS & NUTS	SIZE
1	2-2100	Flange 1		
2	2-2100	Flange 2		
3	2-2100	Flange 3		
4	2-2100	Flange 4		
5	2-2100	Flange 5		
6	2-2102	FE 2181		
7	2-2200	Flange 1		
8	2-2200	Flange 2		
9	2-2200	Flange 3		
10	2-2200	Flange 4		
11	2-2200	Flange 5		
12	2-2202	FE 2182		
13	2-2300	Flange 1		
14	2-2300	Flange 2		
15	2-2300	Flange 3		
16	2-2300	Flange 4		
17	2-2300	Flange 5		
18	2-2302	FE 2183		
19	2-2400	Flange 1		
20	2-2400	Flange 2		
21	2-2400	Flange 3		
22	2-2400	Flange 4		
23	2-2400	Flange 5		
24	2-2402	FE 2184		
25	2-2500	Flange 1	20S & 40N	1.375"
26	2-2500	Flange 2	20S & 40N	1.375"
27	2-2501	Flange 1	20S & 40N	1.375"
28	2-2501	Flange 2	20S & 40N	1.375"
29	2-2520	Flange 1	12S & 24N	1.125"
30	2-2520	Flange 2	12S & 24N	1.125"

PRESSURE RETAINING BOLTING

ITEM	ISO	IDENTIFICATION	TOTAL STUDS & NUTS	SIZE
31	2-2520	FE 610	12S & 24N	1.125"
32	2-2521	Flange 1	12S & 24N	1.125"
33	2-2521	Flange 2	12S & 24N	1.125"
34	2-2521	FE 611	12S & 24N	1.125"
35	2-2530	FE 988	16S & 32N	1.250"
36	2-2531	FE 619	16S & 32N	1.250"
37	2-2532	FE 618	16S & 32N	1.250"
38	2-2541	Flange 1		
39	2-2541	Flange 2		
40	2-2541	Flange 3		
41	2-2541	Flange 4		
42	2-2542	Flange 1		
43	2-2542	Flange 2		
44	2-2542	Flange 3		
45	2-2550	Flange 1	8S & 16N	.625"
46	2-2550	Flange 2	8S & 16N	.625"
47	2-2550	Flange 3	8S & 16N	.625"
48	2-2550	Flange 4	8S & 16N	.625"

PIPING SUPPORTS AND HANGERS

ITEM	ISO	IDENTIFICATION

PIPING INTEGRALLY WELDED SUPPORTS

ITEM	ISO	IDENTIFICATION

WESTINGHOUSE ELECTRIC CORPORATION

Illustrative Only

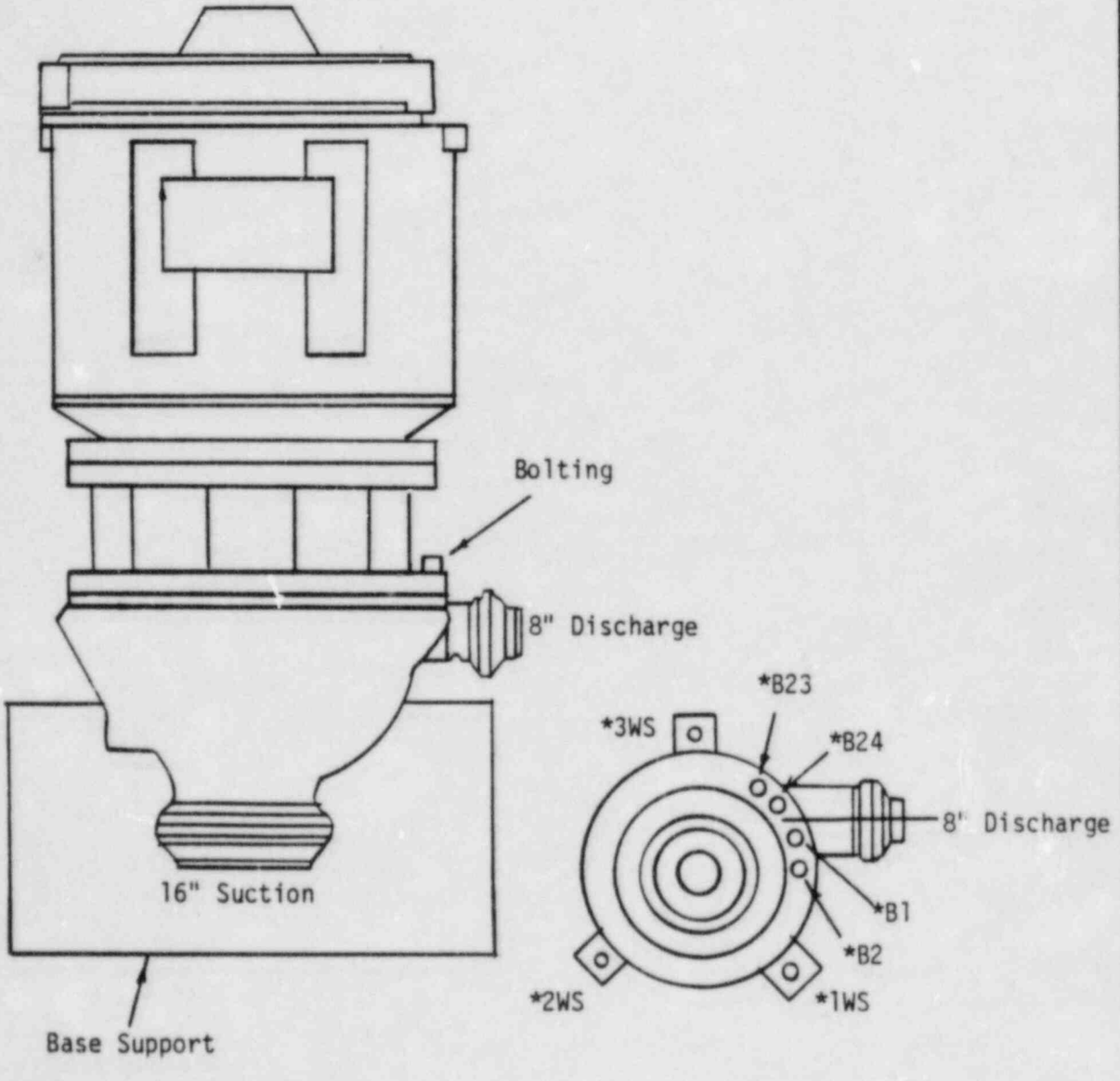
TBX-2-3100

FORM 484

RESIDUAL HEAT REMOVAL PUMPS 1 & 2

Pump Casing Welds: Not Applicable
Bolting: 24 - 2.00" Diameter
Integrally Welded Supports: 3
Support Components: 3 Welded Supports & Base Support
0 Reference: Centerline of 8" Discharge

