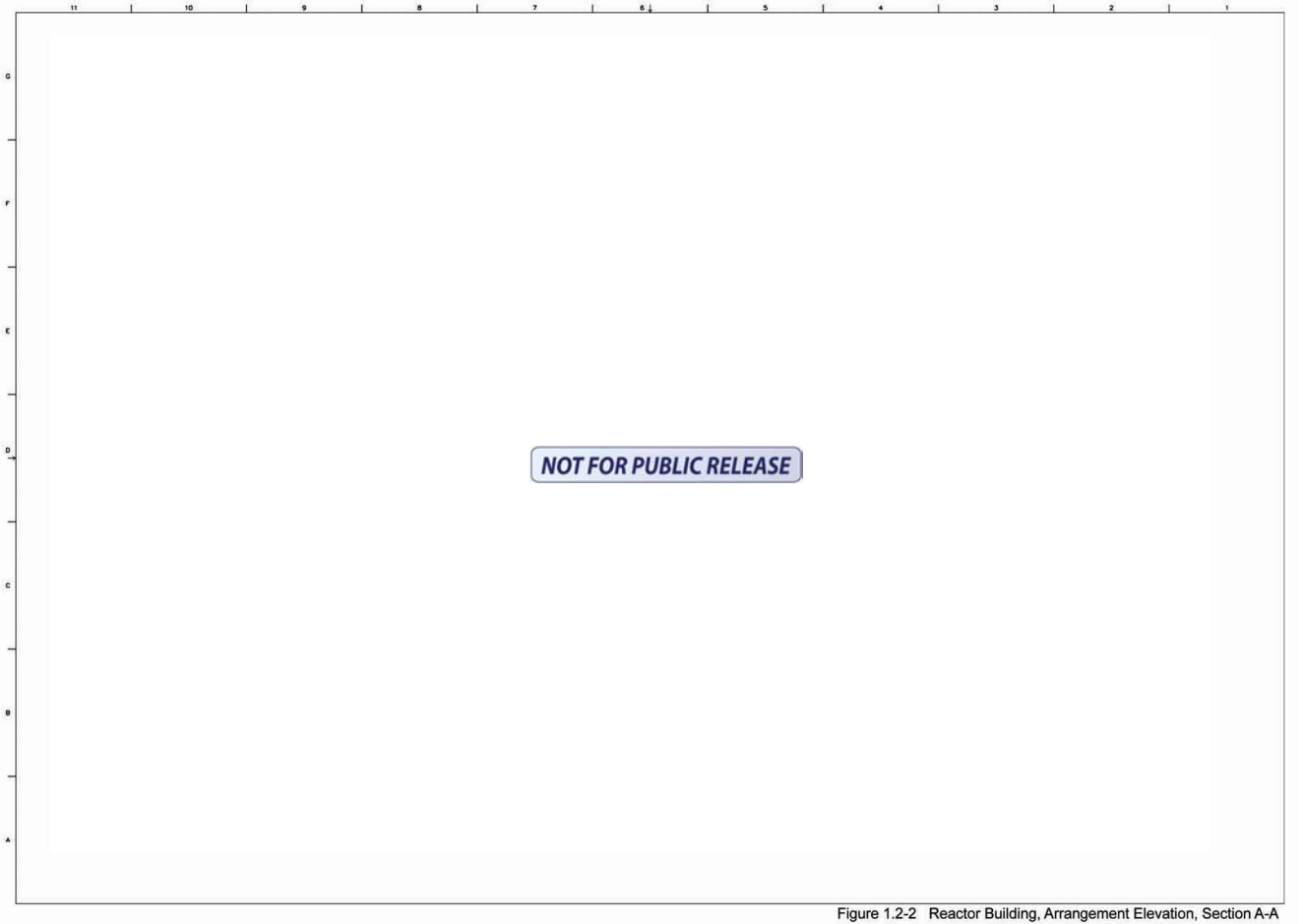


Figure 1.2-2 Reactor Building, Arrangement Elevation, Section A-A
STP 3&4 Rev. 2

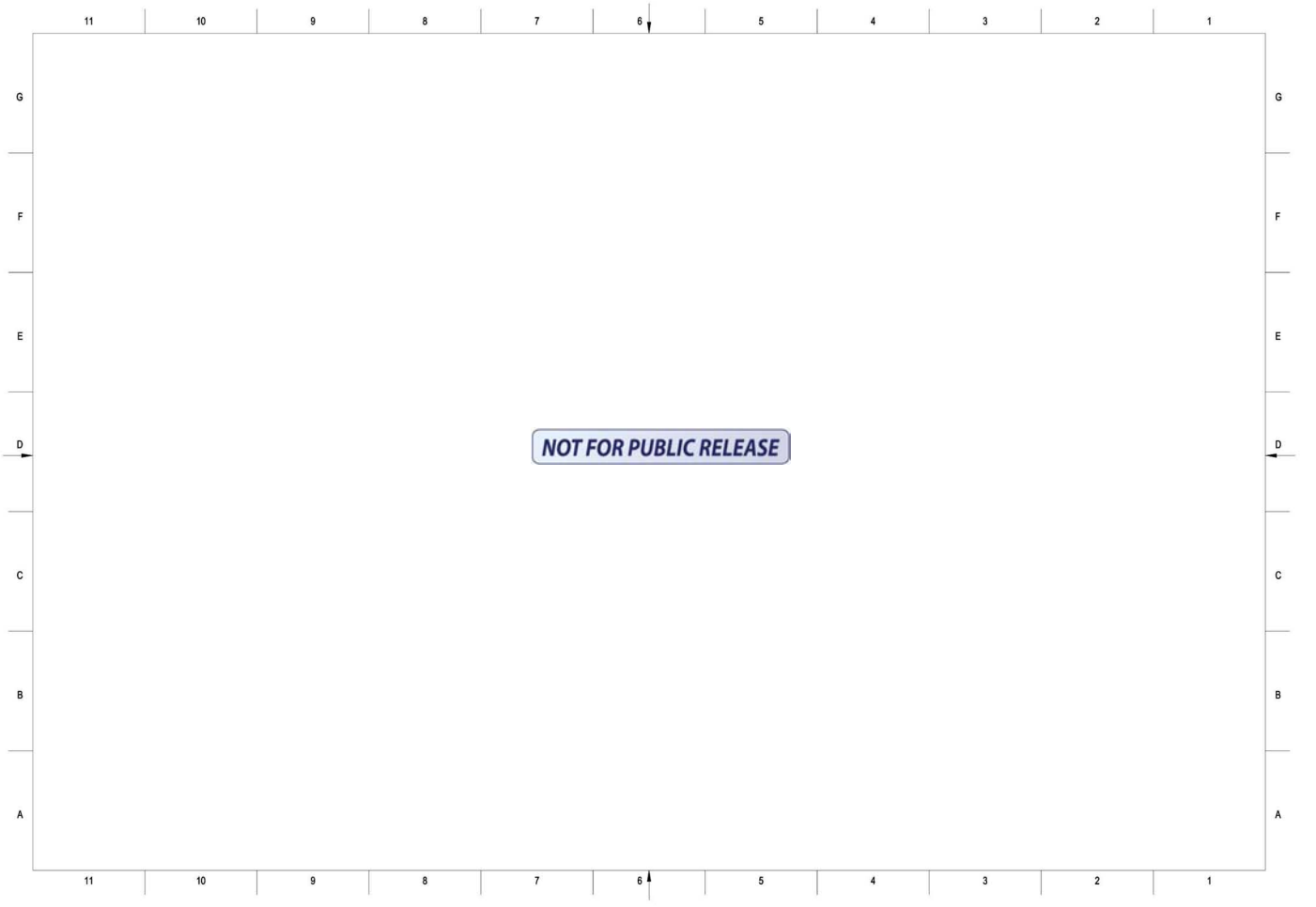


Figure 1.2-8 REACTOR BUILDING, ARRANGEMENT PLAN AT ELEVATION 12300 mm

STP3&4 Rev. 2

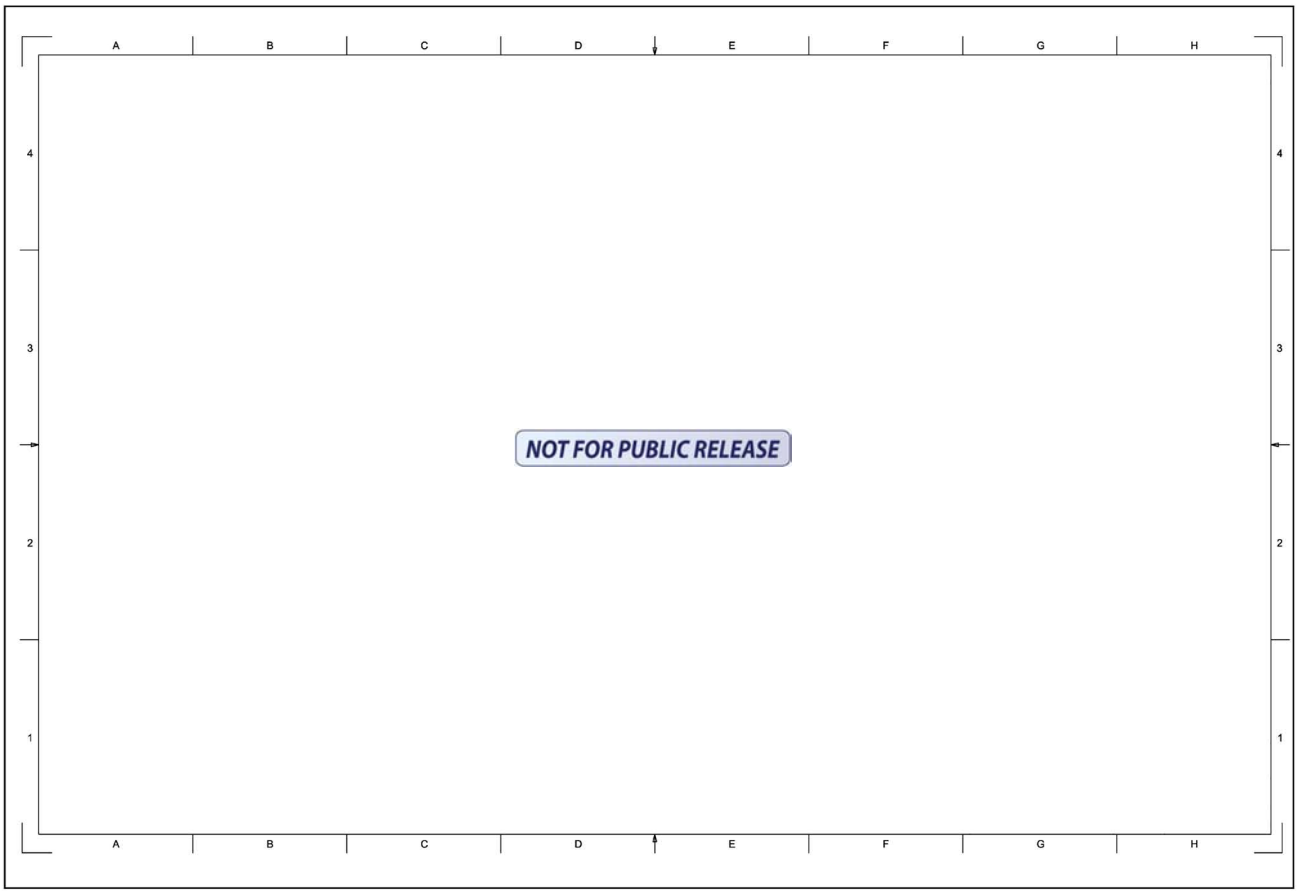


FIGURE 1.2-23a RADWASTE BUILDING AT ELEVATION -1500 MM

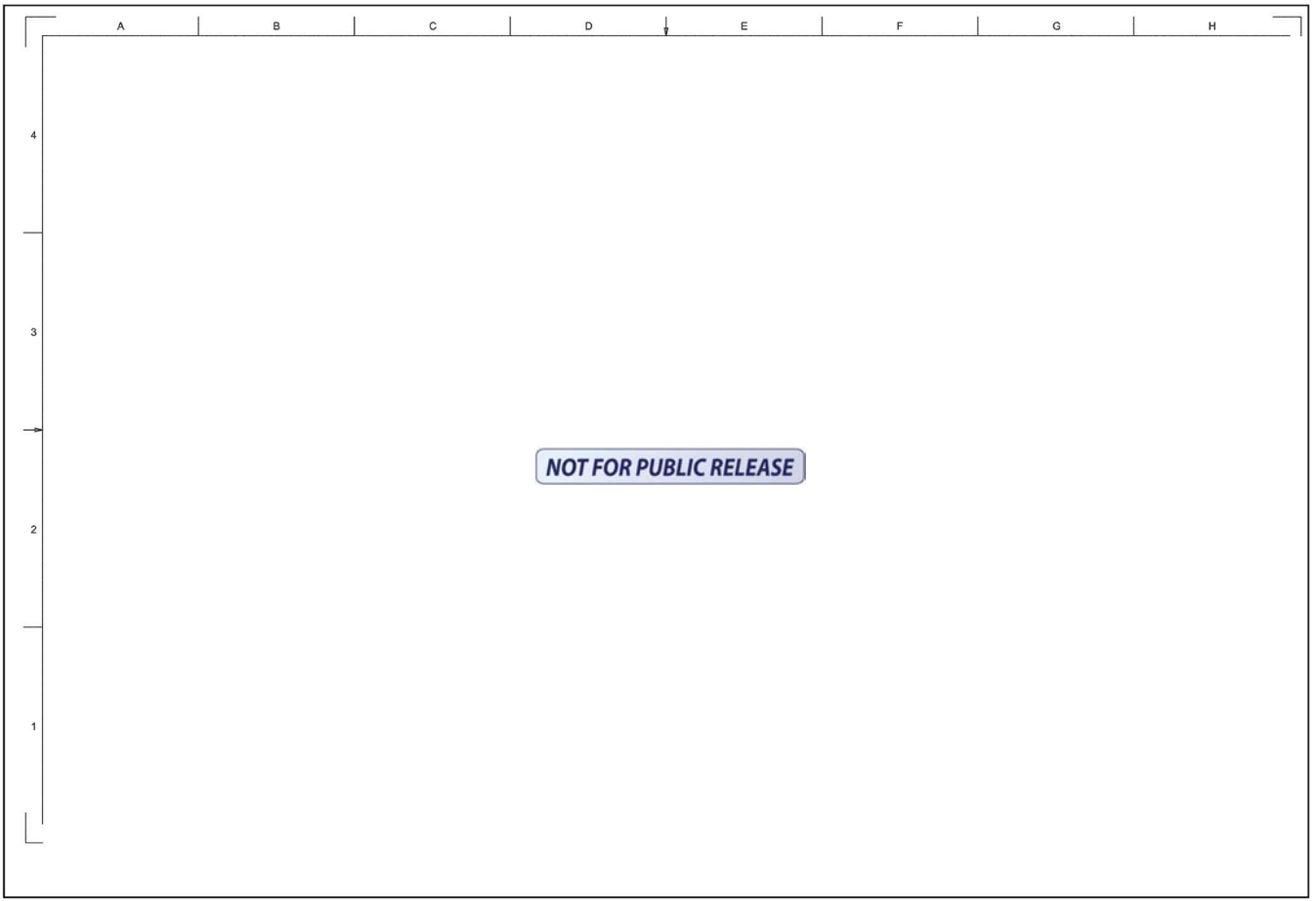


FIGURE 1.2-23b RADWASTE BUILDING AT ELEVATION 4800 MM

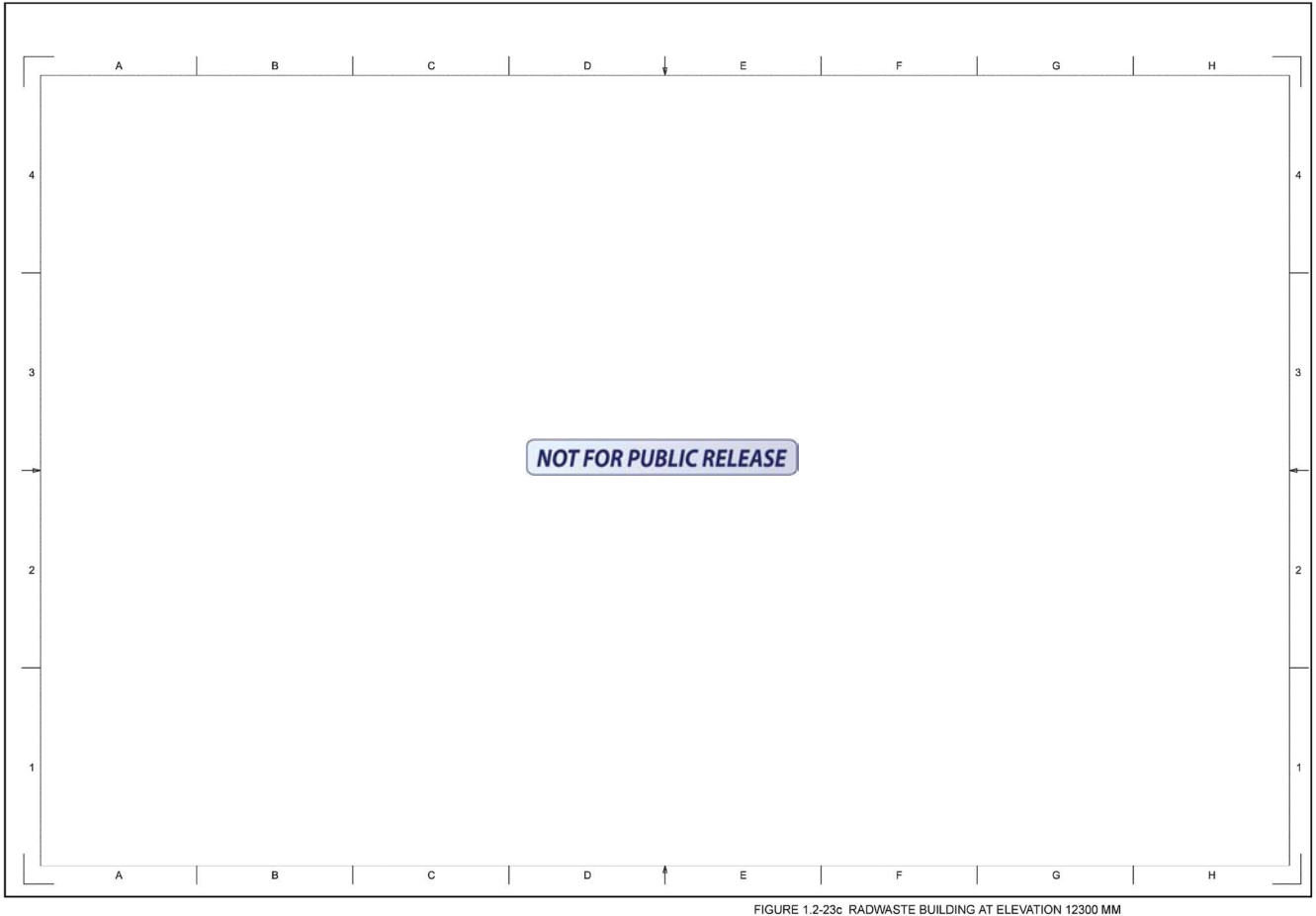


FIGURE 1.2-23c RADWASTE BUILDING AT ELEVATION 12300 MM

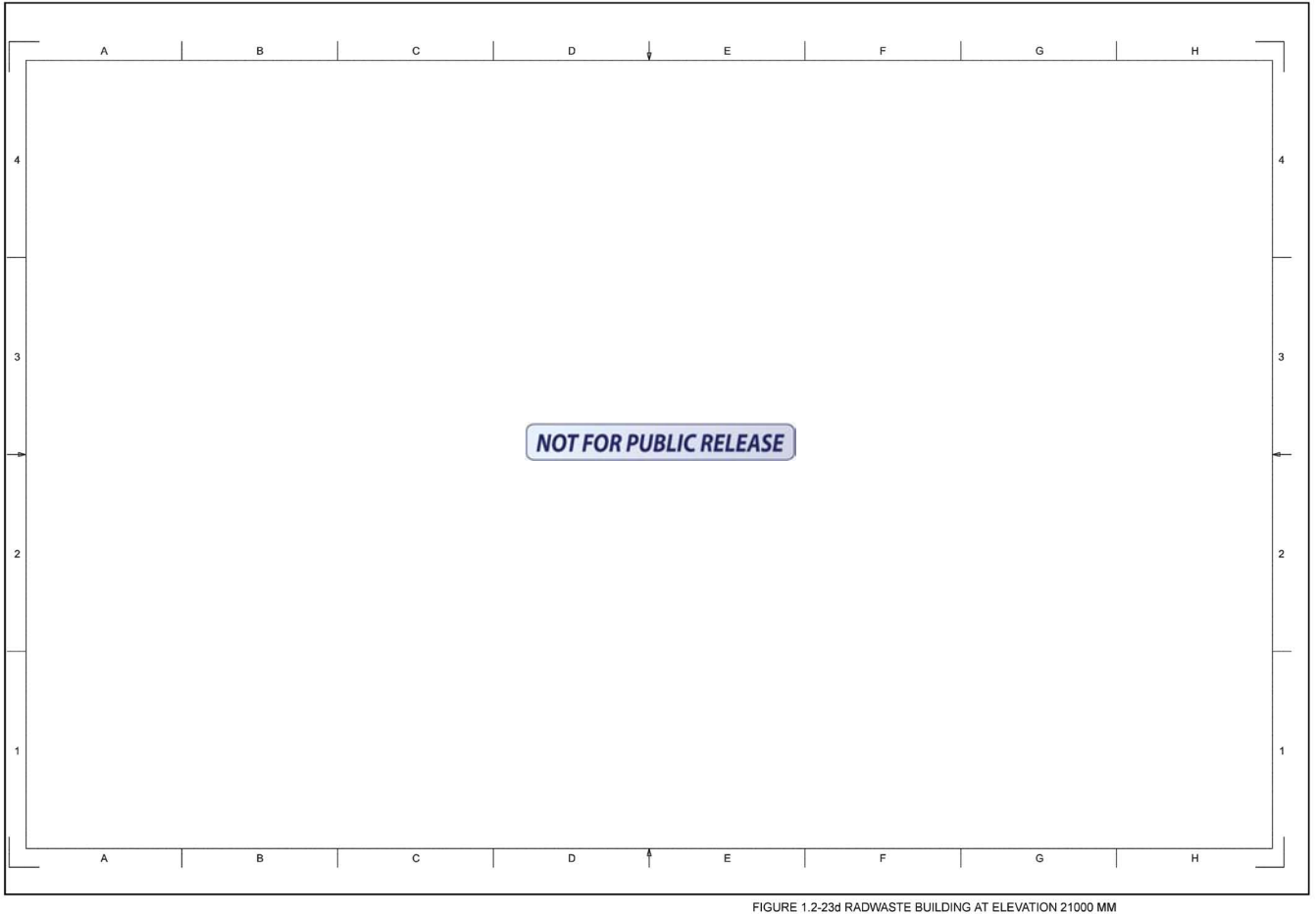


FIGURE 1.2-23d RADWASTE BUILDING AT ELEVATION 21000 MM

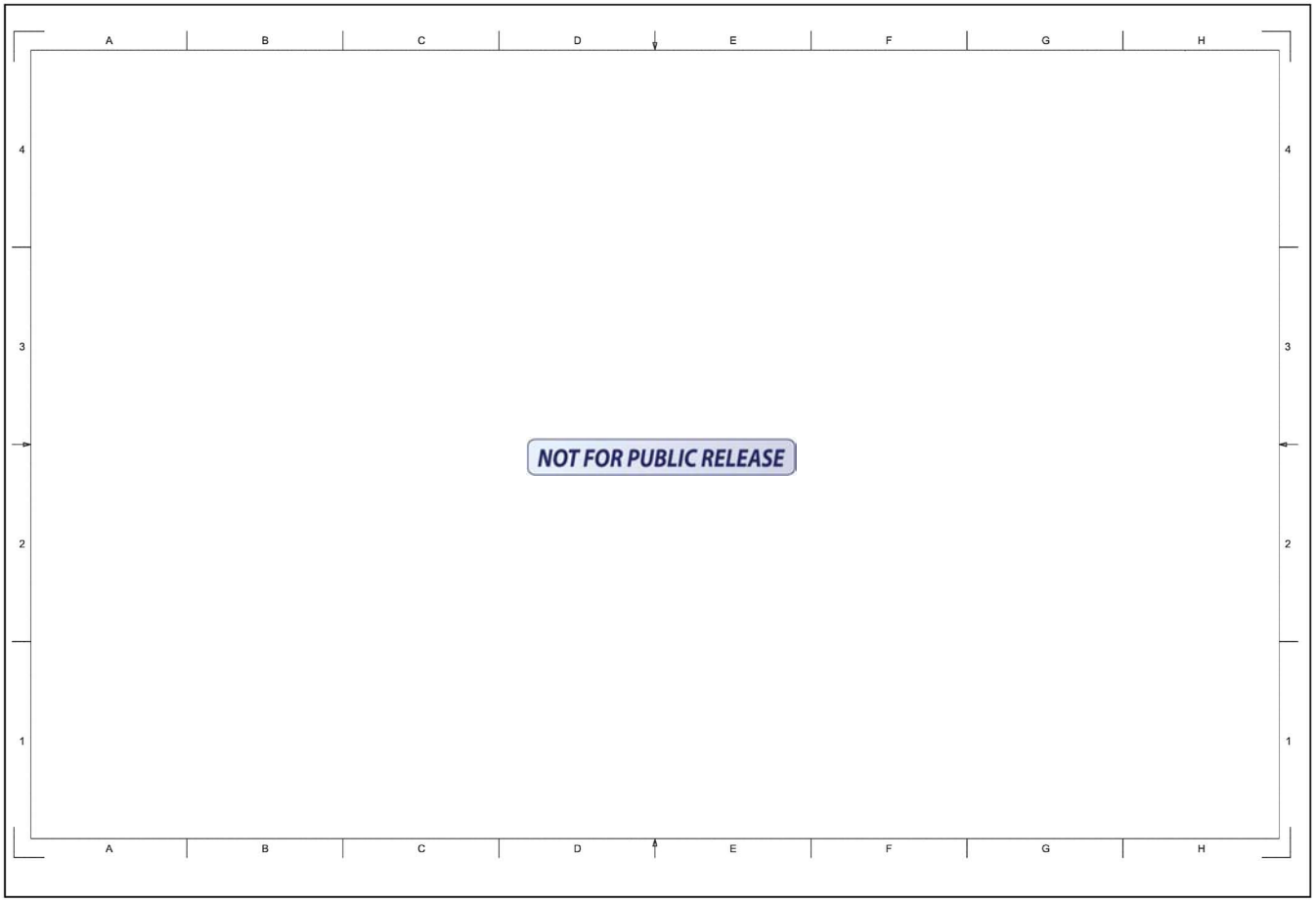


FIGURE 1.2-23e RADWASTE BUILDING, SECTION A-A

Figure 1.2-24 Turbine Building, General Arrangement at Elevation 2300 mm
STP 3&4 Rev. 2

Figure 1.2-25 Turbine Building, General Arrangement at Elevation 6300 mm
STP 3&4 Rev. 2

Figure 1.2-26 Turbine Building, General Arrangement at Elevation 12300 mm

Figure 1.2-27 Turbine Building, General Arragnement at Elevation 19700 mm

Figure 1.2-28 Turbine Building, General Arrangement at Elevation 24400 mm
STP 3&4 Rev. 2

Figure 1.2-29 Turbine Building, General Arrangement at Elevation 27800 mm
STP 3&4 Rev. 2

Figure 1.2-30 Turbine Building, General Arrangement at Elevation 38300 mm
STP 3&4 Rev. 2

Figure 1.2-31 Turbine Building, General Arrangement at Elevation 47200 mm

Figure 1.2-32 Turbine Building, General Arrangement at Section A-A
STP 3&4 Rev. 2

Figure 1.2-33 Turbine Building, General Arrangement at Section B-B
STP 3&4 Rev. 2

Figure 1.2-34 UHS Tower Plans

Figure 1.2-35 UHS Tower Sections

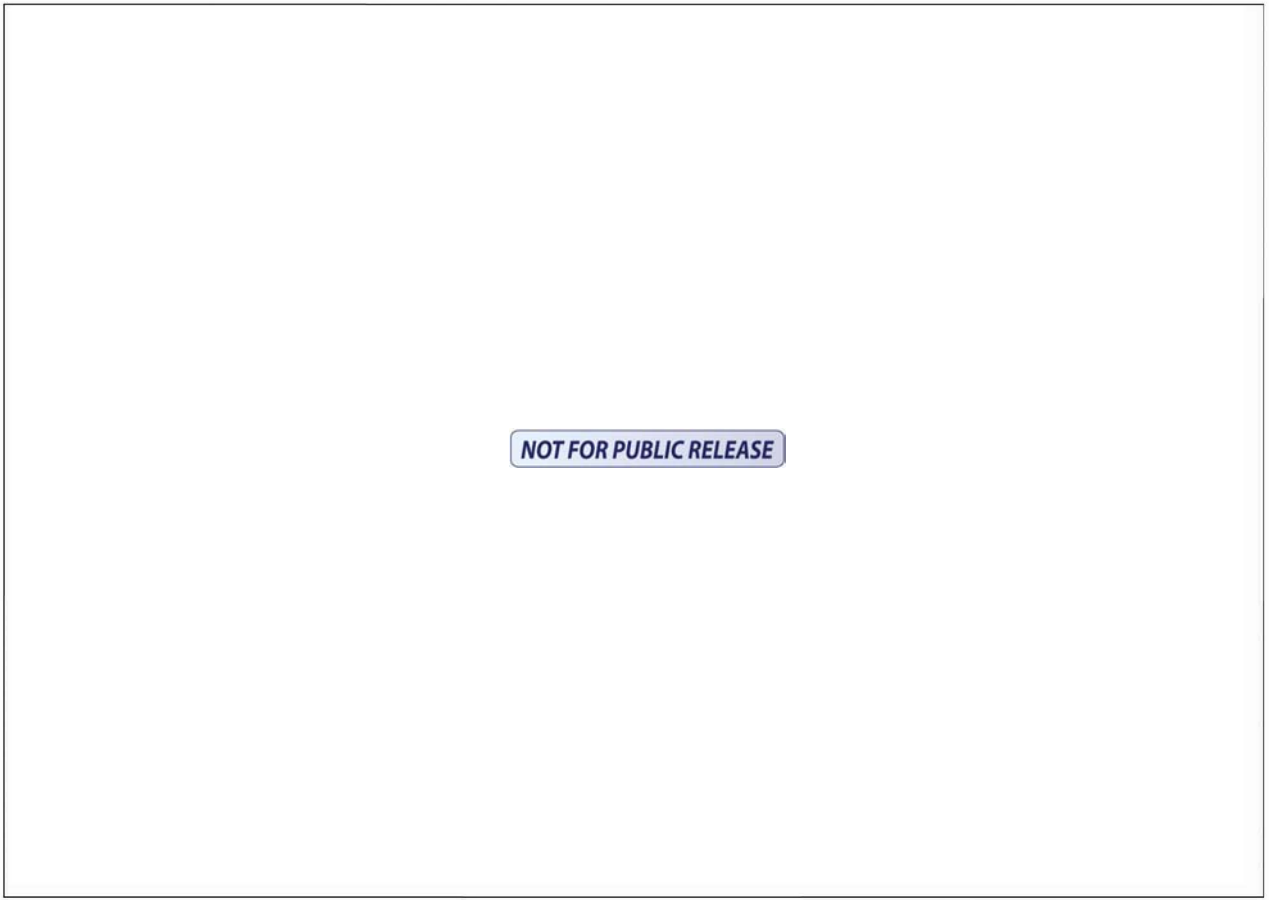


Figure 1.2-36 RSW Pumphouse and Tunnel Plans and Sections

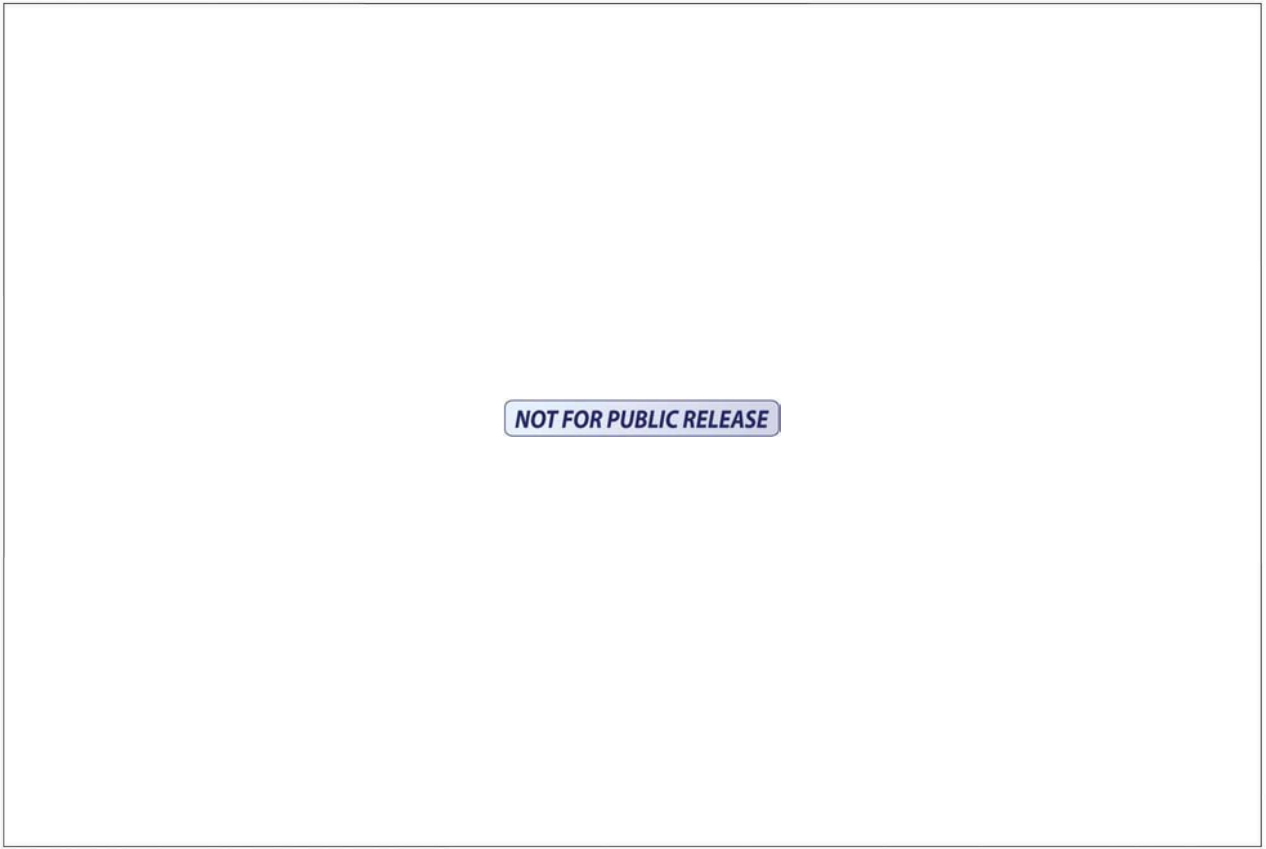


Figure 1.2-37 Plot Plan

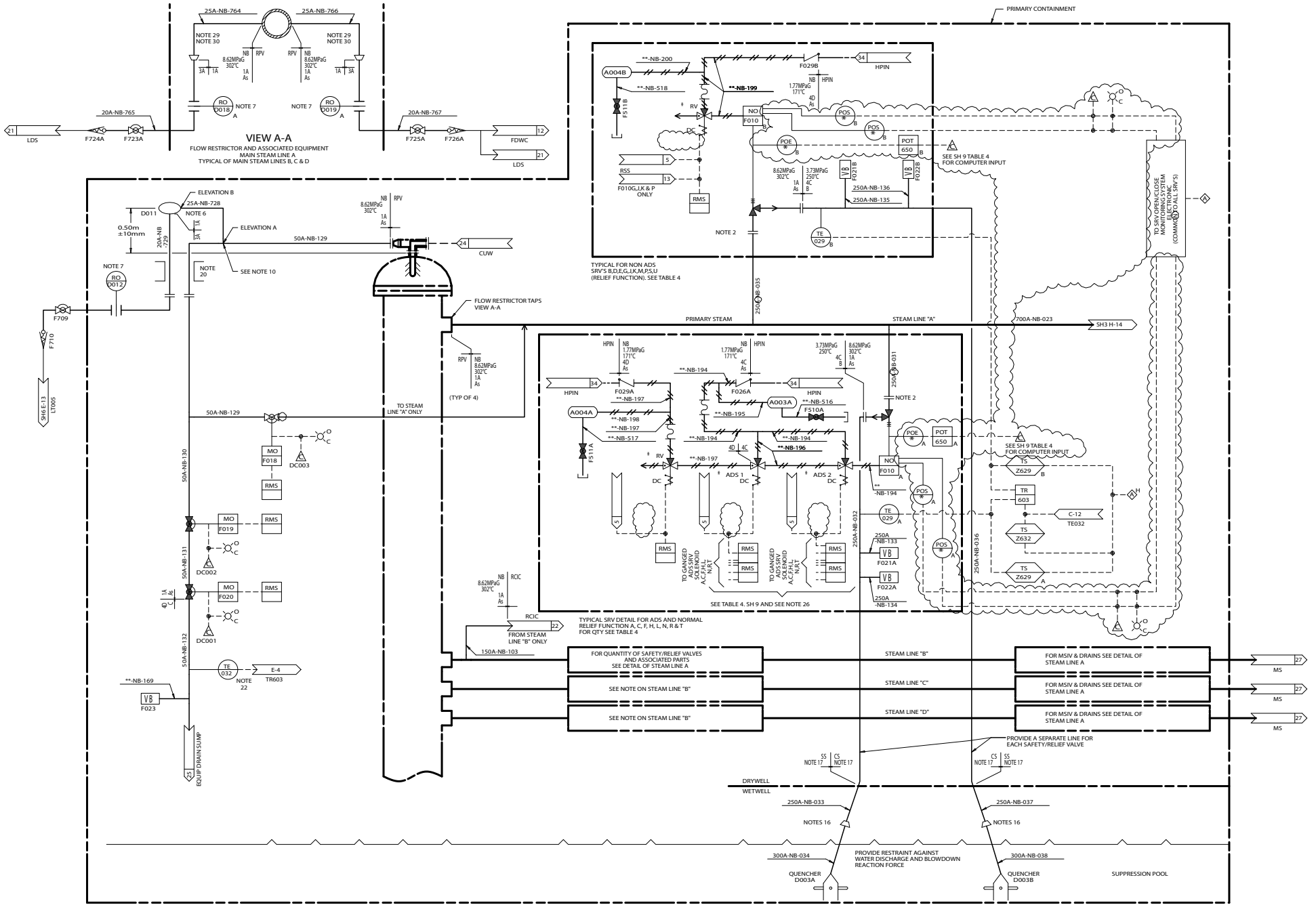


FIGURE 5.1-3 NUCLEAR BOILER SYSTEM P&ID (Sheet 2 of 11)

STP 3&4 Rev.2

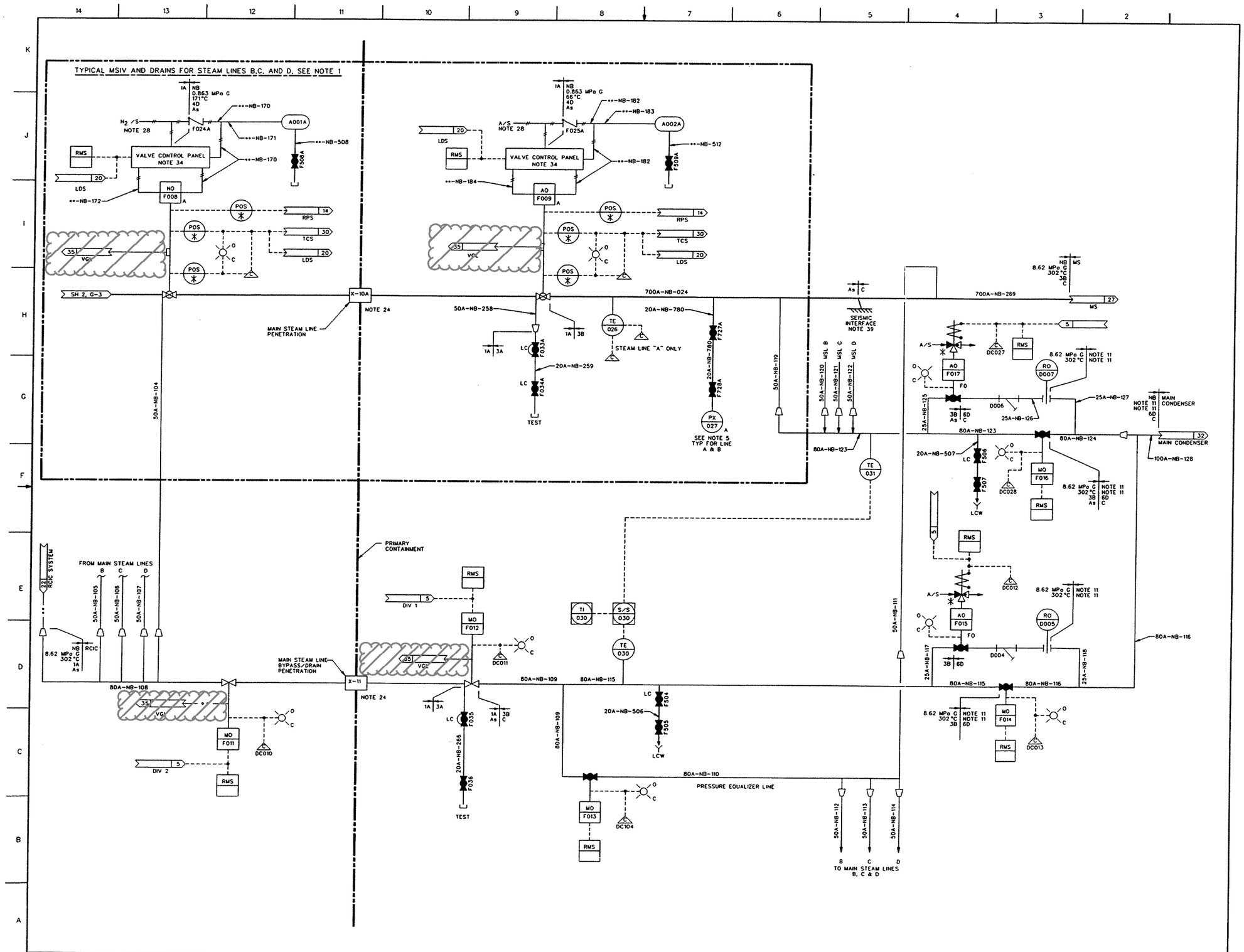


FIGURE 5.1-3 NUCLEAR BOILER SYSTEM P&ID (Sheet 3 of 11)

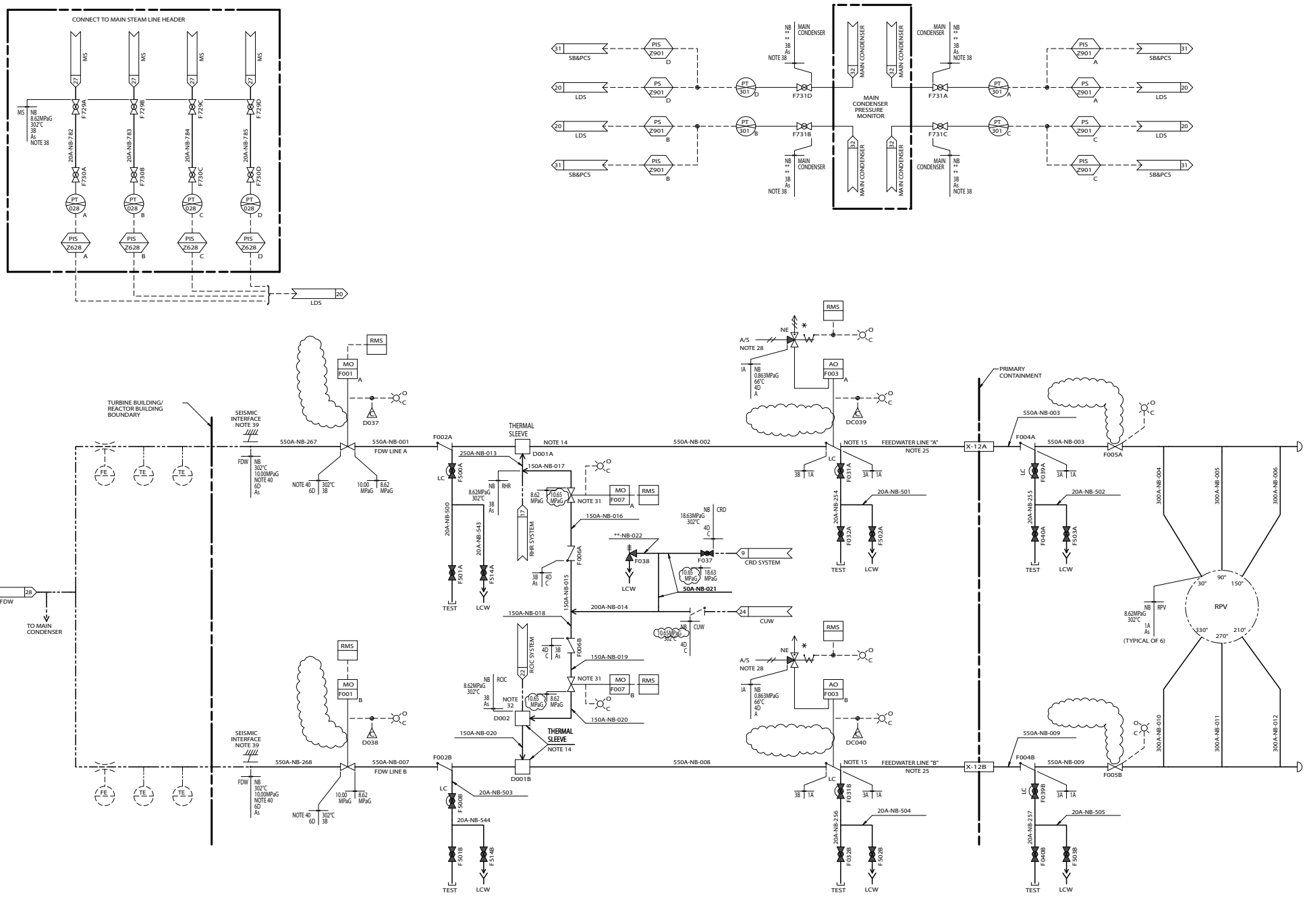


FIGURE 5.1-3 NUCLEAR BOILER SYSTEM P&ID (Sheet 4 of 11)

