



General Electric Company
175 Curtner Avenue, San Jose, CA 95125

April 29, 1993

MFN No. 066-93
Docket No. STN 52-001

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Richard Borchardt, Acting Director
Standardization Project Directorate

Subject: **Submittal of Amendment 27, Non-Proprietary 11x17 Foldout
Drawings, to GE's ABWR SSAR**

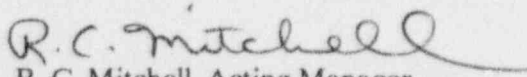
Reference: Submittal of Amendment 27 to GE's ABWR SSAR, MFN 062-93,
dated April 23, 1993

Enclosed are thirty-four copies of selected sections of Chapter 1, *Introduction and General Description of Plant*, Chapter 5, *Reactor Coolant System and Connected Systems*, Chapter 6, *Engineered Safety Features*, Chapter 8, *Electric Power*, Chapter 9, *Auxiliary Systems*, of the Standard Safety Analysis Report (SSAR) for the Advanced Boiling Water Reactor (ABWR).

Revisions for 11x17 foldout drawings are being submitted for the following sections: 1.7, 5.2, 5.4, 6.2, 8.3, 9.2, 9.3 and 9.4 and are also identified on the attached Page Change Instruction(s).

Please note that all or parts of the following sections contain information that is designated as General Electric Company proprietary information: 7.3, 7.4, 7.6, 7.7, and 11.2. This information is being submitted under separate cover.

Sincerely,


R. C. Mitchell, Acting Manager
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ABWR SSAR

Amendment 27 - Page Change Instruction

The following pages (11x17 foldout drawings) have been changed, please make the specified changes in your SSAR. Pages are listed as page pairs (front & back). Bold page numbers represent a page that has been changed by Amendment 27.

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CHAPTER 5

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9.4-7a, 7a.1	9.4-7a, 7a.1
9.4-7a.2, 7a.3	9.4-7a.2, 7a.3
9.4-7a.4	9.4-7a.4
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9.4-7e.2	9.4-7e.2
Add	9.4-10, 11
Add	9.4-12

April 29, 1993

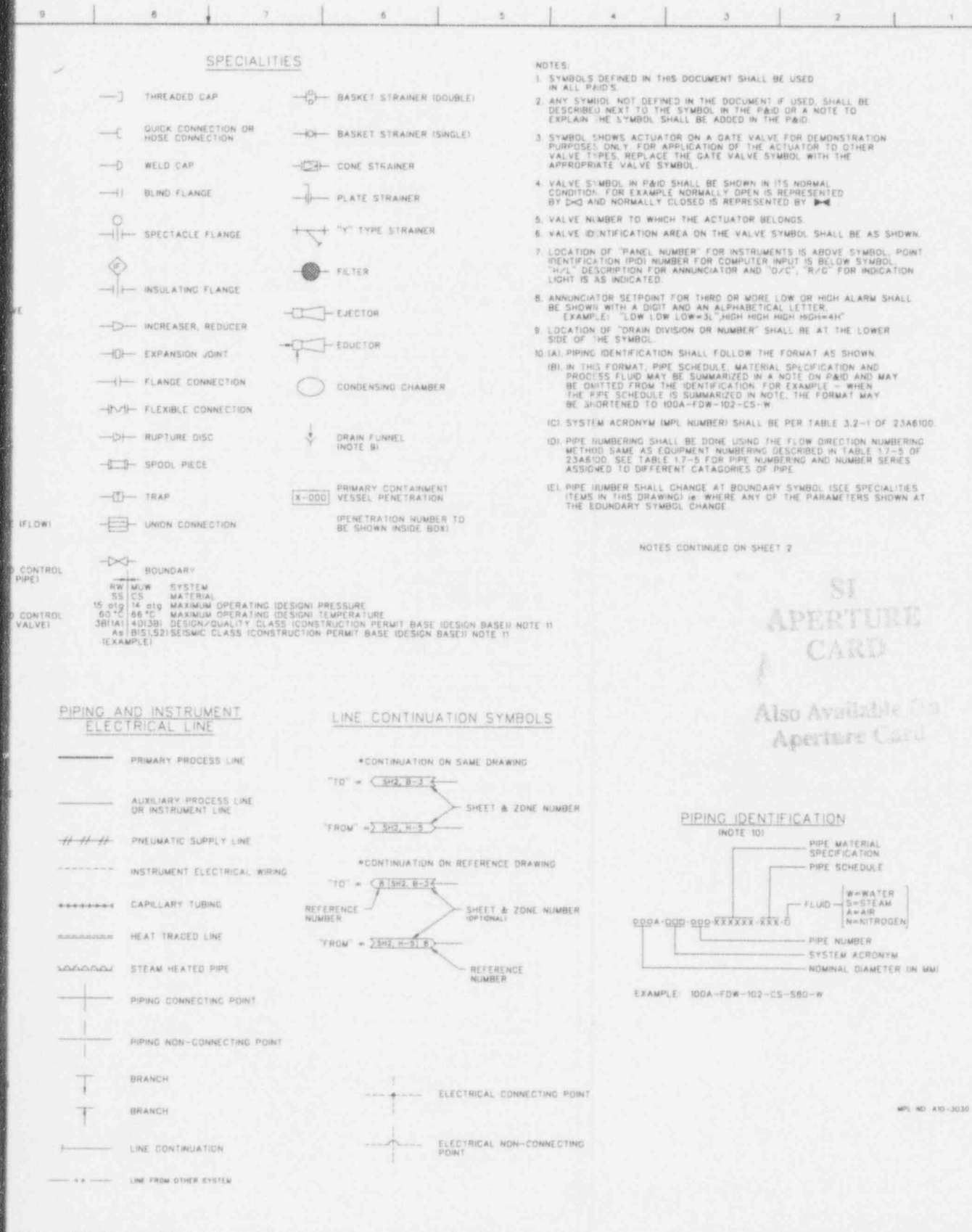


Figure 1.7-1 PIPING AND INSTRUMENTATION DIAGRAM SYMBOLS, (Sheet 1 of 2)

Amendment 27

1.7-6

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TABLE 1: INSTRUMENT LEGENDS															
MEASURED VARIABLE	FUNCTION														
	AMPLIFIER	CONTROLLER	FUNCTION GENERATOR	PRIMARY ELEMENT	INDICATOR	INDICATING CONTROLLER	INDICATING RECORDER	INDICATING SWITCH	ALARM	RECORDER	RECORDER SWITCH	SAMPLER	SIGHT GLASS	SWITCH	TEST POINT
	AM	C	F	E	I	IC	IR	IS	A	R	RS	SM	G	S	X
CONCENTRATION	CN			CNE	CNI										
CASING ELONGATION	SK			SKC	SKI					SKR				SKS	SKT
DENSITY	D	DC		DE	DI			DIS		DR	DRS			DS	DX
DEW POINT	DW			DWE	DWI					DWR				DWS	DWT
DIFFERENTIAL ELONGATION	DX	DXAM		DXE	DXI					DXR				DXS	DXT
DIFFERENTIAL FLOW	DF				DFI			DFIS		DFR	DFRS			DFS	DFT
DIFFERENTIAL PRESSURE	DP	DPC			DPI			DPIS		DPR	DP RS			DP S	DPX
DIFFERENTIAL TEMPERATURE	DT	DTC			DTI			DTIS		DTR	DT RS			DT S	DTT
ECCENTRICITY	E	EAM		EE	EI					ER					ET
ELECTRICAL CONDUCTIVITY	C			CE	CI			CIS		CR		CSM		CS	CX
ELECTRICAL CURRENT	A				AI					AR					AT
ELECTRICAL FREQUENCY	HZ				HZI					HZR					HZT
ELECTRICAL POWER	W				WI					WR					WT
ELECTRICAL POTENTIAL	V				VI					VR					VT
FLOW	F	FC	FF	FE	FI	FIC	FR	FIS	FD	FR	FRS		FG	FS	FX
HYDROGEN	H2			H2E	H2I		H2R	H2IS		H2R	H2RS	H2SM		H2S	H2T
HUMIDITY	M			ME	MI					MR					MT
HYDROGEN ION DENSITY	PH	PHAM	PHC	PHC	PHI					PHR		PHSM			PHX
LEVEL	L	LC		LE	LI			LIS		LR	LRS		LG	LS	LX
NEUTRON FLUX	N	NAM	NC	NE	NI				ND	NR					NX
OXYGEN	O2	O2C		O2E	O2I		O2R	O2IS		O2R	O2RS			O2S	
PRESSURE	P	PC		PE	PI			PIS		PR	PRS			PS	PX
POSITION	PO	POC		POE	POI			POIS		POR	PORS			POS	POT
RADIATION	R			RE	RI			RIS	RD	RR	RRS	RSM		RS	RX
REDUCTION OXIDATION POTENTIAL DIFF	RO			ROE					RDD	RDR				ROS	ROT
SPEED OR ROTATION FREQUENCY	S	SAM	SC	SE	SI					SR				SS	ST
SIGNAL MONITOR	DS													OSS	
SMOKE	SM			SME	SMI									SMS	SMT
TEMPERATURE	T	TC		TE	TI			TIS		TR	TRS			TS	TX
TIME	TM	TMC			TM			TMS	TMD		TMS				
TORQUE	TQ			TQE						TQR				TQS	TQT
TURBIDITY	TU			TUE	TUI					TUR				TUS	TUT
VIBRATION	VB	VBC		VBE	VBI			VBS		VBR				VBS	VBT
VIBRATION PHASE ANGLE	PA			PAE	PAI					PAR					PAT
VOLT-AMPERE REACTIVE POWER HOUR	QH				QHI					QHR					QHT
VOLT-AMPERE REACTIVE POWER	Q				QI					QR					QT
WATT-HOUR	WH				WHI					WHR					WHT
WEIGHT	WF	WFC		WFE	WFI					WFR				WFS	

Figure 1.7-1 PIPING AI

ABBREVIATIONS

MATERIAL

CS = CARBON STEEL
SS = STAINLESS STEEL

SERVICE SUPPLY SOURCES

A/S - AIR SUPPLY
E/S - ELECTRICAL POWER SUPPLY
N₂/S - NITROGEN SUPPLY

Failure Condition	Failure Mode	Failure Location	Failure Time (min)	Failure Type
1	1.1	1.1.1	1.1.1.1	1.1.1.1.1
2	2.1	2.1.1	2.1.1.1	2.1.1.1.1
3	3.1	3.1.1	3.1.1.1	3.1.1.1.1
4	4.1	4.1.1	4.1.1.1	4.1.1.1.1
5	5.1	5.1.1	5.1.1.1	5.1.1.1.1
6	6.1	6.1.1	6.1.1.1	6.1.1.1.1
7	7.1	7.1.1	7.1.1.1	7.1.1.1.1
8	8.1	8.1.1	8.1.1.1	8.1.1.1.1
9	9.1	9.1.1	9.1.1.1	9.1.1.1.1
10	10.1	10.1.1	10.1.1.1	10.1.1.1.1
11	11.1	11.1.1	11.1.1.1	11.1.1.1.1
12	12.1	12.1.1	12.1.1.1	12.1.1.1.1
13	13.1	13.1.1	13.1.1.1	13.1.1.1.1
14	14.1	14.1.1	14.1.1.1	14.1.1.1.1
15	15.1	15.1.1	15.1.1.1	15.1.1.1.1
16	16.1	16.1.1	16.1.1.1	16.1.1.1.1
17	17.1	17.1.1	17.1.1.1	17.1.1.1.1
18	18.1	18.1.1	18.1.1.1	18.1.1.1.1
19	19.1	19.1.1	19.1.1.1	19.1.1.1.1
20	20.1	20.1.1	20.1.1.1	20.1.1.1.1
21	21.1	21.1.1	21.1.1.1	21.1.1.1.1
22	22.1	22.1.1	22.1.1.1	22.1.1.1.1
23	23.1	23.1.1	23.1.1.1	23.1.1.1.1
24	24.1	24.1.1	24.1.1.1	24.1.1.1.1
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26	26.1	26.1.1	26.1.1.1	26.1.1.1.1
27	27.1	27.1.1	27.1.1.1	27.1.1.1.1
28	28.1	28.1.1	28.1.1.1	28.1.1.1.1
29	29.1	29.1.1	29.1.1.1	29.1.1.1.1
30	30.1	30.1.1	30.1.1.1	30.1.1.1.1
31	31.1	31.1.1	31.1.1.1	31.1.1.1.1
32	32.1	32.1.1	32.1.1.1	32.1.1.1.1
33	33.1	33.1.1	33.1.1.1	33.1.1.1.1
34	34.1	34.1.1	34.1.1.1	34.1.1.1.1
35	35.1	35.1.1	35.1.1.1	35.1.1.1.1
36	36.1	36.1.1	36.1.1.1	36.1.1.1.1
37	37.1	37.1.1	37.1.1.1	37.1.1.1.1
38	38.1	38.1.1	38.1.1.1	38.1.1.1.1
39	39.1	39.1.1	39.1.1.1	39.1.1.1.1
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44	44.1	44.1.1	44.1.1.1	44.1.1.1.1
45	45.1	45.1.1	45.1.1.1	45.1.1.1.1
46	46.1	46.1.1	46.1.1.1	46.1.1.1.1
47	47.1	47.1.1	47.1.1.1	47.1.1.1.1
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51	51.1	51.1.1	51.1.1.1	51.1.1.1.1
52	52.1	52.1.1	52.1.1.1	52.1.1.1.1
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56	56.1	56.1.1	56.1.1.1	56.1.1.1.1
57	57.1	57.1.1	57.1.1.1	57.1.1.1.1
58	58.1	58.1.1	58.1.1.1	58.1.1.1.1
59	59.1	59.1.1	59.1.1.1	59.1.1.1.1
60	60.1	60.1.1	60.1.1.1	60.1.1.1.1
61	61.1	61.1.1	61.1.1.1	61.1.1.

FA - FAIL AS-IS
FO - OPEN ON AIR OR ELECTRICAL FAILURE
FC - CLOSE ON AIR OR ELECTRICAL FAILURE

VALVE CONDITION

LO -- LOCKED OPEN
LC -- LOCKED CLOSED
NO -- NORMALLY OPEN
NC -- NORMALLY CLOSED
NE -- NORMALLY ENERGIZED
ND -- NORMALLY DE-ENERGIZED

MISCELLANEOUS

AC - ALTERNATING CURRENT
DC - DIRECT CURRENT

GRAINS

LCW - LOW CONDUCTIVITY WASTE
HCW - HIGH CONDUCTIVITY WASTE
SD - STORM DRAIN
NSD - NON-RADIOACTIVE STORM DRAIN
HSD - HOT SHOWER DRAIN

CONTROL VALVES

FCV - FLOW CONTROL VALVE
PCV - PRESSURE CONTROL VALVE
LCV - LEVEL CONTROL VALVE
TCV - TEMPERATURE CONTROL VALVE

PRESSURE UNIT

 $\sigma_0 = \text{kg/m}^2$

NOTES (CONT)

1). DESIGN AND SAFETY CLASSIFICATION CORRELATION

BOUNDARY SYMBOL		REFERENCE TABLE 3-2-2 OF 236600	
DESIGN CLASS	QUALITY CLASS	SAFETY DESIGNATION	QUALITY GROUP
1	A	SC-1	A
2	B	SC-2	B
3	A	SC-2	B
	B	SC-2	B
4	A	SC-2	B
	C	SC-3	C
	D	NWS	C
	F	-	-
5	B	SC-2	B
6	D	NWS	D
	F	-	-
7	C	-	-
	D	-	-
	F	-	-
	G	-	-

SEISMIC DESIGN CLASSIFICATION CORRELATION

SEISMIC CLASS *	SEISMIC CATEGORY
Aa	I
A	I
B	II
C	NSC

NNS - NON NUCLEAR SAFETY
NCS - NON SEISMIC CATEGORY I

* S_1 AND S_2 ARE RESPECTIVELY, DESIGN EARTHQUAKE MAXIMUM AND EXTREME LOADS

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CANO

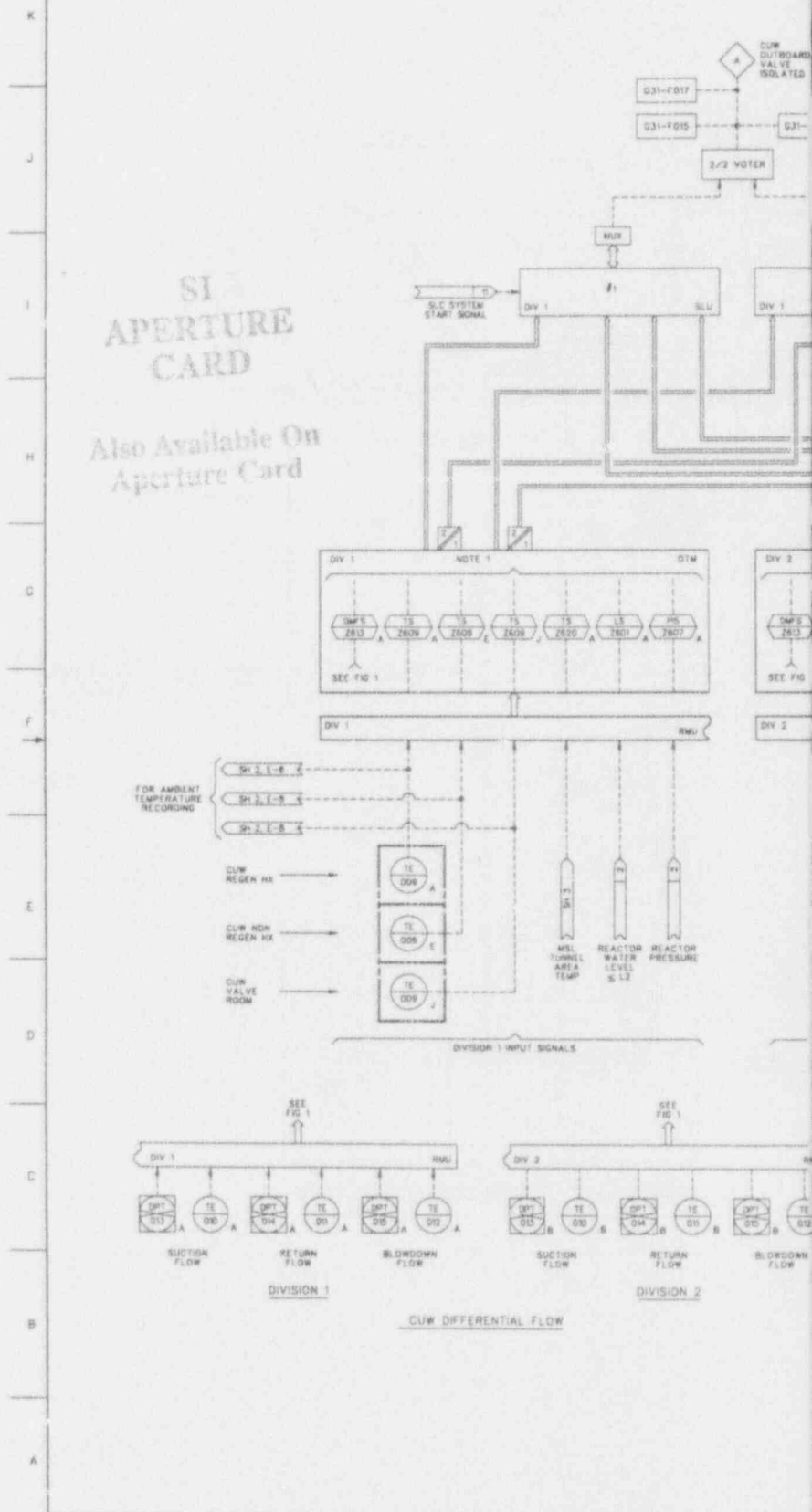
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Figure 1.7-1 PIPING AND INSTRUMENTATION DIAGRAM SYMBOLS, (Sheet 2 of 2)

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SI APERTURE CARD

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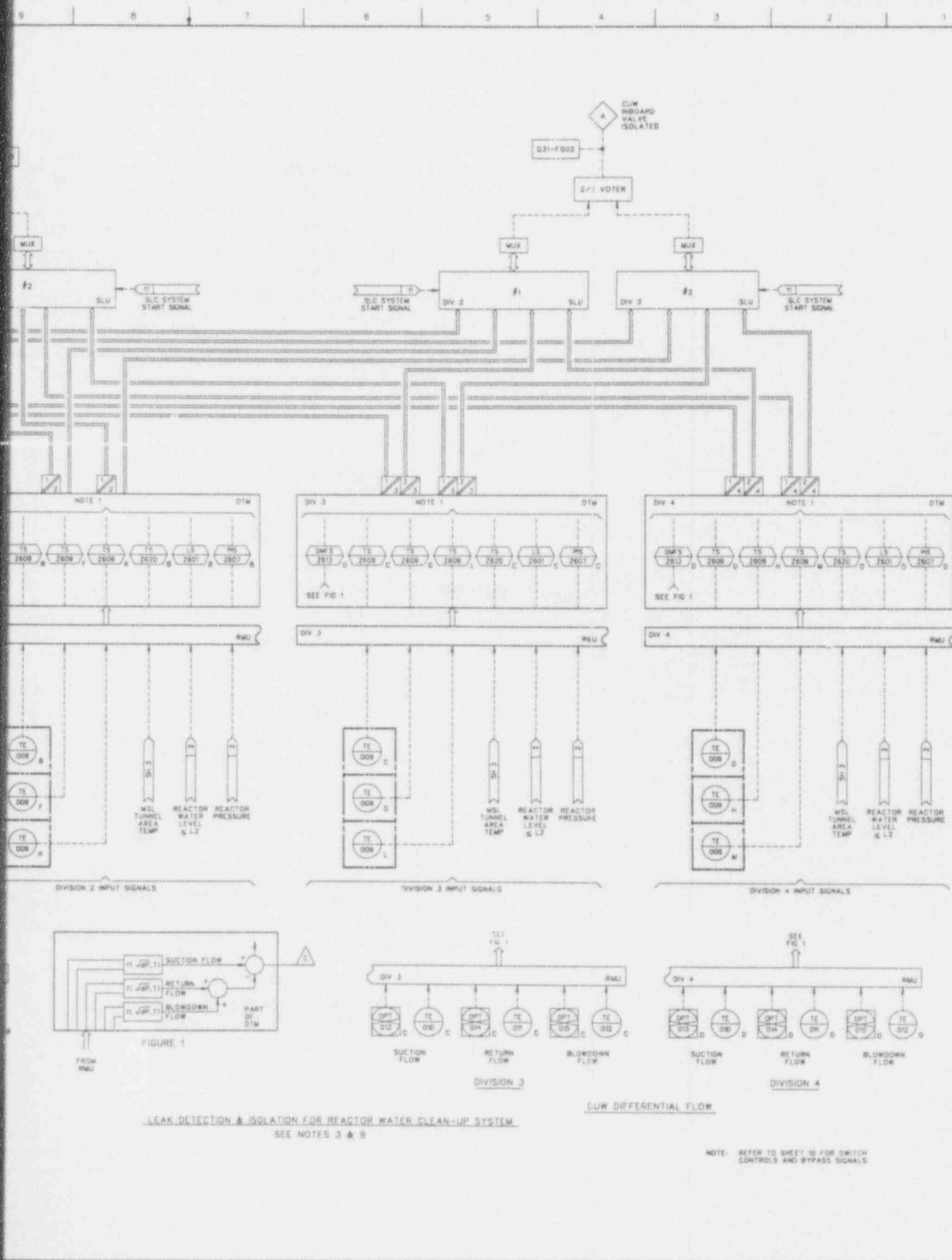
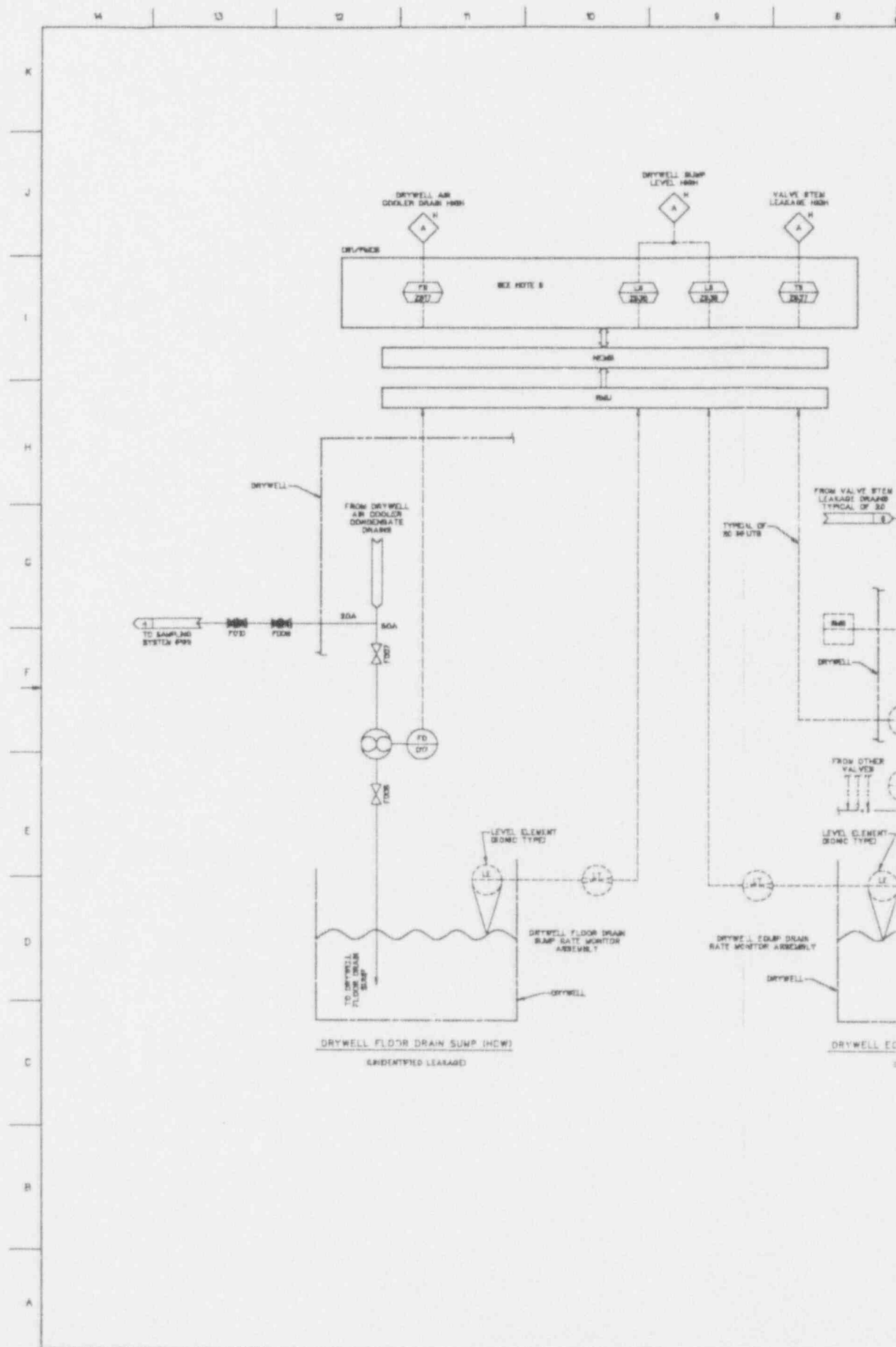
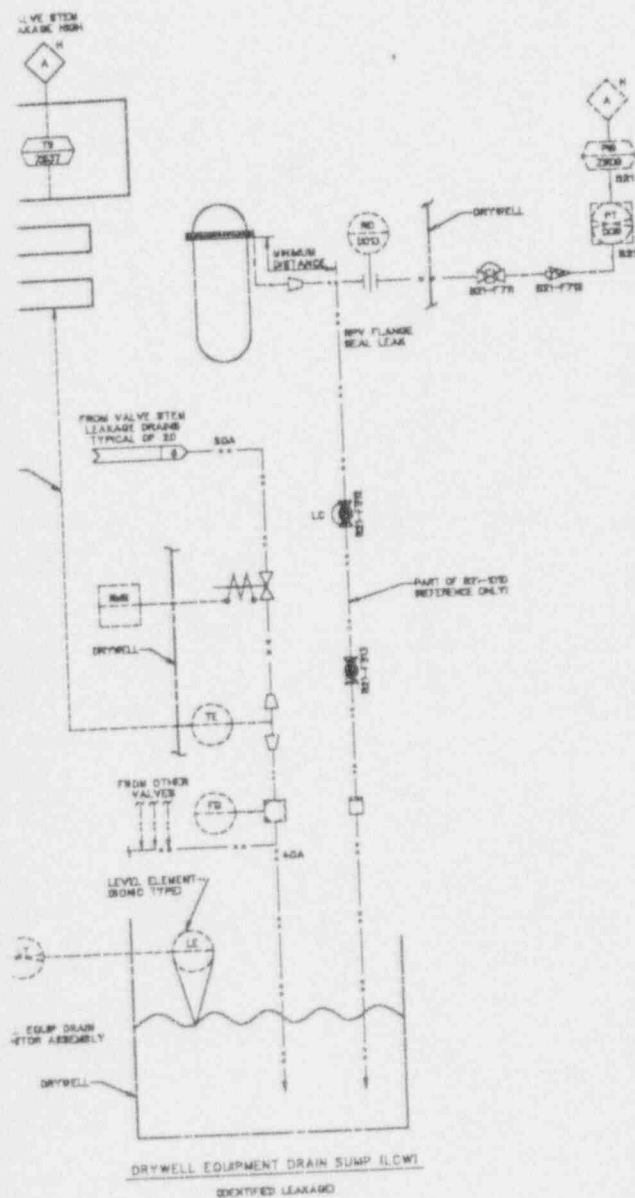


Figure 5.2-8 LEAK DETECTION AND ISOLATION SYSTEM IED (Sheet 7 of 10)



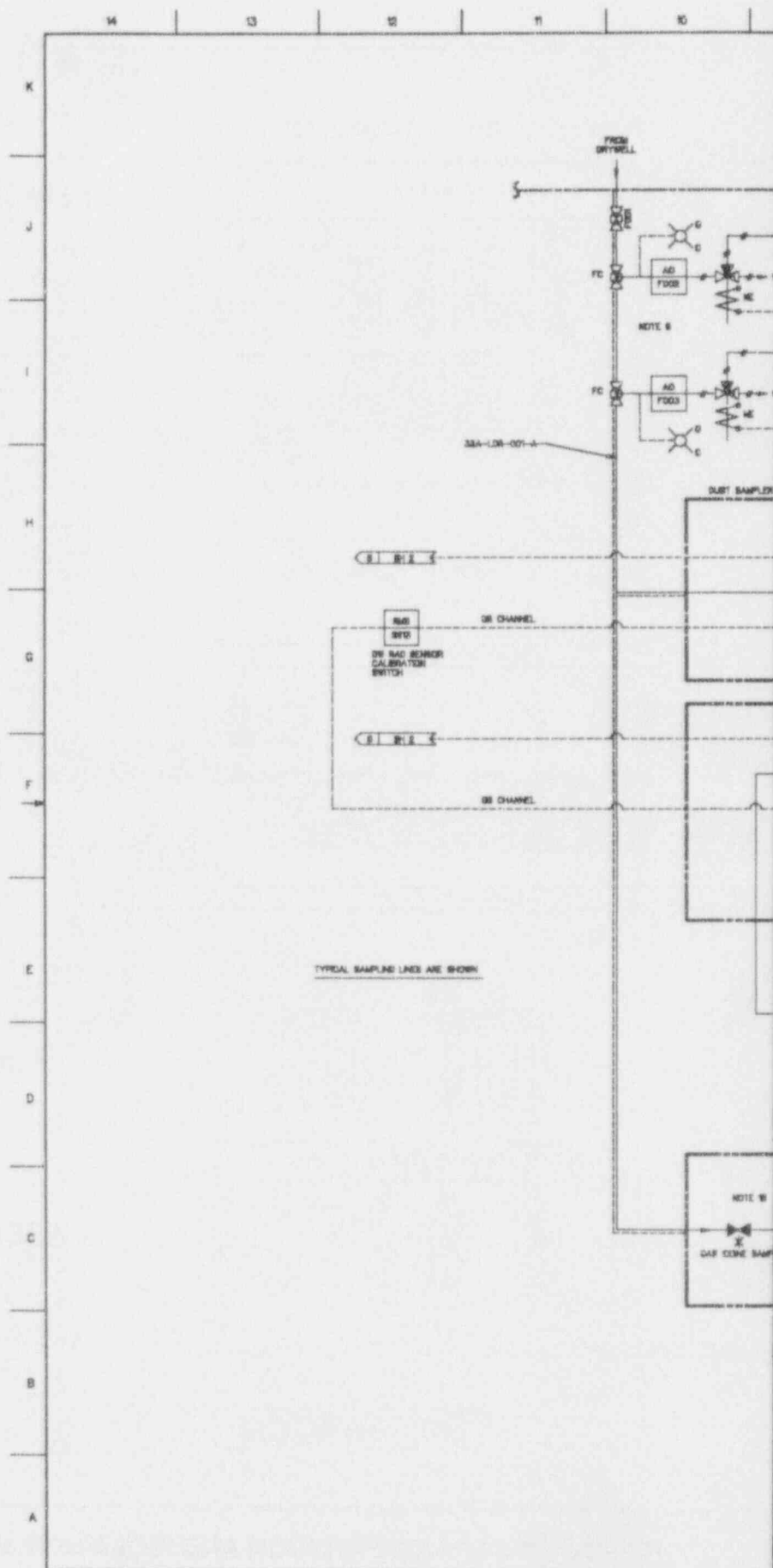


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Figure 5.2-8 LEAK DETECTION AND ISOLATION SYSTEM IED (Sheet 8 of 10)



