

NORTHEAST NUCLEAR ENERGY COMPANY

MILLSTONE UNIT NO. 2

ESTABLISHMENT OF INSERVICE INSPECTION CRITERIA

Revisions to 10 CFR 50.55a (g) set forth the inspection requirements for nuclear power plant components by referencing the ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components". Applicability of code addenda depends on the facilities' commercial operation date and the effective amendment to paragraph (b) of 50.55a.

Millstone Unit No. 2 commenced commercial operation on December 26, 1975. Start dates for inspection periods in the first ten-year inspection interval are as follows:

First 40 months	-- December 26, 1975
Second 40 months	-- April 26, 1979
Third 40 months	-- August 26, 1982

10 CFR 50.55a (g) (5) requires that licensees submit an application for revision to facility Technical Specifications for requirements which conflict with the effective edition and addenda of ASME Section XI, six months before the start of each 40-month inspection period (20 months for pump and valve operational readiness tests, and system pressure tests). The effective edition of the code is the edition and addenda published in 50.55a (b); presently, the 1974 edition including those addenda through the summer of 1975 addenda (Federal Register, Volume 41, No. 235, December 6, 1976).

Subsequent to the CFR revisions, the NRC Staff published guidance for complying with certain provisions of 10 CFR 50.55a (g) which requests that a description

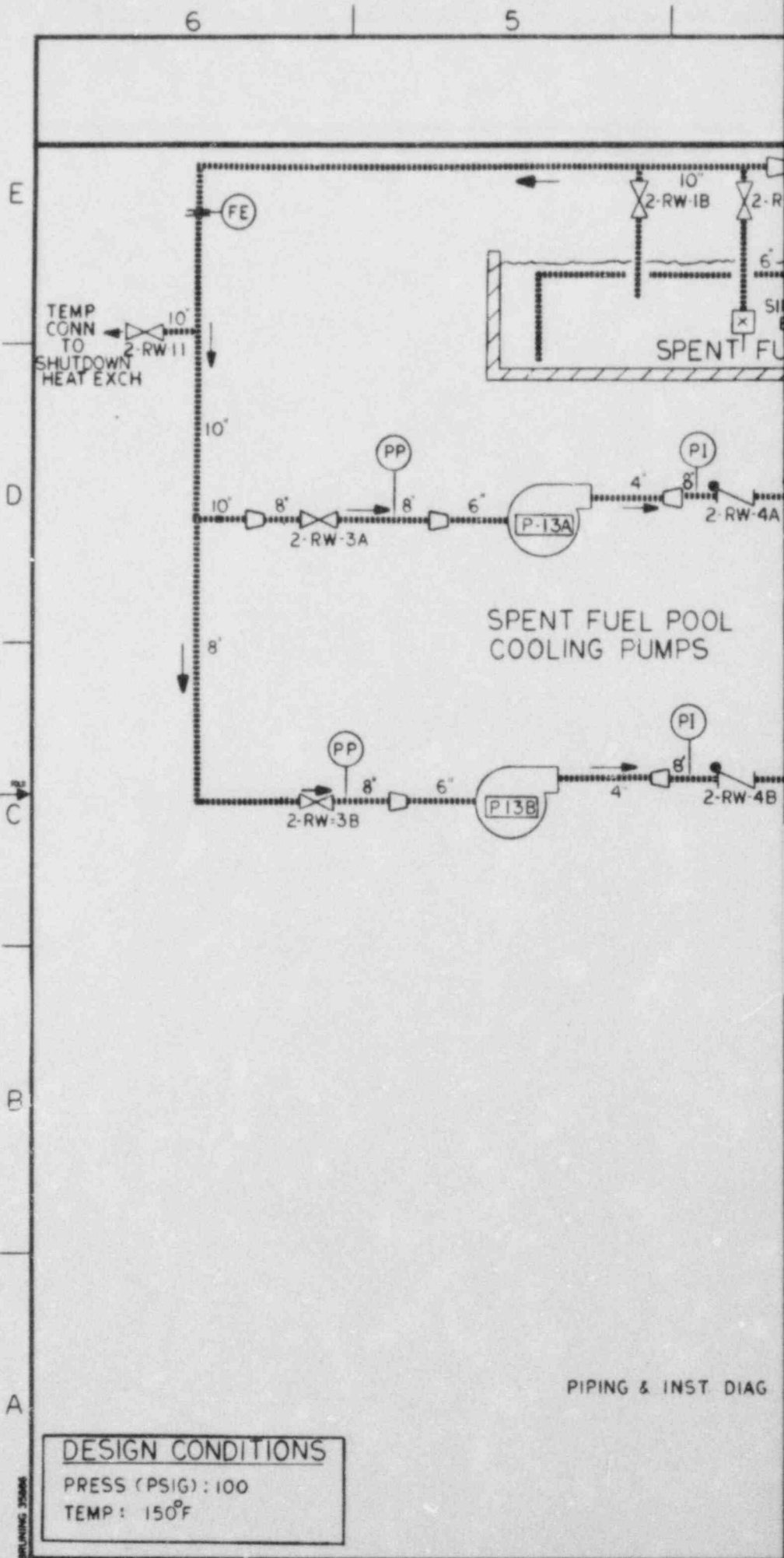
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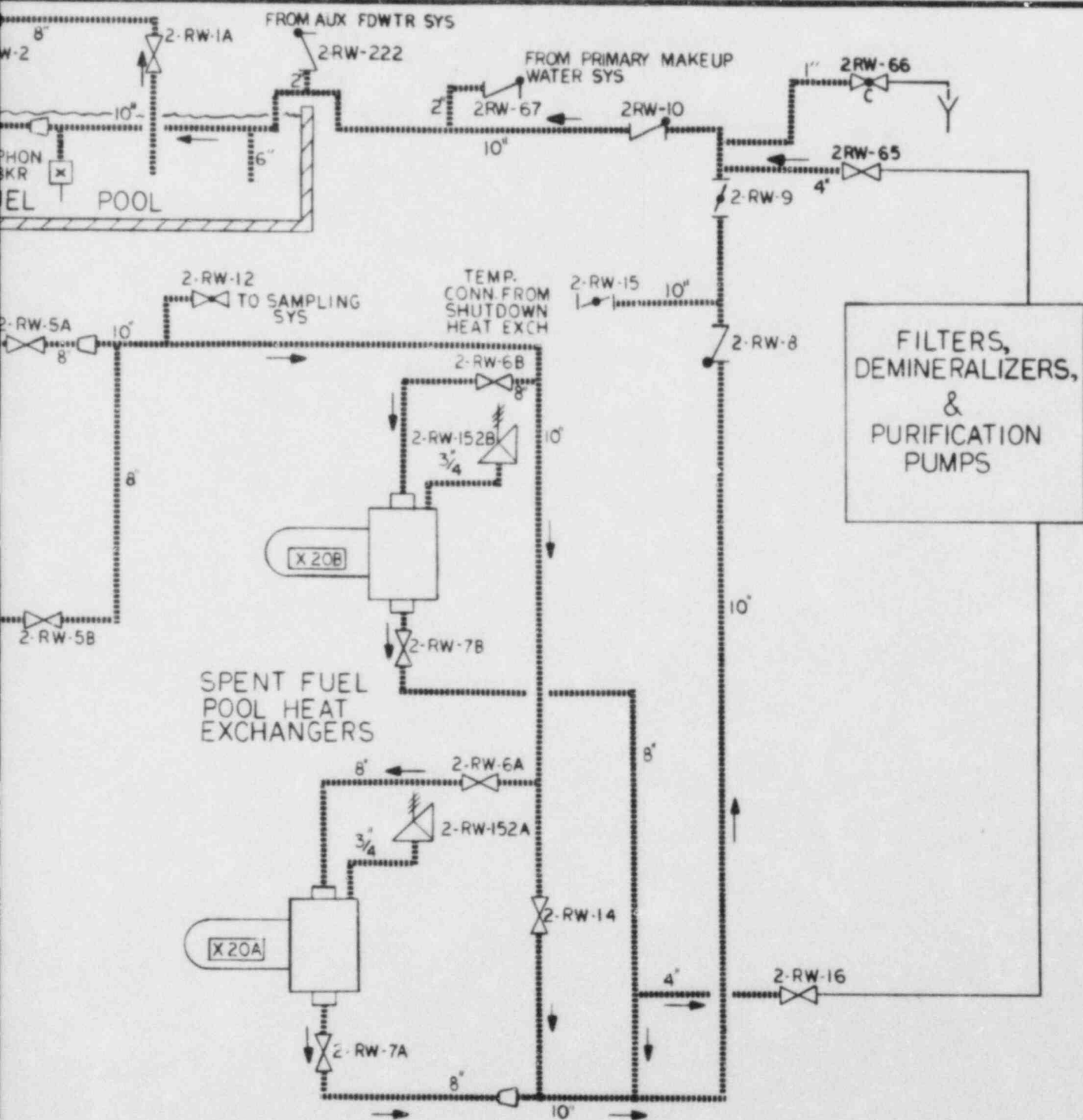
Docket # 50-336
Control # 7901300105
Date 1/25/79 of Document:
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of the planned inservice inspection and testing program as well as any requests for relief from ASME code requirements determined to be impractical be submitted at least 90 days before the start of any inspection or testing period.

Millstone Unit No. 2 commences its second inspection period on April 26, 1979. This submittal contains the Inservice Inspection Program description and request for waivers for this period. The program was developed to the requirements of the Summer 1975 Addenda and is applicable from April 26, 1979 to August 26, 1982, for Inservice Inspection and to December 26, 1980 for operational readiness testing of pumps and valves and system pressure tests.

The submittal is arranged in six sections, to be consistent with ASME Section XI. In addition, a complete set of P&ID "Boundary Diagrams" are included to show system classification boundaries, and pump and valve locations.





LEGEND

- CLASS 2 PIPE
- CLASS 3 PIPE
- NON NUCLEAR

NORTHEAST UTILITIES SERVICE CO.			
FOR MILLSTONE UNIT 2			
TITLE BOUNDARY DIAGRAM			
SPENT FUEL POOL COOLING & CLEAN-UP SYS - INSERVICE INSR PROGRAM			
BY TJB	CHKD J. J. J.	APP J. J. J.	APP J. J. J.
DATE 8/27/76	DATE 9/1/76	DATE 9/1/76	DATE 9/1/76
SCALE NONE	25203-26126 SH1		
P.A.P.	NO. DATE	REVISIONS	BY CHK APP APP

E

D

C

B

A

6

5

TO H.P. TURBINE

2-MS-64A

2-MS-65A

STM. GEN. AUX.
FEED PUMP TURBINE

TO H.P. TURBINE

2-MS-64B

2-MS-242

2-MS-65B

2-MS-243

2-MS-

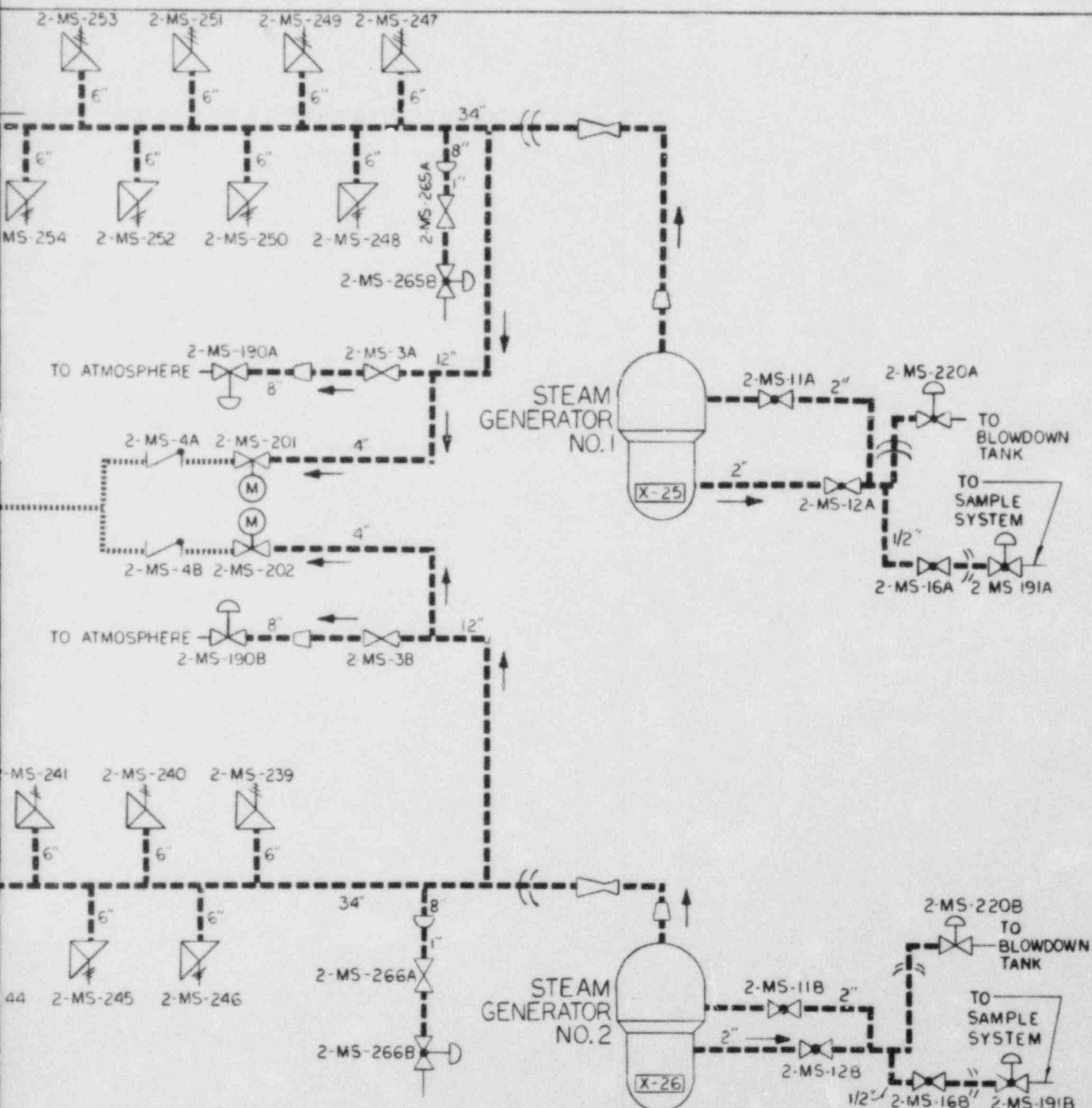
DESIGN CONDITIONS

PRESS (PSIG): 1100

TEMP: 600°F

PIPING & INST. DIAGRAM 2

ENGINEERING 35486

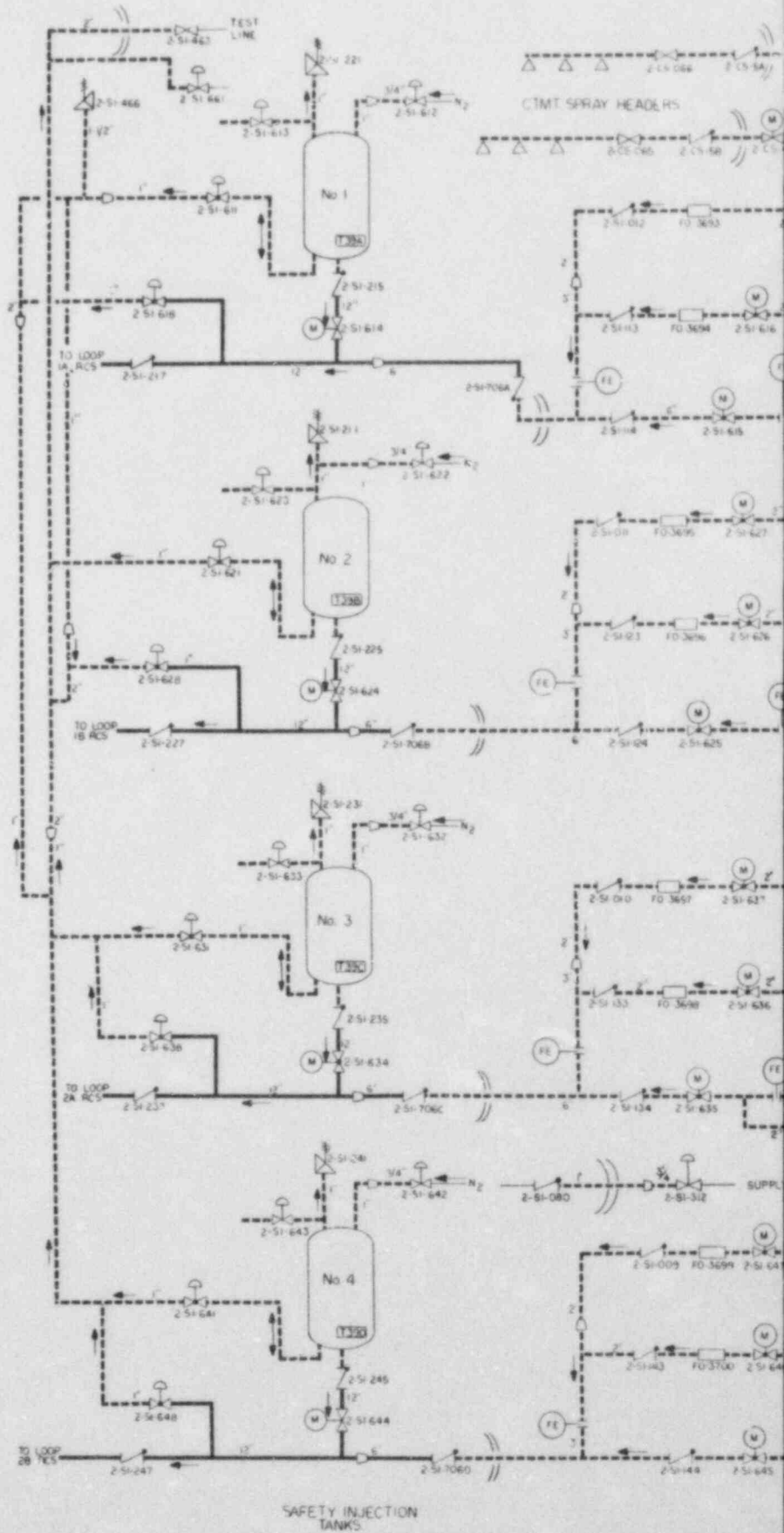


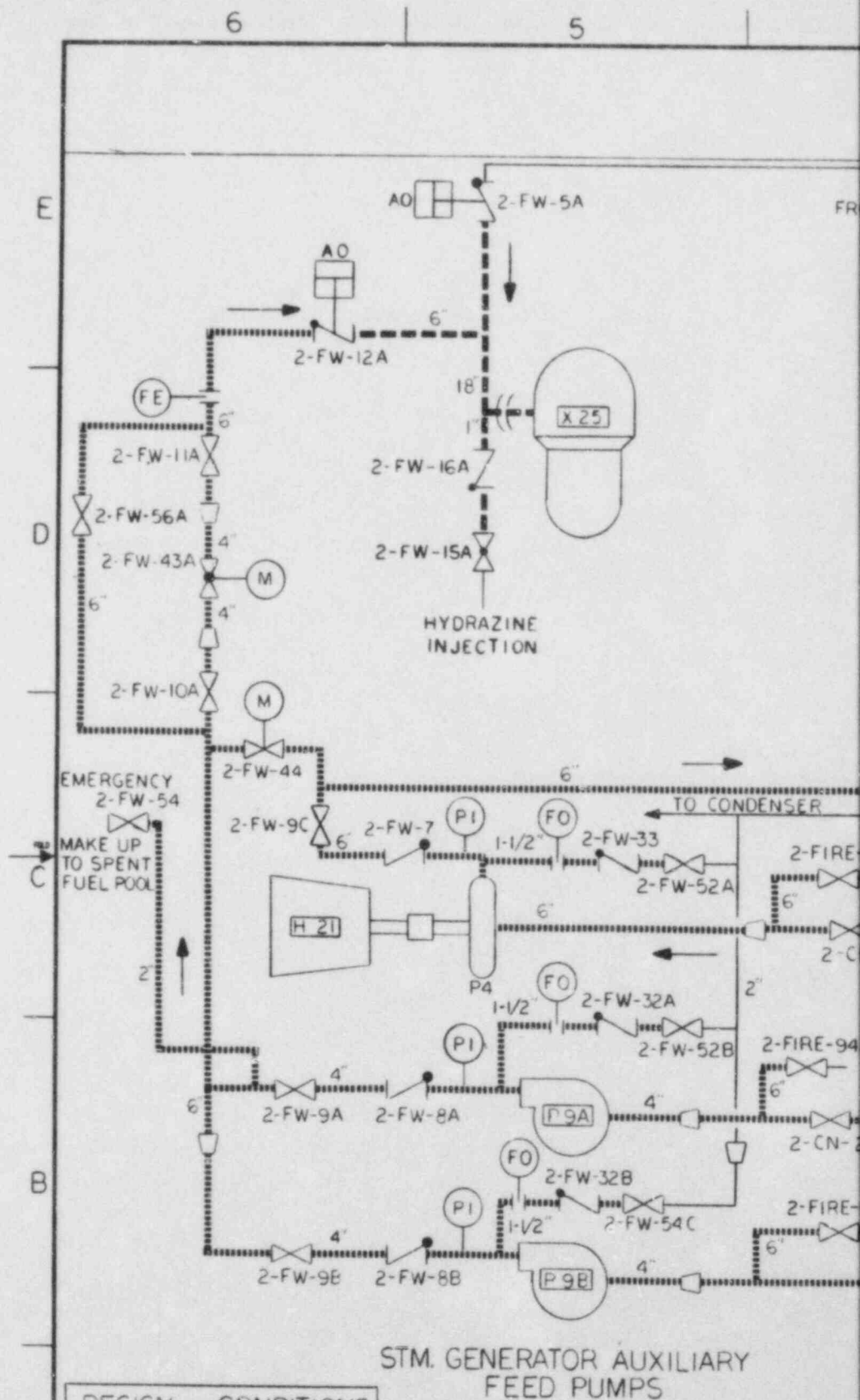
LEGEND

- CLASS 2 PIPE
- NON-NUCLEAR
- CLASS 3 PIPE

5203-26002

										NORTHEAST UTILITIES SERVICE CO. FOR MILLSTONE UNIT 2 BOUNDARY DIAGRAM MAIN STEAM									
										BY MGM CHD BAC APP PA DATE 5-78 DATE 9-78 DATE 4-79 DATE SCALE NONE DWG NO 25203-2612C SH 2 P & F 76-603									
NO	DATE	REVISIONS	BY	CHK	APP	APP													