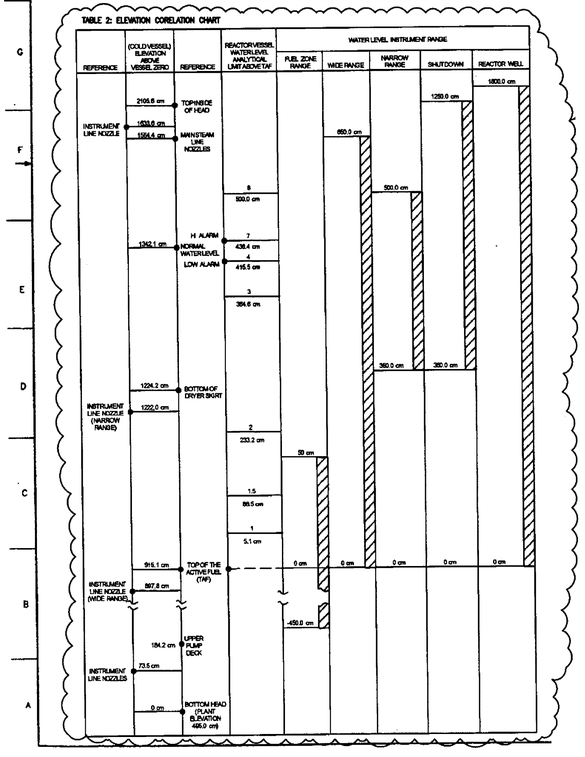
STP 3&4 Rev.2

TABLE 4: SUFFIX LETTER ASSIGNMENTS FOR SAFETY/RELIEF VALVES AND ASSOCIATED EQUIPMENT

SAFETY/RELIEF VALVE F010		P	J	M	G	S	B	K	E	U	D	N	H	T	C	L	F	R	A
TEMPERATURE ELEMENT TE029		P	J	M	G	S	B	K	E	U	D	N	H	T	C	L	F	R	A
SOLENOID VALVE	ADS 1											N	H	T	C	L	F	R	A
	ADS 2											N	H	T	C	L	F	R	A
	RV	P	J	M	G	S	B	K	E	U	D	N	H	T	C	L	F	R	A
ACCUMULATOR	A003											N	H	T	C	L	F	R	A
	A004	P	J	M	G	S	B	K	E	U	D	N	H	T	C	L	F	R	A
CHECK VALVE	F026											N	H	T	C	L	F	R	A
	F029	P	J	M	G	S	B	K	E	U	D	N	H	T	C	L	F	R	A
SRV OPEN CLOSE MONITORING SYSTEM	COMPUTER INPUT ⚠	P	J	M	G	S	B	K	E	U	D	N	H	T	C	L	F	R	A
* COMPUTER INPUT ⚠		N0041	N0042	N0043	N0044	N0045	N0046	N0047	N0048	N0049	N0050	N0051	N0052	N0053	N0054	N0055	N0056	N0057	N0058
		B21 N0023	B21 N0024	B21 N0025	B21 N0026	B21 N0027	B21 N0028	B21 N0029	B21 N0030	B21 N0031	B21 N0032	B21 N0033	B21 N0034	B21 N0035	B21 N0036	B21 N0037	B21 N0038	B21 N0039	B21 N0040
SPRING SET PRESSURE (MPa G)		8.00	8.00	8.07	8.07	8.07	8.07	8.14	8.14	8.14	8.14	8.20	8.20	8.20	8.20	8.27	8.27	8.27	8.27
SPRING RESEAT PRESSURE (MPa G)		7.88	7.88	7.75	7.75	7.75	7.75	7.81	7.81	7.81	7.81	7.87	7.87	7.87	7.87	7.94	7.94	7.94	7.94
SPRING SET PRESSURE (MPa G)		7.58	7.65	7.72	7.72	7.72	7.72	7.79	7.79	7.79	7.79	7.86	7.86	7.86	7.86	7.93	7.93	7.93	7.93
SPRING RESEAT PRESSURE (MPa G)		6.97	7.04	7.41	7.41	7.41	7.41	7.48	7.48	7.48	7.48	7.55	7.55	7.55	7.55	7.81	7.81	7.81	7.81
	PT007A THRU D/ PS-Z807A-6 THRU D-6	≥2 OF A,B,C,D																	
	PT007A THRU D/ PS-Z807A-5 THRU D-5		≥2 OF A,B,C,D																
	PT007A THRU D/ PS-Z807A-4 THRU D-4			≥2 OF A,B,C,D															
	PT007A THRU D/ PS-Z807A-3 THRU D-3							≥2 OF A,B,C,D											
	PT007A THRU D/ PS-Z807A-2 THRU D-2											≥2 OF A,B,C,D							
	PT007A THRU D/ PS-Z807A-1 THRU D-1															≥2 OF A,B,C,D			

* COMPUTER INPUTS FOR SRV POSITION SEE PERFORMANCE MONITORING AND CONTROL SYSTEM C91-4010

TABLE 2: ELEVATION CORRELATION CHART



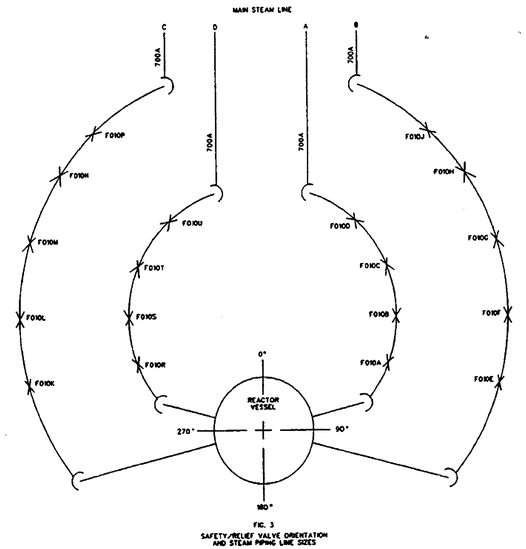


FIG. 3
SAFETY/RELIEF VALVE ORIENTATION AND STEAM PIPING LINE SIZES

TABLE 3 WATER LEVEL TRIP FUNCTION

REACTOR VESSEL WATER LEVEL	DESCRIPTION OF TRIPS	INSTRUMENT PROVIDING TRIP SIGNAL	NOTES
8	TRIPS RCIC TURBINE	LS-Z601A-1 THRU D-1	NARROW RANGE
	TRIP HPCF INJECTION VALVES	LS-Z601A-1 THRU D-1	NARROW RANGE
	CLOSE MAIN TURBINE STOP VALVES TRIPS FEEDWATER PUMPS	SEE REFERENCE DOCUMENT 12	NARROW RANGE
7	HIGH LEVEL ALARM	SEE REFERENCE DOCUMENT 12	NARROW RANGE
4	LOW LEVEL ALARM RRS FLOW RUN BACK ON TRIP OF FEED PUMP)		NARROW RANGE
3	SCRAMS REACTOR	LIS-Z601A THRU D	NARROW RANGE,
	CLOSE RHR SHUTDOWN COOLING ISOLATION VALVES	LIS-Z601A THRU D	NARROW RANGE
	CLOSE CONTAINMENT ISOL VALVES LOS EXCEPT DW COOLING AND CUW ISOL VALVES AND MSIV'S	LIS-Z601A THRU D	NARROW RANGE
	TRIP 4 OF RRS PUMPS	SEE REFERENCE DOCUMENT 12	NARROW RANGE
2	INITIATES RCIC	LS-Z603A-1 THRU D-1	WIDE RANGE
	TRIP REMAINING 6 RRS PUMPS	LS-Z603A-1 THRU D-1	WIDE RANGE
	CLOSE CUW ISOL VALVES	LS-Z603A-2 THRU D-2	WIDE RANGE
1.5	INITIATES HPCF B & C	LS-Z603E-3 THRU H-3	WIDE RANGE
	CLOSE MSIV'S & DW COOLING SYSTEM ISOL VALVES	LS-Z603E-4 THRU H-4	WIDE RANGE
1	INITIATES ADS	LIS-Z603A THRU H	WIDE RANGE
	INITIATES RHR/LPFL MODE	LIS-Z603A THRU H	WIDE RANGE

FIGURE 5.1-3 NUCLEAR BOILER SYSTEM P&ID (SHEET 9 OF 11)

NOTES:

1. ALL SIGNALS ARE TRANSMITTED AS SERIAL DATA TO EACH TLU OR SLU THROUGH EACH SERIAL OUTPUT.

2. FOUR TEMPERATURE ELEMENTS SHALL BE LOCATED AT APPROXIMATELY EQUAL INTERVALS IN THE VERTICAL DIRECTION SO AS TO MONITOR AMBIENT TEMPERATURES OVER THE FULL HEIGHT OF THE DRYWELL.

3. TEMPERATURE DETECTORS SHALL BE LOCATED OR SHIELDED SO THAT THE DETECTOR IS SENSITIVE TO THE AIR TEMPERATURE AND NOT THE RADIATED HEAT FROM HOT EQUIPMENT.

4. ALL INSTRUMENT LINES THAT CONNECT TO THE REACTOR COOLANT PRESSURE BOUNDARY AND PENETRATE THE CONTAINMENT WALL SHALL HAVE 6.35 MM RESTRICTING ORIFICES INSIDE THE CONTAINMENT. SEE SUPPORTING DOCUMENTS 2&3 FOR ADDITIONAL REQUIREMENTS.

5. EACH INSTRUMENT LINE THROUGH THE CONTAINMENT WALL SHALL HAVE TWO ISOLATION VALVES OUTSIDE THE CONTAINMENT LOCATED AS CLOSE TO THE CONTAINMENT AS PRACTICAL.

6. SOLENOID OPERATED GLOBE VALVES MAY BE ADOPTED FOR THE AIR OPERATED VALVES.

7. THIS DOCUMENT PROVIDES A FUNCTIONAL DEFINITION OF THE REQUIRED SYSTEM LEVEL PROCESS MONITORING AND CONTROL INSTRUMENTATION. IT DOES NOT ADDRESS DETAILS OF THE METHODS BY WHICH SIGNALS FROM THESE COMPONENTS WILL BE PROCESSED. THIS PROCESSING MAY INVOLVE THE PLANT MULTIPLEXING SYSTEM (H23) OR MAY UTILIZE HARDWIRING. SPECIFIC ELECTRICAL ISOLATION REQUIREMENTS SHOWN ON THIS DRAWING MAY BE UNNECESSARY IF MULTIPLEXED SIGNAL TRANSMISSION PROVIDES INHERENT ISOLATION.

8. ALL ALARMS SHALL BE LOCATED IN THE MAIN CONTROL ROOM.

9. ALL INPUTS TO C91/PMCS SHALL BE CONTINUOUSLY RECORDED.

10. THE LDS SHALL BE DESIGNED IN ACCORDANCE WITH THE SYSTEM DESIGN SPECIFICATION (E31-4010). OTHER PRIMARY CONTAINMENT ISOLATION (PCIV) VALVES, WHICH ARE PART OF OTHER SYSTEMS, ARE NOT SHOWN IN THIS IED. THOSE VALVES ARE SHOWN ON THE LDS/IBD - INTERLOCK BLOCK DIAGRAM (E31-1030).

11. FOR REACTOR WATER LEVELS MONITORING, SEE B21-1010.

12. FOR DRYWELL PRESSURE MONITORING, SEE B21-1010.

13. FOR DETECTION OF RADIATION LEAKAGE INTO COOLING WATER SUPPLYING RECIRC PUMP, RHR, AND CUW HEAT EXCHANGERS, SEE D11-1040.

14. LETTER DESIGNATIONS FOR FOUR DIVISIONS ARE AS FOLLOWS:

    A, E, J, N - DIVISION 1
    B, F, K, P - DIVISION 2
    C, G, L, R - DIVISION 3
    D, H, M, S - DIVISION 4

15. IF HEAT TRACING OF SAMPLE LINE IS NECESSARY TO PREVENT CONDENSATION, THE MAXIMUM ALLOWABLE SAMPLE TEMPERATURE IS LIMITED BY THE PHOTO MULTIPLIER TUBES IN THE MONITORING CHANNELS.

16. BALL VALVE MAY BE ADOPTED FOR THIS GATE VALVE.

17. DTM, TLU, SLU, OLU ARE PART OF SAFETY SYSTEM LOGIC AND CONTROL. (SEE REFERENCE DOCUMENT 1(2).

    A. DTMs SHOWN ON SHEETS 3 & 4 PROCESS SENSOR INPUTS FOR MSIV ISOLATION TRIP LOGIC.

    B. DTMs SHOWN ON SHEETS 5 & 6 PROCESS SENSOR INPUTS FOR ECCS ISOLATION TRIP LOGIC.

    C. DTMs SHOWN ON SHEETS 7 & 10 PROCESS SENSOR INPUTS FOR AUXILIARY ESF ISOLATION TRIP LOGIC.

    D. TLUs AND OLUs SHOWN ON SHEET 3 AND SHEET 4 PROCESS 2-OUT-OF-4 COINCIDENCE LOGIC FOR MSIV CLOSURE TRIP.

    E. SLUs SHOWN ON SHEETS 5 & 6 PROCESS 2-OUT-OF-4 COINCIDENCE LOGIC FOR ECCS ISOLATION.

    F. SLUs SHOWN ON SHEETS 7 & 10 PROCESS 2-OUT-OF 4 COINCIDENCE LOGIC FOR AUXILIARY ESF ISOLATION.

18. RMUs, MUX, EMS AND NEMS ARE PART OF THE MULTIPLEXING SYSTEM (H23).

19. ALL INSTRUMENT LINES ARE 20A-SS (STAINLESS STEEL) SCHEDULE 40, SAMPLING LINES ARE 32A-SS SCHEDULE 40.

REFERENCES

	MPL NO.
1. REACTOR CORE ISOLATION COOLING SYSTEM P&ID	E51-1010
2. NUCLEAR BOILER SYSTEM P&ID	B21-1010
3. REACTOR WATER CLEANUP SYSTEM P&ID	G31-1010
4. SAMPLING SYSTEM P&ID	P91-1010
5. PROCESS RADIATION MONITORING SYSTEM IED	D11-1040
6. RADWASTE SYSTEM P&ID	K17-1010
7. INSTRUMENT AIR SYSTEM P&ID	P52-1010
8. ESSENTIAL MULTIPLEXING SYSTEM IBD	H23-1030
9. LEAK DETECTION & ISOLATION SYSTEM IBD	E31-1030
10. REACTOR PROTECTION SYSTEM IED	C71-1040
11. STANDBY LIQUID CONTROL SYSTEM IBD	C41-1030
12. SAFETY SYSTEM & LOGIC CONTROL DS	A32-5280
13. PERFORMANCE MONITORING & CONTROL SYSTEM IED	C91-1010
14. NEUTRON MONITORING SYSTEM IED	C51-1010
15. SUPPRESSION POOL CLEAN-UP SYSTEM P&ID	G51-1010
16. REACTOR BUILDING WATER CLEAN-UP SYSTEM P&ID	P31-1010
17. HVAC NORMAL COOLING WATER SYSTEM P&ID	P24-1010
18. STANDBY GAS TREATMENT SYSTEM P&ID	T22-1010
19. ATMOSPHERIC CONTROL SYSTEM P&ID	T31-1010
20. FLAMMABILITY CONTROL SYSTEM P&ID	T49-1010
21. HEATING, VENTILATING & AIR CONDITIONING P&ID	U41-1010

SUPPORTING DOCUMENTS

	MPL NO.
1. PIPING AND INSTRUMENT DIAGRAM SYMBOLS	A10-3030
2. PROCESS INSTRUMENTATION	A11-3030
3. GROUP CLASSIFICATION & CONTAINMENT ISOLATION DIAG	A11-1030

LEGEND

SERIAL MULTIPLEXED DATA

MULTIPLE INSTRUMENT ELECTRICAL WIRING

SERIAL DATA

ABBREVIATIONS:

OLU - OUTPUT LOGIC UNIT
TLU - TRIP LOGIC UNIT
DTM - DIGITAL TRIP MODULE
RMU - REMOTE MULTIPLEXING UNIT
SLU - SAFETY SYSTEM LOGIC UNIT
EMS - ESSENTIAL MULTIPLEXING SYSTEM
NEMS - NON-ESSENTIAL MULTIPLEXING SYSTEM

MPL NO. E31-1040

FIGURE 5.2-8 LEAK DETECTION AND ISOLATION SYSTEM IED (SHEET 1 OF 10)

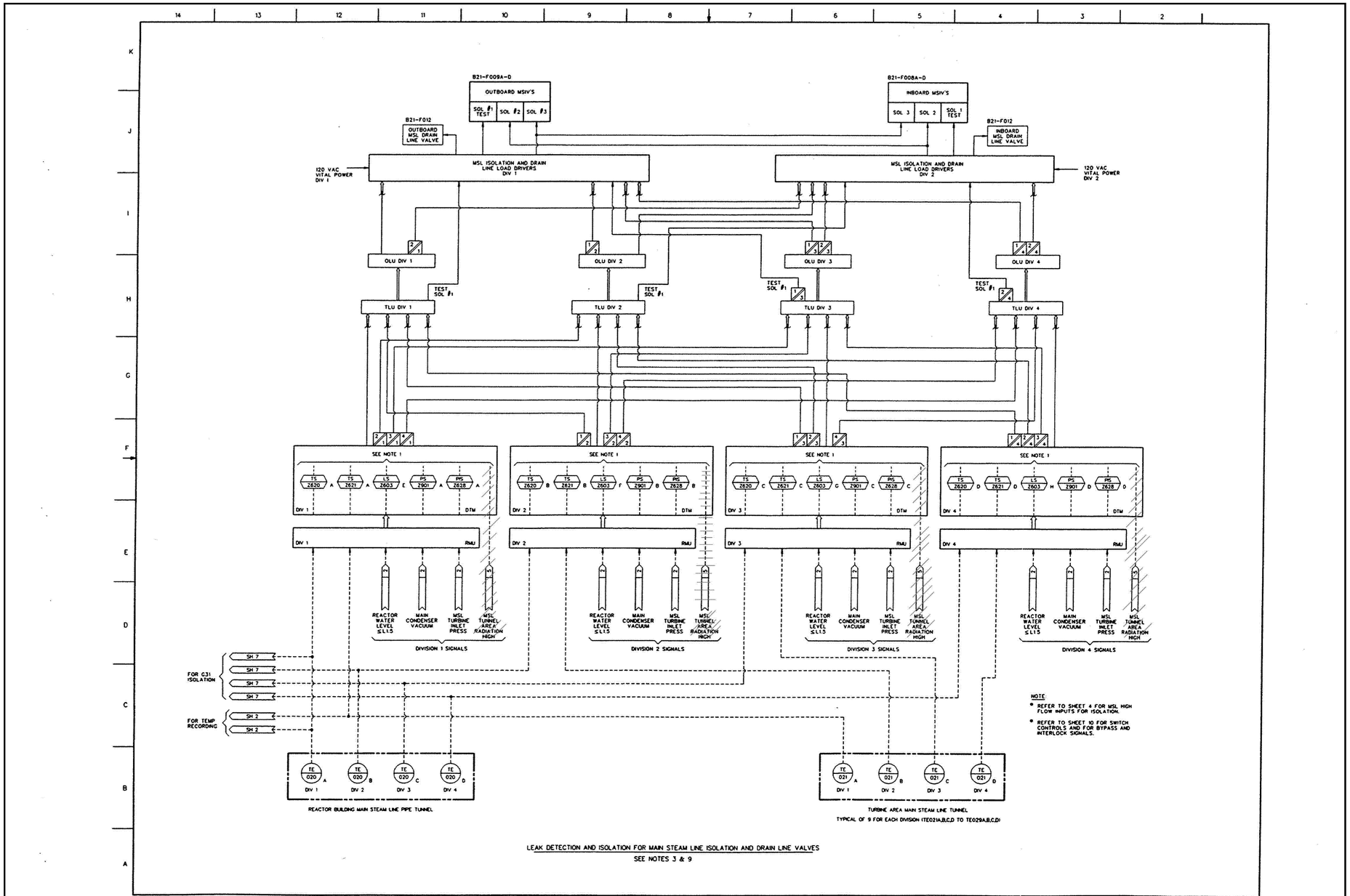


FIGURE 5.2-8 LEAK DETECTION AND ISOLATION SYSTEM IED (SHEET 3 OF 10)

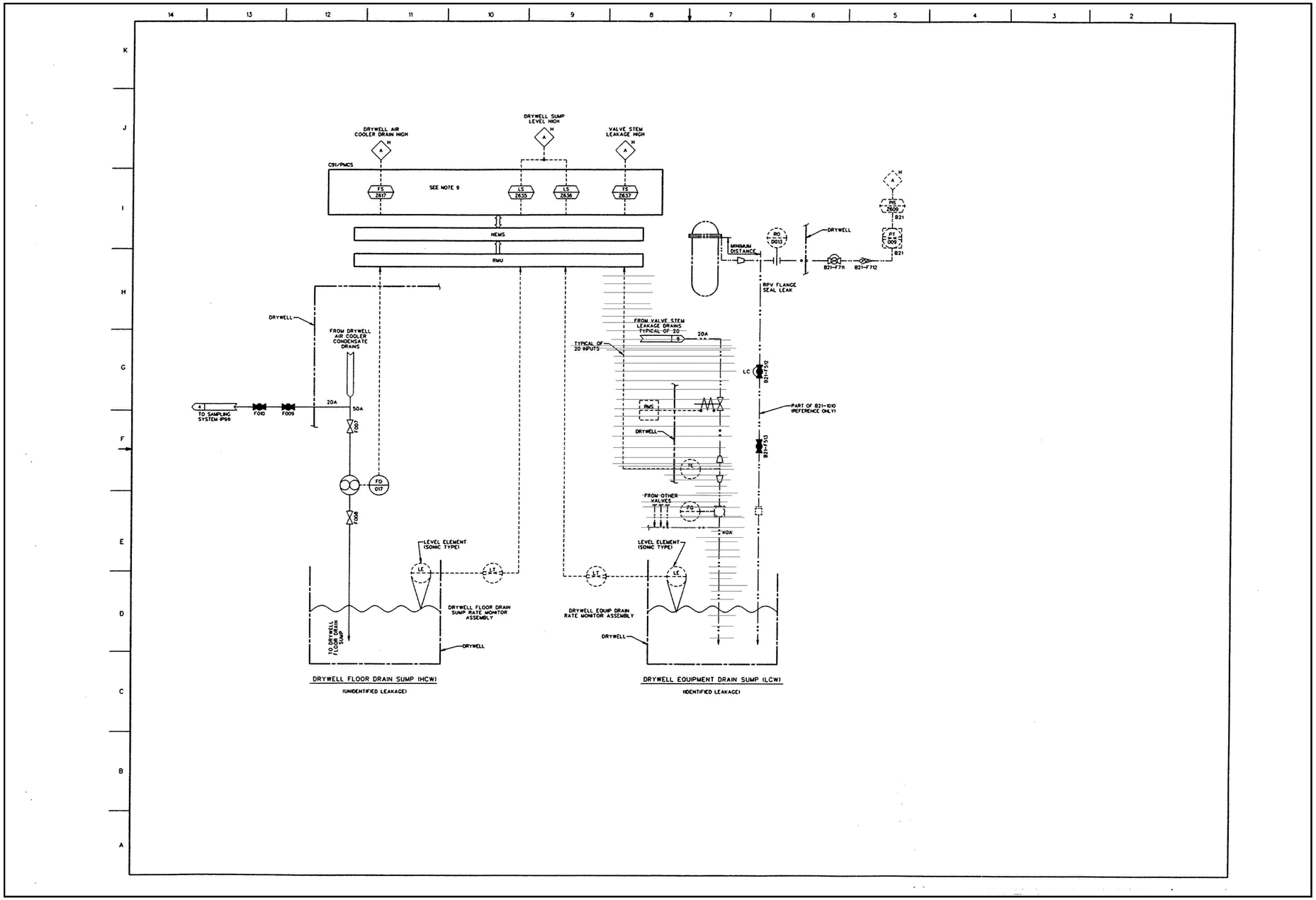
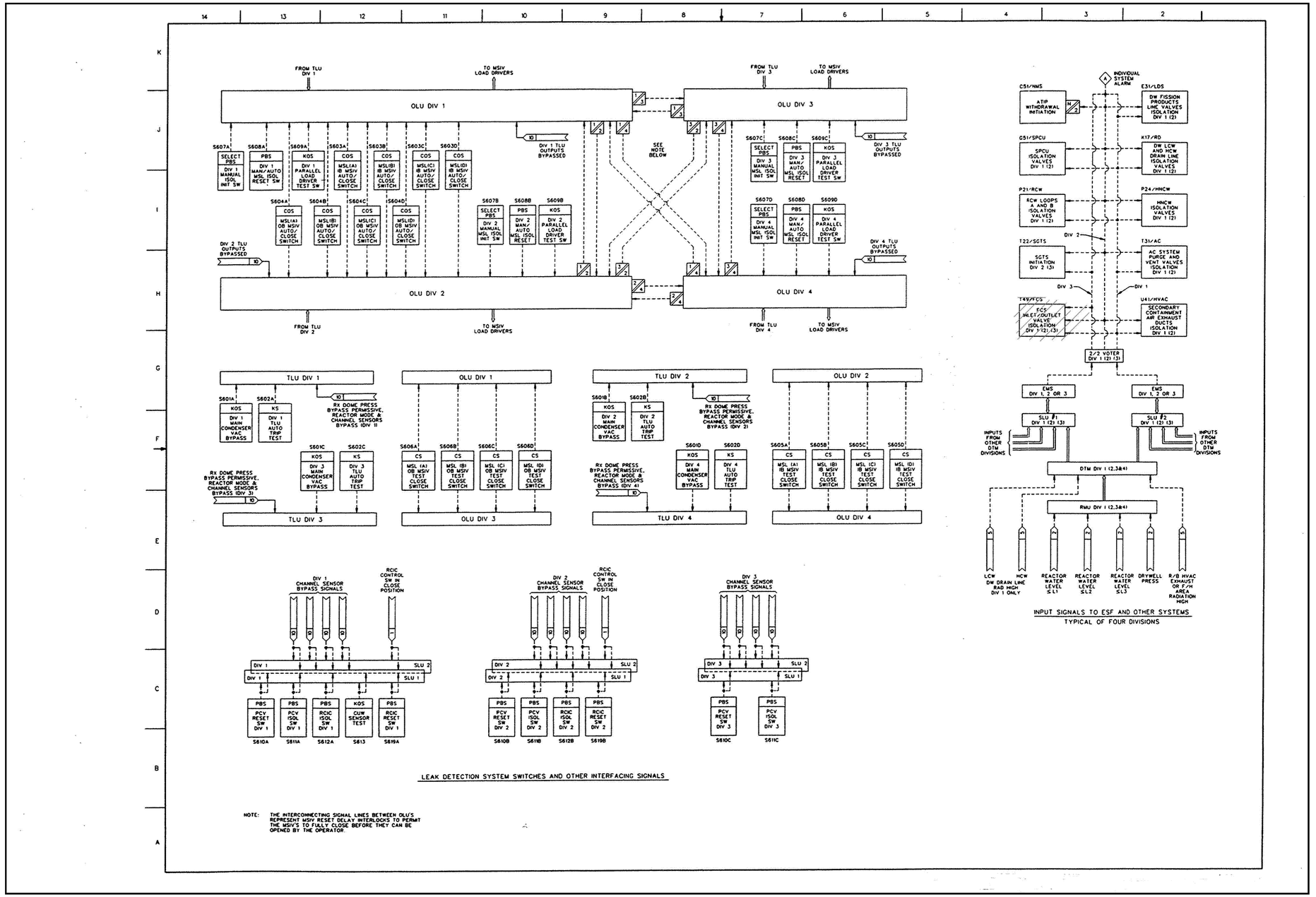


FIGURE 5.2-8 LEAK DETECTION AND ISOLATION SYSTEM IED (SHEET 8 OF 10)

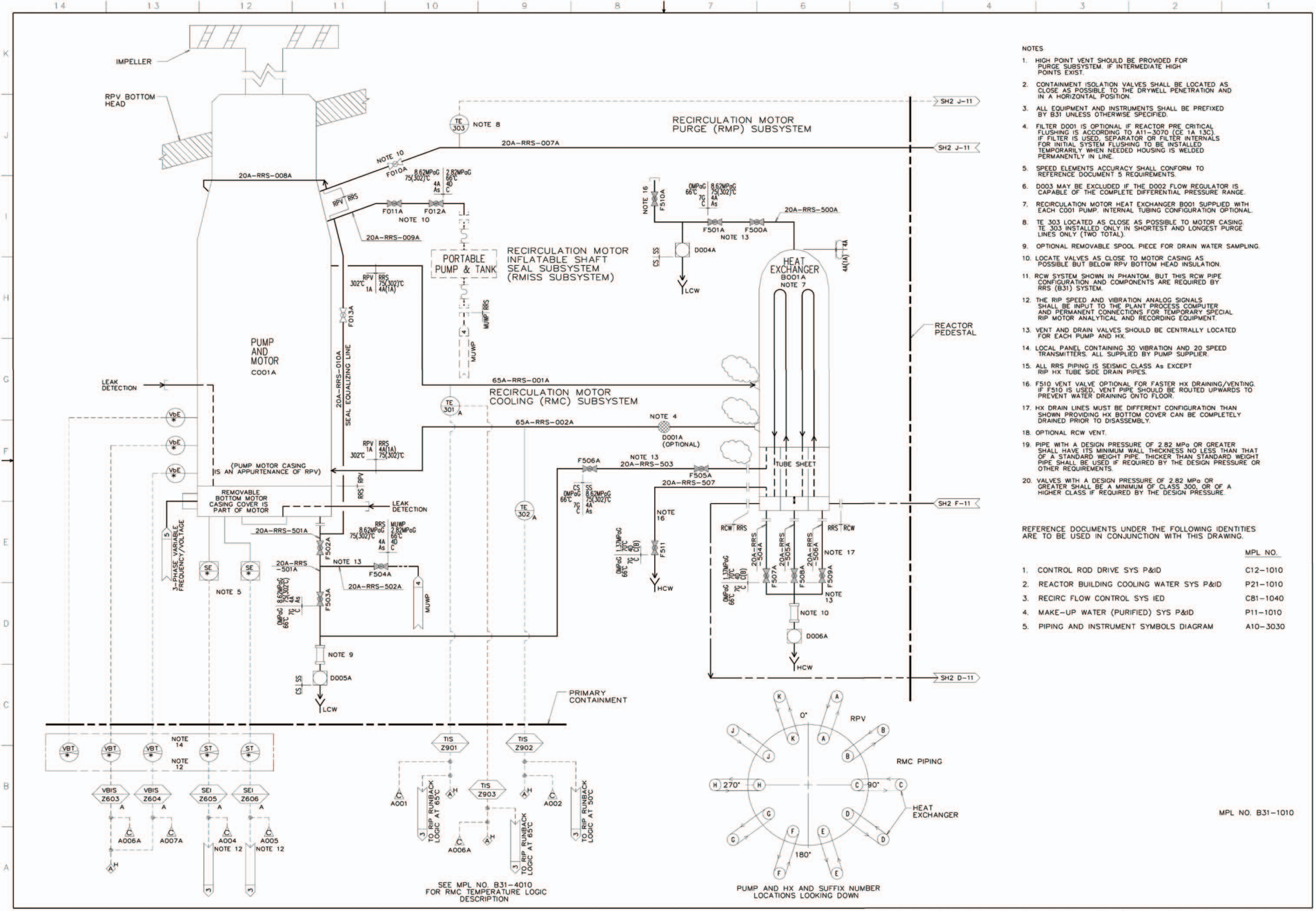


INPUT SIGNALS TO ESF AND OTHER SYSTEMS
TYPICAL OF FOUR DIVISIONS

LEAK DETECTION SYSTEM SWITCHES AND OTHER INTERFACING SIGNALS

NOTE: THE INTERCONNECTING SIGNAL LINES BETWEEN OLU'S REPRESENT MSIV RESET DELAY INTERLOCKS TO PERMIT THE MSIV'S TO FULLY CLOSE BEFORE THEY CAN BE OPENED BY THE OPERATOR.

FIGURE 5.2-8 LEAK DETECTION AND ISOLATION SYSTEM IED (SHEET 10 OF 10)



NOTES

1. HIGH POINT VENT SHOULD BE PROVIDED FOR PURGE SUBSYSTEM. IF INTERMEDIATE HIGH POINTS EXIST.
2. CONTAINMENT ISOLATION VALVES SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE DRYWELL PENETRATION AND IN A HORIZONTAL POSITION.
3. ALL EQUIPMENT AND INSTRUMENTS SHALL BE PREFIXED BY B31 UNLESS OTHERWISE SPECIFIED.
4. FILTER D001 IS OPTIONAL IF REACTOR PRE CRITICAL FLUSHING IS ACCORDING TO A11-3070 (CE 1A 13C). IF FILTER IS USED, SEPARATOR OR FILTER INTERNALS FOR INITIAL SYSTEM FLUSHING TO BE INSTALLED TEMPORARILY WHEN NEEDED HOUSING IS WELDED PERMANENTLY IN LINE.
5. SPEED ELEMENTS ACCURACY SHALL CONFORM TO REFERENCE DOCUMENT 5 REQUIREMENTS.
6. D003 MAY BE EXCLUDED IF THE D002 FLOW REGULATOR IS CAPABLE OF THE COMPLETE DIFFERENTIAL PRESSURE RANGE.
7. RECIRCULATION MOTOR HEAT EXCHANGER B001 SUPPLIED WITH EACH C001 PUMP. INTERNAL TUBING CONFIGURATION OPTIONAL.
8. TE 303 LOCATED AS CLOSE AS POSSIBLE TO MOTOR CASING. TE 303 INSTALLED ONLY IN SHORTEST AND LONGEST PURGE LINES ONLY (TWO TOTAL).
9. OPTIONAL REMOVABLE SPOOL PIECE FOR DRAIN WATER SAMPLING.
10. LOCATE VALVES AS CLOSE TO MOTOR CASING AS POSSIBLE BUT BELOW RPV BOTTOM HEAD INSULATION.
11. RCW SYSTEM SHOWN IN PHANTOM BUT THIS RCW PIPE CONFIGURATION AND COMPONENTS ARE REQUIRED BY RRS (B31) SYSTEM.
12. THE RIP SPEED AND VIBRATION ANALOG SIGNALS SHALL BE INPUT TO THE PLANT PROCESS COMPUTER AND PERMANENT CONNECTIONS FOR TEMPORARY SPECIAL RIP MOTOR ANALYTICAL AND RECORDING EQUIPMENT.
13. VENT AND DRAIN VALVES SHOULD BE CENTRALLY LOCATED FOR EACH PUMP AND HX.
14. LOCAL PANEL CONTAINING 3D VIBRATION AND 2D SPEED TRANSMITTERS. ALL SUPPLIED BY PUMP SUPPLIER.
15. ALL RRS PIPING IS SEISMIC CLASS As EXCEPT RIP HX TUBE SIDE DRAIN PIPES.
16. F510 VENT VALVE OPTIONAL FOR FASTER HX DRAINING/VENTING. IF F510 IS USED, VENT PIPE SHOULD BE ROUTED UPWARDS TO PREVENT WATER DRAINING ONTO FLOOR.
17. HX DRAIN LINES MUST BE DIFFERENT CONFIGURATION THAN SHOWN PROVIDING HX BOTTOM COVER CAN BE COMPLETELY DRAINED PRIOR TO DISASSEMBLY.
18. OPTIONAL RCW VENT.
19. PIPE WITH A DESIGN PRESSURE OF 2.82 MPa OR GREATER SHALL HAVE ITS MINIMUM WALL THICKNESS NO LESS THAN THAT OF A STANDARD WEIGHT PIPE. THICKER THAN STANDARD WEIGHT PIPE SHALL BE USED IF REQUIRED BY THE DESIGN PRESSURE OR OTHER REQUIREMENTS.
20. VALVES WITH A DESIGN PRESSURE OF 2.82 MPa OR GREATER SHALL BE A MINIMUM OF CLASS 300, OR OF A HIGHER CLASS IF REQUIRED BY THE DESIGN PRESSURE.

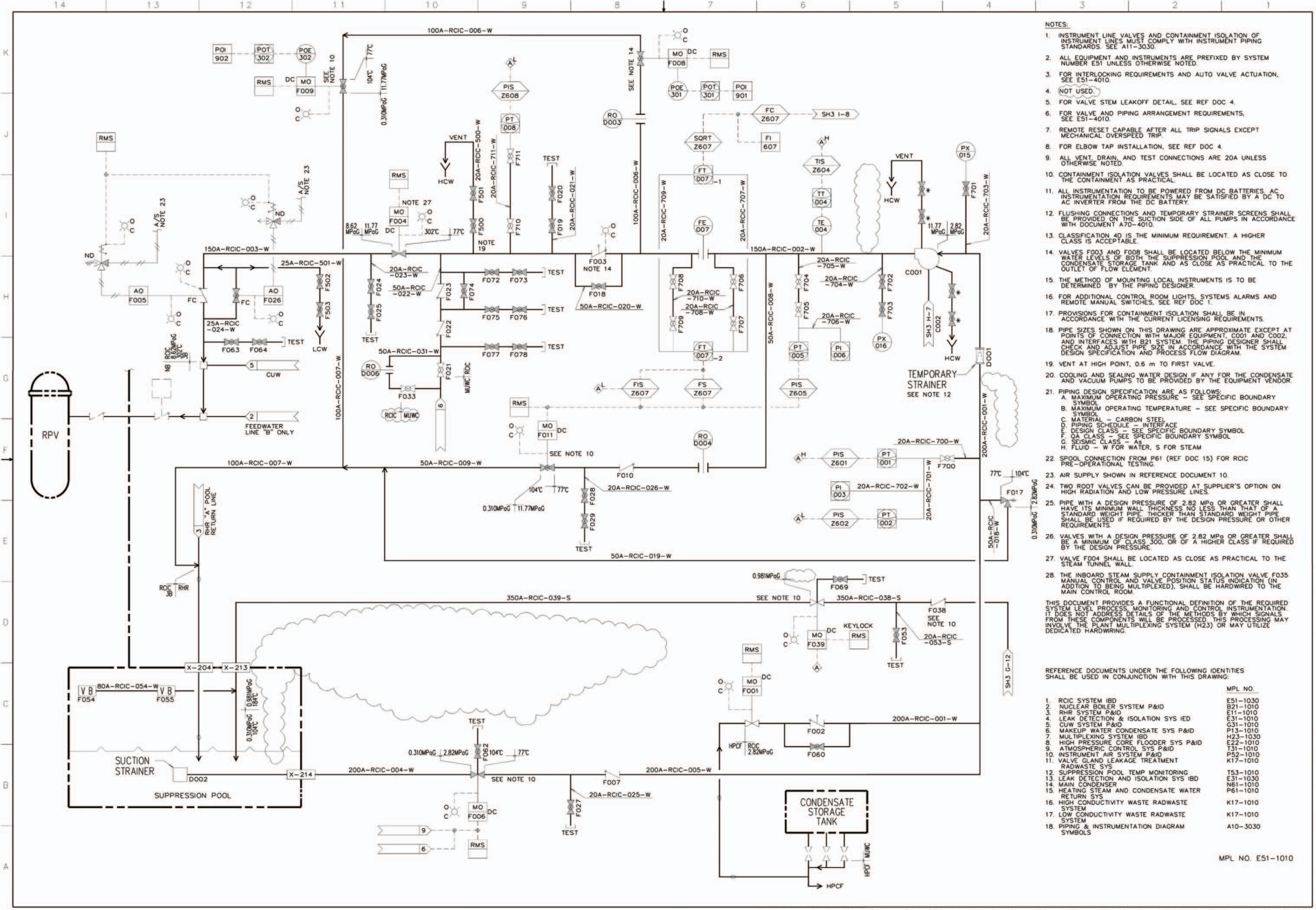
REFERENCE DOCUMENTS UNDER THE FOLLOWING IDENTITIES ARE TO BE USED IN CONJUNCTION WITH THIS DRAWING.

		MPL NO.
1.	CONTROL ROD DRIVE SYS P&ID	C12-1010
2.	REACTOR BUILDING COOLING WATER SYS P&ID	P21-1010
3.	RECIRC FLOW CONTROL SYS IED	C81-1040
4.	MAKE-UP WATER (PURIFIED) SYS P&ID	P11-1010
5.	PIPING AND INSTRUMENT SYMBOLS DIAGRAM	A10-3030

MPL NO. B31-1010

Figure 5.4-4 Reactor Recirculation System P&ID (Sheet 1 of 2)

STP 3&4 Rev. 2



NOTES:

1. INSTRUMENT LINE VALVES AND CONTAINMENT ISOLATION OF INSTRUMENT LINES MUST COMPLY WITH INSTRUMENT PIPING STANDARDS. SEE A11-3030.
2. ALL EQUIPMENT AND INSTRUMENTS ARE PREFIXED BY SYSTEM NUMBER E51 UNLESS OTHERWISE NOTED.
3. FOR INTERLOCKING REQUIREMENTS AND AUTO VALVE ACTUATION, SEE E51-4010.
4. NOT USED.
5. FOR VALVE STEM LEAKOFF DETAIL, SEE REF DOC 4.
6. FOR VALVE AND PIPING ARRANGEMENT REQUIREMENTS, SEE E51-4010.
7. REMOTE RESET CAPABLE AFTER ALL TRIP SIGNALS EXCEPT MECHANICAL OVERSPEED TRIP.
8. FOR ELBOW TAP INSTALLATION, SEE REF DOC 4.
9. ALL VENT, DRAIN, AND TEST CONNECTIONS ARE 20A UNLESS OTHERWISE NOTED.
10. CONTAINMENT ISOLATION VALVES SHALL BE LOCATED AS CLOSE TO THE CONTAINMENT AS PRACTICAL.
11. ALL INSTRUMENTATION TO BE POWERED FROM DC BATTERIES. AC INSTRUMENTATION REQUIREMENTS MAY BE SATISFIED BY A DC TO AC INVERTER FROM THE DC BATTERY.
12. FLUSHING CONNECTIONS AND TEMPORARY STRAINER SCREENS SHALL BE PROVIDED ON THE SUCTION SIDE OF ALL PUMPS IN ACCORDANCE WITH DOCUMENT A70-4010.
13. CLASSIFICATION 4D IS THE MINIMUM REQUIREMENT. A HIGHER CLASS IS ACCEPTABLE.
14. VALVES F003 AND F008 SHALL BE LOCATED BELOW THE MINIMUM WATER LEVELS OF BOTH THE SUPPRESSION POOL AND THE CONDENSATE STORAGE TANK AND AS CLOSE AS PRACTICAL TO THE OUTLET OF FLOW ELEMENT.
15. THE METHOD OF MOUNTING LOCAL INSTRUMENTS IS TO BE DETERMINED BY THE PIPING DESIGNER.
16. FOR ADDITIONAL CONTROL ROOM LIGHTS, SYSTEMS ALARMS AND REMOTE MANUAL SWITCHES, SEE REF DOC 1.
17. PROVISIONS FOR CONTAINMENT ISOLATION SHALL BE IN ACCORDANCE WITH THE CURRENT LICENSING REQUIREMENTS.
18. PIPE SIZES SHOWN ON THIS DRAWING ARE APPROXIMATE EXCEPT AT POINTS OF CONNECTION WITH MAJOR EQUIPMENT, C001 AND C002, AND INTERFACES WITH B21 SYSTEM. THE PIPING DESIGNER SHALL CHECK AND ADJUST PIPE SIZE IN ACCORDANCE WITH THE SYSTEM DESIGN SPECIFICATION AND PROCESS FLOW DIAGRAM.
19. VENT AT HIGH POINT, 0.6 m TO FIRST VALVE.
20. COOLING AND SEALING WATER DESIGN IF ANY FOR THE CONDENSATE AND VACUUM PUMPS TO BE PROVIDED BY THE EQUIPMENT VENDOR.
21. PIPING DESIGN SPECIFICATION ARE AS FOLLOWS:
    A. MAXIMUM OPERATING PRESSURE – SEE SPECIFIC BOUNDARY SYMBOL
    B. MAXIMUM OPERATING TEMPERATURE – SEE SPECIFIC BOUNDARY SYMBOL
    C. MATERIAL – CARBON STEEL
    D. PIPING SCHEDULE – INTERFACE
    E. DESIGN CLASS – SEE SPECIFIC BOUNDARY SYMBOL
    F. QA CLASS – SEE SPECIFIC BOUNDARY SYMBOL
    G. SEISMIC CLASS – As
    H. FLUID – W FOR WATER, S FOR STEAM
22. SPOOL CONNECTION FROM P61 (REF DOC 15) FOR RCIC PRE-OPERATIONAL TESTING.
23. AIR SUPPLY SHOWN IN REFERENCE DOCUMENT 10.
24. TWO ROOT VALVES CAN BE PROVIDED AT SUPPLIER'S OPTION ON HIGH RADIATION AND LOW PRESSURE LINES.
25. PIPE WITH A DESIGN PRESSURE OF 2.82 MPa OR GREATER SHALL HAVE ITS MINIMUM WALL THICKNESS NO LESS THAN THAT OF A STANDARD WEIGHT PIPE. THICKER THAN STANDARD WEIGHT PIPE SHALL BE USED IF REQUIRED BY THE DESIGN PRESSURE OR OTHER REQUIREMENTS.
26. VALVES WITH A DESIGN PRESSURE OF 2.82 MPa OR GREATER SHALL BE A MINIMUM OF CLASS 300, OR OF A HIGHER CLASS IF REQUIRED BY THE DESIGN PRESSURE.
27. VALVE F004 SHALL BE LOCATED AS CLOSE AS PRACTICAL TO THE STEAM TUNNEL WALL.
28. THE INBOARD STEAM SUPPLY CONTAINMENT ISOLATION VALVE F035 MANUAL CONTROL AND VALVE POSITION STATUS INDICATION (IN ADDITION TO BEING MULTIPLEXED), SHALL BE HARDWIRED TO THE MAIN CONTROL ROOM.