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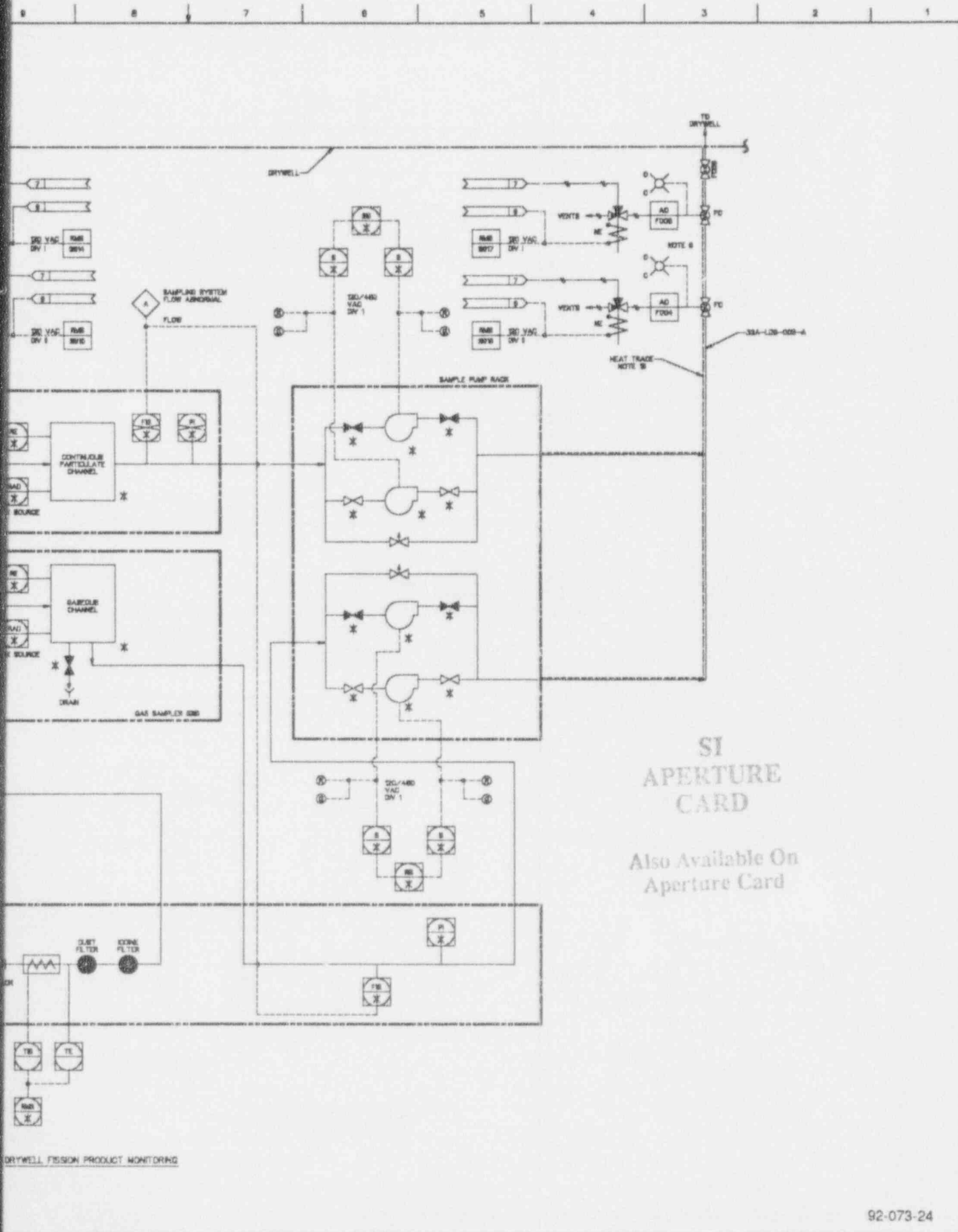
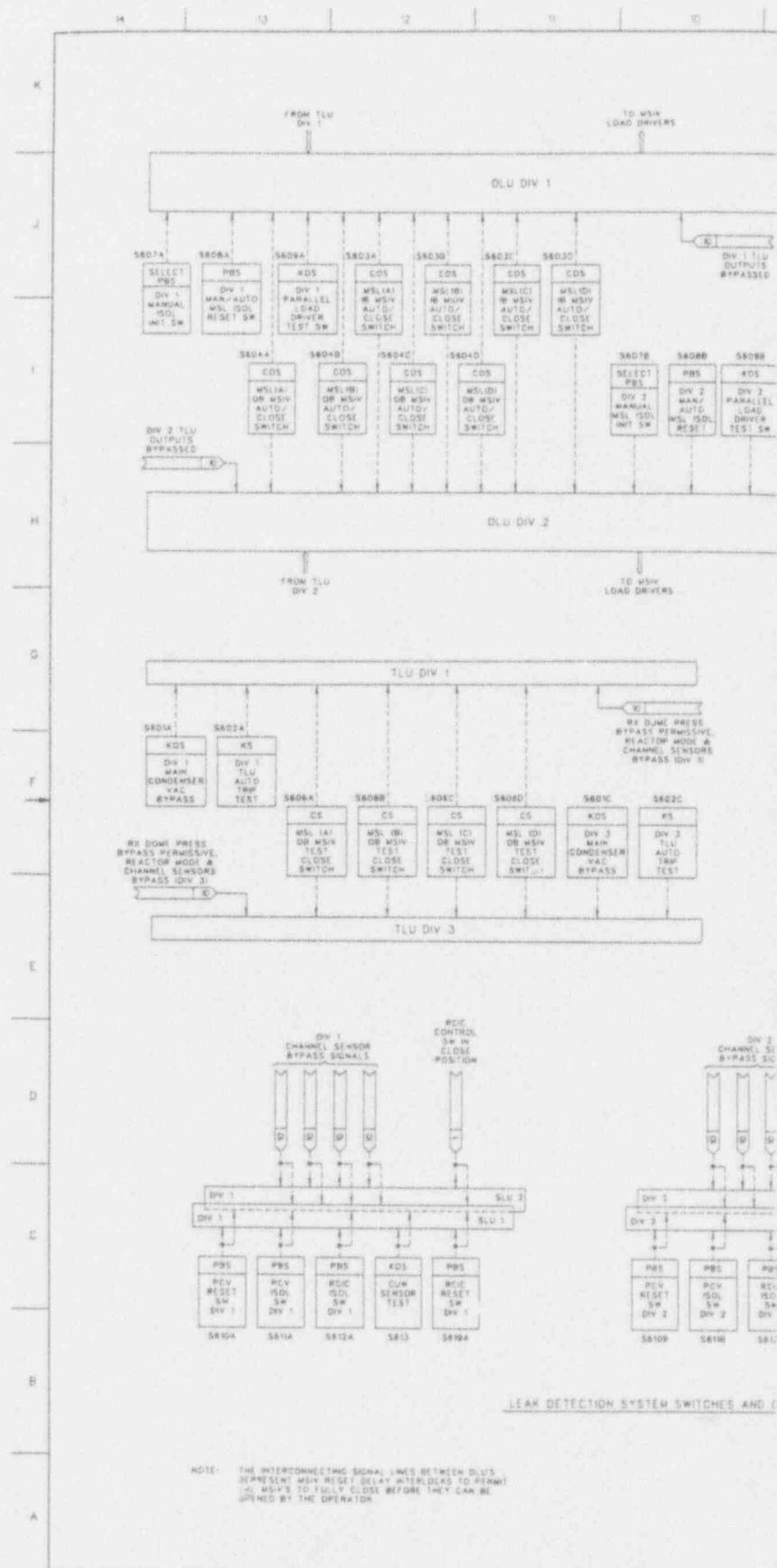
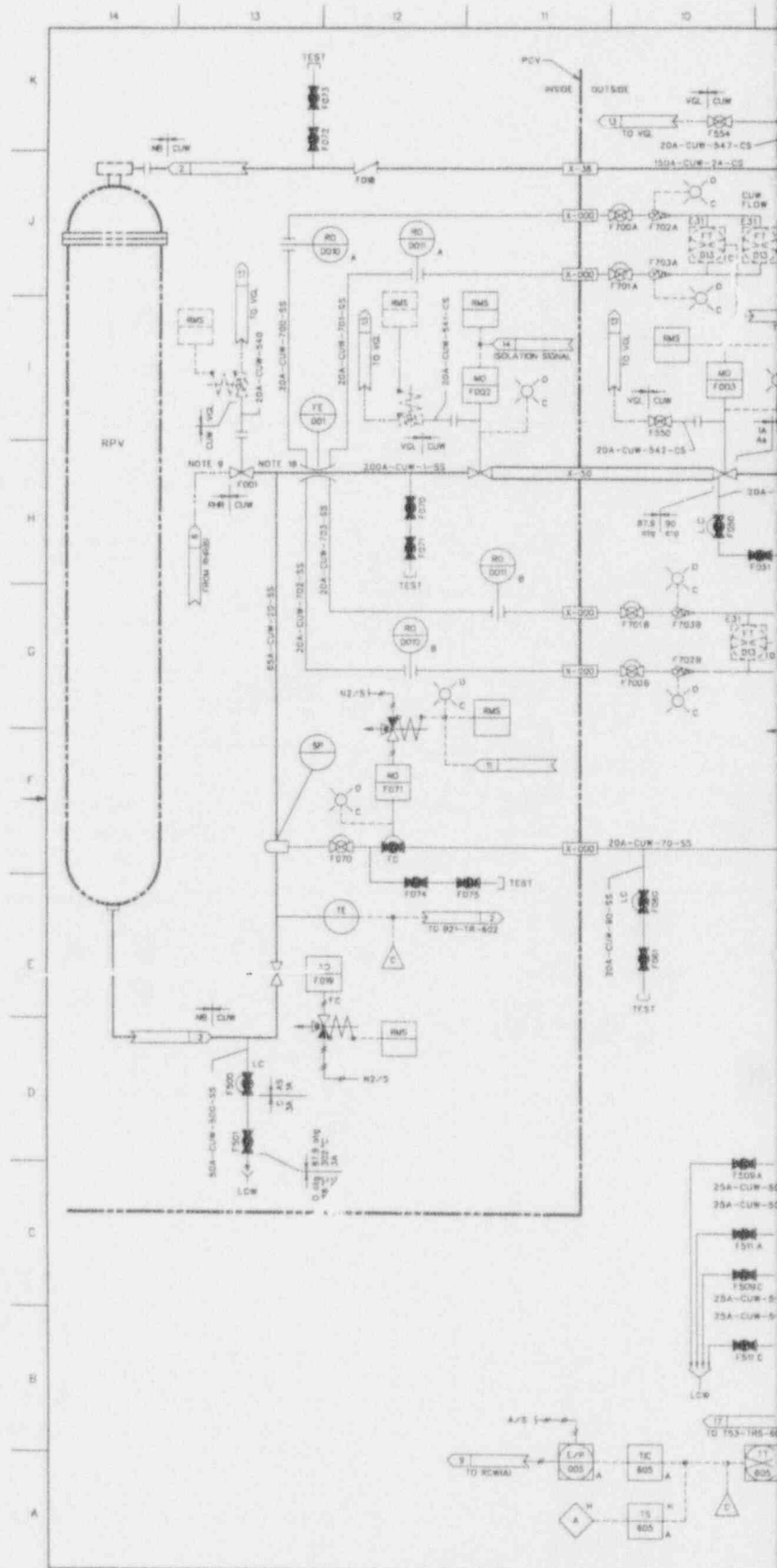


Figure 5.2-8 LEAK DETECTION AND ISOLATION SYSTEM IED (Sheet 9 of 10)





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ABWR Standard Plant

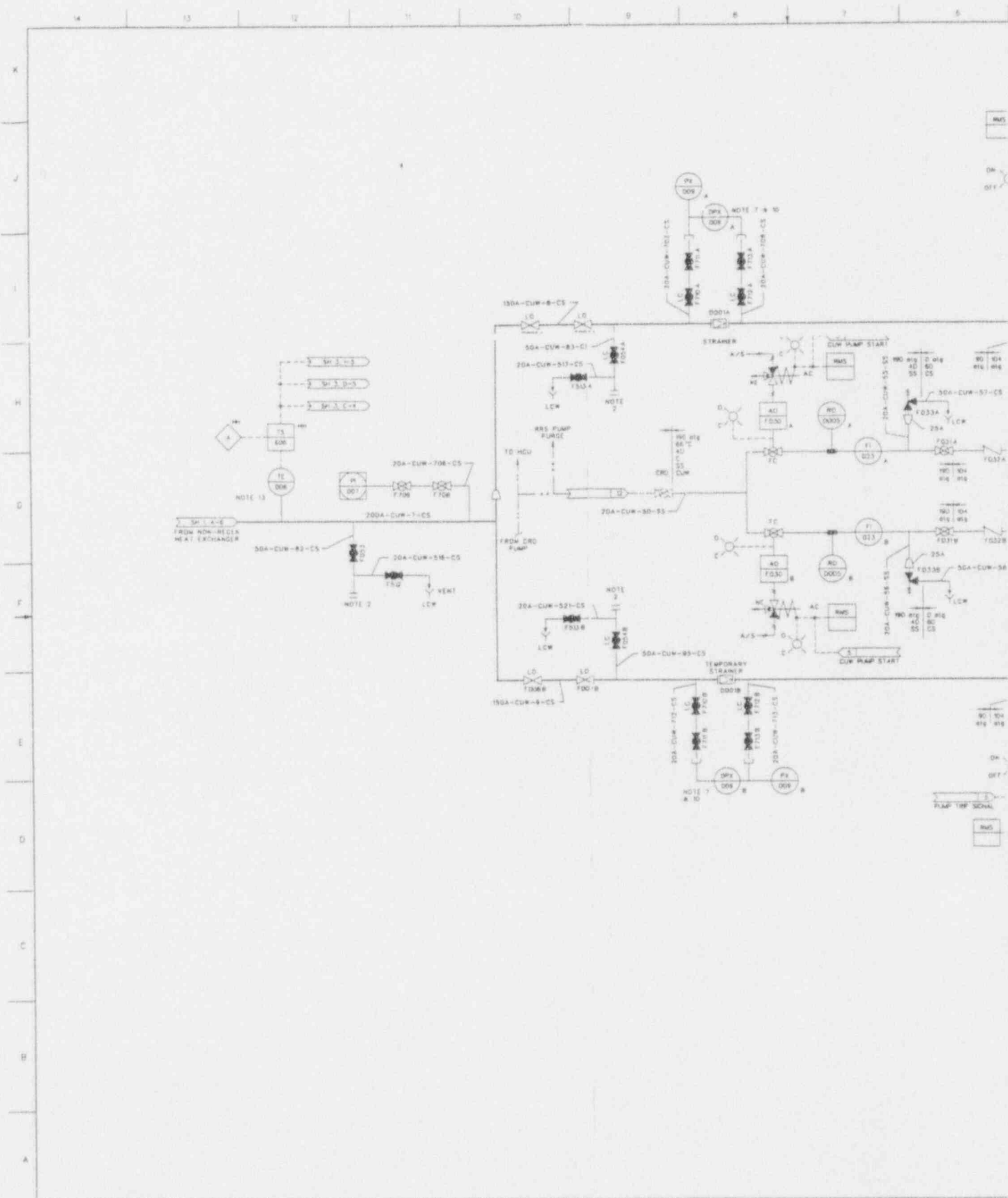
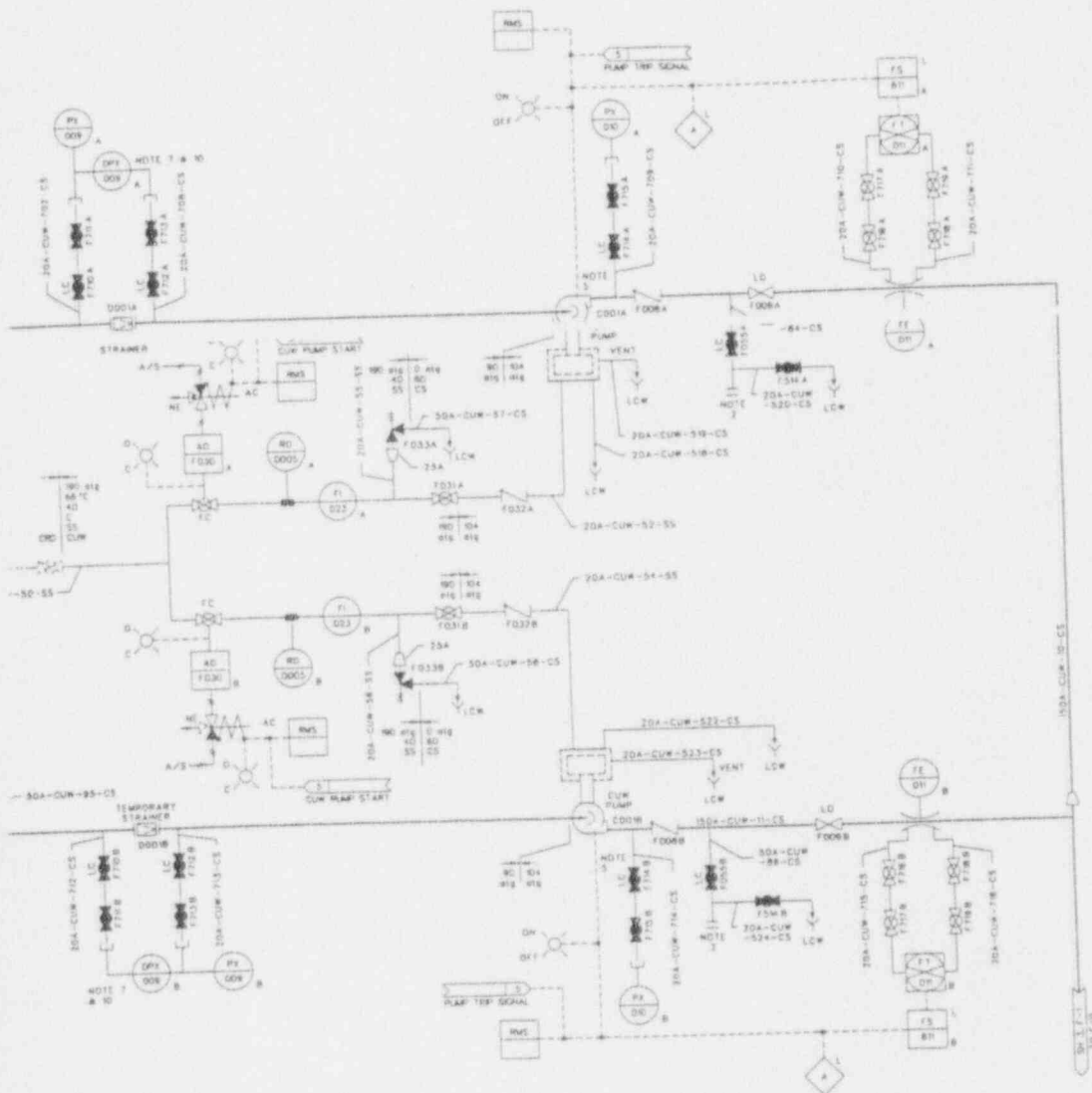


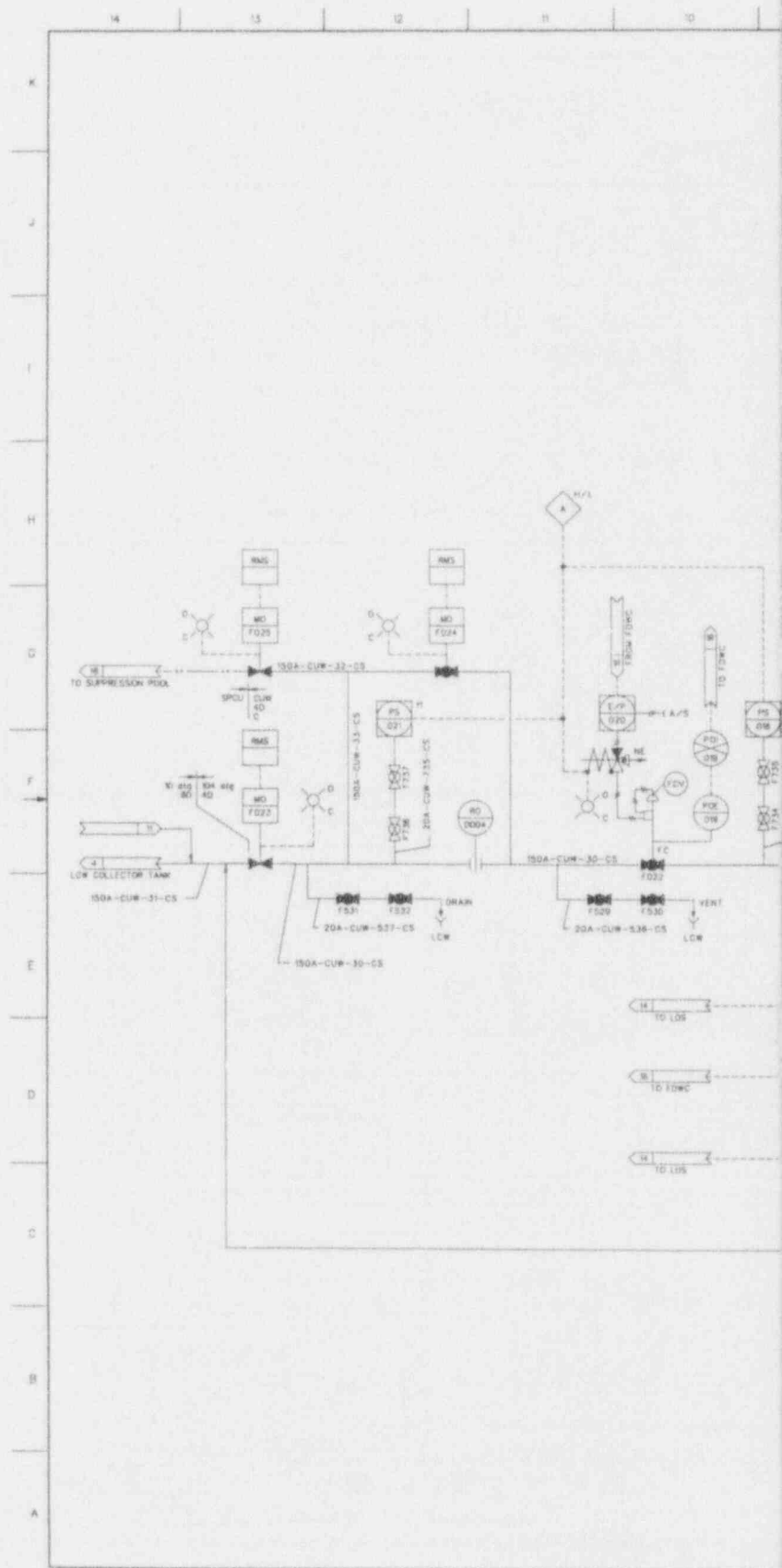
Figure 5.4-12 REACTOR WAT

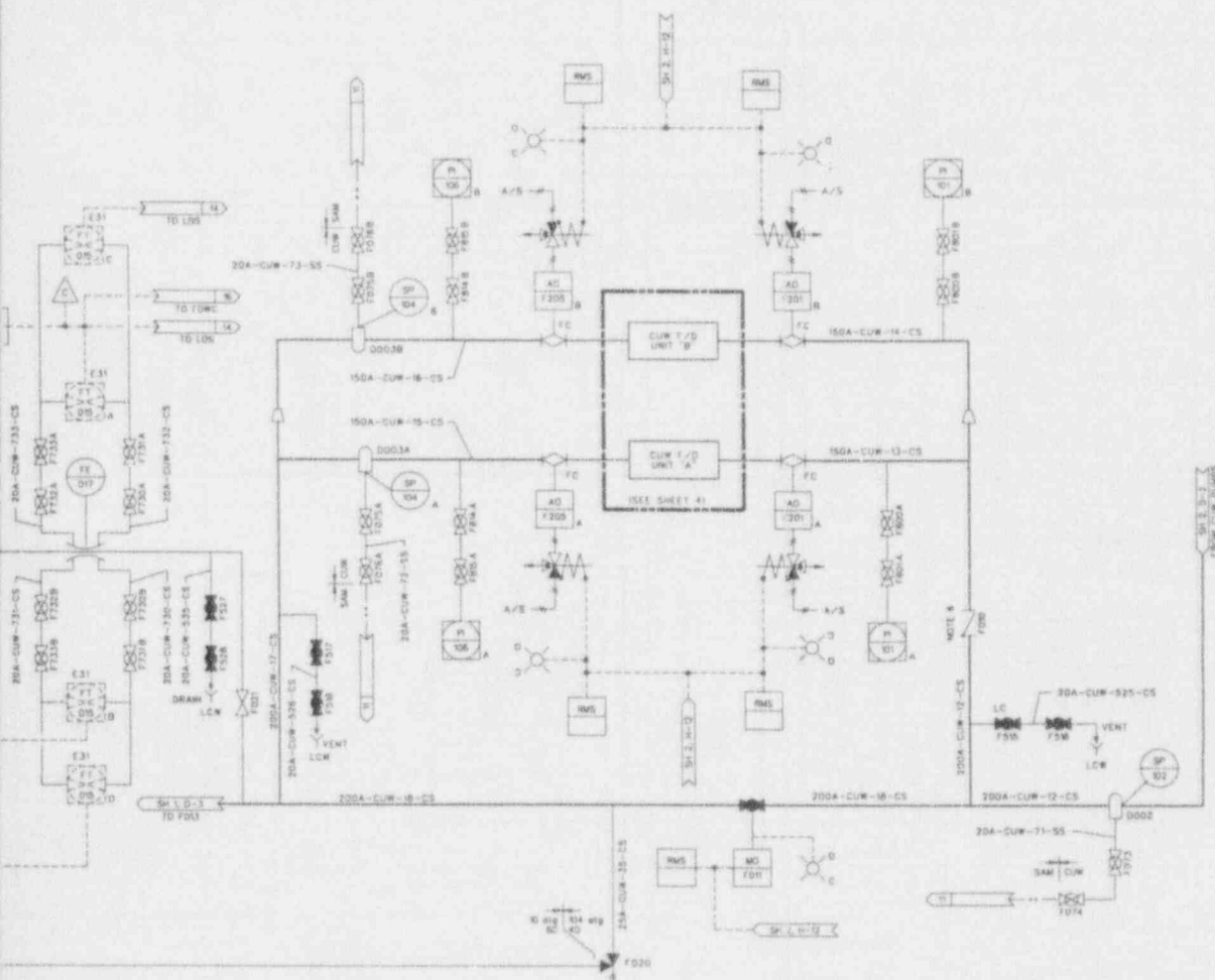


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Figure 5.4-12 REACTOR WATER CLEANUP SYSTEM P&ID, (Sheet 2 of 4)





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Figure 5.4-12 REACTOR WATER CLEANUP SYSTEM P&ID, (Sheet 3 of 4)

ABWR Standard Plant

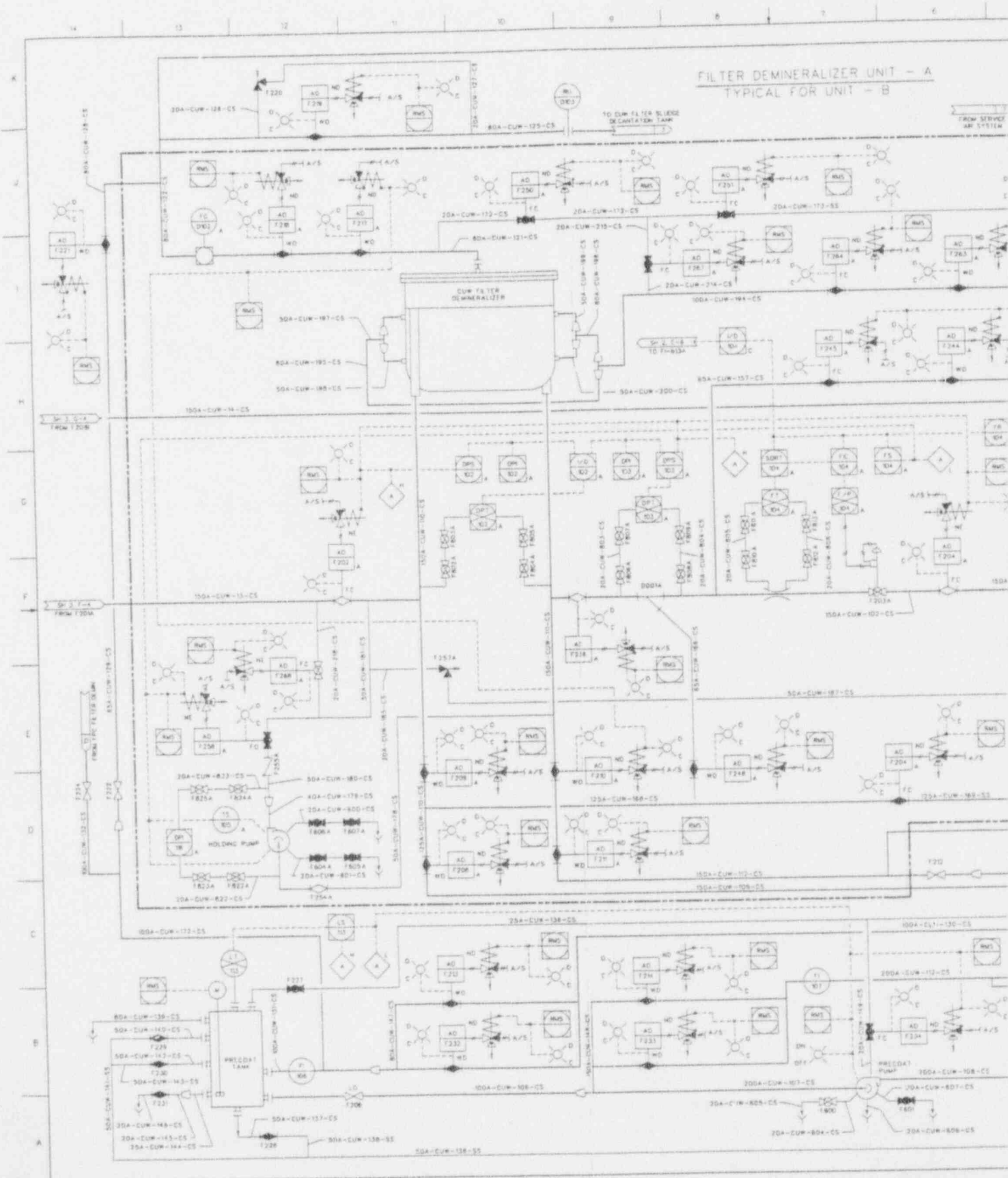


Figure 5.4-12 REACTOR WAT

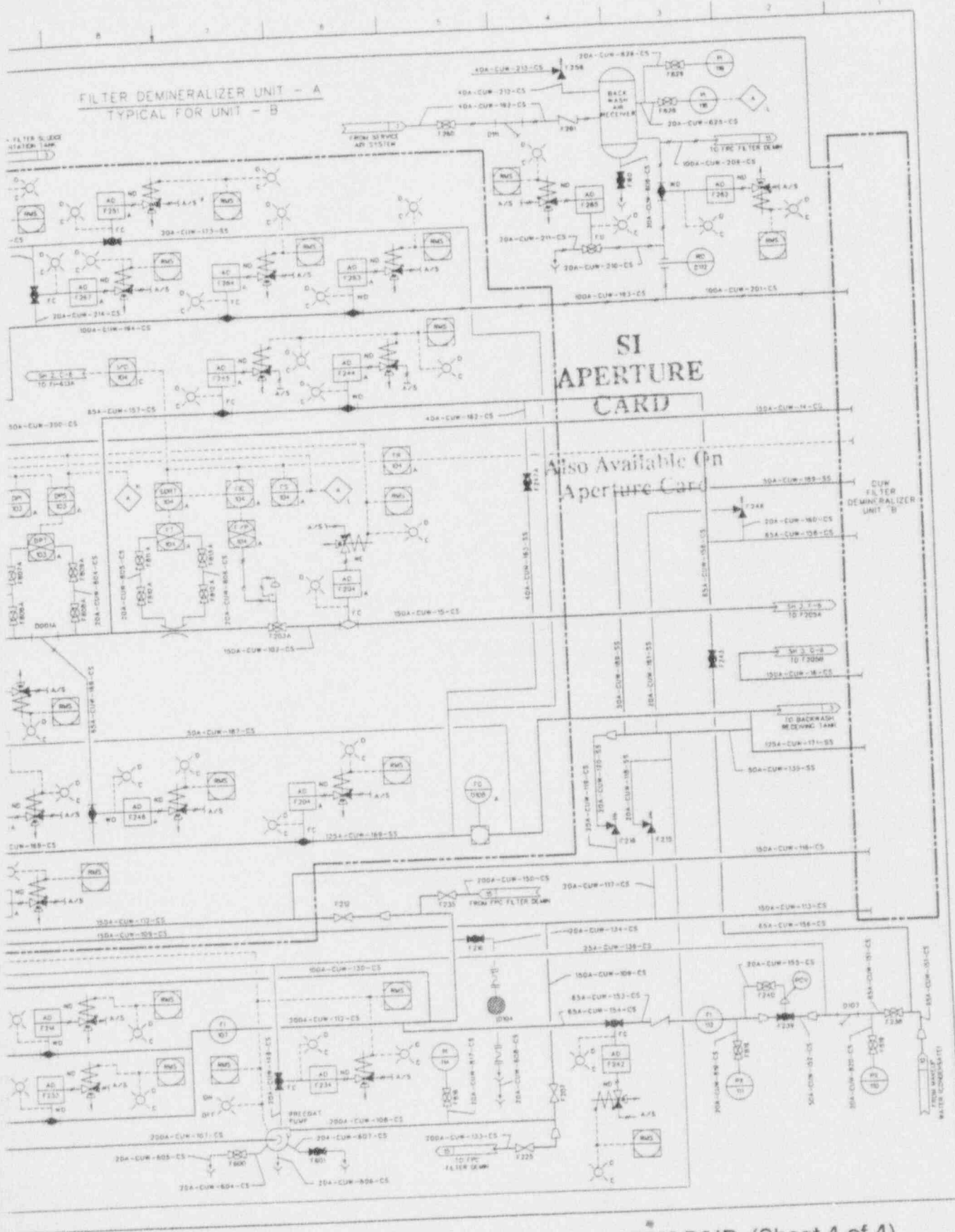
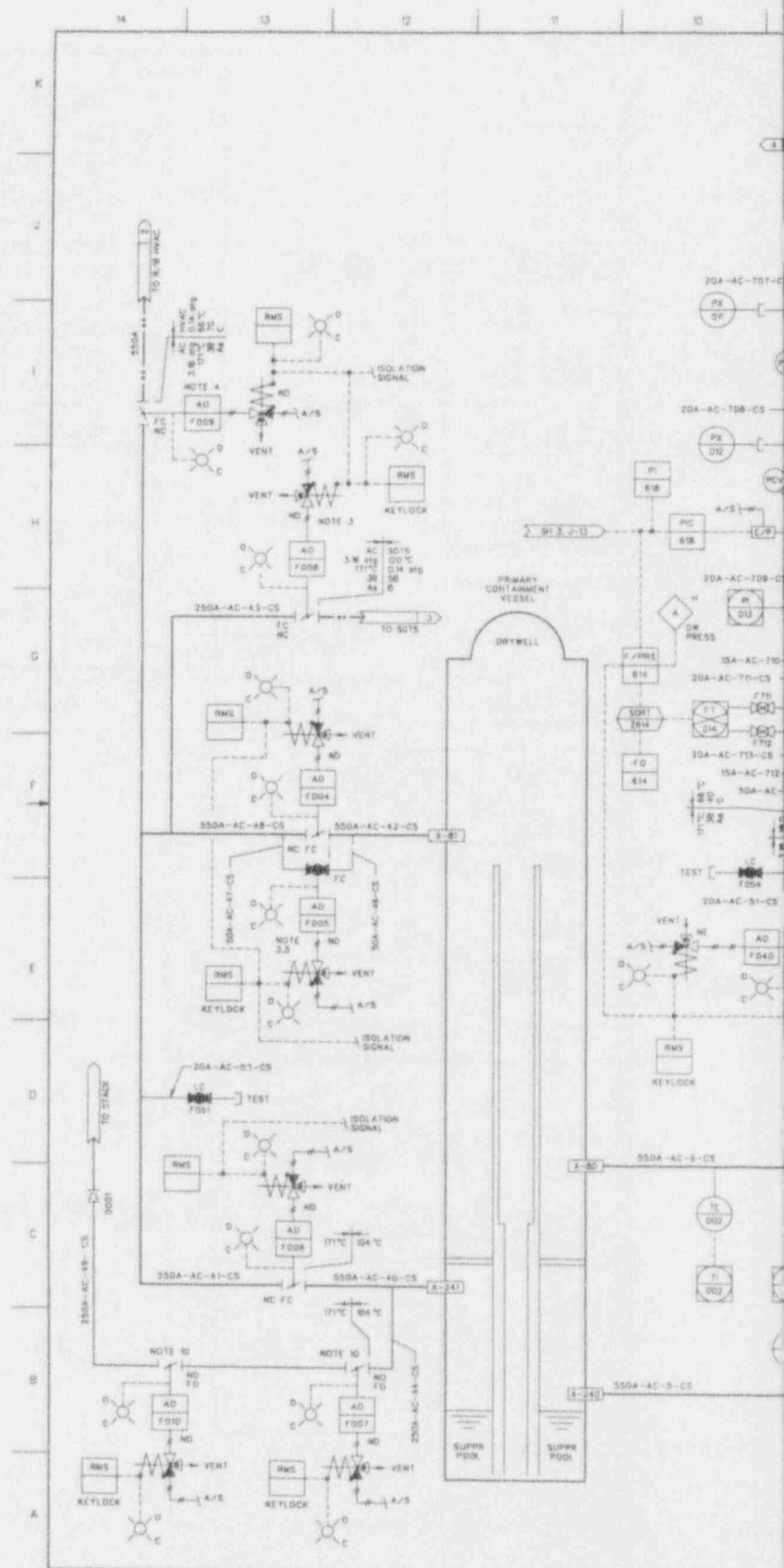


Figure 5.4-12 REACTOR WATER CLEANUP SYSTEM P&ID, (Sheet 4 of 4)

5.4-62.2



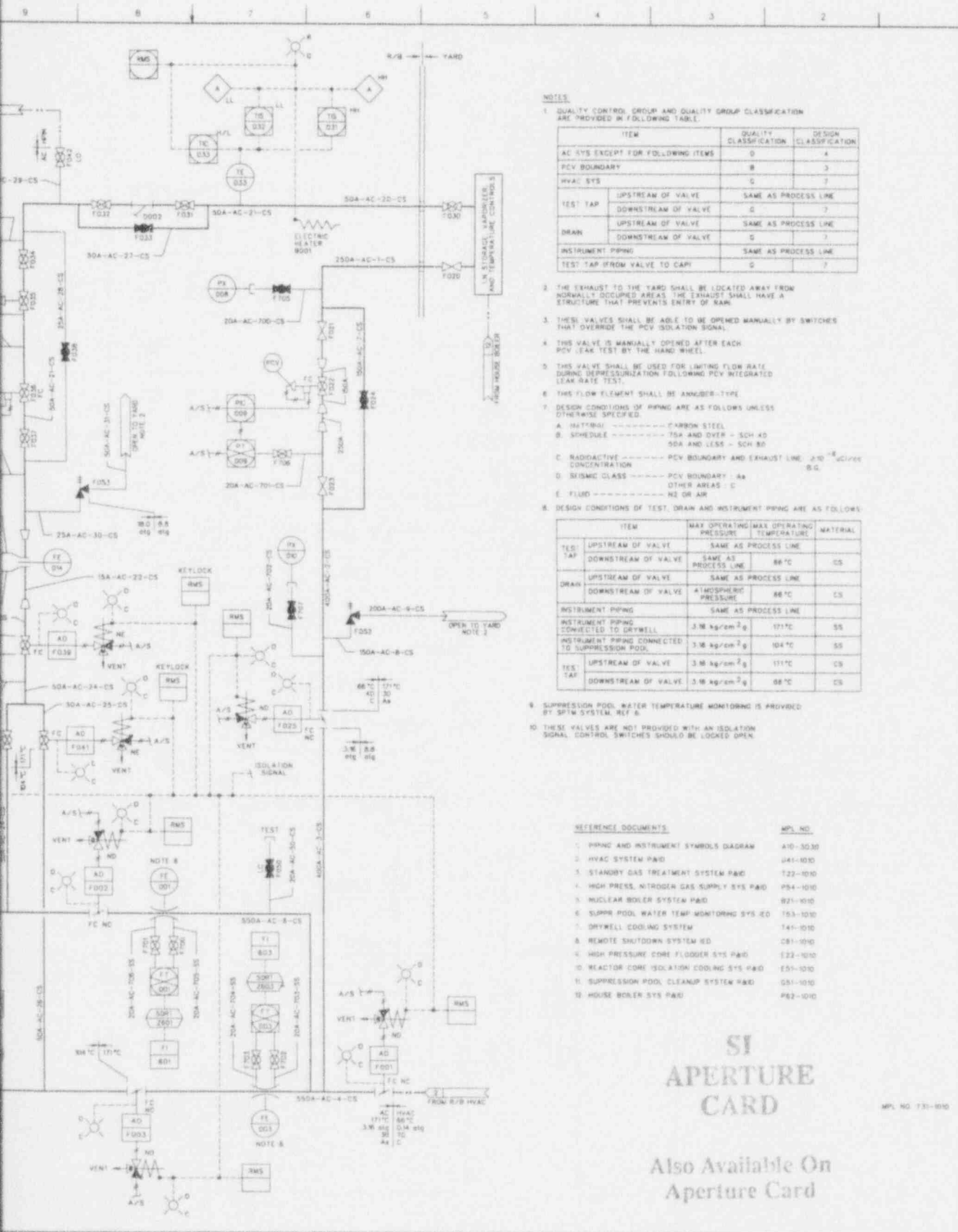


Figure 6.2-39 ATMOSPHERIC CONTROL SYSTEM P&ID, (Sheet 1 of 3)