*Note: Pump designation precedes Item Identification



Illustrative Only

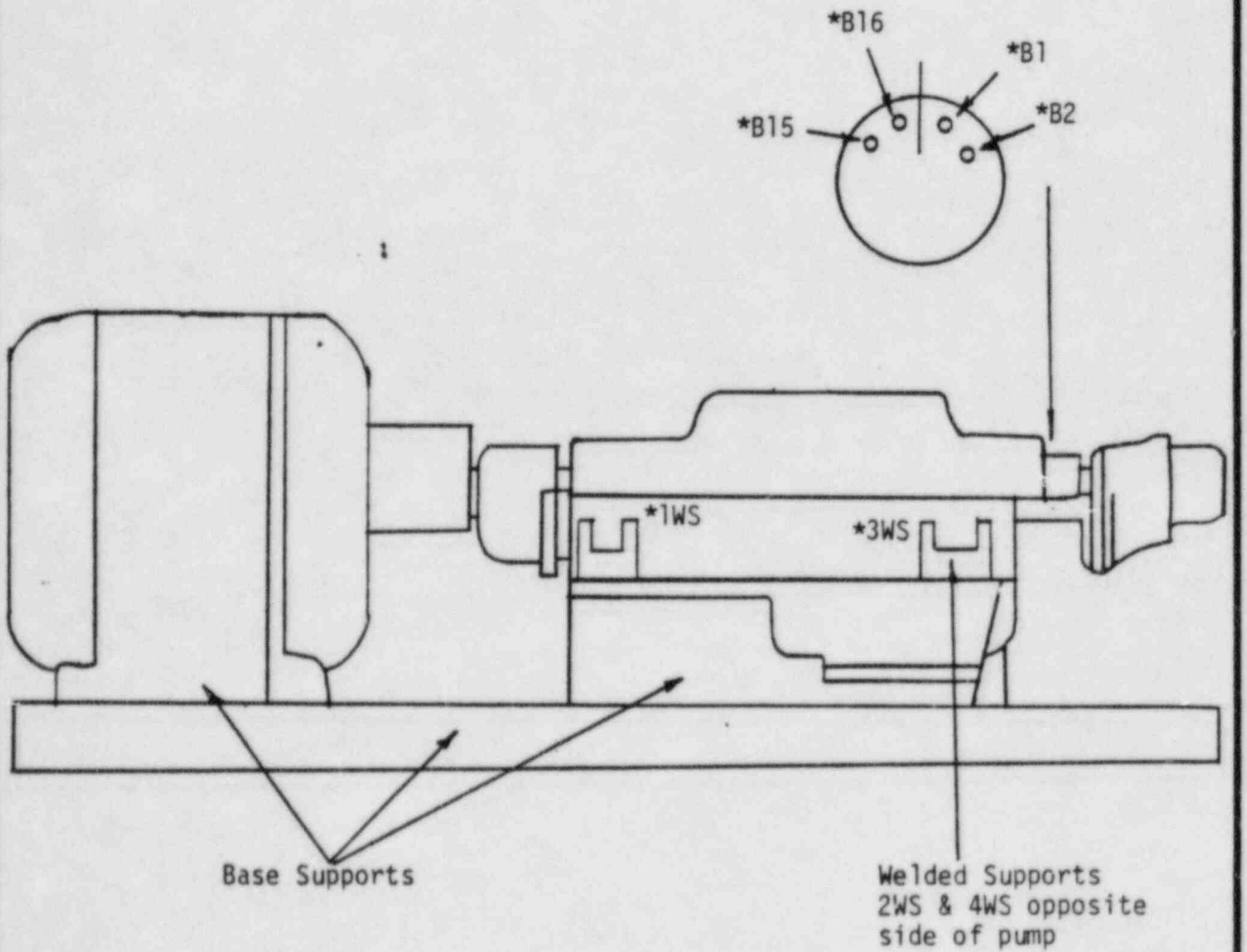
TBX-2-3110

FORM 4844

CENTRIFUGAL CHARGING PUMPS 1&2

Pump Casing Welds: Not Applicable
Bolting: 16 - 1.625" Diameter
Integrally Welded Supports: 4
Support Components: 4 Welded Supports and Base Supports
O Reference: Centerline of Pump Bolting

Note*: Pump Designation precedes Item Identification



Illustrative Only

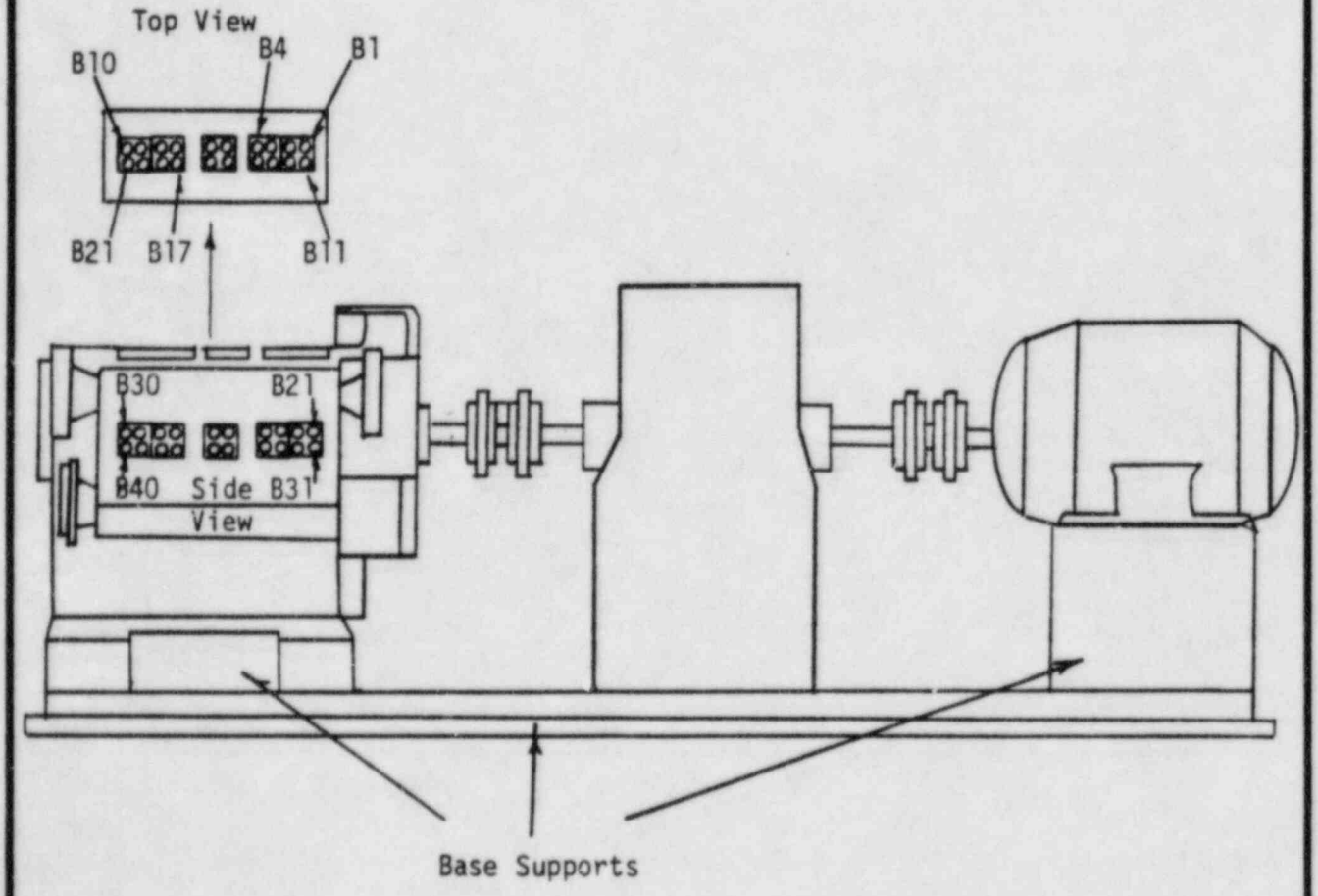
TBX-2-3120

FORM 464

POSITIVE DISPLACEMENT CHARGING PUMP I

Pump Casing Weld: Not Applicable
Bolting: 40 - 1.125" Diameter

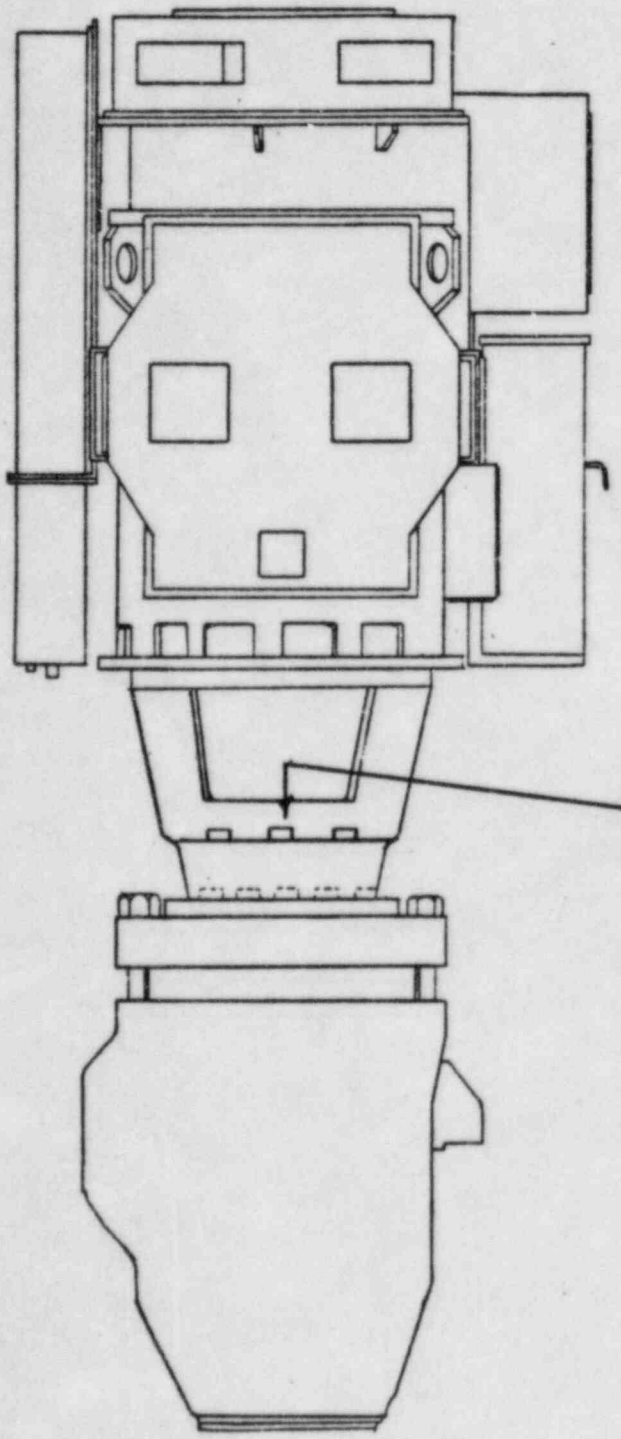
Integrally Welded Supports: Not Applicable
Support Components: Base Supports