THIS DOCUMENT PROVIDES A FUNCTIONAL DEFINITION OF THE REQUIRED SYSTEM LEVEL PROCESS, MONITORING AND CONTROL INSTRUMENTATION. IT DOES NOT ADDRESS DETAILS OF THE METHODS BY WHICH SIGNALS FROM THESE COMPONENTS WILL BE PROCESSED. THIS PROCESSING MAY INVOLVE THE PLANT MULTIPLEXING SYSTEM (H23) OR MAY UTILIZE DEDICATED HARDWIRING.

REFERENCE DOCUMENTS UNDER THE FOLLOWING IDENTITIES SHALL BE USED IN CONJUNCTION WITH THIS DRAWING:

		MPL NO.
1.	RCIC SYSTEM IBD	E51-1030
2.	NUCLEAR BOILER SYSTEM P&ID	B21-1010
3.	RHR SYSTEM P&ID	E11-1010
4.	LEAK DETECTION & ISOLATION SYS IED	E31-1010
5.	CUW SYSTEM P&ID	G31-1010
6.	MAKEUP WATER CONDENSATE SYS P&ID	P13-1010
7.	MULTIPLEXING SYSTEM IBD	H23-1030
8.	HIGH PRESSURE CORE FLOODER SYS P&ID	E22-1010
9.	ATMOSPHERIC CONTROL SYS P&ID	T31-1010
10.	INSTRUMENT AIR SYSTEM P&ID	P52-1010
11.	VALVE GLAND LEAKAGE TREATMENT RADWASTE SYS	K17-1010
12.	SUPPRESSION POOL TEMP MONITORING	T53-1010
13.	LEAK DETECTION AND ISOLATION SYS IBD	E31-1030
14.	MAIN CONDENSER	N61-1010
15.	HEATING STEAM AND CONDENSATE WATER RETURN SYS	P61-1010
16.	HIGH CONDUCTIVITY WASTE RADWASTE SYSTEM	K17-1010
17.	LOW CONDUCTIVITY WASTE RADWASTE SYSTEM	K17-1010
18.	PIPING & INSTRUMENTATION DIAGRAM SYMBOLS	A10-3030

MPL NO. E51-1010

Figure 5.4-8 Reactor Core Isolation Cooling System P&ID (Sheet 1 of 3)

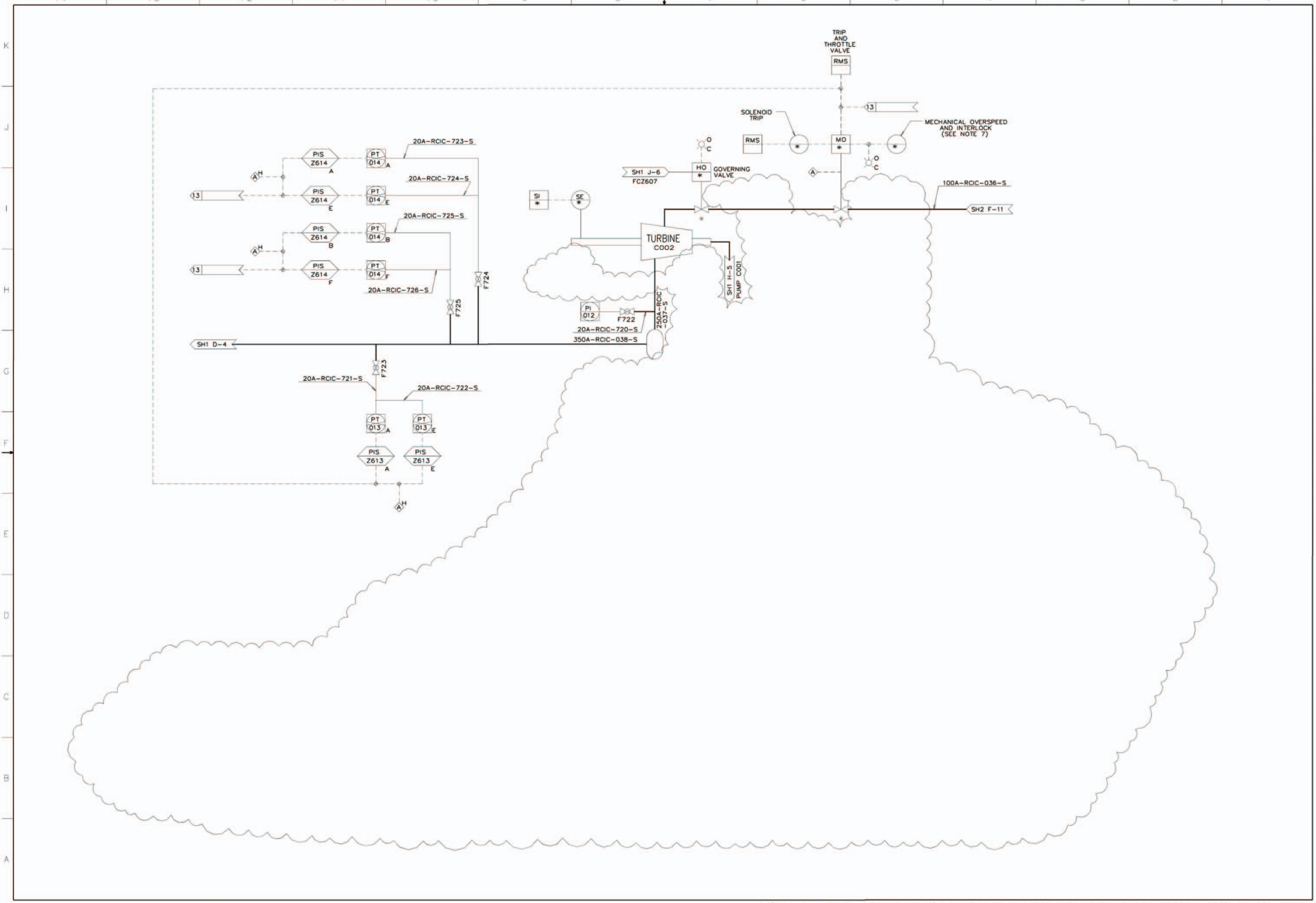
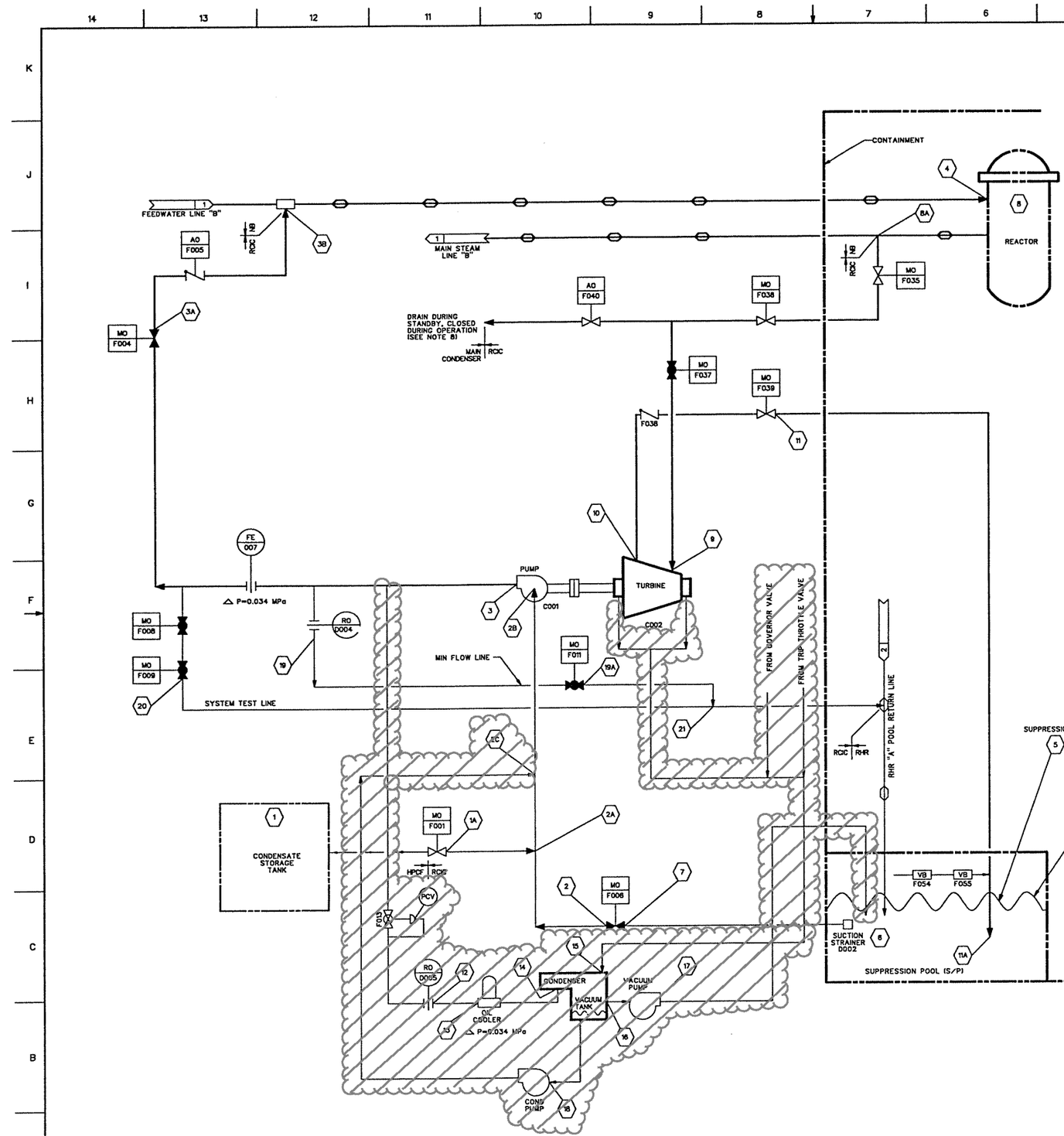


Figure 5.4-8 Reactor Core Isolation Cooling System P&ID (Sheet 3 of 3)

STP 3&4 Rev. 2



NOTES:

1. ATMOSPHERIC PRESSURE OF 0.10 MPa A WAS USED IN CALCULATIONS.
2. WATER FLOWS ARE SHOWN IN m^3/h, STEAM FLOWS IN 1000 kg/h.
3. THE UNRECOVERED FLOW ORIFICE PRESSURE DROP OF 0.31 MPa (PER ORIFICE) IS A FIXED LOSS BETWEEN POSITIONS (3) AND (4)
4. THE LUBE OIL COOLER PRESSURE DROP OF 0.03 MPa IS A FIX LOSS BETWEEN POSITIONS (13) AND (14)
5. THE CONTROLLING MODES FOR LINE SIZING AND ARRANGEMENT ARE:

SUCTION FROM CONDENSATE STORAGE	MODE A & B
SUCTION FROM SUPPRESSION POOL	MODE C & D
PUMP DISCHARGE	MODE C & D
STEAM SUPPLY	MODE A & B
TURBINE EXHAUST	MODE A & C
TEST LINE	MODE E
COOLING SYSTEM	MODE A

6. SYSTEM OPERATION IS POSSIBLE WITH INTERMEDIATE PRESSURES IN THE REACTOR VESSEL AND THE SUPPRESSION POOL. HOWEVER, THESE CONDITIONS DO NOT CONTROL PIPE OR VALVE SIZING OR SPECIFICATION, AND NO DATA IS SHOWN.
7. PUMP MINIMUM FLOW REQUIREMENT MAY OCCUR DURING ANY OPERATING MODE. FLOW REQUIREMENT IS 20.4 m^3/h MINIMUM WITH TURBINE/PUMP AT MAXIMUM SPEED (I.E. MODE A1.
8. DURING SYSTEM STANDBY EQUIPMENT IS NOT OPERATING. INTERMITTENT FLOW OCCURS THROUGH THE STEAM SUPPLY LINE DRAIN TRAP SYSTEM AT 6.87 MPa A AND 293 °C.
9. THIS TABLE IS FOR REFERENCE ONLY, SEE RCIC P&ID (REF DOC 4) FOR REQUIRED VALUES.
10. FLOW VALUES SHOWN IN MODES C & D ARE BASED UPON SUCTION PIPING DESIGN PERMITTING THE MINIMUM REQUIRED NPSH TO CONTINUE TO BE PROVIDED TO THE RCIC PUMP WHEN THE SUPPRESSION POOL SUCTION STRAINER IS 50 PERCENT PLUGGED.
11. STEAM FLOWS FOR TEST MODE AT POSITION (8) (10) (11) AND (11A) ARE BASED UPON A PUMP TDH OF 750 m.
12. DURING RCIC SYSTEM OPERATION A FLOW OF 0.08 m^3/h OCCURS THROUGH THE TURBINE EXHAUST LINE DRAIN POT SYSTEM AT 0.18 MPa A AND 116 °C.
13. SEE REF DOC 1 FOR PEAK PRESSURE.

REFERENCE DOCUMENTS UNDER THE FOLLOWING IDENTITIES SHALL BE USED IN CONJUNCTION WITH THIS DRAWING:

	MPL NO.
1. NUCLEAR BOILER SYSTEM PFD	B21-1020
2. RESIDUAL HEAT REMOVAL SYSTEM PFD	E11-1020
3. HIGH PRESSURE CORE FLOODER SYS PFD	E22-1020
4. RCIC SYSTEM P&ID	E51-1010
5. PIPING AND INSTRUMENTATION DIAGRAM SYMBOLS	A10-3030

FIGURE 5.4-9 REACTOR CORE ISOLATION COOLING SYSTEM PFD (Sheet 1 of 2)

MODE A SUCTION FROM CONDENSATE STORAGE, REACTOR AT HIGH PRESSURE, SUPPRESSION POOL AT ELEVATED PRESSURE

POSITION ⟨⟩	1	2A	3	4	5	6	7	8	9	10	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	20	21
FLOW	–	182	188	182	–	–	0	–	16.4	16.4	16.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	–	0	0
PRESS MPa A	0.10	*	*	8.24	0.13	–	–	8.24	*	*	0.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*	–	–
TEMP °C	40	40	40	40	60	–	–	296	SAT	SAT	109	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40	–	–
Max /Min TEMP °C	40/10	40/10	40/10	40/10	77/10	–	–	296/16	296/16	121/16	121/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/10	–	–

MODE B SUCTION FROM CONDENSATE STORAGE, REACTOR AT LOW PRESSURE, SUPPRESSION POOL AT ELEVATED PRESSURE

POSITION ⟨⟩	1	2A	3	4	5	6	7	8	9	10	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	20	21
FLOW	–	182	188	182	–	–	0	–	5.4	5.3	5.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	–	0	0
PRESS MPa A	0.10	*	*	1.18	0.13	–	–	1.18	*	*	0.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*	–	–
TEMP °C	40	40	40	40	60	–	–	185	SAT	SAT	109	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40	–	–
Max /Min TEMP °C	40/10	40/10	40/10	40/10	77/10	–	–	186/16	186/16	121/16	121/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40/10	–	–

MODE C SUCTION FROM SUPPRESSION POOL, REACTOR AT HIGH PRESSURE, SUPPRESSION POOL AT LOW PRESSURE

POSITION ⟨⟩	1	2	3	4	5	6	7	8	9	10	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	20	21
FLOW SEE NOTE 2	–	182	188	182	–	–	182	–	16.4	16.4	16.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	–	0	0
PRESS MPa A	–	*	*	8.24	0.10	0.14	0.14	8.24	*	*	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*	–	–
TEMP °C	–	60	60	60	60	60	60	296	SAT	SAT	103	N/A	N/A	N/A	N/A	N/A	N/A	N/A	60	–	–
Max /Min TEMP °C	–	77/10	77/10	77/10	77/10	77/10	77/10	296/16	296/16	121/16	121/10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	77/10	–	–

MODE D SUCTION FROM SUPPRESSION POOL, REACTOR AT LOW PRESSURE, SUPPRESSION POOL AT LOW PRESSURE

POSITION ⟨⟩	1	2	3	4	5	6	7	8	9	10	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	20	21
FLOW SEE NOTE 2	–	182	188	182	–	–	182	–	5.4	5.3	5.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	–	0	0
PRESS MPa A	–	*	*	1.18	0.10	0.14	0.13	1.18	*	*	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*	–	–
TEMP °C	–	60	60	60	60	60	60	185	SAT	SAT	103	N/A	N/A	N/A	N/A	N/A	N/A	N/A	60	–	–
Max /Min TEMP °C	–	77/10	77/10	77/10	77/10	77/10	77/10	186/16	186/16	121/16	121/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	77/10	–	–

MODE E TEST MODE: SUCTION FROM SUPPRESSION POOL, REACTOR AT HIGH PRESSURE, SUPPRESSION POOL AT LOW PRESSURE

POSITION ⟨⟩	1	2	3	4	5	6	7	8	9	10	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	20	21
FLOW SEE NOTE 2	–	182	188	–	–	–	182	–	14.15	14.1	14.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	–	182	182
PRESS MPa A	–	*	*	–	0.10	0.14	0.14	7.17	*	*	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*	*	*
TEMP °C	–	35	35	–	35	35	35	285	SAT	SAT	103	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35	35	35
Max /Min TEMP °C	–	77/10	77/10	–	77/10	77/10	77/10	285/16	285/16	121/16	121/16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	77/10	77/10	77/10

(SEE NOTE 9)

POSITION ⟨⟩	1A–2A	2–2B	3–3A	3A–3B	6–7	8A–9	10–11	11–11A	N/A	N/A	N/A	N/A	N/A	N/A	3–19	19–19A	19A–21	3–20	20–21
PEAK PRESS MPa G	N/A	N/A	12.65	NOTE 13	N/A	10.35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.65	12.65	N/A	12.65	N/A
DESIGN MPa G	2.82	2.82	11.77	8.62	0.31	8.62	8.62	0.98	N/A	N/A	N/A	N/A	N/A	N/A	11.77	11.77	0.31	11.77	0.31
DESIGN TEMP °C	77	77	77	302	77	302	302	104	N/A	N/A	N/A	N/A	N/A	N/A	77	77	104	77	104
ESTIMATED LINE SIZE mmA	200	200	150	150	200	200	350	350	N/A	N/A	N/A	N/A	N/A	N/A	50	50	50	100	100

PEAK PRESSURE– IS THE MAXIMUM PRESSURE ANTICIPATED DURING A TRANSIENT PERIOD WITH ALL OF THE CONTRIBUTING ELEMENTS AT A MAXIMUM. IT WOULD BE EXPECTED TO OCCUR LESS THAN 1% OF SYSTEM OPERATING TIME.

* THE PRESSURE AT THIS POSITION DEPENDS ON PIPING ARRANGEMENT AND MAY BE VARIED WITHIN THE FOLLOWING LIMITS.

POSITION

⟨1A⟩ INLET TO PUMP FROM CONDENSATE STORAGE TANK

⟨2⟩ MINIMUM NPSH = 7.0 m (1 METER ABOVE PUMP FLOOR)

⟨3⟩ MAXIMUM PUMP TOTAL DYNAMIC HEAD
900 m FOR MODES A & C
186 m FOR MODES B & D

⟨9⟩ MAXIMUM PRESSURE DROP BETWEEN POSITION ⟨8⟩ AND ⟨9⟩ = 0.11 MPa (SEE NOTE 5)

⟨10⟩ MAXIMUM PRESSURE ALLOWED FOR RATED SYSTEM PERFORMANCE = 0.18 MPa A

⟨19⟩ SUFFICIENT PRESSURE TO RETURN TO SUPPRESSION POOL

⟨20⟩ ⟨21⟩ SUFFICIENT PRESSURE TO RETURN TO SUPPRESSION POOL

TABLE 1 VALVE POSITION CHART

VALVE	F004	F006	F001	F035	F036	F037	F039	F011	F009	F008
MODE A	O	C	O	O	O	O	O	C	C	C
MODE B	O	C	O	O	O	O	O	C	C	C
MODE C	O	O	C	O	O	O	O	C	C	C
MODE D	O	O	C	O	O	O	O	C	C	C
MODE E	C	O	C	O	O	O	O	C	T	T

O = OPEN C = CLOSE T = THROTTLE

E51-1020

FIGURE 5.4-9 REACTOR CORE ISOLATION COOLING SYSTEM PFD (Sheet 2 of 2)

STP 3&4 Rev.2

NOTES:

1. PIPING HIGH POINT VENTS AND LOW POINT DRAINS ARE TO BE ADDED AS NECESSARY.
2. INSTRUMENT LINE DESIGN AND VALVING SHALL BE IN ACCORDANCE WITH INSTRUMENT PIPING SPECIFICATION. A11-3030
3. VALVE F028 IS REQUIRED IF THERE IS POTENTIAL FOR OVERPRESSURE.
4. FOR ADDITIONAL CONTROL ROOM LIGHTS, SYSTEM ALARMS AND REMOTE MANUAL SWITCHES, SEE THE RHR IBD E11-1030.
5. PROVISIONS FOR CONTAINMENT ISOLATION SHALL BE IN ACCORDANCE WITH CURRENT LICENSING REQUIREMENTS.
6. VALVE F002 SHALL BE LOCATED AT AN ELEVATION LOWER THAN THE SUPPRESSION POOL MINIMUM WATER LEVEL.
7. PUMP C001 COOLING WATER, IF REQUIRED, IS SPECIFIED IN P21-1010.
8. ALL PRIMARY CONTAINMENT ISOLATION VALVES SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE CONTAINMENT PENETRATION.
9. ALL MOTOR OPERATED VALVES ARE AC OPERATED UNLESS OTHERWISE NOTED.
10. EQUIPMENT IN SUBSYSTEMS A, B AND C SHALL HAVE THE SUFFIX LETTER A, B AND C RESPECTIVELY AFTER THE EQUIPMENT NUMBER.
11. FLUSHING CONNECTIONS AND TEMPORARY STRAINER SCREENS ON THE SUCTION SIDE OF ALL PUMPS SHALL BE PROVIDED.
12. DRYWELL PIPING RUNS SHALL BE HORIZONTAL OR VERTICAL UPWARDS FROM THE DRYWELL WALL TO THE POINT OF ATTACHMENT WITH THE REACTOR VESSEL.
13. THIS HIGH POINT VENT SHALL BE LOCATED AT THE HIGHEST POINT IN THE PIPING OUTSIDE THE DRYWELL BETWEEN VALVES F017 AND F018.
14. SUBSYSTEM "A" RETURNS TO RPV THROUGH FEEDWATER LINE "A".
15. DISCHARGE LINES FOR COOLING WATER TO BE ROUTED UPSTREAM OF SERVICE WATER RADIATION MONITORS.
16. VALVE F014 SHALL BE AS CLOSE AS POSSIBLE TO THE CONNECTIONS TO THE MAIN LINE.
17. DESIGN LINE SIZE WILL BE FINALIZED AT THE DETAILED DESIGN PHASE. ACTUAL LINE SIZES DETERMINED BY THE PIPING DESIGNER SHALL MEET THE PROCESS DATA HYDRAULIC REQUIREMENTS.
18. CHECK VALVE F006B(C) SHALL BE LOCATED AS CLOSE AS PRACTICAL TO THE REACTOR VESSEL NOZZLE.
19. VALVES F011A, F011B AND F011C ARE IN ELECTRICAL DIVISIONS 2, 3 AND 1 RESPECTIVELY. THE MANUAL CONTROL SWITCHES FOR VALVES F011A, F011B AND F011C ARE IN ELECTRICAL DIVISIONS 1, 2 AND 3 RESPECTIVELY.
20. PIPING DESIGN SPECIFICATIONS ARE AS FOLLOWS:
    A. MAXIMUM OPERATING PRESSURE - SEE SPECIFIC BOUNDARY SYMBOL
    B. MAXIMUM OPERATING TEMPERATURE - SEE SPECIFIC BOUNDARY SYMBOL
    C. MATERIAL - CARBON STEEL
    D. PIPING SCHEDULE - INTERFACE
    E. DESIGN CLASS - SEE SPECIFIC BOUNDARY SYMBOL
    F. QC CLASS - SEE SPECIFIC BOUNDARY SYMBOL
    G. SEISMIC CLASS - RHR - As
    H. FLUID - WATER
21. AIR SUPPLY IS FROM INSTRUMENT AIR SYSTEM, SUPPL DOC 15. NITROGEN SUPPLY IS FROM HIGH PRESSURE NITROGEN GAS SUPPLY SYSTEM, SUPPL DOC 4.
22. STRAINER TYPE AS SUPPLIED WITH PUMP C002.
23. FLANGE CONNECTION USED FOR OCCASSIONAL SUPPRESSION POOL DRAINING.
24. DRAIN AND VENT PIPING DESIGN CONDITIONS ARE:
    MAXIMUM OPERATING PRESSURE - SAME AS MAIN LINE UPSTREAM OF VALVE (ATMOSPHERIC PRESSURE FROM LAST VALVE TO FUNNEL).
    MAXIMUM OPERATING TEMPERATURE - SAME AS MAIN LINE UPSTREAM OF VALVE (66°C FROM LAST VALVE TO FUNNEL)
25. UNIQUE PIPE NUMBERS ARE ASSIGNED SEQUENTIALLY FOR EACH RHR LOOP. RANGES OF NUMBERS ARE ALLOCATED FOR EACH LOOP AND TYPE OF PIPE AS FOLLOWS:

	LOOP A	LOOP B	LOOP C
PROCESS PIPING	001-100	101-200	201-300
DRAIN AND VENT PIPING	500-529	530-559	560-589
INSTRUMENT PIPING	700-729	730-759	760-789

26. THE VALVE TYPE FOR F043 AND F044 WILL BE DECIDED IN THE FINAL DESIGN.
27. THE RECORDING FUNCTION IS ACCOMPLISHED THROUGH MICROPROCESSOR CHANNEL OUTPUT TO PRINTER.
28. TWO ROOT VALVES CAN BE PROVIDED AT THE SUPPLIERS OPTION ON HIGH RADIATION/LOW PRESSURE DRAIN AND VENT LINES.
29. BYPASS VALVES F036A,B,C SHALL BE UTILIZED FOR WARMING UP THE RHR PIPING SYSTEM. THE FLOW WILL BE FROM THE REACTOR SIDE. THESE VALVES ARE ALSO USED DURING OPERABILITY TESTING OF TESTABLE CHECK VALVE F006.
30. PIPE WITH A DESIGN PRESSURE OF 2.82 MPa OR GREATER SHALL HAVE ITS MINIMUM WALL THICKNESS NO LESS THAN THAT OF A STANDARD WEIGHT PIPE. THICKER THAN STANDARD WEIGHT PIPE SHALL BE USED IF REQUIRED BY THE DESIGN PRESSURE OR OTHER REQUIREMENTS.
31. VALVES WITH A DESIGN PRESSURE OF 2.82 MPa OR GREATER SHALL BE A MINIMUM OF CLASS 300, OR OF A HIGHER CLASS IF REQUIRED BY THE DESIGN PRESSURE.
32. *ILOCATE THE GATE VALVE OF THIS SPRING SECTION AT A DISTANCE GREATER THAN OR EQUAL TO 75 PIPE DIAMETERS FROM THE RPV NOZZLE. OTHERWISE PERFORM STRESS ANALYSIS TO SHOW THAT STRESSES AND FATIGUE ARE ACCEPTABLE PER THE ASME CODE FROM THE CONCERN OF NRC BULLETIN 88-08, SUPPLEMENT 3 (APRIL 11, 1988) ON POTENTIAL THERMAL STRATIFICATION AND STRIPING DUE TO PERIODIC EXTERNAL LEAKAGE OF THE GATE VALVE.]*
33. THE THREE RETURN LINES BRINGING FLOW INTO THE SUPPRESSION POOL (S/P) SHALL HAVE AN EXIT DESIGN THAT PROMOTES S/P CIRCULATION AND MIXING FOR EFFECIENT COOLING. CONSIDERATIONS SHALL INCLUDE: (1) DIRECTING THE FLOW HORIZONTALLY WITH THE THREE LINES WORKING TOGETHER TO ACHIEVE CIRCULATION AROUND THE S/P'S ANNULAR SHAPE, (2) DIRECTING THE RETURN FLOW TO AVOID DIRECTLY ENTERING A SUCTION INLET, AND (3) SEPARATE THE RETURN LINES FROM THE SUCTION STRAINERS IN THE ELEVATION PLANE TO THE GREATEST EXTENT PRACTICAL, WITH THE RETURN LINES LOCATED NEAR THE S/P TOP AND THE SUCTION STRAINERS NEAR THE S/P BOTTOM.
34. VALVE TO HAVE MANUAL HAND WHEEL OPERABLE AT LOW DELTA PRESSURE FOR POTENTIAL NEED DURING FIRE WATER ADDITION MODE. (NOTE VALVES F005C, F017C, AND F018C).
35. VALVE F005A SHALL BE LOCATED AS CLOSE AS PRACTICAL TO THE STEAM TUNNEL WALL.

* SEE SUBSECTION 3.9.1.7

SUPPLEMENTAL DOCUMENTS UNDER THE FOLLOWING IDENTITIES ARE TO BE USED IN CONJUNCTION WITH THIS DRAWING.

	MPL NO.
1. RESIDUAL HEAT REMOVAL SYSTEM PFD	E11-1020
2. RESIDUAL HEAT REMOVAL SYSTEM IBD	E11-1030
3. SAMPLING SYSTEM P&ID	P91-1010
4. HIGH PRESSURE NITROGEN GAS SUPPLY SYSTEM P&ID	P54-1010
5. REACTOR WATER CLEANUP SYSTEM P&ID	G31-1010
6. FUEL POOL COOLING AND CLEANUP SYSTEM P&ID	G41-1010
7. VALVE GLAND LEAKAGE TREATMENT, RADWASTE SYSTEM P&ID	K17-1010
8. MAKE-UP WATER SYSTEM (CONDENSATE) P&ID	P13-1010
9. REMOTE SHUTDOWN SYSTEM IED	C61-1040
10. HIGH PRESSURE CORE FLOODER P&ID	E22-1010
11. REACTOR CORE ISOLATION COOLING SYSTEM P&ID	E51-1010
12. NUCLEAR BOILER SYSTEM P&ID	B21-1010
13. HIGH CONDUCTIVITY WASTE, RADWASTE SYSTEM P&ID	K17-1010
14. REACTOR BUILDING COOLING WATER SYSTEM P&ID	P21-1010
15. INSTRUMENT AIR SYSTEM P&ID	P52-1010
16. FLAMMABILITY CONTROL SYSTEM P&ID	C49-1010
17. NUCLEAR BOILER SYSTEM IBD	B21-1030
18. SAMPLING SYSTEM P&ID (INCLUDES PASS)	P91-1010
19. FIRE PROTECTION SYSTEM P&ID	U43-1010
20. LOW CONDUCTIVITY WASTE, RADWASTE SYSTEM P&ID	K17-1010
21. REACTOR ICD	B11-2020

SUPPORTING DOCUMENTS

1. PIPING AND INSTRUMENT SYMBOLS	A10-3030

LEGEND:

LEAK TESTABLE DOUBLE DISC GATE VALVE

MPL NO. E11-1010

FIGURE 5.4-10 RESIDUAL HEAT REMOVAL SYSTEM P&ID (Sheet 1 of 7)

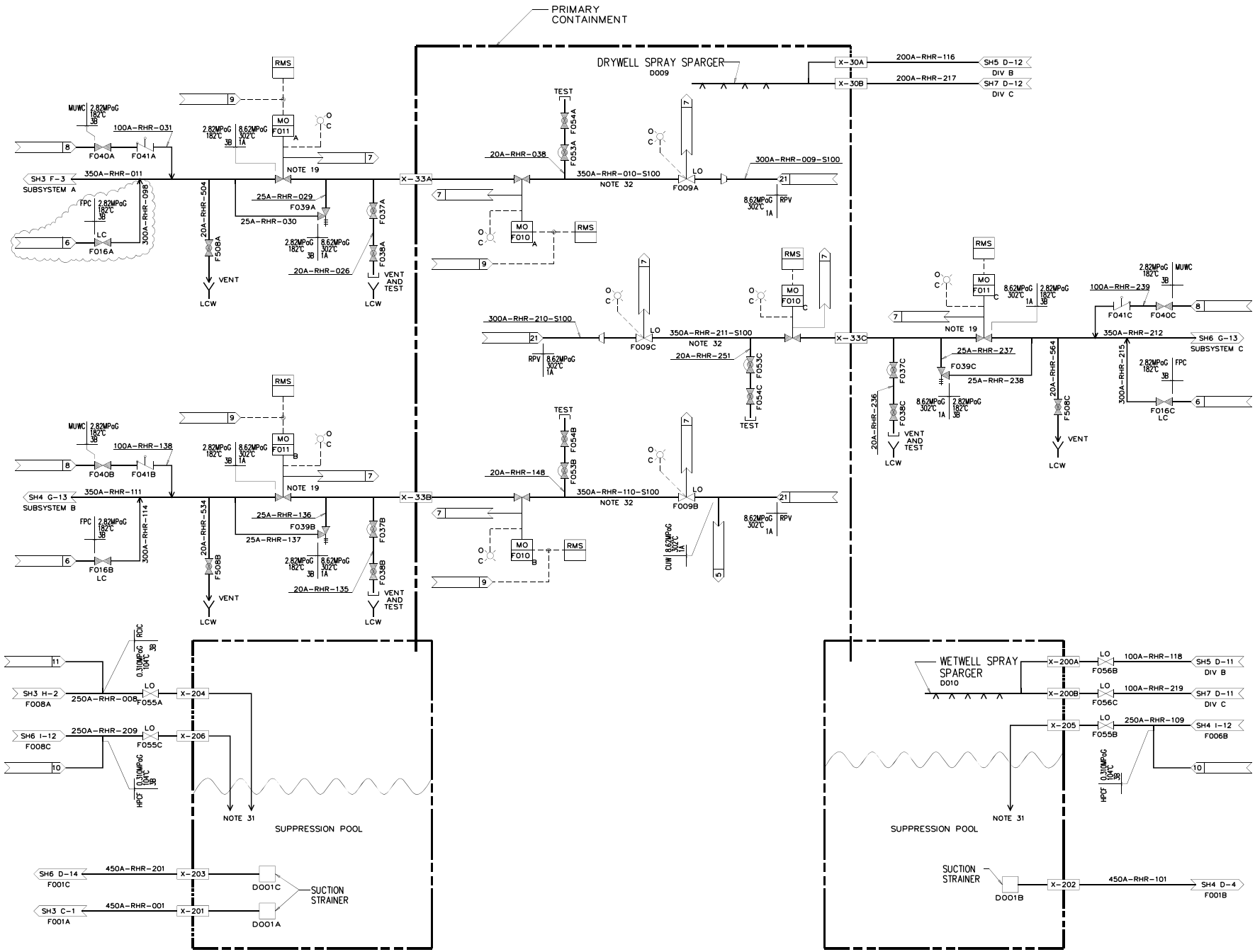


FIGURE 5.4-10 RESIDUAL HEAT REMOVAL SYSTEM P&ID (Sheet 2 of 7)

STP 3&4 Rev.2

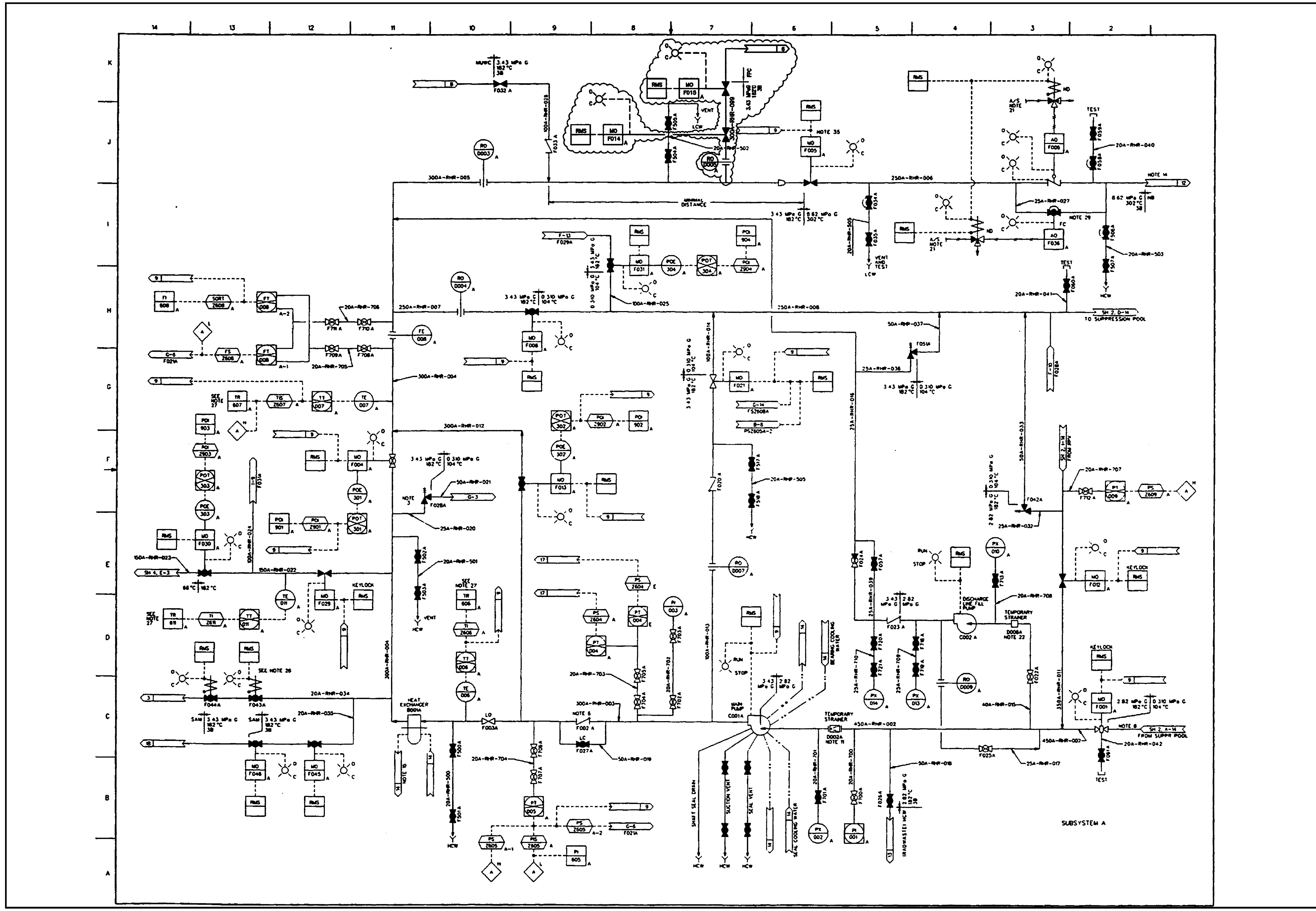


FIGURE 5.4-10 RESIDUAL HEAT REMOVAL SYSTEM P&ID (SHEET 3 OF 7)

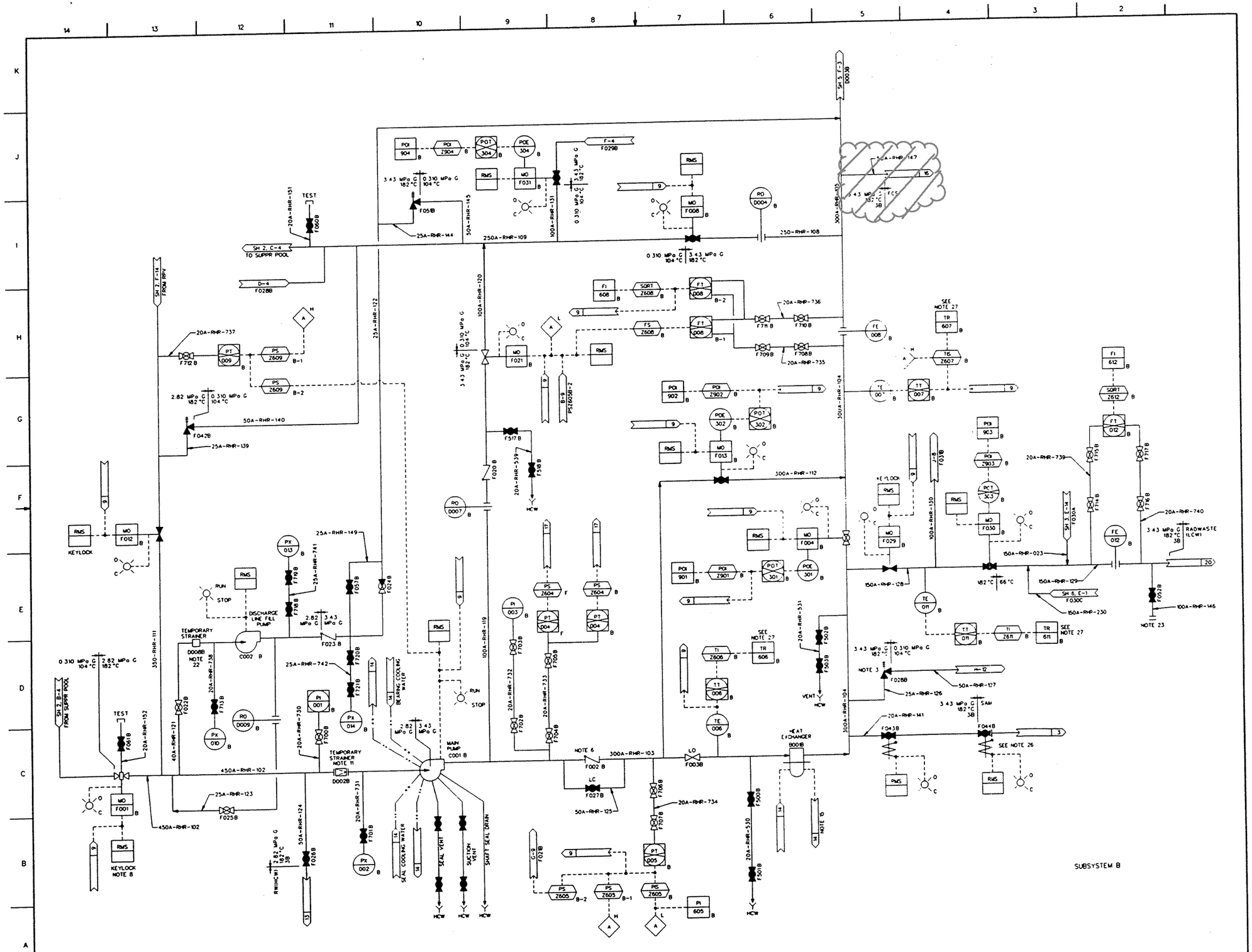


FIGURE 5.4-10 RESIDUAL HEAT REMOVAL SYSTEM P&ID (Sheet 4 of 7)