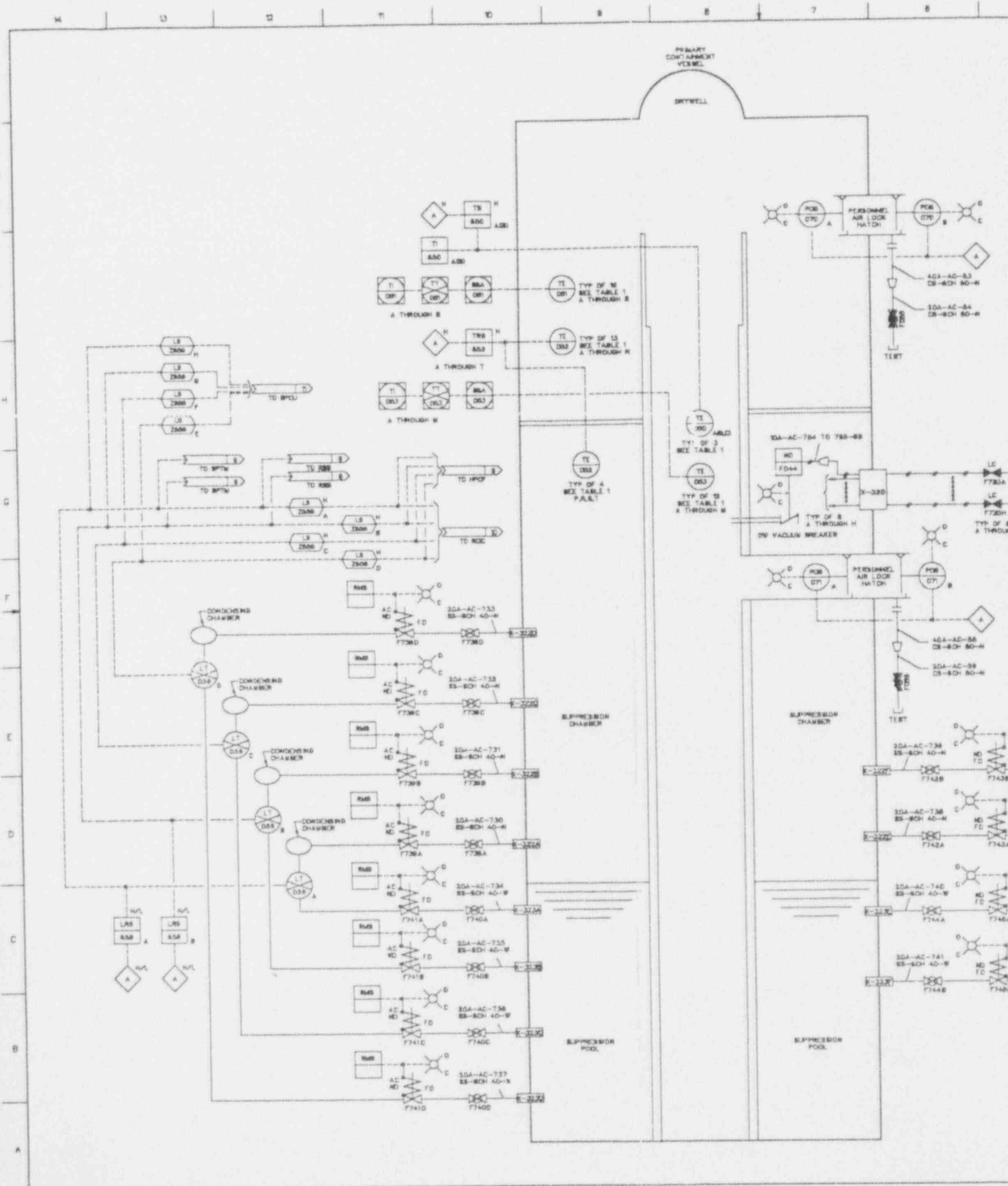


Figure 6.2-39

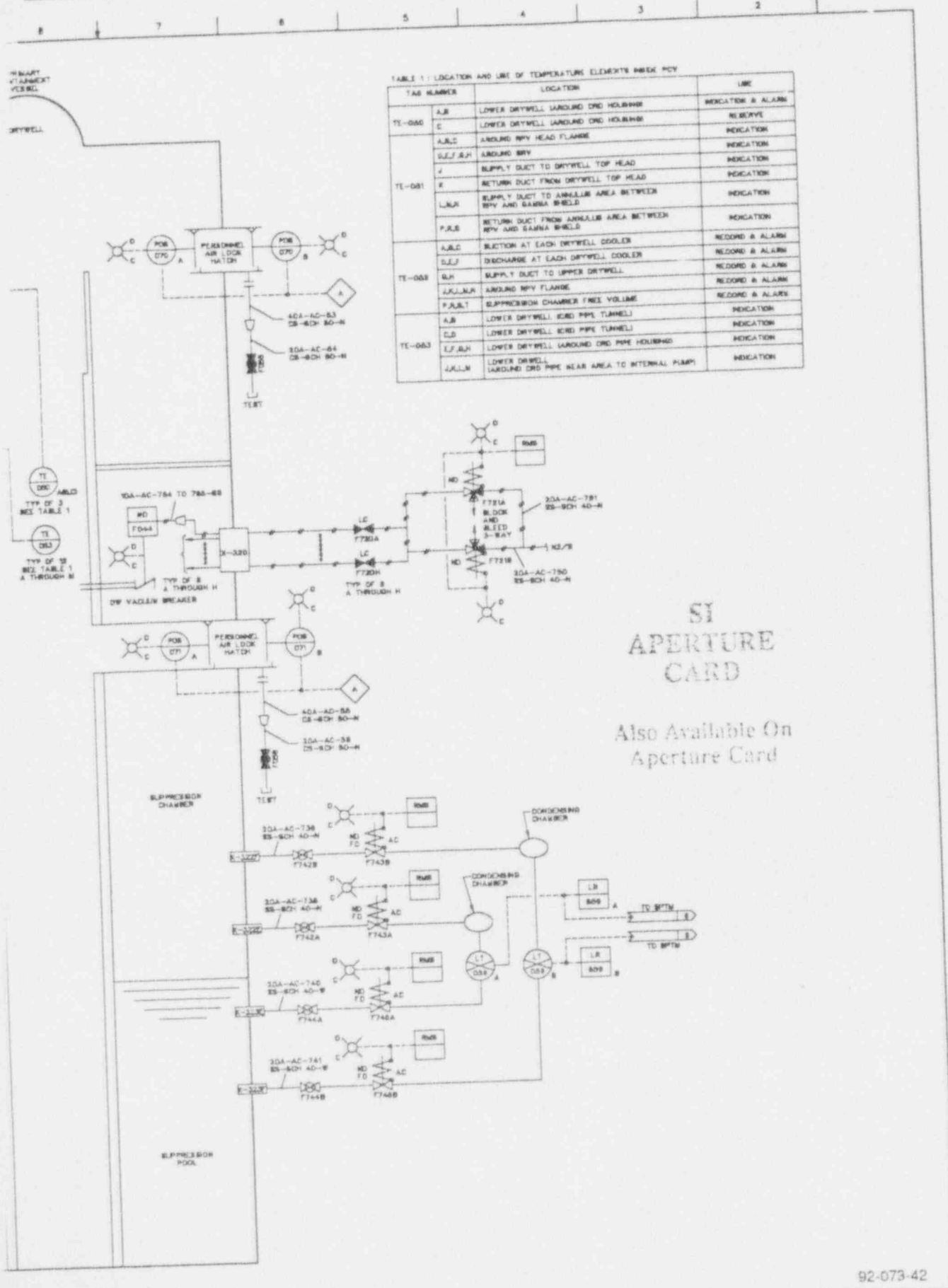
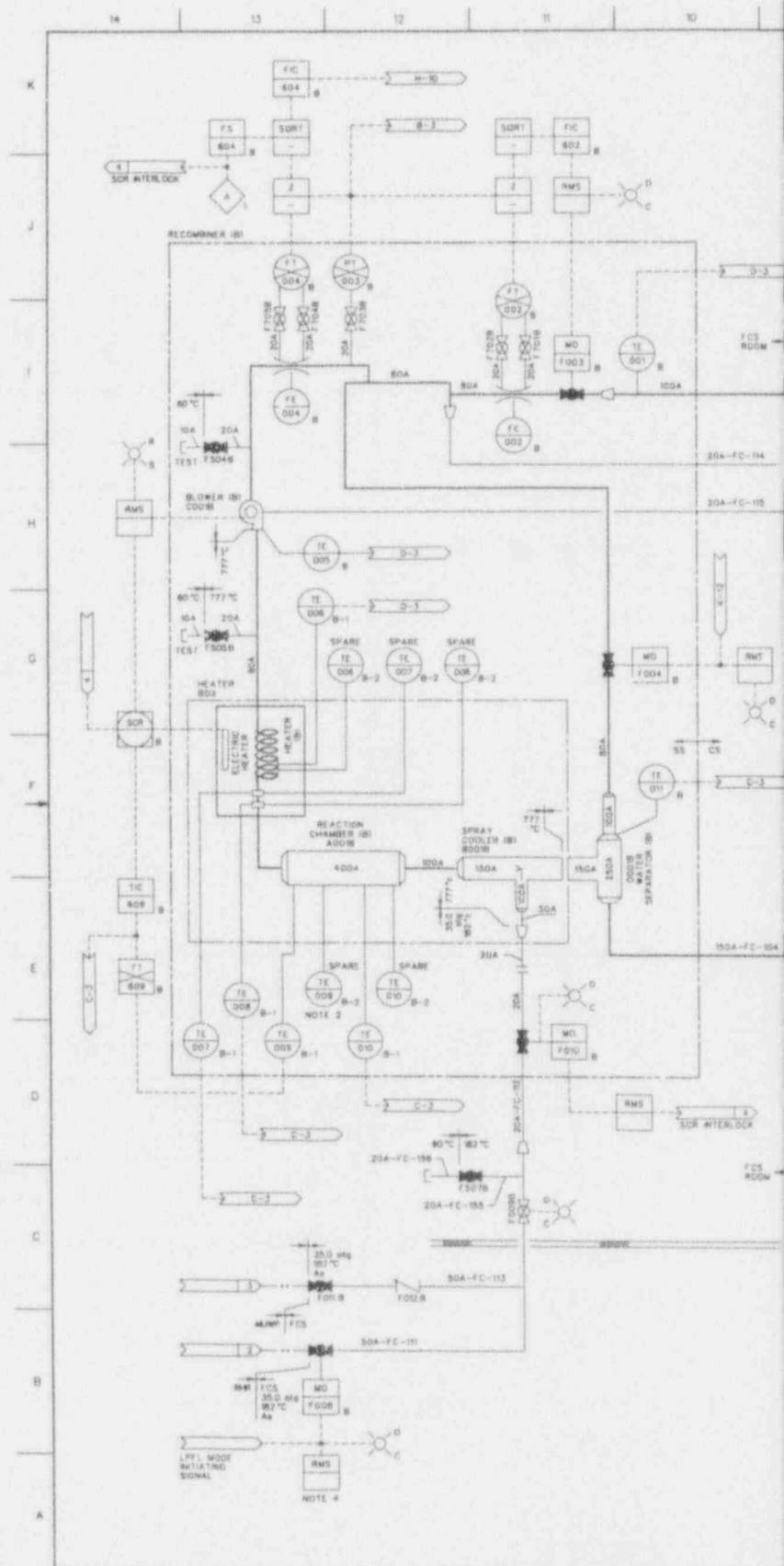


Figure 6.2-39 ATMOSPHERIC CONTROL SYSTEM P&ID (Sheet 2 of 3)



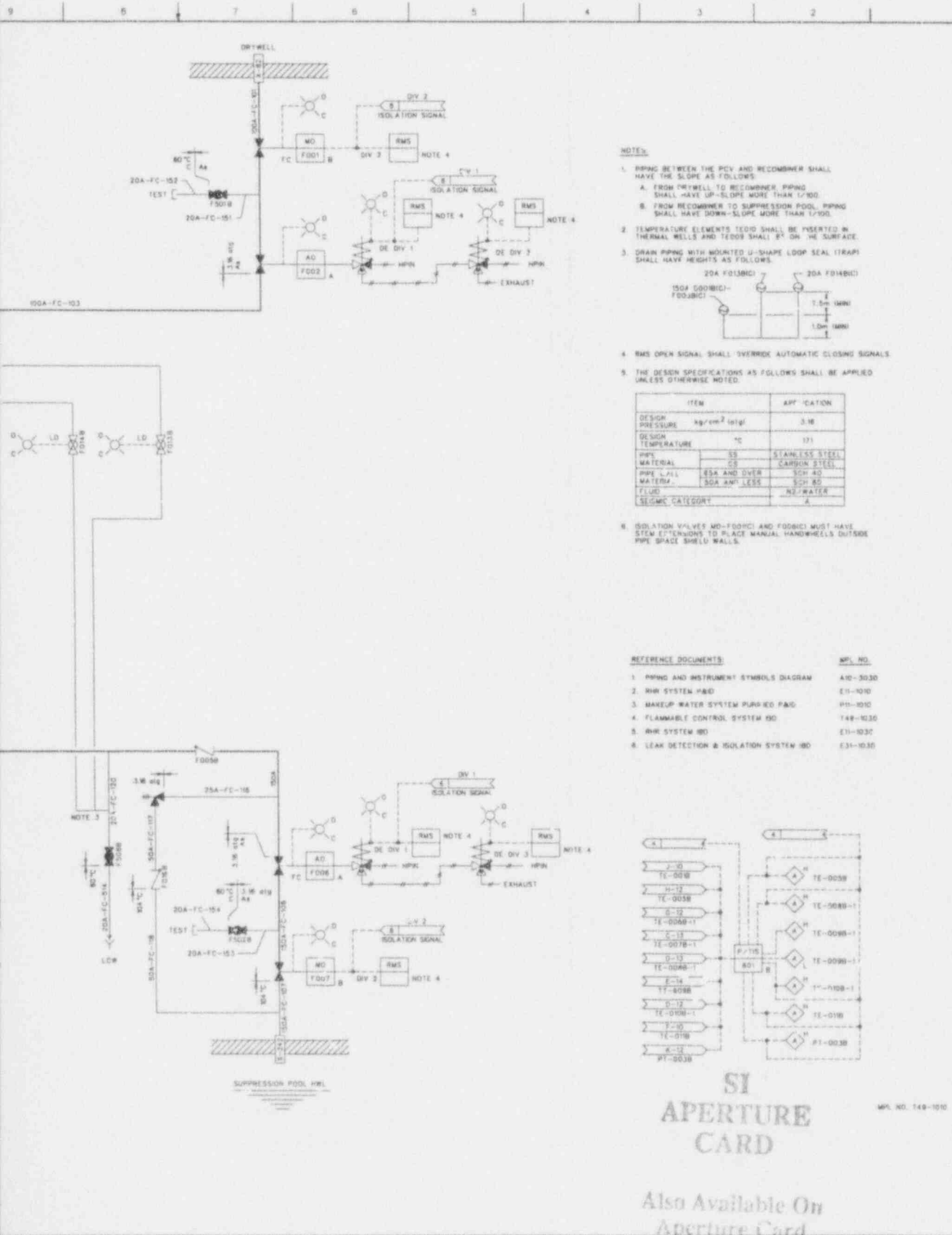


Figure 6.2-40 FLAMMABILITY CONTROL SYSTEM P&ID, (Sheet 1 of 2)

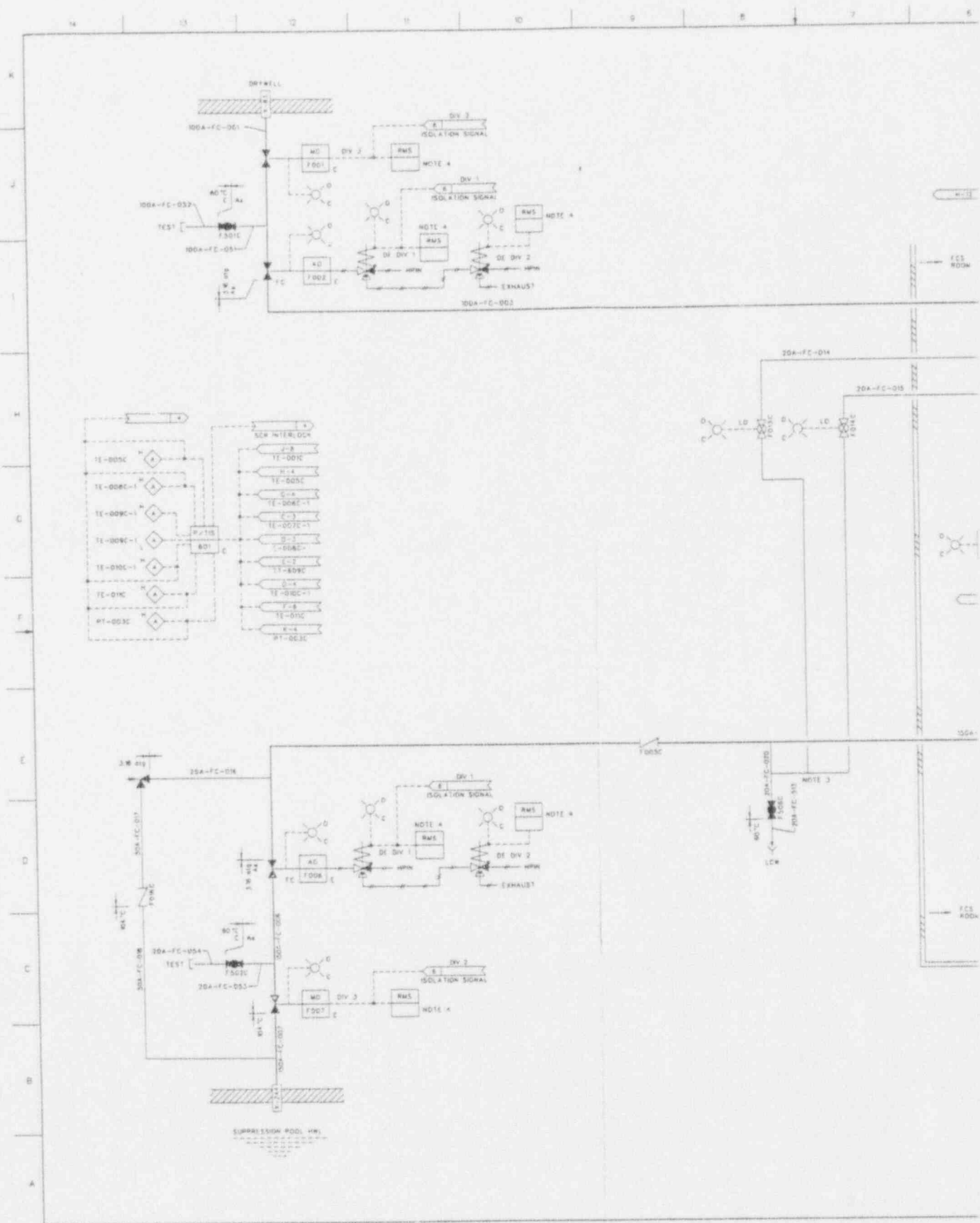
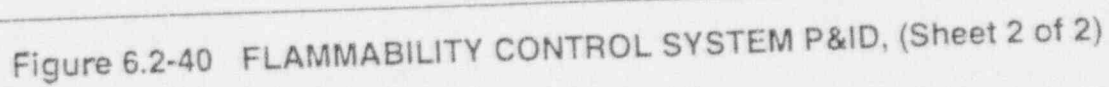
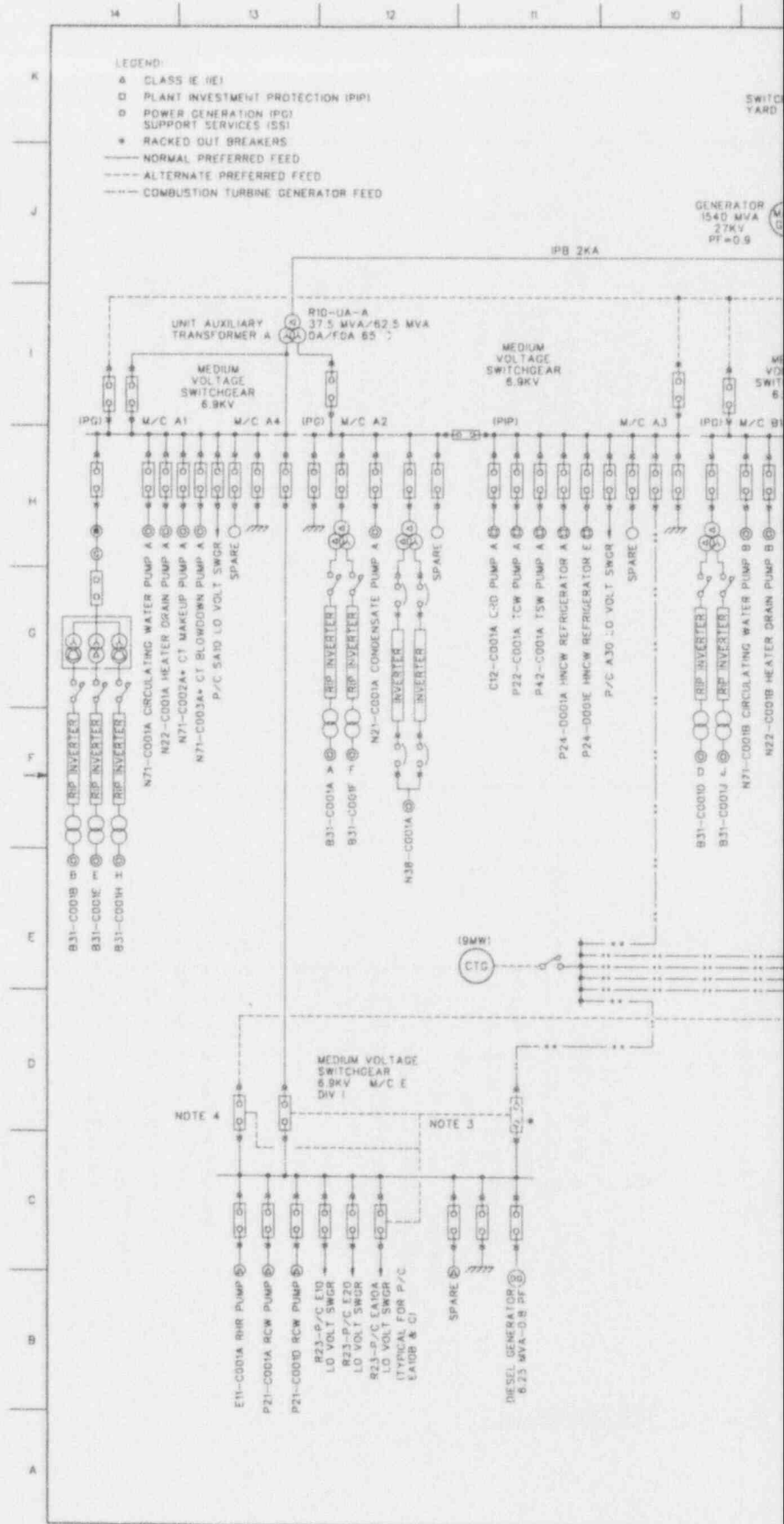


Figure 6.2-40 FLAN





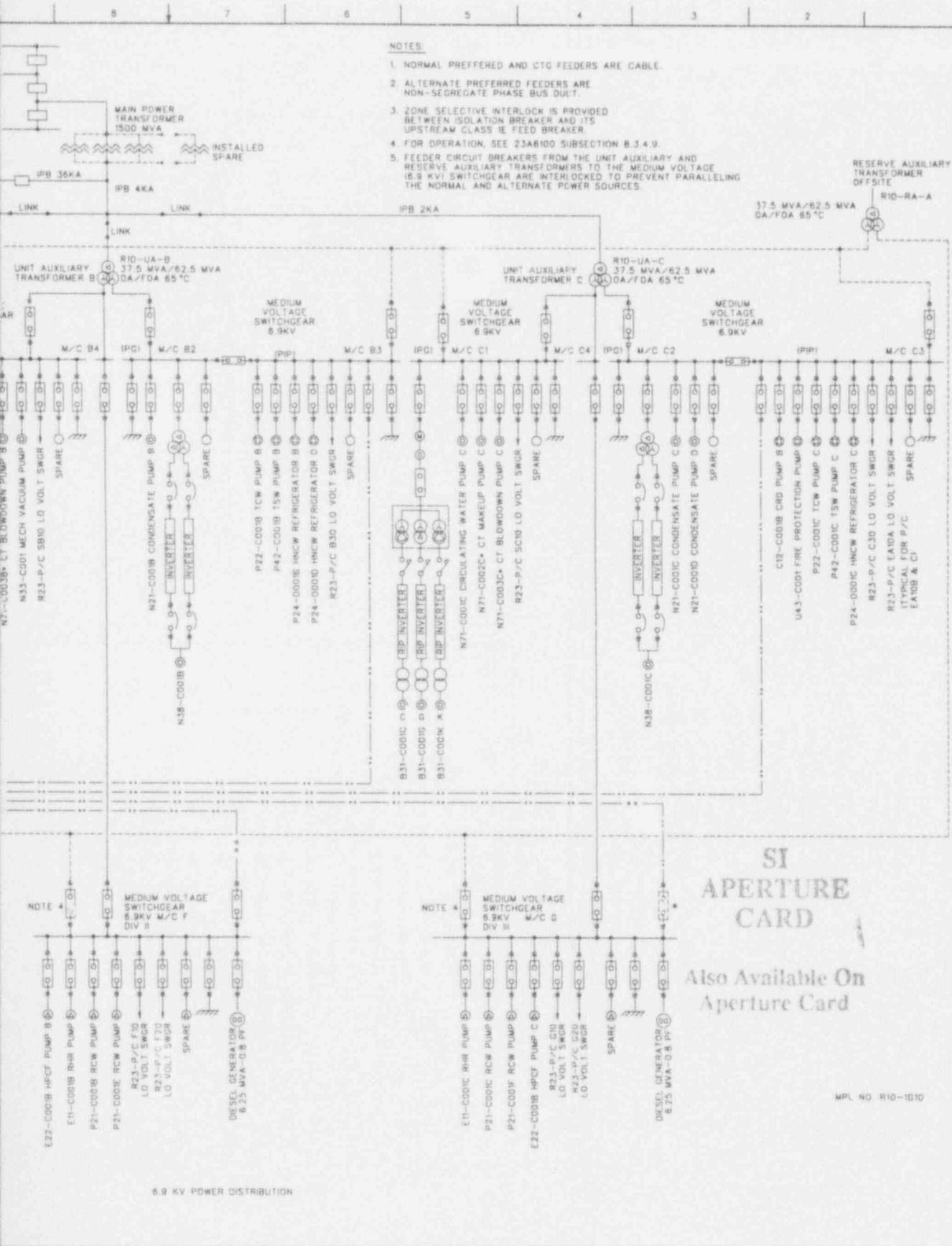


Figure 8.3-1 ELECTRICAL POWER DISTRIBUTION SYSTEM SLD, (Sheet 1 of 3)

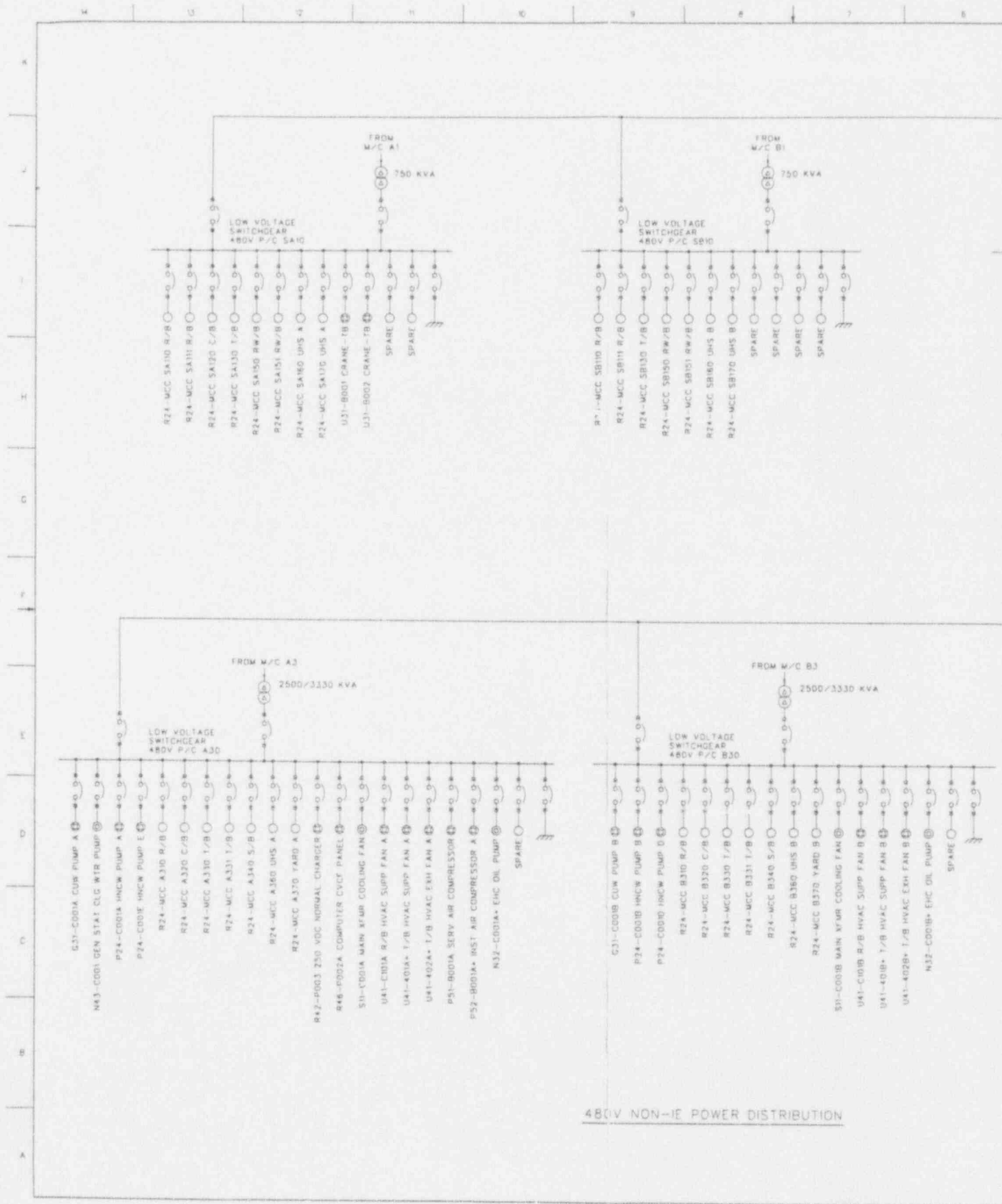
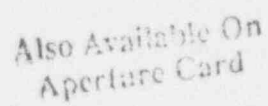
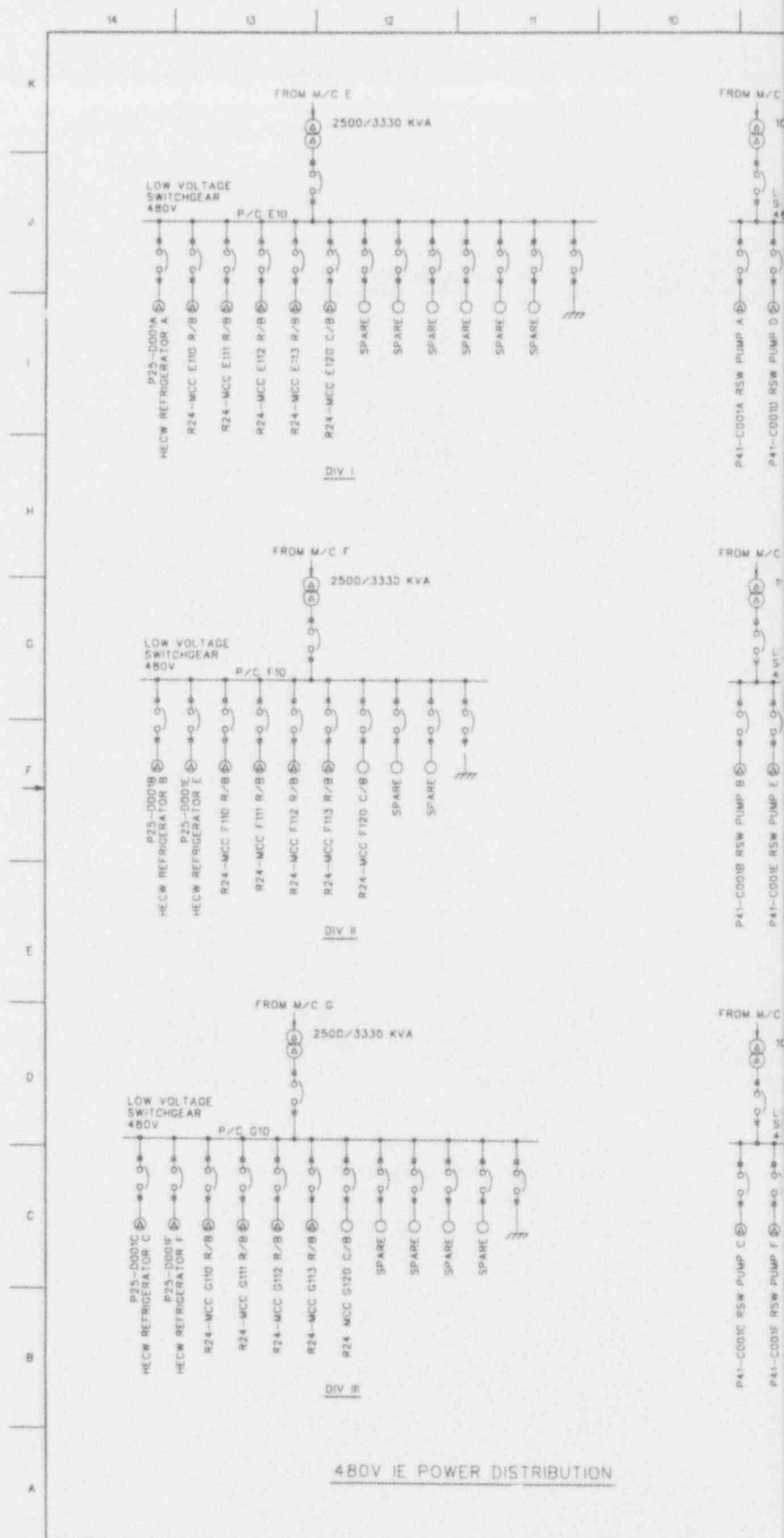


Figure 8.3-1 ELECTRICAL PO

Amendment 27



8.3-31



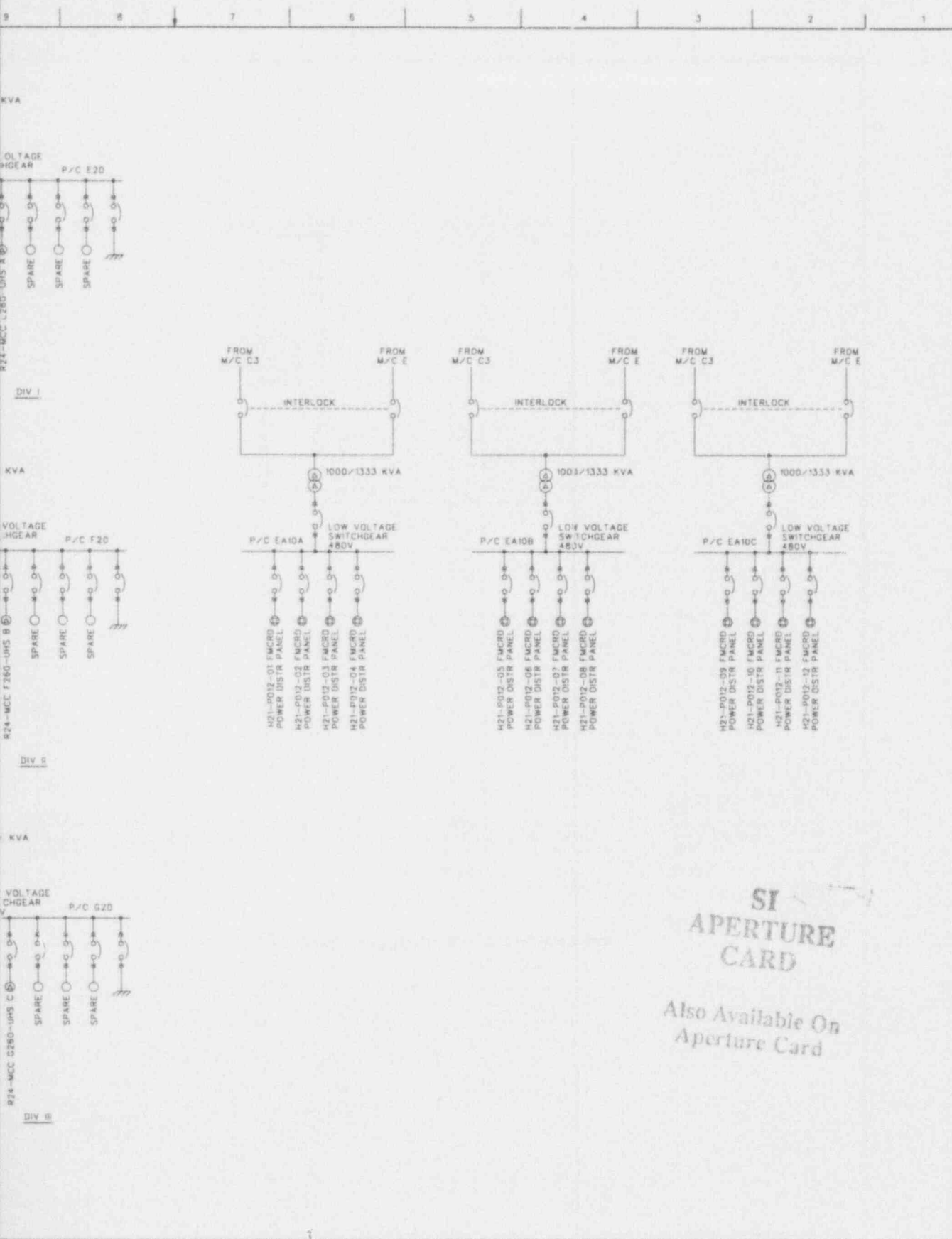


Figure 8.3-1 ELECTRICAL POWER DISTRIBUTION SYSTEM SLD, (Sheet 3 of 3)