Illustrative Only

TBX-2-3130

R.C. PUMP 1, 2, 3 & 4



Pump Casing Welds: Not Applicable
Bolting: 12 - 1.00" Diameter
3.25" Length
Integrally Welded Supports:
Not Applicable
Support Components: Not Applicable

Illustrative Only

TBX-2-3140

FORM 464-

SAFETY INJECTION PUMPS 1 & 2

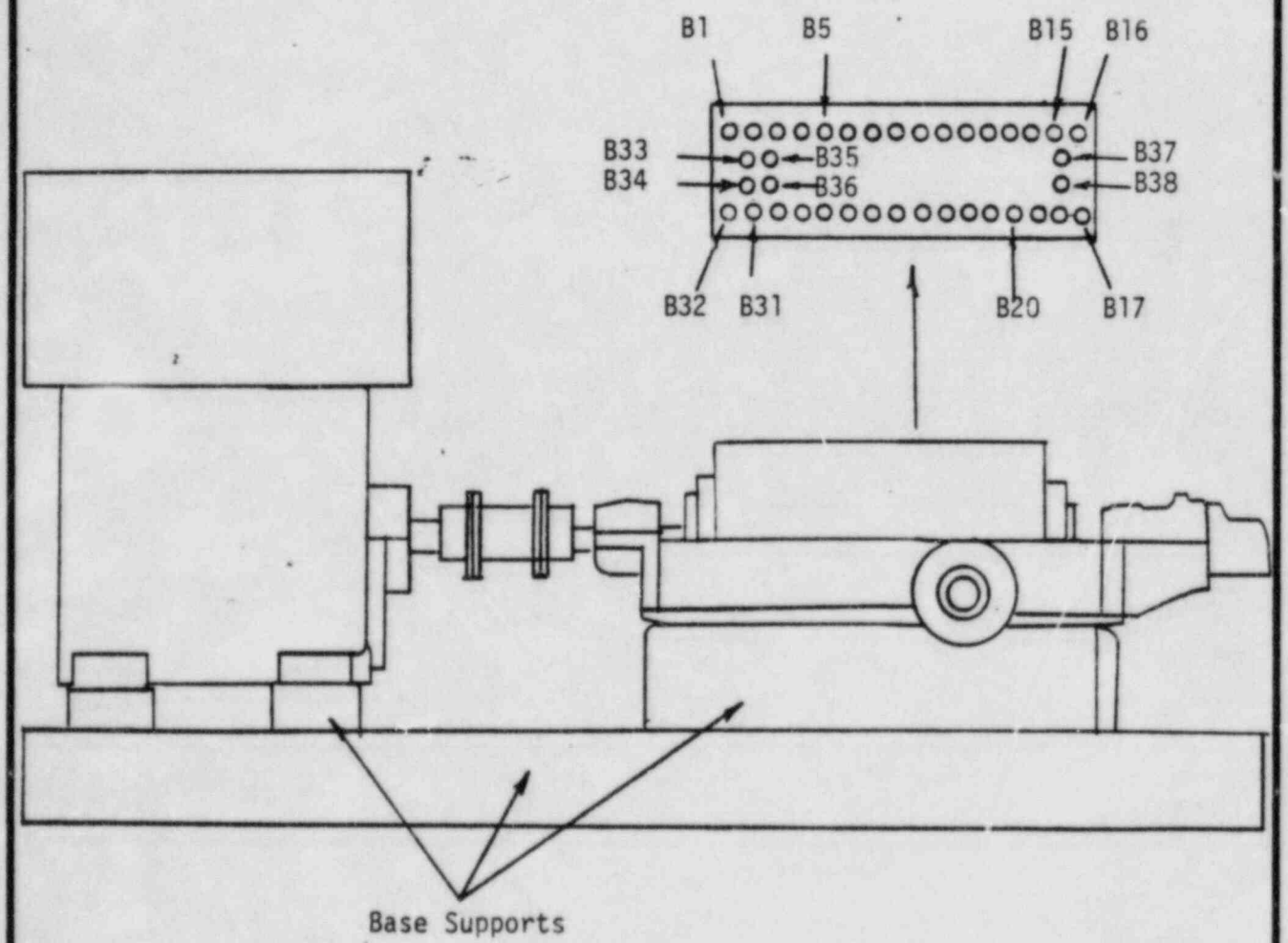
Pump Casing Welds: Not Applicable

Bolting: 32-2.125" Diameter (B1 thru B32): 6 - 1.5" Diameter (B33 thru B38)

Integrally Welded Supports: Not Applicable

Support Components: Base Supports

Note: Pump Designation precedes item identification



VALVE BONNET BOLTING

ITEM	ISO	VALVE	TOTAL STUDS & NUTS	SIZE
1	2-2100	32"- MS064		
2	2-2100	8"- MS026		
3	2-2100	8"- MS259		
4	2-2100	6"- MS021		
5	2-2100	6"- MS022		
6	2-2100	6"- MS023		
7	2-2100	6"- MS024		
8	2-2100	6"- MS025		
9	2-2101	18"- FW083		
10	2-2101	18"- FW082		
11	2-2102	6"- FW200		
12	2-2102	6"- FW196		
13	2-2102	6"- FW192		
14	2-2102	6"- FV2193		
15	2-2102	6"- FW204		
16	2-2102	*4"- FV2181		
17	2-2200	32"- MS029		
18	2-2200	8"- MS063		
19	2-2200	8"- MS258		
20	2-2200	6"- MS058		
21	2-2200	6"- MS059		
22	2-2200	6"- MS060		
23	2-2200	6"- MS061		
24	2-2200	6"- MS062		
25	2-2201	18"- FW077		
26	2-2201	18"- FW076		
27	2-2202	6"- FW201		
28	2-2202	6"- FW197		
29	2-2202	6"- FW193		
30	2-2202	6"- FW2194		
31	2-2202	6"- FW205		
32	2-2202	*4"- FV2182		
33	2-2300	32"- MS027		

VALVE BONNET BOLTING

ITEM	ISO	VALVE	TOTAL STUDS & NUTS	SIZE
34	2-2300	8"- MS098		
35	2-2300	8"- MS257		
36	2-2300	6"- MS093		
37	2-2300	6"- MS094		
38	2-2300	6"- MS095		
39	2-2300	6"- MS096		
40	2-2300	6"- MS097		
41	2-2301	18"- FW071		
42	2-2301	18"- FW070		
43	2-2302	6"- FW202		
44	2-2302	6"- FW198		
45	2-2302	6"- FW194		
46	2-2302	6"- FV2195		
47	2-2302	6"- FW206		
48	2-2302	4"- FV2183		
49	2-2400	32"- MS065		
50	2-2400	8"- MS134		
51	2-2400	8"- MS260		
52	2-2400	6"- MS129		
53	2-2400	6"- MS130		
54	2-2400	6"- MS131		
55	2-2400	6"- MS132		
56	2-2400	6"- MS133		
57	2-2401	18"- FW089		
58	2-2401	18"- FW088		
59	2-2402	6"- FW199		
60	2-2402	6"- FW195		
61	2-2402	6"- FW191		
62	2-2402	6"- FV2196		
63	2-2402	6"- FW203		
64	2-2402	*4"- FV2184		
65	2-2500	14"- 8958A	16S & 16N	.875"
66	2-2501	14"- 8958B	16S & 16N	.875"