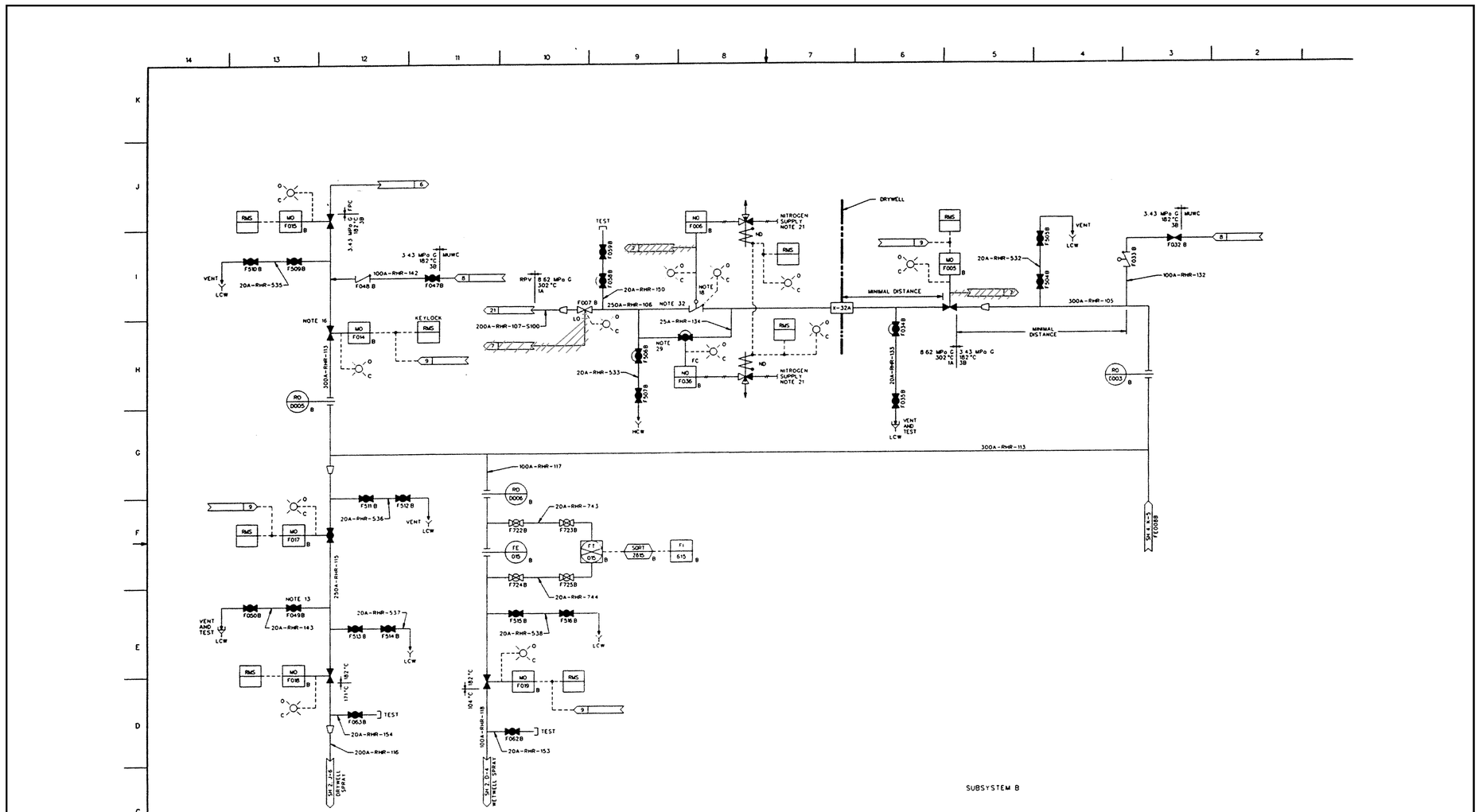


FIGURE 5.4-10 RESIDUAL HEAT REMOVAL SYSTEM P&ID (SHEET 5 OF 7)

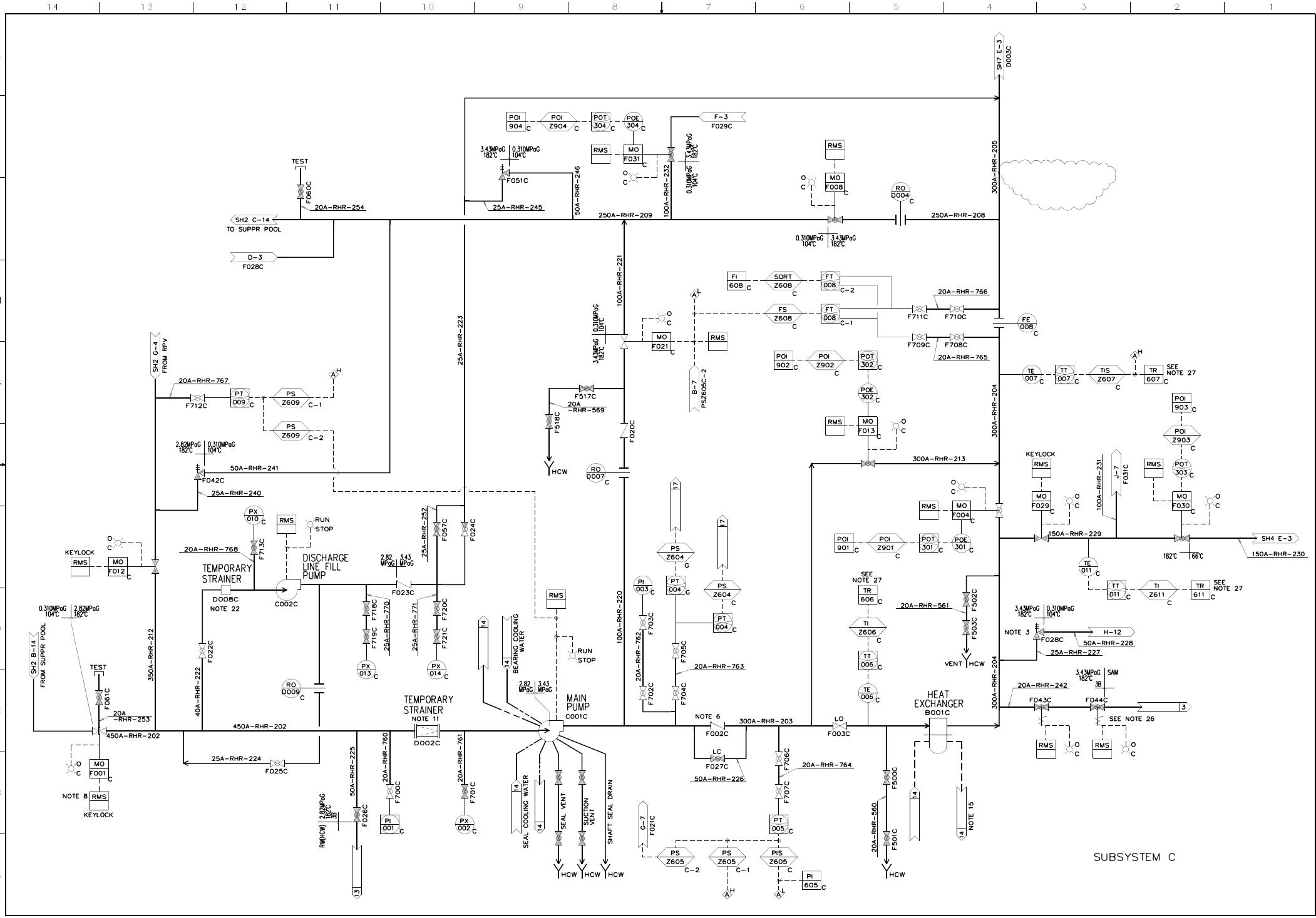
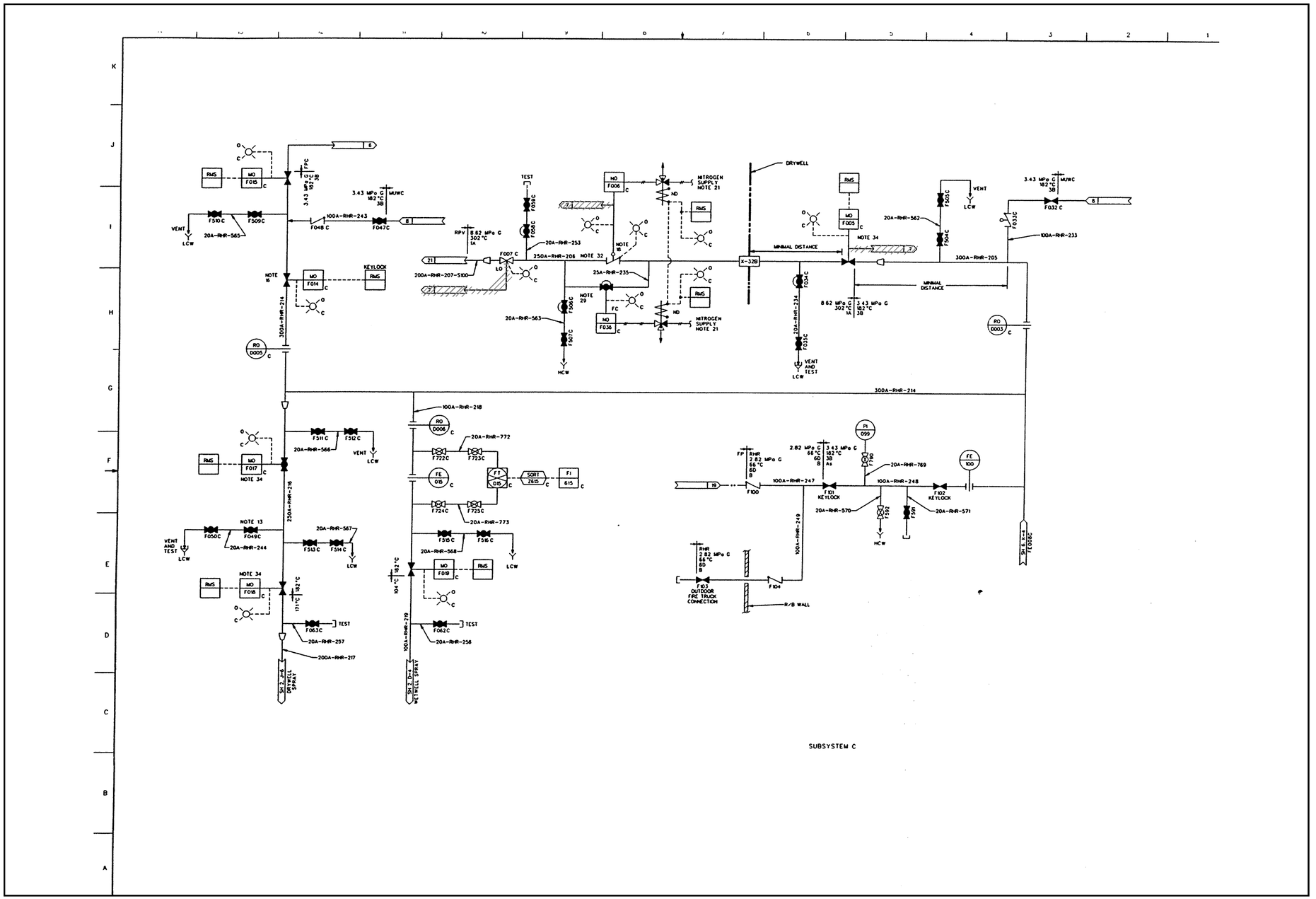


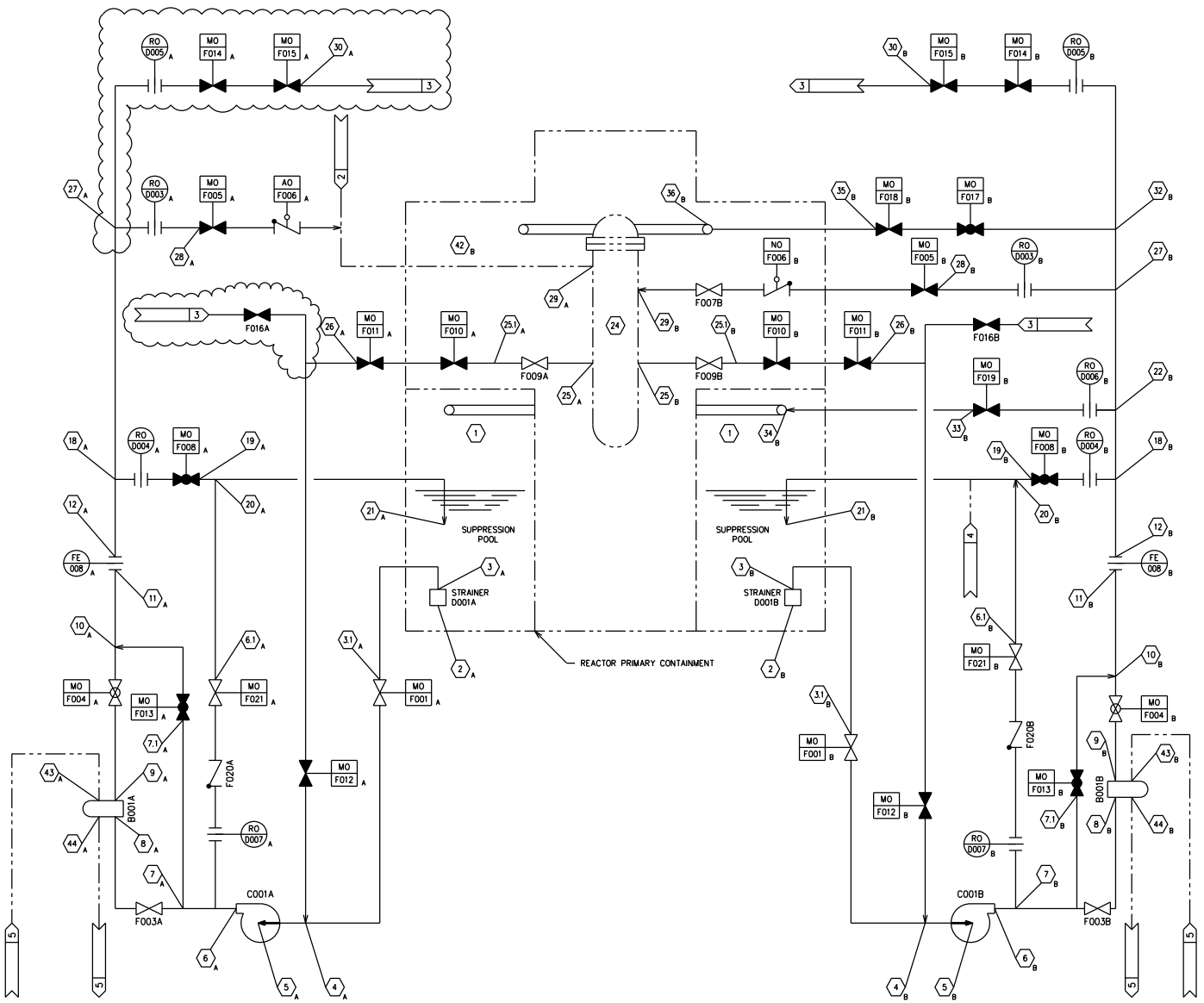
FIGURE 5.4-10 RESIDUAL HEAT REMOVAL SYSTEM P&ID (Sheet 6 of 7)

STP 3&4 Rev.2



SUBSYSTEM C

FIGURE 5.4-10 RESIDUAL HEAT REMOVAL SYSTEM P&ID (SHEET 7 OF 7)



NOTES

1. SHOWN AS TYPICAL FOR ONE SUBSYSTEM. IF SUBSYSTEMS ARE NOT SYMMETRICALLY ARRANGED, VALUES FOR EACH SUBSYSTEM SHALL BE SUBMITTED.
2. PIPING BETWEEN POINTS WITH EMPTY DATA BLANKS SHALL BE SIZED BY OTHERS BASED ON SPECIFIED OPERATING CONDITIONS. EMPTY DATA BLANKS CAN BE FILLED IN BASED ON ACTUAL ARRANGEMENT OR EQUIVALENT HYDRAULIC DATA.

[ ] ---- INDICATES THE DATA IS NOT SIGNIFICANT.

3. MODE C2 IS THE LIMITING MODE FOR HEAT LOAD. HEAT CAPACITY BASED ON K=4.27X10 W/C
4. [X / Y] ---- INDICATES MAXIMUM (X) AND MINIMUM (Y) VALUES FOR THE MODE SPECIFIED.
5. DASHED LINES INDICATE FLOW DOES NOT PASS THROUGH THESE POINTS.
6. TYPICAL VALUES FOR MAXIMUM SUPPRESSION POOL TEMPERATURE SHOWN FINAL TEMPERATURE DEPENDS ON INITIAL POOL WATER TEMPERATURE AND POOL WATER VOLUME.
7. THE NPSH AVAILABLE IN MODES A AND C-1, AT A REFERENCE LOCATION 1 METER ABOVE THE PUMP MOUNTING FLOOR MUST EQUAL OR EXCEED 2.0 METERS ASSUMING SATURATION TEMPERATURES OF 100°C AND 182°C RESPECTIVELY THE NPSH AVAILABLE AT THE PUMP SUCTION NOZZLE MUST EQUAL OR EXCEED THIS VALUE PLUS THE DIFFERENCE IN ELEVATION BETWEEN THE REFERENCE LOCATION AND THE CENTERLINE OF THE PUMP SUCTION NOZZLE.
8. TABLE 1 INDICATES VALVE POSITIONS DURING VARIOUS MODES OF OPERATION.
9. THIS TABLE IS FOR REFERENCE ONLY : SEE P&ID, FOR REQUIRED VALUES.
10. THE WEIGHT OF WATER IN THE SHUTDOWN COOLING SUBSYSTEM PIPING, INCLUDING THE HEAT EXCHANGERS AND PUMPS SHALL NOT EXCEED THE VALUE SPECIFIED C41-4010 IN ORDER TO PREVENT DILUTION OF STANDBY LIQUID CONTROL NEUTRON ABSORBER BELOW MINIMUM REQUIREMENTS.
11. HEAT EXCHANGER HEAT REMOVAL AND SPRAY BASED UPON 954 m /h TUBE SIDE FLOW.
12. SOH=195 METERS REQUIRED MINIMUM AND 220 METERS MAXIMUM.
13. MAXIMUM TUBE SIDE FLOW RATE IS 1130 m /h WHICH IS MAXIMUM PUMP RUNOUT FLOW.
14. HEAT EXCHANGER HEAT REMOVAL SHOWN FOR FULL FLOW AND MAXIMUM TEMPERATURE DIFFERENCE.
15. ONLY TWO SUBSYSTEMS ARE REQUIRED AT THIS STAGE OF SHUTDOWN.
16. LOCATIONS 19,20,21 AND 22,33,34 SHOW THE FLOW SPLIT ON LOOPS B AND C WHEN THE WETWELL SPRAY FUNCTION IS MANUALLY INITIATED.
17. ONLY ONE SUBSYSTEM IS REQUIRED FOR THIS MODE OF OPERATION (RHR A OR B OR C).
18. THESE TEMPERATURE VALUES HAVE BEEN CALCULATED UNDER NOMINAL CONDITIONS, I.E., WITH AN ULTIMATE HEAT SINK TEMPERATURE OF 30°C.

SUPPLEMENTAL DOCUMENTS UNDER THE FOLLOWING IDENTITIES ARE TO BE USED IN CONJUNCTION WITH THIS DRAWING.

	MPL NO.
1. RESIDUAL HEAT REMOVAL SYSTEM P&ID	E11-1010
2. NUCLEAR BOILER SYSTEM PFD	B21-1020
3. FUEL POOL COOLING & CLEANUP SYS PFD	G41-1020
4. HIGH PRESSURE CORE FLOODER SYS PFD	E22-1020
5. REACTOR BUILDING COOLING WATER SYSTEM PFD	P21-1020

SUPPORTING DOCUMENTS

	MPL NO.
1. PIPING & INSTRUMENT DIAGRAM SYMBOLS	A10-3030

MPL NO. E11-1020

FIGURE 5.4-11 RESIDUAL HEAT REMOVAL SYSTEM PFD (Sheet 1 of 2)

STP 3&4 Rev.2

MODE A POST ACCIDENT CORE COOLING WITH STRAINER 50% PLUGGED (SEE NOTE 11)

POSITION ○	1	2	3	4	5	6	7	8	9	10	11	12	27	28	29	24	43	44
FLOW m^3/h	-	954	←												954	-		
TEMP °C	-	97/35	←					97/35								-		
PRESS MPa A	0.41/0.10	-	-	-	-											0.41/0.10		
Max PRESS DIFF-METERS	-				Δ TDH = 125		-	ΔH = 7.0		-	ΔH = 6.1		-	-			Δ H = 7.0	

HEAT REMOVAL CAPACITY PER HX LOOP = 82.48 x 10^6 kJ/h

ALL SUBSYSTEMS

MODE B1 POST ACCIDENT SUPPRESSION POOL COOLING WITH STRAINER 50% PLUGGED (SEE NOTES 8 & 16)

POSITION ○	1	2	3	4	5	6	7	8	9	10	11	12	18	19B&C	20B&C	21B&C	1	22B&C	33B&C	34B&C	1	19A	20A	21A	1	43	44
FLOW m^3/h	-	954	←									→	954	840	840	840	-	114	114	114	-	954	954	954	-		
TEMP °C	-	97	←					97									-				-				-		
PRESS MPa A	0.41/0.10	-	-	-	-												0.41/0.10				0.41/0.10				0.41/0.10		
Max PRESS DIFF-METERS	←				Δ TDH = 125			ΔH = 7.0			ΔH = 6.1										→				ΔH = 7.0		

HEAT REMOVAL CAPACITY PER HX LOOP = 82.48 x 10^6 kJ/h (3 HX'S OPERATING) (SEE NOTE 3)

SUBSYSTEM B & C

SEE NOTE 5 TYP ALL TABLES

SUBSYSTEM A

MODE B2 SUPPRESSION POOL COOLING DURING REACTOR HOT STANDBY OPERATION

POSITION ○	1	2	3	4	5	6	8	9	11	12	18	19	20	21	1	43	44
FLOW m^3/h	-	954	←										→	954	-		
TEMP °C	-	49	←				49								-		
PRESS MPa A	0.10	-	-	-	-										0.10		
Max PRESS DIFF-METERS	←				Δ TDH = 125		ΔH = 7.0		ΔH = 6.1					→		ΔH = 7.0	

HEAT REMOVAL CAPACITY PER HX LOOP = 18.67 x 10^6 kJ/h

SUBSYSTEM B & C

MODE C1 INITIATION OF SHUTDOWN COOLING AFTER BLOWDOWN TO MAIN CONDENSER AT 4 HOURS Rx PRESS =1.03 MPa A (SEE NOTES 16 & 13)

POSITION ○	24	25	4	5	6	7	8	9	10	11	12	27	28	29	24	43	44
FLOW m^3/h	-	954	←											954	-		
TEMP °C	-	182	←				182								-		
PRESS MPa A	1.03	-	-	-											1.03		
Max PRESS DIFF-METERS	←			Δ TDH = 125			ΔH = 7.0			ΔH = 6.1				→		ΔH = 7.0	

HEAT REMOVAL CAPACITY PER HX LOOP = 195.94 x 10^6 kJ/h

ALL SUBSYSTEMS (3 HX'S OPERATING)

MODE C2 CONTINUATION OF SHUTDOWN COOLING AT 20 HOURS Rx PRESS = 0 MPa

POSITION ○	24	25	4	5	6	7	8	9	10	11	12	27	28	29	24	43	44
FLOW m^3/h	-	954	←										→	954	-		
TEMP °C	-	≤52	←				≤52								-		
PRESS MPa A	0.10	-	-	-											0.10		
Max PRESS DIFF-METERS	←			Δ TDH = 125			ΔH = 7.0			ΔH = 6.1				→		ΔH = 7.0	

HEAT REMOVAL CAPACITY PER HX LOOP = 22.65 x 10^6 kJ/h

ALL SUBSYSTEMS (3 HX'S OPERATING) (SEE NOTE 15)

MODE C3 CONTINUATION OF SHUTDOWN COOLING WITH RETURN TO UPPER CONTAINMENT POOL AT GREATER 20 HOURS Rx PRESS =0 MPa

POSITION ○	24	25	4	5	6	7	8	9	10	11	12	27	30	43	44
FLOW m^3/h	-	954	←									→	954		
TEMP °C	-	≤52	←				≤52								
PRESS MPa A	0.10														
Max PRESS DIFF-METERS	←			Δ TDH = 125			ΔH = 7.0			ΔH =6.1			→	Δ H = 7.0	

HEAT REMOVAL CAPACITY PER HX LOOP = 22.65 x 10^6 kJ/h

SUBSYSTEM B & C 12 HX'S OPERATING) (SEE NOTE 15)

MODE D RHR TEST DURING PLANT OPERATION

POSITION ○	1	2	3	4	5	6	7	8	9	10	11	12	18	19	20	21	1	43	44
FLOW m^3/h	-	954	←													954	-		
TEMP °C	-	35/10	←													35/10	-		
PRESS MPa A	0.10																0.10		
Max PRESS DIFF-METERS	←				Δ TDH = 125			ΔH = 7.0			ΔH = 6.1					→		ΔH = 7.0	

ALL SUBSYSTEMS

MODE E POST ACCIDENT CONTAINMENT SPRAY WITH HEAT REMOVAL AND STRAINER 50% PLUGGED

POSITION ○	1	2	3	4	5	6	7	8	9	10	11	12	22	33	34	1	32	35	36	42	43	44
FLOW m^3/h	-	954	←									→	954	114	114	-	840	840	840	-		
TEMP °C	-	97/52	←					97/52								-				-		
PRESS MPa A	0.41/0.10	-	-	-	-											0.41/0.10				0.41/0.10		
Max PRESS DIFF-METERS	←				Δ TDH = 125			ΔH = 7.0			ΔH = 6.1				ΔH = 28				ΔH = 28		ΔH = 7.0	

HEAT REMOVAL CAPACITY PER HX LOOP = 82.48 x 10^6 kJ/h

SUBSYSTEM B & C 12 HX'S OPERATING) (SEE NOTE 17)

MODE C4 FUEL POOL COOLING - CLOSED LOOP WITH FUEL POOL (SEE NOTE 17)

POSITION ○	4	5	6	7	8	9	10	11	12	27	30	43	44
FLOW m^3/h	350	←								→	350		
TEMP °C	≤52	←			≤52								
PRESS MPa A													
Max PRESS DIFF-METERS	←										→	ΔH = 7.0	

SUBSYSTEM B OR C

MODES

A POST ACCIDENT CORE COOLING WITH STRAINER 50% PLUGGED

B-1 POST ACCIDENT SUPPRESSION POOL COOLING WITH STRAINER 50% PLUGGED

B-2 SUPPRESSION POOL COOLING DURING HOT STANDBY OPERATION

C-1 INITIATION OF SHUTDOWN COOLING AFTER BLOWDOWN TO MAIN CONDENSER AT FOUR HOURS

C-2 CONTINUATION OF SHUTDOWN COOLING AT 20 HOURS

C-3 CONTINUATION OF SHUTDOWN COOLING WITH RETURN TO UPPER CONTAINMENT POOL AT GREATER THAN 20 HOURS

C-4 FUEL POOL COOLING - CLOSED LOOP WITH FUEL POOL

D RHR TEST DURING PLANT OPERATION

E POST ACCIDENT CONTAINMENT SPRAY WITH HEAT REJECTION AND SCREEN 50% PLUGGED

F MINIMUM FLOW BYPASS MODE

S SYSTEM ON STANDBY DUTY

MODE S STANDBY DUTY

POSITION ○	1	2	3	4	5	6	8	9	11	12	19	26	28	32	33B&C
FLOW m^3/h	N/A	←												→	N/A
TEMP °C	-	35/10	←								→	35/10	AMBIENT	35/10	35/10	35/10
PRESS MPa A		←												→	
Max PRESS DIFF-METERS	—	—	—	—	TDH = 0		—	—	—	—	—	—	—	—	—

TABLE 1 VALVE POSITION CHART (SEE NOTE 8)

MODE	F001	F004	F005	F008	F010	F011	F012	F013	F014	F015	F016	F017	F018	F019	F021	STRAINER
A	O	O	O													50% P
B-1	O	O		O										O		50% P
B-2	O	O		O												50% P
C-1		O-T	O		O	O	O	T-C								CLEAR
C-2		O-T	O		O	O	O	T-C								CLEAR
C-3		O-T			O	O	O	T-C	O	O						CLEAR
C-4		O-T				O	T-C	O	O	O						CLEAR
D	O	O		O-T												CLEAR
E	O	O										T	O	O		50% P
F - POOL	O	O-T													O	CLEAR
S	O	O													O	CLEAR

O = VALVE OPEN
T = VALVE THROTTLED
T-C = VALVE THROTTLED OR CLOSED
O-T = VALVE OPEN OR THROTTLED
P = STRAINER PLUGGED
BLANK SPACE INDICATE VALVE IS CLOSED

LEGEND

Rx PRESS ------ REACTOR VESSEL PRESSURE
TDH ---------- TOTAL DYNAMIC HEAD
SOH ---------- SHUTOFF HEAD
ΔH ---------- HEAD LOSS

MODE F MINIMUM FLOW BYPASS MODE

POSITION ○	1	2	3	4	5	6	6.1	20	21	1
FLOW m^3/h	-	148	←						→	148	-
TEMP °C	-	35/10	←						→	35/10	-
PRESS MPa A	0.10										0.10
Max PRESS DIFF-METERS							SEE NOTE 12				

ALL SUB SYSTEMS

DESIGN PRESSURE AND TEMPERATURE TABLE (SEE NOTE 9)

POSITION	3	3.1	4	5	6	7	7	8	9	10	7	7.1	10	10	11	12	12	18	22 B&C	27	28	29 B&C	29A	12	18	19	21	12 B&C	18 B&C	22 B&C	33 B&C	34 B&C	25	25.1	26	4	18	27	28	29 B&C	29A	27	30		6	6.1	20	32	35	36
DESIGN PRESS MPa G	0.31	2.82		RHR PUMP	3.43	3.43		RHR HX	3.43	←	3.43		→	3.43	←	3.43	→		8.62				SEE 821-1020	←	3.43	→	0.31	←	3.43	→	3.43	←	8.62	→	2.82	←	3.43	→	8.62		SEE 821-1020	3.43		SEE G41-1020	3.43	0.31	3.43	3.43			
DESIGN TEMP °C	104	182			182	182			182	←	182		→	182	←	182	→		302					←	182	→	104	←	182	→	104	←	302	→		←	182	→	302			182			182	104	182	171			
EST LINE SIZE mm	450A				300A	300A			300A	←	300A		→	300A	FLOW ELEM	300A	→		250A					←	300A	→	250A	←	300A	→	100A	←	350A	→		←	300A	→	250A			300A			100A	→		250A	200A		
	POOL TO PUMP				PUMP TO HX BYPASS LINE				HEAT EXCHANGER LINE		HX BYPASS LINE			HX TO FLOW ELEMENT					FLOW ELEMENT TO RX VESSEL						FLOW ELEMENT TO SUPPRESSION POOL						FLOW ELEMENT TO WETWELL SPRAY						SHUTDOWN SUCTION			SHUTDOWN RETURN TO RX VESSEL					SHUTDOWN RETURN TO UPPER POOL				MINIMUM FLOW BYPASS				FLOW TO DRYWELL SPRAY		

FIGURE 5.4-11 RESIDUAL HEAT REMOVAL SYSTEM PFD (Sheet 2 of 2)

STP 3&4 Rev. 2

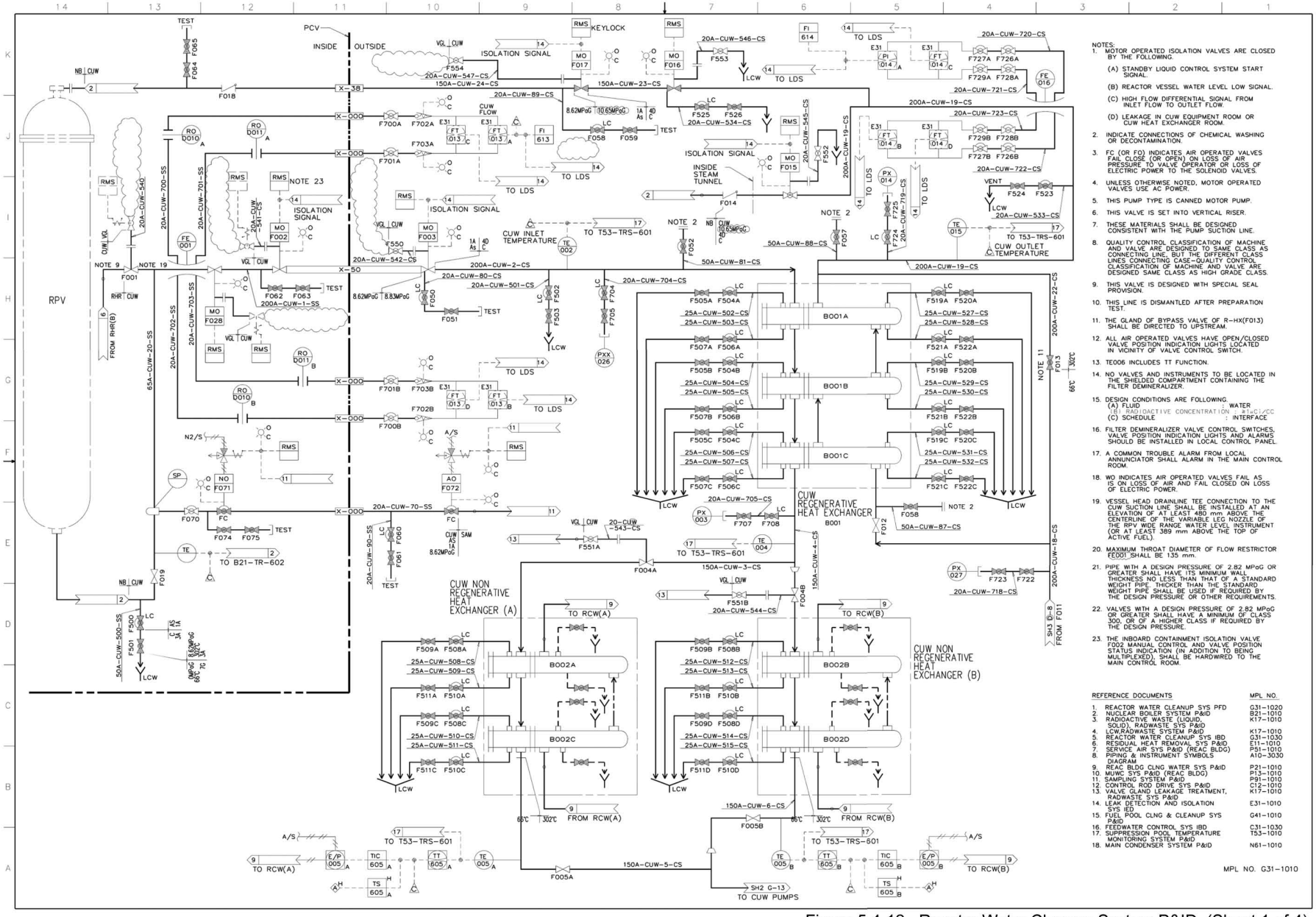


Figure 5.4-12 Reactor Water Cleanup System P&ID (Sheet 1 of 4)

STP 3&4 Rev. 2

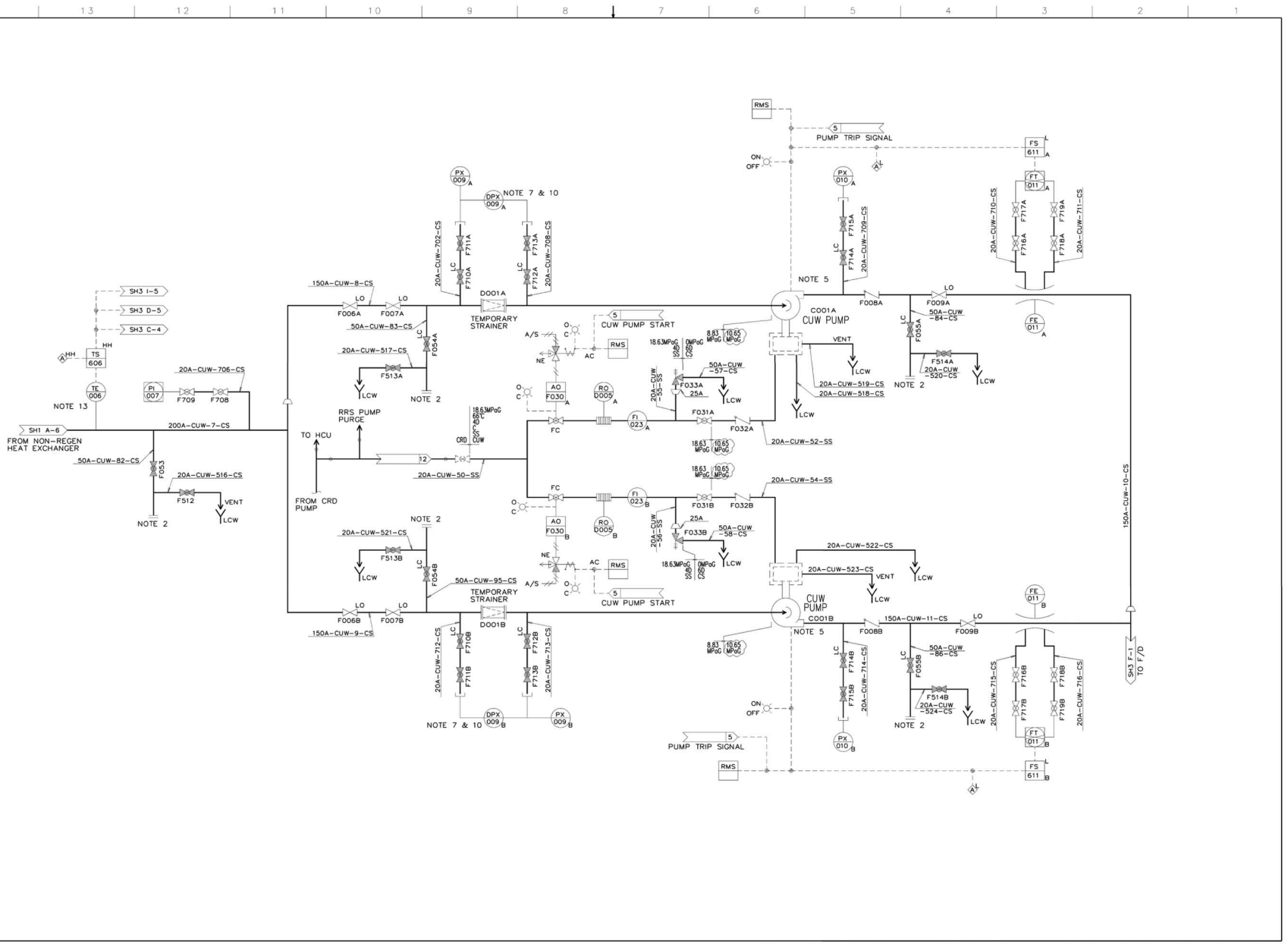


Figure 5.4-12 Reactor Water Cleanup System P&ID (Sheet 2 of 4)
STP 3&4 Rev. 2

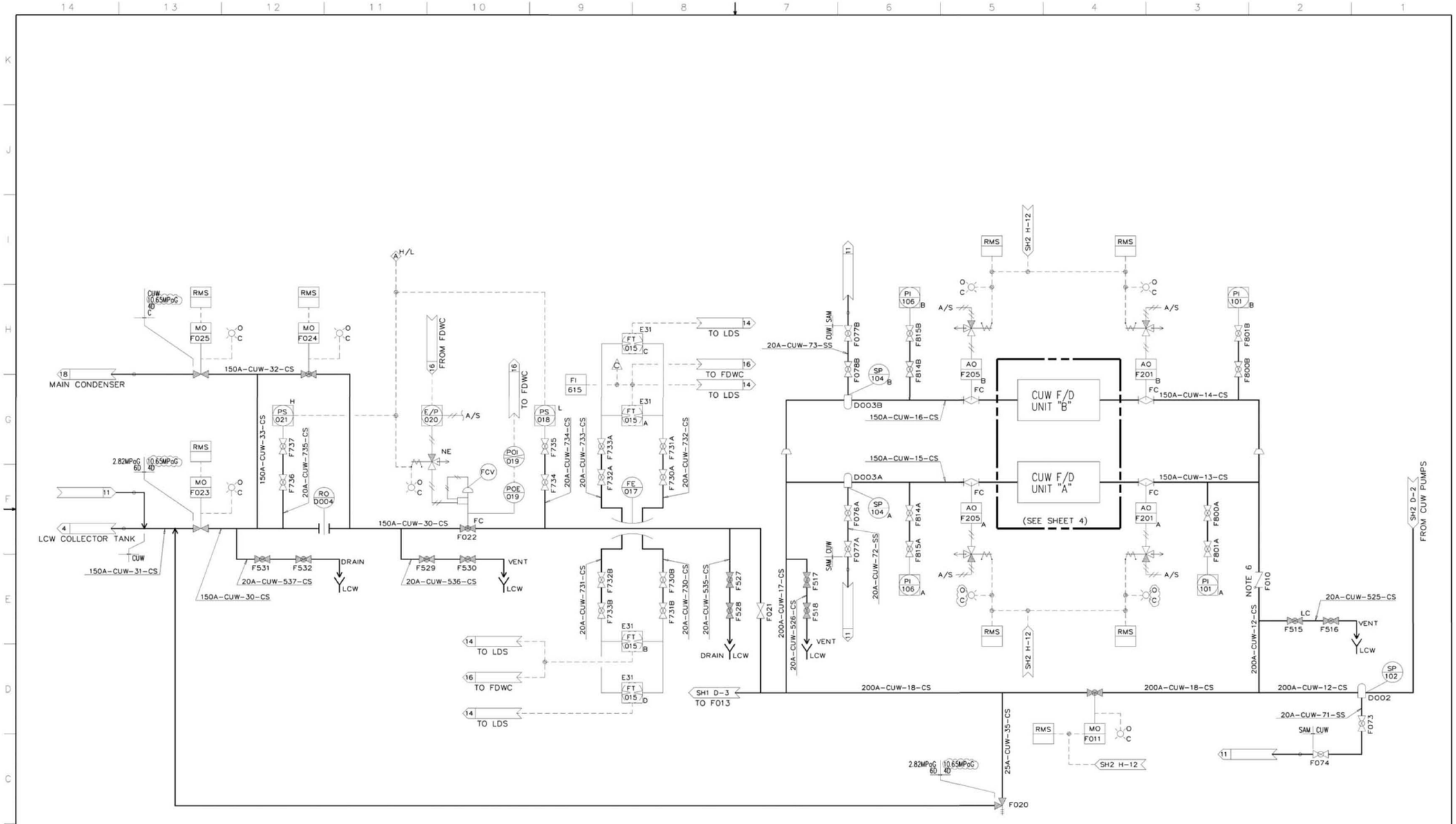


Figure 5.4-12 Reactor Water Cleanup System P & ID (Sheet 3 of 4)
STP 3&4 Rev. 2

MODE A: NORMAL OPERATION (REACTOR PRESS 7.17MPa A)

	1	2	3	4	5	6	7	8 A/B	9 A/B	10	11A(B)	12A(B)	13	14A(B)	15A(B)	16	17	18	19	20	21	22	23	24	25	26	27	28	29 A/B	30 A/B	31
FLOW (m³/h)	30	172	202	←	→	202	160	80	77	154	154	154	154	154	154	–	154	183	←	→	183	–	–	–	–	–	–	–	140	140	–
PRESS (MPa A)	7.50					7.28	7.21	7.28	7.21		7.18	8.36		8.35	7.93	–	7.98	7.91				–	–	–	–	–	–	–			–
TEMP (℃)	278	←			→	278	112	112	49		49	49.5	←		49.5	–	49	225	←	→	225	–	–	–	–	–	–	–	Max 35		–
Max ALLOWABLE PRESS LOSS (m)			ΔP = 3			NOTE 6					TDH = 120			ΔP = 36			NOTE 6		ΔP = 3										ΔP = 10		

MODE B: START-UP OPERATION (REACTOR PRESS 1.08MPa A) NOTE 5

	1	2	3	4	5	6	7	8 A/B	9 A/B	10	11A(B)	12A(B)	13	14A(B)	15A(B)	16	17	18	19	20	21	22	23	24	25	26	27	28	29 A/B	30 A/B	31
FLOW (m³/h)	NOTE 8		172	←	→	172	155	155	77	154	154	154	154	154	154	–	116	–	←	→	127	41	←			→	41	–	140	140	–
PRESS (MPa A)	1.10	1.01											–																		–
TEMP (℃)	179	←			→	179	102	102	Max 54	←			→	Max 54		–	Max 54	156	156	156	156	Max 54	←			→	Max 54	–	Max 35		–
Max ALLOWABLE PRESS LOSS (m)			ΔP = 3			NOTE 6					TDH = 120			ΔP = 36			NOTE 6		ΔP = 3												

MODE C: HOT STANDBY OPERATION (MAIN CONDENSER AVAILABLE) (REACTOR PRESS 7.17MPa A)