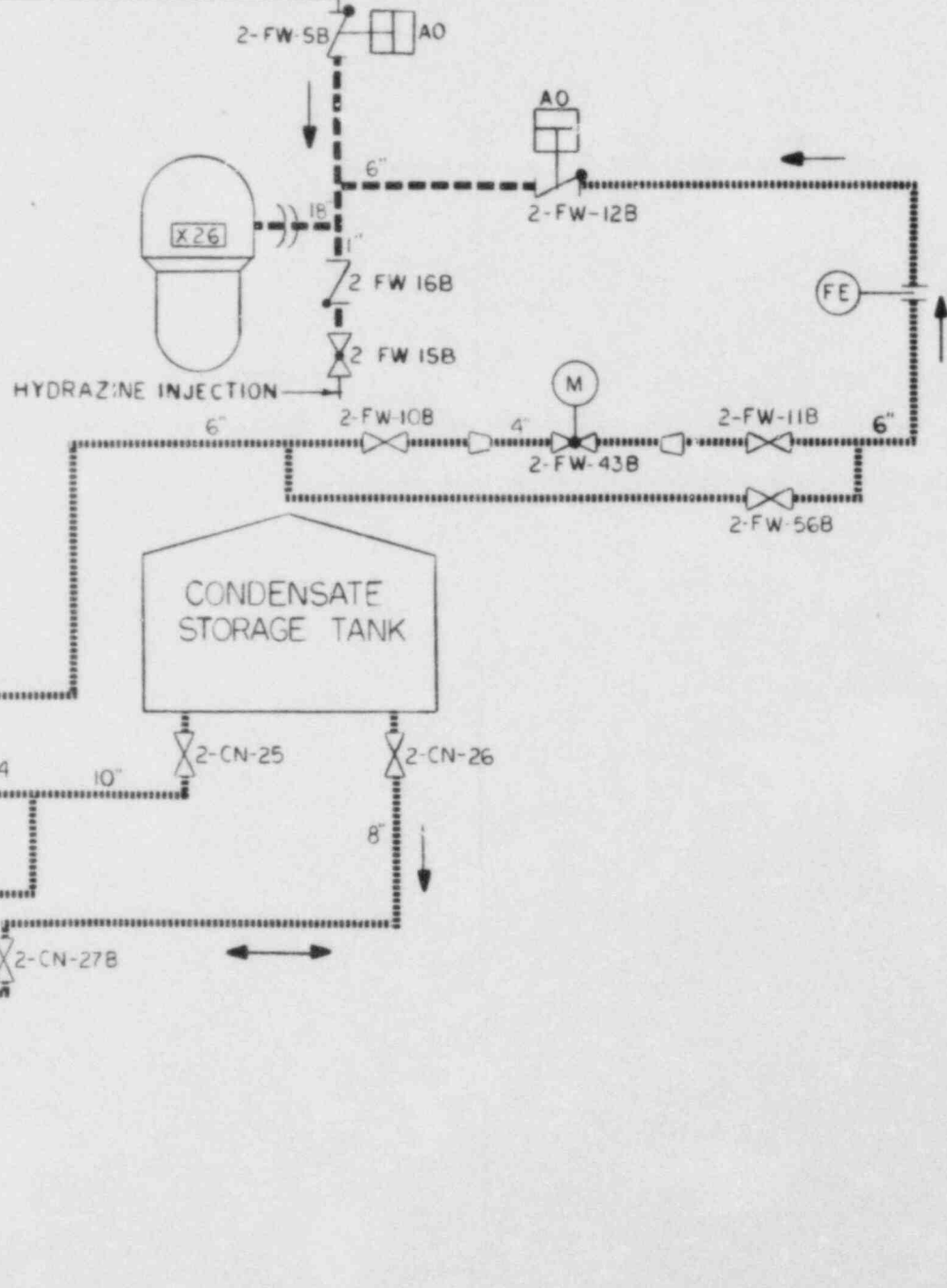
STM. GENERATOR AUXILIARY
FEED PUMPS

DESIGN CONDITIONS		
LOCATION	PRESS PSIG	TEMP
FROM SGF PUMPS & REGULATING VALVES TO STEAM GEN.	1600	600
CST TO AUX FEED PUMP SUCTION	50	100
AUX FEED PUMPS DISCH TO REG. VALVES 2 FW 43A,B INCL BY PASS	1600	100

PIPING & IN

DM STEAM GENERATOR
FEED PUMPS

STEAM
GENERATORS

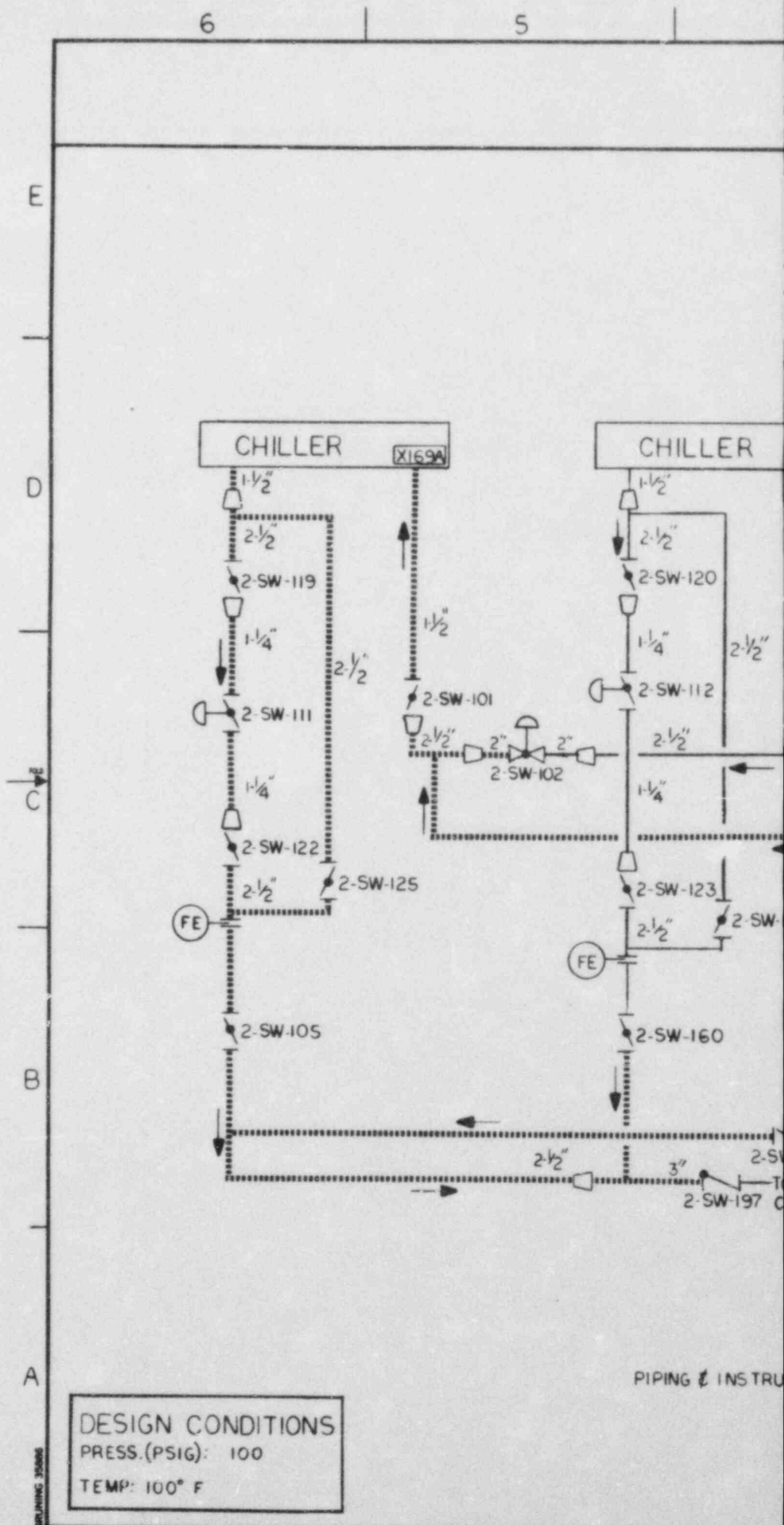


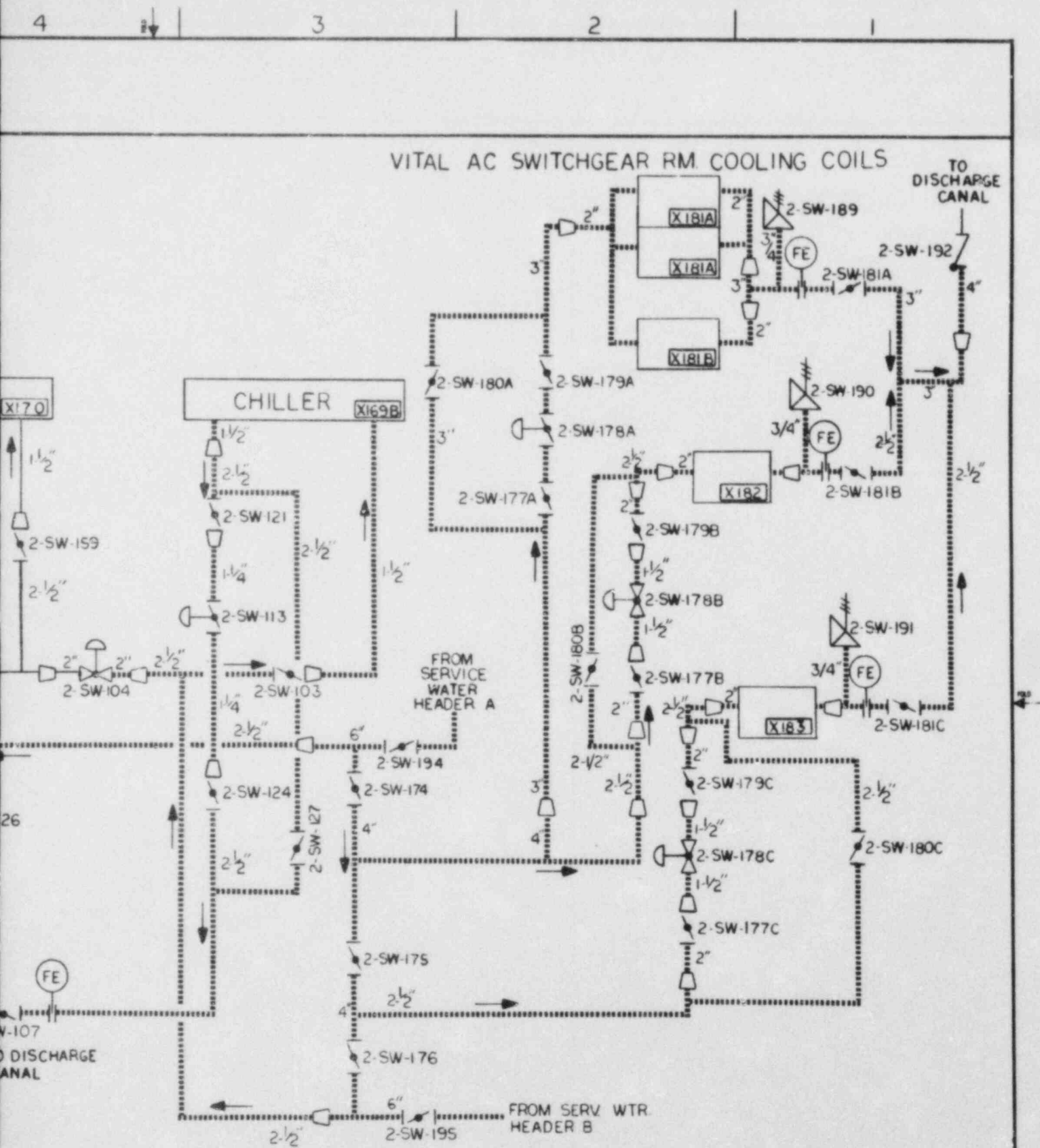
ST. DIAG 25203-26005

LEGEND

- CLASS 2 PIPE
- CLASS 3 PIPE
- NON-NUCLEAR

NORTHEAST UTILITIES SERVICE CO.	
FOR MILLSTONE UNIT 2	
TITLE BOUNDARY DIAGRAM	
CONDENSATE & FEEDWATER SYSTEM	
INSERVICE INSP PROGRAM	
BY M&M	CHKD 4/2/78
DATE 3-7-78	DATE 9-8-78
SCALE NONE	DATE 4-8-78
P.A.# 76-603	DWG NO 25203 26126 SH 4



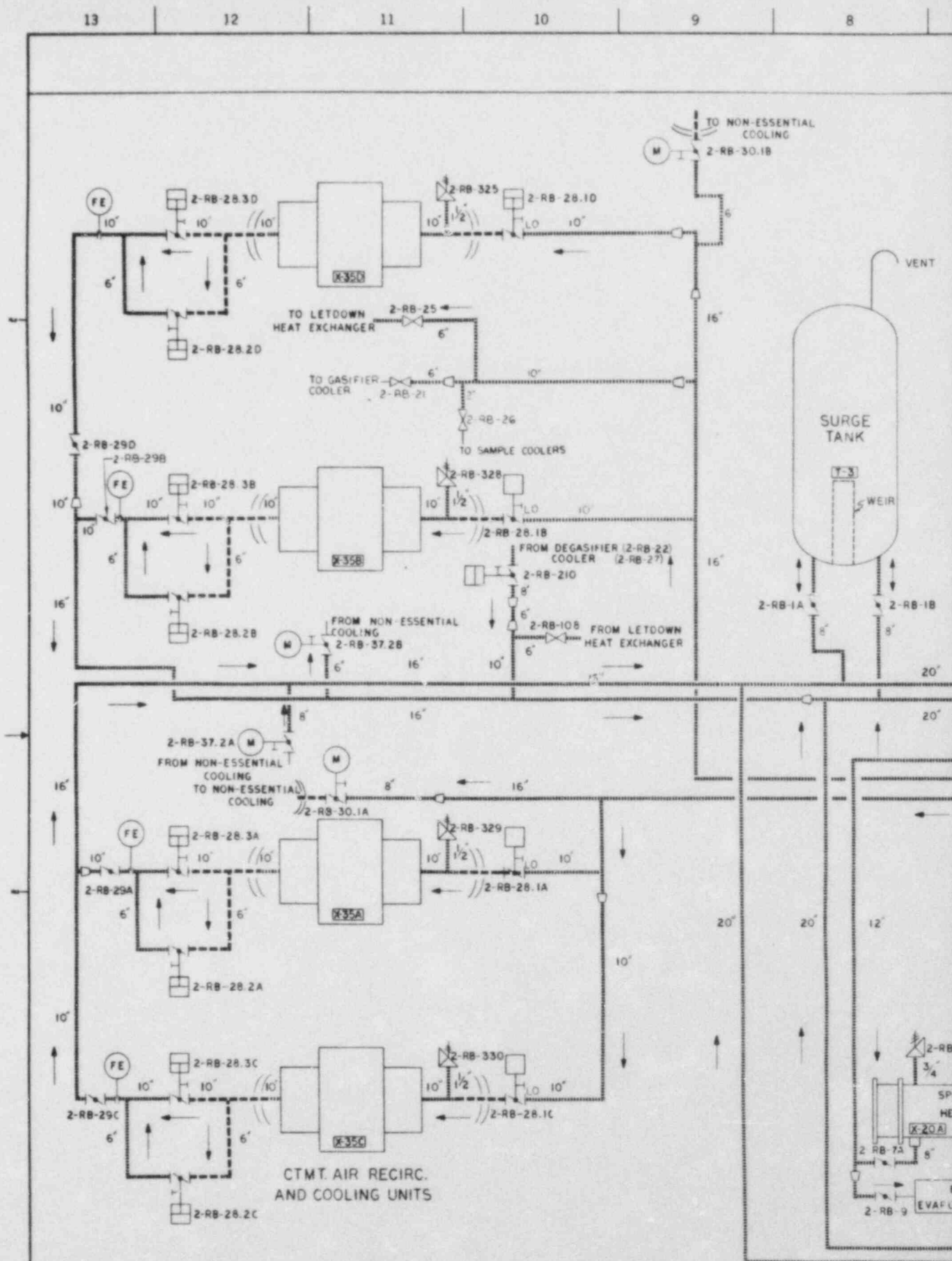


MENTATION DIAGRAM 25203-26027 SH2

LEGEND

CLASS 3 PIPE
NON NUCLEAR PIPE

NORTHEAST UTILITIES SERVICE CO.			
FOR MILLSTONE UNIT 2			
TITLE BOUNDARY DIAGRAM			
SERVICE WATER TO			
CHILLED WATER SYSTEM			
BY T. J. B.	CHKD. [Signature]	APP. [Signature]	APP. [Signature]
DATE 9/21/78	DATE 9/28/78	DATE 9/28/78	DATE
SCALE 1"=20'		Dwg. No. 25203-26126 SH.5	
P. A. B.	NO. DATE	REVISIONS	BY CHK APP APP