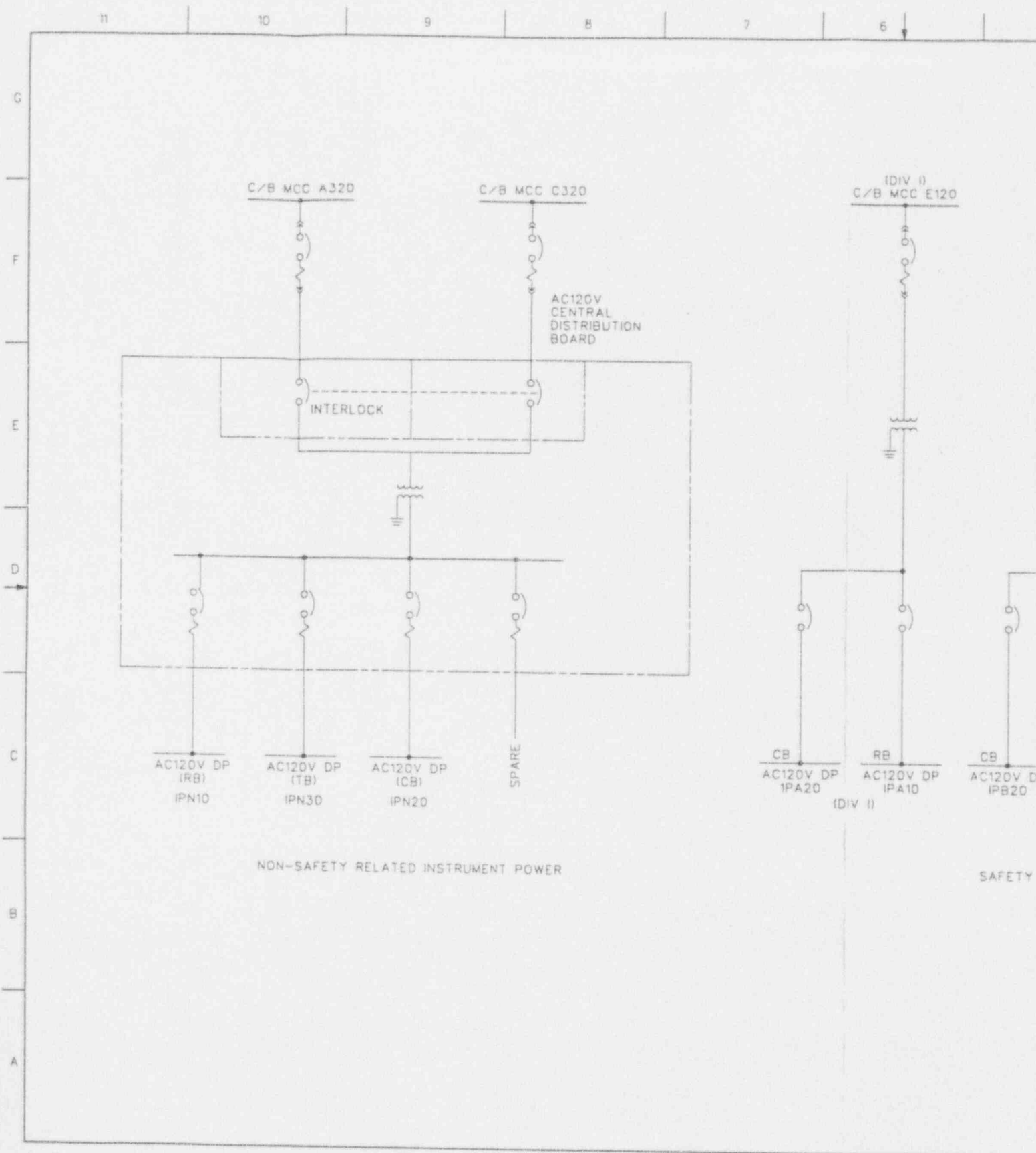


Figure 8.3-

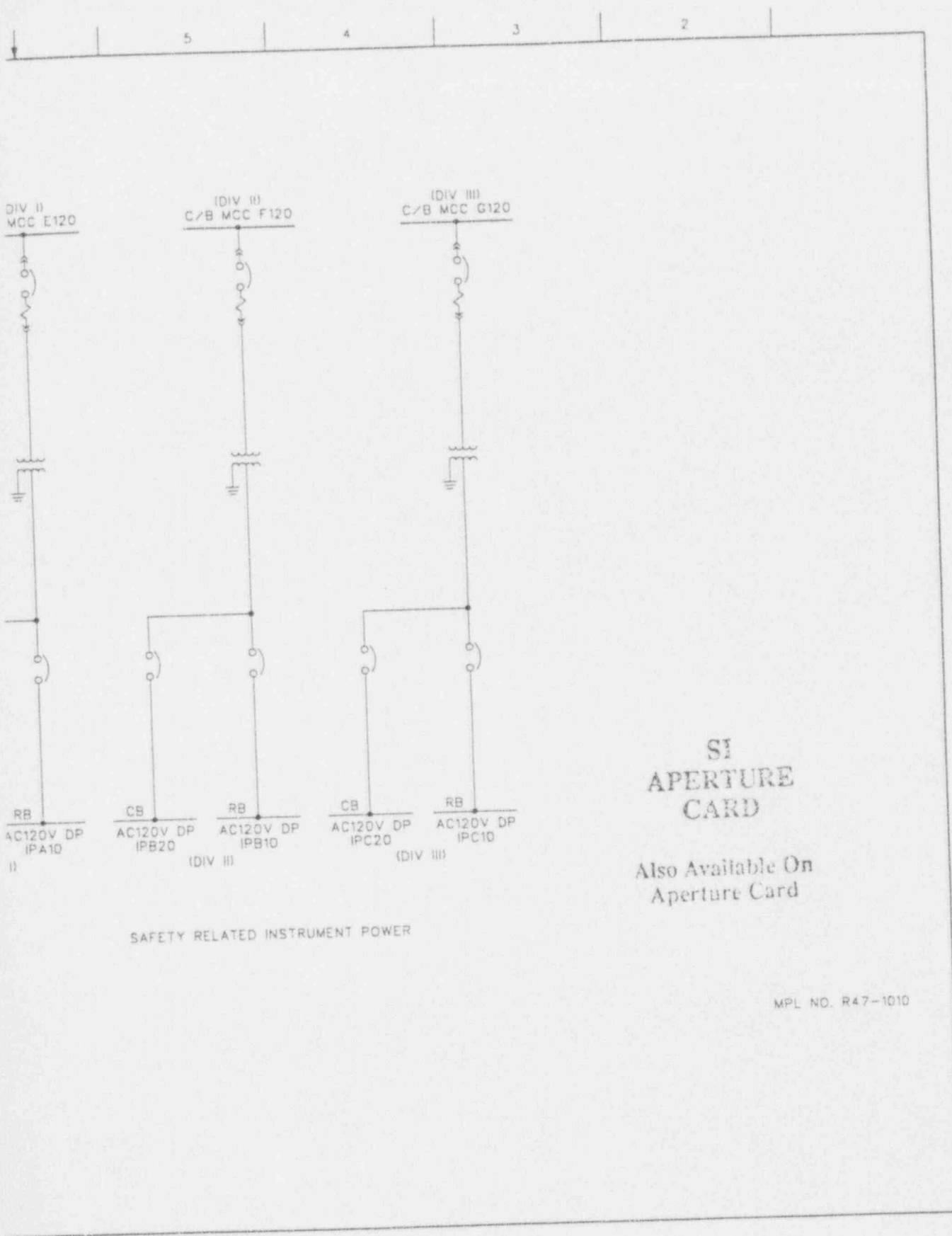
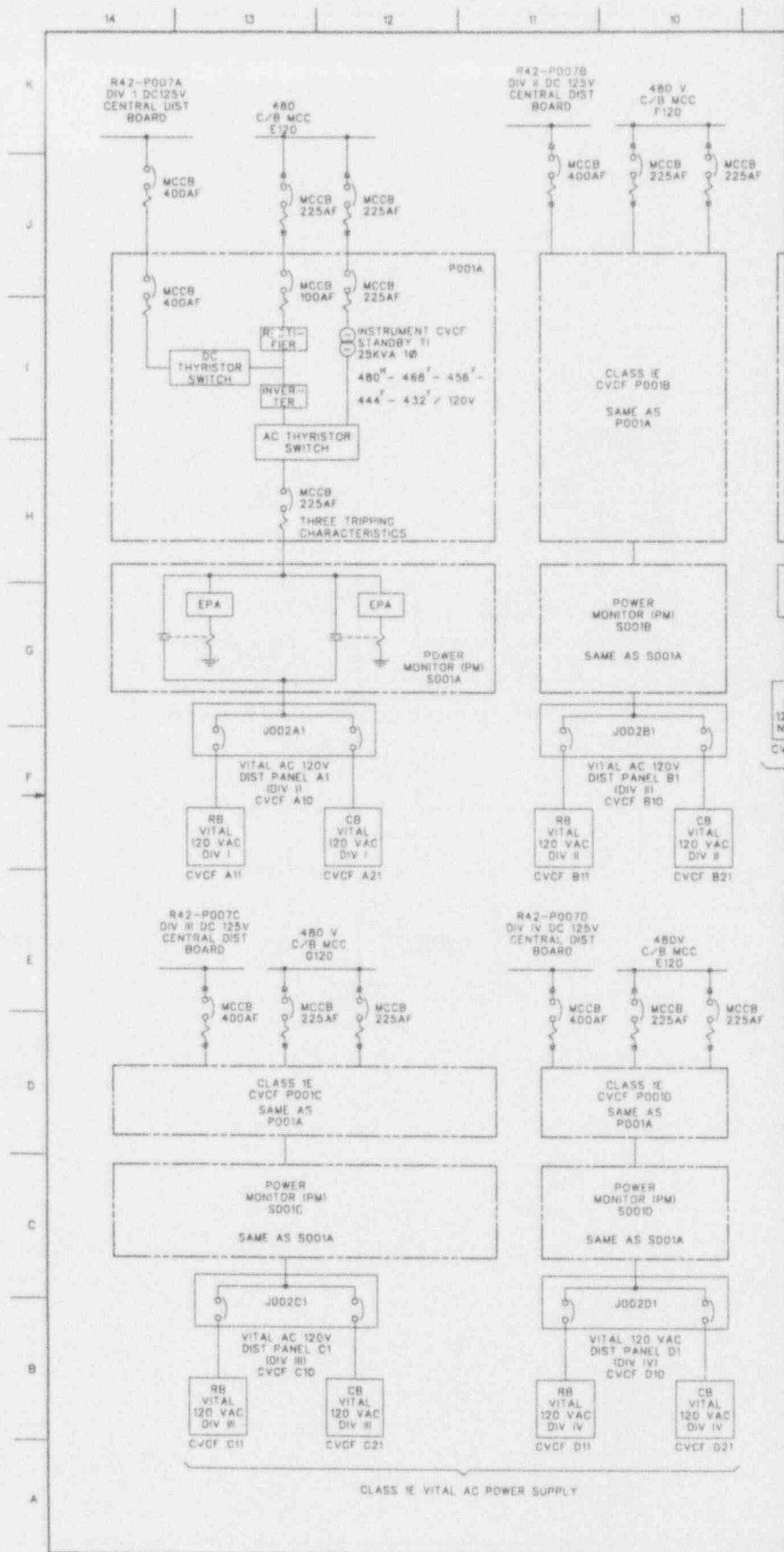
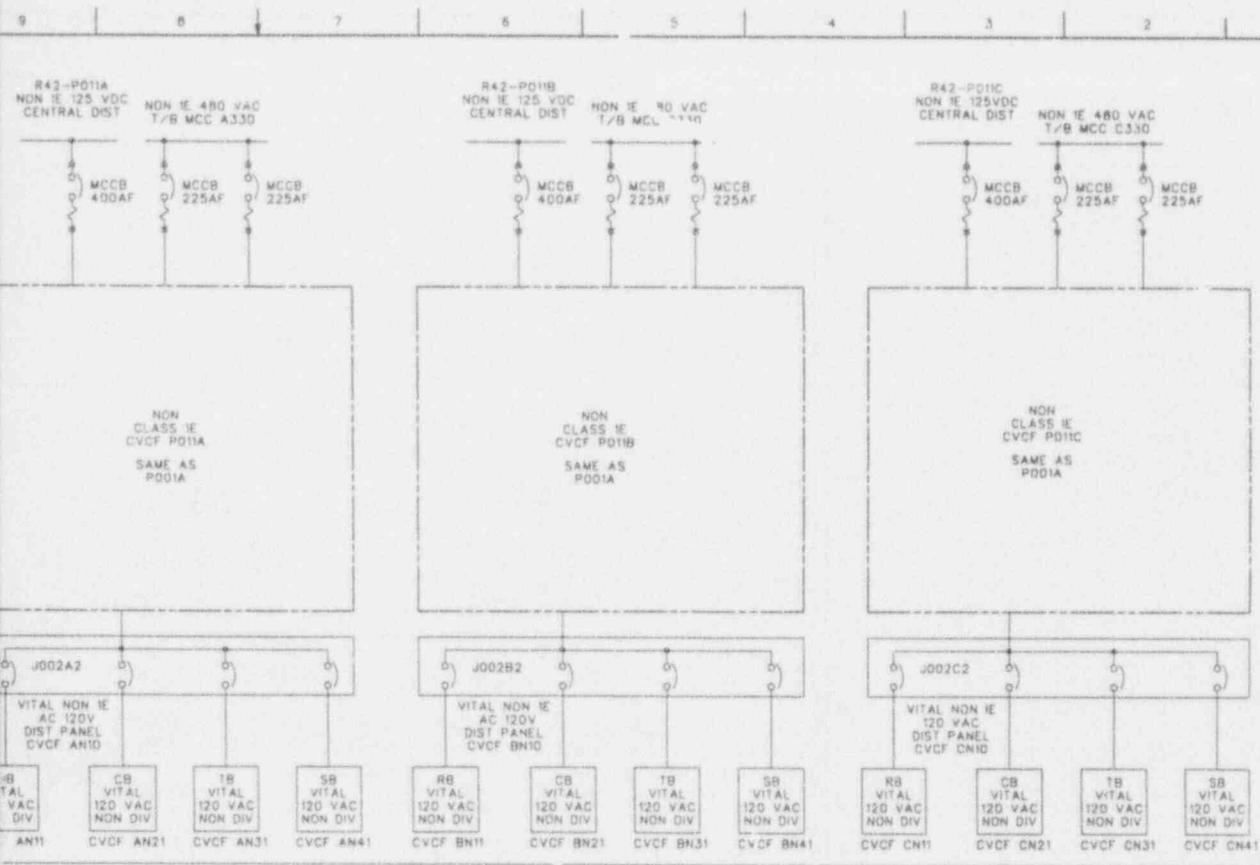


Figure 8.3-2 INSTRUMENT AND CONTROL POWER SUPPLY SYSTEM SLD





NON CLASS 1E VITAL AC POWER SUPPLY

NOTES:

1. ELECTRICAL PROTECTION ASSEMBLY (EPA) TO BE POWERED FROM CIRCUIT IT MONITORS OR 125 VDC.
2. EACH EPA TO BE COMPRISED OF OR THE EQUIVALENT OF A 27 RELAY (UNDER VOLTAGE), A 59 RELAY (OVER VOLTAGE), AND AN 81 RELAY (UNDER AND OVER FREQUENCY).
3. EPA OPERATING RANGE:
UNDER VOLTAGE - 110% VAC
OVER VOLTAGE - 140% VAC
UNDER FREQUENCY - 57 HZ
OVER FREQUENCY - 63 HZ
4. TRIP SETTINGS OF EPA TO BE $\pm 10\%$ OF THE NOMINAL VOLTAGE AND $\pm 5\%$ OF THE NOMINAL FREQUENCY FOR PERIOD OF BETWEEN 0.1 AND 3.0 SECONDS.
5. EACH EPA TO HAVE A "TEST" PUSHBUTTON.

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CONSTANT VOLTAGE CONSTANT FREQUENCY POWER SUPPLY

Figure 8.3-3 PLANT VITAL AC POWER SUPPLY SYSTEM SLD, (Sheet 1 of 2)

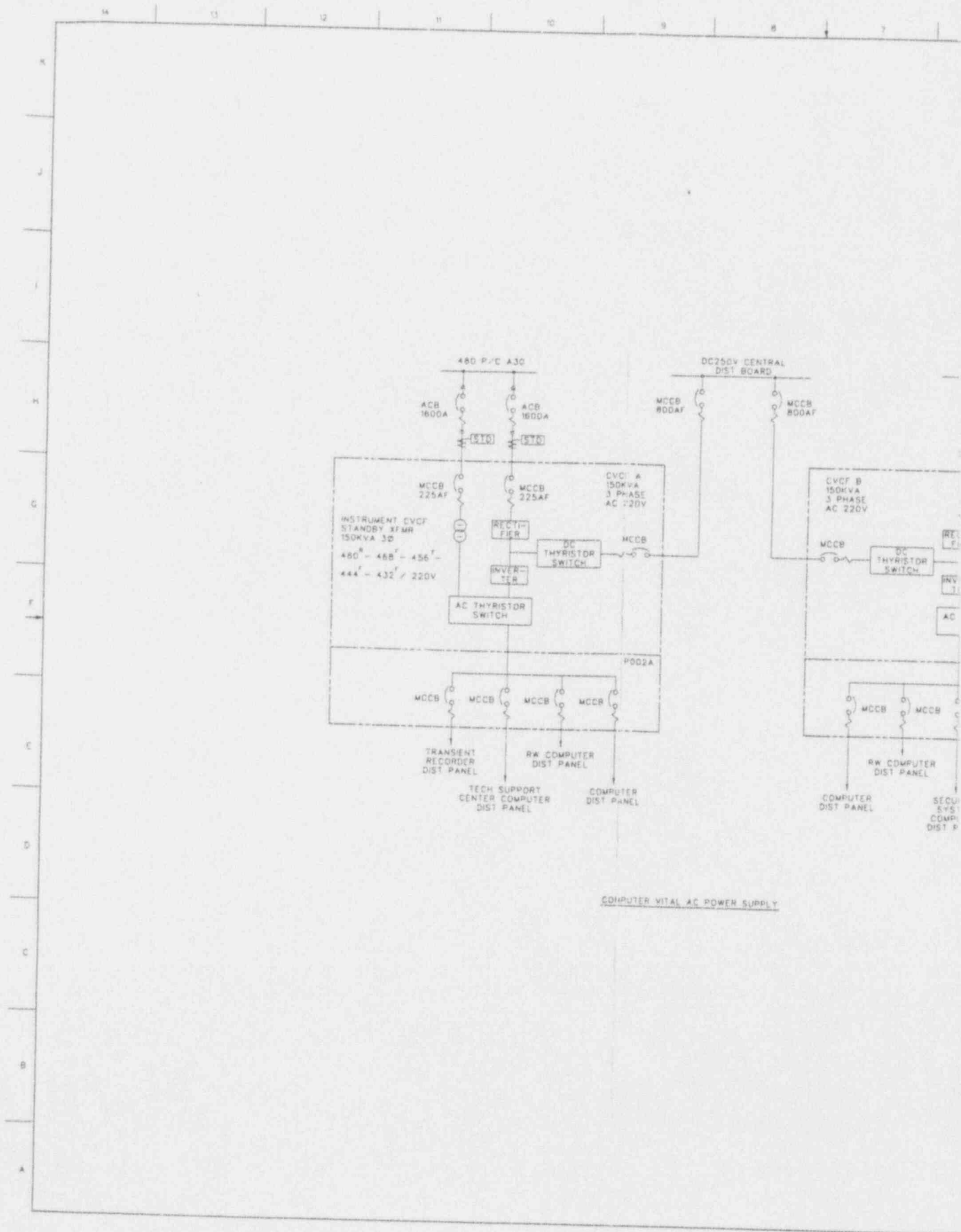
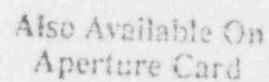
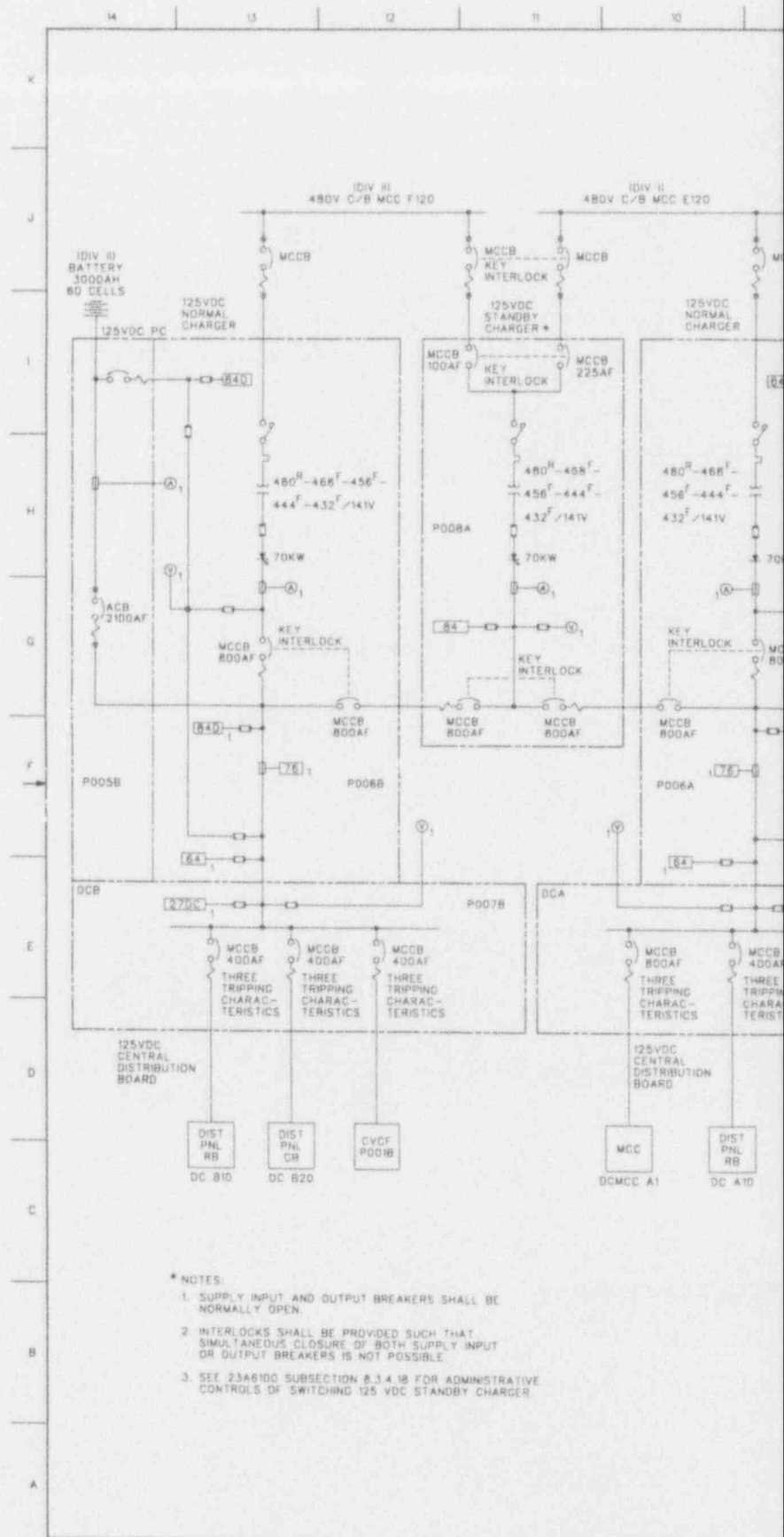


Figure 8.3-3 PLANT VITA



ER VITAL AC POWER SUPPLY

8.3-35



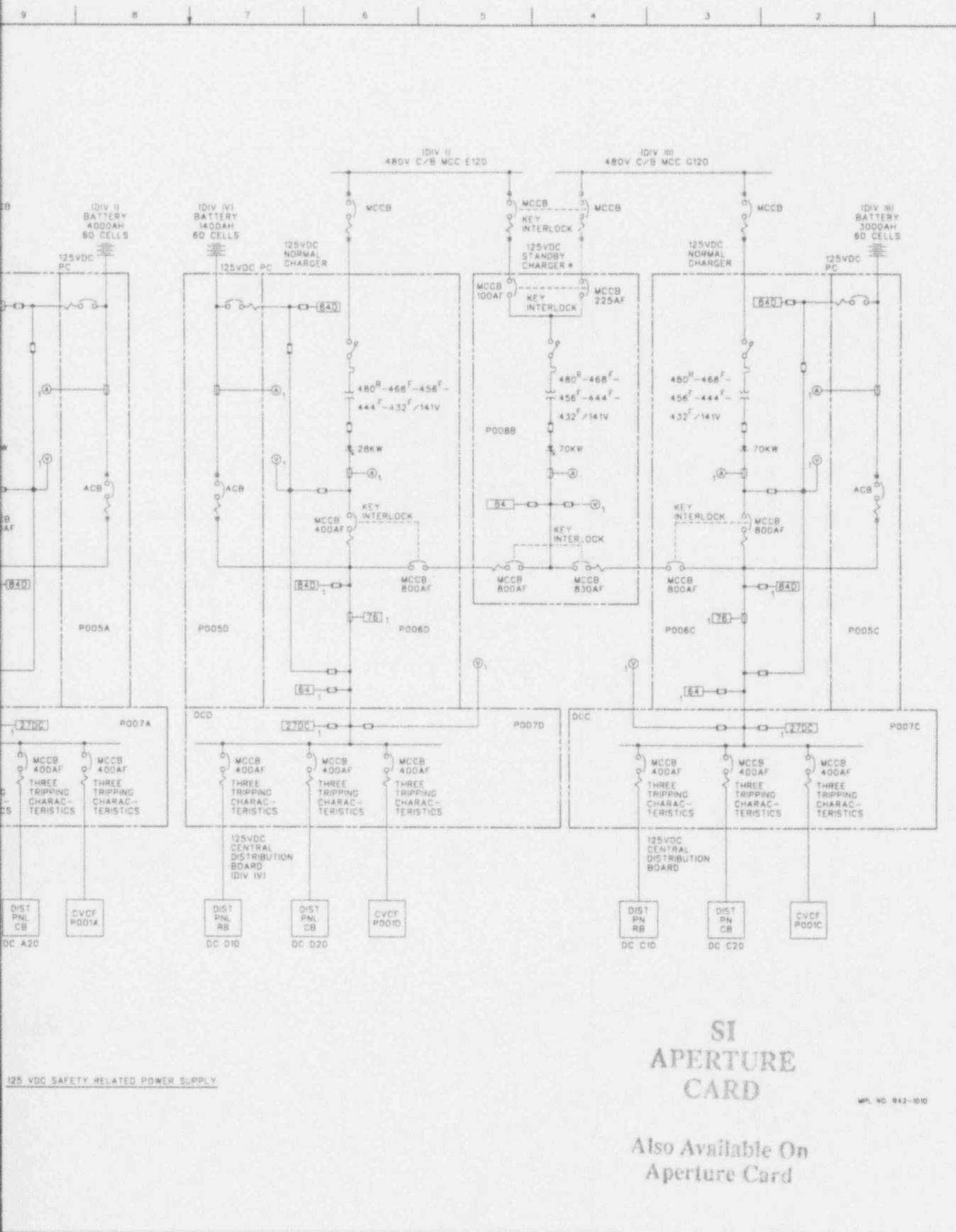


Figure 8.3-4 PLANT VITAL DC POWER SUPPLY SYSTEM SLD, (Sheet 1 of 3)

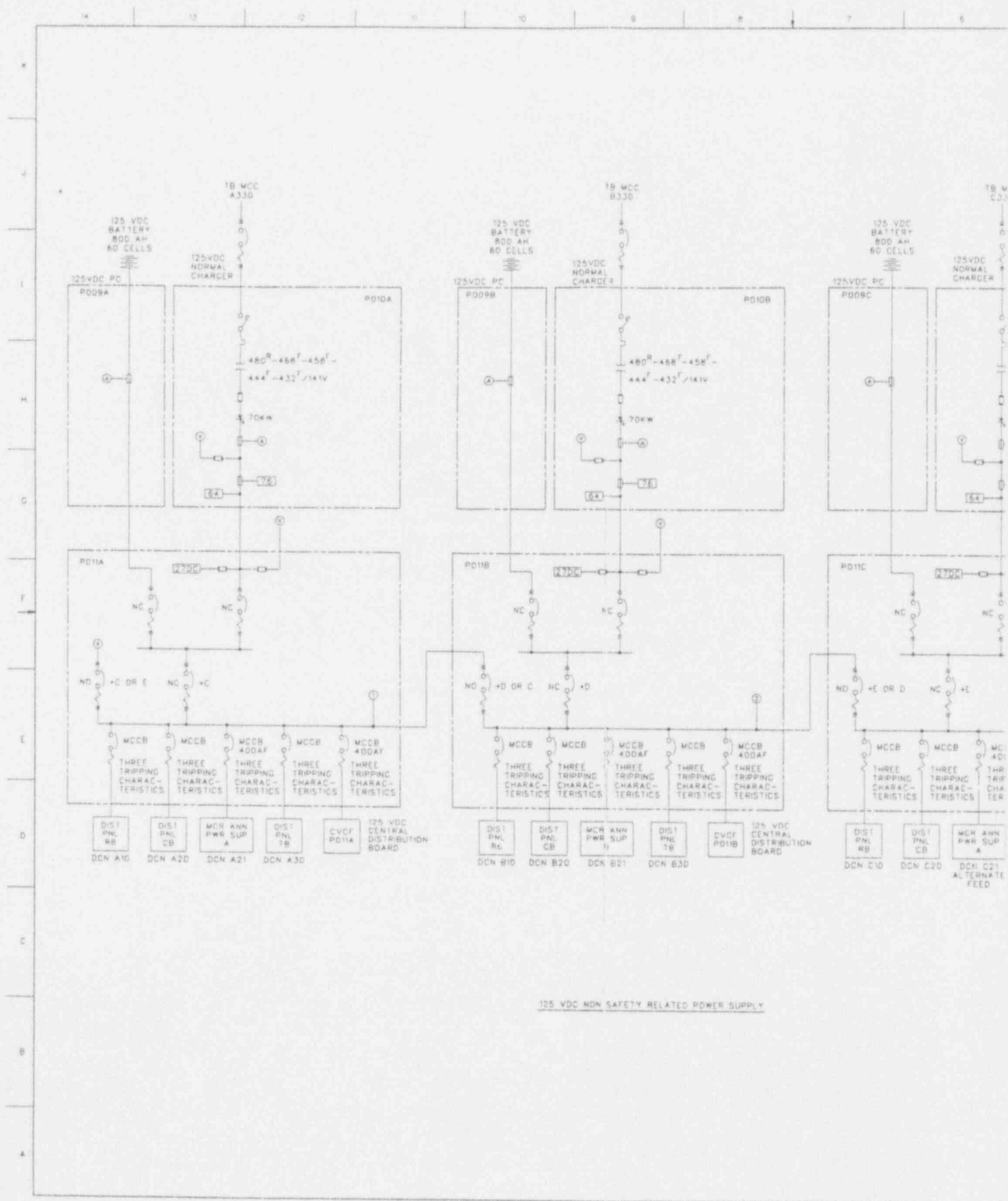


Figure 8.3-4 PLANT VITAL DC

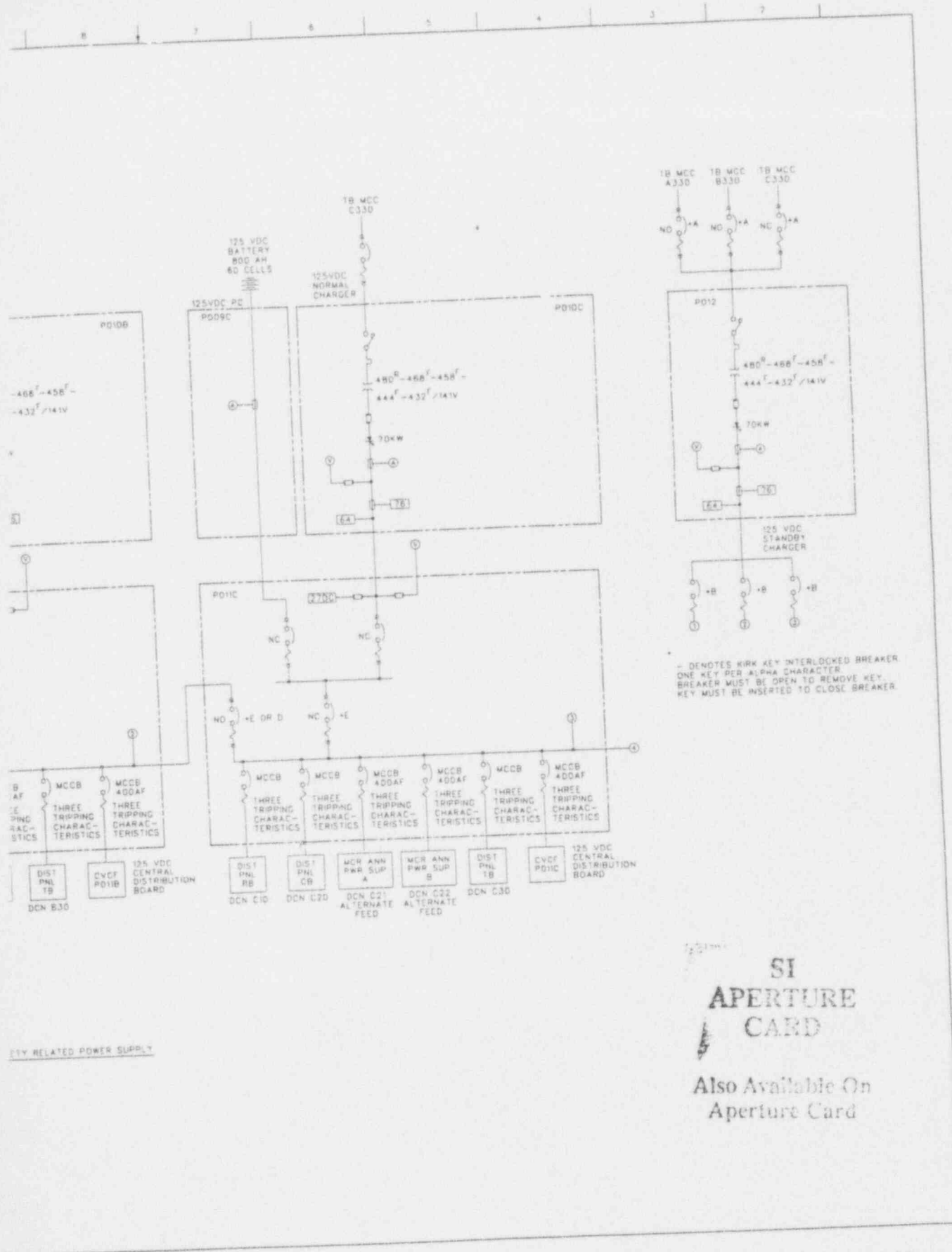
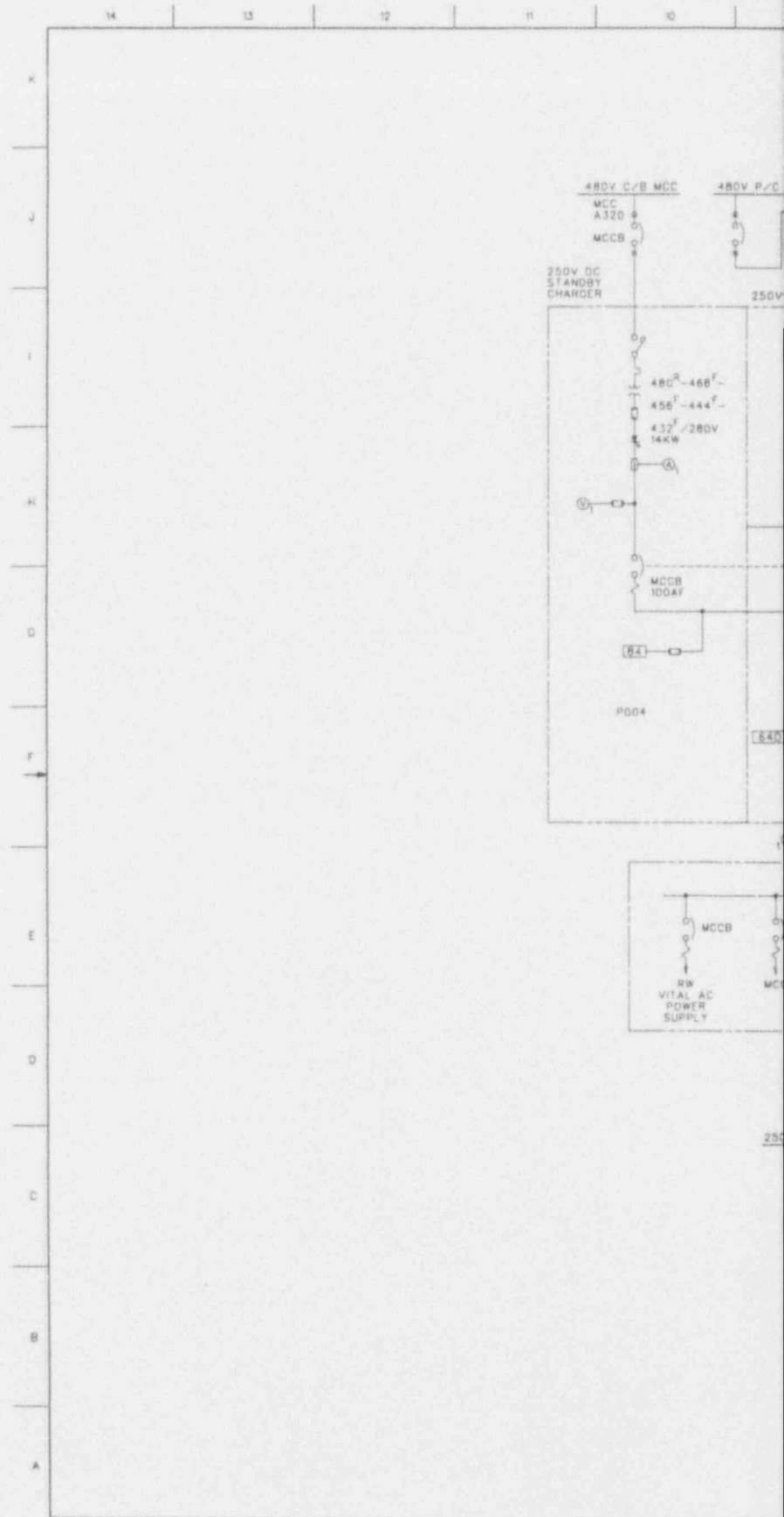
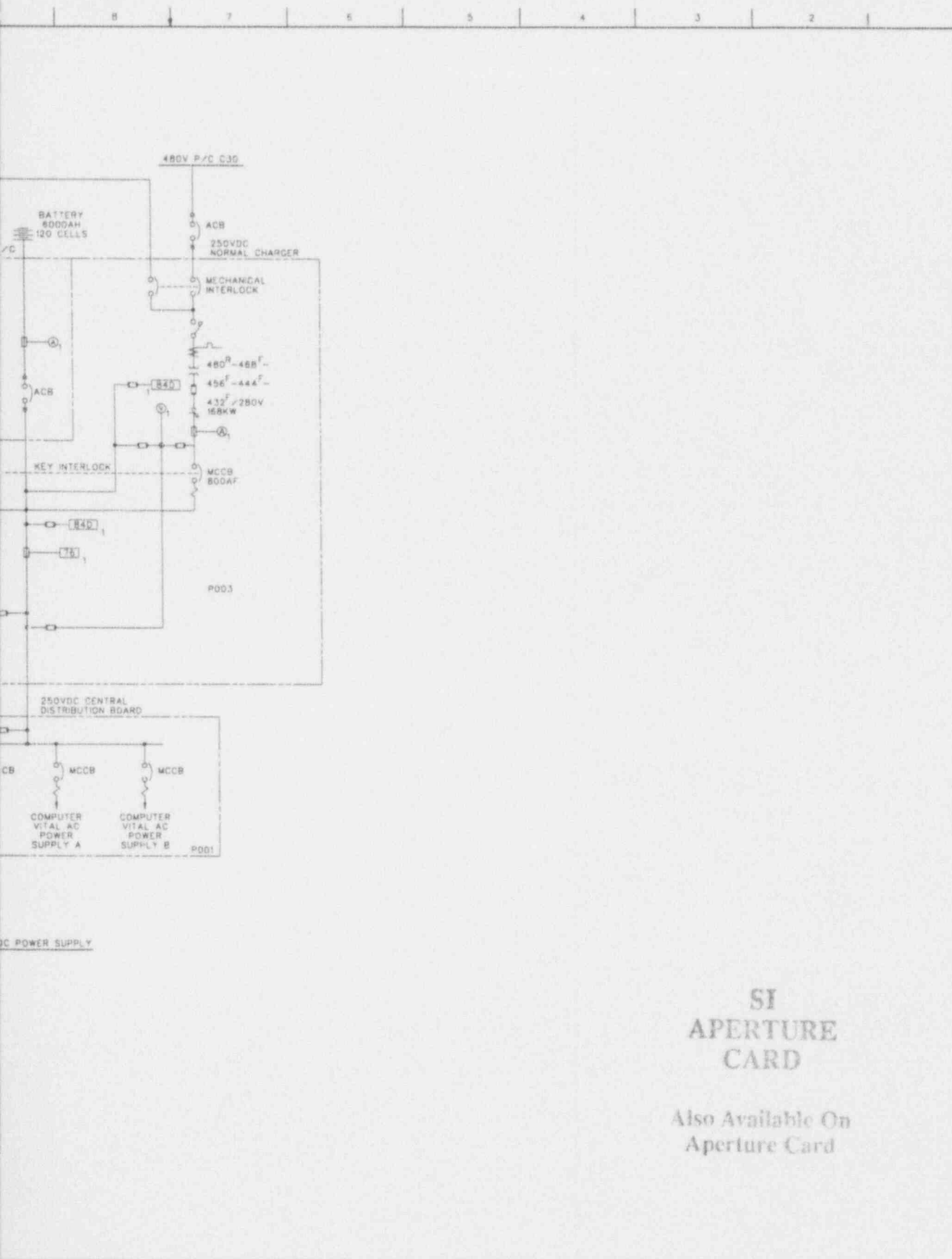


