

Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 1 of 17)

TABLE 1: ANNUNCIATOR/ALARM LIST		TABLE 1 (CONT'D) ANNUNCIATOR/ALARM LIST		
INDICATOR	FUNCTION	INITIATING DEVICE		
ALARMS				
		RCIC TURBINE EXHAUST PRESSURE HIGH	PIS-Z614A,E,B,F	
		RCIC TURBINE EXHAUST LINE DISCHARGE PRESSURE HIGH	PIS-Z613A,E	
		RCIC PUMP SUCTION PRESSURE HIGH	PIS-Z601	
		RCIC PUMP SUCTION PRESSURE LOW	PIS-Z602	
		RCIC AREA TEMP HIGH	E31-PS Z605A,B,C,D	
		RCIC STEAM LINE FLOW HIGH	E31-FS Z606A,B,C,D	
		RCIC STEAMLINE PRESSURE LOW	E31-PS Z607A,B,C,D	
		RCIC ISOLATED	E31 LOGIC OUTPUT	
		STEAM SUPPLY WARM-UP VALVE F048 NOT FULLY CLOSED	LIMIT SWITCH	
		STEAM SUPPLY OUTBOARD ISOLATION VALVE F036 NOT FULLY OPENED	LIMIT SWITCH	
		STEAM SUPPLY INBOARD ISOLATION VALVE F035 NOT FULLY OPENED	LIMIT SWITCH	
		RCIC TURBINE EXHAUST VALVE F039 NOT FULLY OPENED	LIMIT SWITCH	
		RCIC TURBINE INLET STEAM LINE WATER DRAIN POT LEVEL HIGH	LS011	
		RCIC DISCHARGE LINE NOT FILLED	PIS-Z608	
		CONDENSATE STORAGE TANK TO SUPPRESSION POOL SUCTION AUTO TRANSFER OVERRIDE	KOS	
		SUPPRESSION POOL WATER TEMPERATURE HIGH	TIS-Z604	

TABLE 1 (CONT'D) ANNUNCIATOR/ALARM LIST		TABLE 1 (CONT'D) ANNUNCIATOR/ALARM LIST		
INDICATOR	FUNCTION	INITIATING DEVICE		
ALARMS				
		RCIC MANUAL INITIATION SWITCH IN ARMED POSITION	PBS	
		RCIC OUT OF SERVICE	COS LOGIC OUTPUT	
		RCIC LOW FLOW	FIS-Z607	
		RCIC TURBINE TRIP AND THROTTLE VALVE NOT FULLY OPENED	LIMIT SWITCH	
		SUPPRESSION POOL WATER LEVEL HIGH	LOGIC OUTPUT	
		CONDENSATE STORAGE TANK WATER LEVEL LOW	LOGIC OUTPUT	
		RCIC TEST	COS	
		RPV WATER LEVEL LOW (L2)	LOGIC OUTPUT	
		DRYWELL PRESSURE HIGH	LOGIC OUTPUT	
		RCIC INITIATION SIGNAL	LOGIC OUTPUT	
		RPV WATER LEVEL HIGH (L8)	LOGIC OUTPUT	
	ANY RCIC VALVE OVERLOAD OR POWER LOSS	MCC		
	RCIC LOGIC POWER FAILURE	LOGIC OUTPUT		
	STEAM SUPPLY TO TURBINE VALVE F037 CLOSED ON HIGH WATER LEVEL (L8)	LIMIT SWITCH, LOGIC OUTPUT		
	THERMAL OVERLOAD RELAY BYPASS CONTROL SWITCH IN "TEST"	KOS		

Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 2 of 17)