	1	2	3	4	5	6	7	8 A/B	9 A/B	10	11A(B)	12A(B)	13	14 A/B	15 A/B	16	17	18	19	20	21	22	23	24	25	26	27	28	29 A/B	30 A/B	31
FLOW (m³/h)	NOTE 8		207	←	→	207	161	81	77	154	154	154	–	–	–	154	154	186	←	→	186	–	–	–	–	–	–	–	140	140	–
PRESS (MPa A)	7.31					7.27	7.20	7.28	7.21		7.18	8.36	–	–	–	8.35	7.98	7.91				–	–	–	–	–	–	–			–
TEMP (℃)	278	←			→	278	118	118	Max 54	←		Max 54	–	–	–	Max 54	Max 54	236	←	→	236	–	–	–	–	–	–	–	Max 35		–
Max ALLOWABLE PRESS LOSS (m)			ΔP = 3			NOTE 6					TDH = 120					ΔP = 36	NOTE 6		ΔP = 3												

MODE D: HOT STANDBY OPERATION (MAIN CONDENSER ISOLATION) (REACTOR PRESS 7.61MPa A)

	1	2	3	4	5	6	7	8 A/B	9 A/B	10	11A(B)	12A(B)	13	14A(B)	15A(B)	16	17	18	19	20	21	22	23	24	25	26	27	28	29 A/B	30 A/B	31
FLOW (m³/h)	NOTE 8		209	←	→	209	162	81	77	154	154	154	–	154	154	154	154	187	←	→	187	–	–	–	–	–	–	–	140	140	–
PRESS (MPa A)	7.72												–	–	–							–	–	–	–	–	–	–	–	–	–
TEMP (℃)	292	←			→	292	119	119	Max 54	←		Max 54	–	–	–	Max 54	Max 54	240	←	→	240	–	–	–	–	–	–	–	Max 35		–
Max ALLOWABLE PRESS LOSS (m)			ΔP = 3			NOTE 6					TDH = 120					ΔP = 36	NOTE 6		ΔP = 3												

MODE E: REFUELING (RECIRCULATING) (REACTOR PRESS: ATMOSPHERIC PRESS)

	1	2	3	4	5	6	7	8 A/B	9 A/B	10	11A(B)	12A(B)	13	14A(B)	15A(B)	16	17	18	19	20	21	22	23	24	25	26	27	28	29 A/B	30 A/B	31
FLOW (m³/h)	NOTE 8		154	←	→	154	77	77	154	154	154	154	154	154	154	–	154	←	→	154	–	–	–	–	–	–	–	140	140	–
PRESS (MPa A)	STP	←			→	STP										–						–	–	–	–	–	–	–			–
TEMP (℃)	Max 52	←			→	Max 52	Max 49			Max 49	Max 49.5	←		Max 49.5	–	Max 49.5	Max 52	←	→	Max 52	–	–	–	–	–	–	–	Max 35		–
Max ALLOWABLE PRESS LOSS (m)			ΔP = 3			NOTE 6					TDH = 120			ΔP = 36			NOTE 6		ΔP = 3												

MODE F: AFTER REFUELING (REACTOR PRESS: ATMOSPHERIC PRESS) NOTE 5

	1	2	3	4	5	6	7	8 A/B	9 A/B	10	11A(B)	12A(B)	13	14A(B)	15A(B)	16	17	18	19	20	21	22	23	24	25	26	27	28	29 A/B	30 A/B	31
FLOW (m³/h)	NOTE 8		154	←	→	154	77	77	154	154	154	154	154	154	154	–	–	–	–	–	–	154	←			→	154	140	140	–
PRESS (MPa A)	STP	←			→	STP										–	–	–	–	–	–	–									–
TEMP (℃)	Max 52	←			→	Max 52										–	–	–	–	–	–	Max 52	←			→	Max 52	Max 35	–	–
Max ALLOWABLE PRESS LOSS (m)			ΔP = 3			NOTE 6					TDH = 120			ΔP = 36																

MODE G: RPV SPRAY (REACTOR PRESS 1.03 MPa A)NOTE 7

	1	2	3	4	5	6	7	8 A/B	9 A/B	10	11A(B)	12A(B)	13	14A(B)	15A(B)	16	17	18	19	20	21	22	23	24	25	26	27	28	29 A/B	30 A/B	31
FLOW (m³/h)	NOTE 8		172	←	→	172	Max 172	Max 172	76	152	152	152	152	152	152	–	152	Max 172	←	Max 172	–	–	–	–	–	–	–	–	140	140	Max 172
PRESS (MPa A)																–					–	–	–	–	–	–	–	–			1.03
TEMP (℃)	183	←			→	183			Max 49	←	Max 49	Max 49.5	←		Max 49.5	–	Max 49.5	148		148	–	–	–	–	–	–	–	–	Max 35		
Max ALLOWABLE PRESS LOSS (m)			ΔP = 3			NOTE 6					TDH = 120			ΔP = 36			NOTE 6		ΔP = 3												

TABLE 1 VALVE OPENING/CLOSING CONDITION

MODE \ VALVE NO	F002	F003	F011	F015	F016	F022	F023	F024	F201	F205
A	O	O	C	O	C	C	C	C	O	O
B	O	O	C	O	C	T	O	C	O	O
C	O	O	O	O	C	C	C	C	C	C
D	O	O	O	O	C	C	C	C	C	C
E	O	O	C	O	C	C	C	C	O	O
F	O	O	C	C	O	O	O	O	O	O
G	O	O	C	C	O	C	C	C	O	O

O OPENING C CLOSING T THROTTLED

FIGURE 5.4-13 REACTOR WATER CLEANUP SYSTEM PFD (Sheet 2 of 2)

STP 3&4 Rev.2

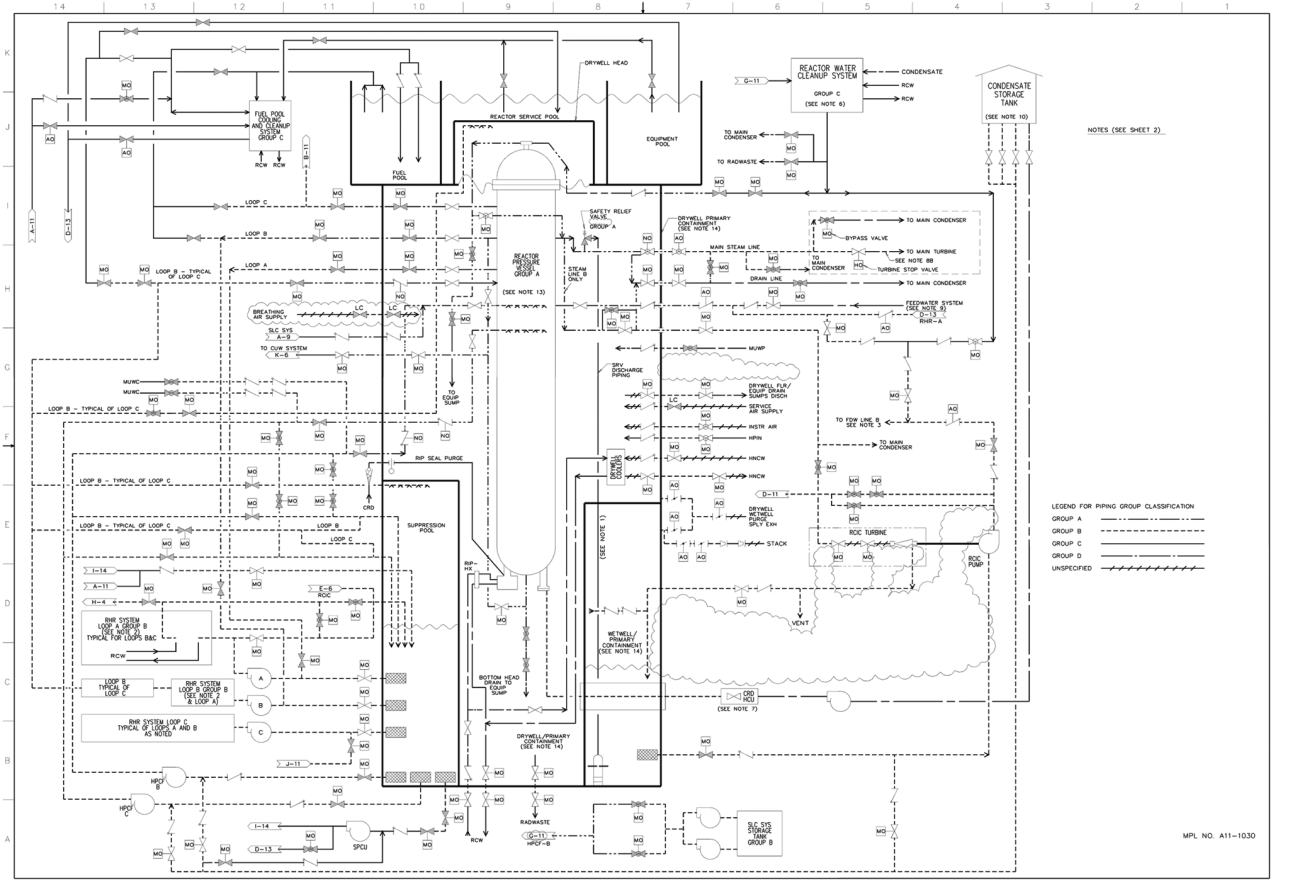


Figure 6.2-38 Group Classification and Containment Isolation Diagram (Sheet 1 of 2)

STP 3&4 Rev. 2

NOTES.

1. A SEPARATE LINE IS TO BE PROVIDED FOR EACH SAFETY/RELIEF VALVE.

2. RESIDUAL HEAT REMOVAL SYSTEM LOOPS (SUBSYSTEMS) A AND B ONLY ARE REPRESENTED AS TYPICAL LOOPS. LOOP C IS SIMILAR TO LOOP B.

3. RCIC INJECTION VIA FEEDWATER SYSTEM B.

4. TABLE 3.2-1 OF 23A6100 IS CONTROLLING FOR GROUP CLASSIFICATION AND CONTAINMENT ISOLATION REQUIREMENTS. THE PRESSURE INTEGRITY OF NUCLEAR COMPONENTS SPECIFICATION (MPL No. A1-3010) DESCRIBES REQUIREMENTS FOR EACH GROUP CLASSIFICATION. INDIVIDUAL SYSTEMS P&IDS SPECIFY SYSTEM AND COMPONENTS REQUIREMENTS

5. GROUP CLASSIFICATION CHANGES AT VALVE UNLESS OTHERWISE STATED. VALVES SHALL COMPLY TO HIGHEST CLASSIFICATION. VALVE PUMPS SHALL HAVE LINE GROUP CLASSIFICATION.

6. REACTOR WATER CLEANUP SYSTEM

THE FILTER-DEMINERALIZER PRECOAT/BACKWASH PORTION OF THE CUW DOWNSTREAM THE HIGH PRESSURE BLOCK VALVES SHALL BE GROUP D.

7. CONTROL ROD DRIVE-HYDRAULIC CONTROL UNIT

THE PORTION OF THE CRD SYSTEM WHICH IS RELATED TO THE SCRAM FUNCTION IS GROUP B; THE PORTION OF THE CRD SYSTEM WHICH IS NOT RELATED TO THE SCRAM FUNCTION IS GROUP D.

8. MAIN STEAM LINE AND BRANCH LINES

A. THE MAIN STEAM LINE INSPECTION RECORDS PERTAINING TO THE LINES BETWEEN THE SHUT-OFF VALVE AND TURBINE STOP VALVE SHALL BE MAINTAINED FOR THE LIFE OF THE PLANT. THESE RECORDS SHALL INCLUDE DATA PERTAINING TO QUALIFICATION OF INSPECTION PERSONNEL, EXAMINATION PROCEEDURES, AND EXAMINATION RESULTS.

B. THE MAIN STEAM LINES AND INLINE COMPONENTS UP TO THE TURBINE STOP VALVES SHALL BE GROUP B, BEYOND IS GROUP D

C. BRANCH LINES OF MSL BETWEEN THE EXTERNAL ISOLATION VALVE AND THE TURBINE STOP VALVE SHALL BE GROUP B OUT TO AND INCLUDING THE FIRST VALVE CAPABLE OF TIMELY ACTUATION.

D. BRANCH LINES OF THE TURBINE BYPASS LINE UP TO THE BYPASS VALVE SHALL BE GROUP B OUT TO AND INCLUDING THE FIRST VALVE CAPABLE OF TIMELY ACTUATION.

9. FEEDWATER

BRANCH LINES OF THE FW LINE BETWEEN THE SECOND AND THIRD VALVE OUT TO AND INCLUDING THE FIRST REMOTE ACTUATED VALVE TO BE GROUP B.

10. CONDENSATE STORAGE TANK

THE CONDENSATE STORAGE TANK WILL BE DESIGNED, FABRICATED, AND TESTED TO MEET THE INTENT OF API STANDARD API 650. IN ADDITION, THE SPECIFICATIONS FROM THIS TANK WILL REQUIRE (1) 100 PERCENT SURFACE EXAMINATION OF THE SIDE WALL TO BOTTOM JOINT AND (2) 100 PERCENT VOLUMETRIC EXAMINATION OF THE SIDE WALL WELD JOINTS, GROUP D CLASSIFICATION.

11. PNEUMATIC PIPING, VESSELS & FITTINGS. (FIG III)

PNEUMATIC SYSTEMS ASSOCIATED WITH ACTUATION OF SAFETY RELATED VALVES TO ACCOMPLISH SAFETY FUNCTIONS (E.G. MAIN STEAM SAFETY/RELIEF VALVES) ARE CLASSIFIED GROUP C. THIS CLASSIFICATION IS INTENDED TO APPLY TO COMPONENTS SUCH AS THE AIR PIPING, FITTINGS, AND ACCUMULATOR TANKS. THIS CLASSIFICATION DOES NOT APPLY TO COMPONENTS OF THE SYSTEM SUCH AS AIR CONTROL VALVES, AIR CHECK VALVES, AND CYLINDER (OR DIAPHRAM) AIR ACTUATORS. THESE COMPONENTS ARE CONSIDERED AS "SPECIAL EQUIPMENT" AND ARE SELECTED BASED ON ENGINEERING REVIEWS, OPERATING EXPERIENCE, AND TESTING AS BEING THE MOST SUITABLE FOR THE APPLICATION. SUCH EQUIPMENT IS REQUIRED TO BE QUALIFIED TO DEMONSTRATE OPERABILITY DURING NORMAL AND EMERGENCY AMBIENT CONDITIONS. COMPONENTS NORMALLY FURNISHED WITH THE PROCESS VALVE (E.G. AIR CONTROL VALVES, AIR ACTUATORS) ARE PERFORMANCE TESTED WITH THE VALVE AS PART OF ITS ACCEPTANCE TEST PROCEDURE.

12. INSTRUMENT, SAMPLE & OTHER SMALL LINES (FIG II)

A. VALVE, ORIFICE DATA

I VALVES AUTOMATIC, REMOTE OPERABLE, OR EXCESS FLOW CHECK* AUTOMATIC OR MANUAL RESETTING, REMOTE POSITION INDICATION (MINIMUM PRACTICAL SPACING FROM CONTAINMENT)

II ORIFICE/PIPE* SIZED TO LIMIT FLOW PER NRC REGULATORY GUIDE 1.11.

III VALVE: LOCKED CLOSED, AUTOMATIC, OR II ABOVE.

IV VALVE: SAME AS I, II, III IS II : OR LOCKED CLOSED AUTOMATIC (NON-CHECK)

V VALVE-PROCESS SHUTOFF.

VI 6.4mm ORIFICE* LOCATED AS CLOSE AS PRACTICAL TO THE PROCESS TO PERMIT OPTIMUM VENTING OF NON-CONDENSIBLES.

* VALVES AND ORIFICES IN THE LINES SHOULD NOT BE SO RESTRICTIVE AS TO DIMINISH THE SAFETY FUNCTION OF THE LINE.

B. GROUP CLASSIFICATION OF SMALL DIAMETER LINES.

PROCESS SYSTEM TO WHICH ALL LINES ARE CONNECTED-GROUP CLASSIFICATION	GROUP CLASSIFICATION OF LINES UP TO AND THRU ROOT OR ISOLATION VALVES		CLASSIFICATION OF LINES BEYOND ROOT OR ISOLATION VALVES	
	LINES OVER 25A: WATER 50A: STEAM	LINES 25A: WATER 50A: STEAM AND SMALLER	SAFETY RELATED SYSTEMS (2)	NON-SAFETY RELATED SYSTEMS
A	A	B (1)	B	D
B	B	B	B	D
C	C (2)	C (2)	C	D
D	D (2)	D (2)	N/A	D

(1) GROUP CLASSIFICATION AND CODE REQUIREMENTS ARE BASED ON CURRENT NRC GUIDELINES; HOWEVER, EACH PROJECT SHALL VERIFY WITH STATE JURISDICTIONAL AUTHORITIES TO AVOID MISUNDERSTANDINGS AND POSSIBLE RETROFITS.

(2) SAFETY RELATED SYSTEMS ARE THOSE SYSTEMS WHOSE ACTIONS ARE ESSENTIAL TO BOTH OF THE FOLLOWING:

A. AVOIDING THE UNACCEPTABLE RESULTS FOR ABNORMAL OPERATIONAL TRANSIENTS, ACCIDENTS, AND SPECIAL EVENTS BY CONTRIBUTING TO THE ACCOMPLISHMENT OF ESSENTIAL SAFETY ACTIONS.

B. SATISFYING THE SINGLE FAILURE CRITERION (WHERE APPLICABLE).

13. THE REACTOR COOLANT PRESSURE BOUNDARY INCLUDES THE REACTOR VESSEL AND CONNECTING PIPING, PUMPS AND VALVES, AND EXTENDS TO AND INCLUDES THE OUTERMOST PRIMARY CONTAINMENT ISOLATION VALVE(S) OF THE SYSTEM OR COMPONENT INDICATED

14. THE CONTAINMENT IS DESIGNED AND CONSTRUCTED TO THE REQUIREMENTS OF THE ASME CODE FOR REINFORCED CONCRETE CONTAINMENT. COMPONENTS WHICH FORM AN EXTENSION OF CONTAINMENT ARE DEFINED AS PRESSURE-RETAINING COMPONENTS, PARTS, MATERIALS OR APPURTENANCES IN THE PORTION OF THE SYSTEM WHICH EXTENDS FROM THE CONTAINMENT TO AND INCLUDING THE OUTERMOST ISOLATION VALVE LOCATED OUTSIDE OF THE CONTAINMENT WHICH IS CAPABLE OF AUTOMATIC ACTUATION GROUP B.

FIG II

INSTRUMENTATION SAMPLE, & OTHER SMALL LINES (SEE NOTE 12) TYPICAL

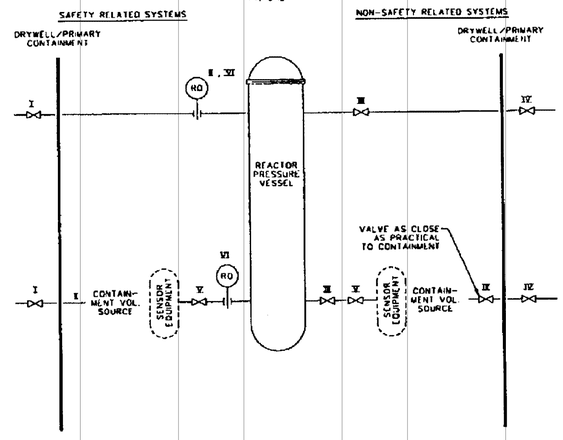


FIG III

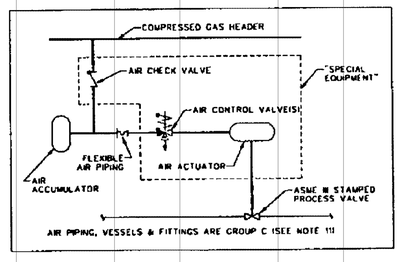
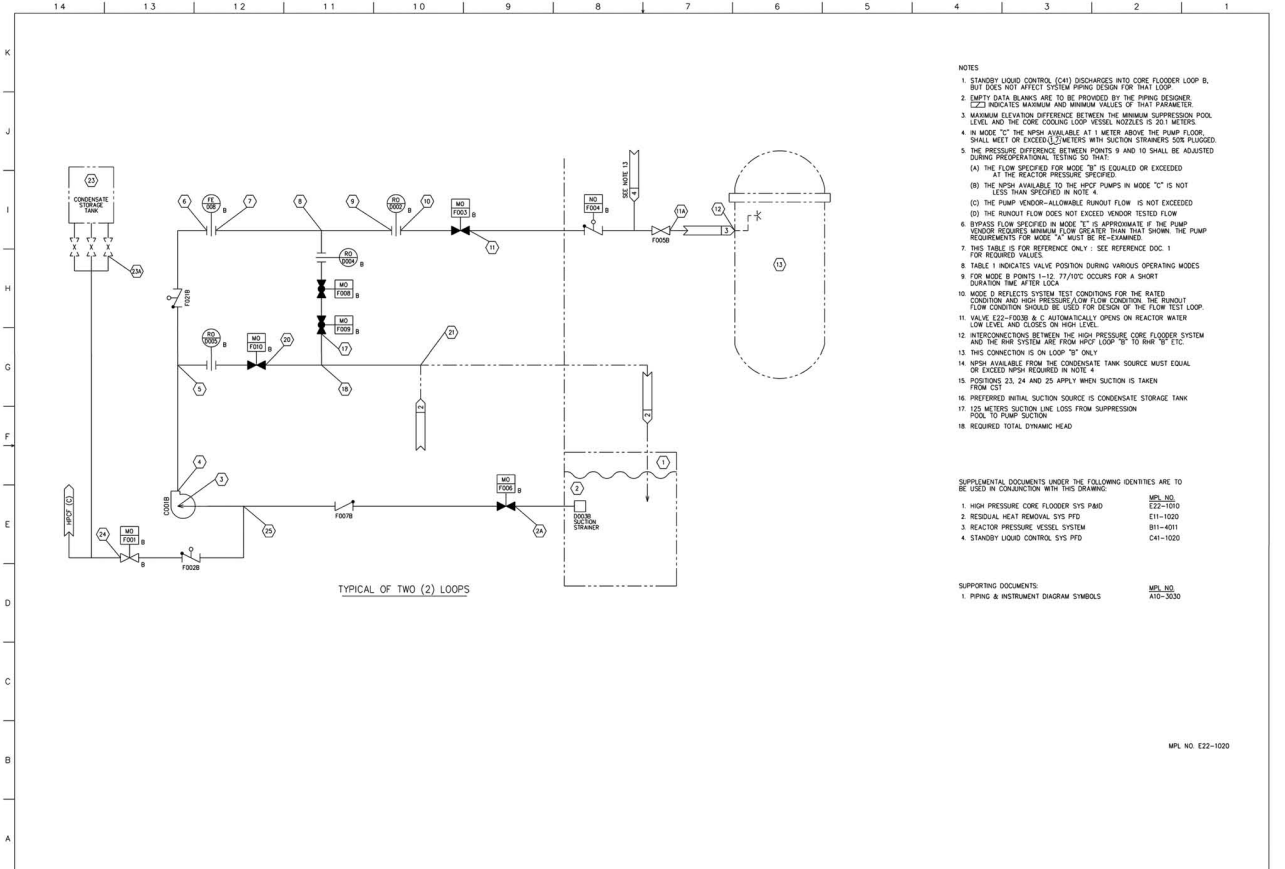


FIGURE 6.2-38 PLANT REQUIREMENTS, GROUP CLASSIFICATION AND CONTAINMENT ISOLATION DIAGRAM (SHEET 2 OF 2)



NOTES

1. STANDBY LIQUID CONTROL (C41) DISCHARGES INTO CORE FLOODER LOOP B, BUT DOES NOT AFFECT SYSTEM PIPING DESIGN FOR THAT LOOP.
2. EMPTY DATA BLANKS ARE TO BE PROVIDED BY THE PIPING DESIGNER. [ ] INDICATES MAXIMUM AND MINIMUM VALUES OF THAT PARAMETER.
3. MAXIMUM ELEVATION DIFFERENCE BETWEEN THE MINIMUM SUPPRESSION POOL LEVEL AND THE CORE COOLING LOOP VESSEL NOZZLES IS 20.1 METERS.
4. IN MODE "C" THE NPSH AVAILABLE AT 1 METER ABOVE THE PUMP FLOOR, SHALL MEET OR EXCEED [3.7] METERS WITH SUCTION STRAINERS 50% PLUGGED.
5. THE PRESSURE DIFFERENCE BETWEEN POINTS 9 AND 10 SHALL BE ADJUSTED DURING PREOPERATIONAL TESTING SO THAT:
   (A) THE FLOW SPECIFIED FOR MODE "B" IS EQUALED OR EXCEEDED AT THE REACTOR PRESSURE SPECIFIED.
   (B) THE NPSH AVAILABLE TO THE HPCF PUMPS IN MODE "C" IS NOT LESS THAN SPECIFIED IN NOTE 4.
   (C) THE PUMP VENDOR-ALLOWABLE RUNOUT FLOW IS NOT EXCEEDED
   (D) THE RUNOUT FLOW DOES NOT EXCEED VENDOR TESTED FLOW
6. BYPASS FLOW SPECIFIED IN MODE "C" IS APPROXIMATE IF THE PUMP VENDOR REQUIRES MINIMUM FLOW GREATER THAN THAT SHOWN. THE PUMP REQUIREMENTS FOR MODE "A" MUST BE RE-EXAMINED.
7. THIS TABLE IS FOR REFERENCE ONLY - SEE REFERENCE DOC. 1 FOR REQUIRED VALUES.
8. TABLE 1 INDICATES VALVE POSITION DURING VARIOUS OPERATING MODES
9. FOR MODE B POINTS 1-12, 77/10°C OCCURS FOR A SHORT DURATION TIME AFTER LOCA
10. MODE D REFLECTS SYSTEM TEST CONDITIONS FOR THE RATED CONDITION AND HIGH PRESSURE/LOW FLOW CONDITION. THE RUNOUT FLOW CONDITION SHOULD BE USED FOR DESIGN OF THE FLOW TEST LOOP.
11. VALVE E22-F023B A/C AUTOMATICALLY OPENS ON REACTOR WATER LOW LEVEL AND CLOSES ON HIGH LEVEL.
12. INTERCONNECTIONS BETWEEN THE HIGH PRESSURE CORE FLOODER SYSTEM AND THE RHR SYSTEM ARE FROM HPCF LOOP "B" TO RHR "B" ETC.
13. THIS CONNECTION IS ON LOOP "B" ONLY
14. NPSH AVAILABLE FROM THE CONDENSATE TANK SOURCE MUST EQUAL OR EXCEED NPSH REQUIRED IN NOTE 4
15. POSITIONS 23, 24 AND 25 APPLY WHEN SUCTION IS TAKEN FROM CST
16. PREFERRED INITIAL SUCTION SOURCE IS CONDENSATE STORAGE TANK
17. 12.5 METERS SUCTION LINE LOSS FROM SUPPRESSION POOL TO PUMP SUCTION
18. REQUIRED TOTAL DYNAMIC HEAD

SUPPLEMENTAL DOCUMENTS UNDER THE FOLLOWING IDENTITIES ARE TO BE USED IN CONJUNCTION WITH THIS DRAWING:

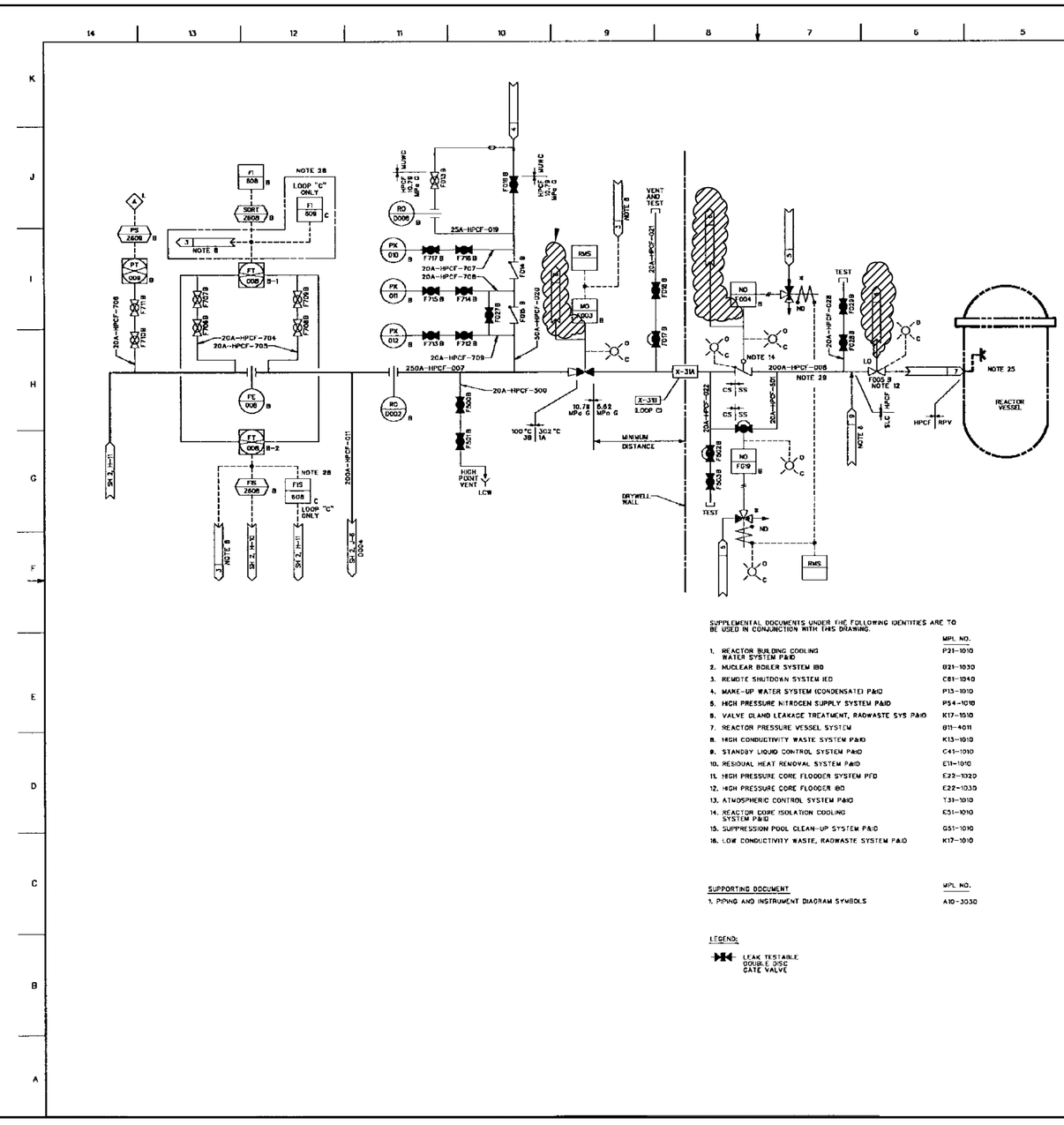
	MPL NO.
1. HIGH PRESSURE CORE FLOODER SYS P&ID	E22-1010
2. RESIDUAL HEAT REMOVAL SYS PFD	E11-1020
3. REACTOR PRESSURE VESSEL SYSTEM	B11-4011
4. STANDBY LIQUID CONTROL SYS PFD	C41-1020

SUPPORTING DOCUMENTS:

	MPL NO.
1. PIPING & INSTRUMENT DIAGRAM SYMBOLS	A10-3030

MPL NO. E22-1020

Figure 6.3-1 High Pressure Core Flooder System PFD (Sheet 1 of 2)
STP 3&4 Rev. 2



SUPPLEMENTAL DOCUMENTS UNDER THE FOLLOWING IDENTITIES ARE TO BE USED IN CONJUNCTION WITH THIS DRAWING.

	MPL NO.
1. REACTOR BUILDING COOLING WATER SYSTEM P&ID	P21-1010
2. NUCLEAR BOILER SYSTEM BD	B21-1030
3. REMOTE SHUTDOWN SYSTEM ED	C61-1040
4. MAKE-UP WATER SYSTEM (CONDENSATE) P&ID	P13-1010
5. HIGH PRESSURE NITROGEN SUPPLY SYSTEM P&ID	P54-1010
6. VALVE GLAND LEAKAGE TREATMENT, RADWASTE SYS P&ID	K17-1010
7. REACTOR PRESSURE VESSEL SYSTEM	B11-4011
8. HIGH CONDUCTIVITY WASTE SYSTEM P&ID	K13-1010
9. STANDBY LIQUID CONTROL SYSTEM P&ID	C41-1010
10. RESIDUAL HEAT REMOVAL SYSTEM P&ID	E11-1010
11. HIGH PRESSURE CORE FLOODER SYSTEM PFD	E22-1020
12. HIGH PRESSURE CORE FLOODER BD	E22-1035
13. ATMOSPHERIC CONTROL SYSTEM P&ID	T31-1010
14. REACTOR CORE ISOLATION COOLING SYSTEM P&ID	E51-1010
15. SUPPRESSION POOL CLEAN-UP SYSTEM P&ID	G51-1010
16. LOW CONDUCTIVITY WASTE, RADWASTE SYSTEM P&ID	K17-1010

SUPPORTING DOCUMENT	MPL NO.
1. PIPING AND INSTRUMENT DIAGRAM SYMBOLS	A10-3050

LEGEND:

LEAK TESTABLE DOUBLE DISC GATE VALVE

NOTES:

1. PIPING HIGH POINT VENTS AND LOW POINT DRAINS ARE TO BE ADDED AS NECESSARY.
2. INSTRUMENT LINE DESIGN AND VALVING SHALL BE IN ACCORDANCE WITH INSTRUMENT PIPING SPECIFICATION A1A-3030.
3. THE METHOD OF MOUNTING LOCAL INSTRUMENTS IS TO BE DETERMINED BY PIPING DESIGNER.
4. VENT DRAIN AND RELIEF VALVE DISCHARGE SYSTEM TO LCW AND HCW OR SUPPRESSION POOL ARE BY PIPING DESIGNER.
5. FOR ADDITIONAL CONTROL ROOM INDICATOR LIGHTS, SYSTEMS ALARMS AND REMOTE MANUAL SWITCHES, SEE THE HPCF LOGIC DIAGRAM.
6. PROVISIONS FOR CONTAINMENT ISOLATION SHALL BE IN ACCORDANCE WITH THE CURRENT LICENSING REQUIREMENTS.
7. EQUIPMENT AND INSTRUMENTS ARE PREFIXED BY SYSTEM NUMBER (E22) UNLESS OTHERWISE NOTED.
8. THIS EQUIPMENT IS CONTROLLABLE FROM THE REMOTE SHUTDOWN SYSTEM FOR LOOP B ONLY.
9. DRYWELL PIPING RUNS SHALL BE HORIZONTAL OR VERTICAL UPWARDS FROM THE DRYWELL WALL TO THE POINT OF ATTACHMENT WITH THE REACTOR VESSEL.
10. INTERFACES WITH RHR SYSTEM ARE BETWEEN CORRESPONDING LOOPS IN THAT SYSTEM. EXAMPLE, B TO B AND C TO C.
11. DESIGN LINE SIZE WILL BE FINALIZED AT THE DETAILED DESIGN PHASE. ACTUAL LINE SIZES DETERMINED BY THE PIPING DESIGNER SHALL MEET THE PROCESS DATA HYDRAULIC REQUIREMENTS.
12. VALVES F009B&C ARE RECOMMENDED FOR MAINTENANCE AND/OR LEAK RATE TESTING.
13. PUMP C001B&C COOLING WATER, IF REQUIRED, IS FROM SYSTEM P21.
14. CHECK VALVES F004B&C SHALL BE LOCATED AS CLOSE AS PRACTICAL TO THE REACTOR VESSEL NOZZLE.
15. VALVES F039B&C AND F038B&C SHALL BE LOCATED AS CLOSE AS PRACTICAL TO THE CONTAINMENT PENETRATION OF THE RETURN LINE TO THE SUPPRESSION POOL.
16. ALL MOTOR OPERATED VALVES ARE AC OPERATED UNLESS OTHERWISE NOTED.
17. COMMON LINE FOR HPCF-B, HPCF-C, RCIC, AND SPCU.
18. FLUSHING CONNECTIONS AND TEMPORARY STRAINER SCREENS SHALL BE PROVIDED ON THE SUCTION SIDE OF ALL PUMPS C001B & C.
19. FOR LOOP C, REPLACE SUFFIX F WITH G. SUFFIXES D AND E ARE OMITTED.
20. PIPING DESIGN SPECIFICATION ARE AS FOLLOWS:
    A. MAXIMUM OPERATING PRESSURE – SEE SPECIFIC BOUNDARY SYMBOL
    B. MAXIMUM OPERATING TEMPERATURE – SEE SPECIFIC BOUNDARY SYMBOL
    C. MATERIAL – CARBON STEEL EXCEPT AS SPECIFIED
    D. PIPING THICKNESS SHALL BE PER A52-4030. PRESSURE INTEGRITY OF NUCLEAR COMPONENTS.
    E. DESIGN CLASS – SEE SPECIFIC BOUNDARY SYMBOL
    F. QA CLASS – SEE SPECIFIC BOUNDARY SYMBOL
    G. SEISMIC CLASS – As
    H. FLUID – WATER
21. VALVE F012 MUST BE AT LOWEST POINT IN THE SYSTEM TO ALLOW FOR DRAINAGE.
22. DRAIN AND VENT PIPING DESIGN CONDITIONS ARE:
    MAXIMUM OPERATING PRESSURE– SAME AS MAIN LINE UPSTREAM OF VALVE ATMOSPHERIC PRESSURE FROM LAST VALVE TO FUNNEL).
    MAX OPERATING TEMPERATURE– SAME AS MAIN LINE UPSTREAM OF VALVE 66°C FROM LAST VALVE TO FUNNEL).
23. PIPE NUMBERS FOR LOOP C SHALL BE THE SAME AS FOR LOOP B PLUS 100 STARTING AT 005 (EXAMPLE: LOOP B – 005 → LOOP C – 105; LOOP B – 701 → LOOP C – 801).
24. VALVES F021B & C SHALL BE LOCATED BELOW THE SUPPRESSION POOL MINIMUM WATER LEVEL.
25. HPCF SPARGER WITHIN THE RPV IS INCLUDED IN HPCF BOUNDARY.
26. PIPE WITH A DESIGN PRESSURE OF 2.82 MPa G OR GREATER SHALL HAVE ITS MINIMUM WALL THICKNESS NO LESS THAN THAT OF A STANDARD WEIGHT PIPE. THICKER THAN STANDARD WEIGHT PIPE SHALL BE USED IF REQUIRED BY THE DESIGN PRESSURE OR OTHER REQUIREMENTS.
27. VALVES WITH A DESIGN PRESSURE OF 2.82 MPa G OR GREATER SHALL BE A MINIMUM OF CLASS 300, OR OF A HIGHER CLASS IF REQUIRED BY THE DESIGN PRESSURE.
28. SIGNAL PROVIDED BY HARDWIRE (NOT MULTIPLEX).
29. [LOCATE THE GATE VALVE OF THIS PIPING SECTION AT A DISTANCE GREATER THAN OR EQUAL TO 25 PIPE DIAMETERS FROM THE RPV NOZZLE. OTHERWISE, PERFORM STRESS ANALYSIS TO SHOW THAT STRESSES AND FATIGUE ARE ACCEPTABLE PER THE ASME CODE FROM THE CONCERN OF NRC BULLETIN 88-08, SUPPLEMENT 3 (APRIL 11, 1988) ON POTENTIAL THERMAL STRATIFICATION AND STRIPING DUE TO PERIODIC EXTERNAL LEAKAGE OF THE GATE VALVE.]*

* SEE SUBSECTION 3.9.1.7.

MPL NO. E22-1010

FIGURE 6.3-7 HIGH PRESSURE CORE FLOODER SYSTEM P&ID (SHEET 1 OF 2)

NOTES:

1. ALL REFERENCE DESIGNATIONS ARE PREFIXED WITH C71 UNLESS OTHERWISE SPECIFIED.
2. THE POSITION SWITCHES FOR MAIN STEAM LINE ISOLATION VALVE POSITION ARE A PART OF THE MSIV'S. POSITION SWITCH CONTACTS SHALL OPEN BEFORE THE CLOSING VALVE REACHES THE 92% OPEN POSITION AND REMAIN OPEN WHEN THE VALVE IS FULLY CLOSED. THE SWITCH CONTACTS SHALL CLOSE BEFORE THE OPENING VALVE REACHES FULLY OPEN AND REMAIN CLOSED WHEN THE VALVE IS FULLY OPEN.
3. INTERNAL LOGIC AND EQUIPMENT FUNCTIONS ARE SHOWN ON THE REACTOR PROTECTION SYSTEM IBD. C71-1030.
4. LETTER DESIGNATIONS FOR EQUIPMENT IN THE FOUR RPS DIVISIONS ARE AS FOLLOWS:

   A - DIVISION I
   B - DIVISION II
   C - DIVISION III
   D - DIVISION IV

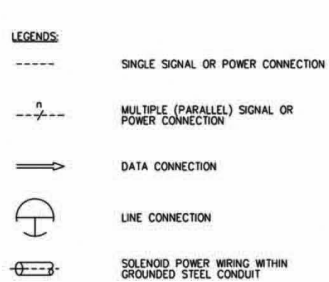
   THESE DESIGNATIONS DO NOT NECESSARILY APPLY TO MATCH CIRCLE LETTERS.
5. REDUNDANT LOGIC POWER SUPPLIES ARE TO BE PROVIDED WITHIN EACH INDIVIDUAL RTIS PANEL AND/OR WITHIN EACH MAJOR RTIS MODULE OR UNIT.
6. REACTOR PROTECTION SYSTEM LOGIC AND MAIN STEAM ISOLATION VALVE LOGIC (PART OF LEAK DETECTION AND ISOLATION SYSTEM) SHARE THE SAME DIGITAL TRIP UNIT AND TRIP LOGIC UNIT. SOFTWARE FUNCTIONS WRITTEN FOR EACH SYSTEM WILL SEPARATELY PROCESS SENSOR INPUT SIGNALS, TRIP DECISION LOGIC, AND INTERLOCK LOGIC RELATED TO A PARTICULAR SYSTEM. HOWEVER, FINAL DIVISION OUTPUT TRIP SIGNALS FOR THE TWO SYSTEMS SHALL BE DEVELOPED IN SEPARATE OUTPUT LOGIC UNITS IN EACH RTIS DIVISION LOGIC PANEL, SEE REF DOC 6.
7. TRIP INPUTS FOR THE TURBINE CONTROL VALVE FAST CLOSURE (TCVFC) TRIP SHALL BE DERIVED FROM ALL THOSE EVENTS CAUSING FAST CLOSURE OF THE TURBINE CONTROL VALVE. PROVISIONS SHALL BE MADE FOR THE PRESSURE SENSORS TO DIRECTLY MEASURE INDIVIDUAL CONTROL VALVE "DISK DUMP" HYDRAULIC TRIP SYSTEM OIL PRESSURE.
8. ONE POSITION SWITCH EACH WITH TWO CONTACTS SHALL BE MOUNTED ON EACH TURBINE MAIN STOP VALVE (TSV). CONTACT NUMBER 1 OF EACH POSITION SWITCH SHALL PROVIDE TSV CLOSURE TRIP SIGNALS TO THE REACTOR PROTECTION SYSTEM. THESE CONTACTS SHALL BE CLOSED AND REMAIN CLOSED WHEN THE STOP VALVE IS FULLY OPEN. SHALL OPEN BEFORE THE CLOSING VALVE REACHES 90% OPEN, SHALL REMAIN OPEN WHILE THE VALVE IS FULLY CLOSED AND SHALL RECLOSE BEFORE THE OPENING VALVE IS FULLY OPEN. CONTACT NUMBER 2 OF EACH POSITION SWITCH SHALL PROVIDE MAIN CONDENSER VACUUM LOW TRIP BYPASS SIGNALS TO THE LEAK DETECTION SYSTEM. IN GENERAL, THE OPERATION OF THE NUMBER 2 SWITCH CONTACTS IS OPPOSITE TO THE OPERATION OF THE NUMBER 1 CONTACTS. SPECIFIC DETAILS OF THE OPERATION OF THE NUMBER 2 CONTACTS IS DESCRIBED IN THE LEAK DETECTION AND ISOLATION SYSTEM IED, REFERENCE DOCUMENT 6.
9. NMS PROVIDES SIMULATED THERMAL POWER (STP) SIGNAL FOR REACTOR POWER LEVEL DETERMINATION BY RPS.
10. LOGIC POWER SOURCES FOR THE SCRAM FOLLOW SIGNALS AND SCRAM TEST SWITCH STATUS SIGNALS SHALL BE PROVIDED BY APPROPRIATE UNITS OF THE ROD CONTROL AND INFORMATION SYSTEM (C11).
11. THE REACTOR MODE SWITCH SHALL BE A SINGLE, FOUR POSITIONS, FOUR BANK, KEYLOCKED SWITCH. EACH OF THE FOUR BANKS SHALL BE ELECTRICALLY ISOLATED FROM ALL OTHER BANKS AND PROVIDE A REACTOR MODE SIGNAL TO ONE OF THE FOUR RPS DIVISIONS. WHEN THE SWITCH IS IN ONE POSITION, THE CONTACTS ASSOCIATED WITH THAT POSITION SHALL BE CLOSED AND THE CONTACTS FOR ALL OTHER POSITIONS SHALL BE OPEN. CONTACT ACTTION UPON SWITCHING SHALL BE MAKE BEFORE BREAK. THE DIVISION II AND DIVISION III BANKS SHALL EACH HAVE AN ADDITIONAL CONTACT ASSOCIATED WITH THE "SHUTDOWN" POSITION. THESE CONTACTS SHALL BE OPEN WHEN THE MODE SWITCH IS IN THE "SHUTDOWN" POSITION AND SHALL BE CLOSED IN ALL OTHER POSITIONS.
12. THE MANUAL SCRAM RESET SWITCH SHALL BE A SINGLE, THREE POSITION, TWO BANK, SPRING RETURN TO NEUTRAL SWITCH. THE TWO BANKS SHALL BE ISOLATED FROM EACH OTHER. WHEN THE SWITCH IS IN ONE OF THE TWO NON-NEUTRAL POSITIONS, THE ASSOCIATED CONTACTS SHALL BE CLOSED. WHEN THE SWITCH IS IN THE NEUTRAL POSITION, ALL CONTACTS SHALL BE OPEN.
13. GROUPS 1A, 1B, 2A, 2B, 3A, 3B, 4A AND 4B SOLENOID POWER WIRING SHALL ALL BE RUN IN SEPARATE CONDUIT. INTERCONNECTIONS BETWEEN PDLU, OLU AND SCC ARE SHOWN IN LOGIC DIAGRAM REPRESENTATION IN SUPPORTING DOC 5.
14. RPS ALARMS AND STATUS SIGNALS ARE DESCRIBED IN SUPPORTING DOCUMENTS 1,5 AND 6.
15. THE NEUTRAL WIRING OF ALL FOUR SCRAM GROUPS SHALL BE CONNECTED TO THE SAME COMMON POINT GROUND.
16. WITHIN THE SCRAM SOLENOID FUSE PANELS, CURRENT SURGE SUPPRESSION DEVICES (E.G. VARISTORS OR EQUIVALENT) SHALL BE CONNECTED ACROSS THE COIL LEADS OF EACH HCU SCRAM PILOT VALVE SOLENOID.