VALVE BONNET BOLTING

ITEM	ISO	VALVE	TOTAL STUDS & NUTS	SIZE
67	2-2502	16"-CT-142		
68	2-2502	16"-CT-052		
69	2-2503	16"-CT-145		
70	2-2503	16"-CT-003		
71	2-2520	10"-HCV606	16S & 32N	1.00"
72	2-2520	8"-8804A	16S & 16N	.500"
73	2-2520	8"-8724A	16S & 16N	.750"
74	2-2520	8"-FCV618	12S & 24N	.875"
75	2-2521	10"-HCV607	16S & 32N	1.00"
76	2-2521	8"-8804B	16S & 16N	.500"
77	2-2521	8"-8969B	16S & 16N	.500"
78	2-2521	8"-8724B	16S & 16N	.750"
79	2-2521	8"-FCV619	12S & 24N	.875"
80	2-2522	10"-8808A	18S & 18N	1.50"
81	2-2523	10"-8808B	18S & 18N	1.50"
82	2-2524	10"-8808C	18S & 18N	1.50"
83	2-2525	10"-8808D	18S & 18N	1.50"
84	2-2530	10"-8716B	16S & 16N	.750"
85	2-2530	10"-8840	18S & 18N	1.625"
86	2-2531	10"-8809B	18S & 18N	1.625"
87	2-2532	10"-8730B	16S & 16N	.750"
88	2-2532	8"-8717	16S & 16N	.500"
89	2-2532	10"-8716A	16S & 16N	.750"
90	2-2532	10"-8730A	16S & 16N	.750"
91	2-2532	10"-8809A	18S & 18N	1.625"
92	2-2536	8"-CC713		
93	2-2536	8"-CC715		
94	2-2536	8"-CC716		
95	2-2540	8"-8564	16S & 16N	.500"T
96	2-2540	8"-LCV112D	16S & 16N	.500"T
97	2-2540	8"-LCV112E	16S & 16N	.500"T
98	2-2540	8"-8969A	16S & 16N	.500"T
99	2-2541	8"-8806		

VALVE BONNET BOLTING

ITEM	ISO	VALVE	TOTAL STUDS & NUTS	SIZE
100	2-2541	8"-8926		
101	2-2541	6"-8923A		
102	2-2542	6"-8923B		
103	2-2543	8"-CC627		
104	2-2544	8"-CC628		
105	2-2550	6"-8471A	16S & 16N	.500"T
106	2-2550	6"-8471B	16S & 16N	.500"T
107	2-2551	6"-8924	16S & 16N	.500"T
108	2-2551	6"-8807A	16S & 16N	.500"T
109	2-2551	6"-8807B	16S & 16N	.500"T
110	2-2560	2"-8816B		
111	2-2560	2"-8816C		
112	2-2560	2"-8905B		
113	2-2560	2"-8905C		
114	2-2561	4"-8802A		
115	2-2561	4"-8821A		
116	2-2561	4"-8921A		
117	2-2562	1.5"-8814A		
118	2-2562	1.5"-8919A		
119	2-2562	4"-8922A		
120	2-2563	1.5"-8814A		
121	2-2563	1.5"-8819B		
122	2-2563	4"-8921B		
123	2-2563	4"-8922A		
124	2-2564	4"-8801A		
125	2-2564	4"-8801B		
126	2-2564	3"-8815		
127	2-2565	2"-8813		
128	2-2565	1.5"-8919B		
129	2-2566	1.5"-8819A		
130	2-2566	2"-8819C		

VALVE BONNET BOLTING

ITEM	ISO	VALVE	TOTAL STUDS & NUTS	SIZE
131	2-2566	2"-8819D		
132	2-2566	4"-8822A		
133	2-2566	4"-8822B		
134	2-2566	2"-8822C		
135	2-2566	2"-8822D		
136	2-2566	4"-8835		
137	2-2567	4"-8821B		
138	2-2568	4"-8802B		
139	2-2568	2"-8816A		
140	2-2568	2"-8816D		
141	2-2568	2"-8905A		
142	2-2568	2"-8905D		

VALVE BODY WELDS

ITEM	ISO	SIZE	VALVE NO.	THICKNESS	MANUFACTURER
1	2-2100	8"	MS026	.864"	Borg Warner
2	2-2101	18"	FW083	1.694"	Borg Warner
3	2-2102	6"	FW200	.756"	Borg Warner
4	2-2102	6"	FW196	.756"	Borg Warner
5	2-2102	6"	FW192	.756"	Borg Warner
6	2-2102	6"	FW204	.713"	Borg Warner
7	2-2200	8"	MS063	.864"	Borg Warner
8	2-2201	18"	FW077	1.694"	Borg Warner
9	2-2202	6"	FW201	.756"	Borg Warner
10	2-2202	6"	FW197	.756"	Borg Warner
11	2-2202	6"	FW193	.756"	Borg Warner
12	2-2202	6"	FW205	.713"	Borg Warner
13	2-2300	8"	MS098	.864"	Borg Warner
14	2-2301	18"	FW071	1.694"	Borg Warner
15	2-2302	6"	FW202	.756"	Borg Warner
16	2-2302	6"	FW198	.756"	Borg Warner
17	2-2302	6"	FW194	.756"	Borg Warner
18	2-2302	6"	FW206	.713"	Borg Warner
19	2-2400	8"	MS134	.864"	Borg Warner
20	2-2401	18"	FW089	1.694"	Borg Warner
21	2-2402	6"	FW199	.756"	Borg Warner
22	2-2402	6"	FW195	.756"	Borg Warner
23	2-2402	6"	FW191	.756"	Borg Warner
24	2-2402	6"	FW203	.713"	Borg Warner

Note: All Valve material SA105 Carbon Steel with Forged necks welded to Forged bodies.

TEXAS UTILITIES SERVICES INC.
PRESERVICE INSPECTION PROCEDURE
PROCEDURE CP-EP-11.1 5/25/82

1.0 REFERENCES

1-A ASME B & PV Code, Section XI, 1980 Edition
1-B TUGCO Quality Assurance Plan
1-C Code of Federal Regulations, Title 10, Part 50.55a(g)(4)
1-D CPSES Preservice Inspection Program

2.0 GENERAL

2.1 PURPOSE

The purpose of this procedure is to provide the guidelines, coordination control and interface with associated organizations in the administration of the preservice inspection program at CPSES.

2.2 This procedure shall apply to all preservice inspection activities, including examination, testing and inspection of Class 1, 2 and 3 components and systems, as required by References 1-A and 1-D.

2.3 RESPONSIBILITY

The TUGCO Manager of Plant Operations, CPSES is responsible for the overall implementation of the preservice inspection program.

TUGCO has delegated the various functions to organizations as listed below:

Function	Responsible Organization
a) Examination & Inspection IWB-2000, IWC-2000 (excluding items b and d below)	Westinghouse
b) Visual inspection of internal surface of pumps and valve bodies	TUGCO QA (Construction) (Note 1)
c) Examination & Inspection IWD-2000	TUGCO (Note 2)
d) System Leakage & Hydraulic Pressure Tests IWB-5000, IWC-5000 and IWD-5000	TUGCO (Note 2
e) Inservice Testing of Pumps IWP	TUGCO
f) Inservice Testing of Valves IWV	TUGCO

Function	Responsible Organization
g) Component Supports	TUGCO QA (Construction) (Note 2)
h) Augmented Inspection	TUGCO (Note 3)
j) Examination and Inspection IWF-2000	B&R

Note 1 - Manufacturer records will be utilized.
Note 2 - Construction records will be utilized.
Note 3 - May be delegated to other organizations as deemed necessary by the TUGCO Operations Manager.

3.0 PROCEDURE

3.1 WORK COORDINATION

The TUSI Project Mechanical Engineer or his designee shall coordinate the activities required to implement the onsite preservice inspection program performed by Westinghouse within the scope of Paragraph 2-3 (a) above.

The TUGCO Manager of Plant Operations or his designee shall coordinate the activities required to implement the remaining portion of the onsite preservice inspection program.

3.2 COMMUNICATION CHANNEL

All site-organization correspondence shall be addressed as follows and with copies to the appropriate personnel.