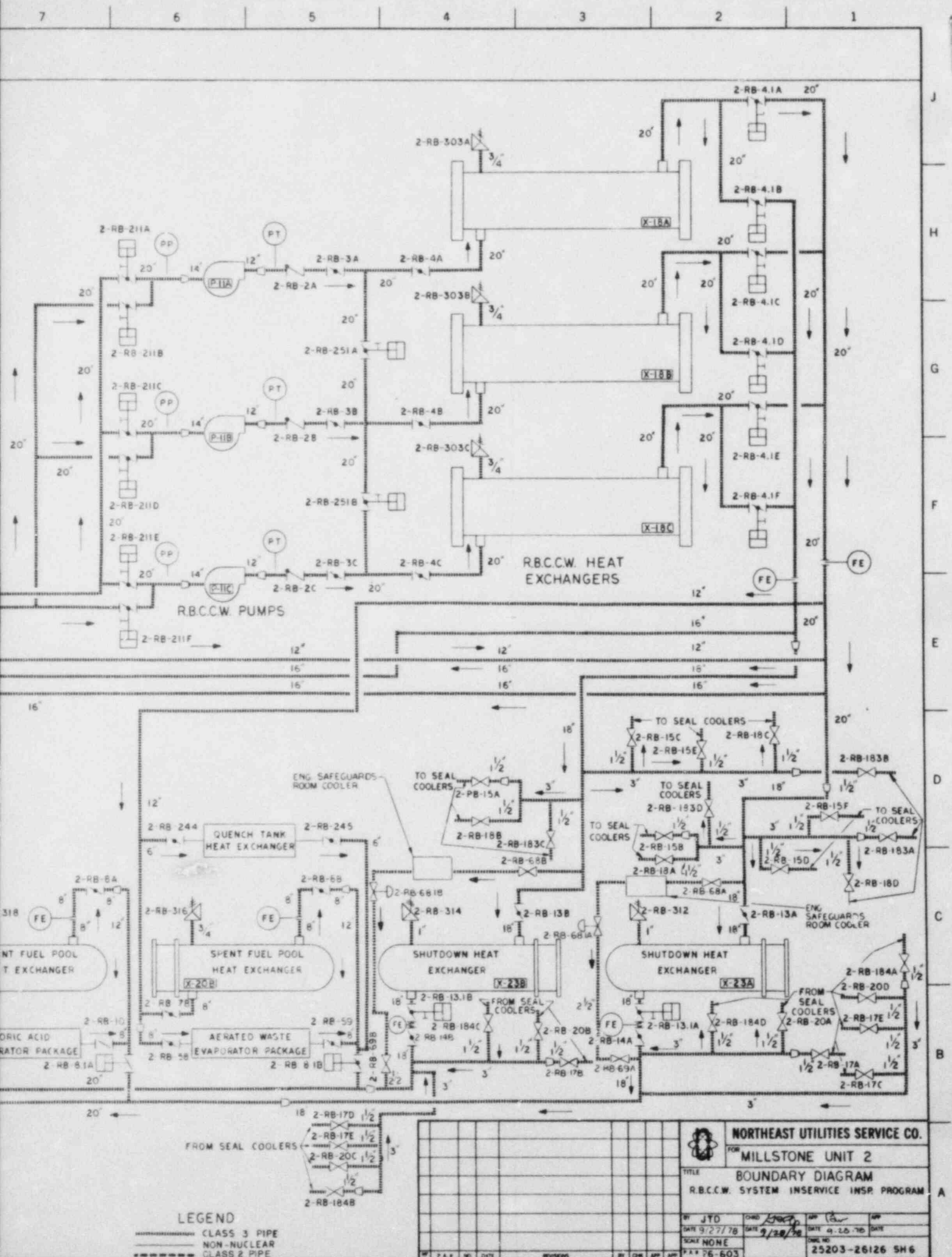


PIPING & INST. DIAG. 25203-26022

DESIGN CONDITIONS

PRESS (PSIG): 150

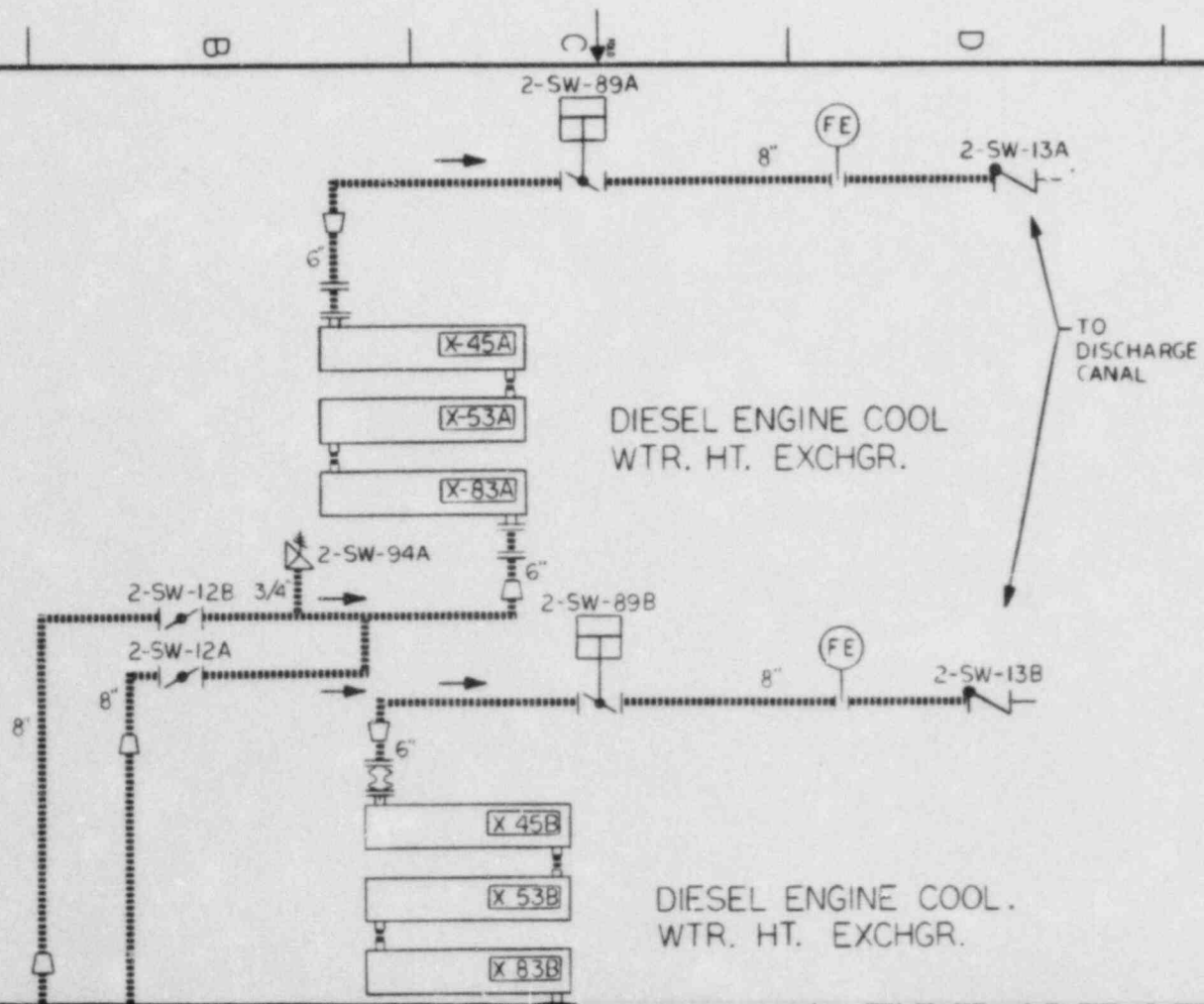
TEMP: 200°F



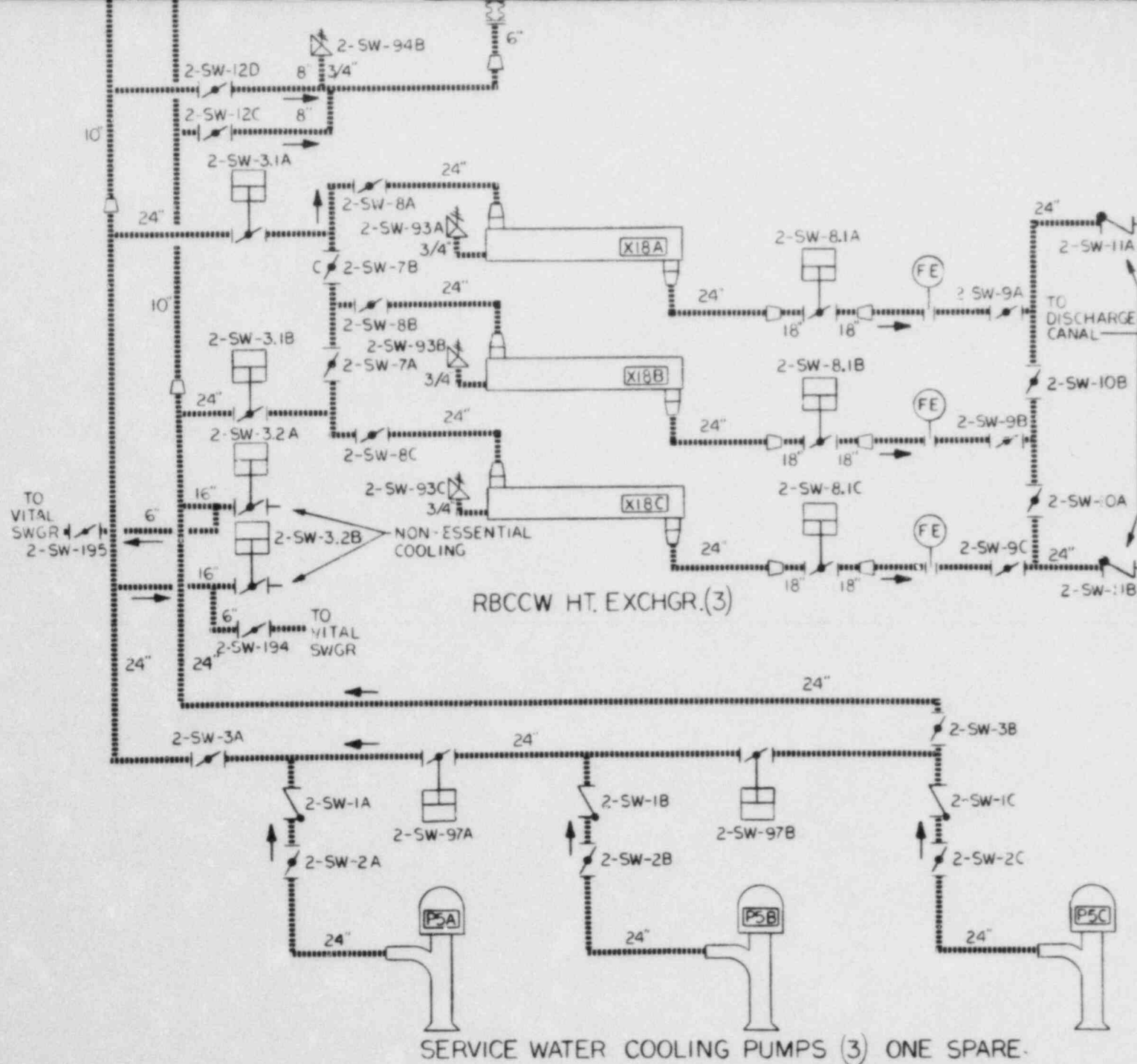
BRUNING 35006

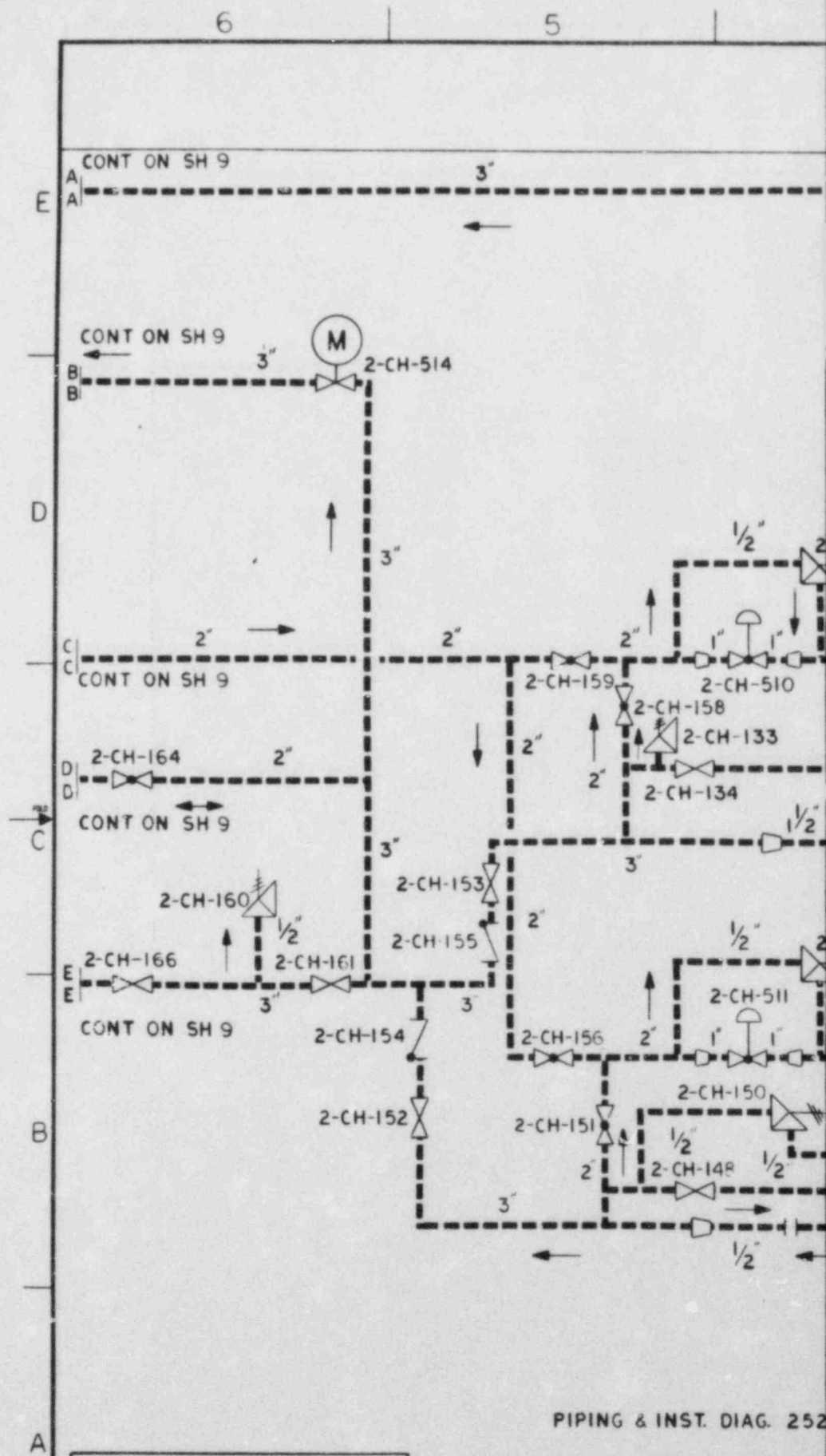
DESIGN CONDITIONS
PRESS (PSIG): 100
TEMP: 100°

PIPING & INST DIAG



NORTH EAST UTILITIES SERVICE CO.									
FOR MILLSTONE UNIT 2									
TITLE BOUNDARY DIAGRAM									
SERVICE WATER SYSTEM									
									
DATE	BY	CHECKED	DATE	BY	CHECKED	DATE	BY	CHECKED	DATE
12/17/81	WJG	WJG	12/17/81	WJG	WJG	12/17/81	WJG	WJG	12/17/81
SCALE: 1" = 10'									
25-203-26126 SH 7									





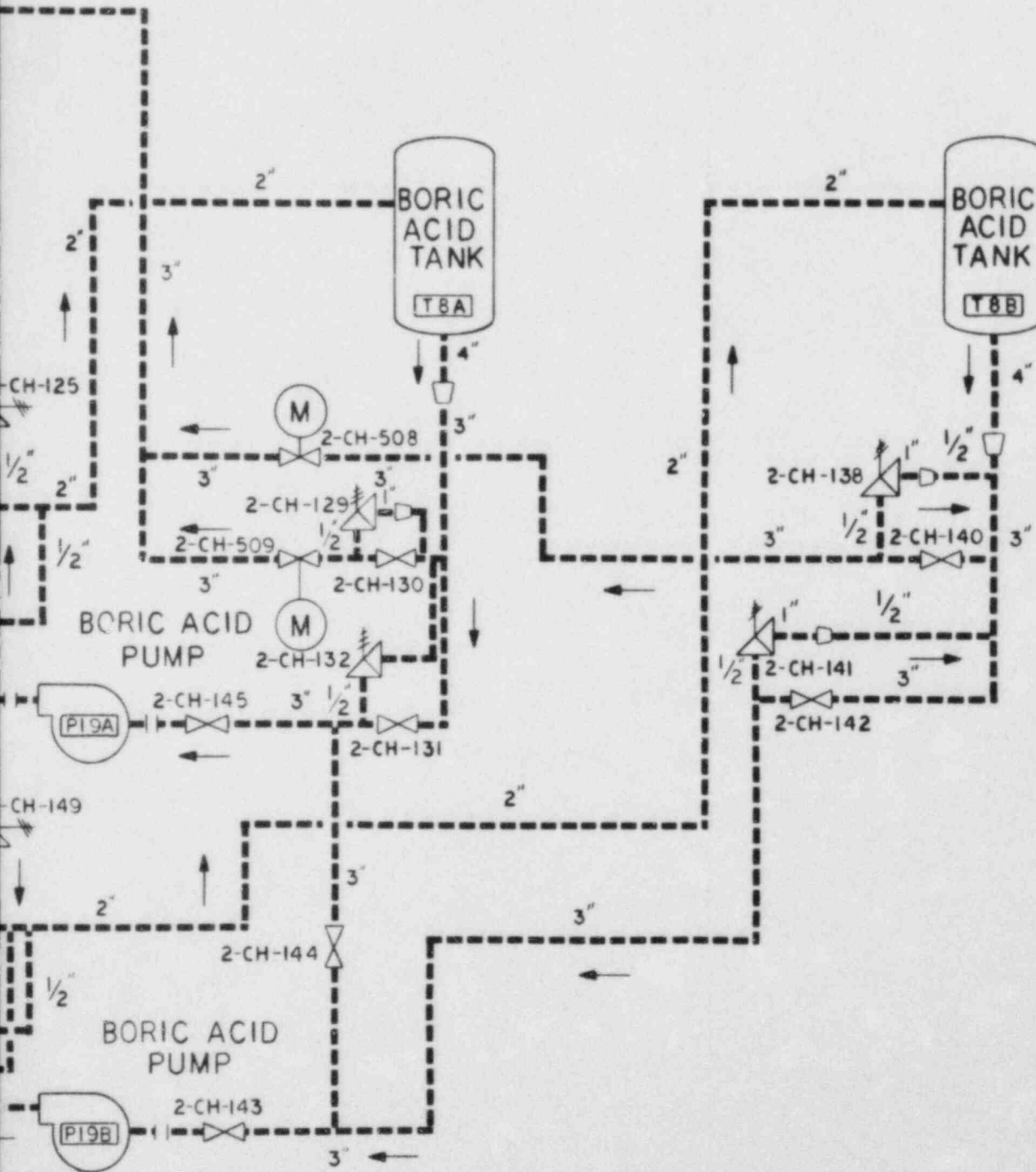
PIPING & INST. DIAG. 252

DESIGN CONDITIONS

PRESS (PSIG): 150

TEMP: 250°F

DRAWING 354896

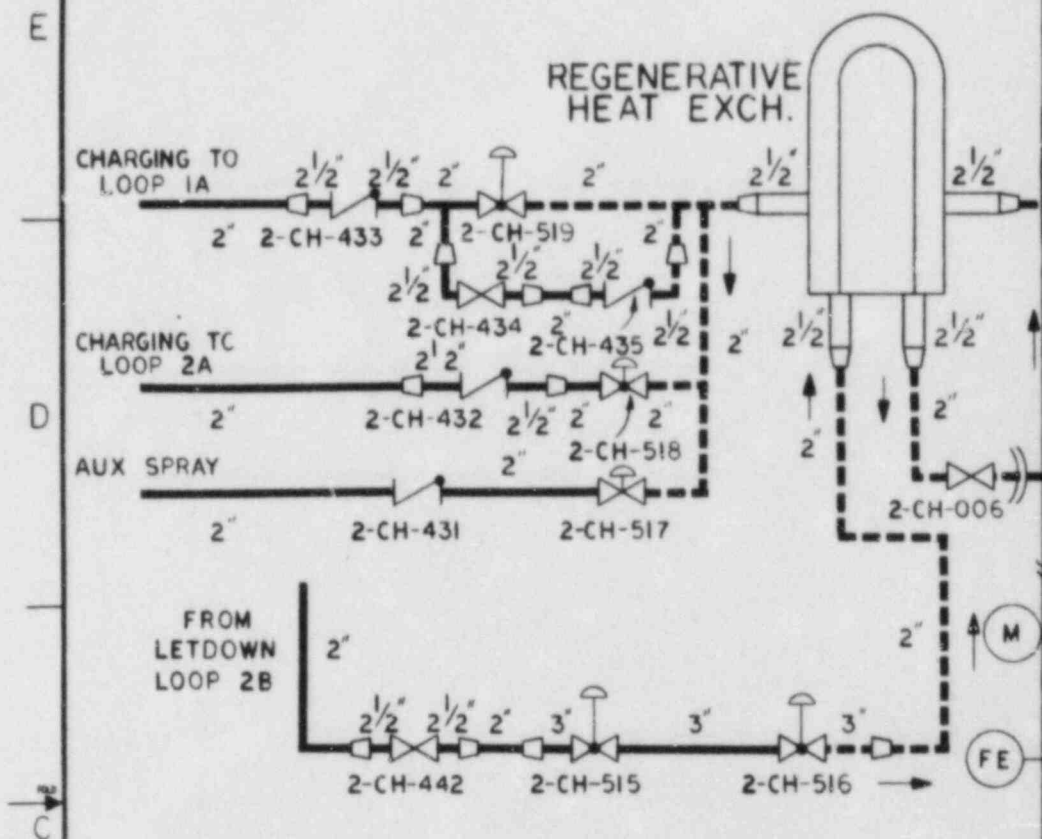


03-26017

LEGEND

--- CLASS 2 PIPE

				NORTHEAST UTILITIES SERVICE CO.			
				FOR MILLSTONE UNIT 2			
				TITLE BOUNDARY DIAGRAM			
				CHEMICAL & VOLUME CONTROL			
				SYS-INSERVICE INSP PROGRAM			
BY JTD		CHKD [Signature]		APP [Signature]		APP [Signature]	
DATE 5/27/75		DATE 9/28/75		DATE 4-28-78		DATE	
SCALE N.T.S.		DWG NO 25203-26126 SH 8		P.A.S.		76-603	
NO	P.A.S.	NO	DATE	REVISIONS	BY	CHK	APP



DESIGN CONDITIONS

CHARGING PUMP DISCHARGE
TO VESSEL:

2735 PSIG; 250°F

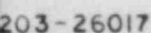
LETDOWN LOOP TO 2-CH-110P
& 2-CH-110Q:

2485 PSIG; 600°F



FROM BORIC ACID & VOLUME
CONTROL TANKS TO CHARG-
ING PUMP SUCTION:


150 PSIG; 250°F

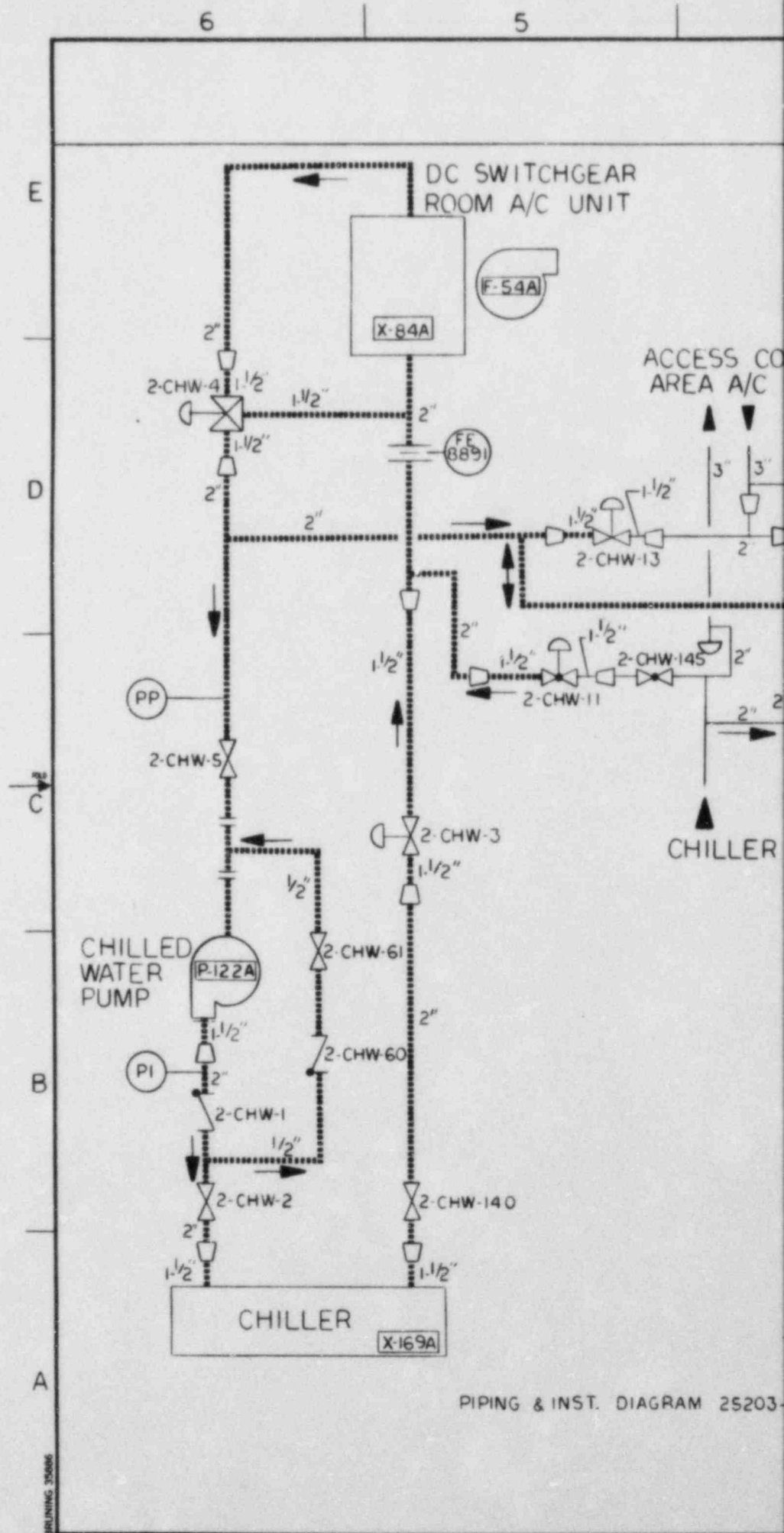
PIPING & INST. DIAG. 25



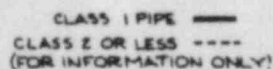
LEGEND

- CLASS 1 PIPE
 CLASS 2 PIPE
 CLASS 3 PIPE
 NON NUCLEAR

										 NORTHEAST UTILITIES SERVICE CO. FOR MILLSTONE UNIT 2									
										TITLE BOUNDARY DIAGRAM CHEMICAL & VOLUME CONTROL SYS INSERVICE INSP. PROGRAM									
										BY JJD CHKD ESB APP ESB APP ESB DATE 5/27/78 DATE 5/27/78 DATE 5/28/78 DATE 5/28/78 SCALE NONE DWG NO. 25203-26/26 SH 3 P.A.# 76-603									
REV	P.A.#	NO	DATE	REVISIONS				BY	CHK	APP	APP								



PIPING & INST. DIAGRAM 25203-



NUC. CR.	BERY. CR.	ELC. CR.	STRUC. CR.	BERY. CR.	ELC. CR.	STRUC. CR.	BERY. CR.	ELC. CR.	STRUC. CR.
ORL. CR.	MACH. CR.	CC#C. CR.	HYDRL. CR.	MACH. CR.	COND. CR.	HYDRL. CR.	MACH. CR.	COND. CR.	HYDRL. CR.