REFERENCES	MPL ITEM NO.
1. NUCLEAR BOILER SYSTEM (NBS) P&ID	B21-1010
2. ROD CONTROL AND INFORMATION SYSTEM (RCIS) IED	C11-1040
3. CONTROL ROD DRIVE SYSTEM (CRD) P&ID	C12-1010
4. NEUTRON MONITORING SYSTEM (NMS) IED	C51-1040
5. PROCESS RADIATION MONITORING SYSTEM (PRRM) IED	D11-1040
6. LEAK DETECTION AND ISOLATION SYSTEM (LDS) IED	E31-1040
7. D.C. POWER ONE LINE DIAGRAM	R42-1010
8. VITAL AC POWER ONE LINE DIAGRAM	R46-1010
9. RECIRCULATION FLOW CONTROL SYSTEM (RFCS) IED	C81-1040
10. SUPPRESSION POOL TEMPERATURE MONITORING (SPTM) SYSTEM IED	T53-1010

SUPPORTING DOCUMENT	MPL ITEM NO.
1. REACTOR PROTECTION SYSTEM DESIGN SPEC	C71-4010
2. DESIGN DOCUMENTS STANDARDS	A10-3020
3. PIPING & INSTRUMENT DIAGRAM SYMBOLS	A10-3020
4. IBD STANDARDS	A10-3070
5. REACTOR PROTECTION SYSTEM IBD	C71-1030
6. REACTOR PROTECTION SYSTEM MMIR	C71-5030

19. FIBER OPTIC CABLES PROVIDING ELECTRICAL SEPARATION BETWEEN EQUIPMENT OF REDUNDANT DIVISIONS SHALL BE RUN IN EITHER THE SENDING OR IN THE RECEIVING DIVISION CABLE TRAYS.
20. THE WIRING CIRCUITS ASSOCIATED WITH THE DIV II AND THE DIV III MODE SWITCH IN "SHUTDOWN" SCRAM SIGNALS SHALL BE RUN SEPARATELY AND BE KEPT SEPARATE BY DISTANCE OR BARRIERS FROM THE WIRING CIRCUITS ASSOCIATED WITH THE DIVISION II MANUAL SCRAM AND THE DIVISION III MANUAL SCRAM SIGNALS SUCH AS TO PREVENT A SINGLE FAULT FROM CAUSING THE LOSS OF BOTH MANUAL SCRAM FUNCTIONS.
21. PLACING ANY ONE OF THE HCU (PAIR-ROD) TEST SWITCHES INTO THE "TEST" POSITION SHALL RESULT IN ISOLATED SIGNALS BEING SENT TO THE RC&IS (REFERNCE DOCUMENT 2) SUCH AS TO PROVIDE TIMING SIGNALS INDICATING THE START OF A ROD SCRAM TEST.
22. METAL ENCLOSED JUNCTION BOXES AND CONDUIT SHALL BE UTILIZED WITHIN THE SCRAM TEST PANEL TO MAINTAIN SEPARATION OF ALL FOUR SCRAM GROUPS AND PROTECTION FROM HOT SHORTS.
23. THE SUPPRESSION POOL TEMPERATURE MONITORING (SPTM) TRIP SIGNALS REPRESENT EITHER SUPPRESSION POOL HIGH BULK TEMPERATURE OR SPTM INOPERATIVE AS DETERMINED BY THE SUPPRESSION POOL TEMPERATURE MONITORING SYSTEM.

LEGENDS:



ABBREVIATIONS

APRM - AVERAGE POWER RANGE MONITOR
BPU - BYPASS UNITS
CRD - CONTROL ROD DRIVE
DIV 1 - ELECTRICAL DIVISION I
DIV 2 - ELECTRICAL DIVISION II
DIV 3 - ELECTRICAL DIVISION III
DIV 4 - ELECTRICAL DIVISION IV
DTU - DIGITAL TRIP UNIT
ECF - ESSENTIAL COMMUNICATION FUNCTION
FO - FIBER OPTIC
HCU - HYDRAULIC CONTROL UNIT
L - LINE
MSIV - MAIN STEAM LINE ISOLATION VALVE
N - NEUTRAL
MSL - MAIN STEAM LINE
OLU - OUTPUT LOGIC UNIT
PDLU - POWER DISTRIBUTION LOGIC UNIT
RDLC - REMOTE DIGITAL LOGIC CONTROLLER
RTIS - REACTOR TRIP AND ISOLATION SYSTEM
SCC - SOLENOID CONTROL CENTER
SRNM - SOURCE RANGE NEUTRON MONITOR
SSFP - SCRAM SOLENOID FUSE PANEL
TLU - TRIP LOGIC UNIT
KOS - KEYLOCK OPERATION SWITCH

MPL NO. C71-1040

Figure 7.2-9 Reactor Protection System IED (Sheet 1 of 11)

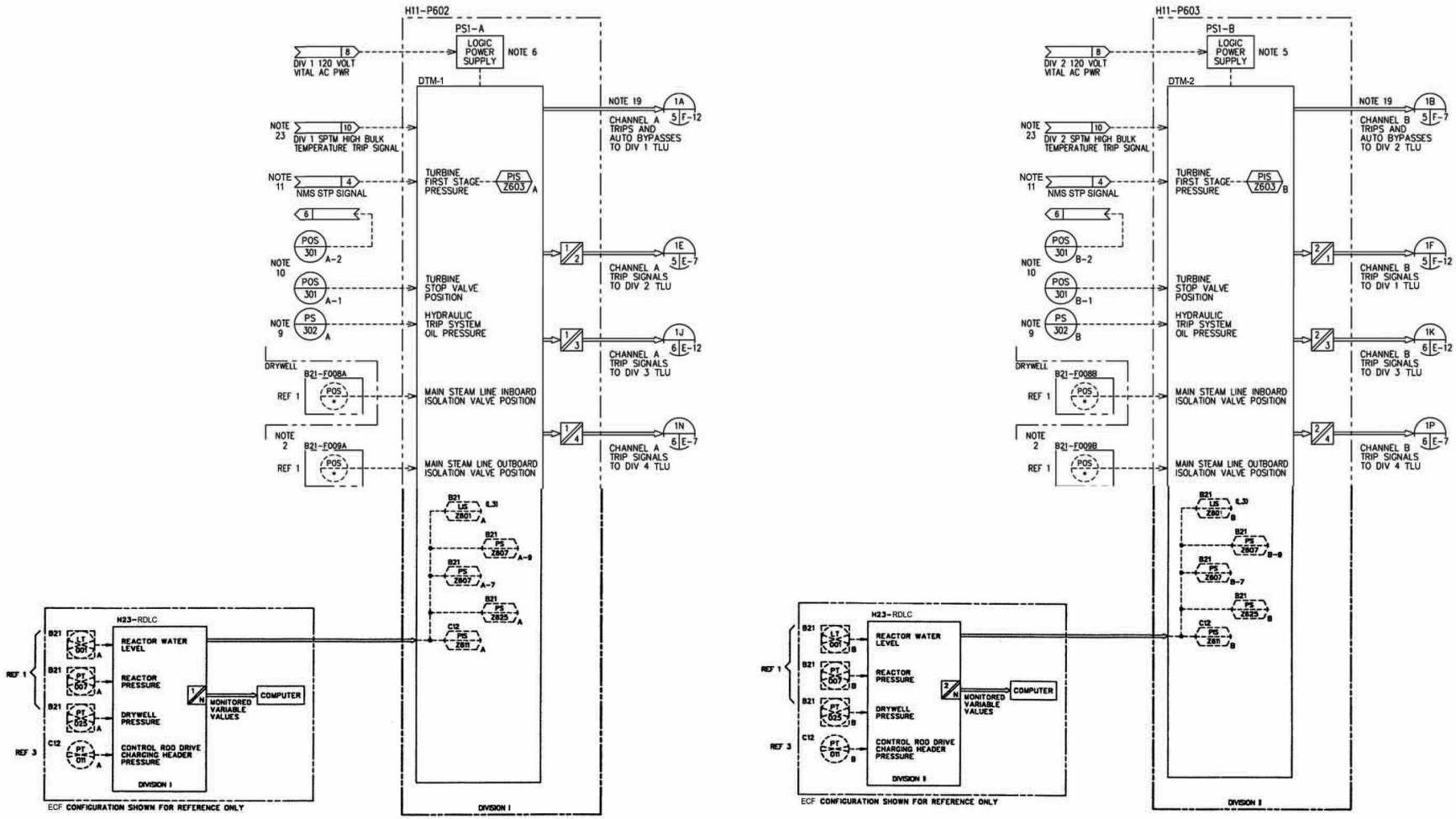


Figure 7.2-9 Reactor Protection System IED (Sheet 2 of 11)

STP 3&4 Rev. 2

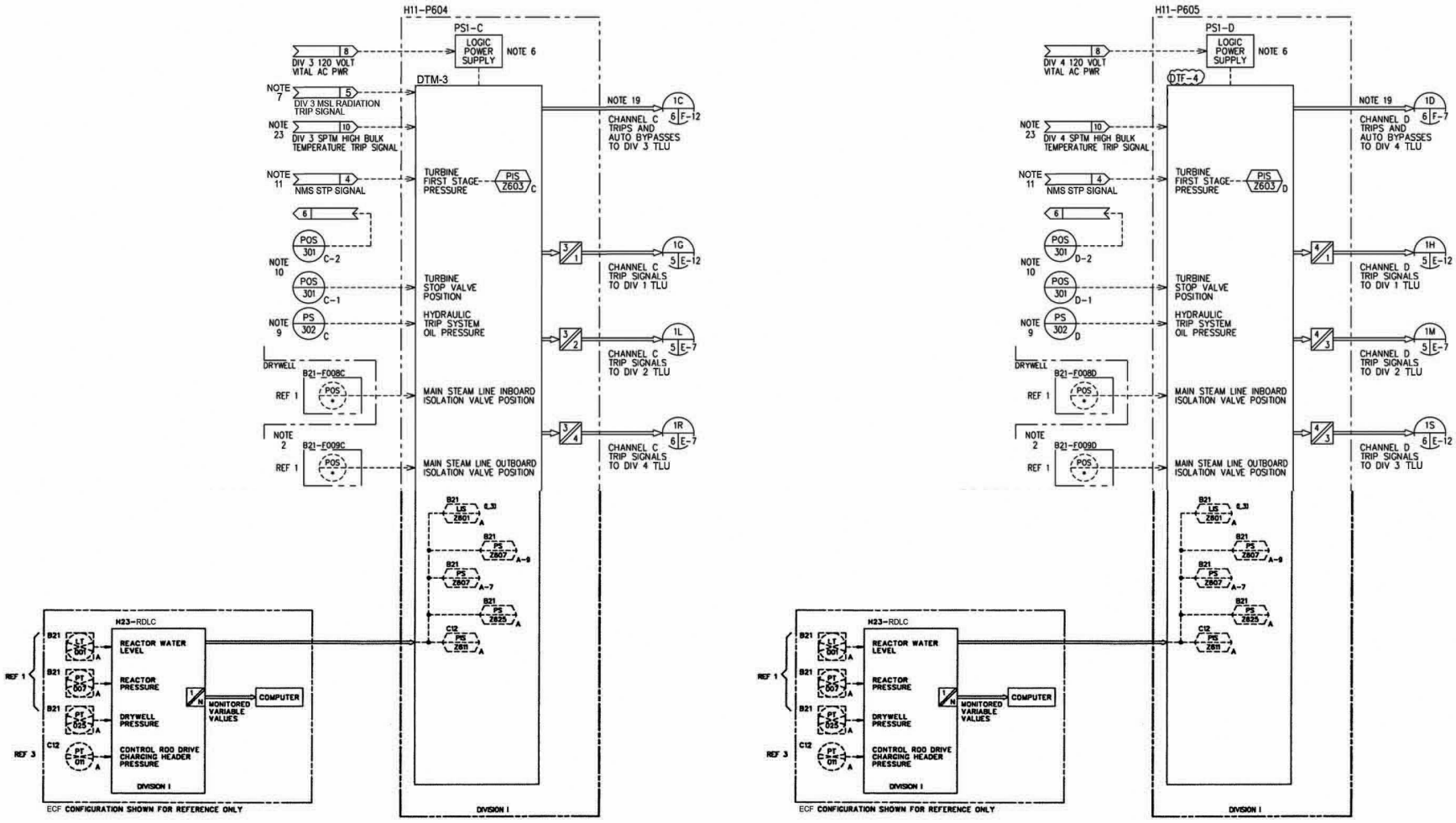


Figure 7.2-9 Reactor Protection System IED (Sheet 3 of 11)

STP 3&4 Rev. 2

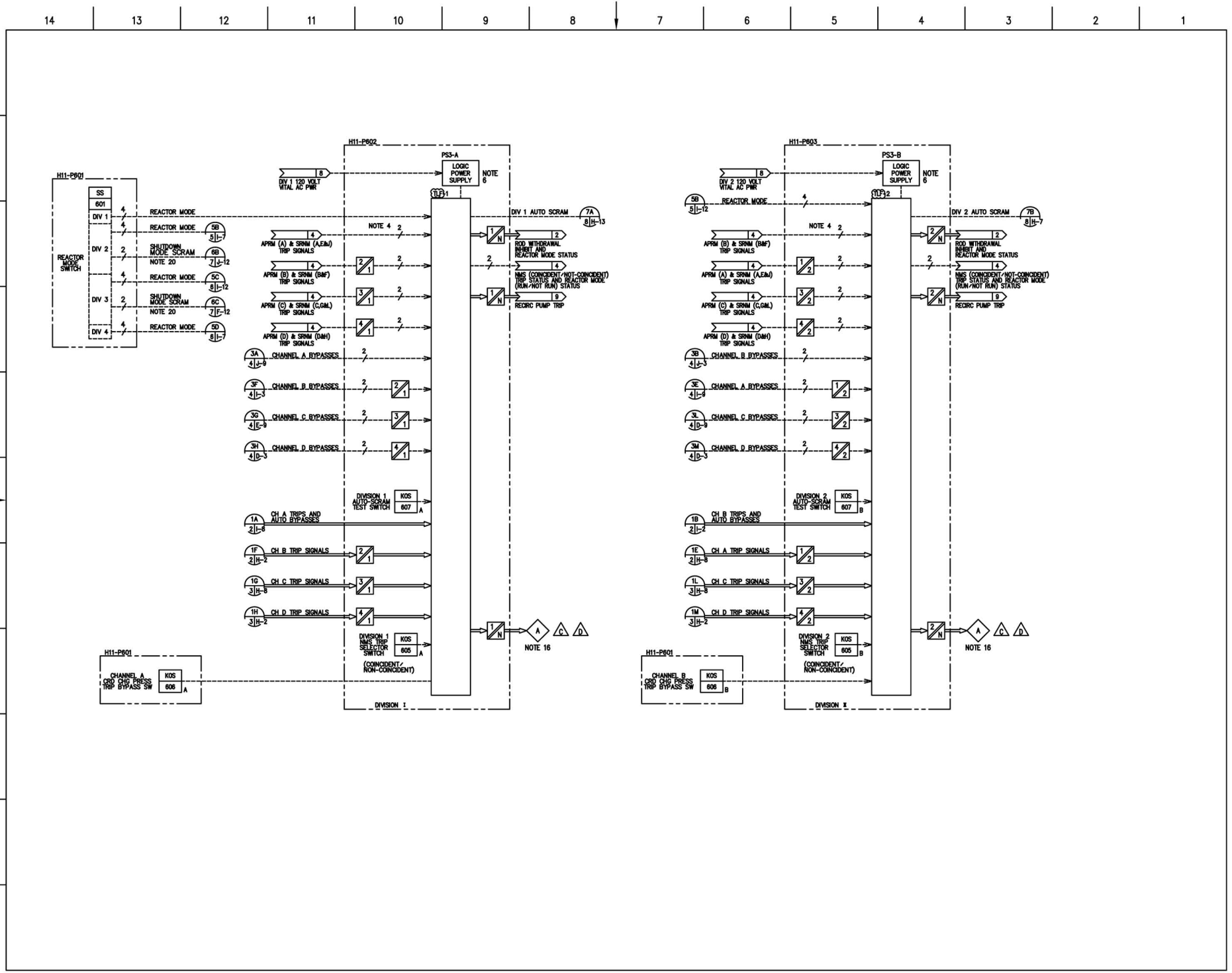


Figure 7.2-9 REACTOR PROTECTION SYSTEM IED (SHEET 5 OF 11)
STP 3 & 4 Rev.2

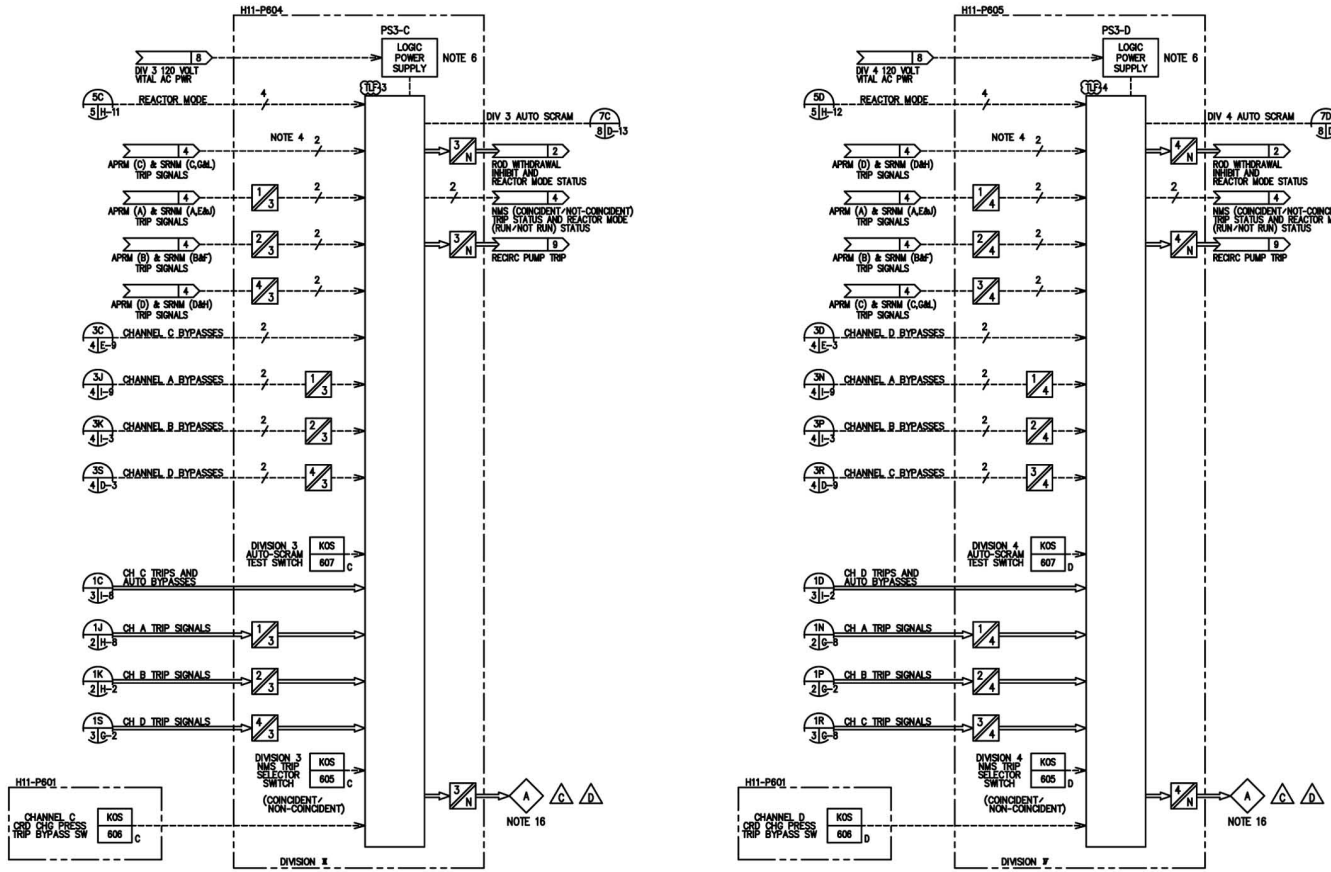


Figure 7.2-9 REACTOR PROTECTION SYSTEM IED (SHEET 6 OF 11)
STP 3 & 4 Rev.2

NOTES:

1. LOGIC GATES ARE USED IN THIS DRAWING TO SHOW REACTOR PROTECTION SYSTEM FUNCTIONAL LOGIC AND NOT ACTUAL HARDWARE.
2. LOGIC REPRESENTED IN THIS DOCUMENT FOR PDLU CAN BE IMPLEMENTED BY RELAY LOGIC.
3. ALL SIGNAL DESCRIPTIONS REFLECT THE CONDITION THAT RESULTS IN A LOGIC "1" ON THE SIGNAL LINE. DTF ANALOG INPUT DESCRIPTIONS REFLECT CONDITIONS THAT WILL CAUSE AN INSTRUMENT TRIP.
4. ALL TRIP SIGNALS INTERNAL TO RPS AT THE CHANNEL AND DIVISION LEVEL ARE ASSERTED LOW.
5. ALL BYPASS SIGNALS AND BYPASS PERMISSIVE SIGNALS ARE ASSERTED HIGH.
6. FOR DRAWING CLARITY. ISOLATED SIGNALS ARE SHOWN WITH AN ISOLATOR AT BOTH TRANSMIT AND RECEIVE END. THIS DOES NOT MEAN TO IMPLY THAT TWO SEPARATE ISOLATORS ARE REQUIRED FOR EACH SIGNAL.
7. 2 OUT OF 4 OUTPUT ARRANGEMENT FOR SCC IS REPRESENTED IN THIS DOCUMMENT.
8. LOGIC AND DEVICE SYMBOLS USED IN THIS DRAWING ARE DEFINED IN THE IBD STANDARDS. SUPPORTING DOCUMENT 4.
9. EACH APRM TRIP SIGNAL REPRESENTS EITHER A HIGH NEUTRON FLUX TRIP. A HIGH SIMULATED THERMAL POWER TRIP. AN APRM INOPERATIVE TRIP. AND/OR A CORE FLOW RAPID COASTDOWN TRIP AS DETERMINED BY AN APRM OF THE NMS.
10. EACH SRNM TRIP SIGNAL REPRESENTS EITHER A SRNM UPSCALE (OR HIGH COUNT RATE) TRIP, A SHORT PERIOD TRIP, AND/OR A SRNM INOPERATIVE TRIP AS DETERMINDED BY EITHER TWO OR THREE OF THE SRNM'S OF THE NMS.
11. SCRAM SOLENOID POWER WIRING SHALL BE PROTECTED FROM HOT SHORT CONDITIONS BY RUNNING ALL OF THE GROUP 1A, 1B, 2A, 2B, 3A, 3B, 4A AND 4B SOLENOID POWER WIRING WITHIN SEPARATE METAL ENCLOSED RACEWAYS OR WITHIN SEPARATE METAL CONDUIT FROM THE PDLU'S THROUGH TO THE INDIVIDUAL HCU SCRAM PILOT VALVE SOLENOID.
12. PLACING ANY ONE OF THE HCU (PAIR ROD) TEST SWITCHES IN THE "TEST" POSITION SHALL RESULT IN AN ISOLATED SIGNAL BEING SENT TO THE ROD CONTROL AND INFORMATION SYSTEM INDICATING THE START OF A CONTROL ROD SCRAM TEST.
13. LOGIC REPRESENTED IN THE SCC'S SHOWN ON SHEETS 65 AND 66 OF THIS DOCUMENT CAN BE IMPLEMENTED BY RELAY LOGIC.

MPL NO. C71-1030

FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 1 of 72)

SH NO.	TITLE
1	NOTES
2	TABLE OF CONTENTS, REF DOCUMENTS, SUPPORTING DOCUMENTS, ABREVIATIONS
3	DIV 1 TLF; RX MODE AND RELATED BYPASSES
4	DIV 2 TLF; RX MODE AND RELATED BYPASSES
5	DIV 3 TLF; RX MODE AND RELATED BYPASSES
6	DIV 4 TLF; RX MODE AND RELATED BYPASSES
7	DIV 1 BPU; BYPASS LOGIC–TLF BYPASS, CHANNEL SENSOR BYPASS, SPECIAL MSLI TRIP BYPASS
8	DIV 2 BPU; BYPASS LOGIC–TLF BYPASS, CHANNEL SENSOR BYPASS, SPECIAL MSLI TRIP BYPASS
9	DIV 3 BPU; BYPASS LOGIC–TLF BYPASS, CHANNEL SENSOR BYPASS, SPECIAL MSLI TRIP BYPASS
10	DIV 4 BPU; BYPASS LOGIC–TLF BYPASS, CHANNEL SENSOR BYPASS, SPECIAL MSLI TRIP BYPASS
11	DIV 1 DTF; CHANNEL A SENSOR TRIP LOGIC
12	DIV 2 DTF; CHANNEL B SENSOR TRIP LOGIC
13	DIV 3 DTF; CHANNEL C SENSOR TRIP LOGIC
14	DIV 4 DTF; CHANNEL D SENSOR TRIP LOGIC
15	DIV 1 DTF; CHANNEL A SENSOR TRIP LOGIC
16	DIV 2 DTF; CHANNEL B SENSOR TRIP LOGIC
17	DIV 3 DTF; CHANNEL C SENSOR TRIP LOGIC
18	DIV 4 DTF; CHANNEL D SENSOR TRIP LOGIC
19	DIV 1 TLF; NMS DIV 1 TRIP LOGIC
20	DIV 2 TLF; NMS DIV 2 TRIP LOGIC
21	DIV 3 TLF; NMS DIV 3 TRIP LOGIC
22	DIV 4 TLF; NMS DIV 4 TRIP LOGIC
23	DIV 1 TLF; RX PRESS DIV 1 TRIP, SUPPRESSION POOL TEMP, TSV CLOSURE DIV 1 TRIP LOGIC
24	DIV 2 TLF; RX PRESS DIV 2 TRIP, SUPPRESSION POOL TEMP, TSV CLOSURE DIV 2 TRIP LOGIC
25	DIV 3 TLF; RX PRESS DIV 3 TRIP, SUPPRESSION POOL TEMP, TSV CLOSURE DIV 3 TRIP LOGIC
26	DIV 4 TLF; RX PRESS DIV 4 TRIP, SUPPRESSION POOL TEMP, TSV CLOSURE DIV 4 TRIP LOGIC
27	DIV 1 TLF; TSV,TCV CLOSURE DIV 1 TRIP LOGIC
28	DIV 2 TLF; TSV,TCV CLOSURE DIV 2 TRIP LOGIC
29	DIV 3 TLF; TSV,TCV CLOSURE DIV 3 TRIP LOGIC
30	DIV 4 TLF; TSV,TCV CLOSURE DIV 4 TRIP LOGIC
31	DIV 1 TLF; MSLI DIV 1 TRIP LOGIC
32	DIV 2 TLF; MSLI DIV 2 TRIP LOGIC
33	DIV 3 TLF; MSLI DIV 3 TRIP LOGIC
34	DIV 4 TLF; MSLI DIV 4 TRIP LOGIC
35	BLANK
36	BLANK

SH NO.	TITLE
37	BLANK
38	BLANK
39	DIV 1 TLF; DW PRESS DIV 1 TRIP LOGIC
40	DIV 2 TLF; DW PRESS DIV 2 TRIP LOGIC
41	DIV 3 TLF; DW PRESS DIV 3 TRIP LOGIC
42	DIV 4 TLF; DW PRESS DIV 4 TRIP LOGIC
43	DIV 1 TLF; RX WTR LVL DIV 1, CRD PRESS DIV 1 TRIP LOGIC
44	DIV 2 TLF; RX WTR LVL DIV 2, CRD PRESS DIV 2 TRIP LOGIC
45	DIV 3 TLF; RX WTR LVL DIV 3, CRD PRESS DIV 3 TRIP LOGIC
46	DIV 4 TLF; RX WTR LVL DIV 4, CRD PRESS DIV 4 TRIP LOGIC
47	DIV 1 TLF; DIV 1 AUTO–SCRAM LOGIC
48	DIV 2 TLF; DIV 2 AUTO–SCRAM LOGIC
49	DIV 3 TLF; DIV 3 AUTO–SCRAM LOGIC
50	DIV 4 TLF; DIV 4 AUTO–SCRAM LOGIC
51	DIV 1 TLF; TRIP IN CH A BYPASSED SENSOR
52	DIV 2 TLF; TRIP IN CH B BYPASSED SENSOR
53	DIV 3 TLF; TRIP IN CH C BYPASSED SENSOR
54	DIV 4 TLF; TRIP IN CH D BYPASSED SENSOR
55	DIV 2 PDLU; MANUAL SCRAM, SEAL–IN AND MANUAL SCRAM RESET LOGIC
56	DIV 3 PDLU; MANUAL SCRAM, SEAL–IN AND MANUAL SCRAM RESET LOGIC
57	DIV 1 OLU; DIV 1 AUTO SCRAM, SEAL–IN, RESET, MANUAL TRIP AND LD TEST LOGIC
58	DIV 2 OLU; DIV 2 AUTO SCRAM, SEAL–IN, RESET, MANUAL TRIP AND LD TEST LOGIC
59	DIV 3 OLU; DIV 3 AUTO SCRAM, SEAL–IN, RESET, MANUAL TRIP AND LD TEST LOGIC
60	DIV 4 OLU; DIV 4 AUTO SCRAM, SEAL–IN, RESET, MANUAL TRIP AND LD TEST LOGIC
61	GROUP 1 LD ARRANGEMENT AND HCU'S
62	GROUP 2 LD ARRANGEMENT AND HCU'S
63	GROUP 3 LD ARRANGEMENT AND HCU'S
64	GROUP 4 LD ARRANGEMENT AND HCU'S
65	BACKUP SCRAM RELAY ARRANGEMENT AND RESET PERMISSIVE LOGIC
66	BACKUP SCRAM RELAY ARRANGEMENT AND RESET PERMISSIVE LOGIC
67	RPS ALARMS
68	RPS ALARMS
69	RPS ALARMS
70	RPS ALARMS
71	RPS ALARMS
72	RPS ALARMS

SUPPORTING DOCUMENTS:

	MPL NO.
1. REACTOR PROTECTION SYS DESIGN SPEC	C71–4010
2. REACTOR PROTECTION SYS IED	C71–1040
3. NEUTRON MONITORING SYS IED	C51–1040
4. IBD STANDARDS DESIGN STANDARDS	A10–3070

REFERENCES:

	MPL NO.
1. NEUTRON MONITORING SYS IBD	C51–1030
2. LEAK DETECTION SYSTEM IBD	E31–1030
3. ROD CONTROL & INFO SYSTEM IBD	C11–1030
4. CONTROL ROD DRIVE SYSTEM P&ID	C12–1010
5. PROCESS RAD MONITORING SYS IED	D11–1040
6. NUCLEAR BOILER SYS P&ID	B21–1010
7. RECIRC FLOW CONTROL SYS IBD	C81–1030
8. SUPPRESSION POOL TEMPERATURE MONITORING SYSTEM IED	T53–1010

ABREVIATIONS

BPU – BYPASS UNITS
DTF – DIGITAL TRIP FUNCTION
RDLC – REMOTE DIGITAL LOGIC CONTROLLER
TLF – TRIP LOGIC FUNCTION
SLF – SAFETY SYSTEM LOGIC FUNCTION
OLU – OUTPUT LOGIC UNIT
PDLU – POWER DISTRIBUTION LOGIC UNIT
SCC – SOLENOID CONTROL CENTER
SSFP – SCRAM SOLENOID FUSE PANEL
SSLC – SAFETY SYSTEM LOGIC & CONTROL
APRM – AVERAGE POWER RANGE MONITOR
CRD – CONTROL ROD DRIVE
HCU – HYDRAULIC CONTROL UNIT
MSIV – MAIN STEAM LINE ISOLATION VALVE
MSL – MAIN STEAM LINE
SRNM – STARTUP RANGE NEUTRON MONITOR
mP – MICROPROCESSOR
LD – LOAD DRIVER
KOS – KEY OPERATED SWITCH
HTS – HYDRAULIC TRIP SYSTEM