Organization	Addressee
TUSI	J. T. Merritt
TUGCO	R. A. Jones
Westinghouse	A. T. Parker
B & R	D. C. Frankum

3.3 SCHEDULING

3.3.1 Each responsible organization (Para. 2.3) shall:

a. Develop a schedule of inspection and work activities and update the schedule, as required.

b. Coordinate the work of interfacing orgar ization.

c. Forward to the planning and scheduling department for incorporation into the master CPM. Specific items affected by this program (vessels, weld joints and etc.) shall be identified so that proper restraints may be added to the logic.

3.3.2 Each interfacing organization shall review the schedule and perform work under their interfacing procedure, as required, to meet the schedule.

3.4 PROCEDURE REVIEW AND APPROVAL

3.4.1 Subcontractor procedures used for conducting inspections, correction of deficiencies and documentation of results shall be subjected to review and approve as described in the Quality Assurance Plan. All work activities shall be in accordance with the approved procedures.

3.5 TECHNICAL PROBLEM RESOLUTION AND EVALUATION

3.5.1 Technical problems discovered during the course of the inspection within Westinghouse scope (para. 2.3a) will be reported to the TUSI Project Mechanical Engineer or his designee. Problems identified in other areas will be reported to the TUGCO Manager of Plant Operations or his designee. Indications identified during the inspection shall be evaluated in accordance with ASME B & PV Code Section XI. Corrective actions taken shall be documented in accordance with approved procedures and QA Plan.

3.6 QUALIFICATIONS OF INSPECTION PERSONNEL

3.6.1 All personnel performing non-destructive examination of systems or components will be qualified under the requirements of ASNT-TC-IA, 1975. Personnel qualifications shall be reviewed by QA personnel and retained in the QA vault.

3.7 REPORTS AND RECORDS

The responsible organization shall be responsible for compiling the inspection results and reports to meet the applicable procedure and ASME Section XI requirements.

The TUGCO Manager of Plant Operations or his designee shall be responsible for ensuring that all records of preservice inspection results, indication evaluation and resolution and changes to the inspection program are prepared and retained in accordance with the applicable procedures and ASME Section XI requirements.

3.8 AUTHORIZED INSPECTION AGENCY INTERFACE

The TUGCO Manager of Plant Operations or his designee shall not act as liason between the ANI and other interfacing organizations. He will ensure that ANI is being provided with the applicable procedures and records.

3.9 NRC INTERFACE

The TUSI Licensing Manager or his designee shall be responsible for providing the NRC with any information pertinent to the Preservice Inspection. TUGCO QA shall act as liason for any NRC site inspection or audit during the performance of the Preservice Inspection.

BROWN & ROOT, INC. CPSES JOB 35-1195	PROCEDURE NUMBER	REVISION	EFFECTIVE DATE	PAGE
	CP-CPM-6.9I	5	4/29/82	1 of 15

TITLE:
PRESSURE TESTING

ORIGINATOR: _____ 4/27/82 DATE

REVIEWED BY: _____ 4/27/82 DATE
B&R QA

_____ 4/28/82 DATE
TUGCO QA

APPROVED BY _____ 4-27-82 DATE
CONSTRUCTION PROJECT MANAGER

ATTACHMENTS

No. 1 Table 6.9I-1
No. 2 Table 6.9I-2
No. 3 Figure 6.9I-1
No. 4 Figure 6.9I-2
No. 5 Figure 6.9I-3
No. 6 Figure 6.9I-4

1.0 INTRODUCTION

This appendix delineates the requirements for pressure testing of components, piping and instrumentation tubing at the CPSES to meet the requirements of ASME Section III or ANSI Standard B31.1, construction specification MS-100 and MS-73 as applicable.

2.0 GENERAL

2.1 RESPONSIBILITY FOR PRESSURE TESTING

Pressure testing is the responsibility of the Construction Project Manager and shall be implemented in accordance with this procedure. Pressure tests shall be witnessed by B&R Quality Control, the Authorized Nuclear Inspector and a client representative as delineated herein.

NOTE: Hydrostatic tests of the Reactor Coolant System shall be performed in accordance with the Owner's procedure. The Reactor Coolant System hydrostatic test procedure shall be approved by the B&R QA Site Manager.

2.2 INSPECTION REQUIREMENTS

Pressure tests of ASME (Class 1, 2, and 3) piping systems shall be inspected by a B&R Quality Control representative and witnessed by the Authorized Nuclear Inspector.

Pressure tests of ANSI B31.1 (Class 5 and G) piping systems shall be inspected by the Test Engineer in accordance with paragraph 5.0 of this procedure. In addition, ANSI B31.1 piping, which falls in the Radwaste Management System, shall be inspected by a TUGCO QA representative.

Pressure testings of safety-related tubing and tubing connected to ASME piping systems shall be witnessed by TUGCO QC.

2.3 NOTIFICATION OF PRESSURE TESTS

The Pressure Test Data Package will be forwarded to the appropriate Quality Engineering and Engineering organizations by the Test Engineer, approximately two weeks prior to the test. Exception to the two weeks prior notice may occur as agreed to by TUSI mechanical engineering and B&R QE, or TUGCO QA for the Radwaste Management System, on a case by case basis.

2.4 DOCUMENTATION

Pressure tests shall be documented with a Pressure Test Data Package consisting of a Pressure Test Data Sheet (Figure 6.9I-1), and the applicable drawings marked to show the test boundaries. Engineering, QE, and the ANI shall indicate concurrence of the Pressure Test Data Package prior to the performance of the test by signing the form.

2.5 OVERPRESSURIZATION NOTIFICATION

The Test Engineer shall submit a written report of system or component overpressurizations to Engineering. A system shall be considered overpressurized if the test pressure is exceeded by more than 6% (pressure greater than 1.06 x minimum test pressure).

3.0 PRESSURE TEST REQUIREMENTS

3.1 ASME (CLASS 1, 2, and 3) PIPING SYSTEMS

The required hydrostatic test pressure for Class 1, 2, and 3 piping is 1.25 times the design pressure.

Pneumatic tests for all cases shall be performed at not less than 1.2 and not more than 1.25 times the design pressure.

When hydrostatically testing a system, the test pressure shall not exceed the maximum test pressure of any component in the system.

Following the application of test pressure for a minimum of 10 minutes, an examination of all joints, connections and high-stress regions shall be made. This examination shall take place at a pressure equal to the design pressure or 0.75 of the test pressure (whichever is greater) and will be noted on the Pressure Test Data Sheet.

When pump and valve bodies require testing, the inspection shall take place at the test pressure and shall be held for a minimum of 15 minutes for each inch of design minimum wall thickness. For wall thickness less than one inch, test pressure shall be held for not less than 10 minutes.

3.2 ANSI B31.1 (CLASS 5 AND G) PIPING SYSTEMS

The minimum hydrostatic test pressure is 1.5 times the design pressure at every point in the system but shall not exceed the maximum test pressure of any component in the piping system. This pressure must be held for at least 10 minutes before the inspection takes place. Following the application of hydrostatic pressure for 10 minutes, an examination shall be made of all joints, connections, and regions of high stress. This examination shall be made at the test pressure.

The test pressure for pneumatic tests shall not be less than 1.2 but not more than 1.25 times the design pressure and must be held at least 10 minutes before inspection starts. The examination of all joints, connections and regions of high stress shall be performed at the test pressure.

When hydrostatically testing a system, the test pressure shall not exceed the maximum test pressure of any component in the system.

An initial service leak test and inspection is acceptable when the other types of tests are not practical or when leak tightness is conventially demonstrated due to the nature of the service. The use of an initial service leak test in lieu of a pressure test on a piping system shall be approved by Engineering on a case by case basis.

3.3 RADWASTE MANAGEMENT PIPING SYSTEMS

ASME or ANSI B31.1 piping, which falls into Radwaste Management Systems, shall be pressure tested at 1.5 times the design pressure but shall not exceed the maximum test pressure of any component in the piping system and not less than 75 psig. Connections at atmospheric tanks where no isolation valves exist shall be tested with a 10 foot head. The test pressure shall be held for a minimum of 30 minutes.

When hydrostatically testing a system, the test pressure shall not exceed the maximum test pressure of any component in the system.

3.4 FIRE PROTECTION PIPING INSTALLED BY BROWN & ROOT

The underground fire protection system shall be hydrostatically tested at a pressure of 225 psig for not less than two hours.