MILLSTONE UNIT NO. 2

Inservice Inspection Program for ASME Code Class 1 Components

The attached table provides a tabulation of the Class 1 pressure-retaining components (and their supports) that are subject to the inspection requirements of Subsection IWB of Section XI of the ASME Boiler and Pressure Vessel Code, 1974 Edition, and Addenda through Summer 1975. This tabulation identifies the components to be inspected, the Section XI Examination Category, area to be examined, and the method of examination. Relief from the inspection requirements of Subsection IWB is requested where these inspection requirements have been determined to be impractical. Where relief is requested, specific information is provided which identifies the applicable code requirement, justification for the relief request, and the inspection method to be used as an alternative. Table IWB-2600 items that are not applicable to Millstone Unit 2 have also been listed and identified in the interest of completeness.

The following provides further clarification concerning the Class 1 inservice inspection program:

- (1) Repairs to Class 1 components will be conducted to the requirements of Article IWA-4000.
- (2) The inservice inspection and testing programs outlined in the attached tabulation have been developed as a result of a design review. Should certain ASME Section XI Code requirements be discovered to be impractical due to unforeseen reasons during the process of performing inspections or tests, relief will be requested from the specific Section XI Code requirement at that time.
- (3) Radiation levels in certain areas or of certain components may be found to prohibit the access for operators or inspectors to perform the inspections or tests described in this program. If source strengths cannot be reduced and access is still restricted by considerations of compliance with the requirements of Regulatory

Guides 8.8 and 8.10, relief will be requested from the specific Section XI Code requirements and alternative examination or test requirements be proposed.

- (4) Ultrasonic examinations are required to be conducted in accordance with the provisions of Appendix I and Article 5 of Section V as required by Paragraph IWA-2232. As an alternative to using Article 5 of Section V, NNECO proposes to use Appendix III of Section XI of the 1974 Edition, Winter, 1975, Addenda of the ASME Boiler and Pressure Vessel Code for ultrasonic examination of piping systems. It is recognized that Appendix III of Section XI was issued in the Winter, 1975, Addenda and, as such, has not been officially recognized by the NRC by reference in 10 CFR 50. However, Appendix III is the first guideline that has been published in the ASME Codes for the ultrasonic examination of pipe welds and, as such, its use is essential.
- (5) Examinations of hydraulic snubbers will be conducted in accordance with Technical Specifications, Section 4.7.8.1, so is excluded from category B-K-2 in the accompanying table.

NORTHEAST NUCLEAR ENERGY COMPANY

MILLSTONE UNIT NO. 2

INSERVICE INSPECTION PROGRAM - CLASS 1 COMPONENTS

<u>Table IWB-2600 Item No.</u>	<u>Table IWB-2500 Examination Category</u>	<u>Components and Parts to be Examined</u>	<u>Examination Method</u>	<u>Section XI Relief Requested</u>
<u>Section 1. Reactor Vessel and Closure Head</u>				
B1.1	B-A	Longitudinal and circumferential shell welds in core region	Volumetric	No - Note 1
B1.2	B-B	Longitudinal and circumferential welds in shell (other than those of Category B-A and B-C) and meridional and circumferential seam welds in bottom head and closure head (other than those of Category B-C)	Volumetric	No - Note 2
B1.3	B-C	Vessel-to-flange and head-to-flange circumferential welds	Volumetric	No
B1.4	B-D	Primary nozzle-to-vessel welds and nozzle-to-vessel inside radiused section	Volumetric	Yes - Note 3
B1.5	B-E	Vessel Penetrations Including Control Rod Drive and Instrument Penetrations	Visual (IWA-5000)	No
B1.6	B-F	Nozzle to safe-end-welds	Surface and Volumetric	No - Note 4
B1.7	B-G-1	Closure studs, in place	Volumetric	No
B1.8	B-G-1	Closure studs and nuts, when removed	Volumetric and Surface	No
B1.9	B-G-1	Ligaments between threaded stud holes	Volumetric	No
B1.10	B-G-1	Closure washers, bushings	Visual	No

Table
IWB-2600
Item
No.

Table
IWB-2500
Examination
Category

Components and Parts to be Examined

Examination
Method

Section
XI
Relief
Requested

B1.11	B-G-2	Pressure-retaining bolting, less than 2"	Visual	No
B1.12	B-H	Integrally-welded vessel supports	Volumetric	No - Note 5
B1.13	B-I-1	Closure head cladding	Visual and Surface or Volumetric	Yes - Note 6
B1.14	B-I-1	Vessel cladding	Visual	Yes - Note 6
B1.15	B-N-1	Vessel interior	Visual	No
B1.16	B-N-2	Interior attachments and core support structures	Visual	No - Note 4
B1.17	B-N-3	Core-support structures	Visual	No
B1.18	B-O	Control rod drive housings	Volumetric	No
B1.19	B-P	Exempted components	Visual (IWA-5000)	No

Section 2. Pressurizer

B2.1	B-B	Longitudinal and circumferential welds	Volumetric	No
B2.2	B-D	Nozzle-to-vessel welds and nozzle-to- vessel inside radiused section	Volumetric	No
B2.3	B-E	Heater connections	Visual (IWA-5000)	No
B2.4	B-F	Nozzle-to-safe end welds	Volumetric and Surface	No
B2.5	B-G-1	Pressure-retaining bolts and studs, in place	Volumetric	No - Note 4
B2.6	B-G-1	Pressure-retaining bolts and studs, when removed	Volumetric and Surface	No - Note 4

Table IWB-2600 Item No.	Table IWB-2500 Examination Category	Components and Parts to be Examined	Examination Method	Section XI Relief Requested
B2.7	B-G-1	Pressure-retaining bolting	Visual	No - Note 4
B2.8	B-H	Integrally-welded vessel supports	Volumetric	No
B2.9	B-I-2	Vessel cladding	Visual	Yes - Note 6
B2.10	B-P	Exempted components	Visual (IWA-5000)	No
B2.11	B-G-2	Pressure-retaining bolting, less than 2"	Visual	No
<u>Section 3. Steam Generators</u>				
B3.1	B-B	Longitudinal and circumferential welds, including tube-sheet-to-head or shell welds on the primary side	Volumetric	No
B3.2	B-D	Primary nozzle-to-vessel head welds and nozzle-to-head inside radiused section	Volumetric	No
B3.3	B-F	Primary nozzle to safe-end welds	Surface and Volumetric	No - Note 4
B3.4	B-G-1	Pressure-retaining bolts and studs, in place	Volumetric	No - Note 4
B3.5	B-G-1	Pressure-retaining bolts and studs, when removed	Volumetric and Surface	No - Note 4
B3.6	B-G-1	Pressure-retaining bolting	Visual	No - Note 4
B3.7	B-H	Integrally-welded vessel supports	Volumetric	No
B3.8	B-I-2	Vessel cladding	Visual	Yes - Note 6
B3.9	B-P	Exempted components	Visual (IWA-5000)	No
B3.10	B-G-2	Pressure-retaining bolting	Visual	No

Table
IWB-2600
Item
No.

Table
IWB-2500
Examination
Category

Components and Parts to be Examined

Examination
Method

Section
XI
Relief
Requested

Section 4. Piping Pressure Boundary

B4.1	B-F	Safe end to piping welds and safe end in branch piping welds	Volumetric and Surface	No
B4.2	B-G-1	Pressure retaining bolts and studs, in place	Volumetric	No - Note 4
B4.3	B-G-1	Pressure retaining bolts and studs, when removed	Volumetric and Surface	No - Note 4
B4.4	B-G-1	Pressure retaining bolting	Visual	No - Note 4
B4.5	B-J	Circumferential and longitudinal pipe welds	Volumetric	No
B4.6	B-J	Pipe branch connection welds exceeding 6" in diameter	Volumetric	No
B4.7	B-J	Pipe branch connection welds 6" and less	Surface	No
B4.8	B-J	Socket welds	Surface	No
B4.9	B-K-1	Integrally welded supports	Volumetric	No
B4.10	B-K-2	Support components, except hydraulic snubbers	Visual	No
B4.11	B-P	Exempted components	Visual (IWA-5000)	No
B4.12	B-G-2	Pressure retaining bolting	Visual	No

Table
IWB-2600
Item
No.

Table
IWB-2500
Examination
Category

Components and Parts to be Examined

Examination
Method

Section
XI
Relief
Requested

Section 5. Pump Pressure Boundary and
Pump Flywheels

B5.1	B-G-1	Pressure retaining bolts and studs, in place	Volumetric	No
B5.2	B-G-1	Pressure retaining bolts and studs, when removed	Volumetric and Surface	No
B5.3	B-G-1	Pressure-retaining bolting	Visual	No
B5.4	B-K-1	Integrally-welded supports	Volumetric	Yes - Note 8
B5.5	B-K-2	Support components (except hydraulic snubbers)	Visual	No
B5.6	B-L-1	Pump casing welds	Volumetric	Yes - Note 7
B5.7	B-L-2	Pump casings	Visual	No
B5.8	B-P	Exempted components	Visual (IWA-5000)	No
		Flywheels	Volumetric	No - Note 9

Section 6. Valve Pressure Boundary

B6.1	B-G-1	Pressure retaining bolts and studs, in place	Volumetric	Yes - Note 10
B6.2	B-G-1	Pressure retaining bolts and studs, when removed	Volumetric and Surface	Yes - Note 10
B6.3	B-G-1	Pressure-retaining bolting	Visual	No
B6.4	B-K-1	Integrally-welded supports	Volumetric	No - Note 4
B6.5	B-K-2	Support components (except hydraulic snubbers)	Visual	No

Table
IWB-2600
Item
No.

Table
IWB-2500
Examination
Category

Components and Parts to be Examined

Examination
Method

Section
XI
Relief
Requested

B6.6

B-M-1

Valve body welds

Volumetric

No - Note 4

B6.7

B-M-2

Valve bodies

Visual

No

B6.8

B-P

Exempted components

Visual (IWA-5000)

No

B6.9

B-G-2

Pressure-retaining bolting

Visual

No

NOTES

1. There are limitations in access to weld SC-2 as shown on drawing E-NEU-661-005 caused by the reactor vessel supports. This interference prevents volumetric examination of 19% of the weld, but does not constitute a variance from Code, as only 5% of this weld requires examination during the inspection interval. Sketch SK-M-97 shows this situation.
2. Weld SC-1, shown on drawing E-NEU-661-005 is partially inaccessible because of reactor vessel supports, which preclude 39% of the weld from being examined. As in Note 1, above, this is in compliance with Code, as Table IWB-2500 requires that only 5% of the weld be examined. Sketches SK-M-97 and SK-M-228 show the Reactor Vessel Nozzle supports and adjacent areas.
3. The lower 50% of nozzles NS-2, NS-4, and NS-6 are inaccessible for volumetric examination of Category B-D Nozzle-to-shell welds. These are the three nozzles that contain the integral Reactor Vessel support pads. Although some redesign of this area was accomplished during construction to provide for better inspectability, we must still request a waiver on the Code requirements for 100% examination of all nozzles during the inspection interval. As an alternate to volumetric examination, these areas will be monitored for leaks and inspected visually for signs of structural distress, until an inspection method meeting Code requirements can be devised. Drawing E-NEU-661-005 and sketches SK-M-97 and SK-M-228 show the arrangements in the nozzle area. Nozzles NS-1, NS-3 and NS-5 are accessible and code examinations will be performed.
4. There are no items of this category at Millstone Unit 2.
5. The Reactor Vessel supports at Millstone Unit 2 are integral with three of the six nozzles and are excluded from this category by Table IWB-2500.

6. NNECO requests a waiver on performing Code cladding examinations based upon the following:
 - a) examinations of clad surfaces in the reactor vessel and reactor vessel head were attempted during the last refueling outage (December, 1977 to March, 1978) and were limited by access problems in the vessel and surface oxidation in the closure head.
 - b) the summer, 1976 addenda to Section XI deleted the requirements for these examinations.

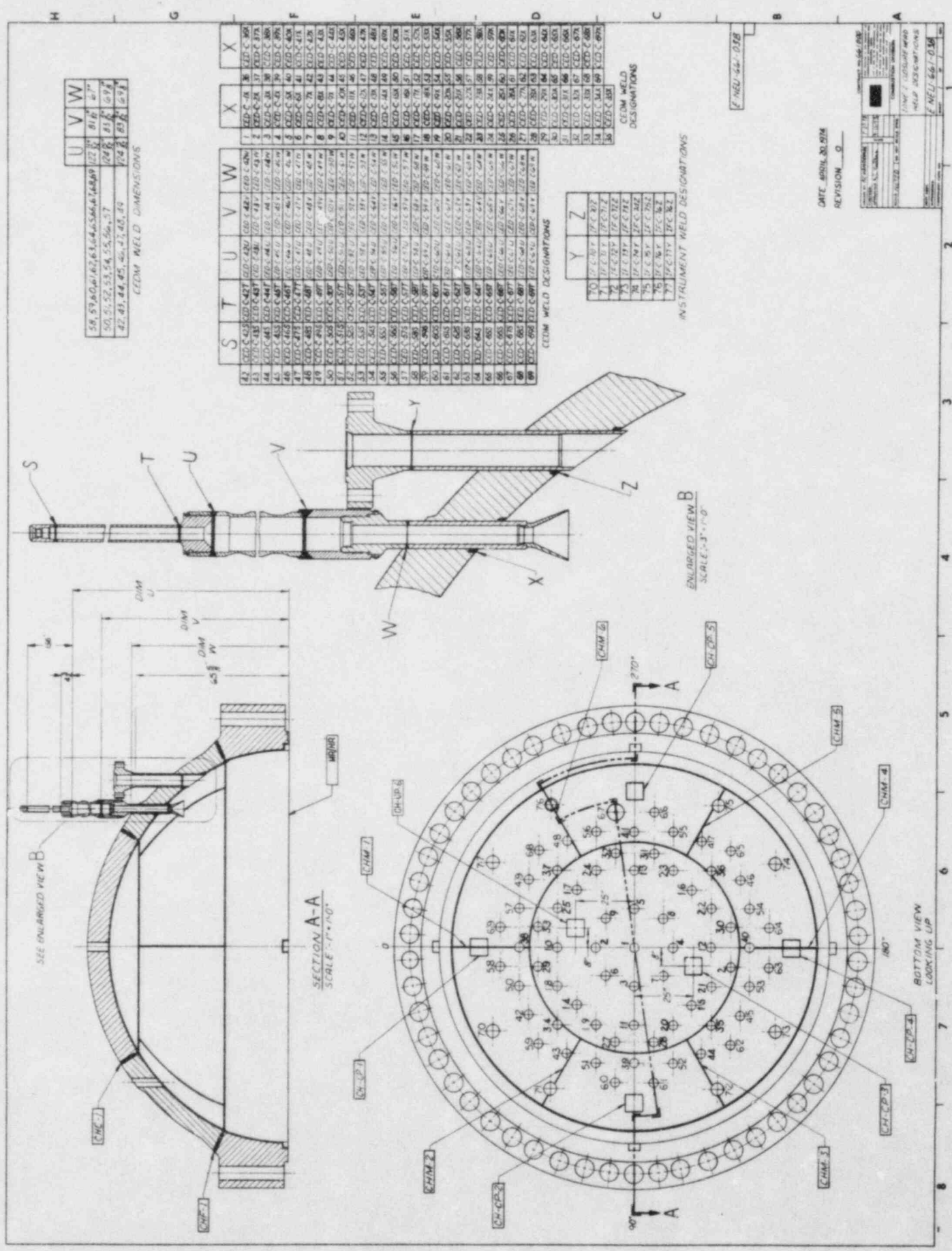
As an alternate, NNECO will perform visual examinations of cladding when the internal components are removed at the end of the interval to perform the Category B-N-3 inspections. Similar inspections will be made on steam generator and pressurizer cladding.

7. Since the pump casings are fabricated as cast stainless steel sections joined with austenitic welds, present volumetric techniques and procedures are not applicable to in-service applications. As a result, in-service examinations of the pumps, visual as well as volumetric, may be delayed until the tenth year as permitted by Code. Should a volumetric technique be available at that time, examinations shall be performed in accordance with the applicable item number. See drawing E-NEU-661-047.
8. Volumetric examinations of attachment welds is not possible because of the cast stainless steel pump casing, as described above in Note 7. A surface examination will be utilized as an alternate. See drawing E-NEU-661-047.
9. Each reactor coolant pump flywheel shall be inspected to the maximum extent practical as described below:

- a. An in-place ultrasonic volumetric examination of the areas of higher stress concentration at the bore and keyway at approximately 3-1/3 year intervals, during the refueling or maintenance shutdowns coinciding with the inservice inspection schedule as required by ASME Boiler and Pressure Vessel Code, Section XI.
- b. A complete ultrasonic examination of all exposed surfaces at approximately 10-year intervals, during the plant shutdown coinciding with the inservice inspection schedule required by the ASME Boiler and Pressure Vessel Code, Section XI. Removal of the flywheels is not required to perform these examinations.
- c. Examination procedure and acceptance criteria is in conformance with the requirements equivalent to those specified for Class I vessels in the ASME Boiler and Pressure Vessel Code, Section III - Nuclear Power Plant Components. All flywheels shall be inspected by the same volumetric examination methods used during the baseline examination.

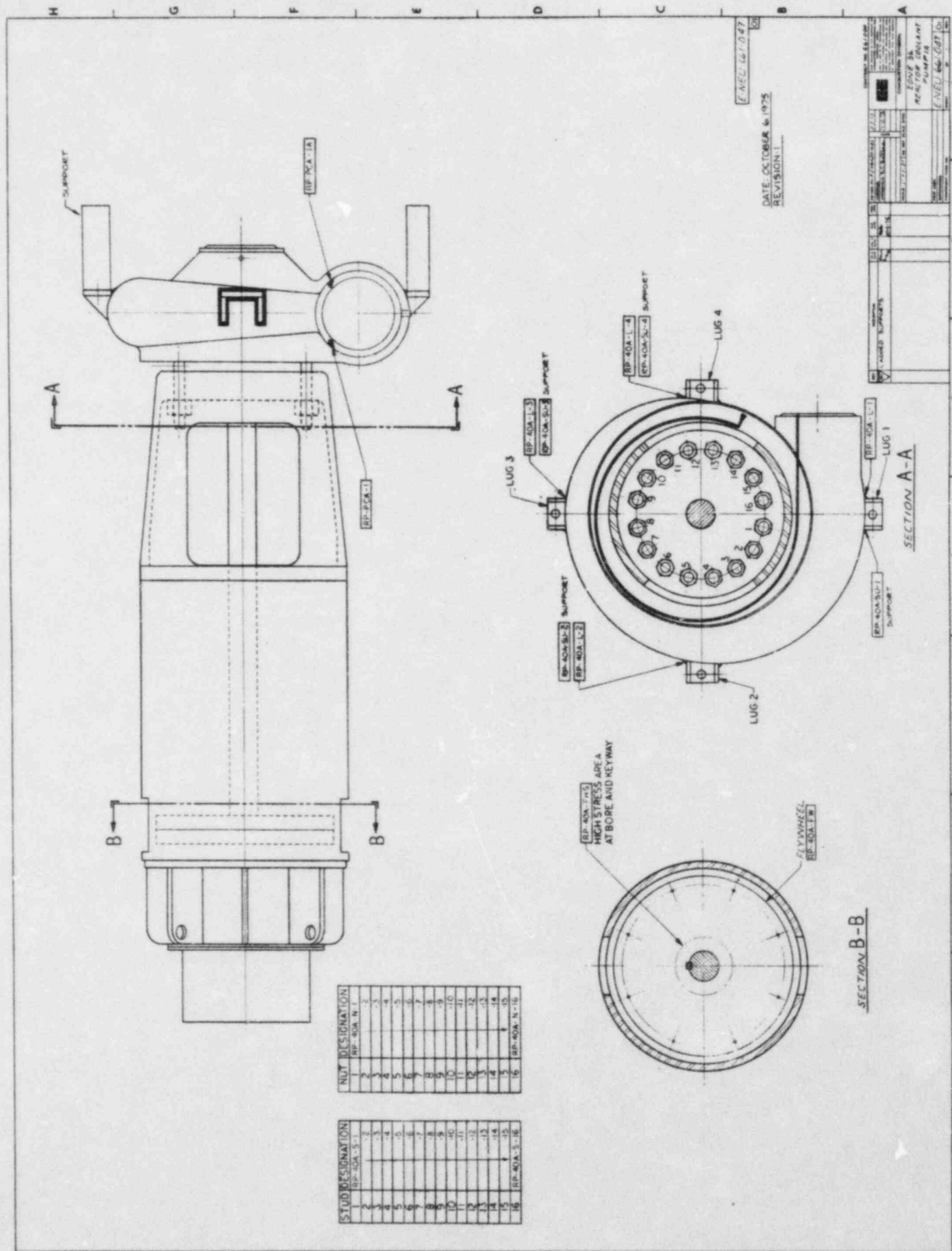
Limitations exist in the hub area where the closeness of the shaft support and seal prevents straight beam examinations of flywheel flat surfaces for 10" on top and 12" on the bottom radially out from the shaft. Examinations from the edge of the flywheel are possible and are currently being conducted.

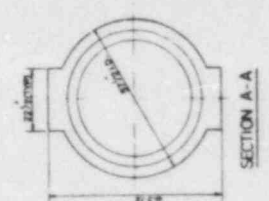
10. In that the 2" diameter bonnet bolting in the safety injection system valves has spherical ends and cannot be volumetrically examined, the examination requirements for category B-G-2 will be applied.