TABLE OF CONTENTS, REFERENCE DOCUMENTS, SUPPORTING DOCUMENTS, ABREVIATIONS

FIGURE 7.2–10 REACTOR PROTECTION SYSTEM IBD (Sheet 2 of 72)
STP 3 & 4 Rev.2

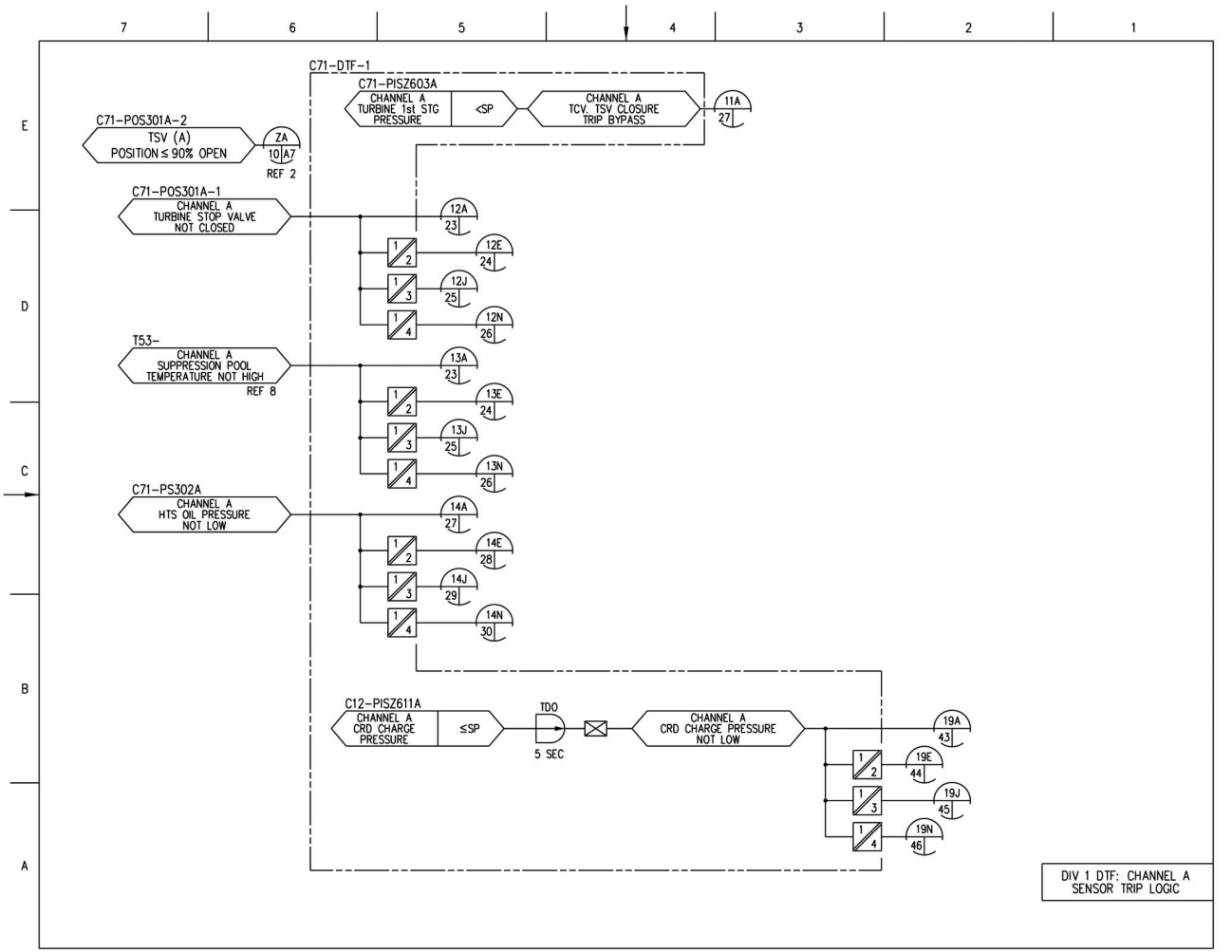


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 11 of 72)
STP 3 & 4 Rev.2

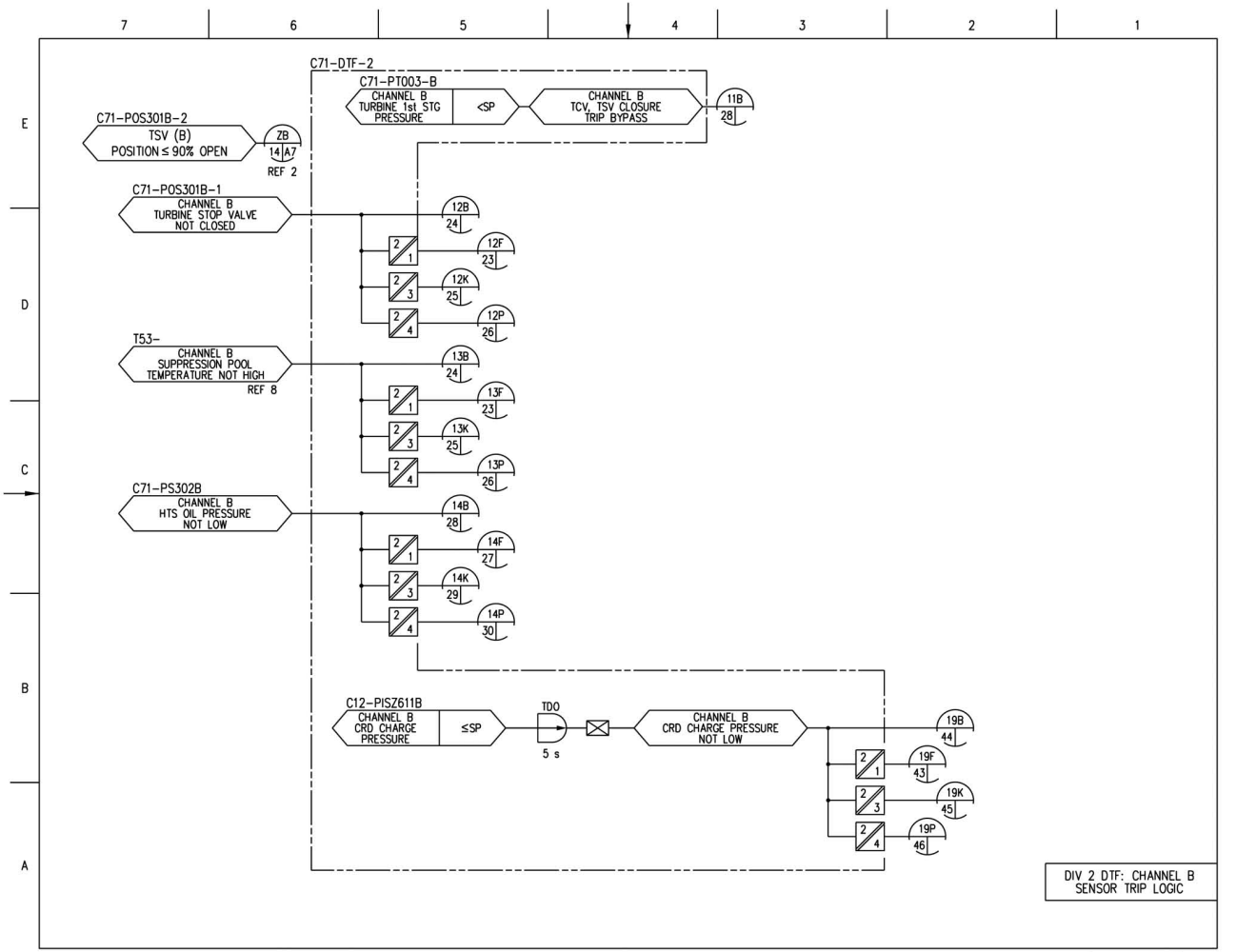


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 12 of 72)
STP 3 & 4 Rev.2

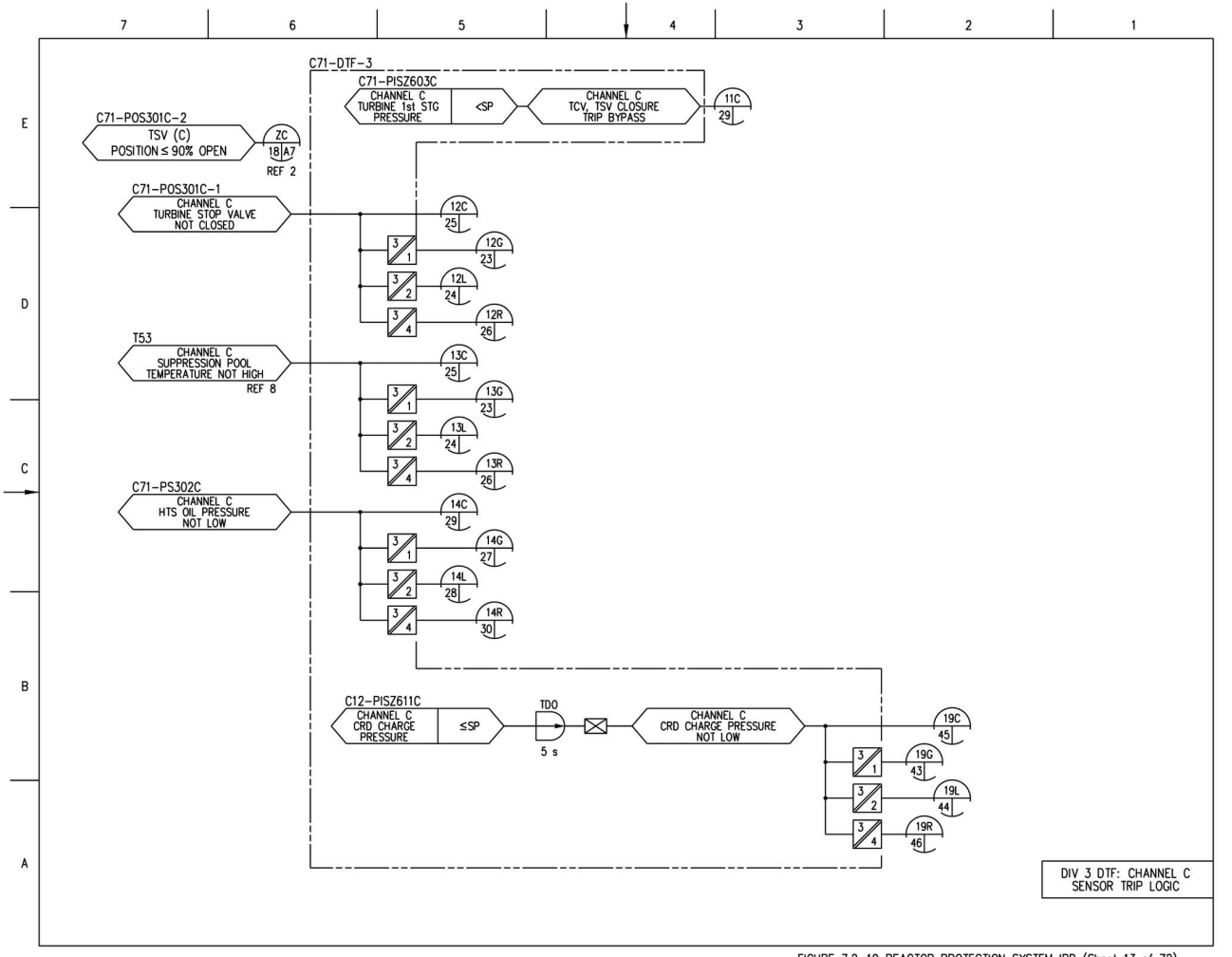


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 13 of 72)
STP 3 & 4 Rev.2

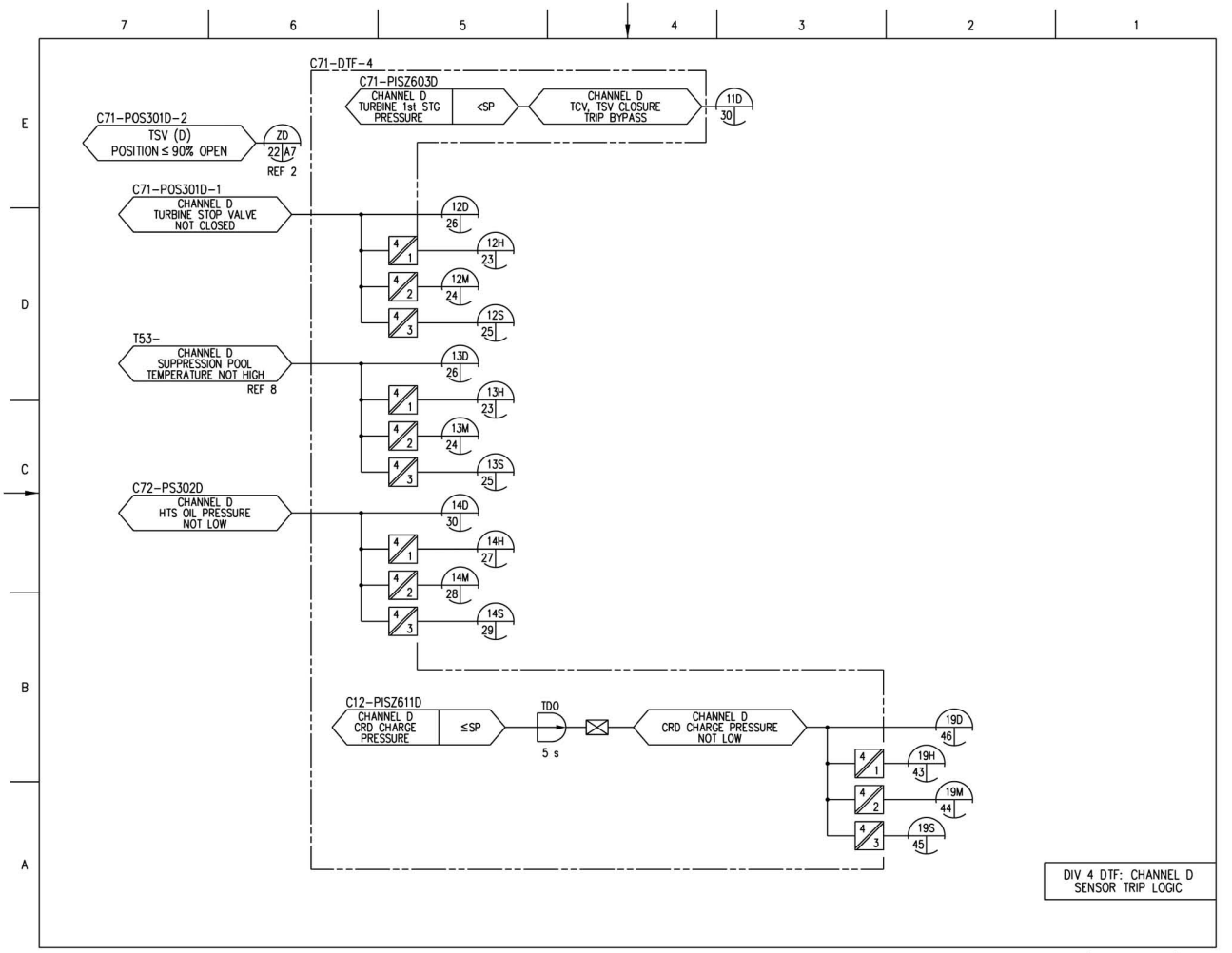


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 14 of 72)
STP 3 & 4 Rev.2

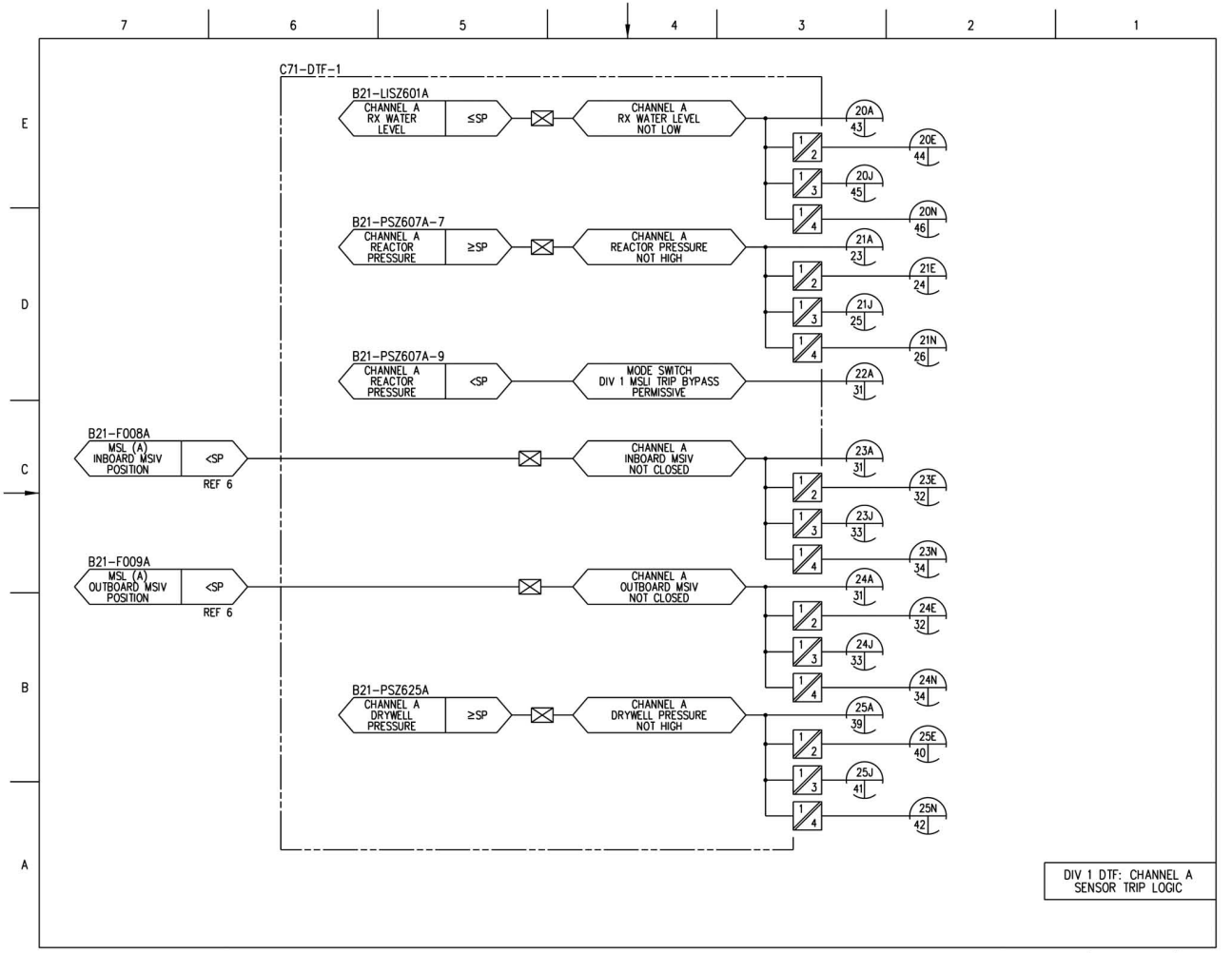


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 15 of 72)
STP 3 & 4 Rev.2

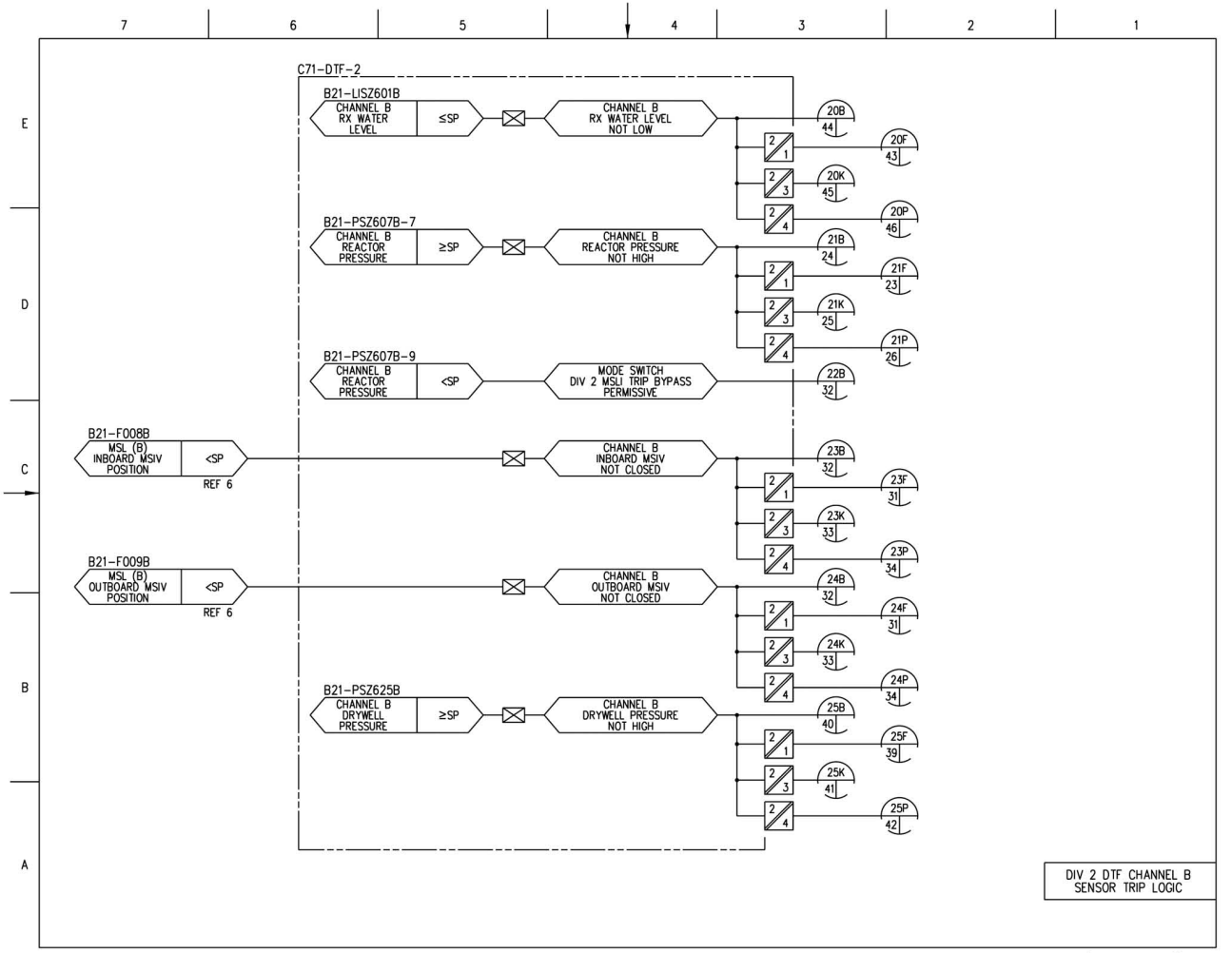


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 16 of 72)
STP 3 & 4 Rev.2

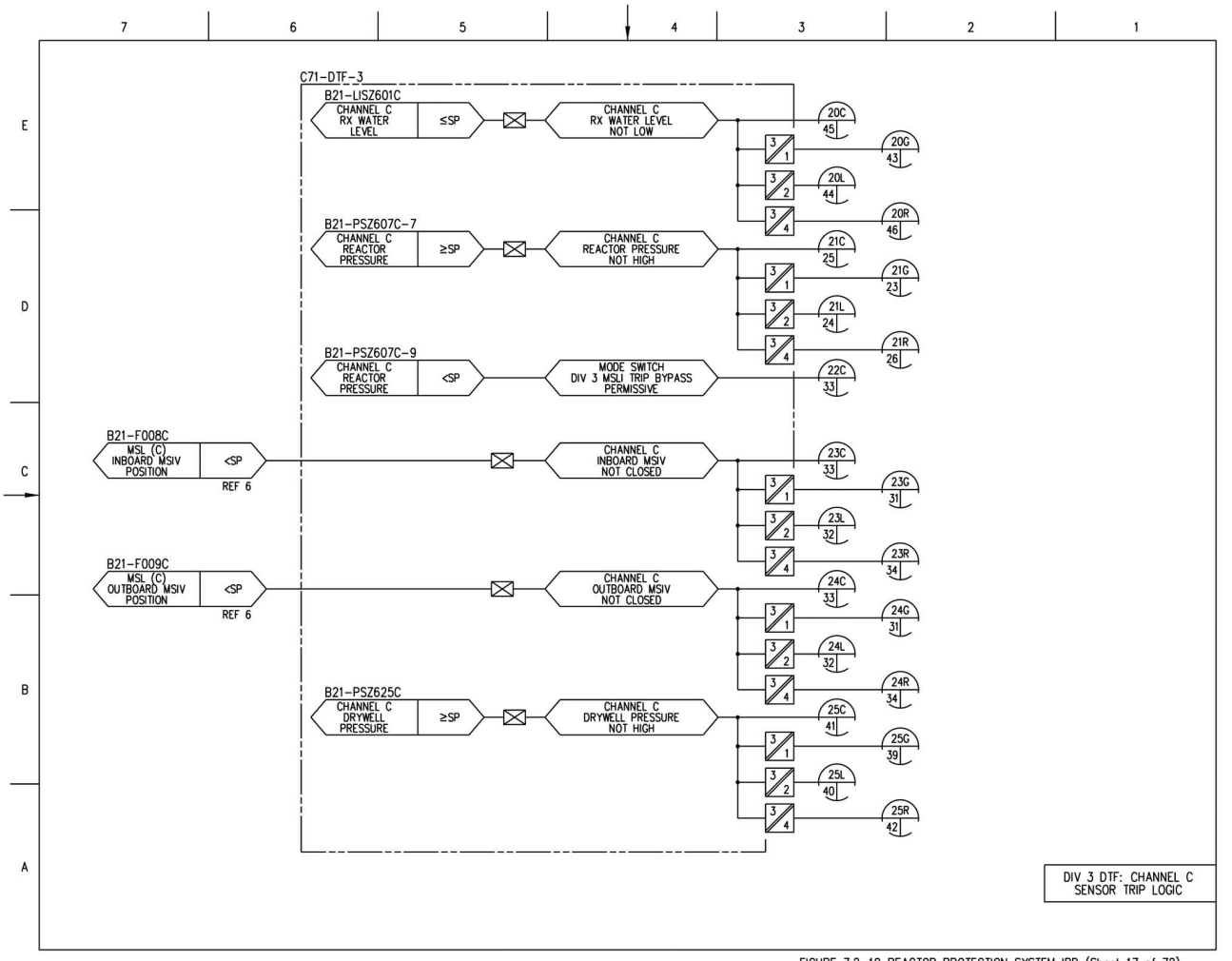


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 17 of 72)
STP 3 & 4 Rev.2

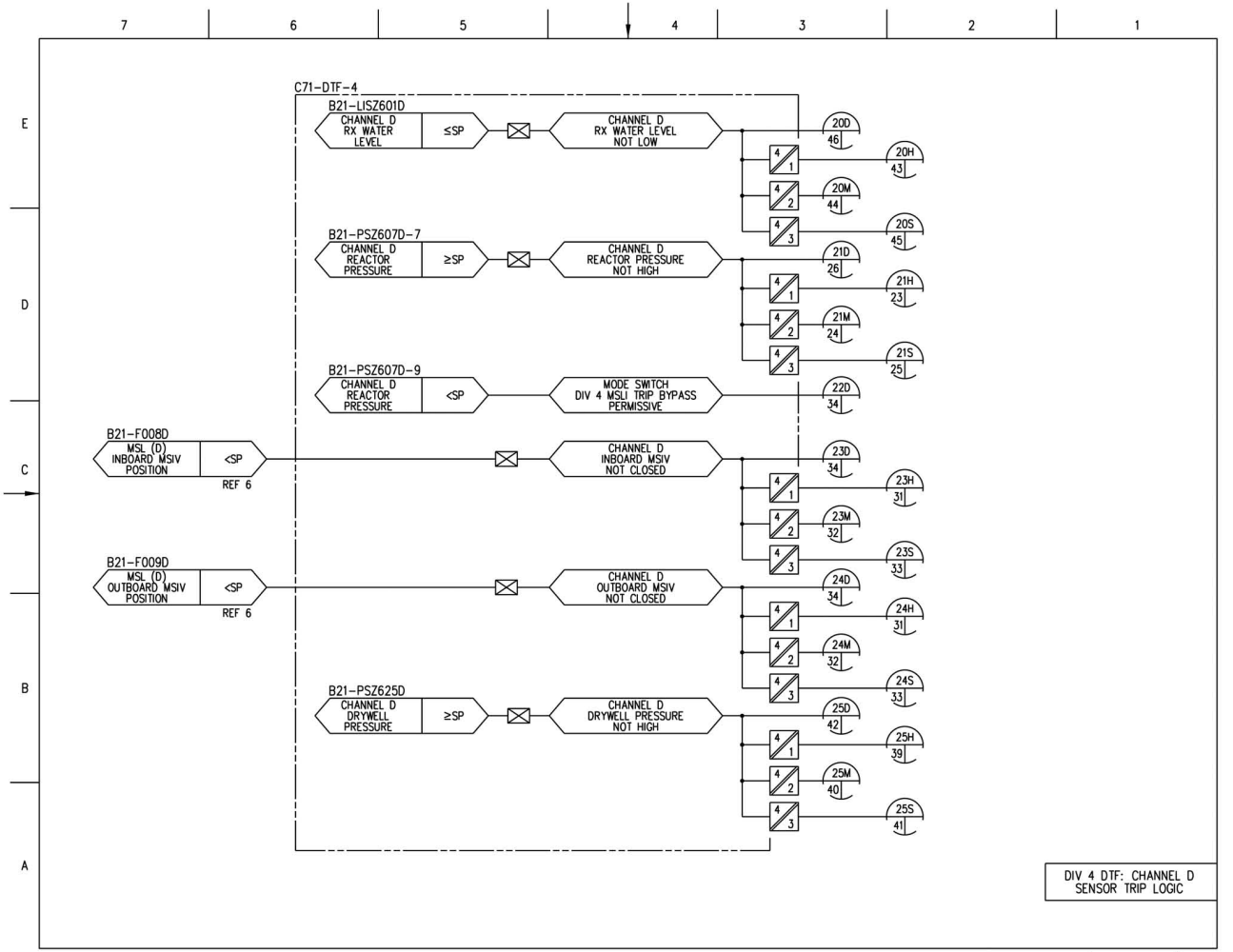


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 18 of 72)
STP 3 & 4 Rev.2

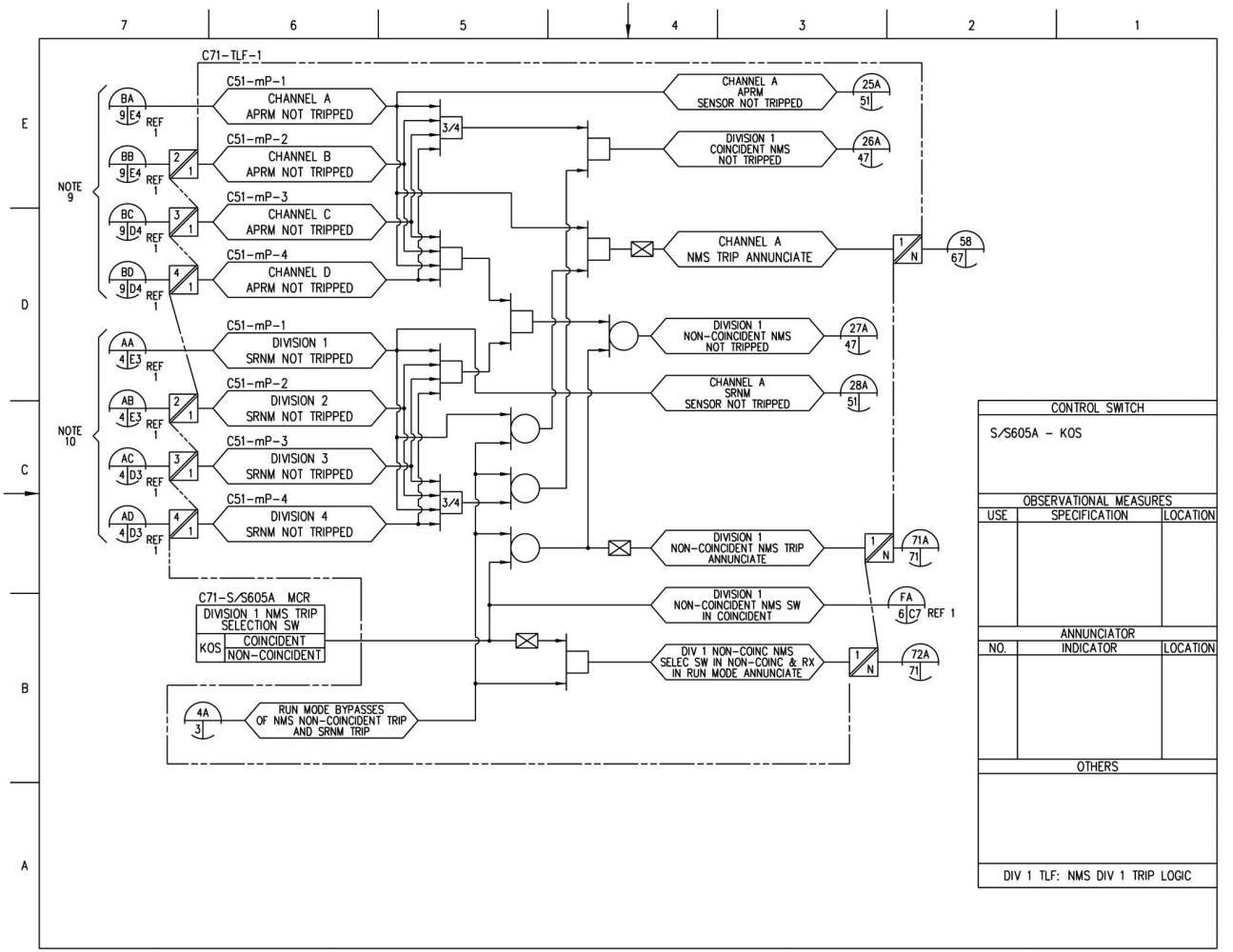


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 19 of 72)
STP 3 & 4 Rev.2

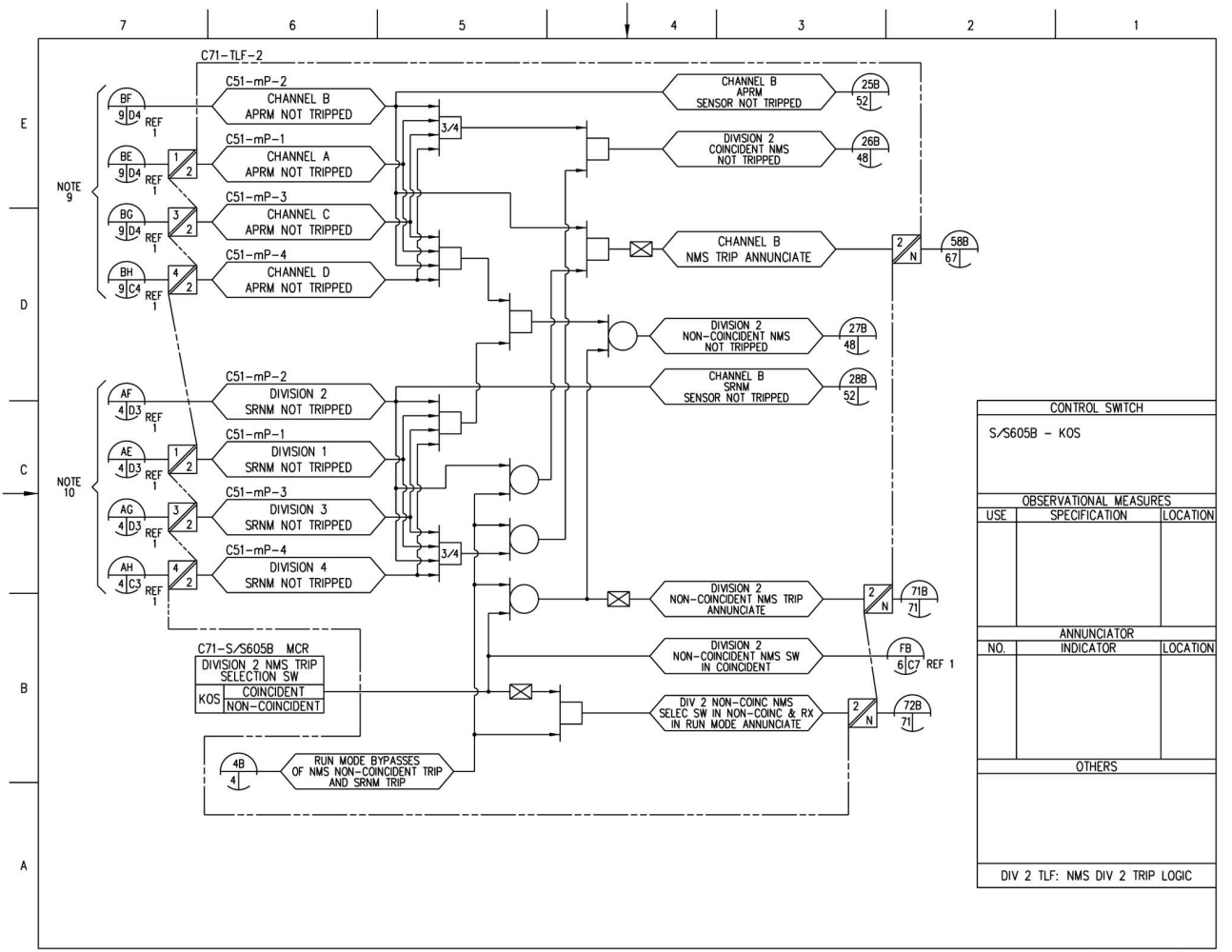


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 20 of 72)
STP 3 & 4 Rev.2

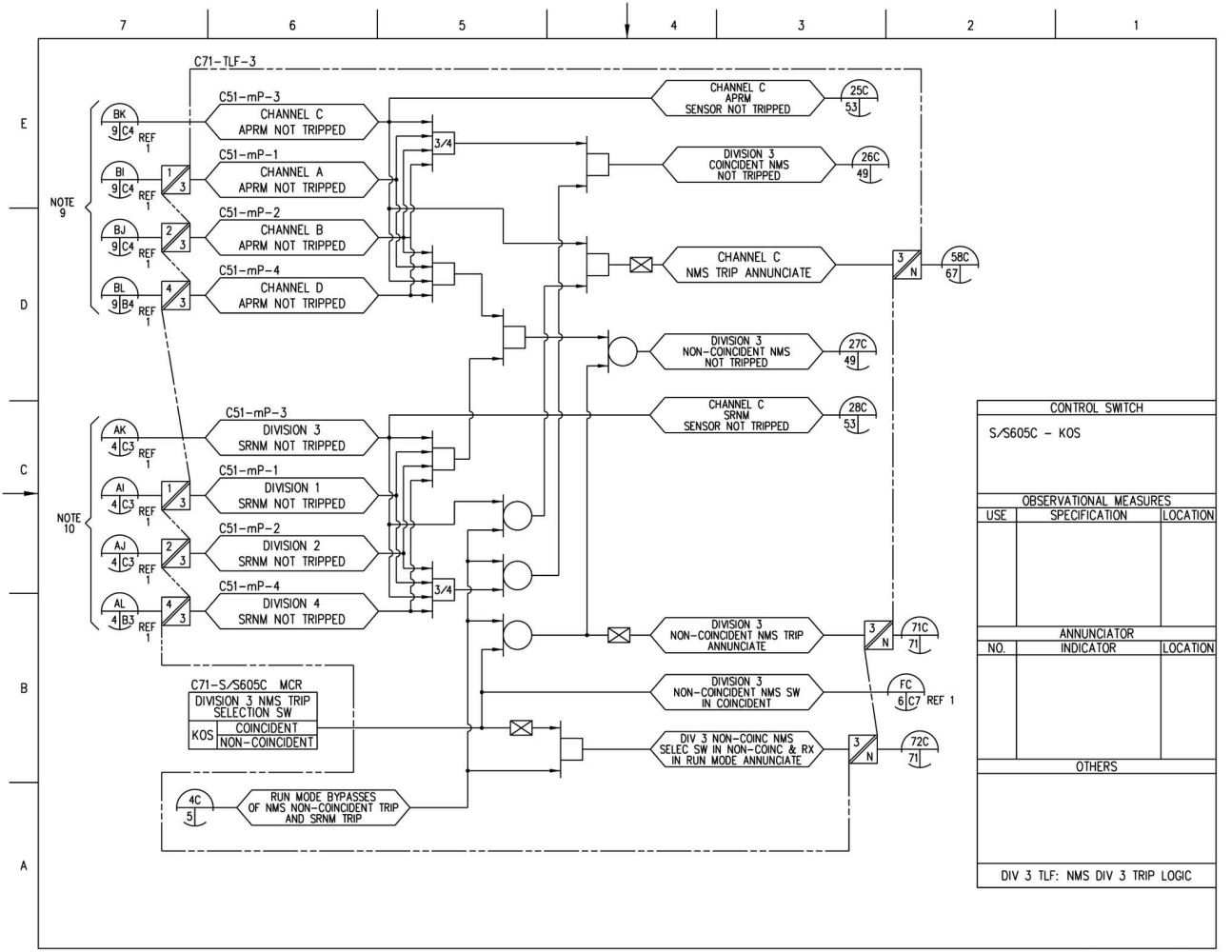


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 21 of 72)
STP 3 & 4 Rev.2

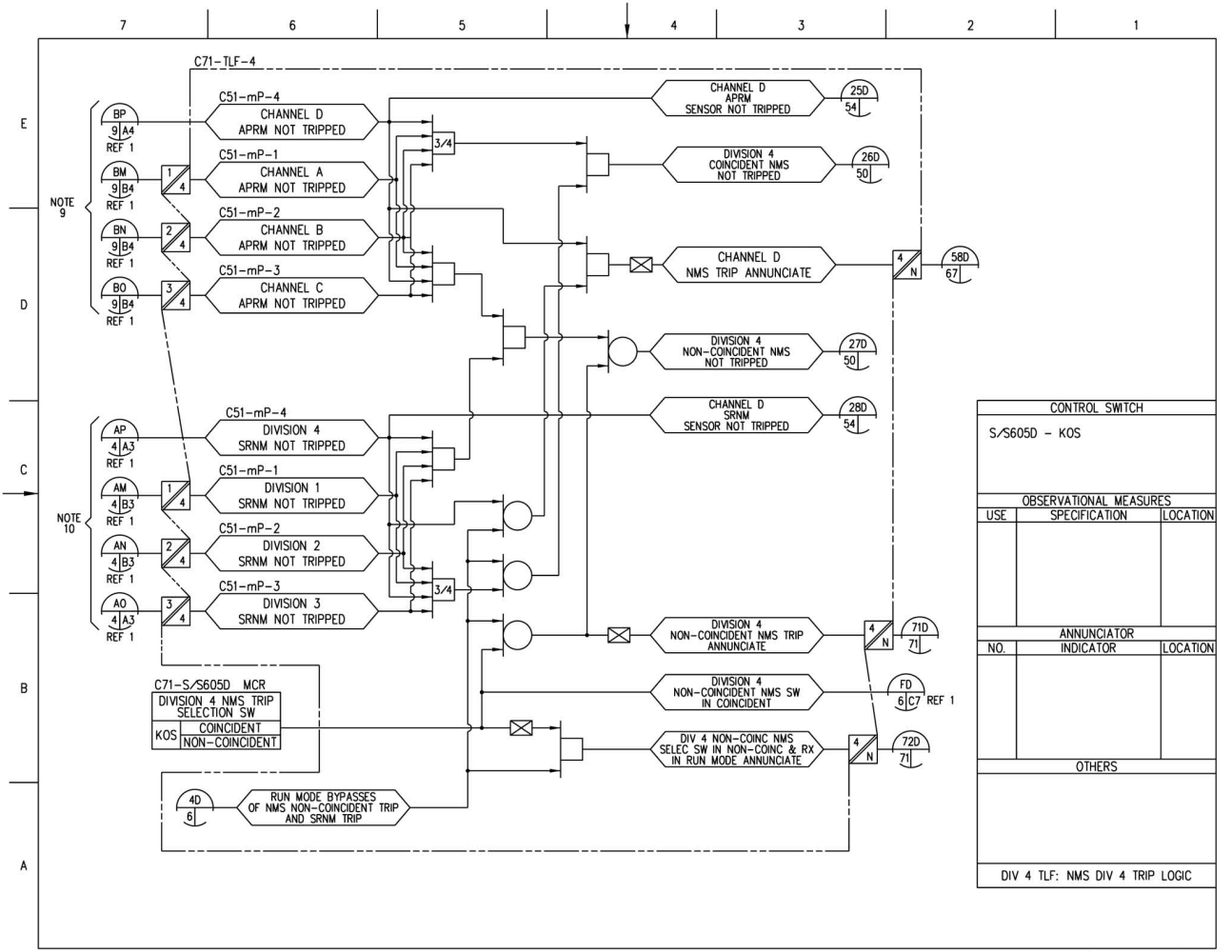


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 22 of 72)
STP 3 & 4 Rev.2

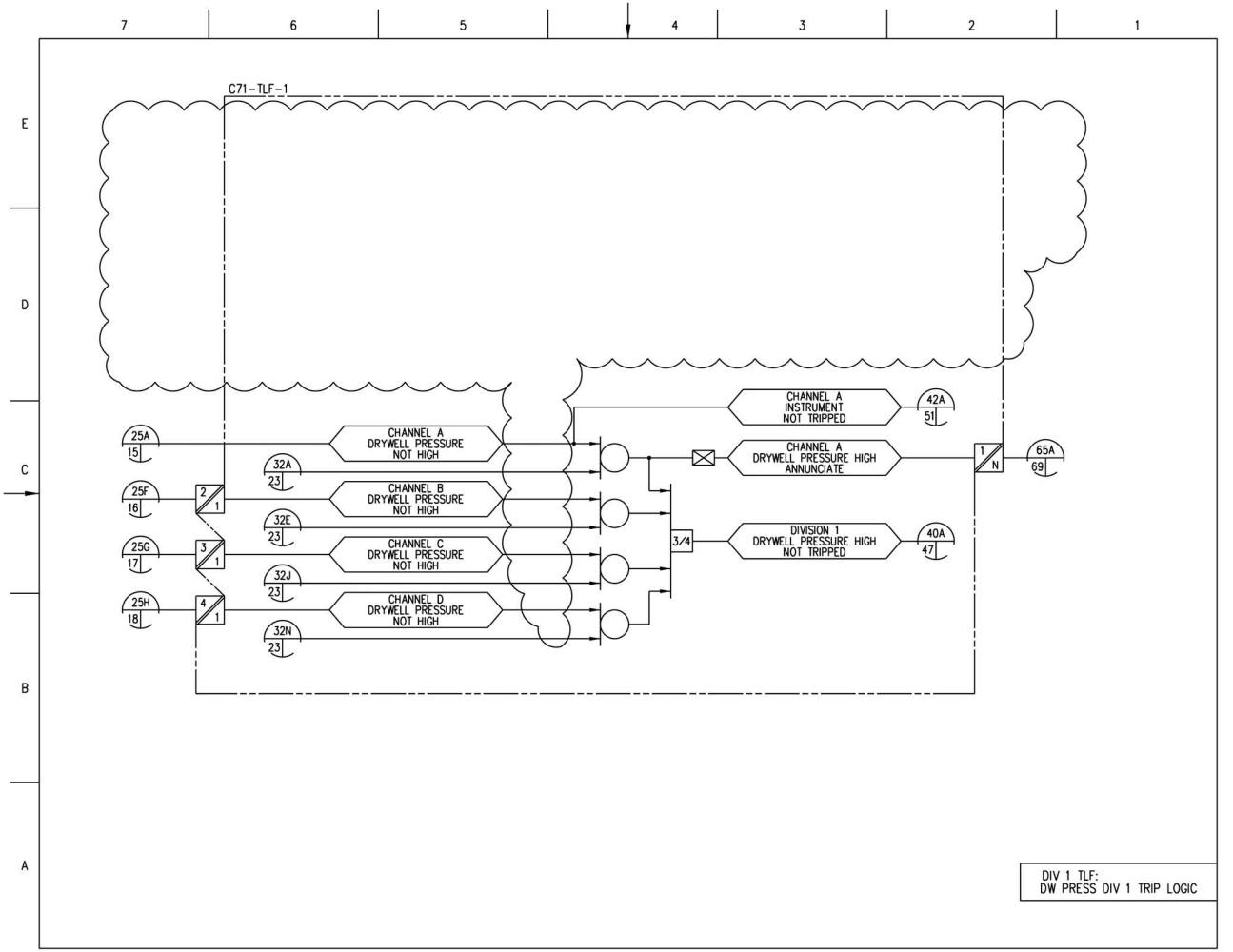


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 39 of 72)
STP 3 & 4 Rev.2

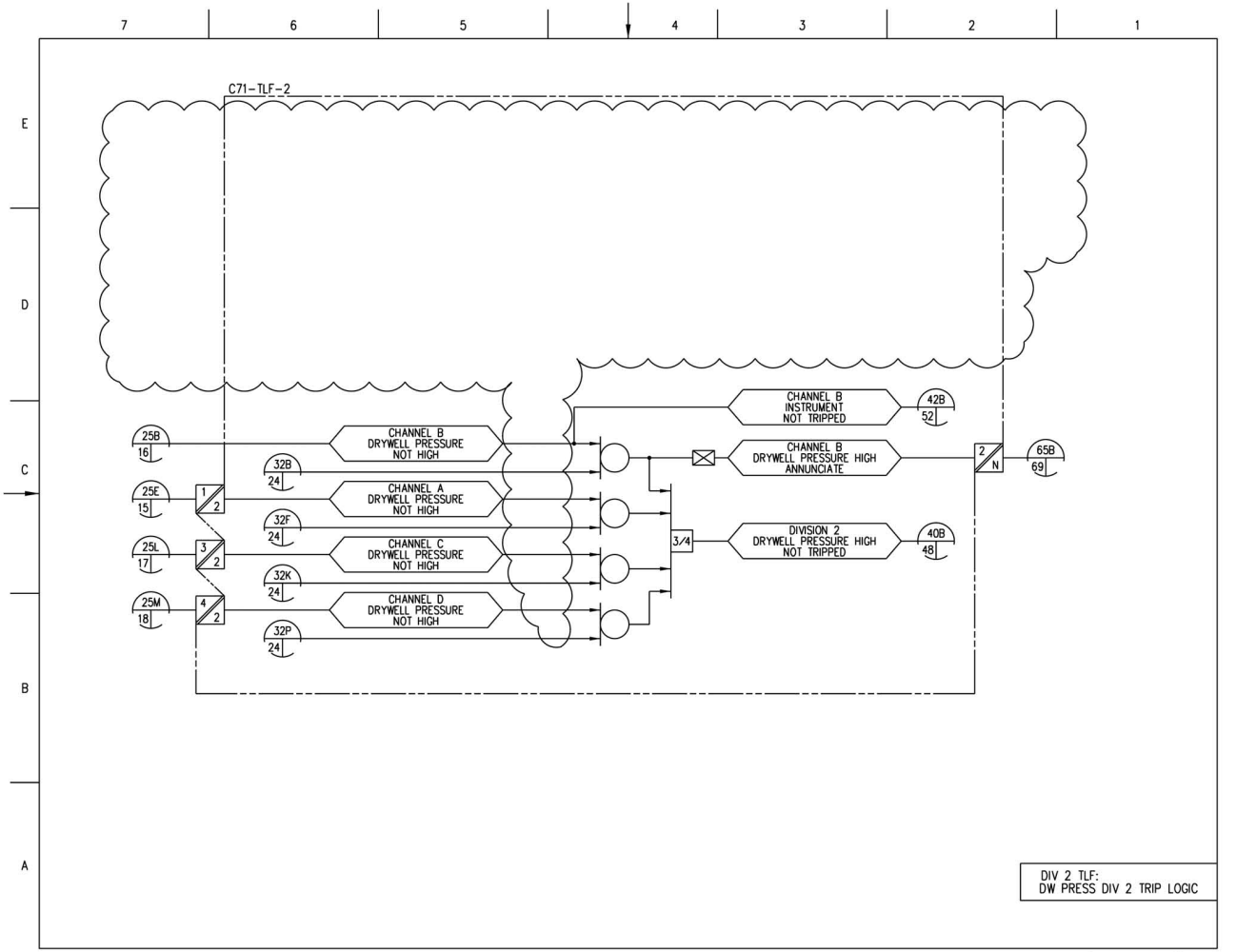


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 40 of 72)
STP 3 & 4 Rev.2

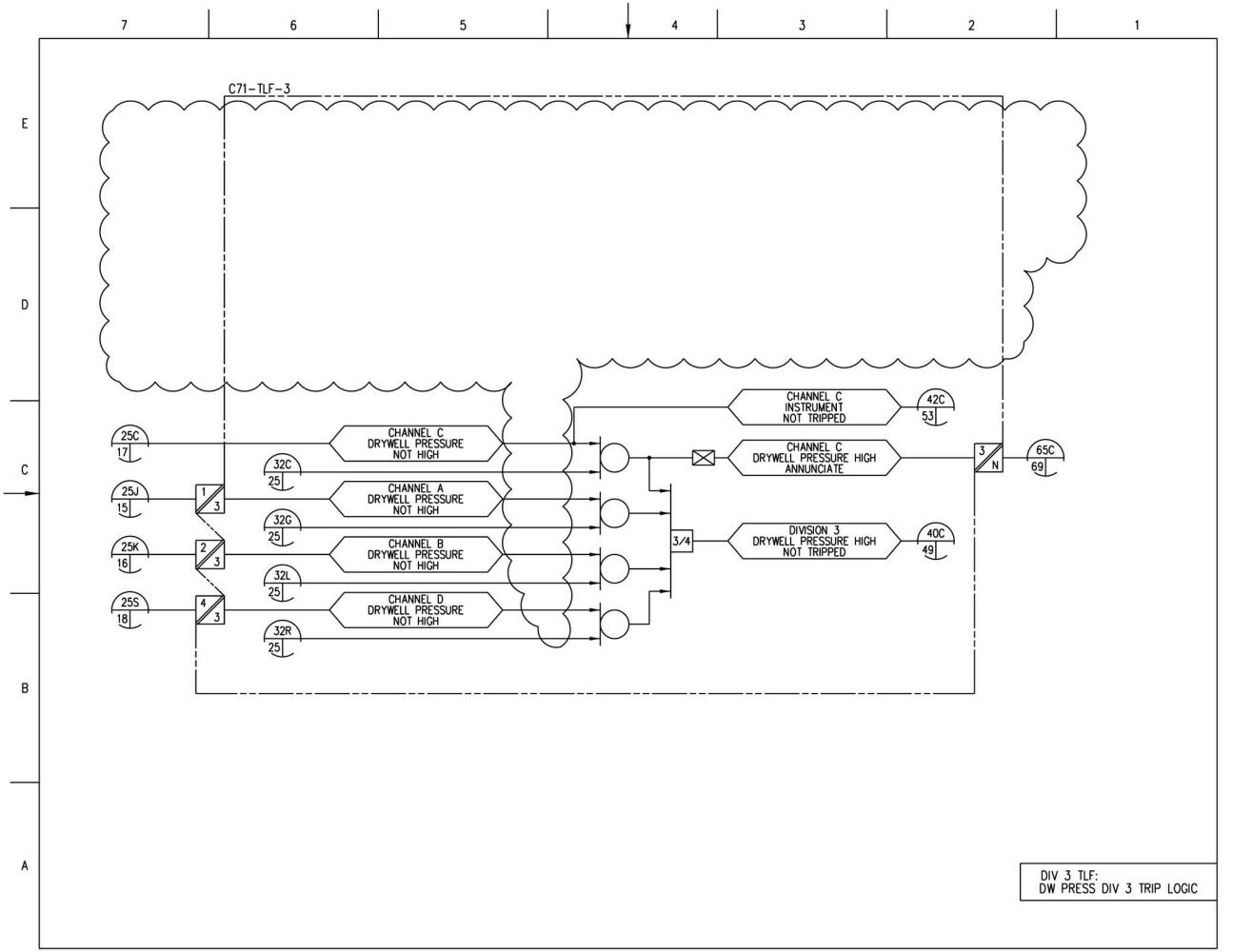


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 41 of 72)
STP 3 & 4 Rev.2

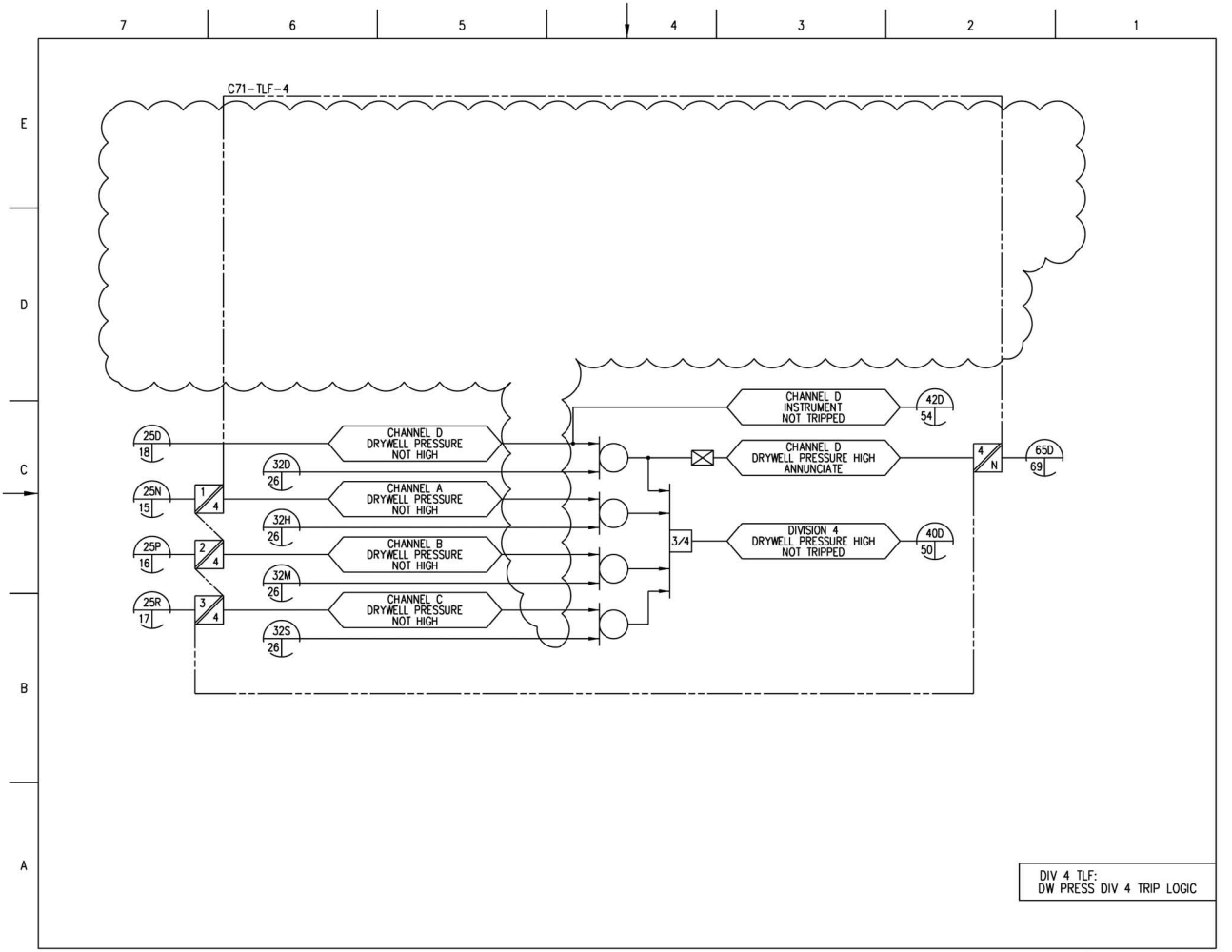


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 42 of 72)