Figure 8.3-4 PLANT VITAL DC POWER SUPPLY SYSTEM SLD, (Sheet 2 of 3)

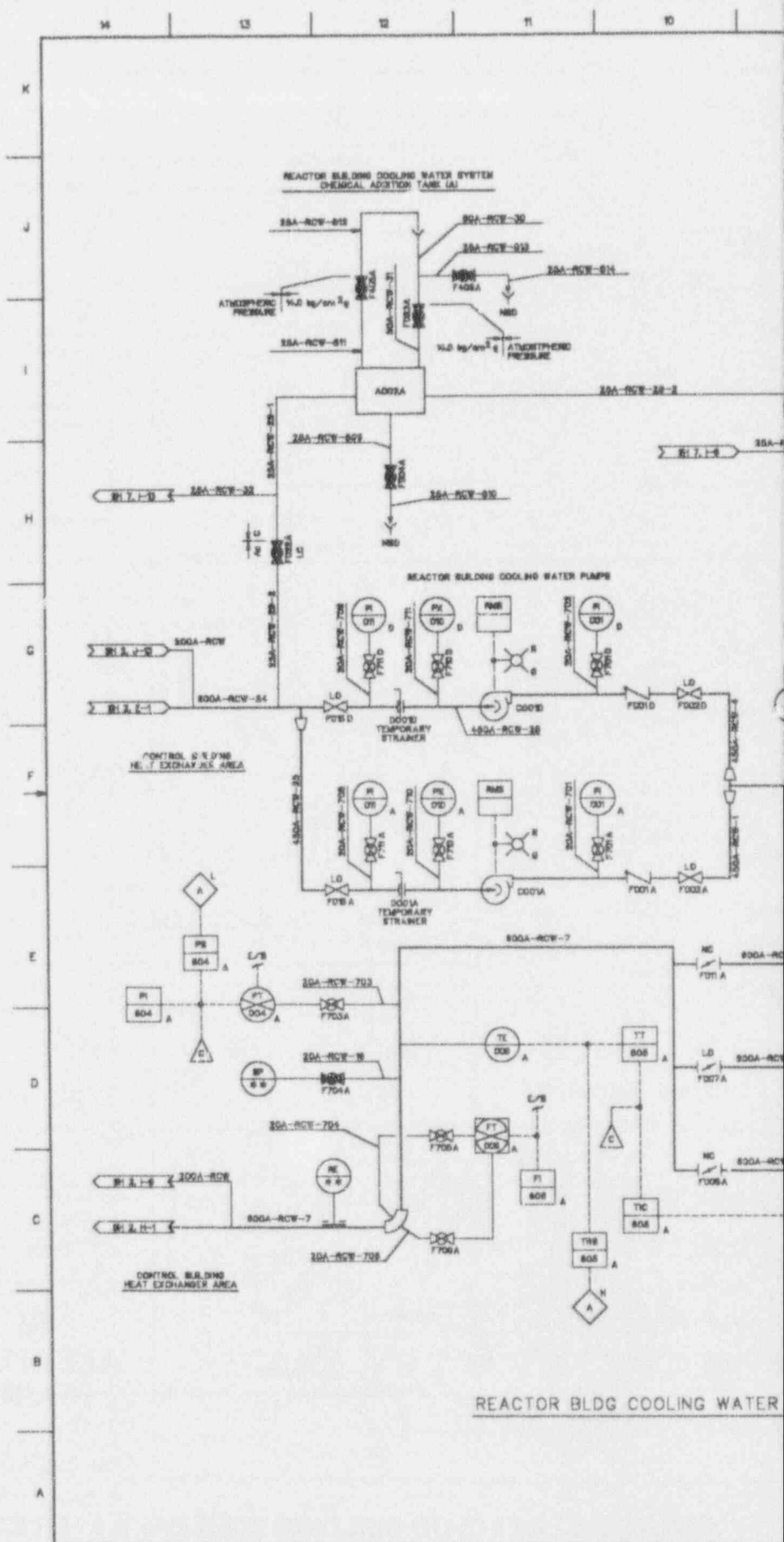


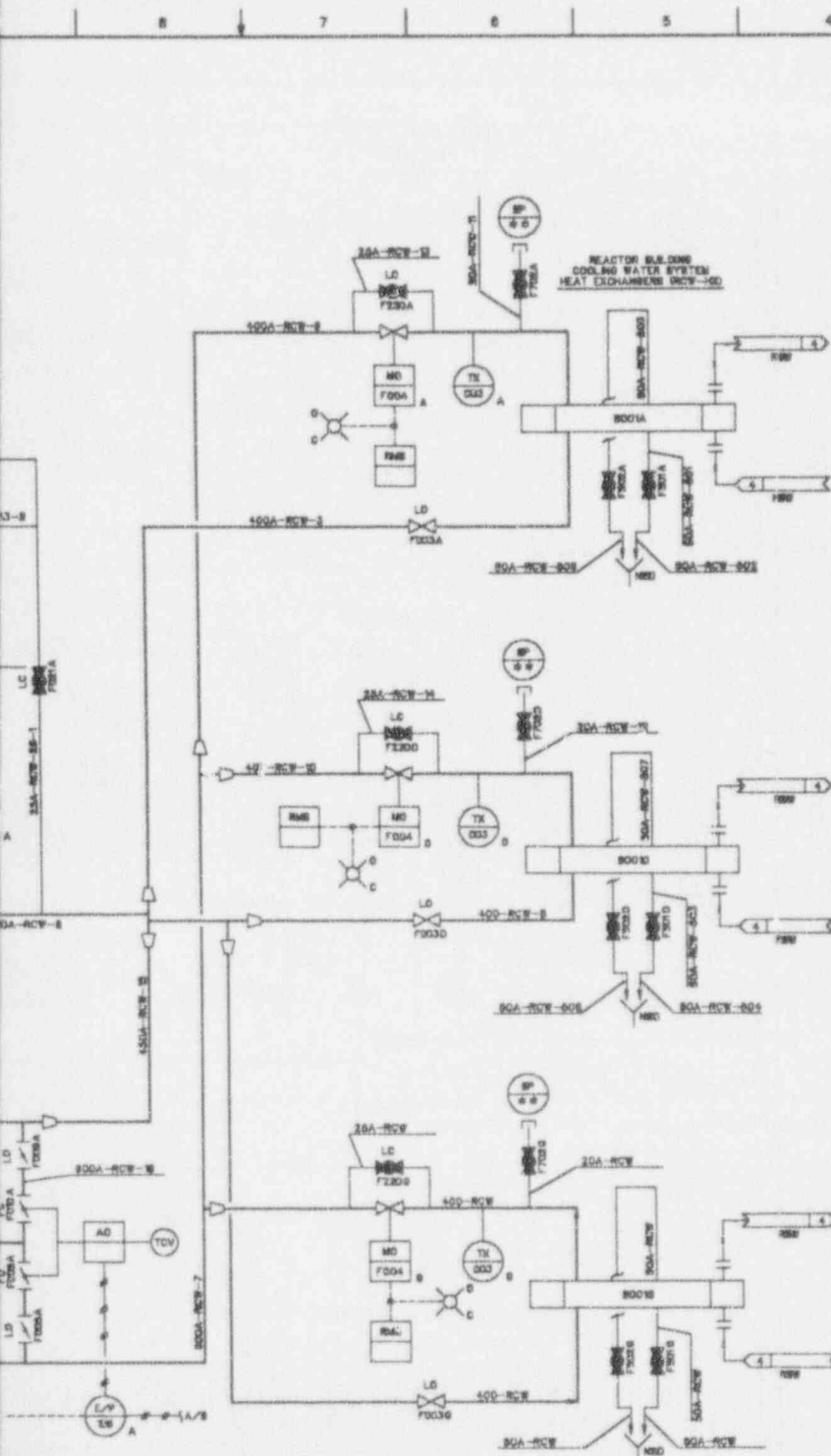


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Figure 8.3-4 PLANT VITAL DC POWER SUPPLY SYSTEM SLD, (Sheet 3 of 3)





NOTES

1. THE FOLLOWING DESIGN SPECIFICATIONS ARE APPLIED UNLESS OTHERWISE NOTED.

ITEM	APPLICATION
DESIGN PRESSURE (kg/cm ² G)	H ₂ O
DESIGN TEMPERATURE (°C)	70MBB
MAX OPERATING TEMP (°C)	
PIPE MATERIAL	CARBON STEEL
PIPE WALL THICKNESS	60A AND LESS: SCH 80 60A TO 360A: SCH 40 400A AND OVER: STD
FLUID	DEMINERALIZED WATER
SEISMIC CLASS	AS CLASS C CLASS

2. THE HEATING ISOLATION OF LOADS INLET OR OUTLET LINES AND INTERCONNECTION SUPPLY AND RETURN LINES THAT ACCURATE THE ULTRASONIC FLOW METER WLL. CONSIDER TO TAKE DOWN.
3. THE FOLLOWING VALVES SHOULD BE LOCATED AT THE CLEAN AREA.
- (A) SURGE TANK DISCHARGE LINE STOP VALVE
 - (B) INTERCONNECTION LINE CHANGE VALVE
 - (C) R/S SAMPLING ETC. PRIMARY VALVE
4. THE TEMPERATURE PRIMARY ELEMENTS SHOULD BE LOCATED AT THE POINT THAT THE COOLING WATER WILL BE SUFFICIENTLY MIXED.
5. TYPE OF THE STRAINER SIZES CAN BE CHANGED.

REFERENCE DOCUMENTS

1. Piping and Instrument Symbols Diagram
2. MAKEUP WATER SYSTEM P&ID
3. CONTAINMENT ATMOSPHERIC MONITORING SYS P&ID
4. REACTOR SERVICE WATER SYS P&ID
5. EMERGENCY DIESEL GENERATOR COOLING WATER SYS P&ID
6. SAMPLING SYS P&ID
7. HVAC EMERGENCY COOLING WATER SYS P&ID
8. REACTOR WATER CLEANUP SYS P&ID
9. HOT WATER HEATING SYS P&ID
10. OFFGAS SYS P&ID
11. RESIDUAL HEAT REMOVAL SYS P&ID
12. INSTRUMENT AIR SYS P&ID
13. REACTOR REDUC SYS P&ID
14. LEAK DETECTION & ISOLATION SYS P&ID
15. REAC BLDG COOLING WATER P&ID
16. TURBINE BLDG COOLING WATER SYS P&ID
17. SUPPRESSION POOL CLEANUP SYS P&ID
18. HIGH PRESSURE CORE FLOODER SYS P&ID
19. REACTOR CORE ISOLATION COOLING SYS P&ID
20. FUEL POOL COOLING CLEANUP SYS P&ID
21. RADWASTE SYSTEM P&ID
22. TURBINE MAIN STEAM SYS P&ID
23. CONDENSATE, FEEDWATER AND CONDENSATE AIR EXTRACTION SYS P&ID
24. TURBINE BLAND STEAM SYS P&ID
25. STATION SERVICE AIR SYS P&ID
26. HEATING STEAM & CONDENSATE WATER RETURN SYS P&ID
27. STANDBY GAS TREATMENT SYS P&ID
28. DRYWELL COOLING SYS P&ID
29. FLAMMABILITY CONTROL SYS P&ID

MPL NO.

- A10-1010
- P11-1010
- D23-1010
- P41-1010
- P43-1010
- P81-1010
- P28-1010
- G21-1010
- P63-1010
- H03-1010
- E11-1010
- P63-1010
- G31-1010
- E31-1010
- P81-1010
- P83-1010
- G61-1010
- E23-1010
- E51-1010
- P41-1010
- E17-1010
- K11-1010
- H81-1010
- G33-1010
- P81-1010
- P81-1010
- T28-1010
- T41-1010
- T48-1010

LEGEND:

- ** - REGISTRATION BY THE OTHER SYS
- - FLOAT TYPE FLOW SWITCH

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92-075-01

Figure 9.2-1 REACTOR BUILDING COOLING WATER SYSTEM P&ID (Sheet 1 of 9)

ABWR Standard Plant

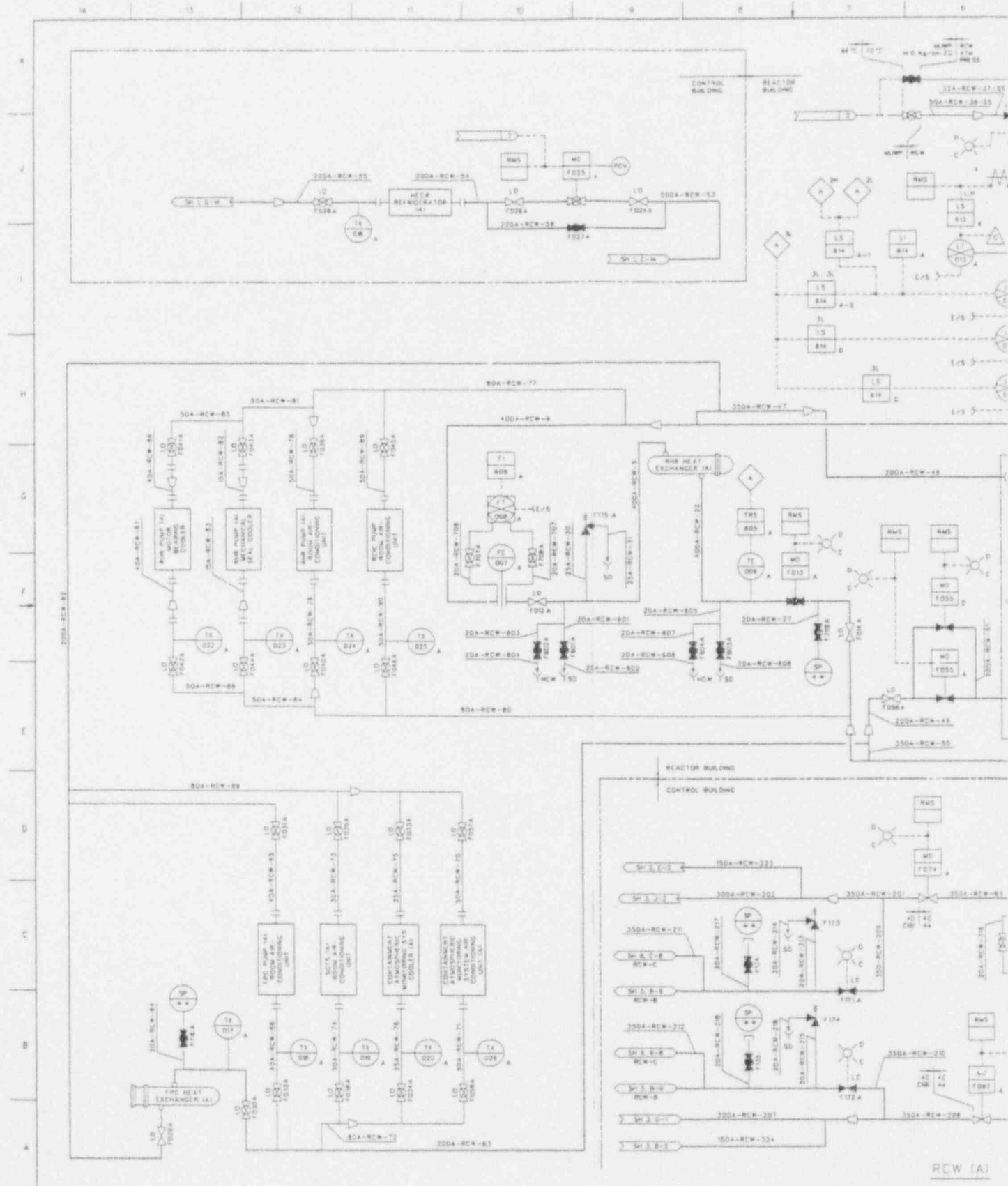


Figure 9.2-1 REACTOR BUILDIN

Amendment 27

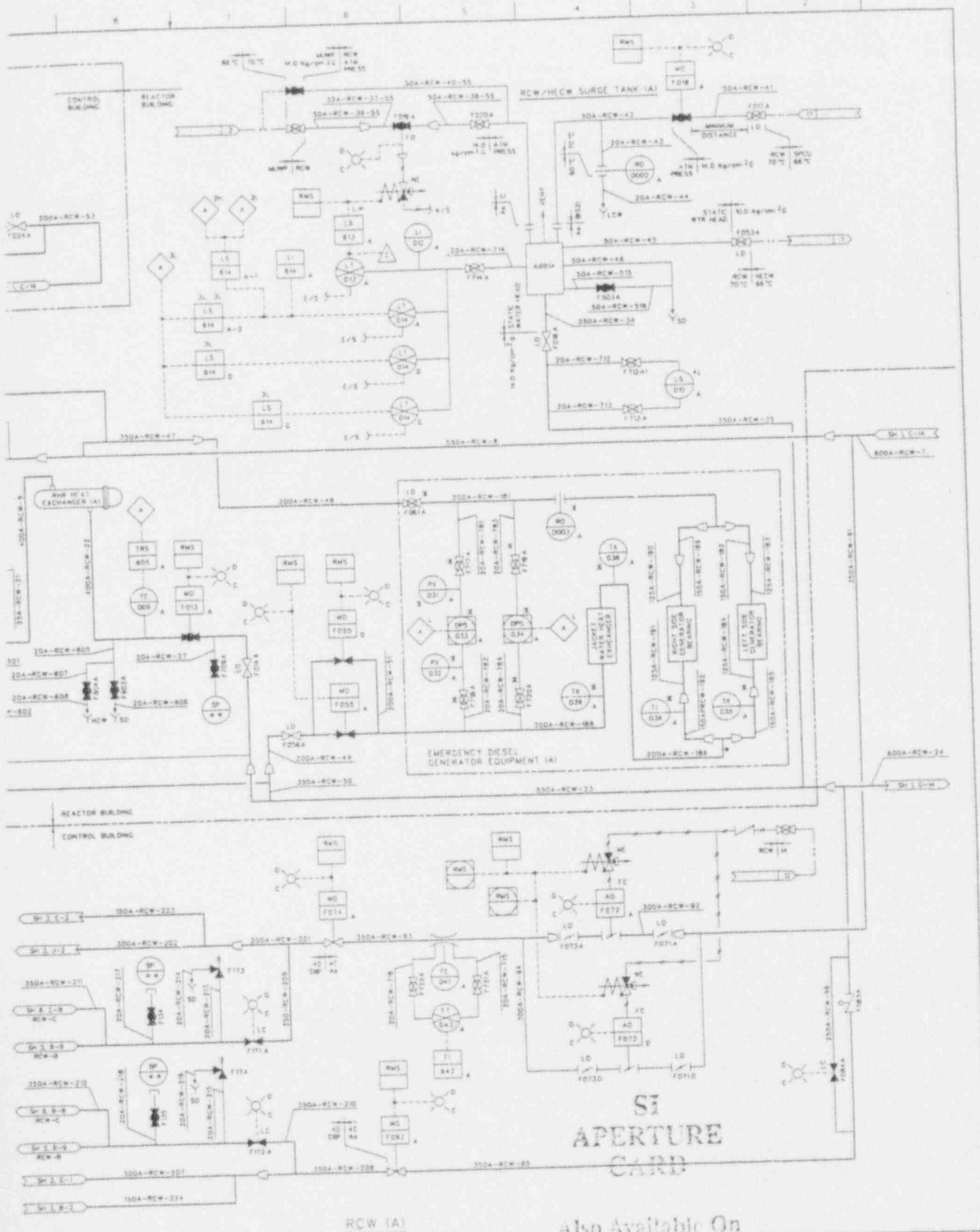
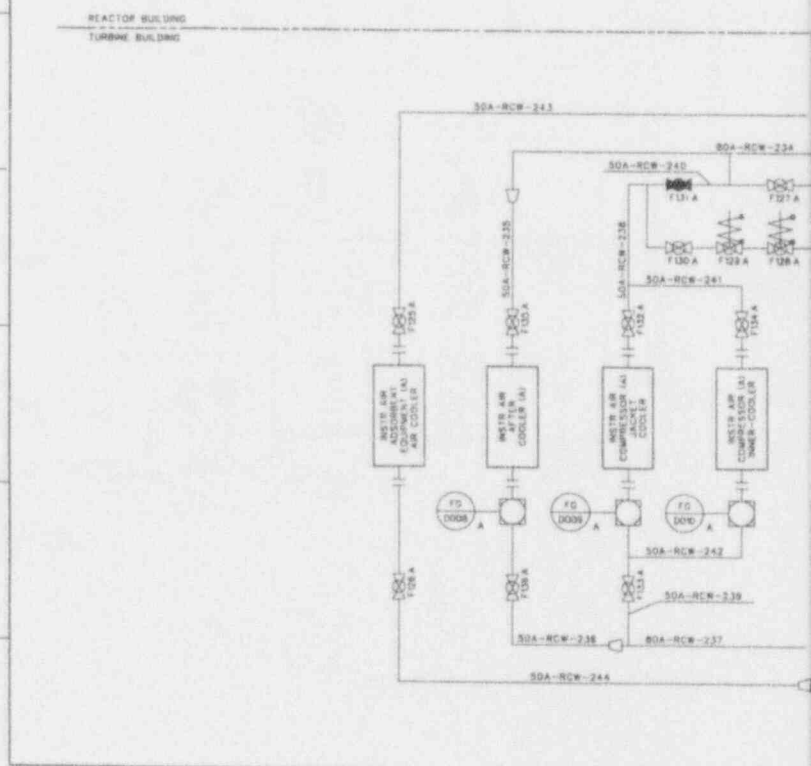
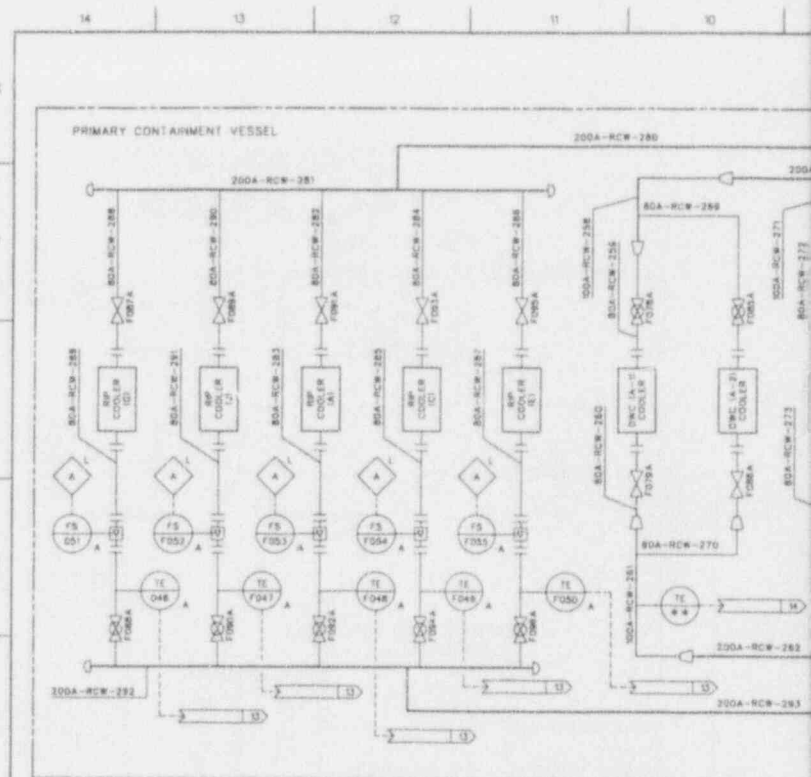


Figure 9.2-1 REACTOR BUILDING COOLING WATER SYSTEM P&ID, (Sheet 2 of 9)



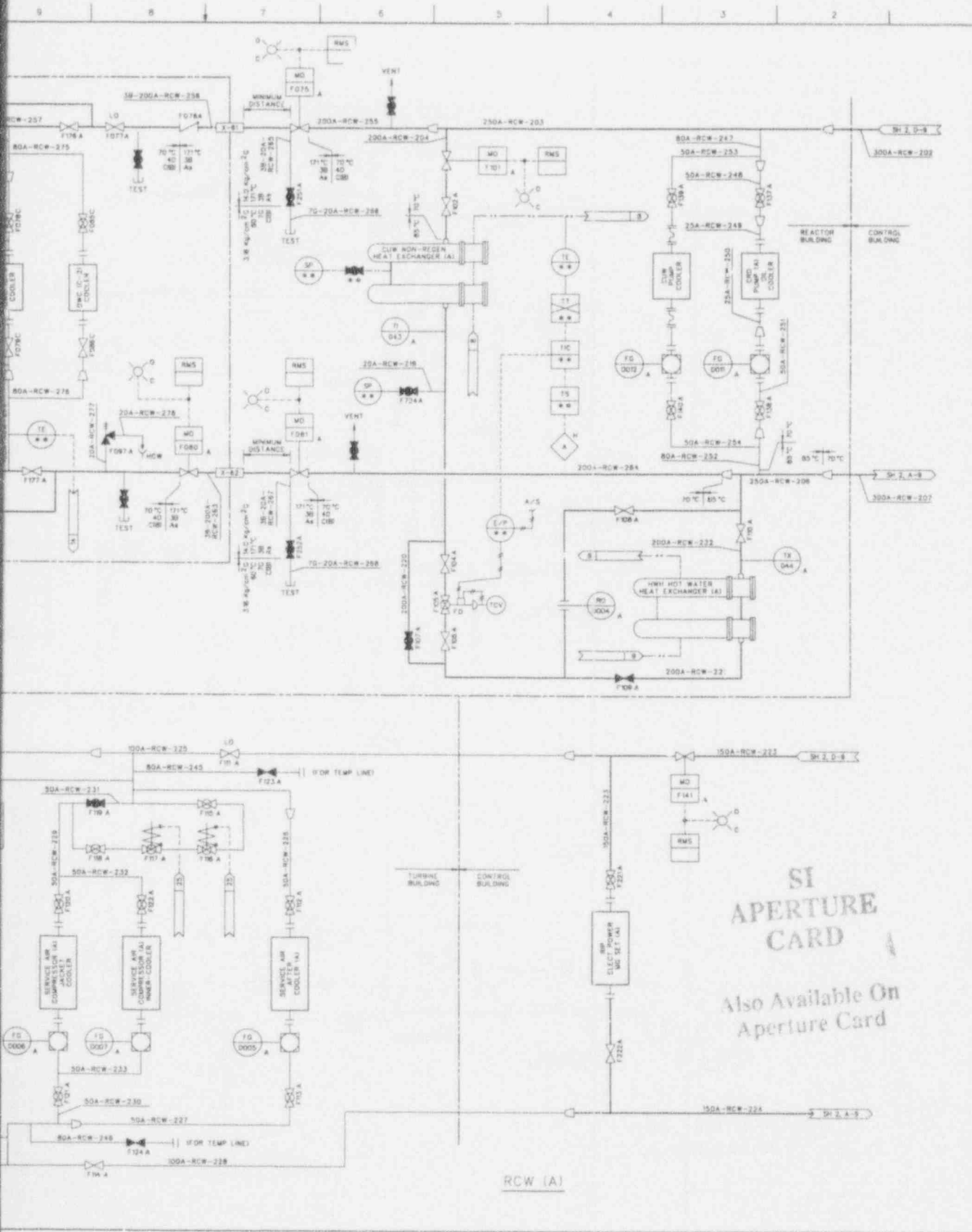


Figure 9.2-1 REACTOR BUILDING COOLING WATER SYSTEM P&ID, (Sheet 3 of 9)



Amendment 20



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92-075-04

Figure 9.2-1 REACTOR BUILDING COOLING WATER SYSTEM P&ID (Sheet 4 of 9)

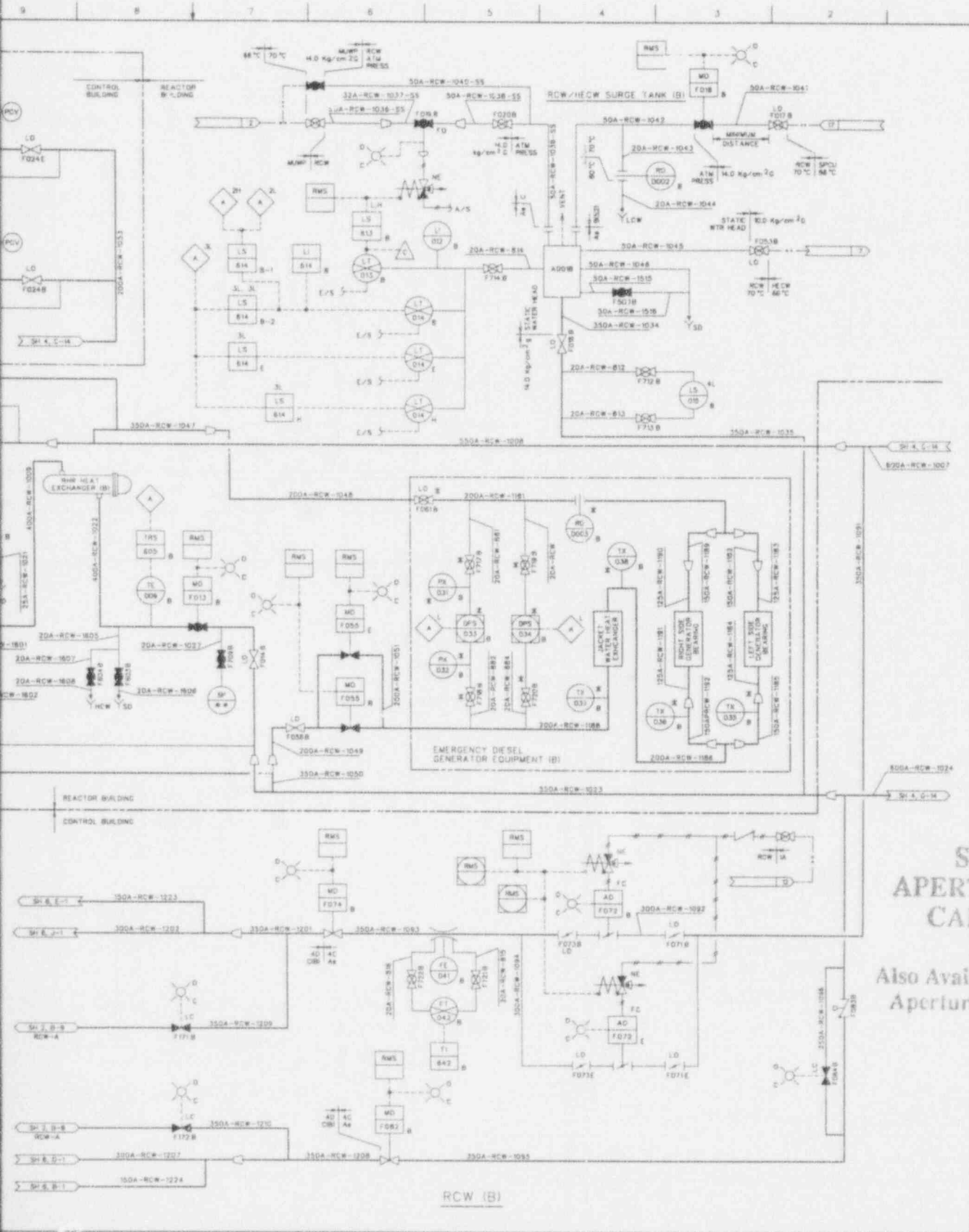


Figure 9.2-1 REACTOR BUILDING COOLING WATER SYSTEM P&ID, (Sheet 5 of 9)

Amendment 27

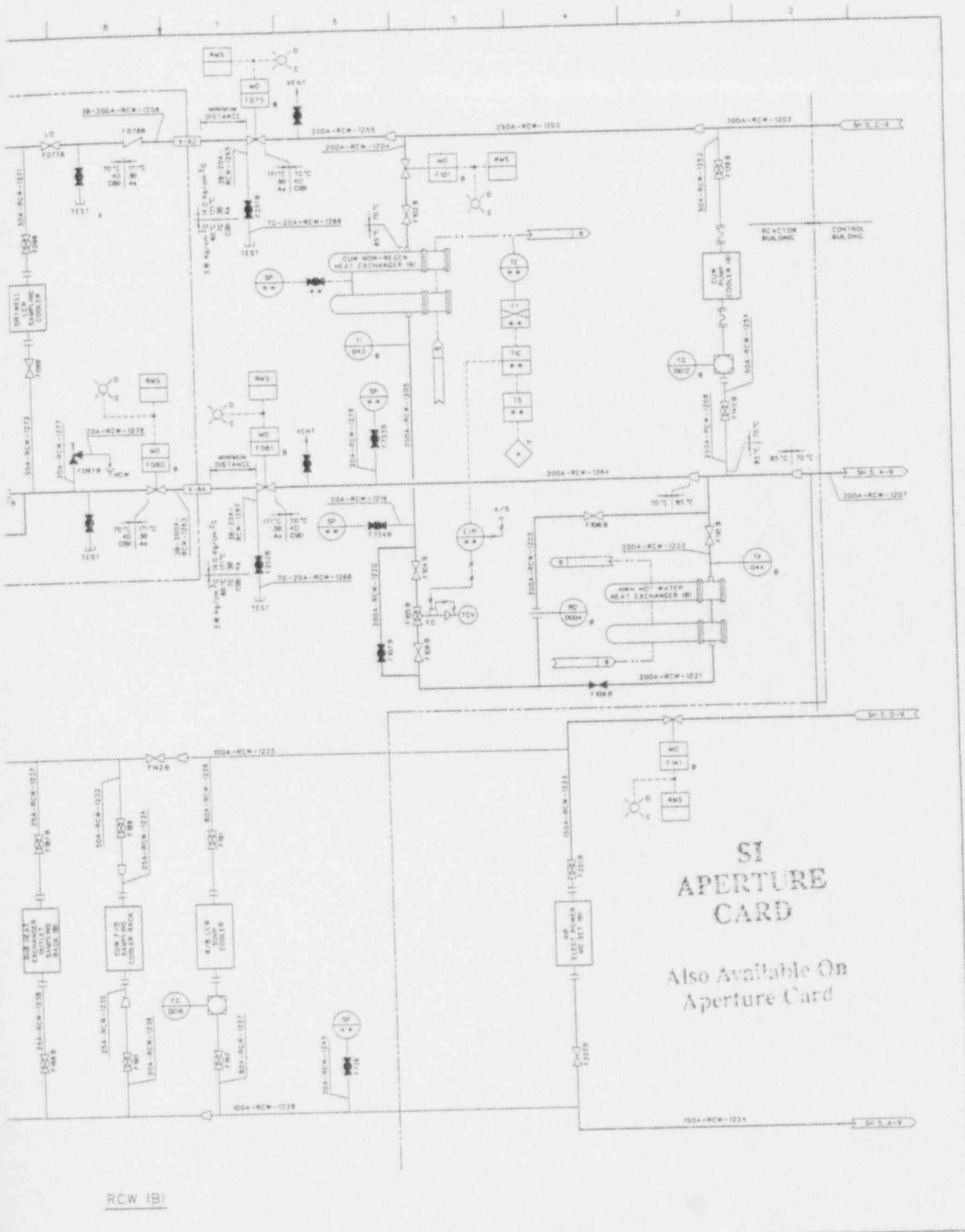
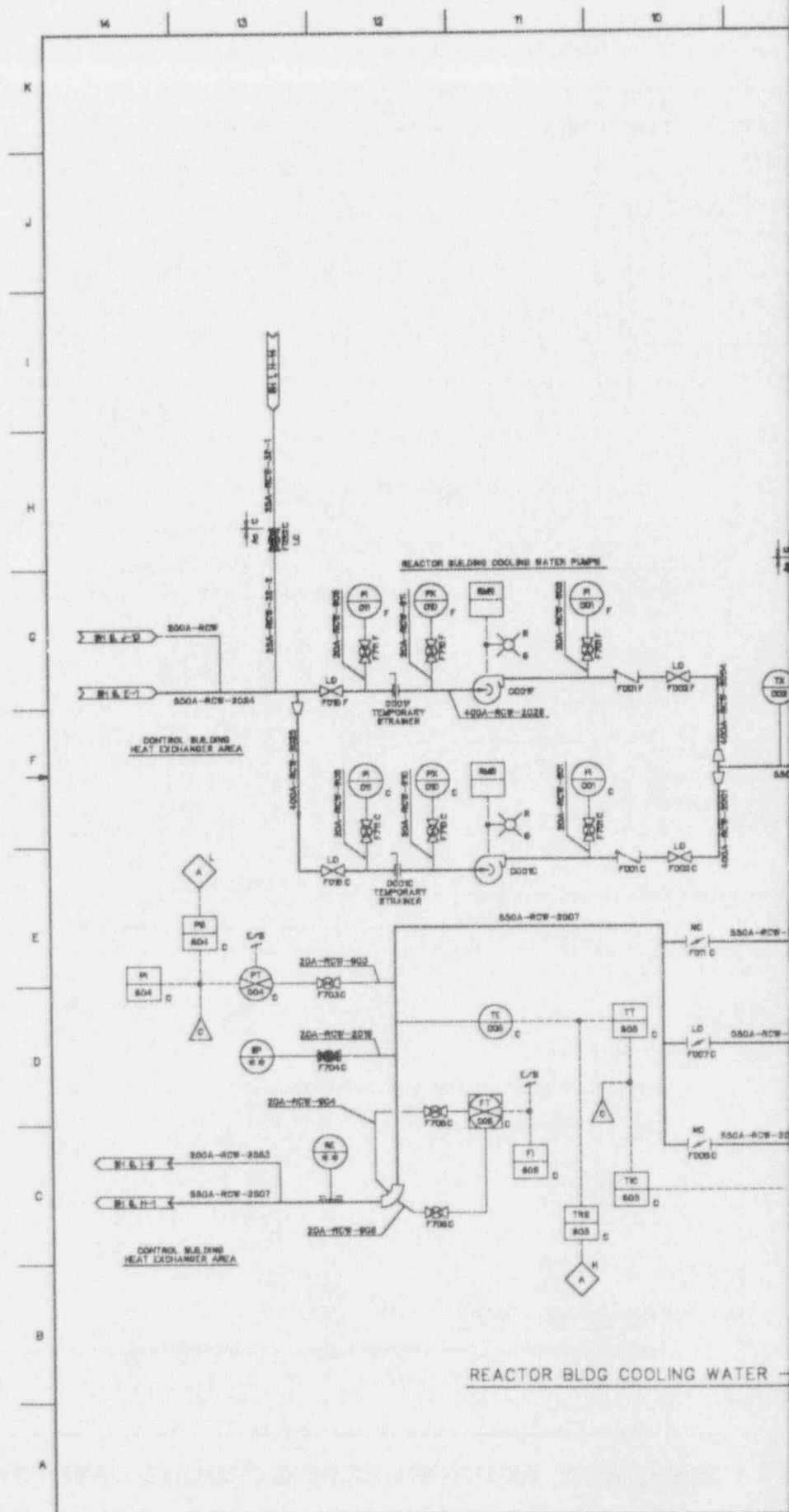
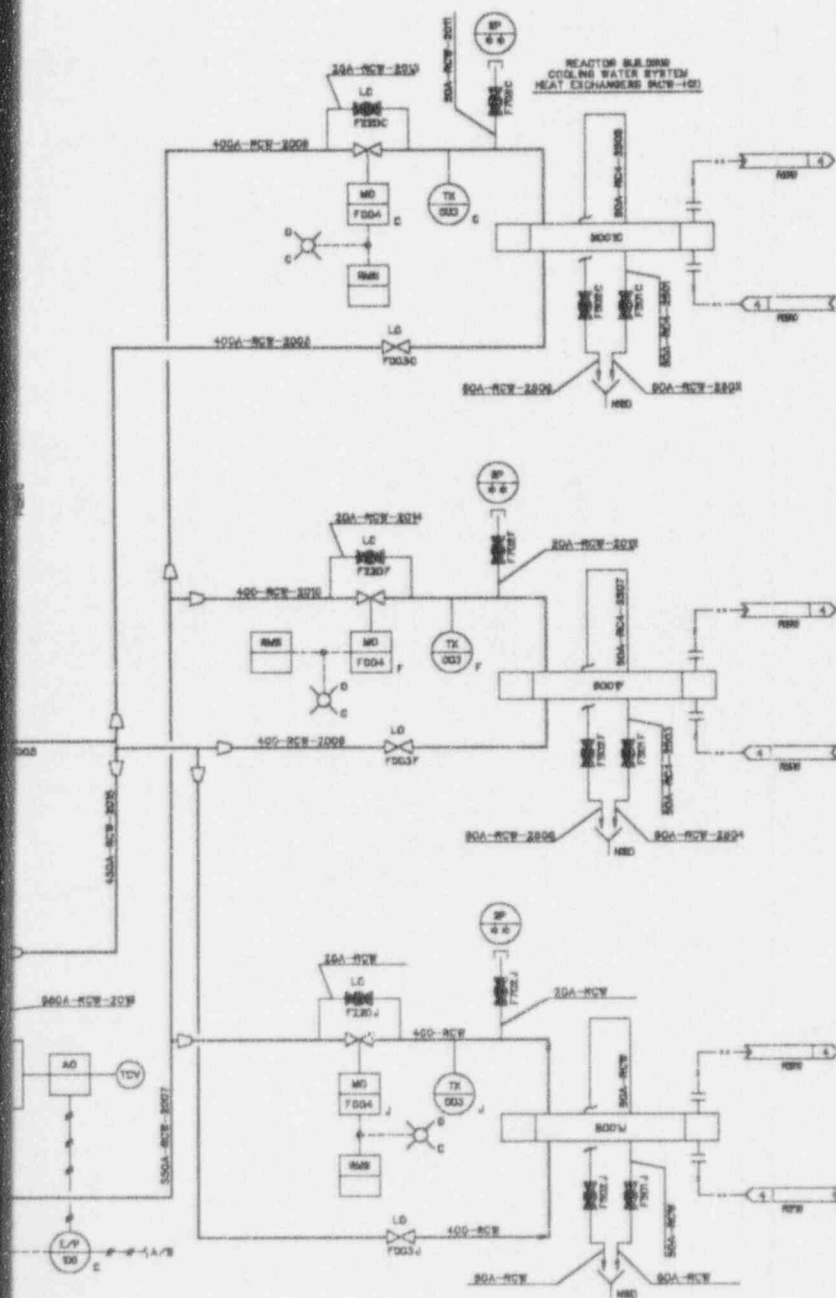