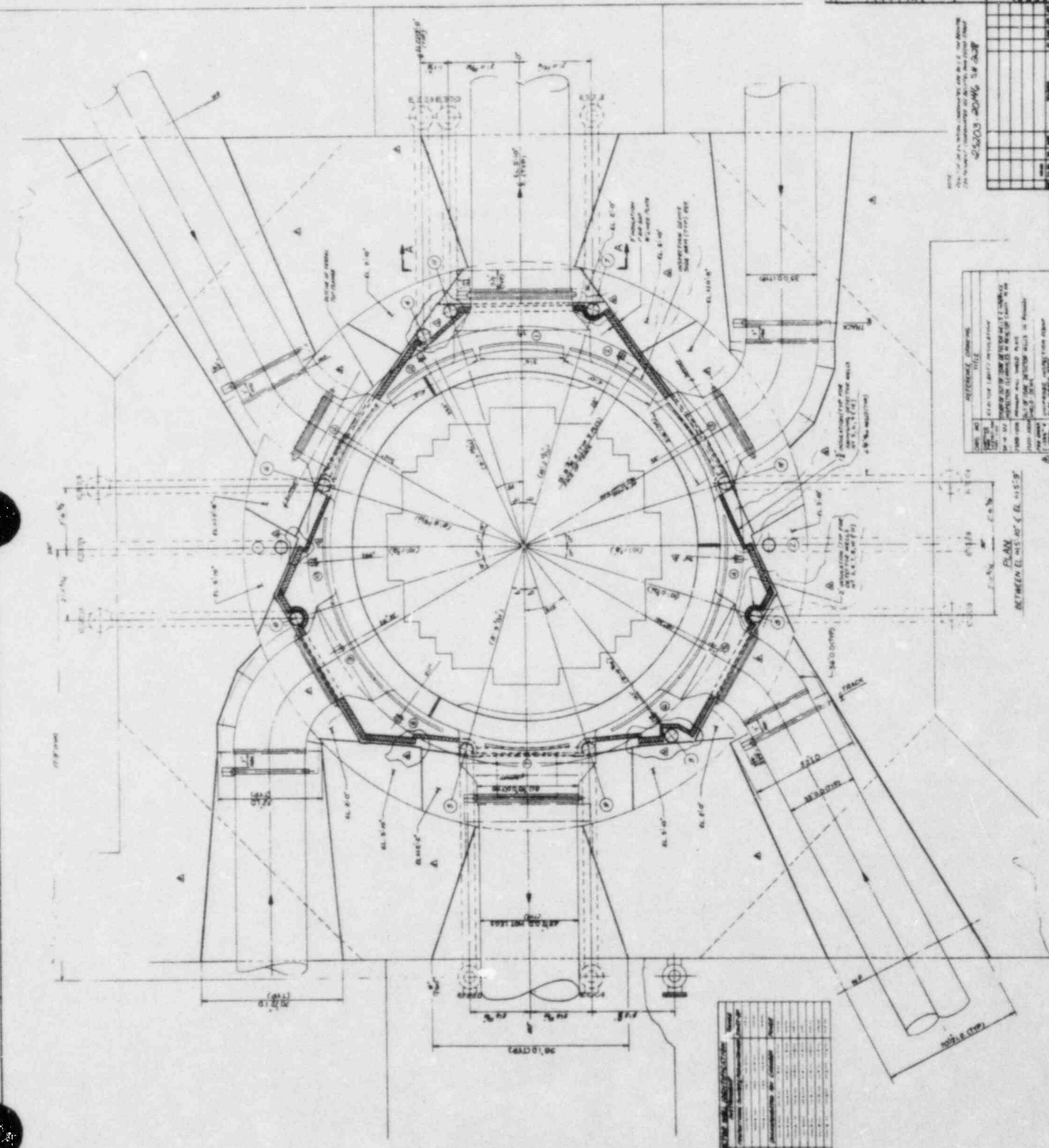
CEM WELD DIMENSIONS

U	V	W
58.57	60.61	62.63
59.51	61.55	63.57
60.45	62.49	64.51
61.39	63.43	65.45
62.33	64.37	66.39
63.27	65.31	67.33
64.21	66.25	68.27
65.15	67.19	69.21
66.09	68.13	70.15
67.03	69.07	71.09
67.97	69.99	72.03
68.91	70.93	72.97
69.85	71.87	73.91
70.79	72.81	74.85
71.73	73.75	75.79
72.67	74.69	76.73
73.61	75.63	77.67
74.55	76.57	78.61
75.49	77.51	79.55
76.43	78.45	80.49
77.37	79.39	81.43
78.31	80.33	82.37
79.25	81.27	83.31
80.19	82.21	84.25
81.13	83.15	85.19
82.07	84.09	86.13
83.01	85.03	87.07
83.95	85.97	88.01
84.89	86.91	88.95
85.83	87.85	89.89
86.77	88.79	90.83
87.71	89.73	91.77
88.65	90.67	92.71
89.59	91.61	93.65
90.53	92.55	94.59
91.47	93.49	95.53
92.41	94.43	96.47
93.35	95.37	97.41
94.29	96.31	98.35
95.23	97.25	99.29
96.17	98.19	100.23
97.11	99.13	101.17
98.05	100.07	102.11
98.99	101.01	103.05
99.93	101.95	103.99
100.87	102.89	104.93
101.81	103.83	105.87
102.75	104.77	106.81
103.69	105.71	107.75
104.63	106.65	108.69
105.57	107.59	109.63
106.51	108.53	110.57
107.45	109.47	111.51
108.39	110.41	112.45
109.33	111.35	113.39
110.27	112.29	114.33
111.21	113.23	115.27
112.15	114.17	116.21
113.09	115.11	117.15
114.03	116.05	118.09
114.97	116.99	119.03
115.91	117.93	120.00
116.85	118.87	120.97
117.79	119.81	121.94
118.73	120.75	122.91
119.67	121.69	123.88
120.61	122.63	124.85
121.55	123.57	125.82
122.49	124.51	126.79
123.43	125.45	127.76
124.37	126.39	128.73
125.31	127.33	129.70
126.25	128.27	130.67
127.19	129.21	131.64
128.13	130.15	132.61
129.07	131.09	133.58
130.01	132.03	134.55
130.95	132.97	135.52
131.89	133.91	136.49
132.83	134.85	137.46
133.77	135.79	138.43
134.71	136.73	139.40
135.65	137.67	140.37
136.59	138.61	141.34
137.53	139.55	142.31
138.47	140.49	143.28
139.41	141.43	144.25
140.35	142.37	145.22
141.29	143.31	146.19
142.23	144.25	147.16
143.17	145.19	148.13
144.11	146.13	149.10
145.05	147.07	150.07
145.99	148.01	151.04
146.93	148.95	152.01
147.87	149.89	152.98
148.81	150.83	153.95
149.75	151.77	154.92
150.69	152.71	155.89
151.63	153.65	156.86
152.57	154.59	157.83
153.51	155.53	158.80
154.45	156.47	159.77
155.39	157.41	160.74
156.33	158.35	161.71
157.27	159.29	162.68
158.21	160.23	163.65
159.15	161.17	164.62
160.09	162.11	165.59
161.03	163.05	166.56
161.97	163.99	167.53
162.91	164.93	168.50
163.85	165.87	169.47
164.79	166.81	170.44
165.73	167.75	171.41
166.67	168.69	172.38
167.61	169.63	173.35
168.55	170.57	174.32
169.49	171.51	175.29
170.43	172.45	176.26
171.37	173.39	177.23
172.31	174.33	178.20
173.25	175.27	179.17
174.19	176.21	180.14
175.13	177.15	181.11
176.07	178.09	182.08
177.01	179.03	183.05
177.95	180.00	184.02
178.89	180.94	185.00
179.83	181.88	185.97
180.77	182.82	186.94
181.71	183.76	187.91
182.65	184.70	188.88
183.59	185.64	189.85
184.53	186.58	190.82
185.47	187.52	191.79
186.41	188.46	192.76
187.35	189.40	193.73
188.29	190.34	194.70
189.23	191.28	195.67
190.17	192.22	196.64
191.11	193.16	197.61
192.05	194.10	198.58
192.99	195.04	199.55
193.93	195.98	200.52
194.87	196.92	201.49
195.81	197.86	202.46
196.75	198.80	203.43
197.69	199.74	204.40
198.63	200.68	205.37
199.57	201.62	206.34
200.51	202.56	207.31
201.45	203.50	208.28
202.39	204.44	209.25
203.33	205.38	210.22
204.27	206.32	211.19
205.21	207.26	212.16
206.15	208.20	213.13
207.09	209.14	214.10
208.03	210.08	215.07
208.97	211.02	216.04
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210.85	212.90	217.98
211.79	213.84	218.95
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216.49	218.54	223.80
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218.37	220.42	225.74
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220.25	222.30	227.68
221.19	223.24	228.65
222.13	224.18	229.62
223.07	225.12	230.59
224.01	226.06	231.56
224.95	227.00	232.53
225.89	227.94	233.50
226.83	228.88	234.47
227.77	229.82	235.44
228.71	230.76	236.41
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231.53	233.58	239.32
232.47	234.52	240.29
233.41	235.46	241.26
234.35	236.40	242.23
235.29	237.34	243.20
236.23	238.28	244.17
237.17	239.22	245.14
238.11	240.16	246.11
239.05	241.10	247.08
240.00	242.04	248.05
240.94	242.98	249.02
241.88	243.92	250.00
242.82	244.86	250.97
243.76	245.80	251.94
244.70	246.74	252.91
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246.58	248.62	254.85
247.52	249.56	255.82
248.46	250.50	256.79
249.40	251.44	257.76
250.34	252.38	258.73
251.28	253.32	259.70
252.22	254.26	260.67
253.16	255.20	261.64
254.10	256.14	262.61
255.04	257.08	263.58
255.98	258.02	264.55
256.92	258.96	265.52
257.86	259.90	266.49
258.80	260.84	267.46
259.74	261.78	268.43
260.68	262.72	269.40
261.62	263.66	270.37
262.56	264.60	271.34
263.50	265.54	272.31
264.44	266.48	273.28
265.38	267.42	274.25
266.32	268.36	275.22
267.26	269.30	276.19
268.20	270.24	277.16
269.14	271.18	278.13
270.08	272.12	279.10
271.02	273.06	280.07
271.96	274.00	281.04
272.90	274.94	282.01
273.84	275.88	282.98
274.78	276.82	283.95
275.72	277.76	284.92
276.66	278.70	285.89
277.60	279.64	286.86
278.54	280.58	287.83
279.48	281.52	288.80
280.42	282.46	289.77
281.36	283.40	290.74
282.30	284.34	291.71
283.24	285.28	292.68
284.18	286.22	293.65
285.12	287.16	294.62
286.06	288.10	295.59
287.00	289.04	296.56
287.94	290.00	297.53
288.88	290.94	298.50
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302.04	304.10	312.08
302.98	305.04	313.05
303.92	305.98	314.02
304.86	306.92	314.99
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313.32	315.38	323.72
314.26	316.32	324.69



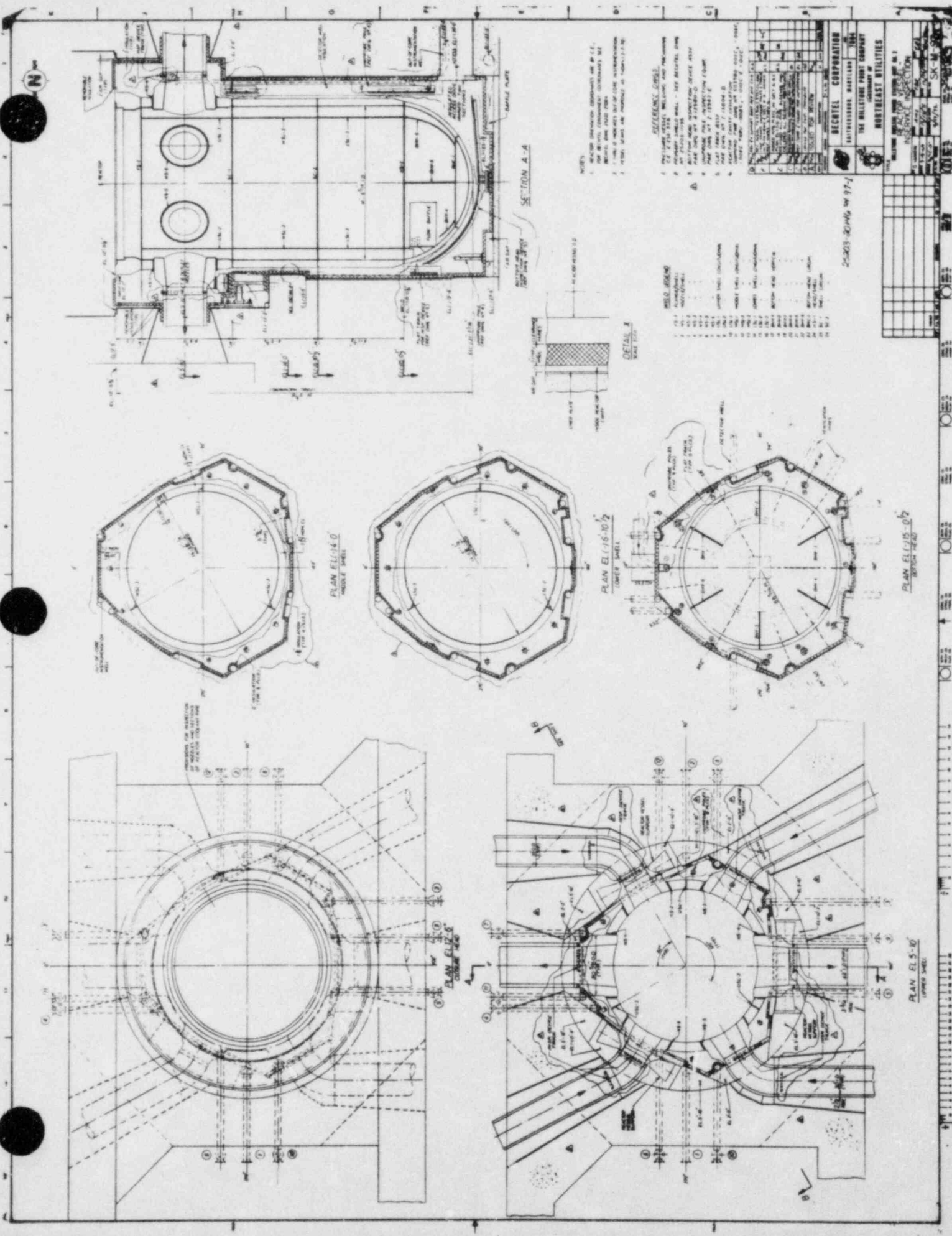


RECEIVED	
THE BELLINGHURST COMPANY	
BELLINGHURST BUILDINGS	
1000 10th Avenue, Seattle, Wash. 4	
DATE: 10/1/34	
BY: J. H. BELLINGHURST	
CHECKED: J. H. BELLINGHURST	
APPROVED: J. H. BELLINGHURST	
PROJECT: 25003 200' 1/2\"/>	



NO.	DESCRIPTION	DATE
1	REVISION	10/1/34
2	REVISION	10/1/34
3	REVISION	10/1/34
4	REVISION	10/1/34
5	REVISION	10/1/34
6	REVISION	10/1/34
7	REVISION	10/1/34
8	REVISION	10/1/34
9	REVISION	10/1/34
10	REVISION	10/1/34

REVISION	
NO.	DESCRIPTION
1	REVISION
2	REVISION
3	REVISION
4	REVISION
5	REVISION
6	REVISION
7	REVISION
8	REVISION
9	REVISION
10	REVISION



MILLSTONE UNIT NO. 2

INSERVICE INSPECTION PROGRAM

CLASS 2 COMPONENTS

The attached table provides a listing of Class 2 pressure-retaining components (and their supports) which are subject to the inspection requirements of Sub-section IWC of Section XI of the ASME Boiler and Pressure Vessel Code, 1974 Edition, and Addenda through Summer 1975.

These tabulations identify the components to be inspected, the components safety class, the applicable code to which the component was built, and the method of examination. Relief from the inspection requirements of each Sub-section is requested in cases where these inspection requirements have been determined to be impractical. Where relief is requested, specific information is provided which identifies the applicable code requirement, justification for the relief request, and the inspection method to be used as an alternative.

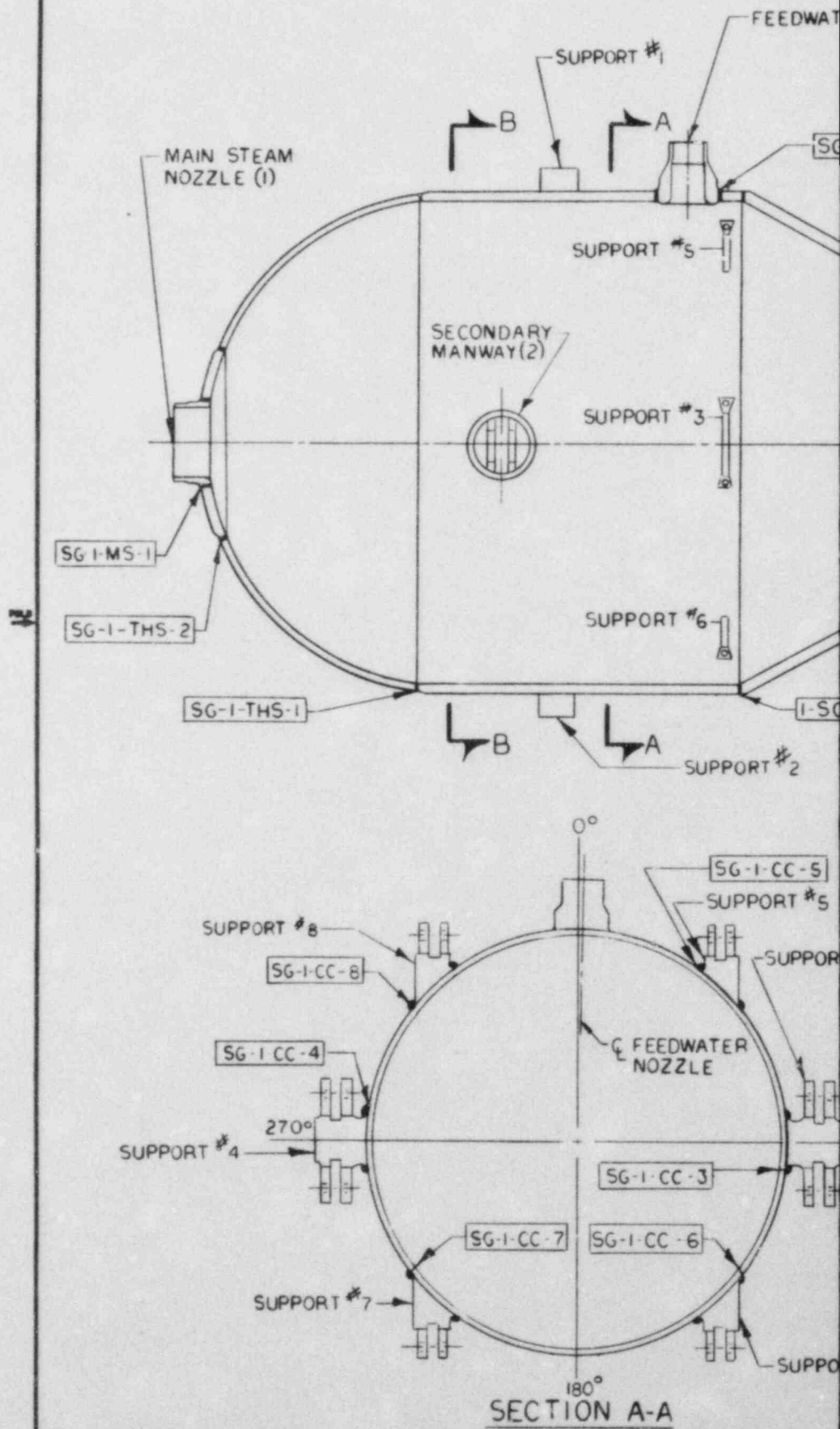
The rules of IWA-4000 will be adhered to for repairs to all Class 2 components.

The inservice inspection and testing programs outlined in the attached tabulation have been developed as a result of a design review. Should certain ASME Section XI Code requirements be discovered to be impractical due to unforeseen reasons during the process of performing inspections or tests, relief will be requested from the specific Section XI Code requirement at that time.

Radiation levels in certain areas or of certain components may be found to prohibit the access for operators or inspectors to perform the inspections or tests described in this program. If source strengths cannot be reduced and access is still restricted by considerations of compliance with the requirements of Regulatory Guides 8.8 and 8.10, relief will be requested from the specific Section XI Code requirements and alternative examination or test requirements be proposed.

Ultrasonic examinations are required to be conducted in accordance with the provisions of Appendix I and Article 5 of Section V as required by Paragraph IWA-2232. As an alternative to using Article 5 of Section V, NNECO proposes to use Appendix III of Section XI of the 1974 Edition, Winter, 1975, Addenda of the ASME Boiler and Pressure Vessel Code for ultrasonic examination of piping systems. It is recognized that Appendix III of Section XI was issued in the Winter, 1975, Addenda and, as such, has not been officially recognized by the NRC by reference in 10 CFR 50. However, Appendix III is the first guideline that has been published in the ASME Codes for the ultrasonic examination of pipe welds and, as such, its use is essential.

Examinations of hydraulic snubbers will be conducted in accordance with Technical Specifications, Section 4.7.8.1 so is excluded from Category C-E-2 in the accompanying table.



-1-FW-1

2" DRAIN

1-SC-2

2" DRAIN

1- BHSC-2

ELEVATION

05

- SUPPORT #1

SECONDARY MANWAYS

SG-1-CC-1


90°

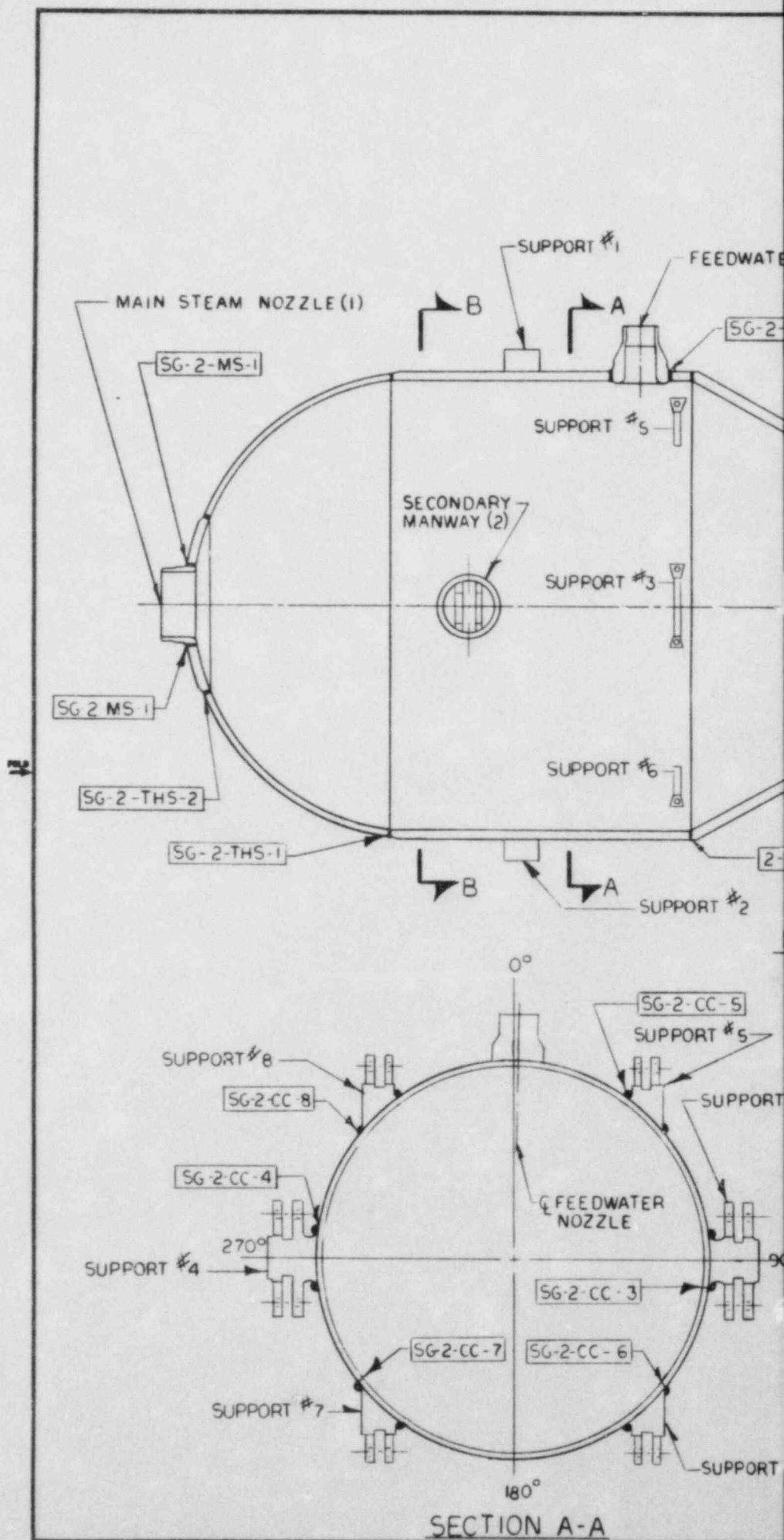
SG-1-CC-2

 180°

SUPPORT #2

SECTION B-B

										 NORTHEAST UTILITIES SERVICE CO. MILLSTONE UNIT 2									
										STEAM GENERATOR No 1 INSERVICE INSPECTION PROGRAM									
										BY TJB DATE 12/1/75 APP. [Signature] APP. [Signature] DATE 12/1/75 DATE 12/16/75 DATE [Blank] SCALE NONE MICROFILM DATE NONE									
P. A. # [Blank] NO DATE [Blank] REVISIONS [Blank] BY [Blank] CHK APP APP										P. A. # 602 25203-20163									
SERV. CH. MECH. CH. ELEC. CH. CONC. CH. STRUC. CH. HYDRIL. CH.										SERV. CH. MECH. CH. ELEC. CH. CONC. CH. STRUC. CH. HYDRIL. CH.									