The amount of leakage shall be measured by pumping water from a container of a known volume while maintaining pressure at 225 psig.

Temporary blocking during tests shall not be used to replace permanent anchors or thrust blocks. Systems provided with thrust blocks shall not be tested until 36 hours have elapsed after pouring early high strength concrete and seven days for standard concrete.

3.5 DRAIN PIPING

The pipe shall be filled and tested with at least a 10-foot head of water.

The pressure shall be held at least 15 minutes before the inspection takes place.

3.6 GENERAL REQUIREMENTS

3.6.1 Test Mediums

Table 6.9I-1 specifies the test medium to be used for each piping system. Table 6.9I-2 specifies the quality of the test mediums to be used during system operation and pressure testing.

a. Water - Grade A and B water shall be as supplied by TUGCO. For piping systems involving more than one grade of water, or not specified by Table 6.9I-1, the Test Engineer shall determine the grade of water to be used. Water of a higher quality grade may be used in lieu of that specified by Table 6.9I-1.

b. Other pipe systems (e.g., Diesel Fuel Oil and Turbine Lube Oil) will require test mediums that may differ from those mentioned above. The test medium should be the same fluid as used during normal operation. The Test Engineer shall identify this fluid or determine an appropriate alternate.

c. Nitrogen or Air - The nitrogen or air used in a pneumatic test shall be commercially bottled, clean and dry, or shall be plant instrument air.

3.6.2 Test pressure shall not be applied until the system and the medium are at approximately the same temperature. The minimum temperature allowable are as follows:

a. 40°F for stainless steel and non-ferrous materials.

b. 50°F for carbon steel and low alloy steels in Code classes 2, 3 and 5 and NNS, where pipe nominal wall thicknesses are less than 5/8 inch.

c. 60°F for carbon steel and low alloy steels in Code classes 2 and 3, 5 and NNS, where pipe nominal wall thicknesses are 5/8" to 2-½" (incl.) and no impact testing of the materials is required.

d. 70°F for carbon steel and low alloy steels in Code classes 2 and 3, 5 and NNS, where pipe nominal wall thicknesses are greater than or equal to 5/8 inch and impact testing of the materials is required. Also, if material wall is greater than 2-½" regardless of impact requirements, 70°F is the minimum temperature of the test medium.

The test medium temperature shall be measured as close as practical to the line supplying the system being tested.

3.6.3 Plasite on the interior of piping and paint on the exterior of piping may be applied before pressure testing. If the design requires the pipe to be coated and wrapped or insulated, the pressure test must be conducted before the welds are covered.

3.6.4 Pressure test gauges shall be six inch minimum diameter Ashcroft or equivalent and calibrated before each test or series of tests, as required by CPM 13.1. The gauge range shall be within 1.5 to 4.0 times the maximum test pressure. Where there is a choice of more than one gauge range within these limits, the gauge with the range closest to 1.5 times the test pressure should be used.

3.6.5 Overpressure protection shall be provided for all system pressure tests. The overpressure protection can be accomplished automatically through the use of relief valves, rupture discs or manually by the operator controlling the pressurizing device and venting system on the test apparatus. If a relief valve or rupture disc is utilized, it should be sized to relieve at 6% above the minimum test pressure (setpoint = 1.06 x minimum test pressure). Overpressure protection is not required on static head type pressure tests.

3.6.6 When great changes in elevation occur in a piping system that is being pressure tested, the lowest section of the pipe shall be subjected to the required test pressure. During the test, a remote pressure gauge shall be located as close to the highest elevation of the piping being tested as practical; the test relief valve and operator's gauge shall be located as close as practical to the lowest elevation of the piping system being tested.

3.6.7 Containment Spray system distribution manifold piping shall be hydrostatically tested before installing spray heads. For this test, each nozzle shall be capped using the existing threads on the nipples. Tack welds on installed spray heads need not be pressure tested.

3.6.8 Process instrument tubing shall be tested to the same parameters as the process pipe to which it is connected unless otherwise specified by the Test Engineer. The test media will normally be the same as for the process piping. For instruments with a pressure range less than the test pressure, the instrument shall be isolated at the instrument isolation valve and vented between the instrument and the isolation valve. Differential pressure type instruments should be equalized (e.g., open equalizing valve between high and low side sensing lines).

3.6.9 Prior to hydro/pneumatic testing, a pre-test inspection may be performed by QC to release items for the installation of insulation. The results of these inspection shall be documented on a Piping/Equipment Insulation Release Form (Figure 6.9I-3). A copy of the completed form shall be submitted to the Piping Insulation Group and authorizes the insulation of the accepted portions of the piping. Welds, base metal repairs, and areas of high stress as identified by Engineering shall not be insulated until after pressure testing and release for insulation by QC.

4.0 TEST PREPARATIONS AND INSTRUCTIONS

4.1 PRESSURE TEST DATA PACKAGE PREPARATIONS

The Test Engineer shall be responsible for the preparation of the Pressure Test Data Package which will consist of the following:

4.1.1 A Pressure Test Data Sheet (Figure 6.9I-1) which will be completed to document the test parameters used as follows:

1. Enter the unit number, Unit 1, 2, or X.

2. Enter the test number. It will be made up of the system alphabetical identifier and sequential number to identify what test it is (i.e., DD-1 to identify DD as demineralized water and 1 as the first test in the demineralized water system).

3. Identify the system.

4. Enter the design pressure and temperature from the piping line list.

5. Identify the test method to be used.

6. Enter the test medium to be used from Table 6.9I-1. In the case of water, enter the grade of water to be used.

7. The Test Engineer shall determine the required minimum temperature of the test medium and enter the temperature in the appropriate space. (Refer to section 3.6).

8. The Test Engineer shall determine the test and inspection pressures, including tolerances, relief valve set points, and shall enter these values in the appropriate spaces. The Test Engineer shall review the design pressure for each component in the test boundary to assure no components are inadvertently over-pressurized.

NOTE: The test pressure for each line is listed in the line list. If the test pressure, specified by the line list is unacceptable, Engineering shall be contacted to determine an acceptable test pressure.

9. Enter the minimum required time at the test pressure. (Refer to section 3.1 through 3.4).

4.1.2 System flow diagrams will generally be used as the drawing which shows the test boundaries, temporary instruments and other temporary test modifications. The boundary drawing shall be stamped (Figure 6.9I-2) with the date, test number and spaces available for signoff by the Test Engineer, B&R QC, and the ANI.

4.1.3 Additional test package information such as valve lineup sheets, instrument lists (Attachment 5), lists of temporary test modifications, specific prerequisites or precautions is recommended for system pressure tests but is not mandatory.

4.1.4 Once the Pressure Test Data Package preparations have been completed, the package shall be sent to the TUSI Engineering Manager. Engineering shall indicate concurrence with the pressure test by signing the Pressure Test Data Sheet (Figure 6.9I-1) in the space provided. The Pressure Test Data Package shall then be sent to the Site QA Manager for QA documentation review. The pressure test data package shall be returned to the Test Engineer for use during the hydro test.

4.2 GENERAL TEST PRECAUTIONS

Air pockets in components or systems shall be minimized during the conduct of the hydrostatic test by venting piping highpoints, by flushing, or by providing calculations to show that the entrapped air is dissolved at the pressure and temperature conditions during the hydrostatic test.

A system under test pressure shall not be left unattended by the Test Operator.

Compressed gas is hazardous when used as a test medium and special care should be taken for personnel protection.

Components and systems designed to handle vapors or gases may require additional temporary supports and permanent hangers will have to be locked to support the additional weight of the test fluid, when other than the design fluid is to be used.

The test medium temperature shall be maintained at or above that stated on the Pressure Test Data Sheet to minimize the possibility of brittle fracture and shall not exceed 200oF.

Piping adjacent to the test boundary valves should be vented to preclude pressurization of that piping due to valve seat leakage.