STP 3 & 4 Rev.2

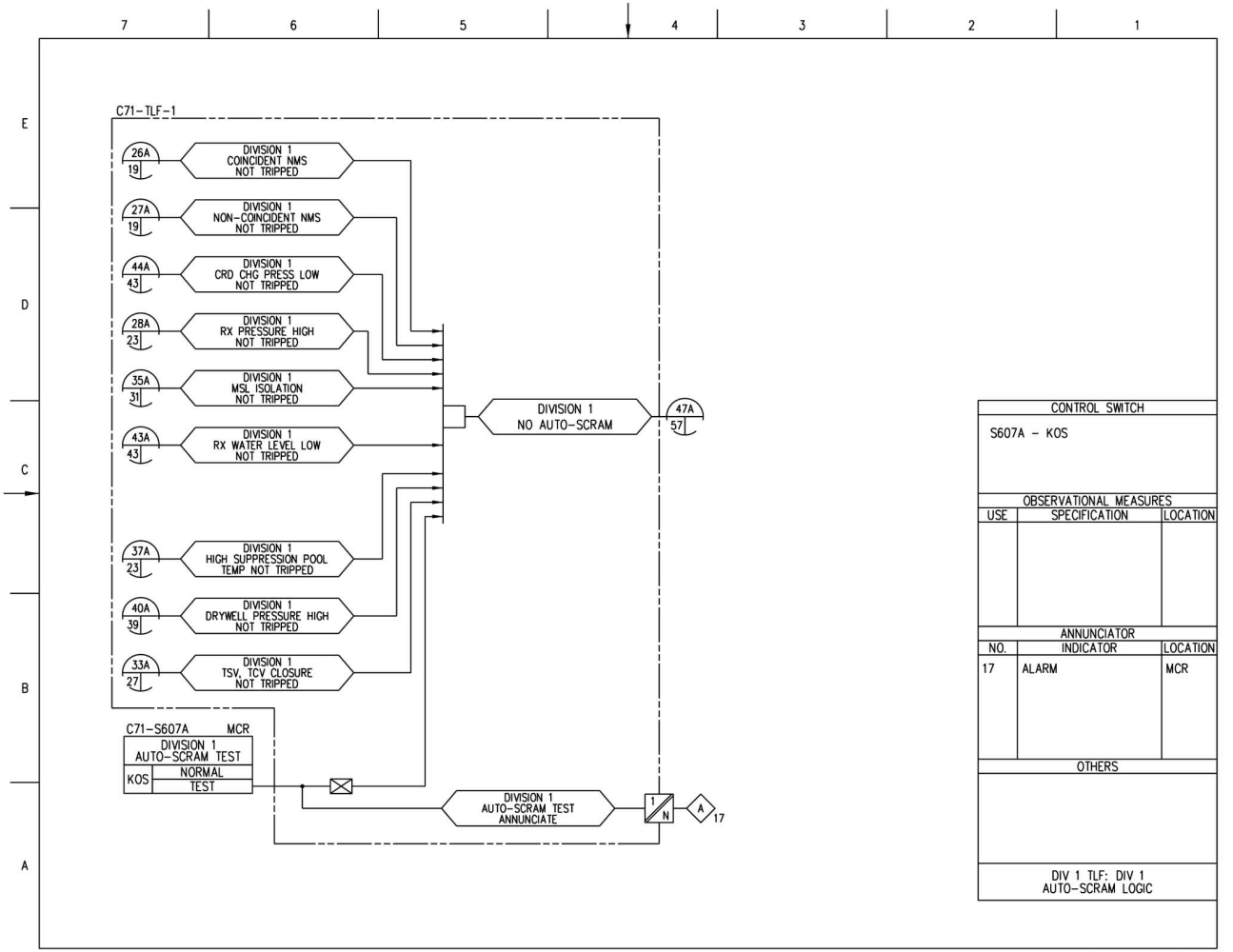


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 47 of 72)
STP 3 & 4 Rev.2

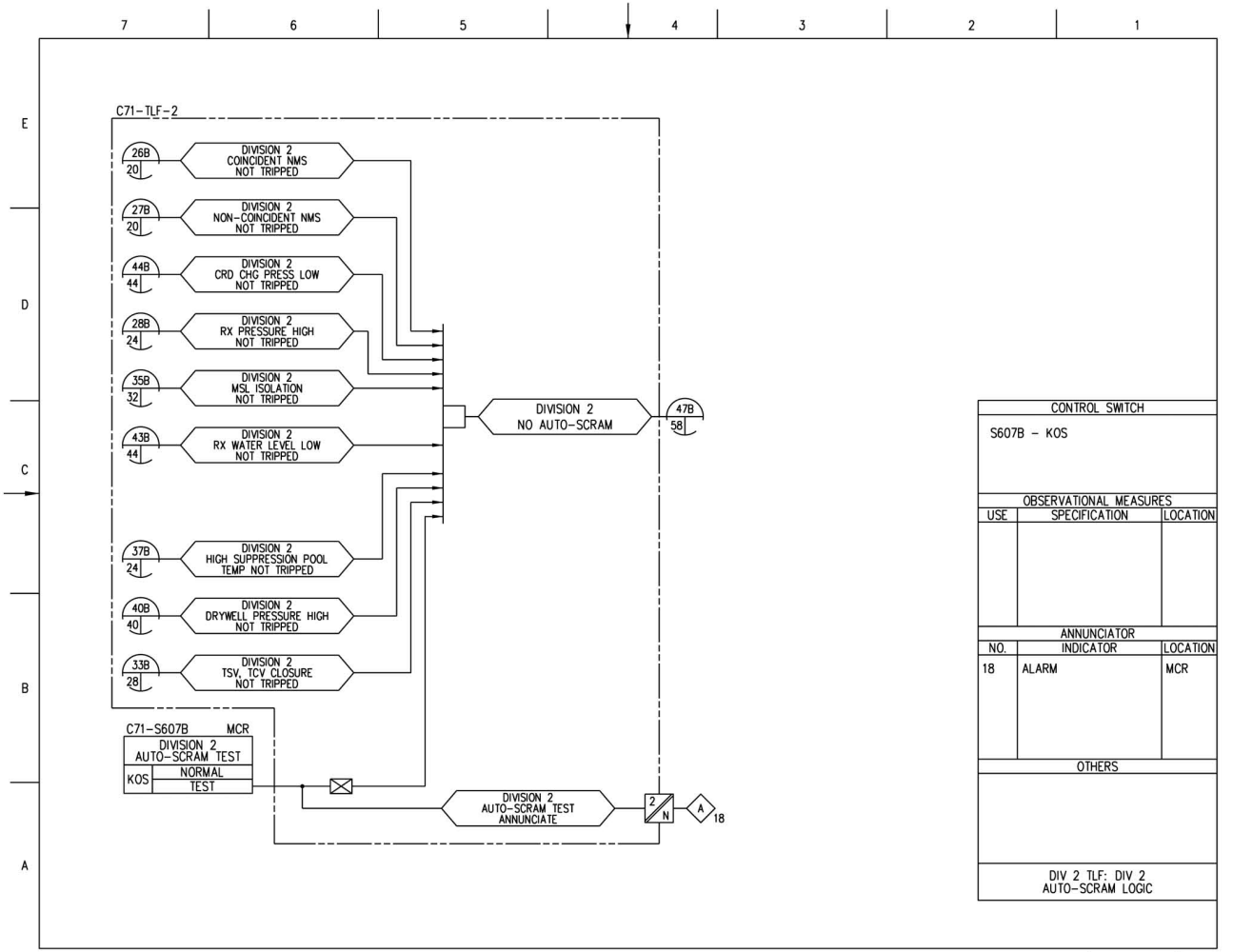


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 48 of 72)
STP 3 & 4 Rev.2

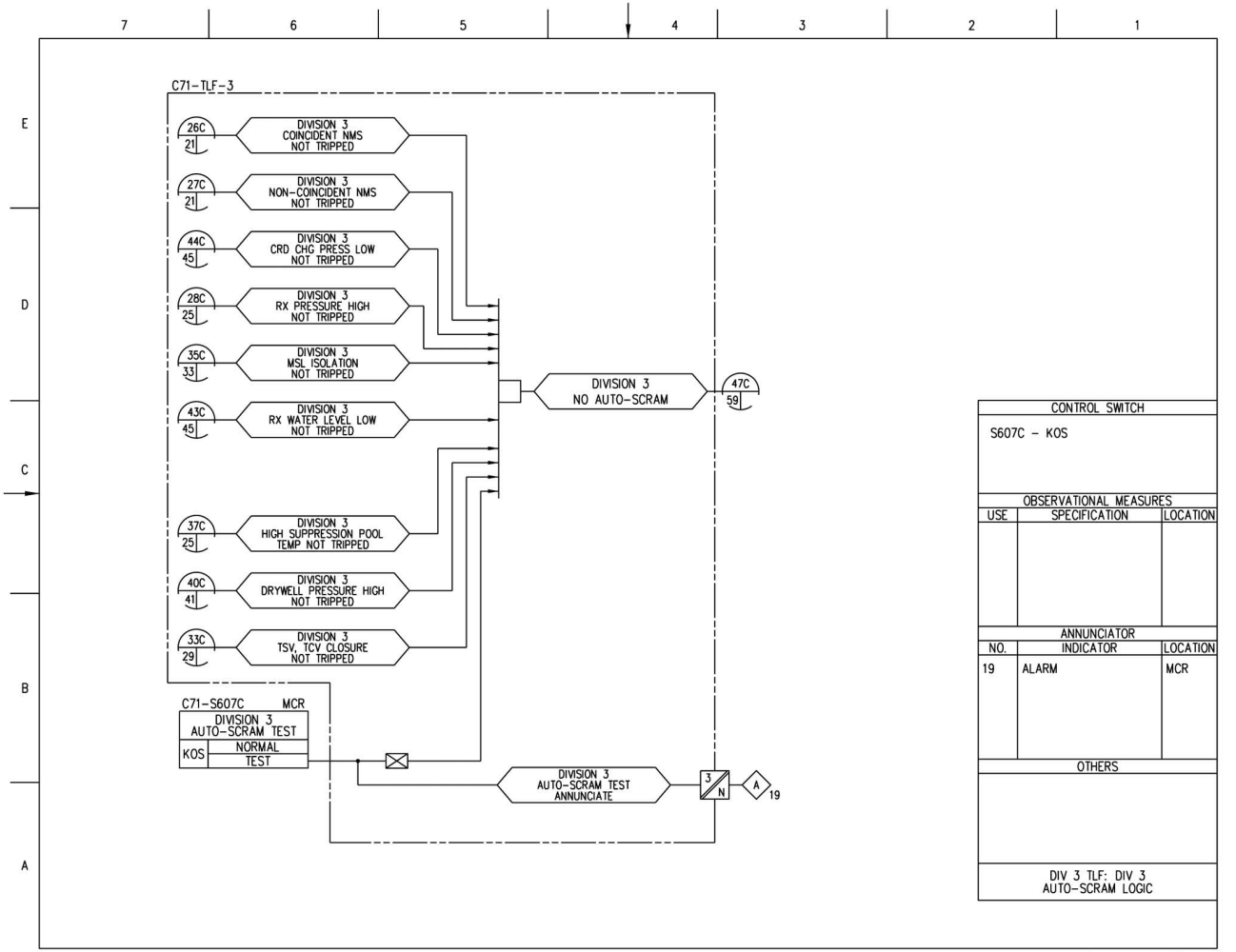


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 49 of 72)
STP 3 & 4 Rev.2

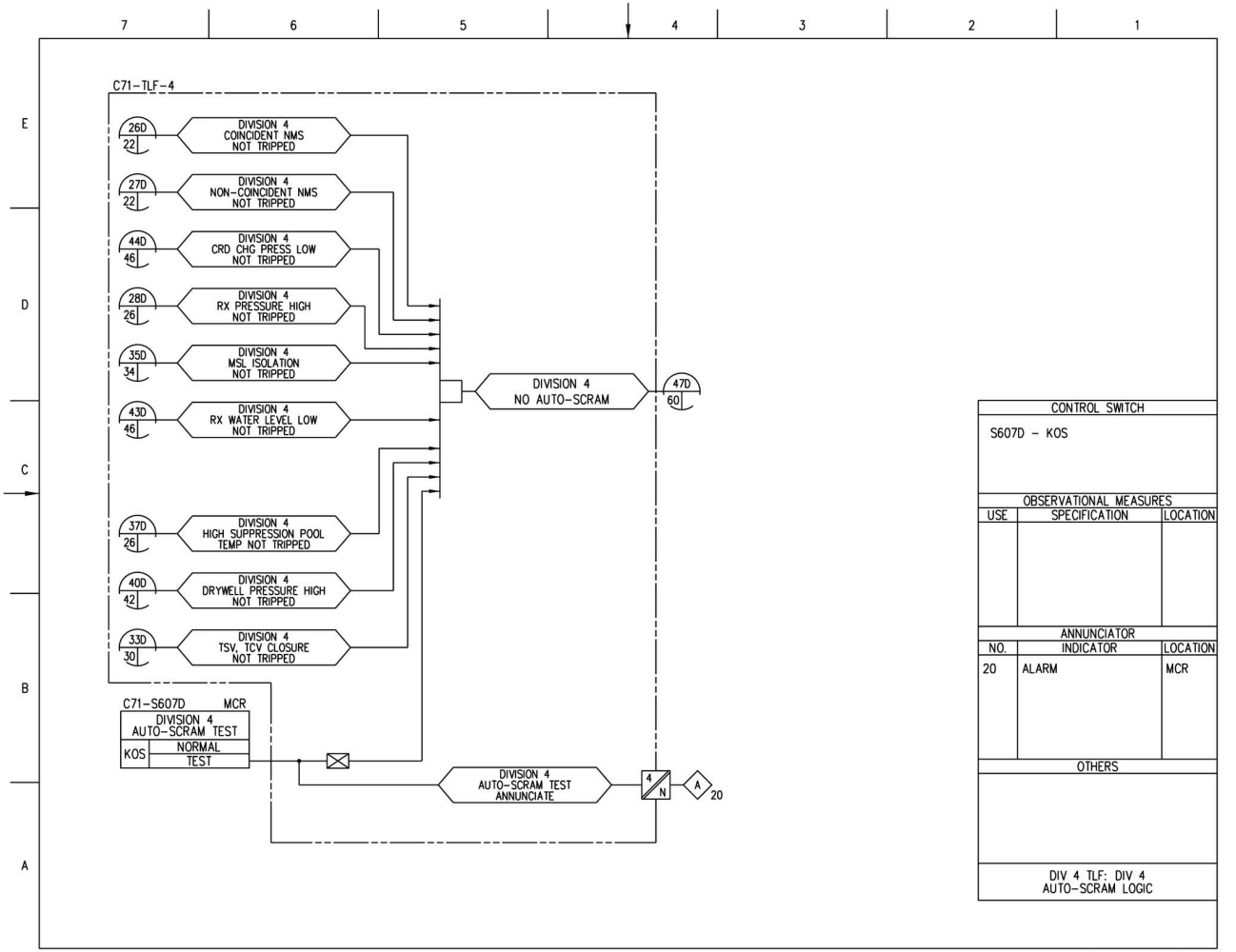


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 50 of 72)
STP 3 & 4 Rev.2

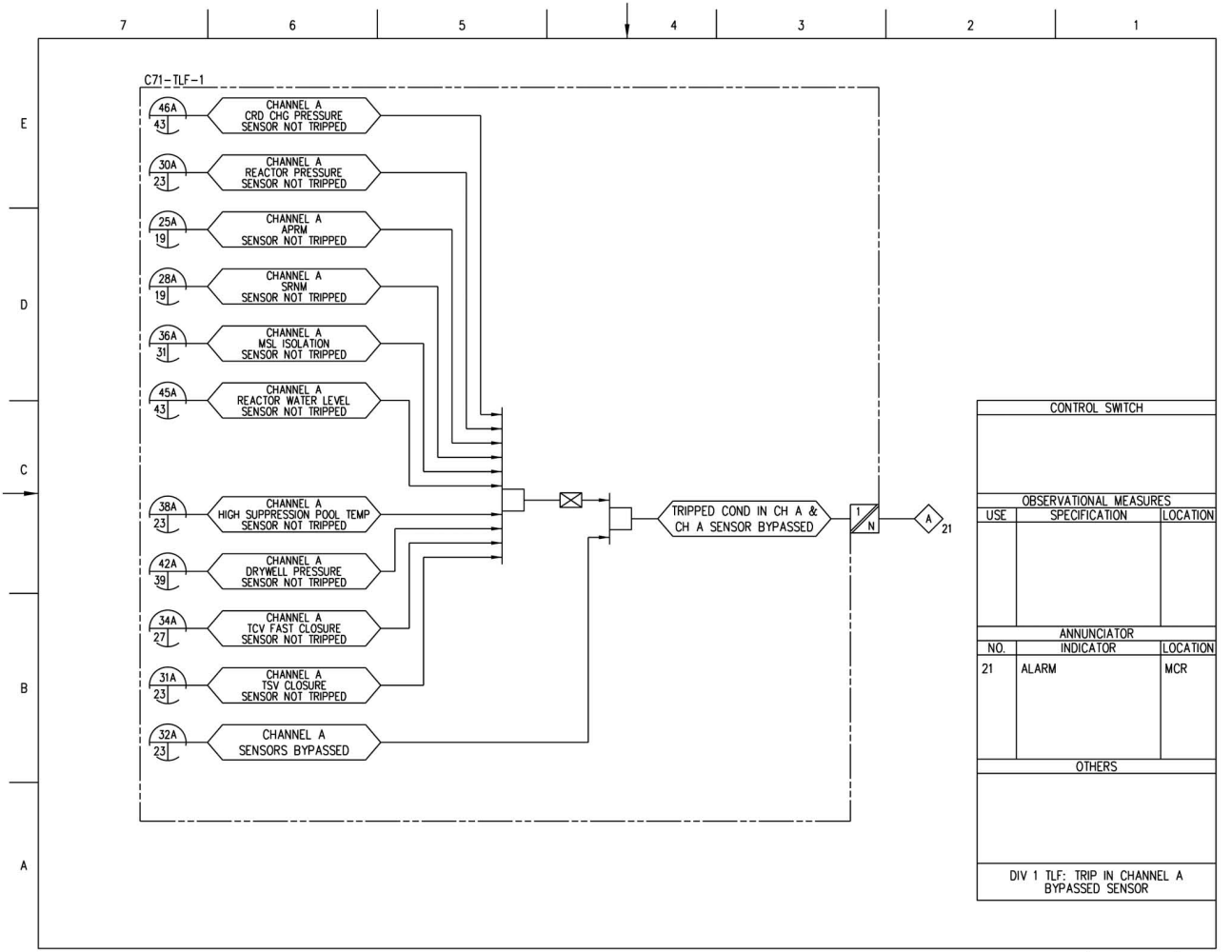


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 51 of 72)
STP 3 & 4 Rev.2

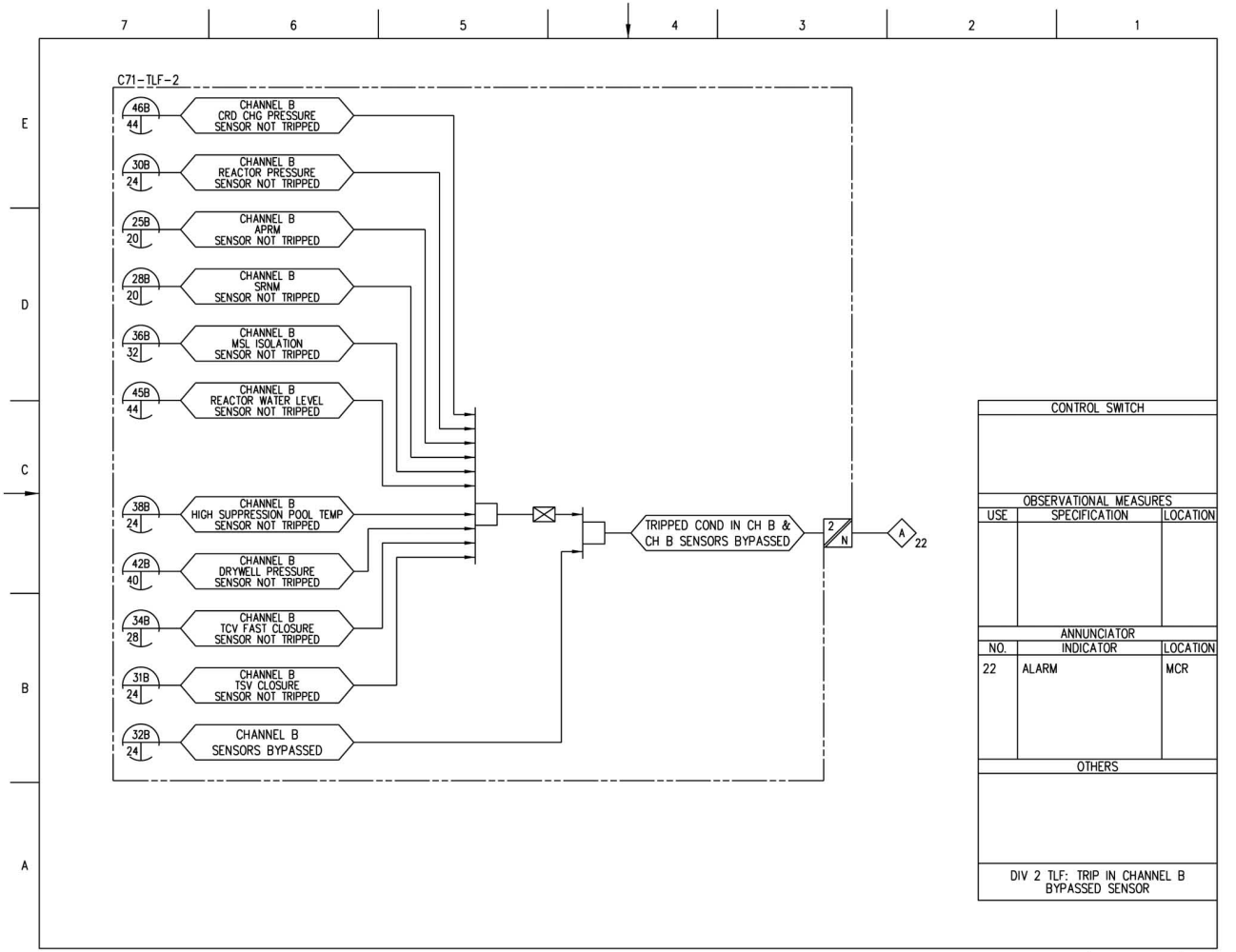


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 52 of 72)
STP 3 & 4 Rev.2

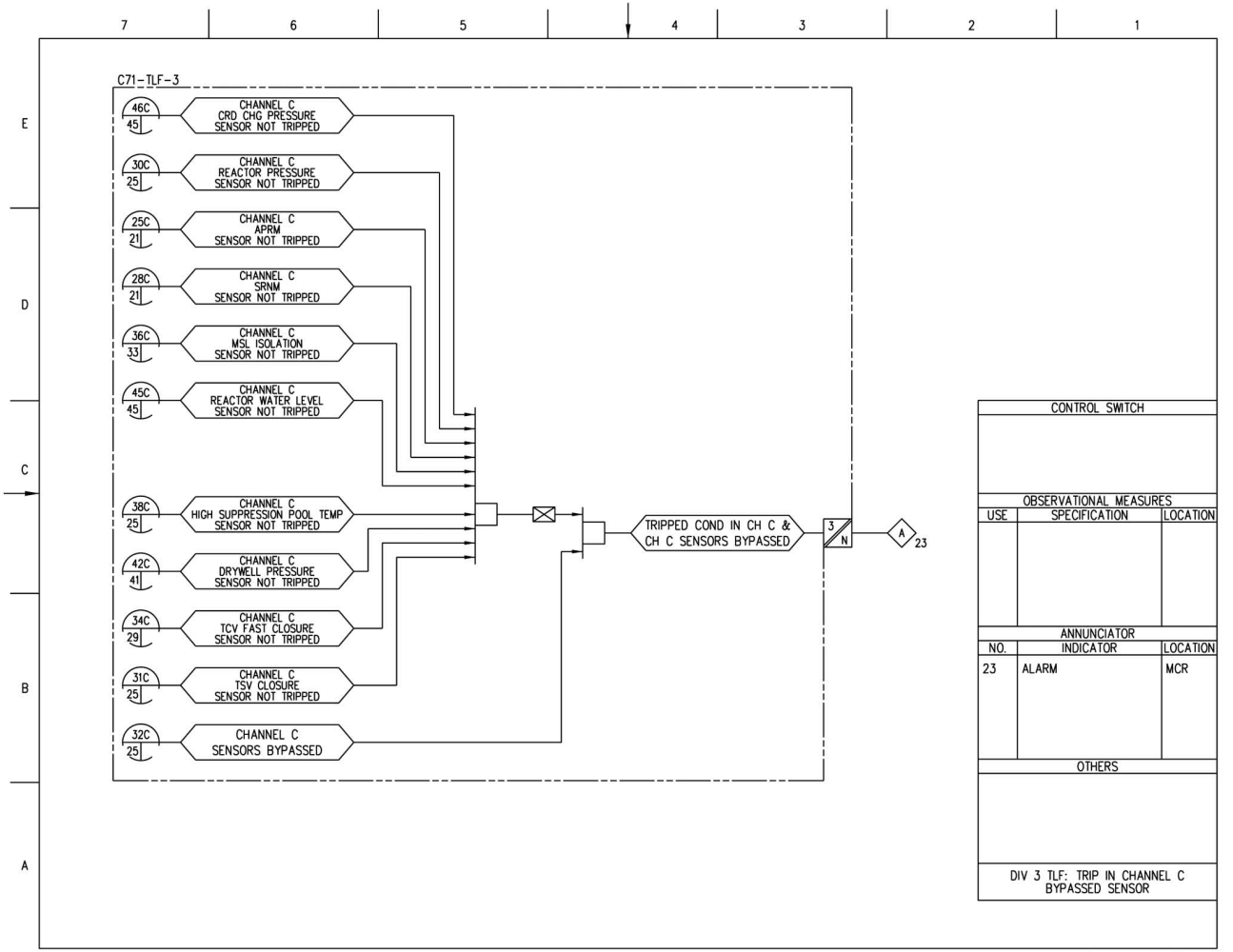


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 53 of 72)
STP 3 & 4 Rev.2

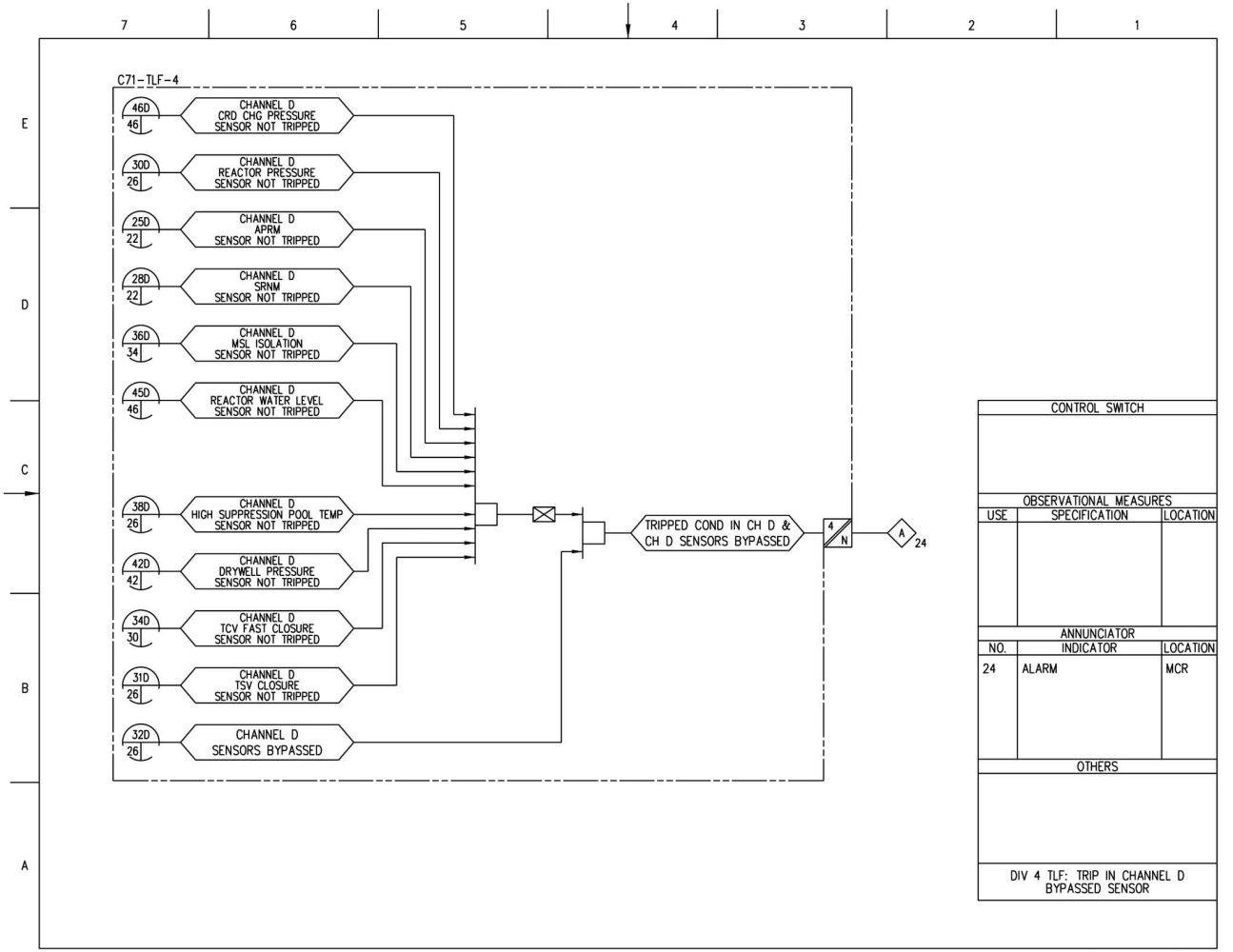


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 54 of 72)

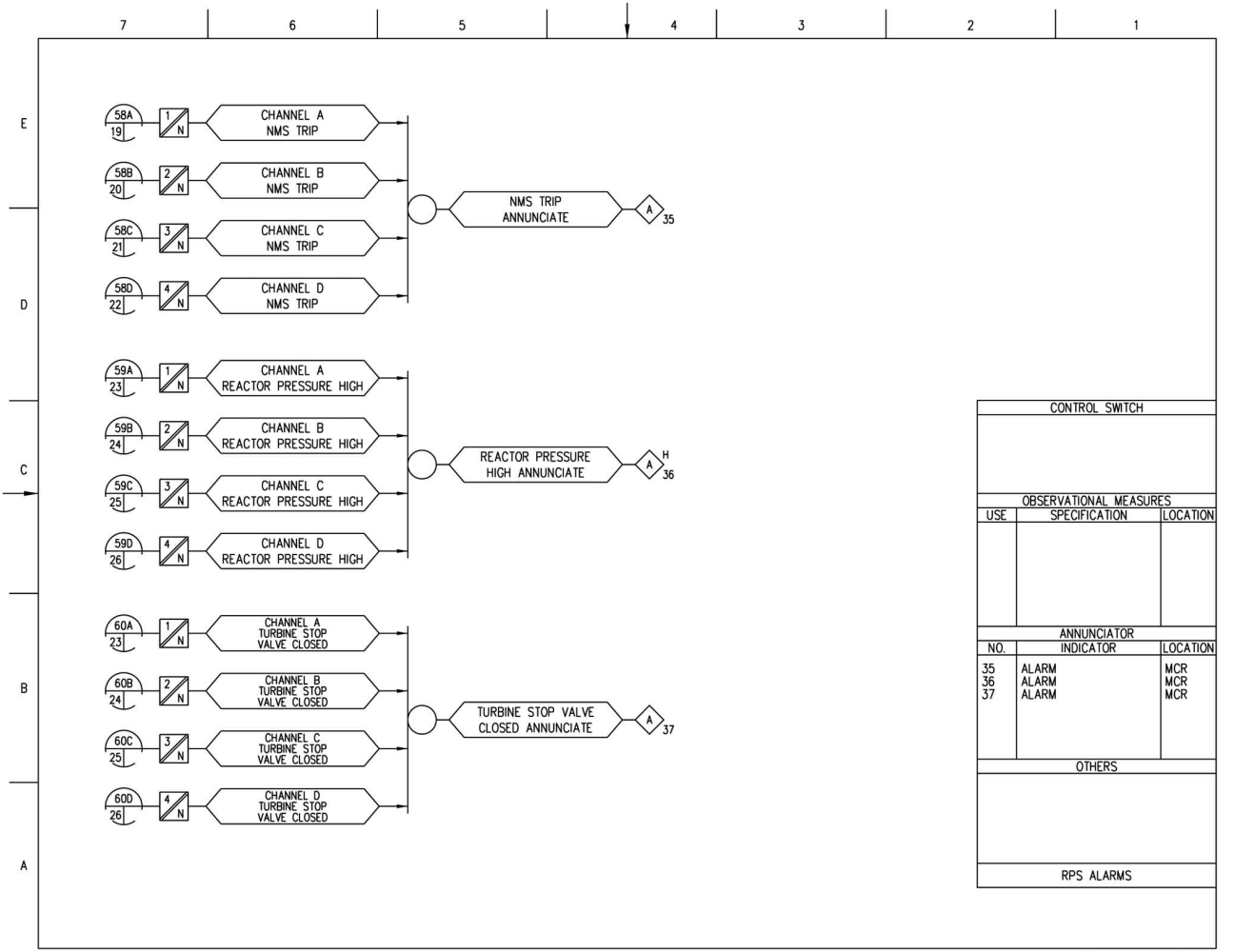


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 67 of 72)
STP 3 & 4 Rev.2

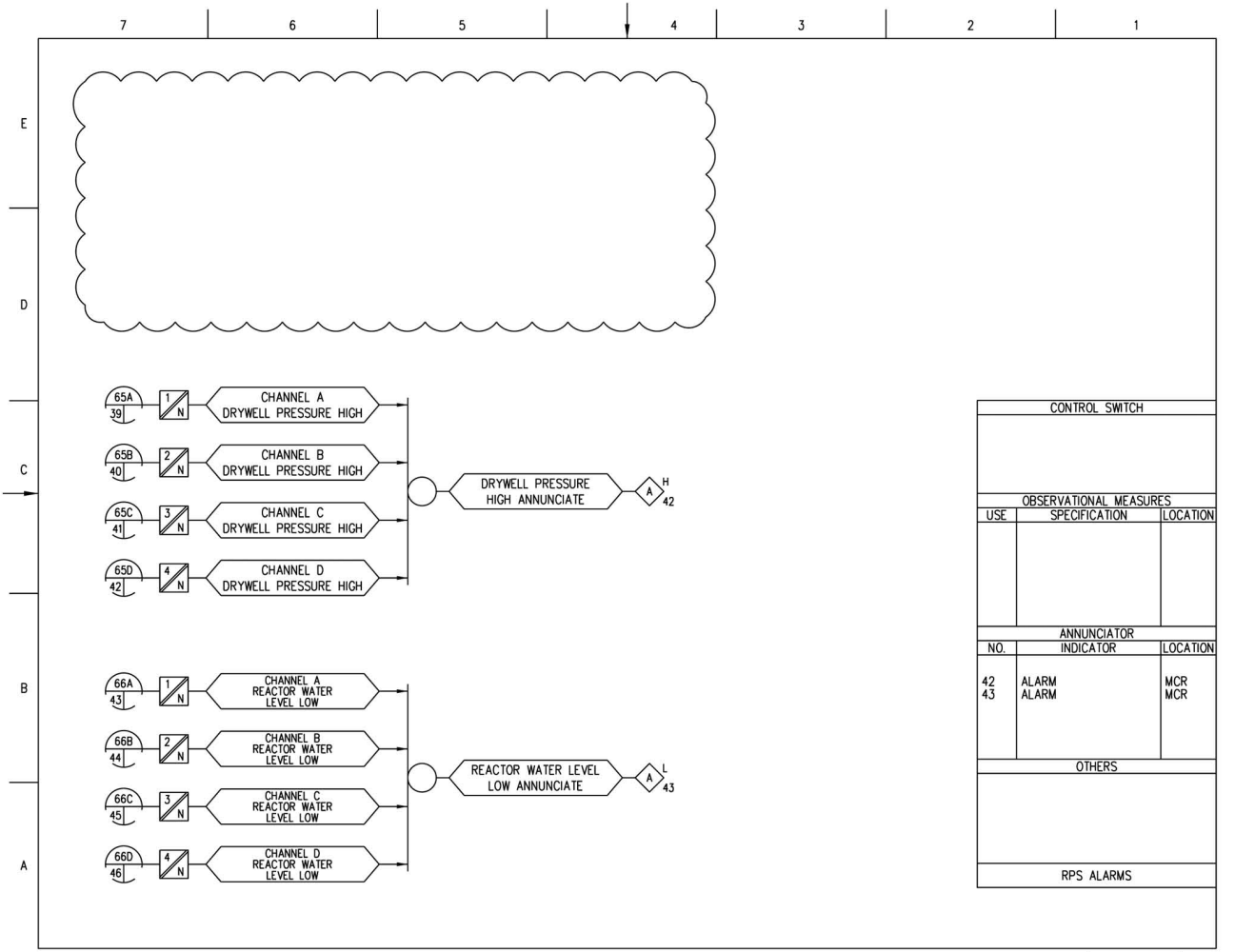


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 69 of 72)
STP 3 & 4 Rev.2

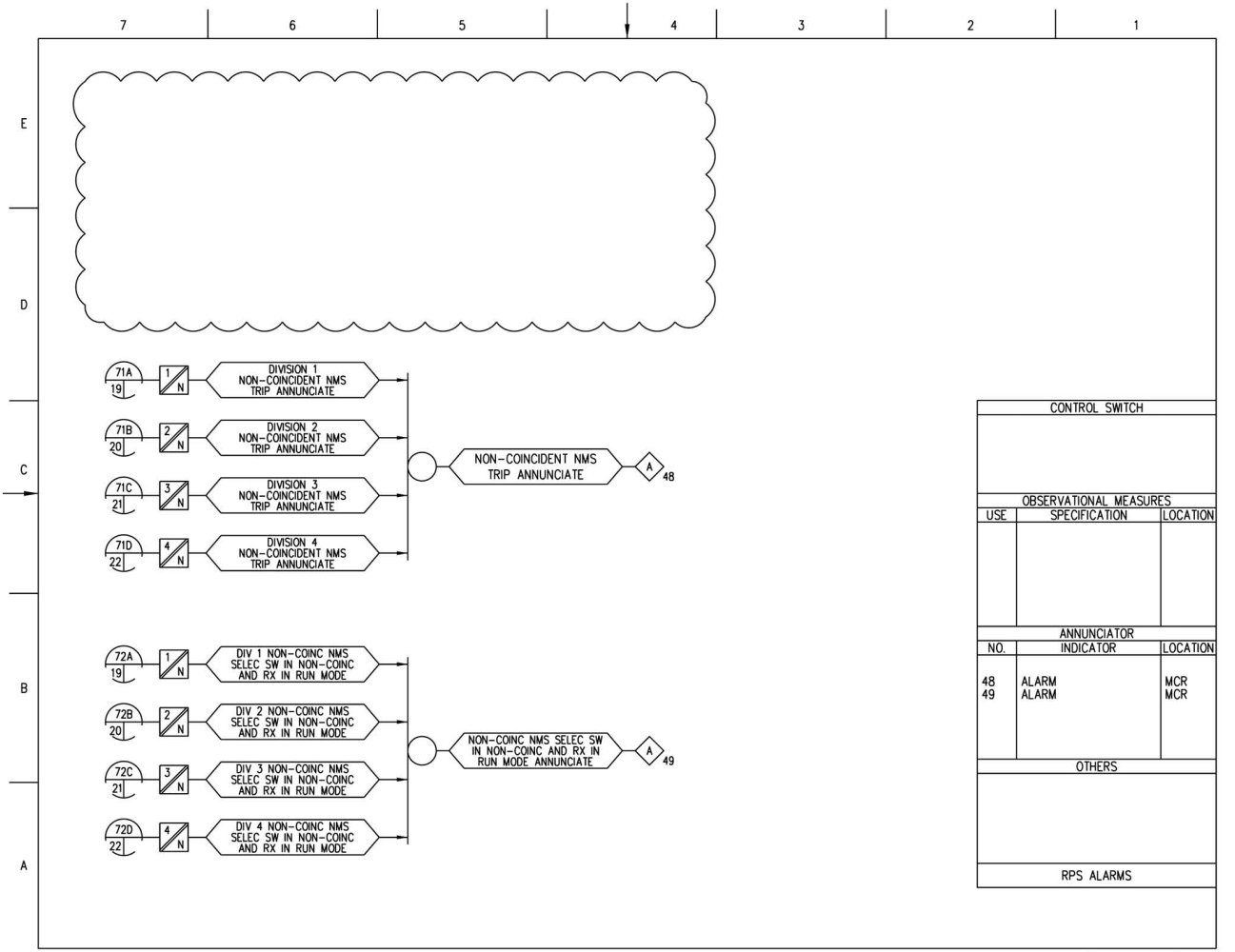


FIGURE 7.2-10 REACTOR PROTECTION SYSTEM IBD (Sheet 71 of 72)

STP 3 & 4 Rev.2