SERV. CK.
 MECH. CK.

ELEC. CK.
 CONC. CK.

STRUC. CK.
 HYDRL. CK.

SERV. CK.
 MECH. CK.

ELEC. CK.
 CONC. CK.

STRUC. CK.
 HYDRL. CK.

FW-1

2" DRAIN -

2-SC-2

2" DRAIN

2-BHSC-2

ELEVATION

0°

SUPPORT #1

SECONDARY
MANWAYS

SG-2-CC-1

SG-2-CC-2

SUPPORT #2

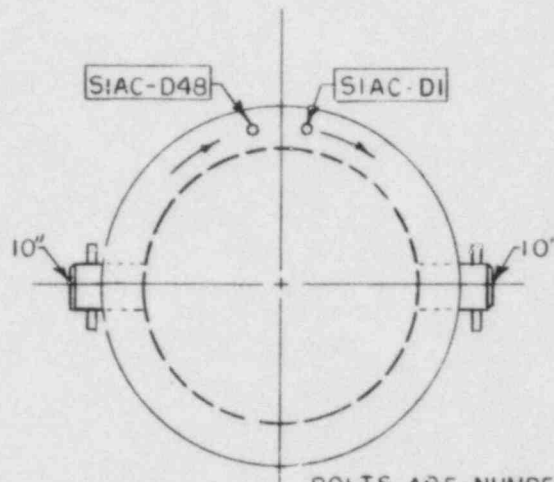
SECTION B-B

[illegible]

NORTHEAST UTILITIES SERVICE CO.
FOR **MILLSTONE UNIT 2**

TITLE
STEAM GENERATOR No 2
INSERVICE INSPECTION PROGRAM

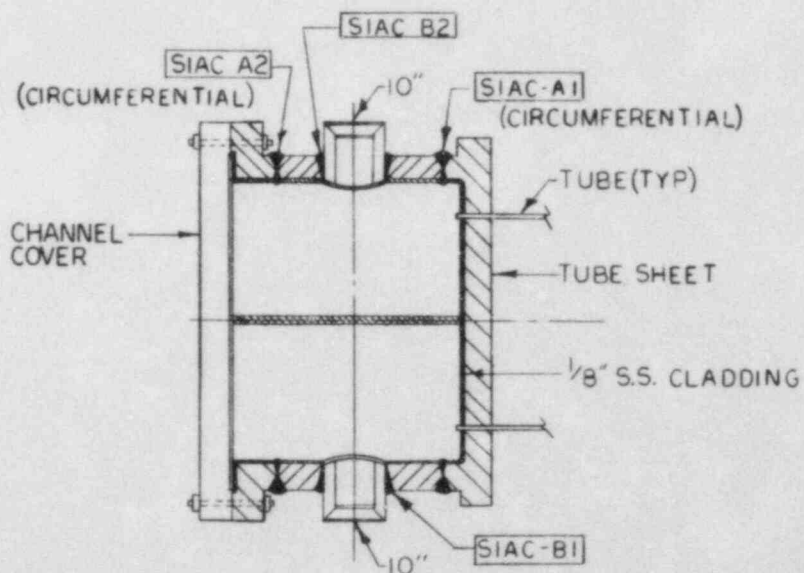
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DATE	DATE 12/2/76	DATE 12-2-76	DATE
BUDGET NONE	IMAGE FILM DATE	OWN. NO.	
P.A. 76 60		25203 - 20164	



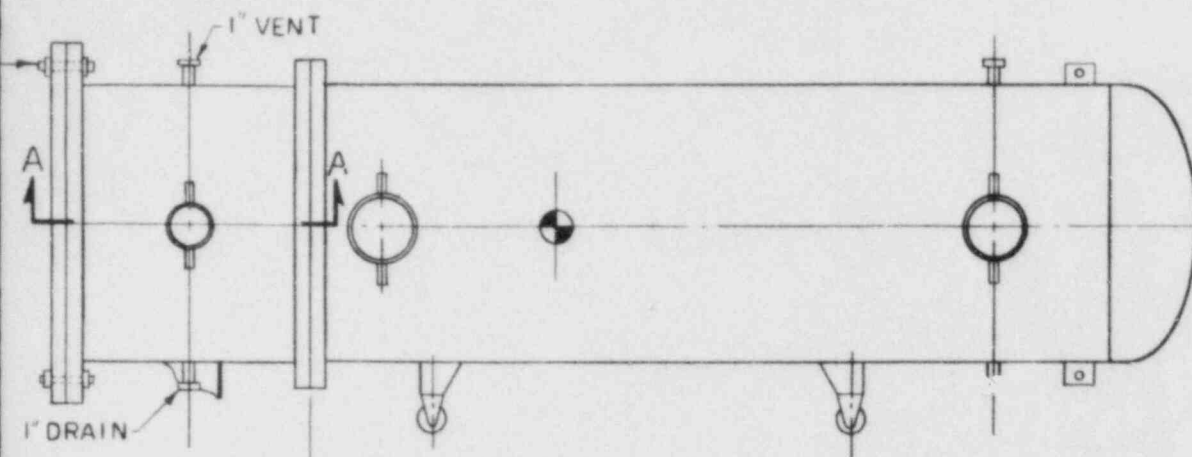
1-1/2" BOLTS
(TYP)

BOLTS ARE NUMBERED
CLOCKWISE, SIAC-D1
THRU SIAC-D48

CHANNEL COVER BOLTING



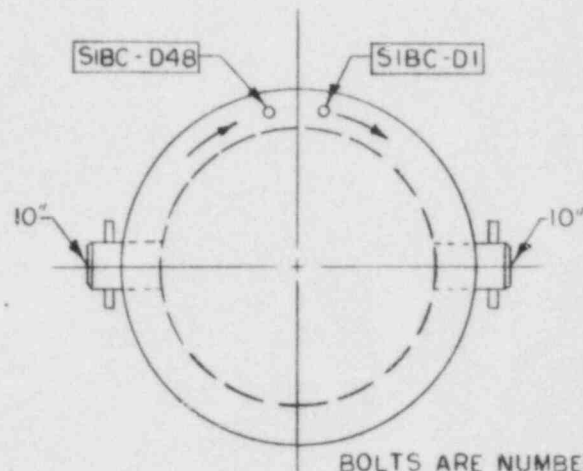
VIEW A-A



CLASS 2 CLASS 3

ELEVATION

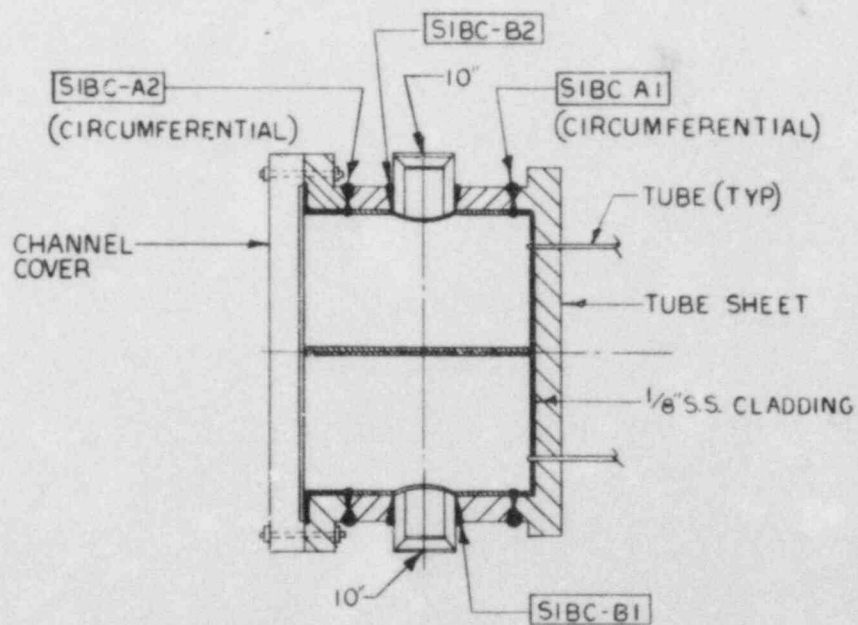
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				FOR MILLSTONE UNIT 2			
				TITLE			
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				INSERVICE INSPECTION PROGRAM			
BY TJB		CHKD [Signature]		APP [Signature]		APP	
DATE		DATE 12-26-85		DATE		DATE	
SCALE NONE		DWG NO.		25203-20165			
P.A.F. NO. DATE		REVISIONS		BY CHK APP APP		P.A.F. 76-903	



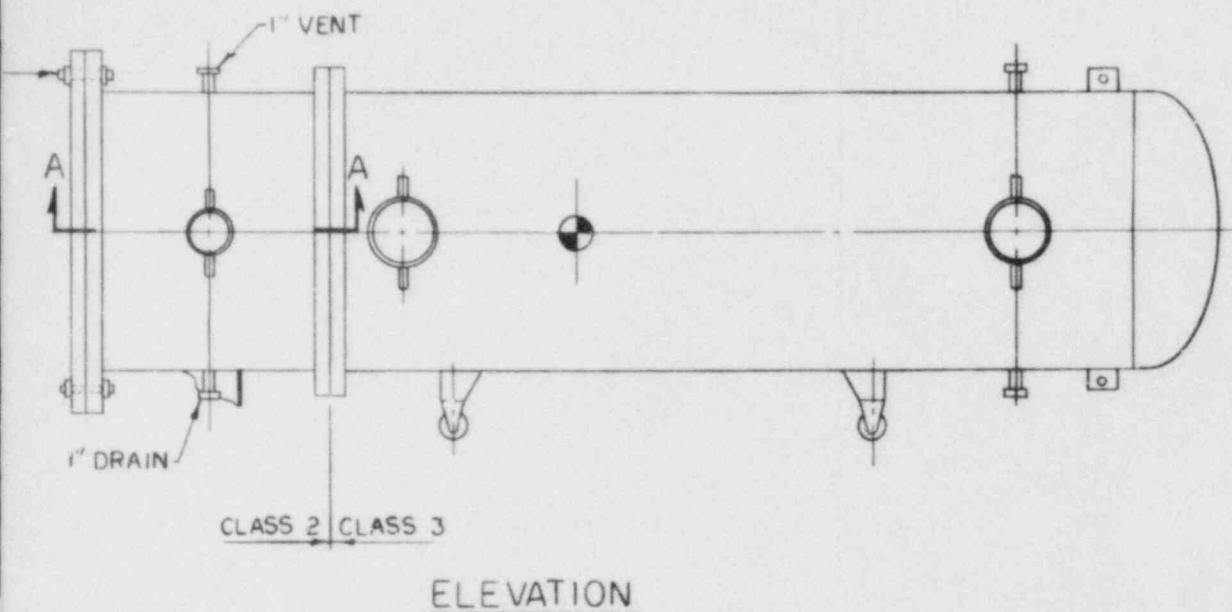
1-1/2" BOLTS
(TYP)

BOLTS ARE NUMBERED
CLOCKWISE, SIBC-D1
THRU SIBC-D48

CHANNEL COVER BOLTING



VIEW A-A



										NORTHEAST UTILITIES SERVICE CO. FOR MILLSTONE UNIT 2									
										TITLE SHUTDN HT EXCH X-23B INSERVICE INSPECTION PROGRAM									
										BY TJB CHD 12/1/87 APP 12/1/87 APP DATE 12/1/87 DATE 12 Mo. 5 DATE									
										SCALE NONE INCHES 25203-20166									
REV	DATE	NO.	DATE	REVISIONS	BY	CHK	APP	APP	DATE	25203-20166									

MILLSTONE UNIT NO. 2
INSERVICE INSPECTION PROGRAM--CLASS 2 COMPONENTS
ASME SECTION XI--SUBSECTION IWC "S 75" ADDENDA

Item No.	Examination Category	Components and Parts To Be Examined	Construction Code	Area To Be Examined	Method Of Examination	Section XI Code Relief Requested
C1.1	C-A	Steam Generators	ASME III. Class A S 69 Addenda	Shell and Head Welds, Tubesheet to Shell Welds	Volumetric	No - Note 1
C1.2	C-B			Nozzle to Vessel Welds	Volumetric	No
C1.3	C-C			Integrally Welded Supports	Surface	No
C1.4	C-D			Bolting--Exceeding 1" in Dia.	Visual and Either surface or Volumetric	No
C1.1	C-A	Shutdown Heat Exchangers	ASME III Class C S 69 Addenda including VW-2(a) of ASME VIII	Shell and Head Welds, Tubesheet to Shell Welds	Volumetric	No
C1.2	C-B			Nozzle to Vessel Welds	Surface	Yes--Note 2
C1.3	C-C			Integrally Welded Supports	Surface	Not Applicable Note 3
C1.4	C-D			Bolting--Exceeding 1" in Dia.	Visual and Either Surface or Volumetric	No
C2.1	C-G	Main Steam Piping	B31.7 C1.2	Piping Welds	Volumetric	No
C2.3	C-G			Pipe Branch Connections	Volumetric	No

MILLSTONE UNIT NO. 2
INSERVICE INSPECTION PROGRAM--CLASS 2 COMPONENTS
ASME SECTION XI--SUBSECTION IWC "S 75" ADDENDA

Item No.	Examination Category	Components and Parts To Be Examined	Construction Code	Area To Be Examined	Method Of Examination	Section XI Code Relief Requested
C2.4	C-D	Main Steam Piping (cont'd)		Bolting > 1"	Visual and either surface or volumetric	No
C2.5	C-E-1			Integrally Welded Supports	Surface	No
C2.6	C-E-2			Support Components, except hydraulic snubbers	Visual	No
C2.1	C-G			Piping Welds	Volumetric	No
C2.3	C-G	Feedwater Piping	B31.7 Cl.2	Pipe Branch Connections	Volumetric	No
C2.4	C-D			Bolting > 1"	Visual and either surface or volumetric	Not Applicable Note 3
C2.5	C-E-1			Integrally Welded Supports	Surface	No
C2.6	C-E-2			Support Components, except hydraulic snubbers	Visual	No
C2.1	C-F	Safety Injection System	B31.7 Cl.2	Piping Welds	Volumetric	No
C2.3	C-F			Pipe Branch Connections	Volumetric	No
C2.4	C-D			Bolting > 1"	Visual and either surface or volumetric	No

MILLSTONE UNIT NO. 2
INSERVICE INSPECTION PROGRAM--CLASS 2 COMPONENTS
ASME SECTION XI--SUBSECTION IWC "S 75" ADDENDA

Item No.	Examination Category	Components and Parts To Be Examined	Construction Code	Area To Be Examined	Method Of Examination	Section XI Code Relief Requested
C2.5	C-E-1	Safety Injection System (cont'd)	ASME Draft Code For Pumps and Valves 1968—Class II	Integrally W-lded Supports	Surface	No
C2.6	C-E-2	Low Pressure Safety Injection Pumps		Support Components, except hydraulic snubbers	Visual	No
C3.1	C-F			Pump Casing Welds	Volumetric	Not Applicable Note 3
C3.2	C-D			Pressure Retaining Bolting > 1"	Visual and either surface or volumetric	No
C3.3	C-E-1	High Pressure Safety Injection Pumps	ASME Draft Code For Pumps and Valves 1968—Class II	Integrally Welded Supports	Surface	Not Applicable Note 3
C3.4	C-E-2			Support Components	Visual	No
C3.1	C-F			Pump Casing Welds	Volumetric	Not Applicable Note 3
C3.2	C-D			Pressure Retaining Bolting > 1"	Visual and either surface or volumetric	No
C3.3	C-E-1			Integrally Welded Supports	Surface	Not Applicable Note 3
C3.4	C-E-2			Support Components	Visual	No

MILLSTONE UNIT NO. 2
 INSERVICE INSPECTION PROGRAM--CLASS 2 COMPONENTS
 ASME SECTION XI--SUBSECTION IWC "S 75" ADDENDA

Item No.	Examination Category	Components and Parts To Be Examined	Construction Code	Area To Be Examined	Method Of Examination	Section XI Code Relief Requested
C3.1	C-F	Containment Spray Pump	ASME Draft Code For Pumps and Valves 1968--Class II	Pump Casing Welds	Volumetric	Not Applicable Note 3
C3.2	C-D			Pressure Retaining Bolting > 1"	Visual and either surface or volumetric	Not Applicable Note 3
C3.3	C-E-1			Integrally Welded Supports	Surface	Not Applicable Note 3
C3.4	C-E-2			Support Components	Visual	No
C4.1	C-F	Valves	Various	Valve Body Welds	Volumetric	Not Applicable Note 3
C4.2	C-D			Bolting > 1"	Visual and either surface or volumetric	No
C4.3	C-E-1			Integrally Welded Supports	Surface	Not Applicable Note 3
C4.4	C-E-2			Support Components	Surface	Not Applicable Note 3

NOTES

1. Three of the five Category C-A Steam Generator shell welds are presently included in the existing inservice inspection program. See Tech Specs. Table 4.4-4.
2. Category C-B nozzle to vessel welds in the shutdown heat exchangers were originally inspected using liquid penetrant (surface examination). The weld design precludes volumetric examination, as is required by Section XI. Inservice examinations will be conducted using surface methods. See drawings 25203-20165 and 25203-20166.
3. There are no items of this category.

OPERATIONAL READINESS TESTING FOR PUMPS

There are twenty-five pumps at Millstone Unit 2 which qualify for operational readiness testing under Subsection IWP of Section XI. Since all of these pumps are either under continuous service or periodically surveillance tested under the plant Technical Specifications, or other existing programs, the additional data taking, formal evaluation of data and administration of records and reports required by code will be implemented on April 26, 1979, at the start of the next (second) inspection period.

Table IWP lists the pumps falling under the program, test attributes and frequency of testing.

The provisions of Subsection IWP will be adhered to insofar as installed instrumentation allows at a test frequency compatible with Subsection IWP and safe operating criteria.

IWA-2120 (c) requires that the Authorized Nuclear Inspector assure himself that inservice tests of pumps and valves have been completed and the results recorded. NNECO interprets this section of the code to mean that the ANI may elect to witness any or all operational readiness tests and the preparations thereof. In that operating tests may be conducted at any hour, seven days a week, and that the ANI has no training or experience in plant operations, we request a waiver from IWA-2120 (c). As an alternate, NNECO and NUSCO Quality Assurance will witness, audit or otherwise verify that these tests are being properly conducted and documented.

To meet the vibration monitoring requirements of ASME Section XI, Subsection IWP, exception is taken to the specific vibration requirements of IWP and an alternate, more effective vibration signature analysis program as described herein, is proposed. During the inservice pump test, vibration data shall be acquired in the form of a "vibration signature" rather than a simple reading of overall vibration amplitude. The vibration signature shall consist of a plot of vibration velocity in units of inches per second, versus frequency in cycles per second, normally using a frequency range of 0 to 500 cycles per second. The vibration signature analysis approach provides a more reliable means of detecting a deterioration of pump mechanical condition, a means of diagnosing the cause of a problem and a more accurate assessment of vibration severity. The periodically acquired vibration signatures shall be compared to a baseline reference signature and analyzed for changes in amplitude peaks exceeding a threshold value. Criteria for evaluation of changes as to cause, severity and the establishment of the Alert and Required Action Ranges shall be specified in the NNECO procedures.

Vibration measurements are made typically with an accelerometer mounted at a reference location on an equipment bearing housing and the output processed by a spectrum analyzer to produce a hard copy vibration signature.

The measurement locations to be used for monthly and baseline vibration signature data shall be established and specified by NNECO procedures.