Figure 9.2-1 REACTOR BUILDING COOLING WATER SYSTEM P&ID, (Sheet 6 of 9)



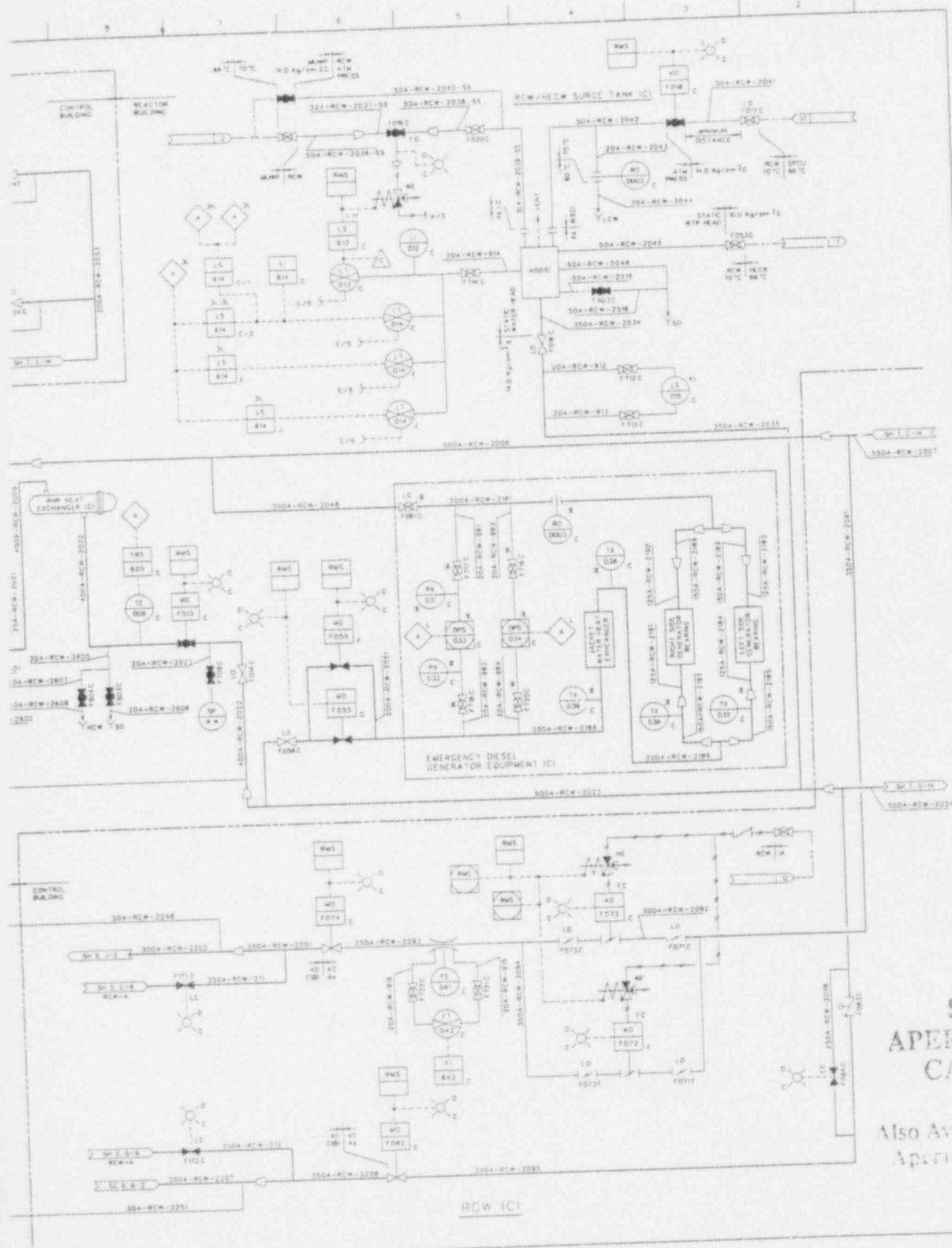


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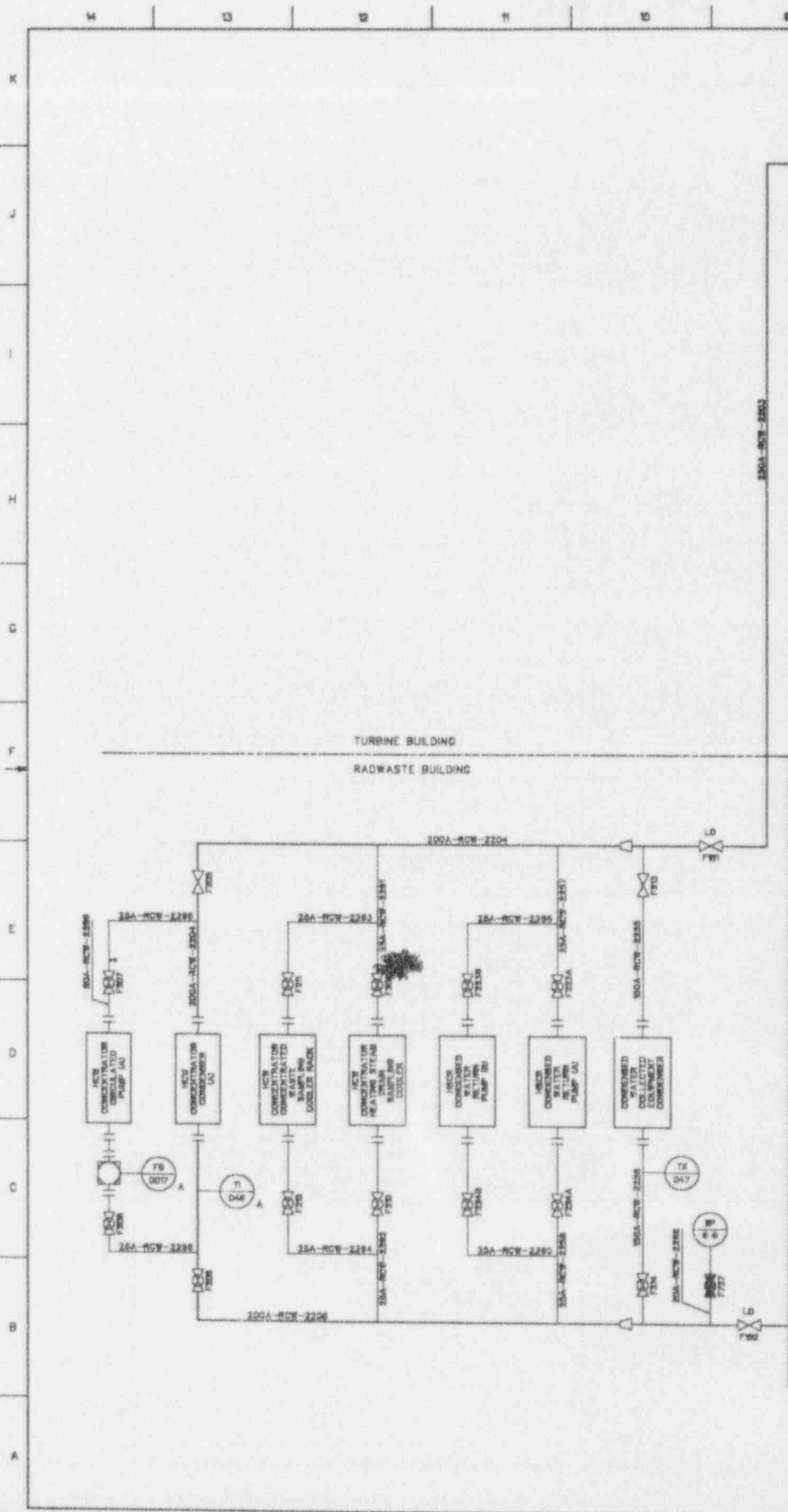
Figure 9.2-1 REACTOR BUILDING COOLING WATER SYSTEM P&ID (Sheet 7 of 9)



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Figure 9.2-1 REACTOR BUILDING COOLING WATER SYSTEM P&ID, (Sheet 8 of 9)





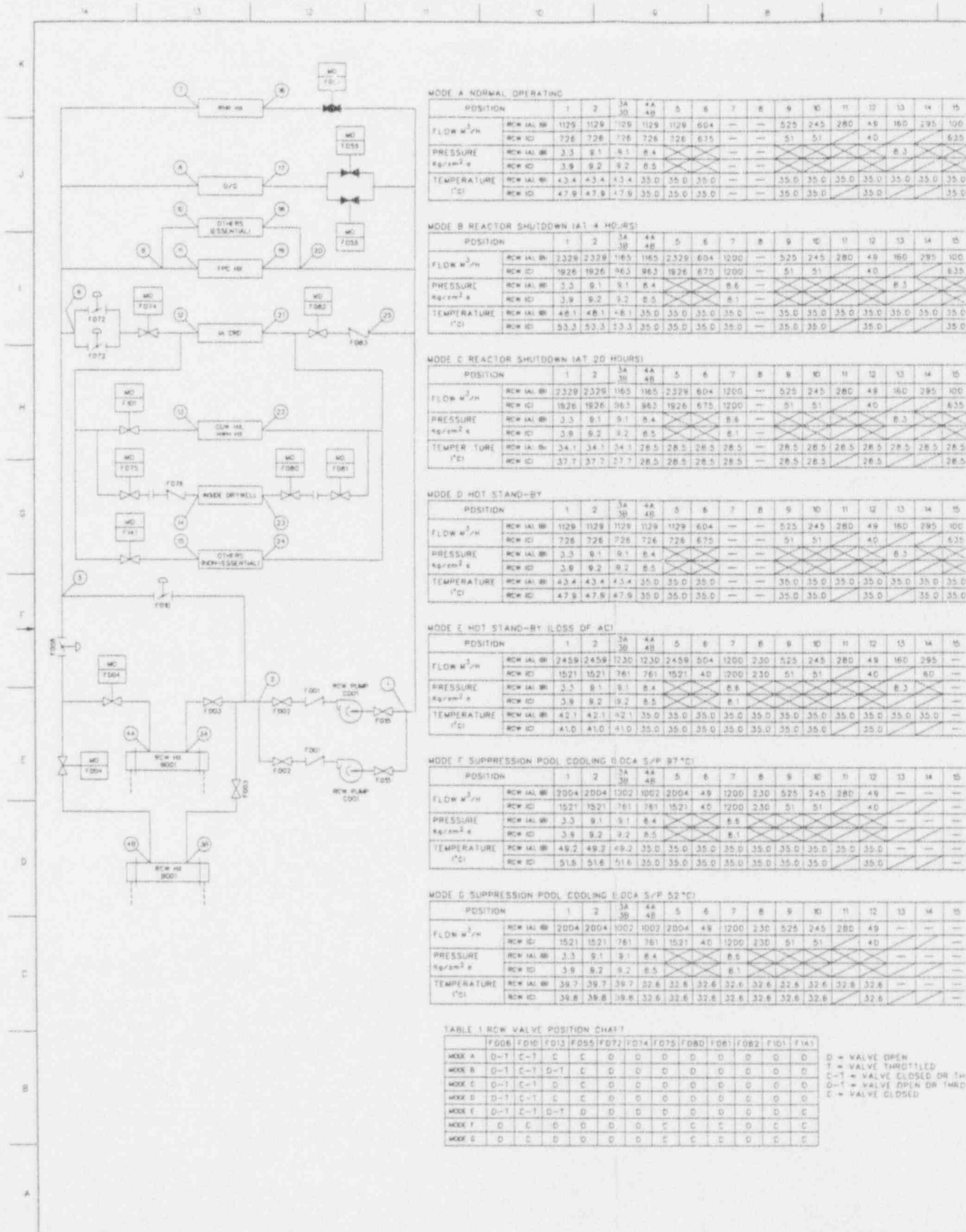


Figure 9.2-1a REACTOR BUILDING

	F4	F075	F080	F081	F082	F010	F041
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
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13	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0
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35	0	0	0	0	0	0	0
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42	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0
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56	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0

D = VALVE OPEN
T = VALVE THROTTLED
C-T = VALVE CLOSED OR THROTTLED
O-T = VALVE OPEN OR THROTTLED
C = VALVE CLOSED

- #### REFERENCE DOCUMENTS

1. REAC BLDG COOLING WATER SYS PAID

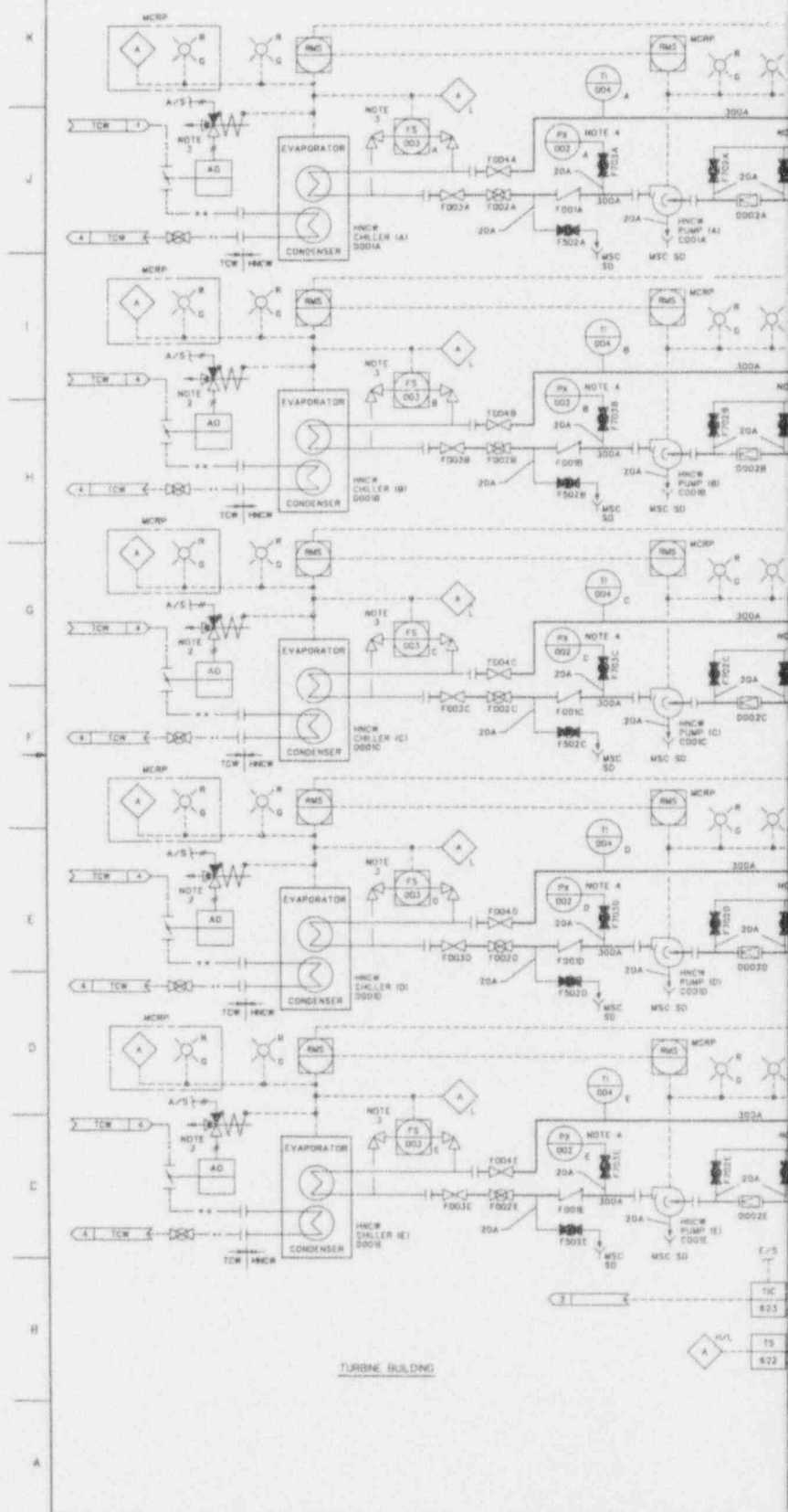
MP, NC

P21-1010

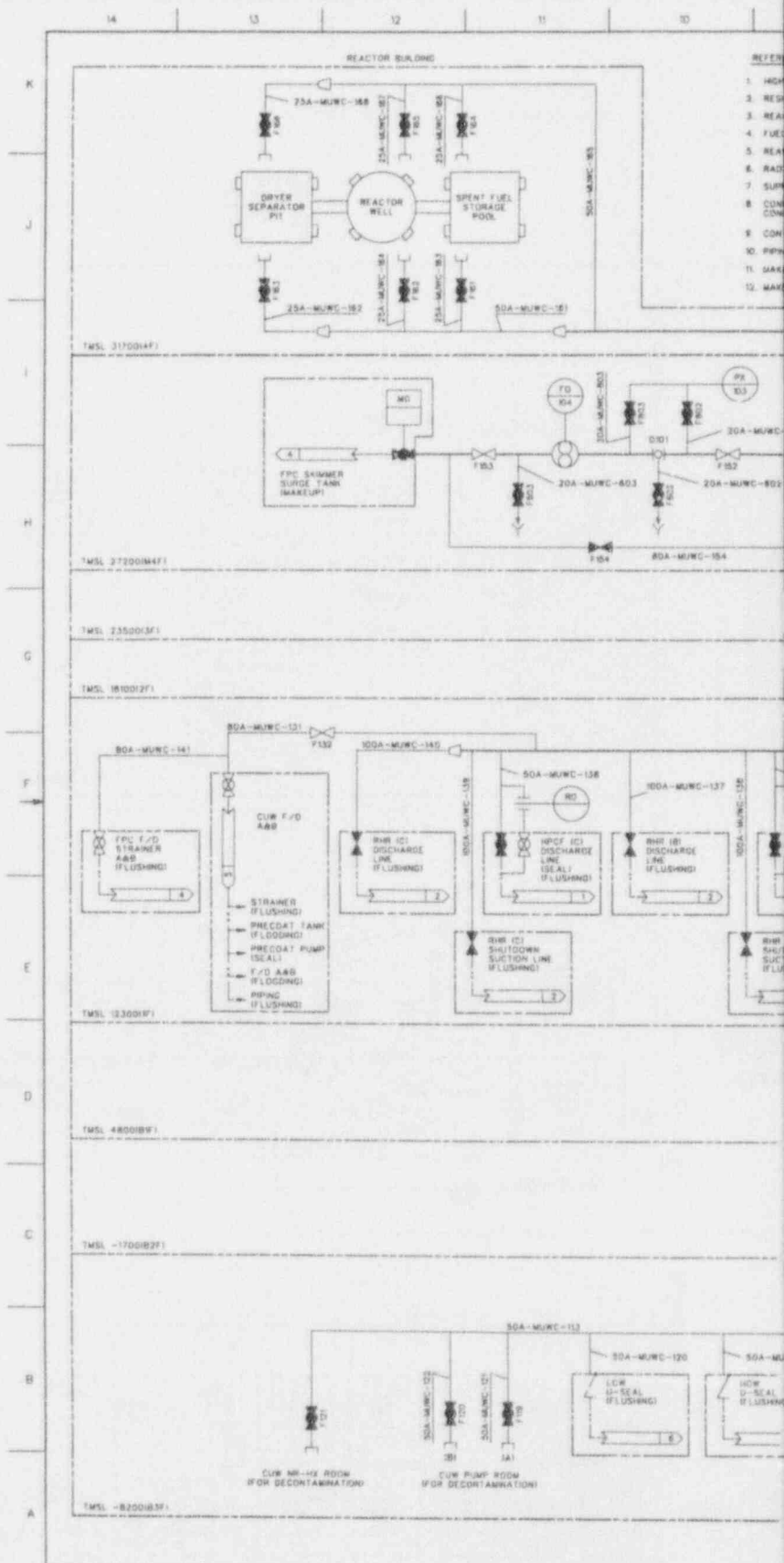
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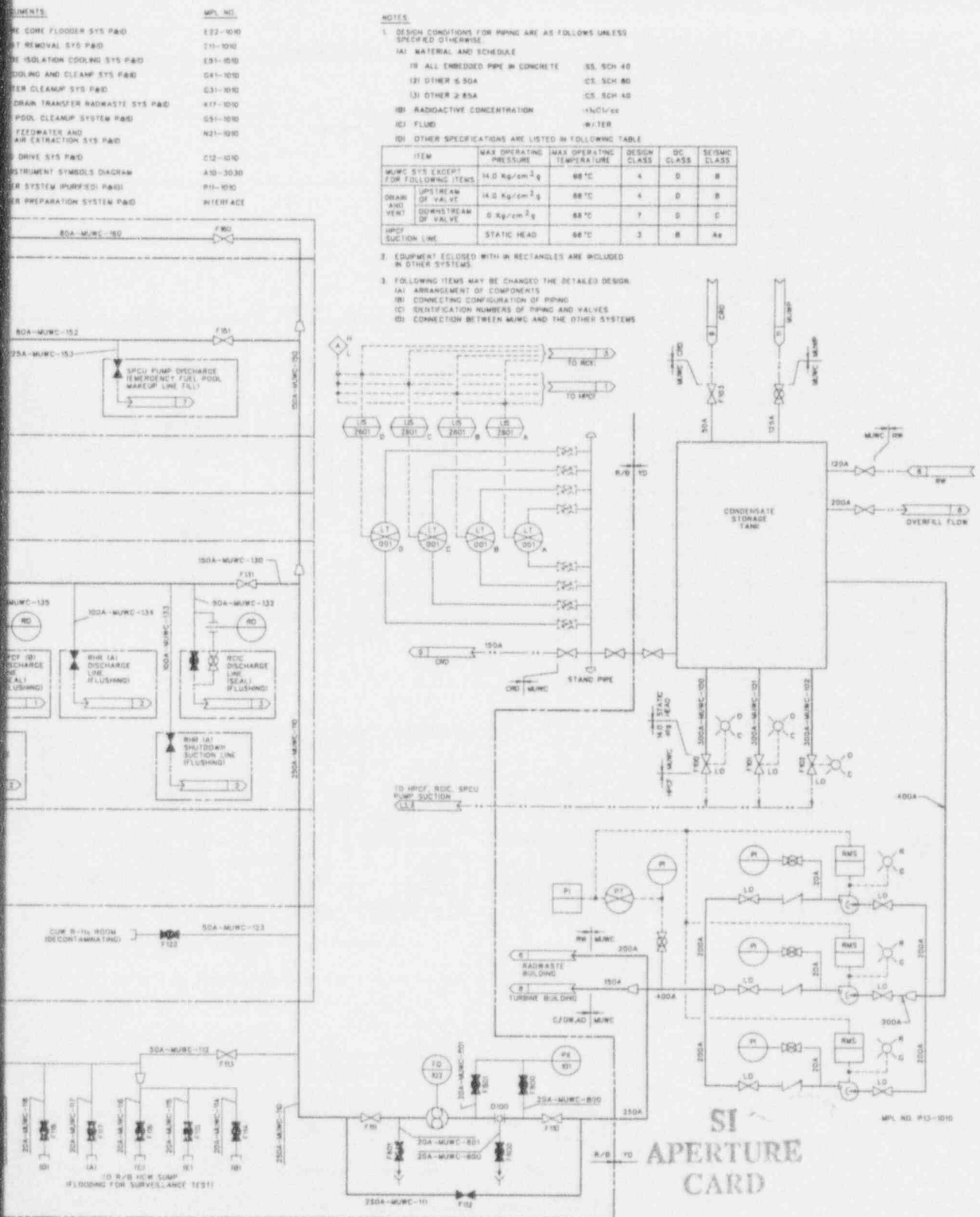
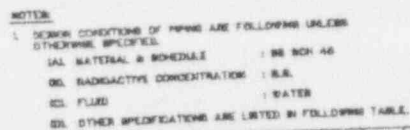


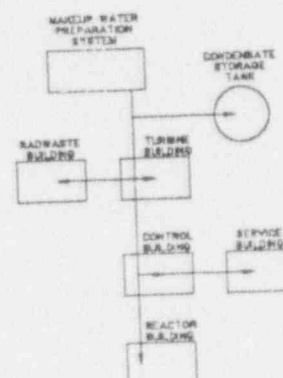
Figure 9.2-4 MAKEUP WATER (CONDENSATE) P&ID



ITEM	MAX OPERATING PRESSURE	MAX OPERATING TEMP	MTT CLASS	OC CLASS	BEARING CLASS
WATER SYSTEM EXCEPT FOR FOLLOWING ITEMS	W-20 kg/cm ² g	300 °C	4	B	C
DRUM	W-20 kg/cm ² g	300 °C	4	B	C
VENT	W-20 kg/cm ² g	300 °C	7	B	C
PCV BOUNDARY	W-20 kg/cm ² g	175 °C	3	B	Aa

3. EQUIPMENT ENCLOSED IN RECTANGLE ARE INCLUDED IN OTHER SYSTEMS.
4. FOLLOWING ITEMS MAY BE OMADED DURING DETAILED DESIGN.
 - (A) ARRANGEMENT OF COMPONENTS
 - (B) CONNECTING CONFIGURATION OF PIPING
 - (C) IDENTIFICATION NUMBERS OF PIPING & VALVES
 - (D) CONNECTION BETWEEN MWP AND THE OTHER SYSTEMS
5. MAKEUP WATER TO THIS EQUIPMENT SHALL BE SUPPLIED FROM THE CONNECTION IN SERVICE BOIL.

<u>REFERENCE DOCUMENT</u>	<u>WFL NO.</u>
1. REAC REGRD SYS PWD	831-1010
2. BLC SYS PWD	041-1010
3. PORT ACCESS SAMPLING SYS PWD	901-1010
4. STANDBY GAS TREATMENT SYS PWD	723-1010
5. FLAMMABILITY CONTROL SYS PWD	144-1010
6. DECONTAMINATION SYSTEM PWD	144-1010
7. REAC BLEND COOLING WATER SYS PWD	843-1010
8. EMERGENCY D/D COOLING WATER SYS PWD	733-1010
9. STACK SYSTEM PWD	921-1010
10. MAKEUP WATER SYSTEM (CONDENSATES) PWD	913-1010
11. SAMPLING SYS PWD	901-1010
12. MAKEUP WATER PREPARATION SYS PWD	INTERFACE
13. RADWASTE SYSTEM PWD	877-1010
14. CONDENSATE DEMINERALIZER SYS PWD	837-1010
15. TURBINE BUILDING COOLING WATER SYS PWD	823-1010
16. HOUSE WALKER PWD	963-1010
17. HVAC SYSTEM PWD	141-1010
18. SUPPLEMENTARY POOL CLEANUP SYSTEM PWD	041-1010
19. WARDING AND INSTRUMENT SYMBOLS DIAGRAM	810-5030



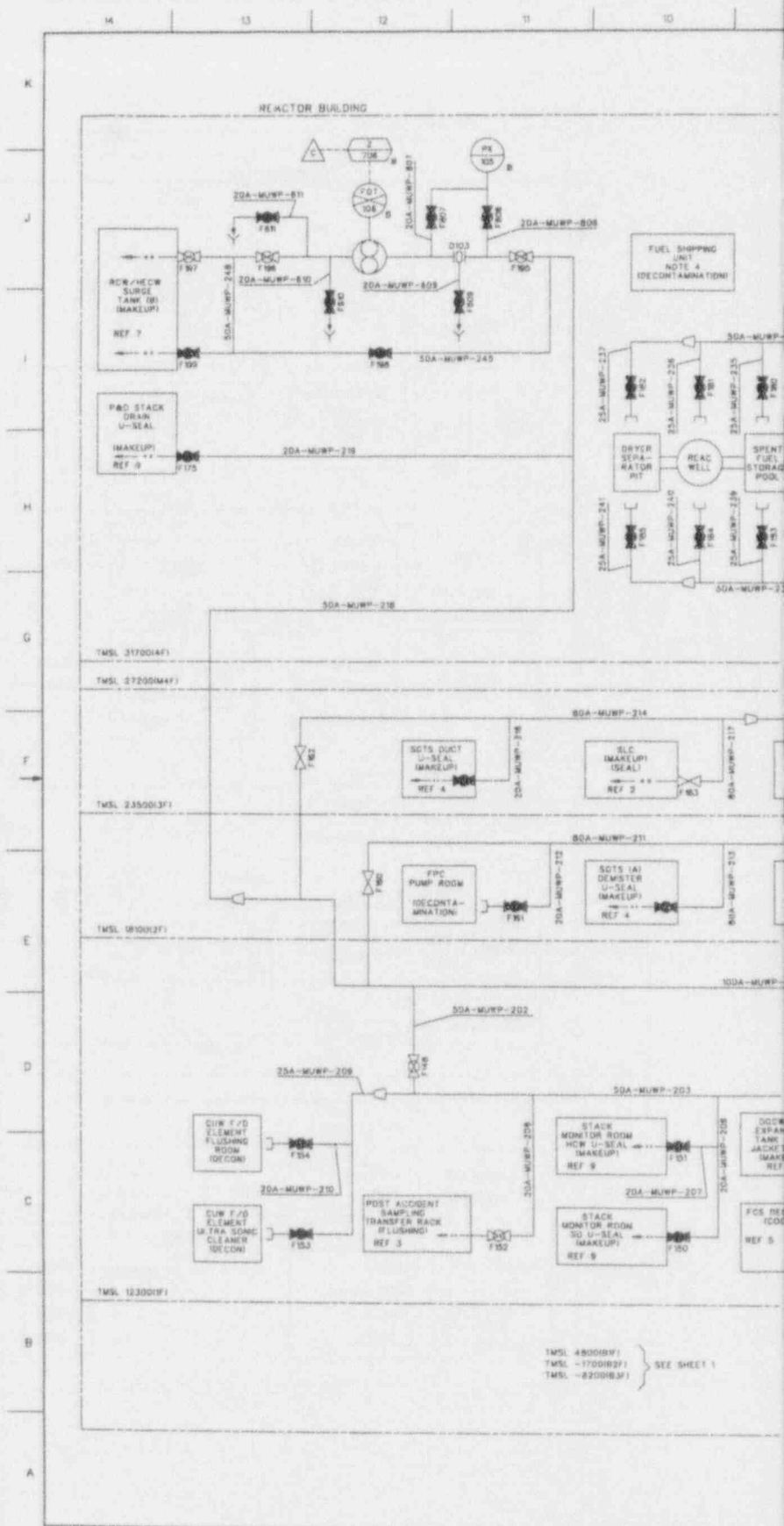
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Figure 9.2-5 MAKEUP WATER (PURIFIED) P&ID (Sheet 1 of 3)



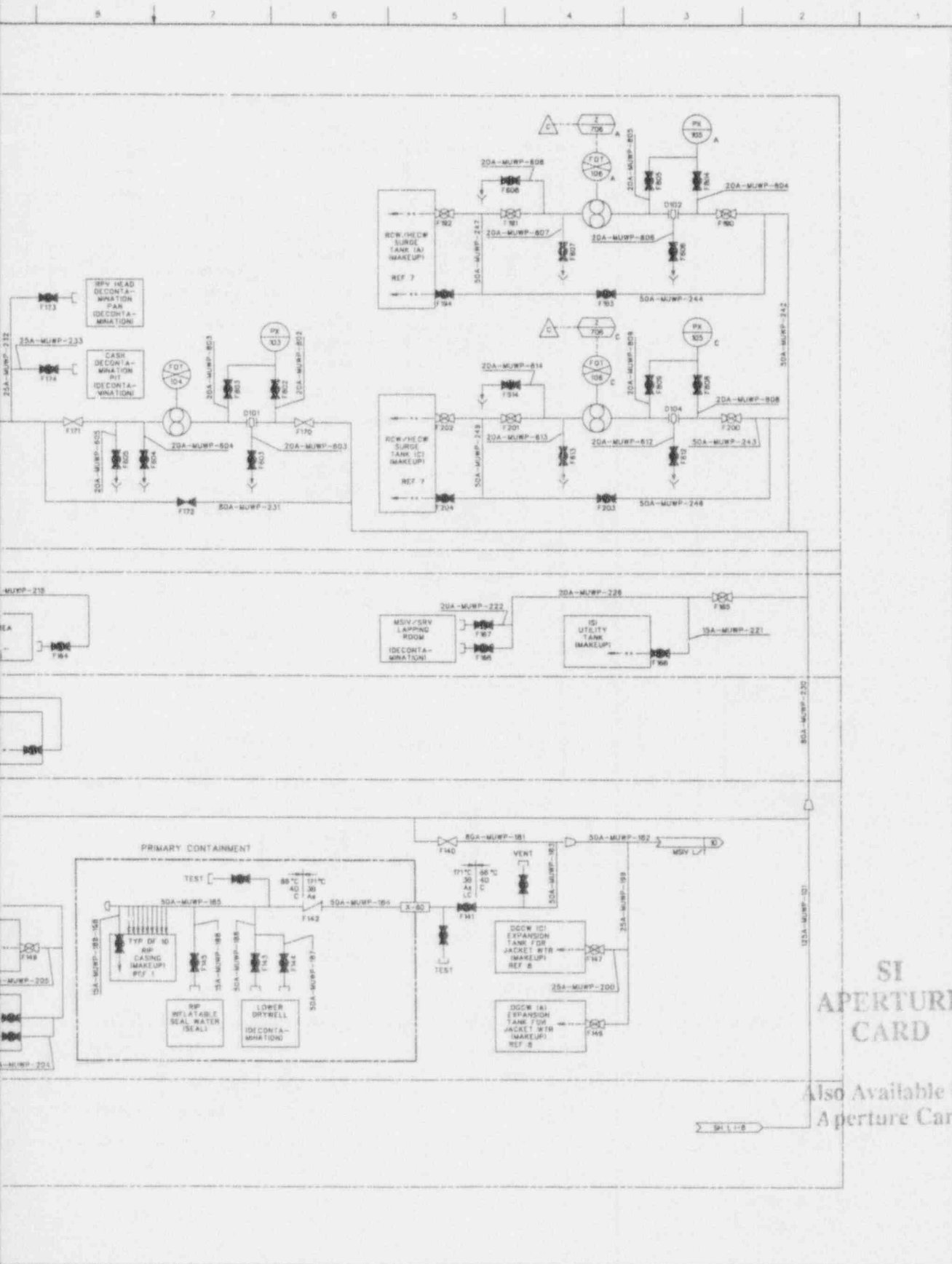
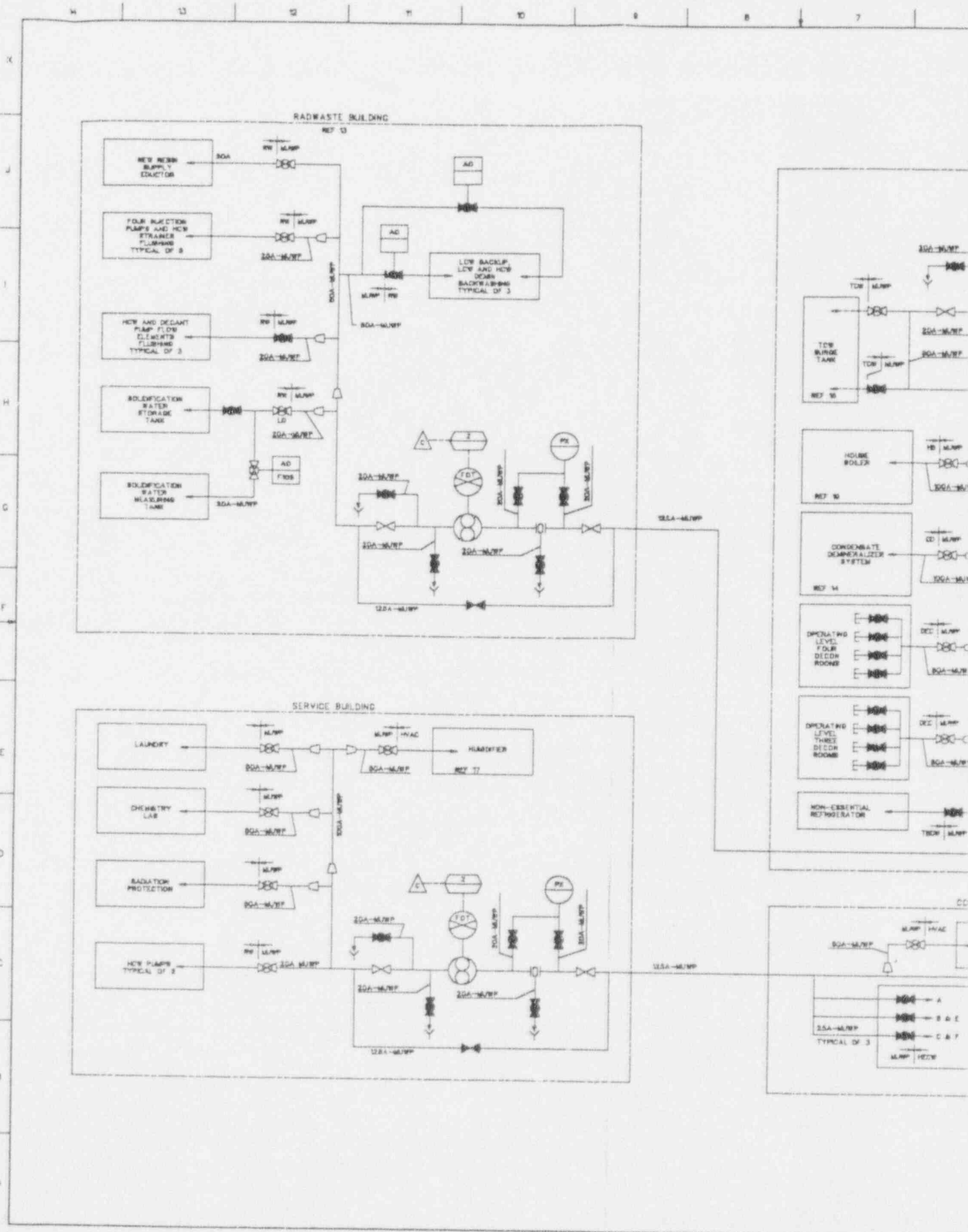