4.3 TEST PREREQUISITES

The Test Engineer shall inspect the system prior to the pressure test for the following items:

a. For systems that are designed to handle vapor or gases that are to be hydrostatically tested, all spring cans (or other adjustable supports) shall be locked. Additionally, the Test Engineer shall also determine if temporary supports are required to support the piping;

b. The valves in the system to be tested shall be positioned in accordance with the test boundary drawing. Boundary valves shall be tagged for personnel and equipment protection;

c. At the Test Engineer's discretion, the internals of any check valve in the system being tested may be removed in accordance with CPM 6.9, Appendix E, or blocked open;

d. Reviewing the system to assure that components and instruments having lower pressure rating than the test pressure or an incompatible temperature requirements are not within the test boundary;

e. Ensuring that adequate lighting is available and that the system being tested is accessible for inspection;

f. All permanent relief valves been tagged or removed and blanked prior to the pressure test. After the test, ensuring all relief valves are restored to their operating condition;

g. Examining test equipment before pressure is applied to the system to ensure that all fittings are tight and that all low-pressure lines and other appurtenances that should not be subjected to test pressures are isolated;

h. Verifying test gauges used in pressure testing are connected directly to the piping system or component being tested. If the test gauge is not readily visible to the operator controlling the pressure or the piping system involves great changes in elevation, additional test gauge(s) shall be used. The Test Engineer shall determine the location of the test gauges and identify this location on the boundary drawing. In general, one test gauge should be located at the most remote location practical from the point pressure being applied; and other gauge should be located on the test manifold. Test gauges may be connected to the system being tested with snubbers.

4.4 TEST CONDUCT

4.4.1 For hydrostatic and pneumatic tests (All Pipe Classes), the Test Engineer shall:

a. Ensure any temporary pressure test modifications have been installed;

b. Establish the test boundary and valve lineup per the Valve Lineup Sheet. Tag the boundary valves;

c. Connect the hydro test pump (pneumatic pressure regulator) and remote pressure gauge to the system. Verify the test equipment is operational;

d. With the test manifold isolated from the system, verify that the relief valve is set at the required pressure;

e. Establish a "Solid" system by filling and venting the system and test apparatus;

f. Slowly increase the system pressure until the test pressure has been reached. Periodically inspect piping system within the test boundary;

NOTE: For pneumatic test, the system pressure shall be gradually increased to not more than one-half (½) the test pressure, after which the pressure shall be increased in steps of approximately one-tenth (1/10th) the test pressure until the required test pressure has been reached.

g. Maintain the test pressure for the minimum time specified on the Pressure Test Data Sheet;

h. Establish the required inspection pressure as specified on the Pressure Test Data Sheet and examine the piping system for leaks within the test boundary;

i. Depressurize the system. Remove the test apparatus and any temporary hydro modifications.

4.4.2 Initial service leak tests (Class 5, G, and ANSI B31.1 piping) shall be performed when the system is at normal operating pressure. The Test Engineer shall:

a. Ensure data required by the Pressure Data Sheet is recorded from permanent plant instrumentation or installed test gauges as determined by the Test Engineer and indicated on the test boundary drawing;

b. Examine the system piping at the normal system operating pressure;

c. Upon completion of the examination, direct the system shall be placed in the condition prior to the test as directed by the Test Engineer.

During the pressure test, the Test Engineer shall complete the Pressure Test Data Sheet. Acceptance of the pressure test shall be indicated and the data sheet signed by the Test Engineer, B&R QC, TUGCO QC (for instrumentation), TUGCO QA (for Radwaste Management System Piping) and ANI as applicable.

Upon completion of the test, the Pressure Test Data Package for all classes of piping systems shall be sent to the Permanent Plant Records Vault.

5.0 INSPECTION OF ANSI B31.1 (CLASS 5 AND G) PIPING SYSTEMS

5.1 HYDROSTATIC TESTS AND INITIAL SERVICE LEAK TEST

The Test Engineer shall inspect all joints and connections on piping and instrument tubing for leakage.

The Test Engineer shall inspect gasketed joints and valve bonnets and packing for leakage.

5.2 PNEUMATIC TESTS

The Test Engineer shall inspect all joints and connections on piping and instrument tubing for leakage utilizing a chloride-free non-residual type liquid leak detector. Each joint shall be sprayed liberally in accordance with the manufacturer's instructions.

The balance of the pressure boundary shall be visually inspected to detect any escape of air or gas.

6.0 ACCEPTANCE CRITERIA

There shall be no visible leakage from any welded joints.

A weeping at the packing, bonnet or seat of a valve, gasketed joints or pressure retaining mechanical joints, shall not be a cause for rejection of a pressure test.

NOTE: If a packing, bonnet, gasket or mechanical joint leak exists and the test pressure can be maintained, the pressure test is acceptable and such leaks are the responsibility of the TUGCO Start Up Engineer for evaluation and acceptance. Evaluation of the leaks will be made by reducing the system to the operating pressure and re-inspecting the leaking area. If the leak continues at the operating pressure, the Test Engineer shall make the necessary repairs, following completion of the pressure test.

The amount of allowable leakage for underground fire protection piping at the joints shall not exceed two quarts per hour for 100 joints irrespective of pipe diameter. This leakage should be distributed over the majority of the joints. The amount of allowable leakage may be increased by one fluid ounce per inch of valve diameter per hour for each valve seated at the boundary of the test section.

During pneumatic tests, there shall be no leakage as indicated through use of chloride-free non-residual type liquid leak detector at all welds or by visual means at other pressure boundaries. Packing or gasket leaks are acceptable as described above.

Process instrument tubing shall be tested at the same pressure as the system test pressure unless otherwise specified by the Test Engineer.

7.0 PIPING MODIFICATION/REPAIR AND RETESTING

Following turnover, control of piping modification and/or repair and subsequent retest shall be performed in accordance with CPM-12.2, "Work Activities on Systems Released to TUGCO".

Prior to turnover, if a portion of a system is revised by adding new welds or other pressure boundary joints after it has been satisfactorily pressure tested, Engineering shall notify the Test Engineer in writing to ensure that the new joints, components, etc. are retested.

Permament or temporary attachments may be welded to the piping system after the hydrostatic test has been performed provided:

a. the welds do not require postweld heat treatment;

b. the cross-sectional area of the material attached shall not exceed 6 square inches at the surface of the pressure boundary material;

c. the welds shall be restricted to fillet welds not exceeding 3/8 inch throat thickness and to full penetration welds attaching materials not exceeding 1/2 inch thickness;

d. the welds shall be examined in accordance with CPM 6.9G, table 6.9G3.

Any portion of a pressure that fails, shall be retested after repair. Only the failed portion need be reinspected. The retest boundaries may vary from the original test boundaries. If a portion of the test fails, it will be noted in the Remarks section of the Pressure Test Data Sheet. Retest shall also be recorded on a new Pressure Test Data Sheet with a reference to the original test in the Remarks section.

8.0 PRESSURE TESTING OF VENDOR ITEMS DURING SYSTEM PRESSURE TESTING

Vendor components (e.g. the steam generators, the pressurizer, etc.) which have not been pressure tested by the vendor, may be tested as part of the sytem pressure test. A holdpoint shall be established on the Pressure Test Data Sheet by the Test Engineer.

Based on this holdpoint, the Test Engineer shall ensure that the component manufacturer is contacted so that he and the component manufacturer's ANI are notified of the pressure test and are on site to witness the pressure testing and complete their Code responsibilities.

TABLE 6.9I-1

TEST MEDIUM REQUIREMENTS

See Table 6.9I-2 for Test Medium Grades and Quality Requirements

SYSTEM	TEST MEDIUM
Auxiliary Feedwater	B
Auxiliary Steam	B
Boron Recycle	A
Chemical Feed	B
Chemical and Volume Control	A
Chilled Water	B
Circulating Water	D
Component Cooling Water	B
Condensate	B
Condensate Polishing	B
Condenser Vacuum & Water Box Priming	B (Pump Side) D (Water Box Side)
Containment Spray	A/Air
Demineralized & Reactor Make-Up Water	A
Diesel Generator Fuel Oil Storage & Transfer System	Oil
Diesel Generator Fuel Oil	Oil
Diesel Generator Starting Air	Air
Diesel Generator Intake, Exhaust & Crankcase Air	Air
Diesel Generator Jacket Water	B
Diesel Generator Lube Oil	Oil
Extraction Steam	B
Fire Protection	D

TABLE 6.9I-1 (Cont'd)

Gaseous Waste Processing	Air
Generator Gas Supply	Air
Generator Primary Water Supply	A
Generator Seal Oil Supply	Oil
Heater Drains	B
Instrument Air	Air
Liquid Waste Processing - Reactor Coolant Drain Tank	A
Liquid Waste Processing - Drain Channel A	B
Liquid Waste Processing - Drain Channel B	B
Liquid Waste Processing - Drain Channel C	B
Liquid Waste Processing - Disposal	B
Main Steam Hot & Cold Reheat	B
Main Steam Reheat & Steam Dump	B
Potable Water	C
Process Sampling	A
Plant Gas - CO_2	Air
Plant Gas - H_2	Air
Plant Gas - N_2	Air
Plant Gas - O_2	Air
Reactor Coolant	A
Residual Heat Removal	A
Safety Injection	A
Secondary Sampling	B
Service Air	Air
Sewage Treatment	D