TABLE IWP

PUMP	FLOW RESISTANCE	SPEED CONTROL	INLET PRESSURE	DIFFERENTIAL PRESSURE	FLOW	VIBRATION	LUBRICATION	BEARING TEMPERATURE	FREQUENCY
Service Water A	Variable	Fixed	Sea Level	X	X	X	X	Note 2	Monthly
Service Water B	Variable	Fixed	Sea Level	X	X	X	X	Note 2	Monthly
Service Water C	Variable	Fixed	Sea Level	X	X	X	X	Note 2	Monthly
Aux. Feedwater A	Fixed	Fixed	X	X		X	X	Note 2	Monthly
Aux. Feedwater B	Fixed	Fixed	X	X		X	X	Note 2	Monthly
Turbine Driven Aux. Feedwater	Fixed	Variable	X	X		X	X	Note 2	Monthly
RBCCW A	Variable	Fixed	X	X	X	X	X	Note 2	Monthly
RBCCW B	Variable	Fixed	X	X	X	X	X	Note 2	Monthly
RBCCW C	Variable	Fixed	X	X	X	X	X	Note 2	Monthly
H.P. Safety Injection A	Fixed	Fixed	X	X		X	X	Note 2	Monthly
H.P. Safety Injection B	Fixed	Fixed	X	X		X	X	Note 2	Monthly
H.B. Safety Injection C	Fixed	Fixed	X	X		X	X	Note 2	Monthly
L.P. Safety Injection A	Fixed	Fixed	X	X		X	X	Note 2	Monthly
L.P. Safety Injection B	Fixed	Fixed	X	X		X	X	Note 2	Monthly
Containment Spray A	Fixed	Fixed	X	X		X	X	Note 2	Monthly
Containment Spray B	Fixed	Fixed	X	X		X	X	Note 2	Monthly
Charging A	Fixed	Fixed	Note 1		X	X	X	Note 2	Monthly
Charging B	Fixed	Fixed	Note 1		X	X	X	Note 2	Monthly
Charging C	Fixed	Fixed	Note 1		X	X	X	Note 2	Monthly
Spent Fuel A	Fixed	Fixed	X		X	X	X	Note 2	Monthly
Spent Fuel B	Fixed	Fixed	X		X	X	X	Note 2	Monthly
Chilled Water A	Fixed	Fixed	X		X	X	X	Note 2	Monthly
Chilled Water B	Fixed	Fixed	X		X	X	X	Note 2	Monthly
Boric Acid A	Fixed	Fixed	X	X		X	X	Note 2	Monthly
Boric Acid B	Fixed	Fixed	X	X		X	X	Note 2	Monthly

X = parameters to be measured or
observed per Code

NOTES

TABLE IWP

1. Charging pumps are positive displacement pumps and will be tested during normal charging to the Reactor Coolant System. Under these conditions, flow measurement is indicative of pump performance.
2. Bearing Temperatures - None of the tabulated pumps have installed temperature sensors. The auxiliary feedwater, and HPSI pumps have bearing housings cooled by water which would prevent meaningful measurements on the housing. Boric acid, spent fuel pool cooling and containment spray have a single pump bearing in a large oil filled housing. The mass of the housing and its direct contact with the pumped liquid prevents meaningful measurements on this housing. The LPSI and chilled water pumps have shaft bearings in the motor housing. Construction of this housing and the influence of motor heat prevents meaningful temperature measurements on these bearings. The charging pump bearings are deeply recessed into the casing making valid temperature measurement unreliable.

As an alternate to recording bearing temperatures, NNECO has elected to perform the vibration "signature" analysis described on page P-1 which should provide more meaningful data on the pump's mechanical characteristics than the Code referenced vibration and bearing temperature data.

OPERATIONAL READINESS TESTING FOR VALVES

There are approximately 250 valves at Millstone Unit 2 which qualify for operational readiness testing under Subsection IWV of Section XI, "S75" addenda. Some of these valves are presently being operated under surveillance testing required by the plant Technical Specifications, or in conjunction with pump surveillance, or during normal pump rotations. In addition, containment isolation valves are periodically leak-rate tested under the 10CFR50 Appendix J program.

Table IWV-1, submitted herewith, identifies the valves to be tested, valve code classes, Section XI category as defined by IWV-2000, and test frequencies. Where exceptions to the Code are necessary due to design or operating considerations, they are so noted.

The system boundary diagrams, included in this submittal, may be consulted to note the location of the valves.

As with operational readiness testing of pumps, NNECO takes exception to IWA-2120(c) regarding the Authorized Nuclear Inspector's surveillance of operating tests.

Valves with fail-safe actuators will be tested by observing the operation of these valves upon loss or simulated loss of actuator power.

LEGEND FOR VALVE TESTING

- Q - Exercise valve (full stroke) for operability every (3) months.
- LT - Valves are leak tested per Section XI Article IWV-3420.
- MT - Stroke time measurements are taken and compared to the stroke time limiting value per Section XI Article IWV-3410.
- CV - Exercise check valves to the position required to fulfill their function every (3) months.
- SRV - Safety and relief valves are tested per Section XI Article IWV-3510.
- ET - Verify and record valve position before operations are performed and after operations are completed, and verify that valve is locked or sealed.
- CS - Exercise valve for operability every cold shutdown.
- RR - Exercise valve for operability every reactor refueling.

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 3	SAFETY INJECTION SYSTEM													
2-SI-007	2	E5			x			.75	REL			SRV				
2-SI-008	2	E6			x			6	CK		C	CV				
2-SI-009	2	C9			x			2	CK		C	CV				
2-SI-010	2	E9			x			2	CK		C	CV				
2-SI-011	2	G9			x			2	CK		C	CV				
2-SI-012	2	J9			x			2	CK		C	CV				
2-SI-113	2	H9			x			2	CK		C	CV				
2-SI-114	2	H9			x			6	CK		C	CV	x	CS		
2-SI-123	2	G9			x			2	CK		C	CV				
2-SI-124	2	F9			x			6	CK		C	CV	x	CS		
2-SI-133	2	D9			x			2	CK		C	CV				
2-SI-134	2	D9			x			6	CK		C	CV	x	CS		
2-SI-143	2	B9			x			2	CK		C	CV				
2-SI-144	2	B9			x			6	CK		C	CV	x	CS		
2-SI-211	2	G11			x			1	REL			SRV				
2-SI-215	1	H11	x		x			12	CK		C	CV,LT				
2-SI-217	1	H12	x		x			12	CK		C	CV,LT	x	CS		
2-SI-221	2	K11			x			1	REL			SRV				
2-SI-225	1	F11	x		x			12	CK		C	CV,LT				
2-SI-227	1	F12	x		x			12	CK		C	CV,LT	x	CS		
2-SI-231	2	E11			x			1	REL			SRV				
2-SI-235	1	D11	x		x			12	CK		C	CV,LT				
2-SI-237	1	D12	x		x			12	CK		C	CV,LT	x	CS		
2-SI-241	2	C11			x			1	REL			SRV				
2-SI-245	1	B11	x		x			12	CK		C	CV,LT				
2-SI-247	1	B12	x		x			12	CK		C	CV,LT	x	CS		
2-SI-306	2	F5					x	10	Ball	AO	LO	ET				
2-SI-401	2	C1			x			8	CK		C	CV				
2-SI-405	2	D4			x			3	CK		C	CV				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 3	SAFETY INJECTION SYSTEM													
2-SI-409	2	C7			x			.75	REL			SRV				
2-SI-410	2	F1			x			8	CK		C	CV				
2-SI-414	2	E4			x			3	CK		C	CV				
2-SI-417	2	G8			x			1	REL			SRV				
2-SI-427	2	F4			x			3	CK		C	CV				
2-SI-434	2	G3			x			10	CK		C	CV	x	CS		
2-SI-439	2	C7			x			.75	REL			SRV				
2-SI-446	2	H3			x			10	CK		C	CV	x	CS		
2-SI-466	2	J12			x			1.5	REL			SRV				
2-SI-468	2	F7			x			1.5	REL			SRV				
2-SI-469	1	D7			x			1	REL			SRV				
2-SI-614	1	H11					x	12	GA	MO	LO	ET				
2-SI-615	2	H9	x	x				6	GL	MO	C	Q MT,LT				
2-SI-616	2	H8		x				2	GL	MO	C	Q MT				
2-SI-617	2	J8		x				2	GL	MO	C	Q MT				
2-SI-618	1	H12	x	x				1	GL	AO	C	Q MT,LT				
2-SI-624	1	F11					x	12	GA	MO	LO	ET				
2-SI-625	2	F9	x	x				6	GL	MO	C	Q MT,LT				
2-SI-626	2	F8		x				2	GL	MO	C	Q MT				
2-SI-627	2	G8		x				2	GL	MO	C	Q MT				
2-SI-628	1	F12	x	x				1	GL	AO	C	Q MT,LT				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 3	SAFETY INJECTION SYSTEM													
2-SI-634	1	D11					x	12"	GA	MO	LO	ET				
2-SI-635	2	D9	x	x				6"	GL	MO	C	Q MT,LT				
2-SI-636	2	D8		x				2"	GL	MO	C	Q MT				
2-SI-637	2	E8		x				2"	GL	MO	C	Q MT				
2-SI-638	2	D12	x	x				1"	GL	AO	C	Q MT,LT				
2-SI-644	1	B11					x	12"	GA	MO	LO	ET				
2-SI-645	2	B8	x	x				6"	GL	MO	C	Q MT,LT				
2-SI-646	2	B8		x				2"	GL	MO	C	Q MT				
2-SI-647	2	C8		x				2"	GL	MO	C	Q MT				
2-SI-648	1	B12	x	x				1"	GL	AO	C	Q MT,LT				
2-SI-651	1	E7		x				12"	GA	MO	C	Q MT	x	CS		
2-SI-652	1	D7		x				12"	GA	MO	C	Q MT	x	CS		
2-SI-654	2	D5					x	6"	GA	MO	LO	ET				
2-SI-656	2	E5					x	6"	GA	MO	LO	ET				
2-SI-657	2						x	10"	BALL	AO	LC	ET				
2-SI-659	2	K4		x				4"	GL	AO	LO	Q MT	x	CS		

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS	
			A	B	C	D	E										
		25203- 26126 Sh. 3	SAFETY INJECTION SYSTEM														
2-SI-660	2	K4		x				4	GL	AO	O	Q MT	x	CS			
2-SI-706A	1	H10			x			6	CK		C	CV					
2-SI-706B	1	F10			x			6	CK		C	CV					
2-SI-706C	1	D10			x			6	CK		C	CV					
2-SI-706D	1	B10			x			6	CK		C	CV					
2-SI-312	2	D9		x				.75	GL	AO	O	Q MT					
2-SI-422	2				x			2"	CK		C	CV					
2-SI-424	2				x			2"	CK		C	CV					
2-SI-426	2				x			2"	CK		C	CV					
2-SI-448	2				x			2"	CK		C	CV					
2-SI-451	2				x			2"	CK		C	CV					

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS	
			A	B	C	D	E										
		25203- 26126 Sh. 3	CONTAINMENT SPRAY SYSTEM														
2-CS-2A	2	K3			x			8"	CK		C	CV	x	RR			
2-CS-2B	2	J3			x			8"	CK		C	CV	x	RR			
2-CS-4.1A	2	K8		x				8"	GA	MO	C	Q					
												MT					
2-CS-4.1B	2	J8		x				8"	GA	MO	C	Q					
												MT					
2-CS-5A	2	K8			x			8"	CK		C	CV	x	RR			
2-CS-5B	2	J8			x			8"	CK		C	CV	x	RR			
2-CS-13.1A	2	B3		x				18"	GA	MO	LO	Q	x	CS			
												MT					
2-CS-13.1B	2	B3		x				18"	GA	MO	LO	Q	x	CS			
												MT					
2-CS-14A	2	B3			x			18	CK		C	CV					
2-CS-14B	2	B3			x			18	CK		C	CV					
2-CS-15A	2	B4			x			24	CK		C	CV					
2-CS-15B	2	B4			x			24	CK		C	CV					
2-CS-16.1A	2	B4		x				24	GA	MO	C	Q					
												MT					
2-CS-16.1B	2	B4		x				24	GA	MO	C	Q					
												MT					
2-CS-6A	2				x			2"	CK		C	CV					
2-CS-6B	2				x			2"	CK		C	CV					

RELIEF REQUEST BASIS

SYSTEM: SAFETY INJECTION

Valve: 2-SI-114
Category: C
Class: 2

Function: Prevent backflow in low pressure safety injection line.

Test Requirement: Exercise to open position every three months.

Basis for Relief: Low pressure safety injection pump does not generate sufficient pressure to overcome safety injection tank pressure downstream of valve.

Alternate Testing: Exercise to open position during cold shutdown when Safety Injection Tank is isolated and Reactor Coolant System pressure is less than 180 PSIG.

Valve: 2-SI-124
Category: C
Class: 2

Function: Prevent backflow in low pressure safety injection line.

Test Requirement: Exercise to open position every three months.

Basis for Relief: Low pressure safety injection pump does not generate sufficient pressure to overcome safety injection tank pressure downstream of valve.

Alternate Testing: Exercise to open position during cold shutdown when Safety Injection Tank is isolated and Reactor Coolant System pressure is less than 180 PSIG.

Valve: 2-SI-134
Category: C
Class: 2

Function: Prevent backflow in low pressure safety injection line.

Test Requirement: Exercise to open position every three months.

Basis for Relief: Low pressure safety injection pump does not generate sufficient pressure to overcome safety injection tank pressure downstream of valve.

Alternate Testing: Exercise to open position during cold shutdown when Safety Injection Tank is isolated and Reactor Coolant System pressure is less than 180 PSIG.

Valve: 2-SI-144
Category: C
Class: 2

Function: Prevent backflow in low pressure safety injection line.

Test Requirement: Exercise to open position every three months.

Basis for Relief: Low pressure safety injection pump does not generate sufficient pressure to overcome safety injection tank pressure downstream of valve.

Alternate Testing: Exercise to open position during cold shutdown when Safety Injection Tank is isolated and Reactor Coolant System pressure is less than 180 PSIG.

Valve: 2-SI-217
Category: A-C
Class: 1

Function: Provide isolation and backflow prevention between Reactor Coolant System and Safety Injection Tank No. 1.

Test Requirement: Exercise check valve to open position quarterly.

Basis for Relief: Because of pressure differential across disc this valve cannot be opened with the Reactor Coolant System at normal operating pressure.

Alternate Testing: Exercise valve for operability during cold shutdown when Reactor Coolant System is less than 180 PSIG.

Valve: 2-SI-227
Category: A-C
Class: 1

Function: Provide isolation and backflow prevention between Reactor Coolant System and Safety Injection Tank No. 2.

Test Requirement: Exercise check valve to open position quarterly.

Basis for Relief: Because of pressure differential across disc this valve cannot be opened with the Reactor Coolant System at normal operating pressure.

Alternate Testing: Exercise valve for operability during cold shutdown when Reactor Coolant System pressure is less than 180 PSIG.

Valve: 2-SI-237
Category: A-C
Class: 1

Function: Provide isolation and backflow prevention between Reactor Coolant System and Safety Injection Tank No. 3.

Test Requirement: Exercise check valve to open position quarterly.

Basis for Relief: Because of pressure differential across disc this valve cannot be opened with the Reactor Coolant System at normal operating pressure.

Alternate Testing: Exercise valve for operability during cold shutdown when coolant system pressure is less than 180 PSIG.

Valve: 2-SI-247
Category: A-C
Class: 1

Function: Provide isolation and backflow prevention between Reactor Coolant System and Safety Injection Tank No. 4.

Test Requirement: Exercise check valve to open position quarterly.

Basis for Relief: Because of pressure differential across disc this valve cannot be opened with the Reactor Coolant System at normal operational pressure.

Alternate Testing: Exercise valve for operability during cold shutdown when coolant system pressure is less than 180 PSIG.

Valve: 2-SI-434
Category: C
Class: 2

Function: Prevent backflow through low pressure safety injection pump.

Test Requirement: Exercise to open position every three months.

Basis for Relief: This valve cannot be exercised without placing the low pressure safety injection system in an inoperative status by opening locked closed valve 2-SI-657.

Alternate Testing: Exercise to open position during cold shutdown.

Valve: 2-SI-446
Category: C
Class: 2

Function: Prevent backflow through low pressure safety injection pump.

Test Requirement: Exercise to open position every three months.

Basis for Relief: This valve cannot be exercised without placing the low pressure safety injection system in an inoperative status by opening locked closed valve 2-SI-657.

Alternate Testing: Exercise to open position during cold shutdown.

Valve: 2-SI-651
Category: B
Class: 1

Function: Isolate shutdown cooling system piping from Reactor Coolant System.

Test Requirement: Exercise and measure stroke time every three months.

Basis for Relief: Valves are locked closed when Reactor Coolant System pressure exceeds 300 PSIG to protect the low pressure shutdown piping. Valve exercise would require violation of plant interlocks.

Alternate Testing: Exercise and measure stroke time during cold shutdown when Reactor Coolant System pressure is less than 300 PSIG.

Valve: 2-SI-652
Category: B
Class: 1

Function: Isolate shutdown cooling system piping from Reactor Coolant System.

Test Requirement: Exercise and measure stroke time every three months.

Basis for Relief: Valves are locked closed when Reactor Coolant System pressure exceeds 300 PSIG to protect the low pressure shutdown cooling piping. Valve exercise would require violation of plant interlocks.

Alternate Testing: Exercise and measure stroke time during cold shutdown when Reactor Coolant System pressure is less than 300 PSIG.

Valve: 2-SI-659
Category: B
Class: 2

Function: Isolate minimum flow recirculation piping from refueling water storage tank when Safety Injection System is operating in containment sump recirculation mode.

Test Requirement: Exercise (full stroke) and measure stroke time every three months.

Basis for Relief: Valve is required by plant technical specification to be open with valve operator power removed during plant operation.

Alternate Testing: Exercise (full stroke) and measure stroke time during shutdown.

Valve: 2-SI-660
Category: B
Class: 2

Function: Isolate minimum flow recirculation piping from refueling water storage tank when Safety Injection System is operating in containment sump recirculation mode.

Test Requirement: Exercise (full stroke) and measure stroke time every three months.

Basis for Relief: Valve is required by plant technical specification to be open with valve operator power removed during plant operation.

Alternate Testing: Exercise (full stroke) and measure stroke time during cold shutdown.

Valve: 2-CS-2A
Category: C
Class: 2

Function: Prevent backflow through Containment Spray Pump.

Test Requirement: Exercise to open position every three months.

Basis for Relief: This valve cannot be exercised without placing the containment spray system in an inoperative status in violation of Technical Specification requirements.

Alternate Testing: Exercise to open position during reactor refueling.

Valve: 2-CS-2B
Category: C
Class: 2

Function: Prevent backflow through Containment Spray Pump.

Test Requirement: Exercise to open position every three months.

Basis for Relief: This valve cannot be exercised without placing the containment spray system in an inoperative status in violation of Technical Specification requirements.

Alternate Testing: Exercise to open position during reactor refueling.

Valve: 2-CS-5A
Category: C
Class: 2

Function: Provide post incident containment isolation inside containment.

Test Requirement: Exercise to open position every three months.

Basis for Relief: Testing of valve would require containment spray system be made inoperable. Both systems are required by Technical Specification to be operable during plant operation.

Alternate Testing: Exercise valve to open position with air during reactor refueling.

Valve: 2-CS-5B
Category: C
Class: 2

Function: Provide post incident containment isolation inside containment.

Test Requirement: Exercise to open position every three months.

Basis for Relief: Testing of valve would require containment spray system be made inoperable. Both systems are required by Technical Specification to be operable during plant operation.

Alternate Testing: Exercise valve to open position with air during reactor refueling.

Valve: 2-CS-13.1A
Category: B
Class: 2

Function: Refueling Water Storage Tank Outlet Header "A" Isolation Valve.

Test Requirement: Exercise valve for operability every three months.

Basis for Relief: Failure of this valve in closed position would interrupt an emergency core cooling flowpath.

Alternate Testing: This valve will be exercised for operability during cold shutdown.

Valve: 2-CS-13.1B
Category: B
Class: 2

Function: Refueling Water Storage Tank Outlet Header "B" Isolation Valve.

Test Requirement: Exercise valve for operability every three months.

Basis for Relief: Failure of this valve in closed position would interrupt an emergency core cooling flowpath.

Alternate Testing: This valve will be exercised for operability during cold shutdown.

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203-26126 Sh. 8, 9	CHEMICAL AND VOLUME CONTROL SYSTEM													
2-CH-089	2	Sh. 9 D-4		x				2	GL	AO	O	Q MT	x	CS		
2-CH-154	2	Sh. 8 B-5			x			3	CK		C	CV				
2-CH-155	2	Sh. 8 G-5			x			3	CK		C	CV				
2-CH-177	2	Sh. 9 C-2			x			3	CK		C	CV				
2-CH-190	2	Sh. 9 C-2			x			3	CK		C	CV				
2-CH-196	2	Sh. 9 C-2		x				3	GL	AO	C	Q MT				
2-CH-324	2	Sh. 9 C-4			x			.75	REL			SRV				
2-CH-325	2	Sh. 9 B-4			x			.75	REL			SRV				
2-CH-326	2	Sh. 9 B-4			x			.75	REL			SRV				
2-CH-328	2	Sh. 9 B-4			x			2	CK		O	CV				
2-CH-331	2	Sh. 9 B-4			x			2	CK		O	CV				
2-CH-334	2	Sh. 9 B-4			x			2	CK		O	CV				
2-CH-429	2	Sh. 9 C-4		x			x	2	GA	MO	O	ET				
2-CH-432	1	Sh. 9 D-6			x			2.5	CK		O	CV				
2-CH-433	1	Sh. 9 E-6			x			2.5	CK		O	CV				
2-CH-501	2	Sh. 9 D-2		x				4	GA	MO	O	Q MT	x	CS		
2-CH-504	2	Sh. 9 C-1		x				3	GA	MO	C	Q MT				
2-CH-508	2	Sh. 8 D-3		x				3	GA	MO	C	Q MT				
2-CH-509	2	Sh. 8 C-3		x				3	GA	MO	C	Q MT				
2-CH-510	2	Sh. 8 D-4		x				1	GL	AO	O	Q MT				
2-CH-511	2	Sh. 8 B-4		x				1	GL	AO	O	Q MT				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 8, 9	CHEMICAL AND VOLUME CONTROL SYSTEM													
2-CH-512	2	Sh. 9 C-2		x				4"	BALL	MO	C	Q MT	x	CS		
2-CH-514	2	Sh. 8 D-5		x				3"	GA	MO	C	Q MT				
2-CH-515	1	Sh. 9 C-5		x				3"	GL	AO	O	Q MT	x	CS		
2-CH-516	1	Sh. 9 C-5		x				3"	GL	AO	O	Q MT	x	CS		
2-CH-517	1	Sh. 9 D-5					x	2"	GL	AO	C	ET				
2-CH-518	1	Sh. 9 D-5		x				2"	GL	AO	O	Q MT				
2-CH-519	1	Sh. 9 E-5		x				2"	GL	AO	O	Q MT				
2-CH-769	2	Sh. 9 C-3			x			.5	CK		C	CV				

RELIEF REQUEST BASIS

Valve: 2-CH-515
Category: B
Class: 2

Function: Isolate Reactor Coolant System letdown line on safety injection actuation signal.

Test Requirement: Exercise (full stroke) and measure stroke time every three months.

Basis for Relief: Operation of this valve during plant operation would cause undesirable thermal transients on the regenerative heat exchanger. This component has a limited number of design thermal transients.

Alternate Testing: Exercise (full stroke) and measure stroke time during cold shutdown.

Valve: 2-CH-516
Category: B
Class: 2

Function: Isolate Reactor Coolant System letdown line on containment isolation signal.

Test Requirement: Exercise (full stroke) and measure stroke time every three months.

Basis for Relief: Operation of this valve during plant operation would cause undesirable thermal transients on the regenerative heat exchanger. This component has a limited number of design thermal transients.

Alternate Testing: Exercise (full stroke) and measure stroke time during cold shutdown.

Valve: 2-CH-089
Category: B
Class: 2

Function: Provide containment isolation for RCS letdown piping on containment isolation signal.

Test Requirement: (1) Exercise (full stroke) and measure stroke time every three months.