Figure 9.2-5 MAKEUP WATER (PURIFIED) P&ID (Sheet 2 of 3)

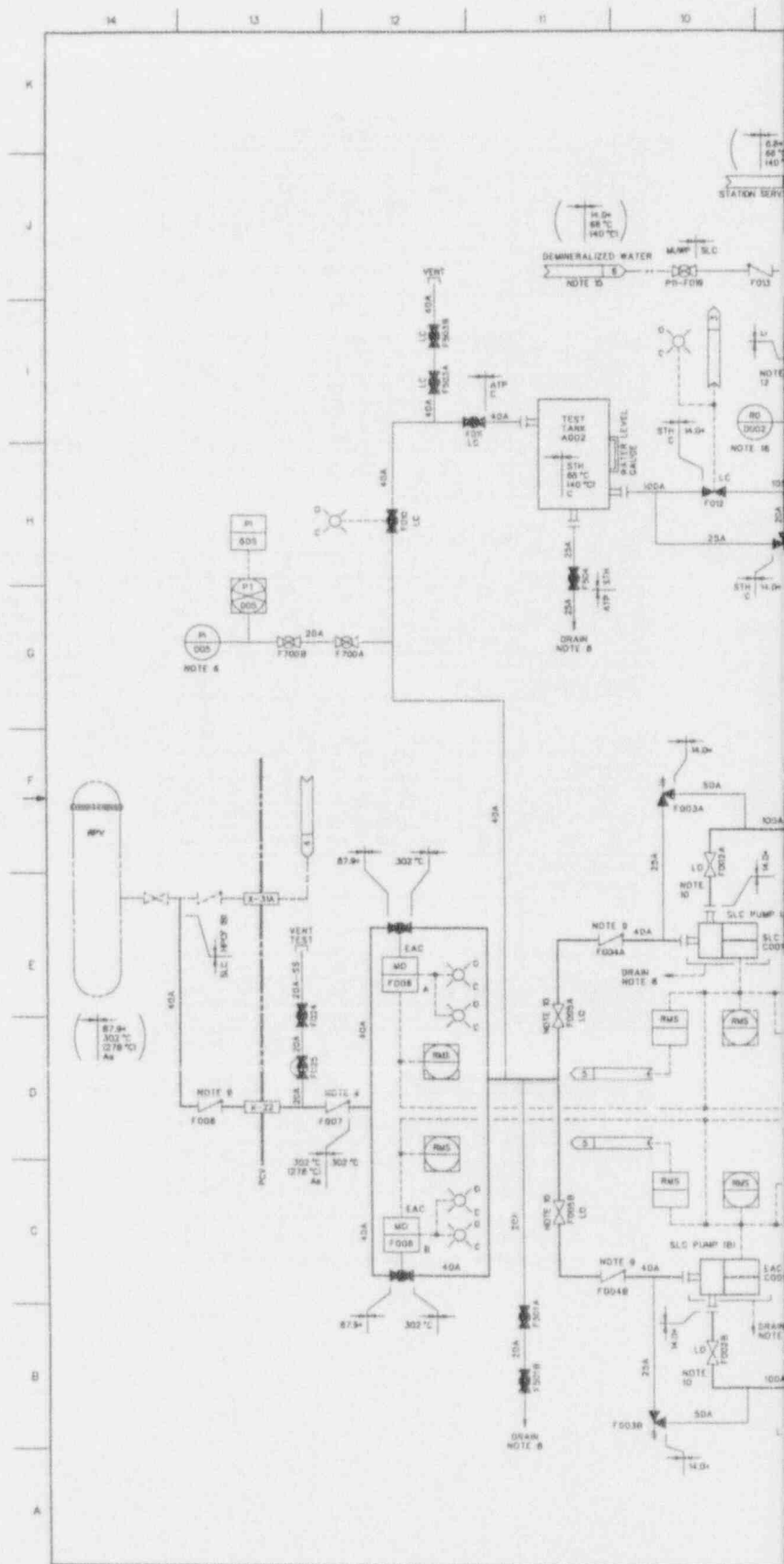
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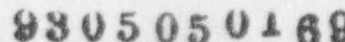


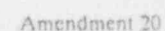


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9.2-41.1







MODE A REACTOR INJECTION MODE NOTE B

LOCATION	1	2	3	4	5	6	7
FLOW (l/min)	189	189	189	189	189	D	D
PRESS (Kg/cm ² g)	STH	-01	MAX 88.0*	81.3	80.8	STH	ATP
TEMP (°C)	30	30	30	30	30	AMT	AMT
MAX ALLOWABLE PRESS LOSS (m)	0.12 * PEAK PRESS 100 Kg/cm ² g						

MODE B NON-INJECTION TEST MODE NOTE B

LOCATION	6	2	3	7	1	4	5
FLOW (l/min)	189	189	189	189	D	D	D
PRESS (Kg/cm ² g)	STH	-01	MAX 88.0*	ATP	STH	RxP	RxP
TEMP (°C)	DWT	DWT	DWT	DWT	30	RxT	RxT
MAX ALLOWABLE PRESS LOSS (m)	0.12 * PEAK PRESS 100 Kg/cm ² g						

MODE C INJECTION TEST MODE NOTE B

LOCATION	6	2	3	4	5	1	7
FLOW (l/min)	189	189	189	189	189	D	D
PRESS (Kg/cm ² g)	STH	-01	*	*	RxP	STH	ATP
TEMP (°C)	DWT	DWT	DWT	DWT	DWT	30	AMT
MAX ALLOWABLE PRESS LOSS (m)	0.12						

MODE D STANDBY MODE

LOCATION	1	2	3	4	5	6	7
FLOW (l/min)	D	D	D	D	D	D	D
PRESS (Kg/cm ² g)	STH	DWP	DWP	RxP	RxP	ATP	ATP
TEMP (°C)	30	AMT	AMT	RxT	RxT	AMT	AMT
MAX ALLOWABLE PRESS LOSS (m)							

	A	B	C	D	E	F
MAX OPERATING PRESSURE (Kg/cm ² g)	87.9	110	14.0	STH	8.8	ATP
MAX OPERATING TEMPERATURE (°C)	302	66	66	66	66	66

VALVE OPENING/CLOSING CONDITION NOTE B

	F 001 ABB	F 002 ABB	F 004 ABB	F 005 ABB	F 006 ABB	F 007	F 008	F 010	F 011	F 012	F 014
MODE A	D	D	D	D	D	D	D	X	X	X	X
MODE B	X	D	D	D	X	X	X	P	D	D	X
MODE C	X	D	D	D	X	D	D	X	X	D	X
MODE D	X	D	X	D	X	X	X	X	X	X	X

D: FULL OPEN P: PARTIALLY OPEN X: CLOSE

NOTES:

1. * SHOWS THE VALUE WHICH IS NOT NEEDED IN A BASIC PLANNING OF THIS SYSTEM.
2. SOLUTION TEMP IN SLC TANK SHALL BE MAINTAINED AT 30±3°C DURING NORMAL PLANT OPERATION.
3. SLC TANK SHALL BE LOCATED SUCH THAT PUMP SUCTION PIPING IS ALWAYS FILLED WITH THE SOLUTION.
4. SLC PUMP SHALL BE ABLE TO INJECT BORDON SOLUTION AT REACTOR PRESSURE OF 80.8 Kg/cm²g.
5. TEST TANK SHALL BE LOCATED SUCH THAT PUMP SUCTION PIPING IS ALWAYS FILLED WITH WATER.
6. DURING OPERATING MODE A,B OR C, ONLY ONE PUMP IS RUN.

REFERENCE DOCUMENTS:

1. STANDBY LIQUID CONTROL SYS IBD
2. STANDBY LIQUID CONTROL SYS P&ID

MPL ITEM NO.

C41-1030
C41-1010

ABBREVIATION:

STH : STATIC WATER HEAD
ATP : ATMOSPHERIC PRESSURE
AMT : AMBIENT TEMPERATURE
DWT : SUPPLIED DEAMN WATER TEMPERATURE
DWP : SUPPLIED DEAMN WATER PRESSURE
RxP : REACTOR PRESSURE
RxT : REACTOR TEMPERATURE

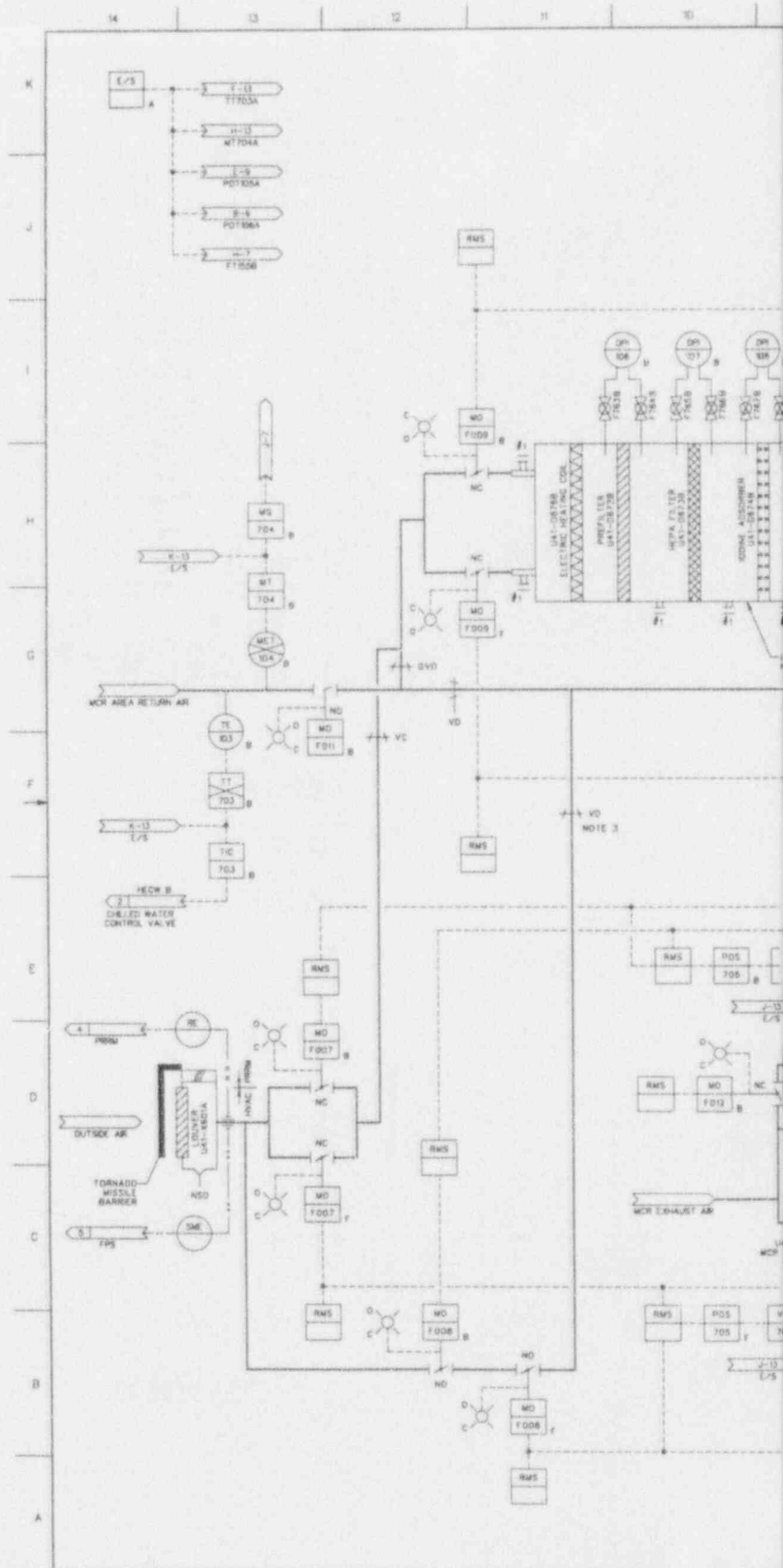
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APERTURE
CARD

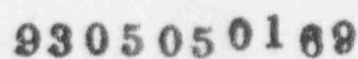
Also Available On
Aperture Card

MPL NO. C41-1020

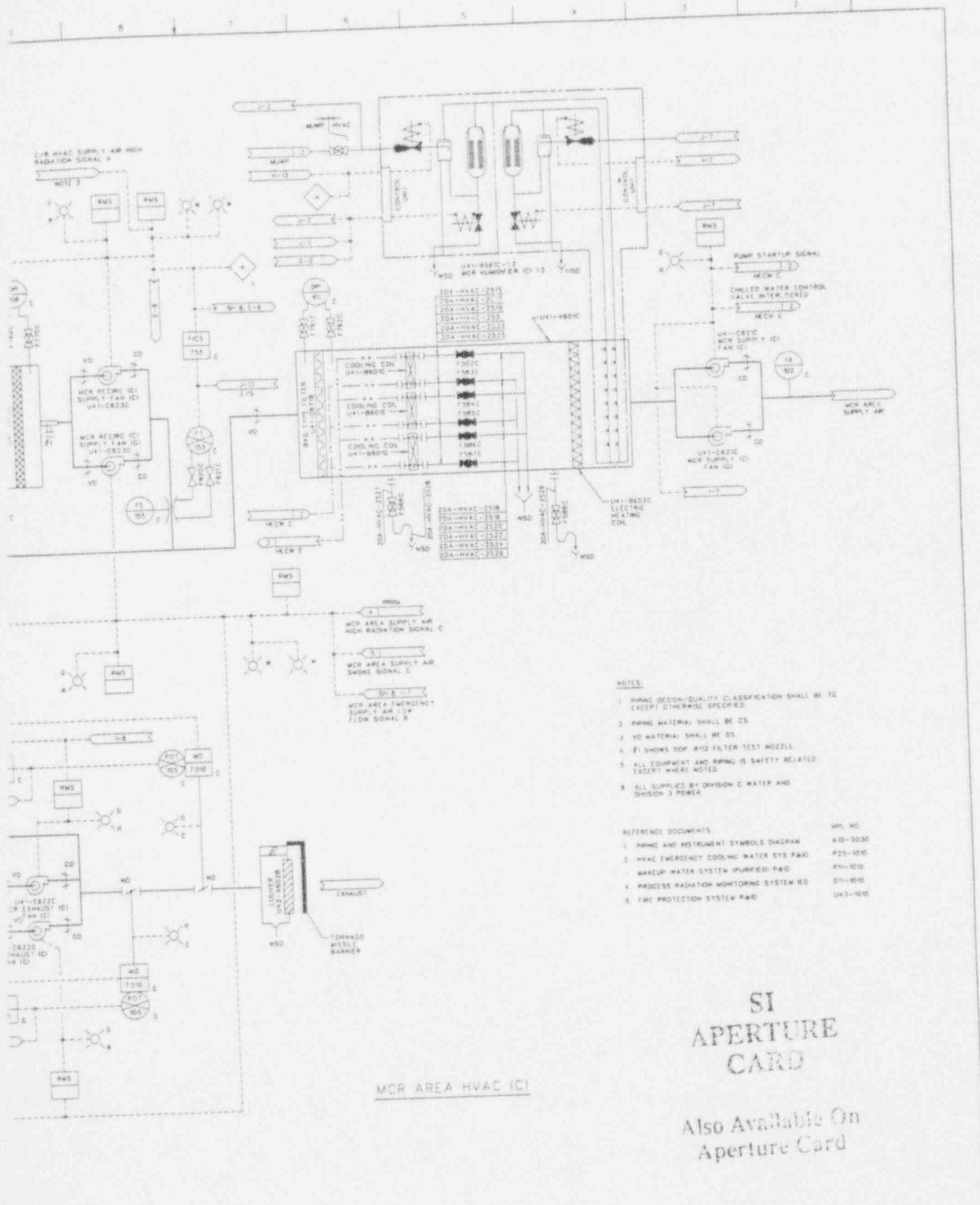
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Figure 9.3-1A STANDBY LIQUID CONTROL SYSTEM PROCESS FLOW DIAGRAM





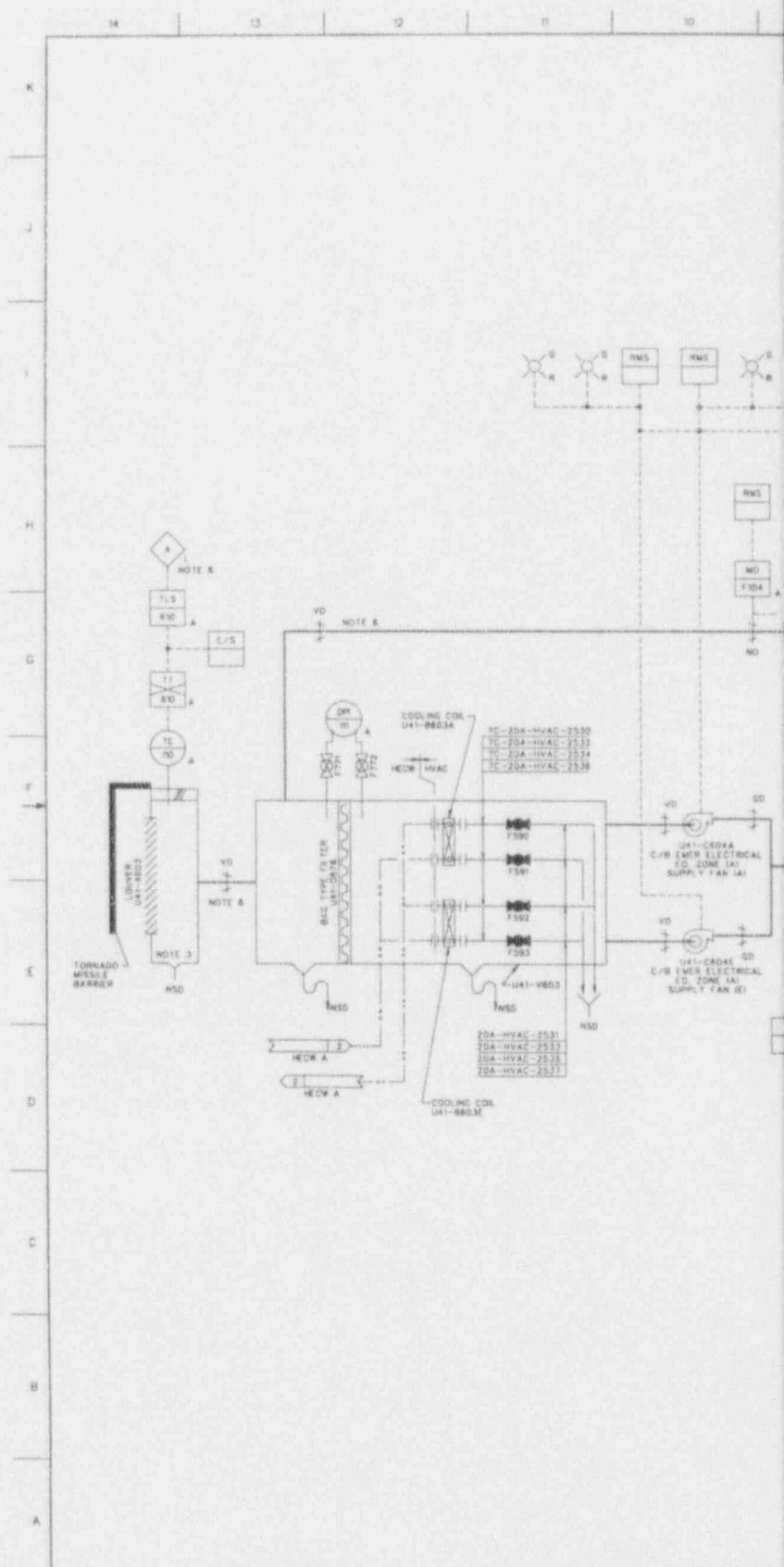
Amendment 27



- NOTES
1. HVAC DESIGN/QUALITY CLASSIFICATION SHALL BE TO EXCEPT OTHERWISE SPECIFIED
 2. PIPING MATERIAL SHALL BE CS
 3. VD MATERIAL SHALL BE SS
 4. FI SHOWS DOP R12 FILTER TEST NOZZLE
 5. ALL EQUIPMENT AND PIPING IS SAFETY RELATED EXCEPT WHERE NOTED
 6. ALL SUPPLIES BY DIVISION C WATER AND DIVISION 3 POWER

REFERENCE DOCUMENTS	WPL NO
1. PIPING AND INSTRUMENT SYMBOLS DIAGRAM	A10-3030
2. HVAC EMERGENCY COOLING WATER SYS P&ID	P25-1010
3. MAKEUP WATER SYSTEM (PUMPED) P&ID	P41-1010
4. PROCESS RADIATION MONITORING SYSTEM P&ID	D11-1010
5. FIRE PROTECTION SYSTEM P&ID	U43-1010

Figure 9.4-1 CONTROL BUILDING HVAC PROCESS FLOW DIAGRAM, (Sheet 2 of 5)



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9.4-7a.2

9305050169-43

Figure 9.4-1 CONTROL BUILDING HVAC

C/B HVAC (B)

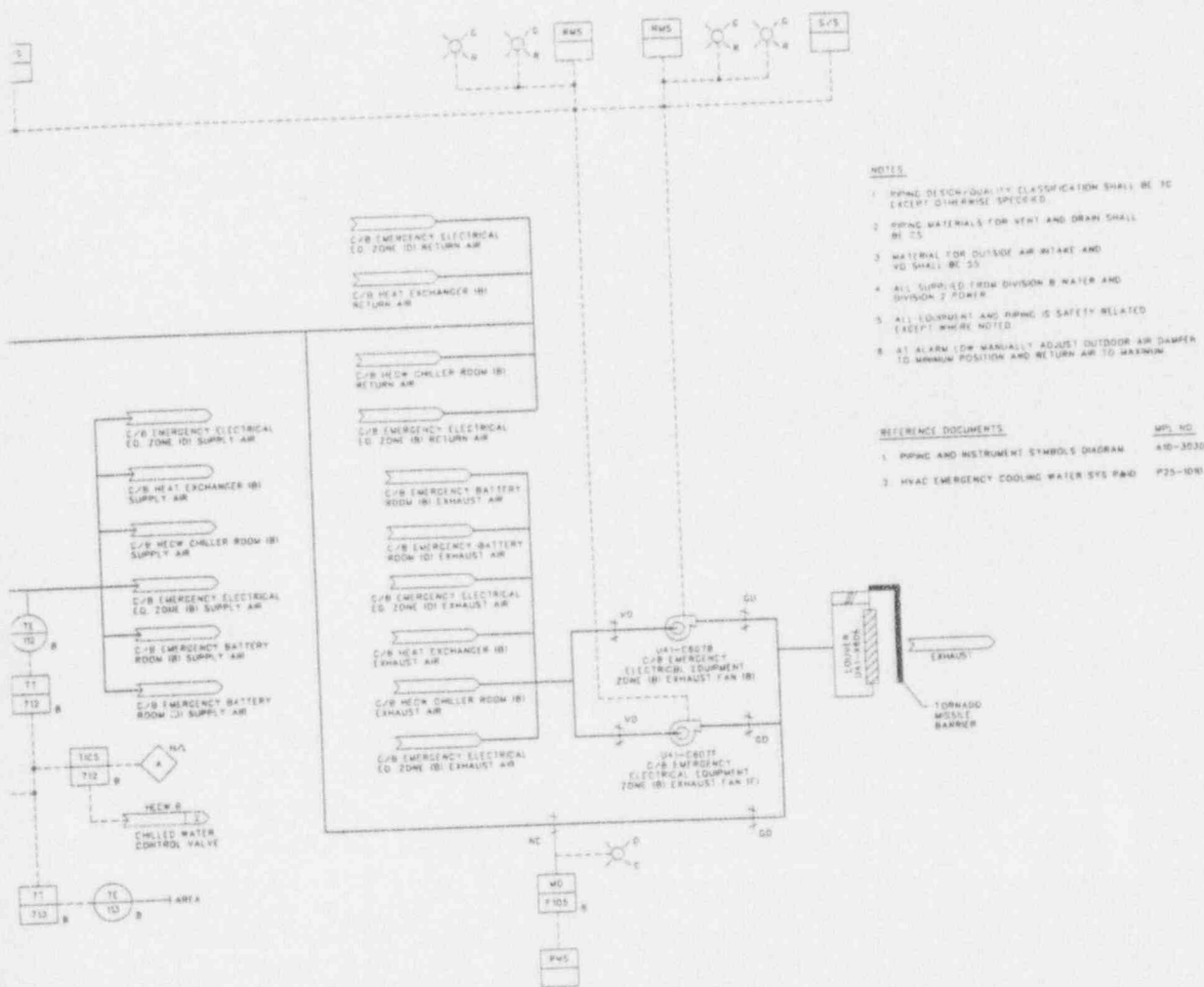
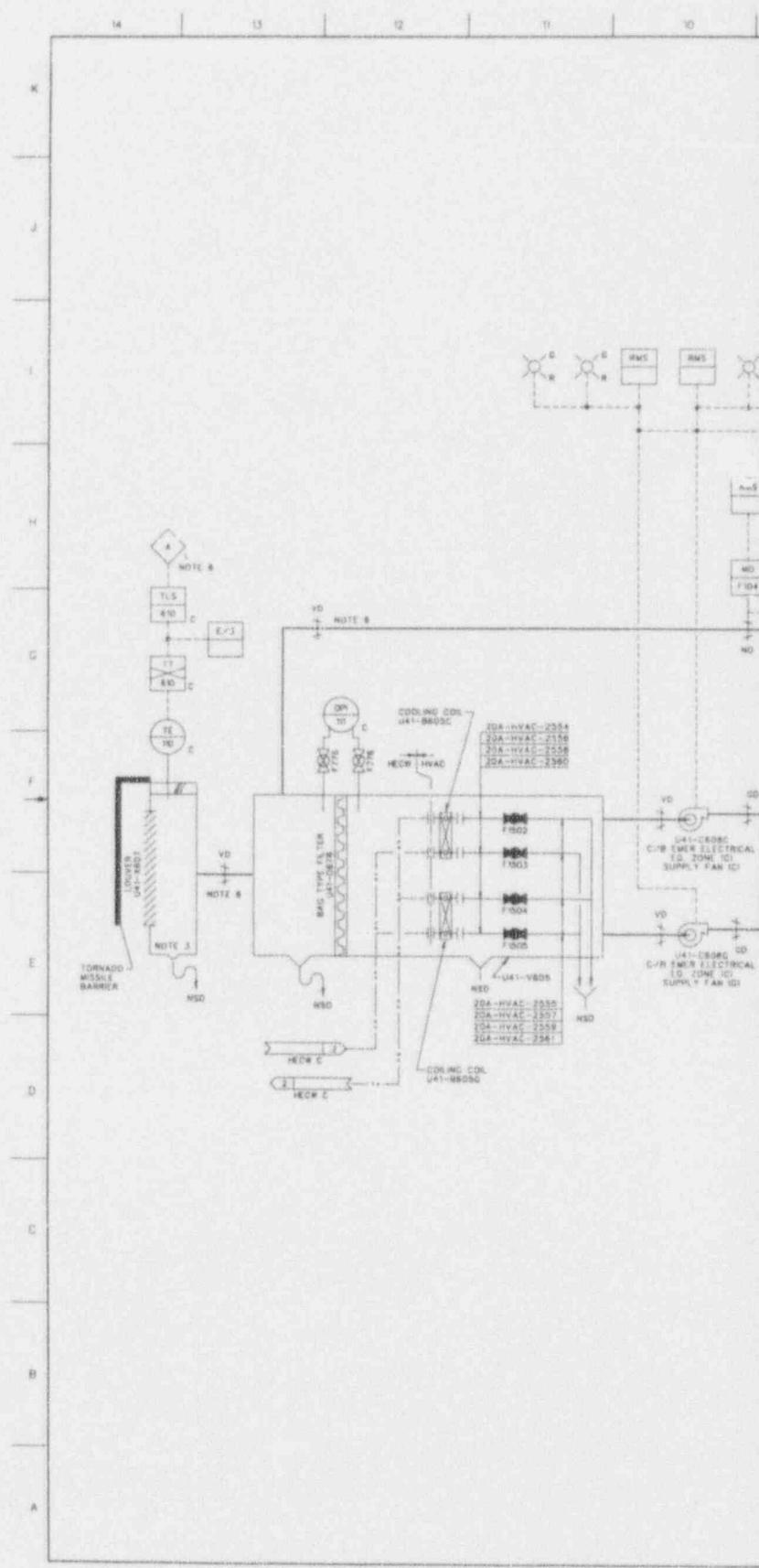


Figure 9.4-1 CONTROL BUILDING HVAC PROCESS FLOW DIAGRAM, (Sheet 4 of 5)

9.4-7a.3

Amendment 27

9305050169 - 44



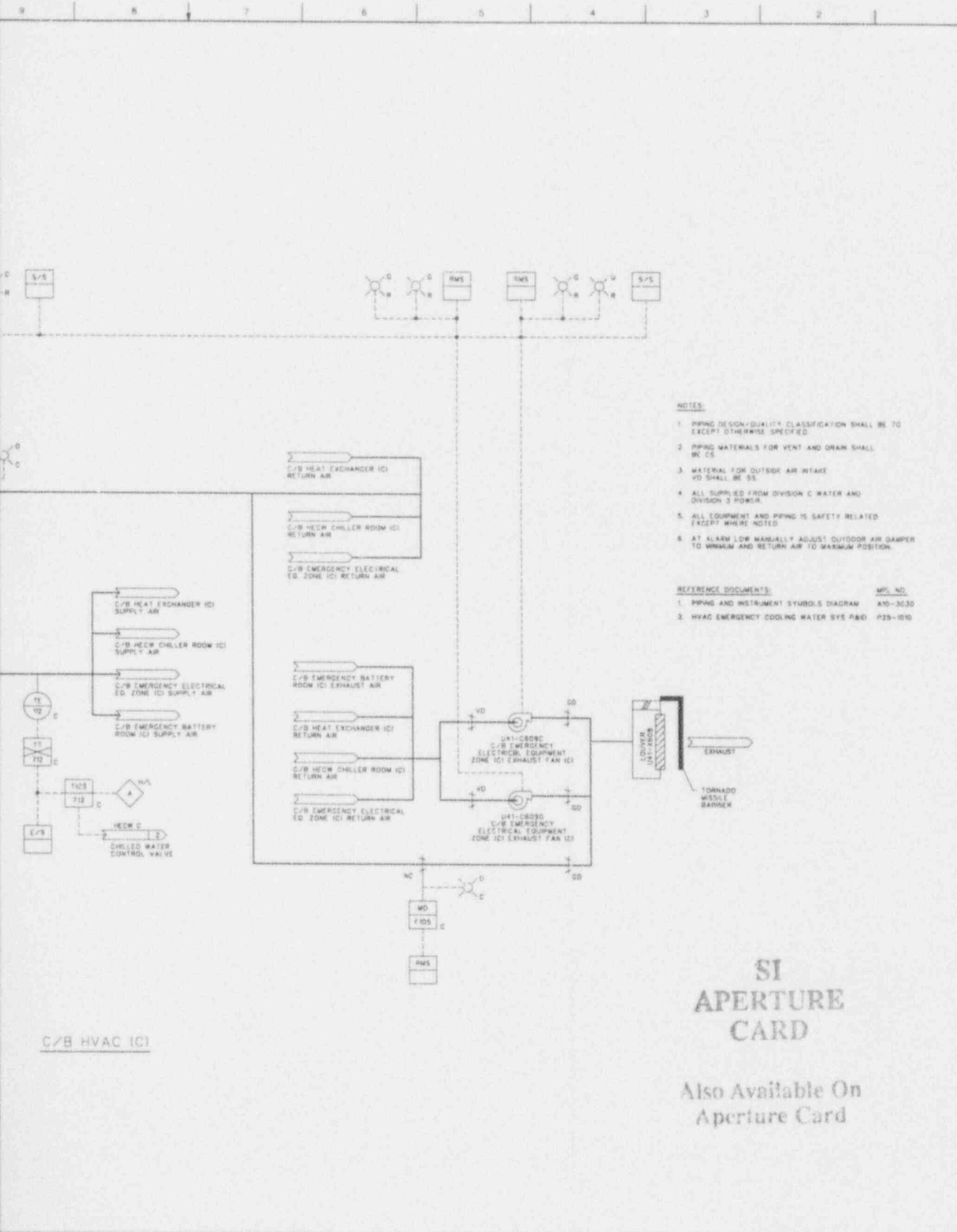
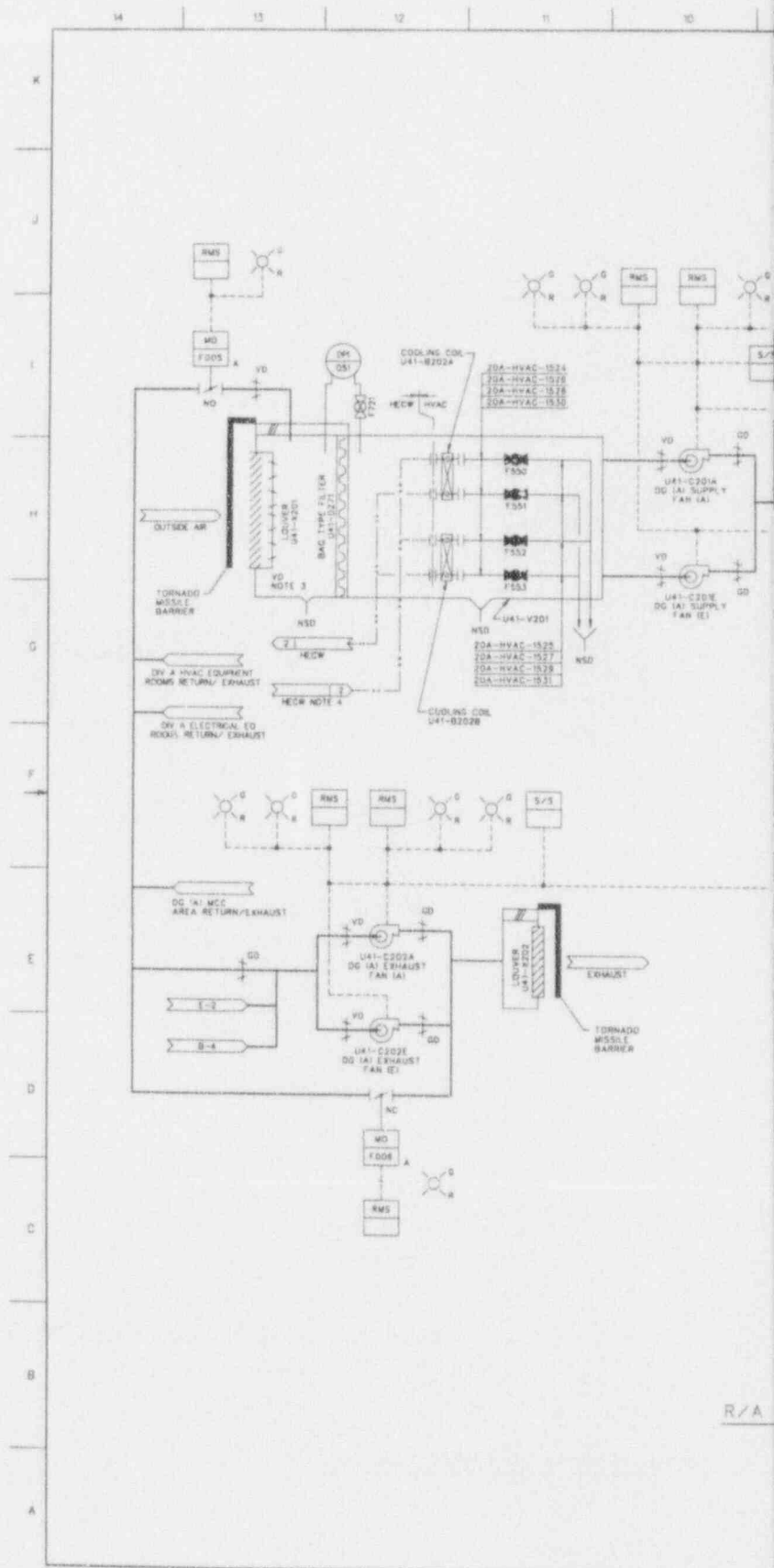