TABLE 6.9I-1 (Cont'd)

Spent Fuel Pool Cooling & Cleanup	A
Station Service Water	D
Steam Generator Blowdown Cleanup	B
Steam Generator Feedwater	B
Turbine/Generator Lube Oil	Oil
Turbine Control Fluid	Oil
Turbine Gland Steam System	B
Turbine Oil Purification	Oil
Turbine Plant Cooling Water	B
Turbine Seal Steam (Supply & Drain)	B
Vents & Drains	
a. Containment, Safeguards, Auxiliary & Fuel Building	C
b. Turbine Building Floor Drains	C
c. All drains to Atmospheric Drain Tank and Main and Auxiliary Condenser	B
Water Treatment Systems (@ effluent to DWST)	A
Surface Water Pretreatment	C

TABLE 6.9I-2
QUALITY OF TEST MEDIUMS

GRADE A - DEMINERALIZED WATER

Chlorides, maximum ppm	0.15
Fluorides, maximum ppm	0.15
Silica as SiO_2 mg/l	0.10
Ph range	6.0 - 8.0
Conductivity, maximum micromhos/cm	2
Total Solids maximum ppm	.5

Clarity: No visual turbidity, oil or sediment.

GRADE B - DEMINERALIZED WATER

Chlorides, maximum ppm	1.0
Fluoride, maximum ppm	0.15
Conductivity, maximum micromhos/cm	20
Ph range	6.0 - 8.0

Clarity: No visual turbidity, oil or sediment.

Demineralized water meets the requirements for Grade A water. Where water has been subjected to possible CO_2 absorption, such as when retained in storage tanks, the pH requirement may be lowered to 5.8 to compensate for CO_2 pickup.

The water qualities given above are typical qualities required for operating systems. Demineralized water used for pressure testing, when obtained from the plant demineralized water system, does not require a chemical analysis. Demineralized water obtained from a source other than the plant demineralized water system, when used for pressure testing, shall have had a water analysis performed to verify the above quality requirements. The results of this analysis shall then become part of the pressure test data package.

TABLE 6.9I-2 (Contd)

GRADE C - WELL WATER

Water as obtained from the plant wells or potable water system

GRADE D - RESERVOIR WATER

Water in its natural state as obtained from the lake.

OIL

Chemistry requirement of oil will be of grade as specified by vendors' instruction or equivalent.

AIR

When air is specified as the test medium, it shall be clean, dry, filtered air, free of oil vapor and droplets. Air shall be filtered through filters rated at 10 micron removal capacity before use for pressure testing. The dew point shall be -40°F at atmospheric pressure. Plant instrument air shall be generally used for this purpose.

FIGURE 6.9I-1

PRESSURE TEST DATA SHEET

Unit No.: _____ Test No.: _____

System: _____

Test Procedure: _____ Revision _____

Reference Drawings: _____ Revision _____

_____ Revision _____

_____ Revision _____

Design Pressure: _____ Design Temperature: _____ Pipe Category: _____

Test Method: _____Hydrostatic _____Pneumatic _____In-Service _____ Other

Medium: _____ Required Temperature of Medium _____ ^{o}F Minimum

Required Test Pressure: _____ +_____,-0 psig

Minimum Required Inspection Pressure: _____ +_____,-0 psig

Required Test Relief Valve Set Point: _____ psig

Minimum Required Time @ Test Pressure: _____minutes (minimum)

Engineering Concurrence: _____ Date _____

QE Pretest Concurrence: _____ Date _____

ANI Pretest Concurrence: _____ Date _____

Time Test Started: _____ Time Test Completed _____

Relief Valve Setting: _____psig Medium Temperature _____ ^{o}F

Operator Gauge Pressure: _____psig Remote Gauge Pressure: _____psig

Operator Gauge No.: _____ Calibration Date _____

Remote Gauge No.: _____ Calibration Date _____

Temperature Gauge No.: _____ Calibration Date _____

REMARKS: _____

_____

_____

_____

Test Engineer Acceptance: _____ Date _____

ANI Test Witness: _____ Date _____

B&R QC Acceptance: _____ Date _____

TUGCO QC Instrumentation Acceptance: _____ Date _____

Final ANI Acceptance: _____ Date _____

TUGCO QA Acceptance: _____ Date _____

FIGURE 6.9I-2

HYDRO/PNEUMATIC TEST

DATE_____TEST NO._____

B&R TEST ENG._____

B&P Q.A._____

ANI_____

ENG. WITNESS_____

FIGURE 6.9I-3

PIPING/EQUIPMENT INSULATION RELEASE

DATE _____ REPORT # _____

SYSTEM _____ DRAWING # _____

BOUNDARIES & LOCATION _____

_____

_____

RELEASED FOR INSULATION BY	NAME	DATE
PIPING SUPERINTENDENT		
AREA MANAGER		
AREA MANAGER (INSULATION)		
SYSTEM ENGINEER MECHANICAL TUGCO/COMPLETIONS		
SYSTEM TEST ENGINEER MECHANICAL (PRESSURE TEST COMPLETED)		
MECHANICAL ENGINEER		
PAINT SUPERINTENDENT		
MILLWRIGHT SUPERINTENDENT		
QUALITY CONTROL SUPERINTENDENT (FOR Q SYSTEMS ONLY)		
ELECTRICAL SUPERINTENDENT (FOR HEAT TRACE ONLY)		
SYSTEM ENGINEER ELECTRICAL (FOR HEAT TRACE ONLY)		
SYSTEM TEST ENGINEER ELECTRICAL (FOR HEAT TRACE ONLY)		
EQUIPMENT QUALIFICATION SUPERVISOR		

SPECIAL INSTRUCTIONS TO INSULATION SUPERINTENDENT _____

_____

_____

FIGURE 6.9I-4

INSTRUMENT LIST

TEST NO.: _____ UNIT NO.: _____

SYSTEM: _____

INSTRUMENT NO.: _____ _____

This instrumentation tubing (i.e., tubing, fittings and valves) identified by Instrument Number listed above has been satisfactorily hydrostatically or pneumatically tested.

Test No. _____ System _____

System No. _____ Drawing No. _____

Valve Number	Location Bldg/Elev.	Required Position	Remarks	Position Verified By/Date

O - Open X - Closed G - Gagged T - Tagged

PRESSURE TEST MODIFICATIONS

Test No. _____ System _____

System No. _____ Drawing No. _____

Component	Location Bldg./Elev.	Description of System/Component Modification	System Restored Sign/Date

PRESSURE TEST DATA SHEET

Unit No.: _____ Test No.: _____

System: _____

Test Procedure: _____ Revision _____

Reference Drawings: _____ Revision _____

_____ Revision _____

_____ Revision _____

Design Pressure: _____ Design Temperature: _____ Pipe Category: _____

Test Method: _____Hydrostatic _____Pneumatic _____In-Service _____ Other

Medium: _____ Required Temperature of Medium _____ °F Minimum

Required Test Pressure: _____ +___, -0 psig

Minimum Required Inspection Pressure: _____ +___, -0 psig

Required Test Relief Valve Set Point: _____psig

Minimum Required Time @ Test Pressure _____minutes (minimum)

Engineering Concurrence _____ Date _____

QE Pretest Concurrence _____ Date _____

ANI Pretest Concurrence _____ Date _____

Time Test Started: _____ Time Test Completed: _____

Relief Valve Setting: _____psig Medium Temperature _____°F

Operator Gauge Pressure: _____psig Remote Gauge Pressure: _____ psig

Operator Gauge No.: _____ Calibration Date: _____

Remote Gauge No.: _____ Calibration Date: _____

Temperature Gauge No. _____ Calibration Date: _____

REMARKS: _____

_____

_____

Test Engineer Acceptance: _____ Date: _____

ANI Test Witness: _____ Date: _____

B&R QC Acceptance: _____ Date: _____

TUGCO QC Instrumentation Acceptance: _____ Date: _____

Final ANI Acceptance: _____ Date: _____

TUGCO QA Acceptance: _____ Date: _____