Basis for Relief: (1) Operation of this valve during plant operation would cause undesirable thermal transients on the regenerative heat exchanger. This component has a limited number of design thermal transients.

Alternate Testing: (1) Exercise (full stroke) and measure stroke time during cold shutdowns.

Valve: 2-CH-501
Category: B
Class: 2

Function: Isolate volume control tank from charging pump suction upon Safety Injection Actuation Signal.

Test Requirement: Exercise full stroke and measure stroke time every three months.

Basis for Relief: Exercising this valve would require interruption of charging flow with the attendant, undesirable, thermal transient on the regenerative heat exchanger. If an alternate charging pump suction source were utilized an undesirable Reactor Coolant System boron concentration transient could result.

Alternate Testing: Exercise full stroke and measure stroke time during cold shutdown.

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203-26126 Sh. 1	SPENT FUEL POOL COOLING SYSTEM													
2-RW-4A	3	D4			x			8	CK	-	O	CV				
2-RW-4B	3	C4			x			8	CK	-	O	CV				
2-RW-8	3	D2			x			10	CK	-	C	CV				
2-RW-10	3	E2			x			10	CK	-	O	CV				
2-RW-67	3	E3			x			2	CK	-	C	CV				
2-RW-222	3	E3			x			2	CK	-	C	CV				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 4	FEEDWATER SYSTEM													
2-FW-5A	2	E5		x	x			18"	STOP-CK	AO	O	Q MT CV	x	CS		
2-FW-5B	2	E2		x	x			18"	STOP-CK	AO	O	Q MT CV	x	CS		
2-FW-7	3	C5			x			6"	CK		C	CV	x	CS		
2-FW-8A	3	B5			x			4"	CK		C	CV	x	CS		
2-FW-8B	3	B5			x			4"	CK		C	CV	x	CS		
2-FW-12A	2	E6		x	x			6"	STOP-CK	AO	C	Q MT CV	x	CS		
2-FW-12B	2	E2		x	x			6"	STOP-CK	AO	C	Q MT CV	x	CS		
2-FW-32A	3	C5			x			1.5	CK		C	CV				
2-FW-32B	3	B5			x			1.5	CK		C	CV				
2-FW-33	3	C5			x			1.5	CK		C	CV				
2-FW-43A	3	D6		x				4"	GL	MO	O	Q MT				
2-FW-43B	3	D2		x				4"	GL	MO	O	Q MT				
2-FW-44	3	C6		x				6"	GA	MO	C	Q MT				
2-FW-56A	3	D6		x				6"	GA	H	C	Q				
2-FW-56B	3	D1		x				6"	GA	H	C	Q				

RELIEF REQUEST BASIS

Valve: 2-FW-5A
Category: BC
Class: 2

Function: Prevent backflow in main feedline to No. 1 steam generator.

Test Requirement: Exercise (full stroke) for operability every three months. Take stroke time measurements per IWV-3410.

Basis for Relief: Valve exercise during plant operation would result in loss of feedwater flow.

Alternate Testing: Exercise valve for operability and measure stroke time during cold shutdown.

Valve: 2-FW-5B
Category: BC
Class: 2

Function: Prevent backflow in main feedline to No. 2 steam generator.

Test Requirement: Exercise (full stroke) for operability every three months. Take stroke time measurements per IWV-3410.

Basis for Relief: Valve exercise during plant operation would result in loss of feedwater flow.

Alternate Testing: Exercise valve for operability and measure stroke time during cold shutdown.

Valve: 2-FW-12A
Category: BC
Class: 2

Function: Prevent backflow in auxiliary feedwater line to No. 1 steam generator.

Test Requirement: Exercise (full stroke) for operability every three months. Take stroke time measurements per IWV-3410.

Basis for Relief: Valve operator exercise, without auxiliary feed system flow will not result in actual valve exercise. Initiating auxiliary feedwater flow during plant operation could result in feed flow anomalies.

Alternate Testing: Exercise valve for operability and measure stroke time during cold shutdown.

Valve: 2-FW-12B
Category: BC
Class: 2

Function: Prevent backflow in auxiliary feedwater line to No. 2 Steam Generator.

Test Requirement: Exercise (full stroke) for operability every three months. Take stroke time measurements per IWV-3410.

Basis for Relief: Valve operator exercise, without auxiliary feed system flow will not result in actual valve exercise. Initiating auxiliary feedwater flow during plant operation could result in feed flow anomalies.

Alternate Testing: Exercise valve for operability and measure stroke time during cold shutdowns.

Valve: 2-FW-7
Category: C
Class: 3

Function: Prevent backflow through steam driven auxiliary feed pump during operation of other auxiliary feed pumps.

Test Requirement: Exercise quarterly for operability.

Basis for Relief: Operation of this valve would require establishing flow through the auxiliary feed lines to the steam generator. Introduction of this cold water could result in steam generator level instability and/or undesirable thermal transients to the feed nozzles.

Alternate Testing: Exercise valve for operability during cold shutdown.

Valve: 2-FW-8A
Category: C
Class: 3

Function: Prevent backflow through motor driven auxiliary feed pump during operation of other auxiliary feed pumps.

Test Requirement: Exercise quarterly for operability.

Basis for Relief: Operation of this valve would require establishing flow through the auxiliary feed lines to the steam generator. Introduction of this cold water could result in steam generator level instability and/or undesirable thermal transients to the feed nozzles.

Alternate Testing: Exercise valve for operability during cold shutdown.

Valve: 2-FW-8B
Category: C
Class: 3

Function: Prevent backflow through motor driven auxiliary feed pump during operation of other auxiliary feed pumps.

Test Requirement: Exercise quarterly for operability.

Basis for Relief: Operation of this valve would require establishing flow through the auxiliary feed lines to the steam generator. Introduction of this cold water could result in steam generator level instability and/or undesirable thermal transients to the feed nozzles.

Alternate Testing: Exercise valve for operability during cold shutdown.

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 11	REACTOR COOLANT SYSTEM													
2-RC-001	2	C4	x					.75"	GL	AG	C	Q MT				
2-RC-002	2	C4	x					.75"	GL	AO	C	Q MT				
2-RC-003	2	D5	x					.75"	GL	SOL	C	Q MT				
2-RC-45	2	B4	x					.5"	GL	AO		Q MT				
2-RC-200	1	E4			x			2.5"	RV			SRV				
2-RC-201	1	E4			x			2.5"	RV			SRV				
2-PMW-43	2	D2	x					2"	GL	AO	C	Q MT				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 5 & 7	SERVICE WATER SYSTEM													
2-SW-1A	3	Sh. 7 B1			x			24	CK		O	CV				
2-SW-1B	3	Sh. 7 C1			x			24	CK		O	CV				
2-SW-1C	3	Sh. 7 D1			x			24	CK		O	CV				
2-SW-3.2A	3	Sh. 7 B3		x				16	BFLY	AO	O	Q MT				
2-SW-3.2B	3	Sh. 7 B2		x				16	BFLY	AO	O	Q MT				
2-SW-8.1A	3	Sh. 7 D3		x				24	BFLY	AO	O	Q MT				
2-SW-8.1B	3	Sh. 7 D3		x				24	BFLY	AO	O	Q MT				
2-SW-8.1C	3	Sh. 7 D2		x				24	BFLY	AO	O	Q MT				
2-SW-11A	3	Sh. 7 E3			x			24	CK		O	CV				
2-SW-11B	3	Sh. 7 E2			x			24	CK		O	CV				
2-SW-13A	3	Sh. 7 D6			x			8	CK		C	CV				
2-SW-13B	3	Sh. 7 D5			x			8	CK		C	CV				
2-SW-89A	3	Sh. 7 C6		x				8	BFLY	AO	C	Q MT				
2-SW-89B	3	Sh. 7 C5		x				8	BFLY	AO	C	Q MT				
2-SW-102	3	Sh. 5 C5		x				2	GL	AO	O	Q MT				
2-SW-104	3	Sh. 5 C4		x				2	GL	AO	O	Q MT				
2-SW-192	3	Sh. 5 E1			x			4	CK		C	CV				
2-SW-197	3	Sh. 5 B4			x			3	CK		C	CV				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
REACTOR BUILDING CLOSED COOLING WATER																
25203-26126 Sh. 6																
2-RB-2A	3	H-5			x			20"	CK		O	CV				
2-RB-2B	3	G-5			x			20"	CK		O	CV				
2-RB-2C	3	E-5			x			20"	CK		O	CV				
2-RB-8.1A	3	B-6		x				12"	BFLY	AO	O	Q				
2-RB-8.1B	3	B-5		x				12"	BFLY	AO	O	Q				
2-RB-13.1A	3	B-3		x				18"	BFLY	AO	C	Q				
2-RB-13.1B	3	B-4		x				18"	BFLY	AO	C	Q				
2-RB-28.1A	2	D-10					x	10"	BFLY	AO	LO	ET				
2-RB-28.1B	2	F-10					x	10"	BFLY	AO	LO	ET				
2-RB-28.1C	2	C-10					x	10"	BFLY	AO	LO	ET				
2-RB-28.1D	2	H-10					x	10"	BFLY	AO	LO	ET				
2-RB-28.3A	2	D-12		x				10"	BFLY	AO	C	Q				
2-RB-28.3B	2	F-12		x				10"	BFLY	AO	C	Q				
2-RB-28.3C	2	C-12		x				10"	BFLY	AO	C	Q				
2-RB-28.3D	2	H-12		x				10"	BFLY	O	C	Q				
2-RB-210	3	F-10		x				8"	BFLY	AO	C	Q				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 6	REACTOR BUILDING CLOSED COOLING WATER													
2-RB-68.1A	3	C-3		x				2"	GL	AO		Q MT				
2-RP-68.1B	3	C-5		x				2"	GL	AO		Q MT				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 2	MAIN STEAM													
2-MS-4A	3	D-4			x			4"	CK		C	CV				
2-MS-4B	3	C-4			x			4"	CK		C	CV				
2-MS-64A	2	E-4		x				34"	STOP	AO	O	Q	x	CS		
												MT				
2-MS-64B	2	B-5		x				34"	STOP	AO	O	Q	x	CS		
												MT				
2-MS-65A	2	D-4		x				3"	GL	MO	C	Q	x	CS		
												MT				
2-MS-65B	2	B-5		x				3"	GL	MO	C	Q	x	CS		
												MT				
2-MS-190A	2	D-3		x				8"	GL	AO	C	Q	x	CS		
												MT				
2-MS-190B	2	C-3		x				8"	GL	AO	C	Q	x	CS		
												MT				
2-MS-201	2	D-3		x				4"	GA	MO	C	Q				
												MT				
2-MS-202	2	C-3		x				4"	GA	MO	C	Q				
												MT				
2-MS-191A	2	C-1		x				.5	GL	AO		Q				
												MT				
2-MS-191B	2	B-1		x				.5	GL	AO		Q				
												MT				
2-MS-220A	2	D-1		x				2"	GL	AO		Q				
												MT				
2-MS-220B	2	B-1		x				2"	GL	AO		Q				
												MT				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS	
			A	B	C	D	E										
		25203- 26126 Sh. 2	MAIN STEAM														
2-MS-239	2	B3			x			6"	REL			SRV					
2-MS-240	2	B4			x			6"	REL			SRV					
2-MS-241	2	B4			x			6"	REL			SRV					
2-MS-242	2	B4			x			6"	REL			SRV					
2-MS-243	2	B5			x			6"	REL			SRV					
2-MS-244	2	B4			x			6"	REL			SRV					
2-MS-245	2	B4			x			6"	REL			SRV					
2-MS-246	2	B4			x			6"	REL			SRV					
2-MS-247	2	E3			x			6"	REL			SRV					
2-MS-248	2	E3			x			6"	REL			SRV					
2-MS-249	2	E3			x			6"	REL			SRV					
2-MS-250	2	E3			x			6"	REL			SRV					
2-MS-251	2	E4			x			6"	REL			SRV					
2-MS-252	2	E4			x			6"	REL			SRV					
2-MS-253	2	E4			x			6"	REL			SRV					
2-MS-254	2	E4			x			6"	REL			SRV					
2-MS-265B	2	D3		x				1"	GL	AO		Q MT					
2-MS-266B	2	B3		x				1"	GL	AO		Q MT					
SV-4188	3	C5		x				4"	GL	MO		Q MT					

RELIEF REQUEST BASIS

System: Main Steam

1. Valve: 2-MS-64A
Category: B-C
Class: 2

Function: Stop flow from steam generator No. 1 following steam line rupture downstream of valve.

Test Requirement: Exercise valve for operability and measure stroke time every three months.

Basis for Relief: Full stroke testing of this valve would require plant shutdown.

Alternate Testing: Part-stroke exercise every three months and full stroke exercise and measure stroke during cold shutdown.
2. Valve: 2-MS-64B
Category: B-C
Class: 2

Function: Stop flow from steam generator No. 2 following steam line rupture downstream of valve.

Test Requirement: Exercise valve for operability and measure stroke time every three months.

Basis for Relief: Full stroke testing of this valve would require plant shutdown.

Alternate Testing: Part-stroke exercise every three months and full stroke exercise and measure stroke time during cold shutdown.
3. Valve: 2-MS-65A
Category: B
Class: 2

Function: Startup bypass valve around main steam isolation valve for No. 1 steam generator.

Test Requirement: Exercise valve (full stroke) for operability and stroke time every three months.

Basis for Relief: Valve is normally closed and not required to change position during plant operation. Failure of this valve in the open position during exercise would jeopardize the ability to stop steam flow in the event of downstream rupture.

Alternate Testing: Full stroke exercise and measure stroke time during cold shutdown.

4. Valve: 2-MS-65B
Category: B
Class: 2

Function: Start-up bypass valve around main steam isolation valve for No. 2 steam generator.

Test Requirement: Exercise valve (full stroke) for operability and stroke time every three months.

Basis for Relief: Valve is normally closed and not required to change position during plant operation. Failure of this valve in the open position during exercise would jeopardize the ability to stop steam flow in the event of a downstream rupture.

Alternate Testing: Full stroke exercise and measure stroke time during cold shutdown.

5. Relief Request Basis:

Valve: 2-MS-190A
Category: B
Class: 2

Function: Provide control of steam flow from No. 1 steam generator to atmosphere during cooldown.

Test Requirement: Exercise (full stroke) for operability and measure stroke time every three months.

Basis for Relief: Operation of valve during plant operation could result in steam flow transient. Isolation of this valve to allow exercising during operation could reduce plant ability to withstand a turbine trip transient.

Alternate Testing: Full stroke exercise and measure stroke time during cold shutdown.

6. Valve: 2-MS-190B
 Category: B
 Class: 2

 Function: Provide control of steam flow from No. 2
 steam generator to atmosphere during cooldown.

 Test Requirement: Exercise (full stroke) for operability and
 measure stroke time every three months.

 Basis for Relief: Operation of valve during plant operation
 could result in steam flow transient. Isola-
 tion of this valve to allow exercising during
 operation could reduce plant ability to withstand
 a turbine trip transient.

 Alternate Testing: Full stroke exercise and measure stroke time
 during cold shutdown.

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
		25203- 26126 Sh. 10	CHILLED WATER SYSTEM													
2-CHW-1	3	B6			x			2	CK		C	CV				
2-CHW-31	3	B4			x			2	CK		C	CV				
2-CHW-3	3	C5		x				1.5	GL	AO	C	Q				
												MT				
2-CHW-33	3	C3		x				1.5	GL	AO	O	Q				
												MT				
2-CHW-11	3	C5		x				1.5	GL	AO	O	Q				
												MT				
2-CHW-12	3	C4		x				1.5	GL	AO	O	Q				
												MT				
2-CHW-13	3	D5		x				1.5	GL	AO	O	Q				
												MT				
2-CHW-14	3	D4		x				1.5	GL	AO	O	Q				
												MT				
2-CHW-4	3	D6			x			1.5	3-way	AO		Q				
												MT				
2-CHW-34	3	D3			x			1.5	3-way	AO		Q				
												MT				

Valve Number	Class	Boundary Diagram	Valve Category					Size (Inches)	Valve Type	Actuator	Normal Position	Test Requirements	Relief Requests	Testing Alternative	Stroke Time - (Seconds Maximum)	REMARKS
			A	B	C	D	E									
			CONTAINMENT ISOLATION VALVES													(Close on CIAS)
2-AC-12	2			x				1"	BFLY	AO	O	Q MT				Containment Air Sample
2-AC-15	2			x				1"	BFLY	AO	O	Q MT				Containment Air Sample
2-AC-20	2			x				1"	BFLY	AO	O	Q MT				Containment Air Sample
2-AC-47	2			x				1"	BFLY	AO	O	Q MT				Containment Air Sample
2-EB-88	2			x				1.5	BFLY	AO	O	Q MT				Containment Air Sample
2-EB-89	2			x				1.5	BFLY	AO	O	Q MT				Containment Air Sample
2-CH-506	2			x				.75	GL	AO	O	Q MT	x	CS		Reactor Coolant Pump Seal Leak-Off
2-CH-198	2			x				.75	GL	AO	O	Q MT	x	CS		Reactor Coolant Pump Seal Leak-Off
2-GR-11.1	2			x				3	GL	AO	O	Q MT				Waste Gas Header
2-GR-11.2	2			x				3	GL	AO	O	Q MT				Waste Gas Header

RELIEF REQUEST BASIS

Valve: 2-CH-506
Category: B
Class: 2

Function: Isolate Reactor Coolant Pump seal leakoff line at containment penetration.

Test Requirement: Exercise and measure stroke time every three months.

Basis for Relief: Exercise of this valve would secure reactor coolant pump seal controlled bleed off and could result in seal degradation.

Alternate Testing: Exercise and measure stroke time during cold shutdown when reactor coolant pumps are secured.

Valve: 2-CH-198
Category: B
Class: 2

Function: Isolate Reactor Coolant Pump seal leakoff line at containment penetration.

Test Requirement: Exercise and measure stroke time every three months.

Basis for Relief: Exercise of this valve would secure reactor coolant pump seal controlled bleed off and could result in seal degradation.

Alternate Testing: Exercise and measure stroke time during cold shutdown when reactor coolant pumps are secured.

SYSTEM PRESSURE TESTS

Articles IWA-5000, IWB-5000, IWC-5000 and IWD-5000 discuss the requirements of system pressure tests for Classes 1, 2 and 3 components.

Table BCD-5000 presents the system pressure test requirements for the Millstone Unit 2 components and notes departures from Code where it was deemed necessary.

Test requirements for open-ended lines such as suction lines from storage tanks, and which receive static tests, are not addressed in the table.

In that NNECO and NUSCO Quality Assurance personnel will be witnessing these tests or auditing the test results, exception to IWA-2120, concerning the Authorized Nuclear Inspector, will be taken.

The location of check valves in several systems that penetrate the primary containment preclude the Class 1 pressure test boundary from extending outward beyond the first of such valves, usually located inside containment even though the Class change boundary is outside containment. In these cases, the Class 1 leakage and pressure test boundary would be the inside check valve. Conversely, pressure tests of Class 2 systems, which are outside containment, would have to be bounded at a stop valve which may or may not be the Class 1/Class 2 boundary.

Precautions must be taken in view of the differences that exist in Class 1/Class 2 test pressures to prevent overpressurization of the Class 1 components.

As an alternate to the Summer, 1975 Addendum, NNECO proposes to utilize the rules of the Winter, 1977 Addendum, IWA-5213, to define test condition holding time for all pressure tests.

In systems which contain pumps, it will not be possible to utilize the pump casing as the boundary between high pressure and low pressure tests without overpressurizing suction piping during the high pressure test. In these cases, the discharge isolation valve will be considered the test boundary.

TABLE BCD - 5000

SYSTEM PRESSURE TESTS

SYSTEM	TEST PRESSURE (psig)	CODE TEST PRESSURE (psig)	REMARKS
<u>Class 1 (IWB-5000)</u>			
Reactor Coolant Pressure Boundary			
System Leakage Test	2250	2250	In Compliance with Code
System Hydrostatic Test	2430 @ 200F	2430 @ 200F	In Compliance with Code
<u>Class 2 (IWC-5000)</u>			
HPSI	1125	1125	In Compliance with Code (IWC-5220c)
Containment Spray	254	254	In Compliance with Code (IWC-5220c)
LPSI/Shutdown Cooling			
Pump suction piping from 2-SI-651 to 2-SI-432 and 2-SI-444.	375	375	In Compliance with Code
Pump discharge piping	625	625	In Compliance with Code
Main Steam from SG's to 2-MS-64A/B 2-MS-65A/B, and 2-MS-201 and 2-MS-202	1250	1250	In Compliance with Code
Feedwater from 2-FW-5A/B and 2-FW-12A/B to SG's	1250	1250	In Compliance with Code
CVCS			
Boric Acid subsystem	188	188	In Compliance with Code
Charging pump suction header	188	188	In Compliance with Code

MILLSTONE UNIT NO. 2

SYSTEM PRESSURE TESTS (cont'd)

SYSTEM	TEST PRESSURE (psig)	CODE TEST PRESSURE (psig)	REMARKS
Charging pump discharge header	3419	3419	In Compliance with Code
Letdown from RCS, Valve 2-CH-516 to RHX to 2-CH-89	3106	3106	In Compliance with Code
<u>Class 3 (IWD-5000)</u>			
Spent Fuel Pool Cooling			
Pump Suction piping	55	55	In Compliance with Code
Pump Discharge piping	110	110	In Compliance with Code
Auxiliary Feedwater			
Aux. Feedpump suction piping	55	55	In Compliance with Code
Aux. Feedpump discharge piping to 2-FW-43A/B	1760	1760	In Compliance with Code
Aux. Feedpump discharge piping from 2-FW-43A/B to 2-FW-12A/B	1210	1210	In Compliance with Code
RBCCW	165	165	In Compliance with Code
Service Water			
Cast Iron underground	94	94	In Compliance with Code
Relief Valve inlet piping	188	94	See Note 1
Remaining system piping	110	94	See Note 1
Chilled Water	55	55	In Compliance with Code
Main Steam from valves 2-MS-201 and 2-MS-202 to SG Aux. Feedpump Turbine	1100	1100	In Compliance with Code

NOTES

1. The service water system consists of piping and components designed to three different pressures, depending upon service conditions and material selection:

Cast Iron Underground	$P_D = 85 \text{ psig}$
Relief Valve Inlets	$P_D = 150 \text{ psig}$
Balance (majority) of system	$P_D = 100 \text{ psig}$

In most instances, it is not possible to isolate these sections from each other to permit Code pressure tests. NNECO requests a waiver from the requirements of IWD-5200 (a) for the service water system for the two higher pressure sections, and as an alternate, propose to test the entire service water system to 94 psig, test pressure, based on the underground portion. Although this pressure is lower than the design pressure for most of the service water system, it is approximately $1\frac{1}{2}$ times the system operating pressure and would constitute a meaningful hydrostatic test.