Figure 9.4-1 CONTROL BUILDING HVAC PROCESS FLOW DIAGRAM, (Sheet 5 of 5)



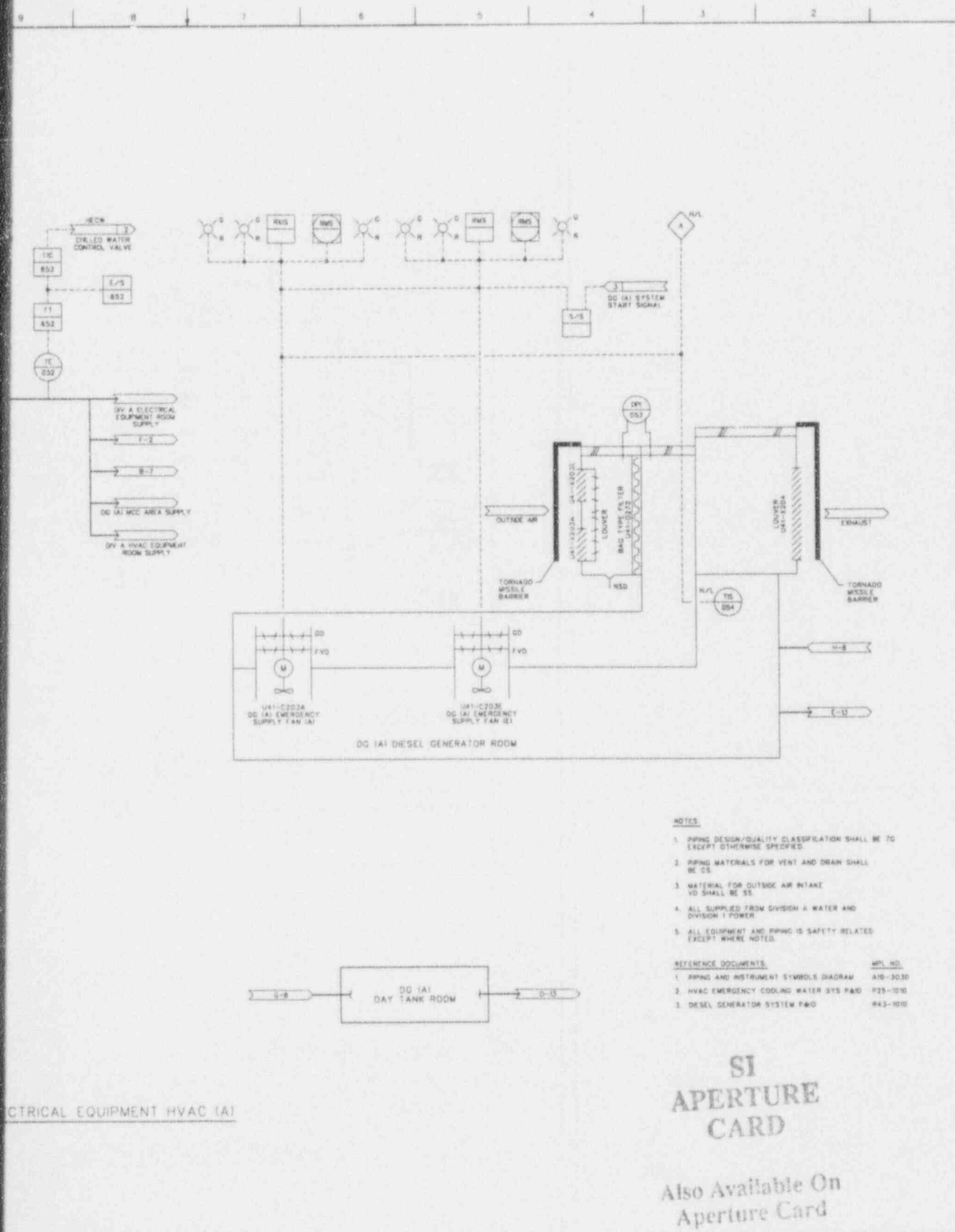


Figure 9.4-4 ESSENTIAL ELECTRICAL EQUIPMENT HVAC SYSTEM, (Sheet 1 of 3)

Amendment 27

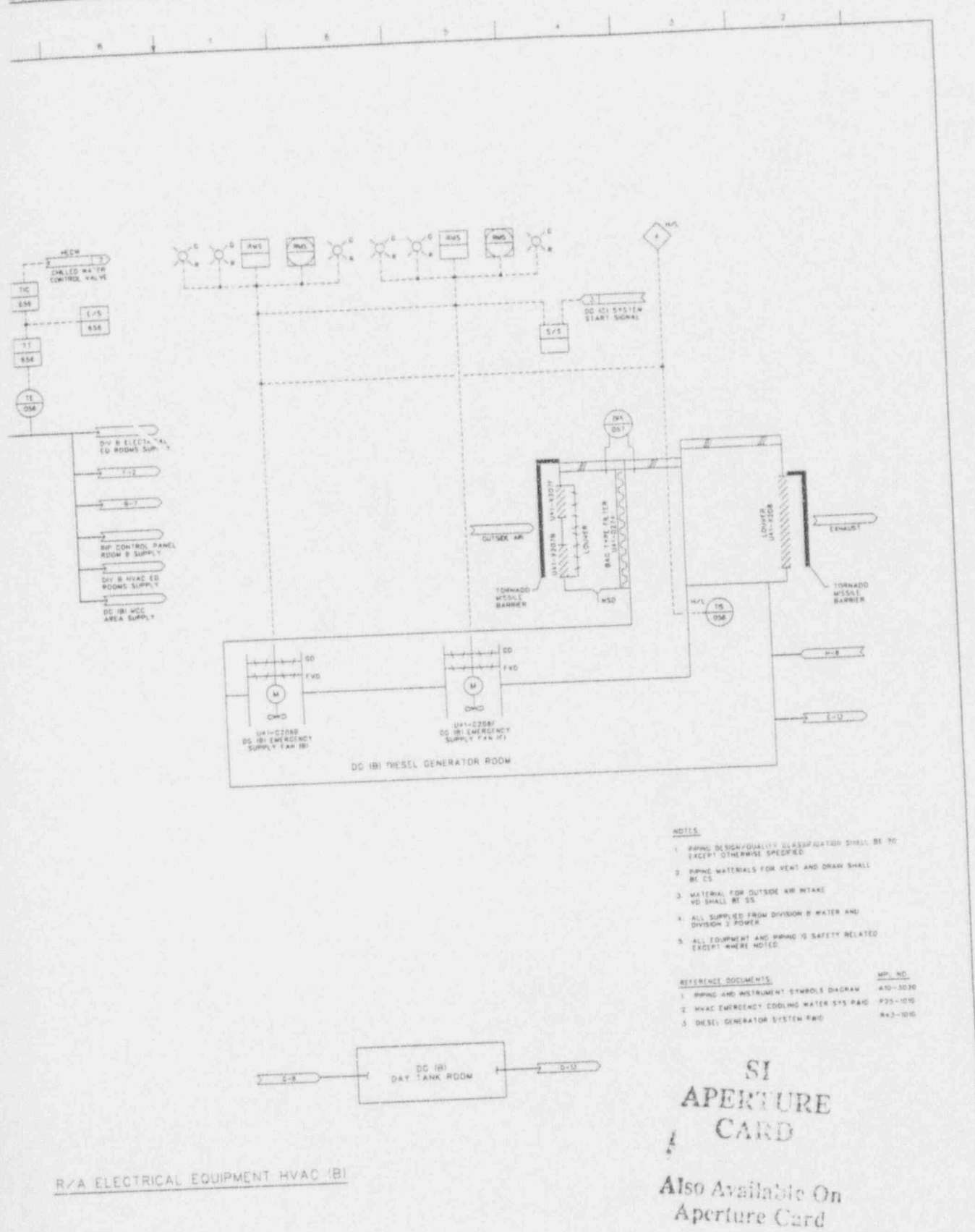
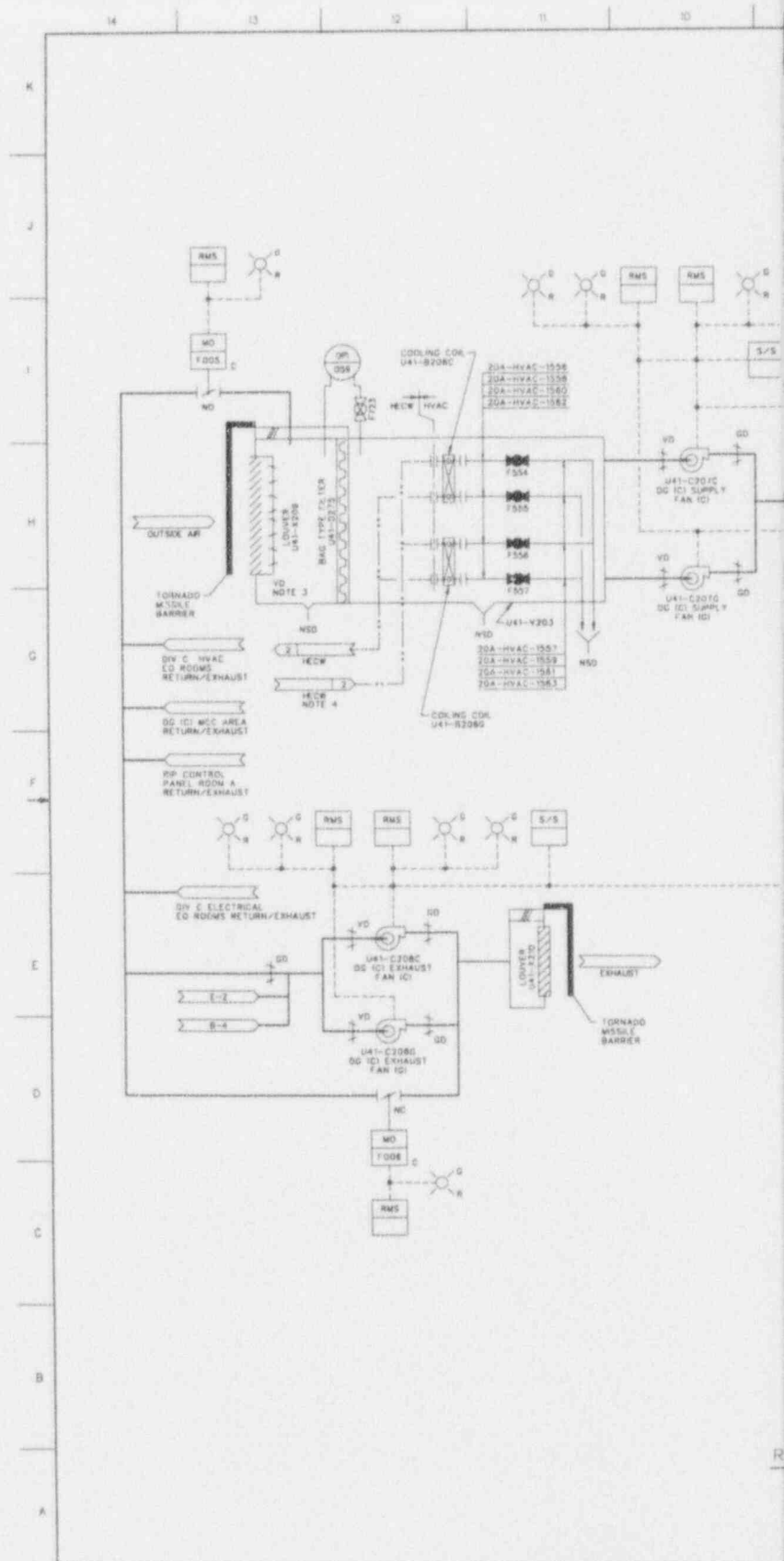


Figure 9.4-4 ESSENTIAL ELECTRICAL EQUIPMENT HVAC SYSTEM, (Sheet 2 of 3)



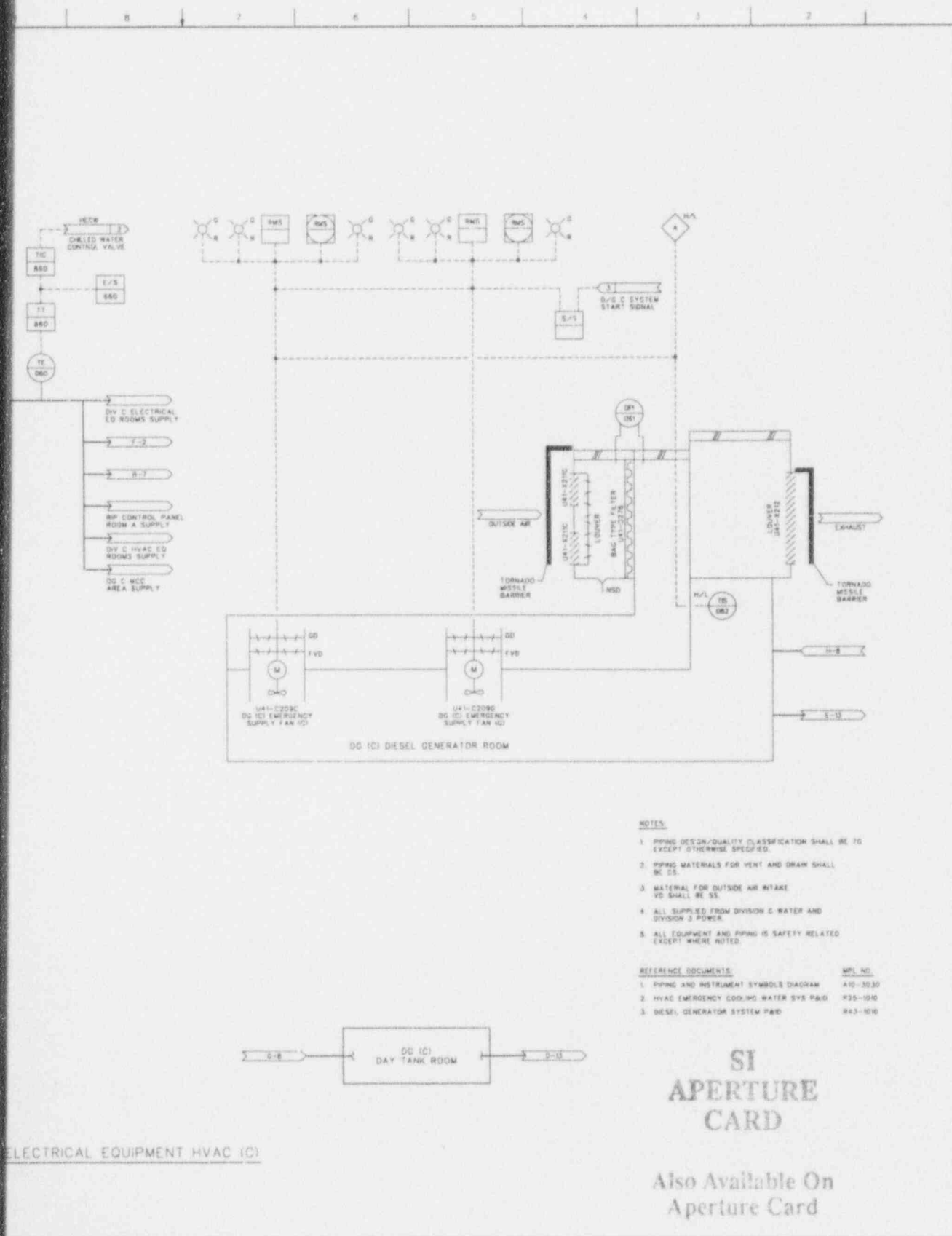
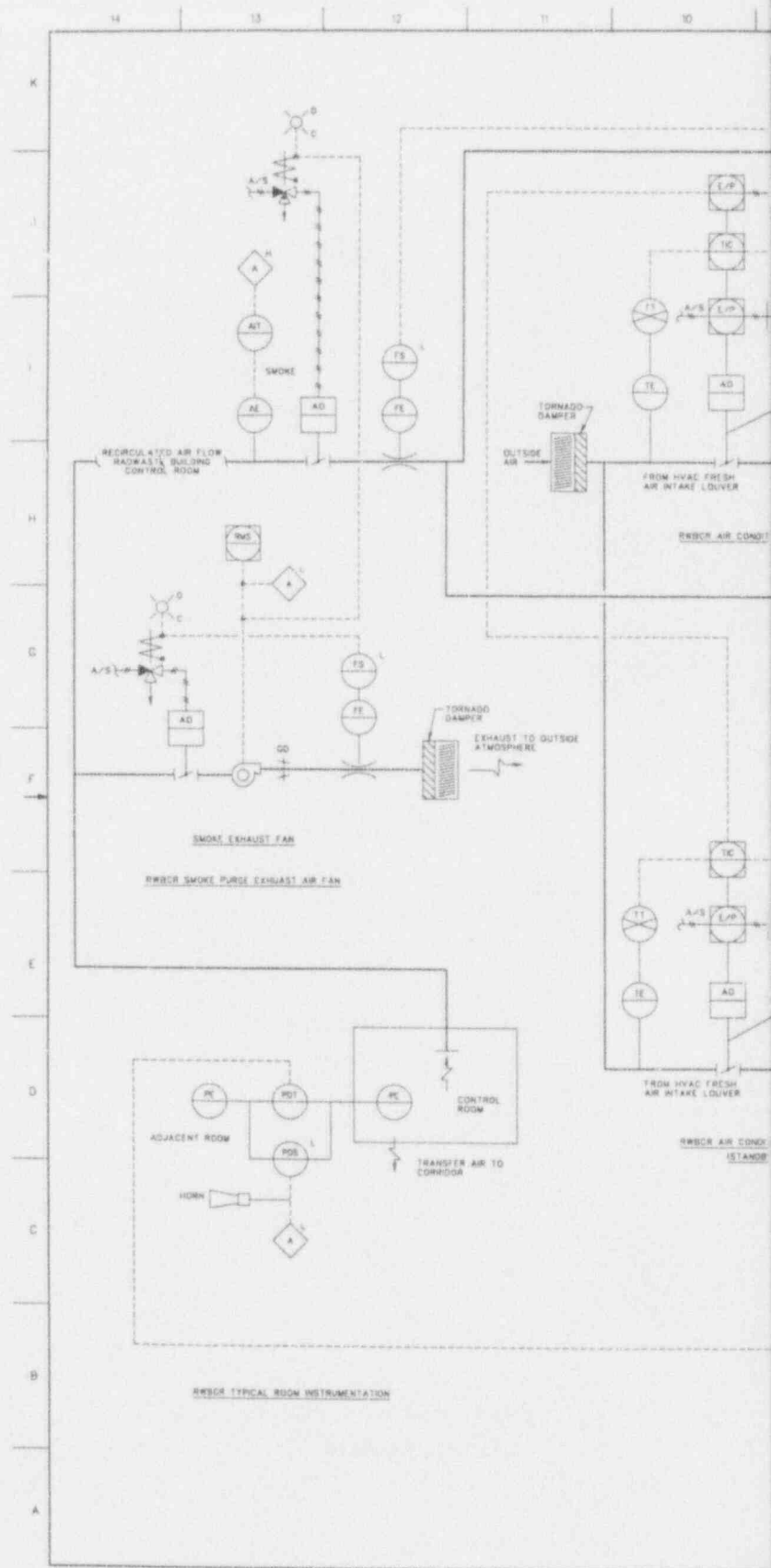


Figure 9.4-4 ESSENTIAL ELECTRICAL EQUIPMENT HVAC SYSTEM, (Sheet 3 of 3)



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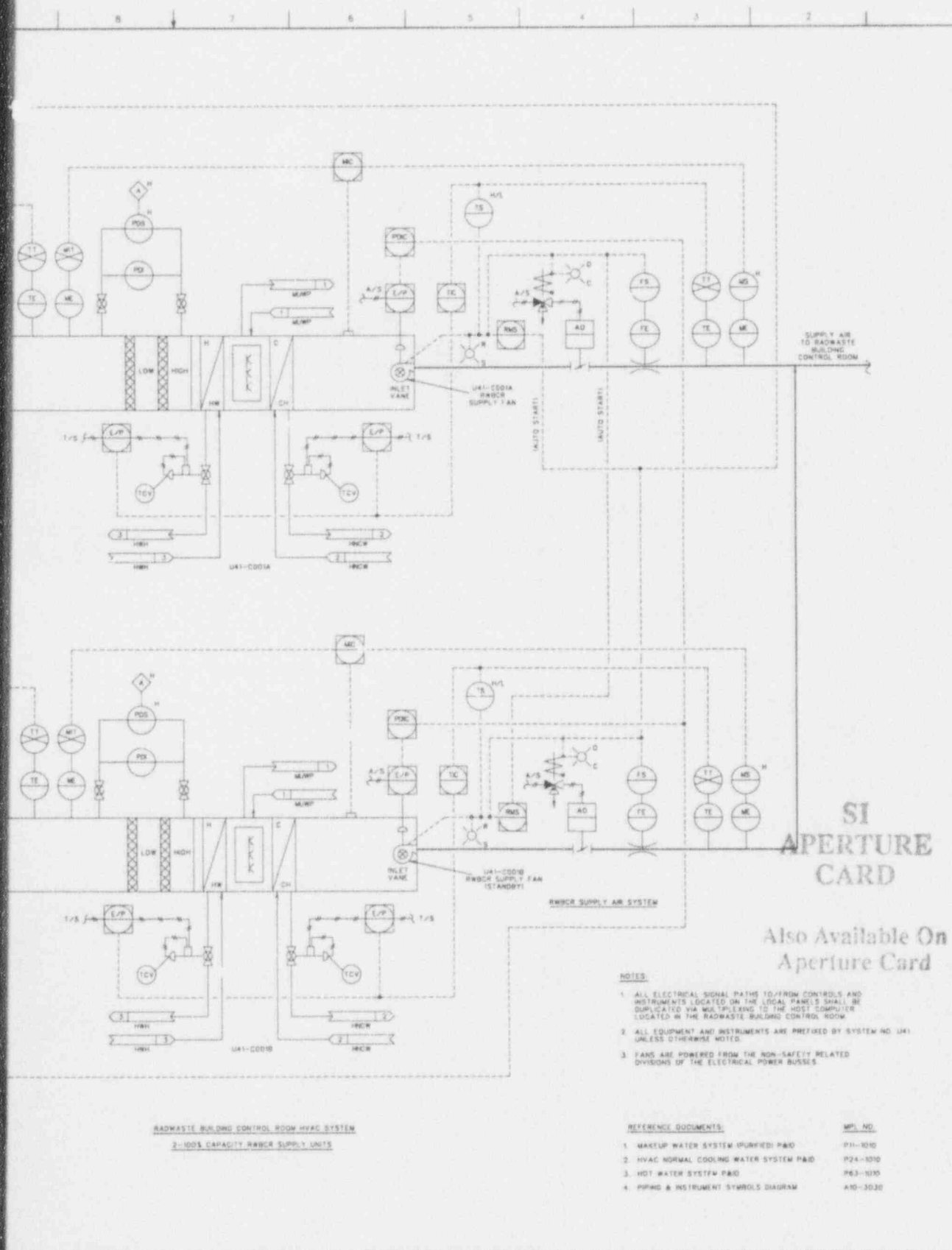
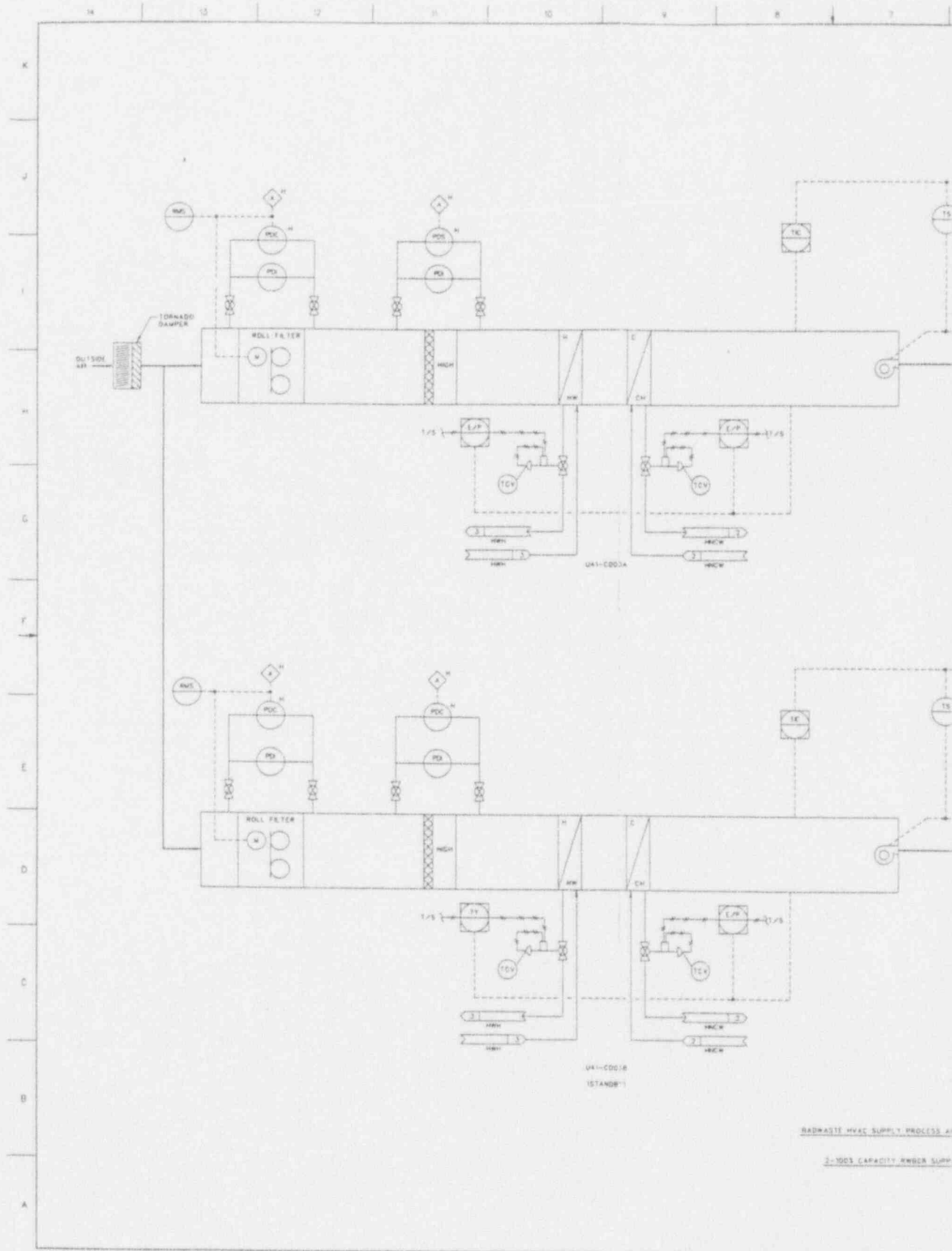


Figure 9.4-10 RADWASTE BUILDING HVAC, (Sheet 1 of 3)



RADWASTE HVAC SUPPLY PROCESS A1
2-100% CAPACITY RWBSR SUPPLY

Figure 9.4

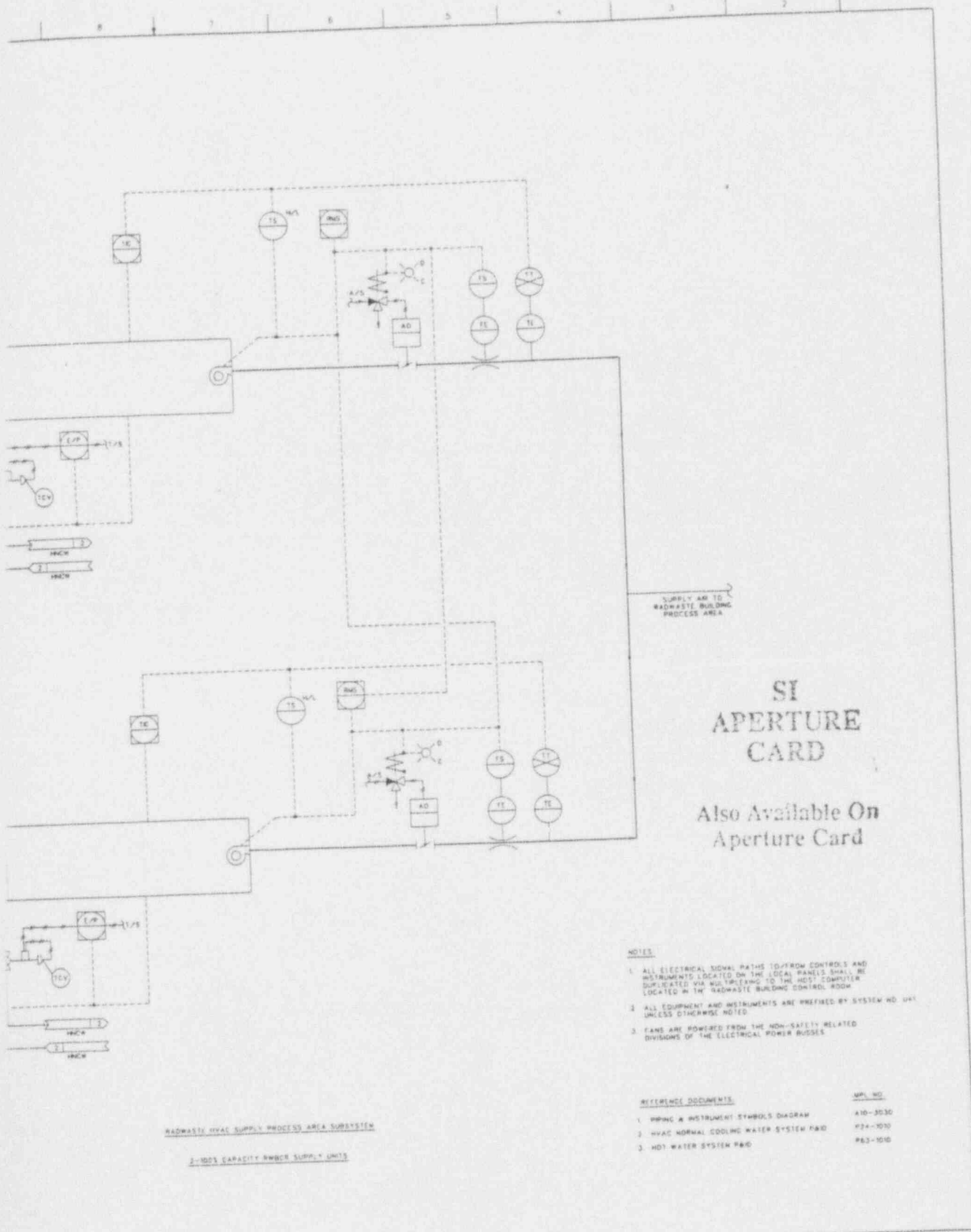
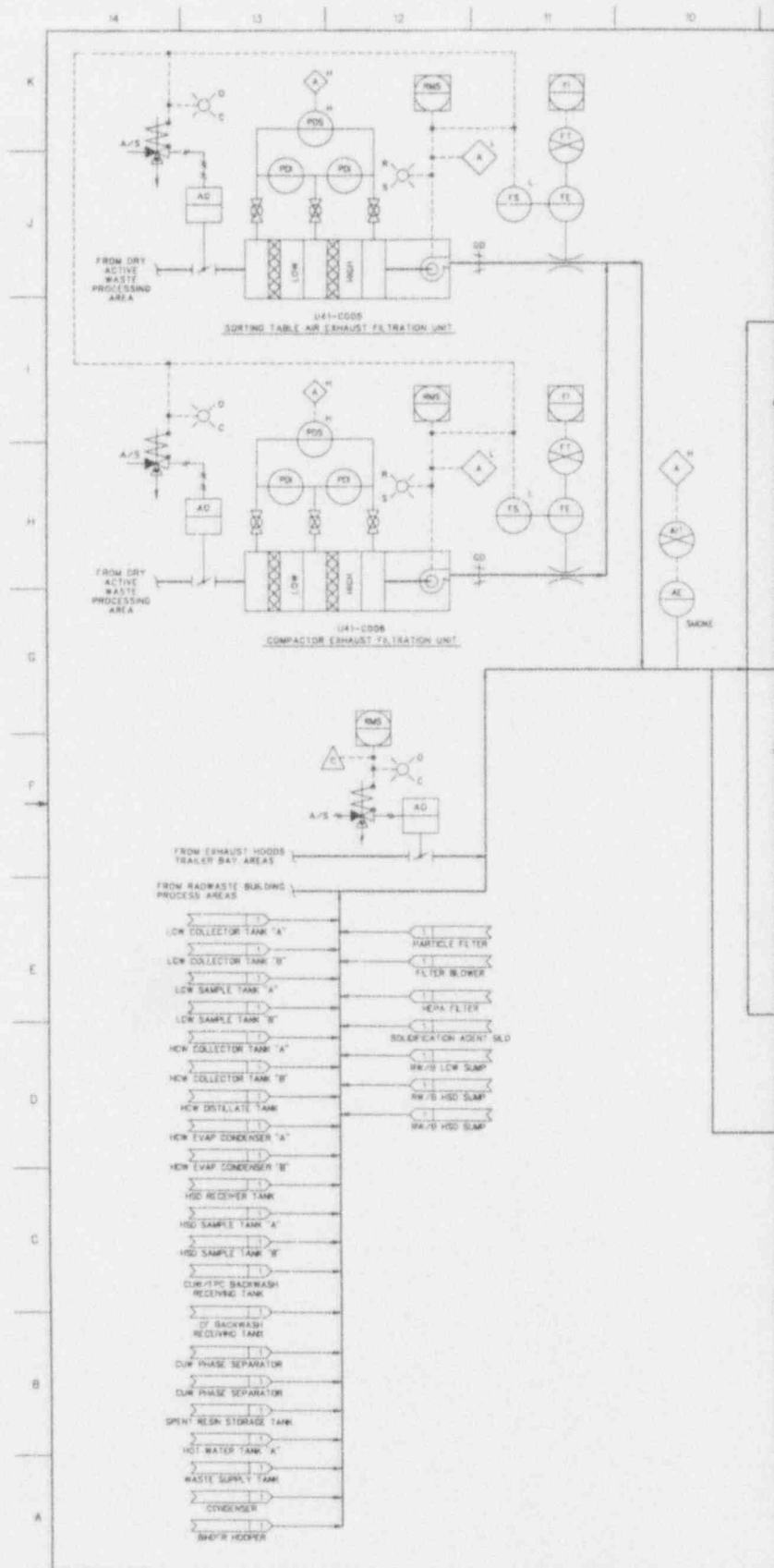


Figure 9.4-10 RADWASTE BUILDING HVAC, (Sheet 2 of 3)



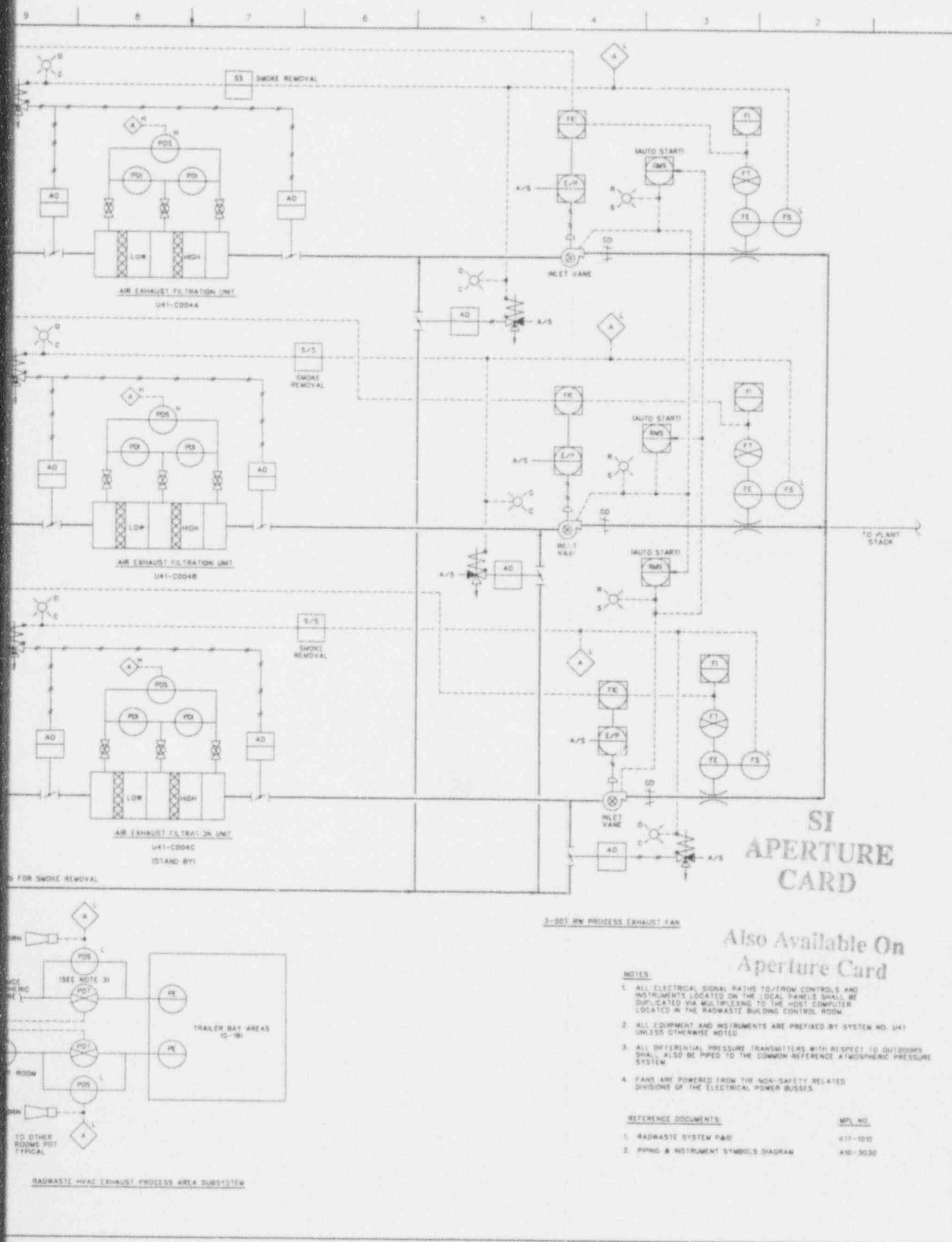


Figure 9.4-10 RADWASTE BUILDING HVAC, (Sheet 3 of 3)