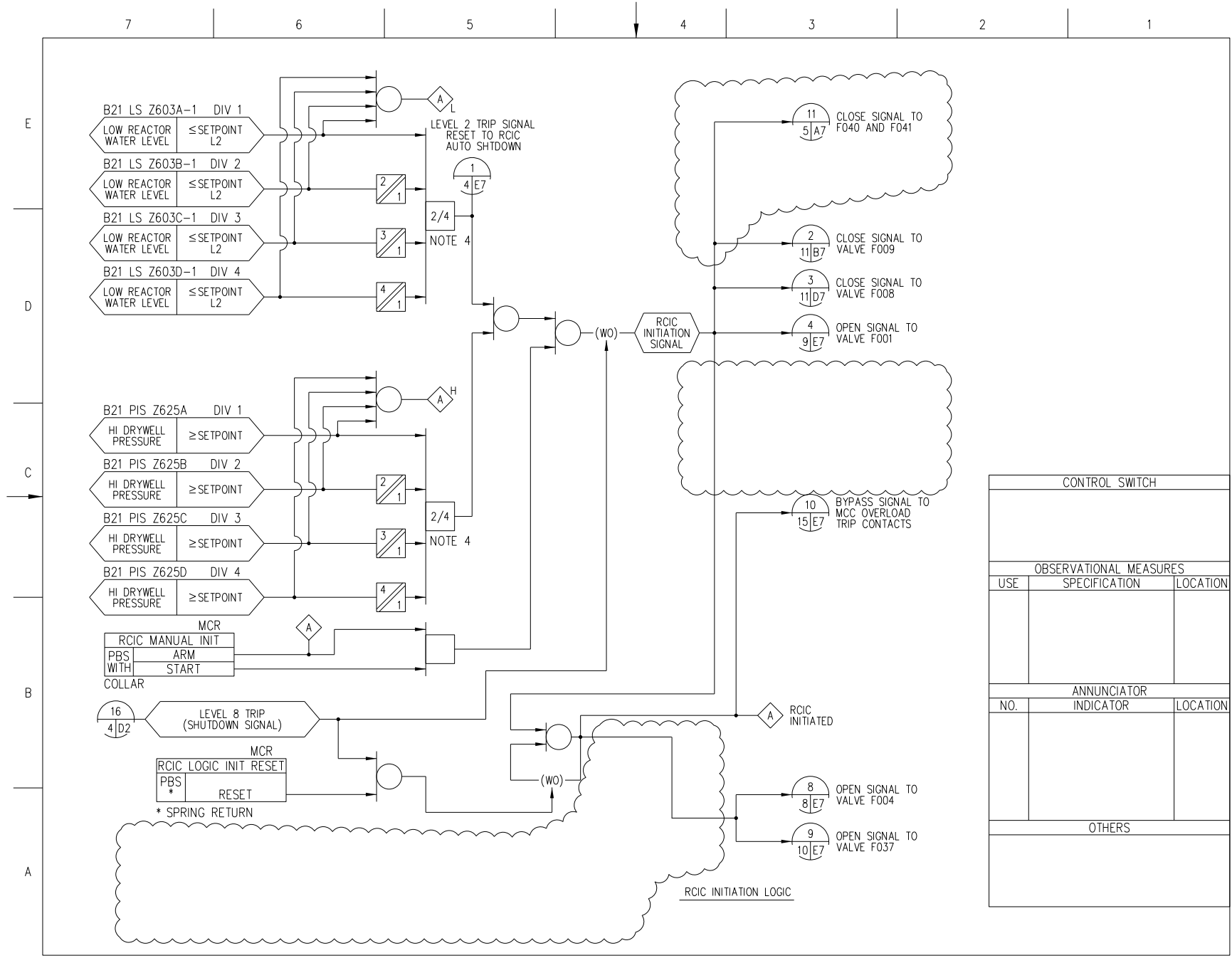
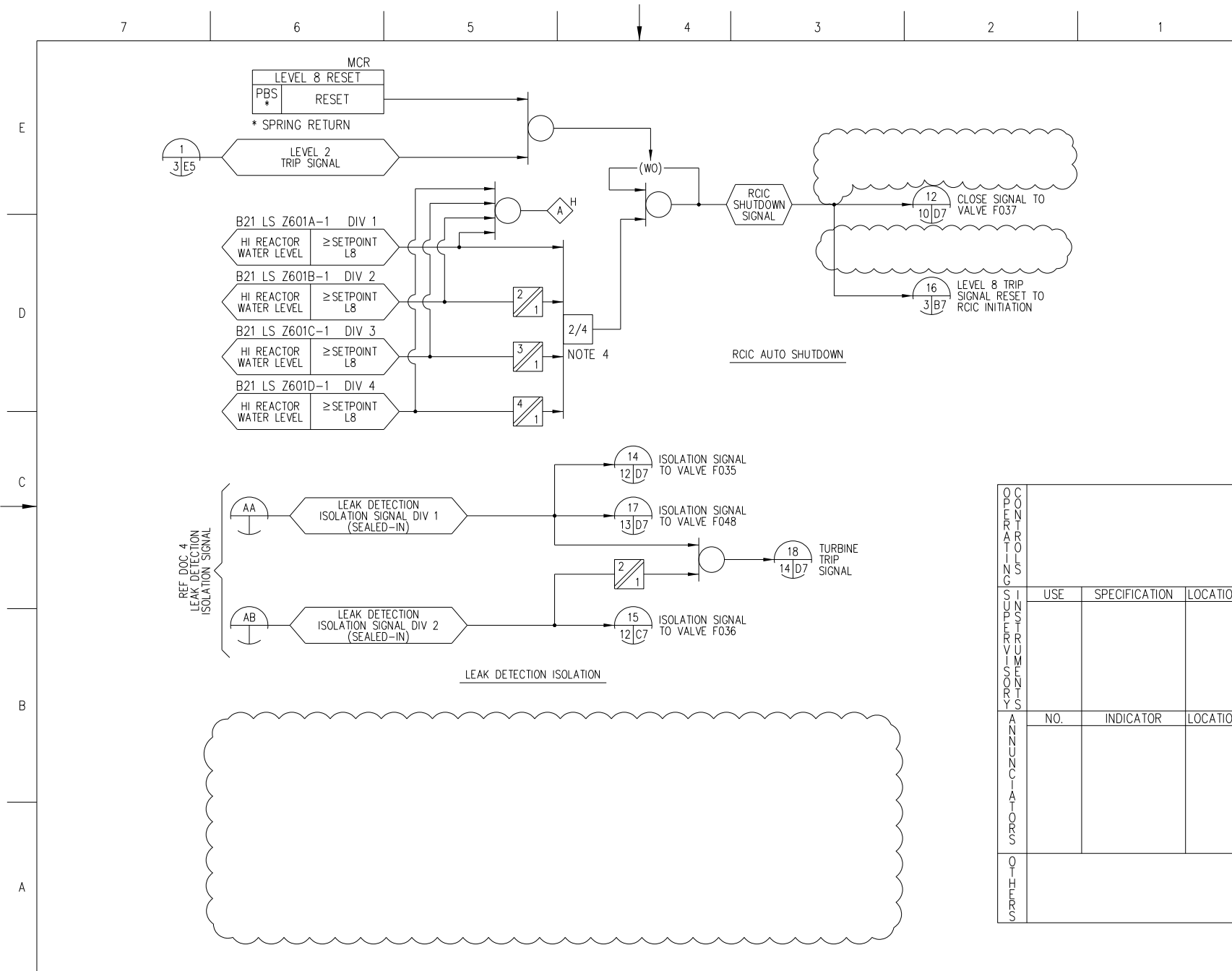


Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 3 of 17)



OPERATORS	USE	SPECIFICATION	LOCATION
ANNUNCIATORS	NO.	INDICATOR	LOCATION
OTHERS			

Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 4 of 17)

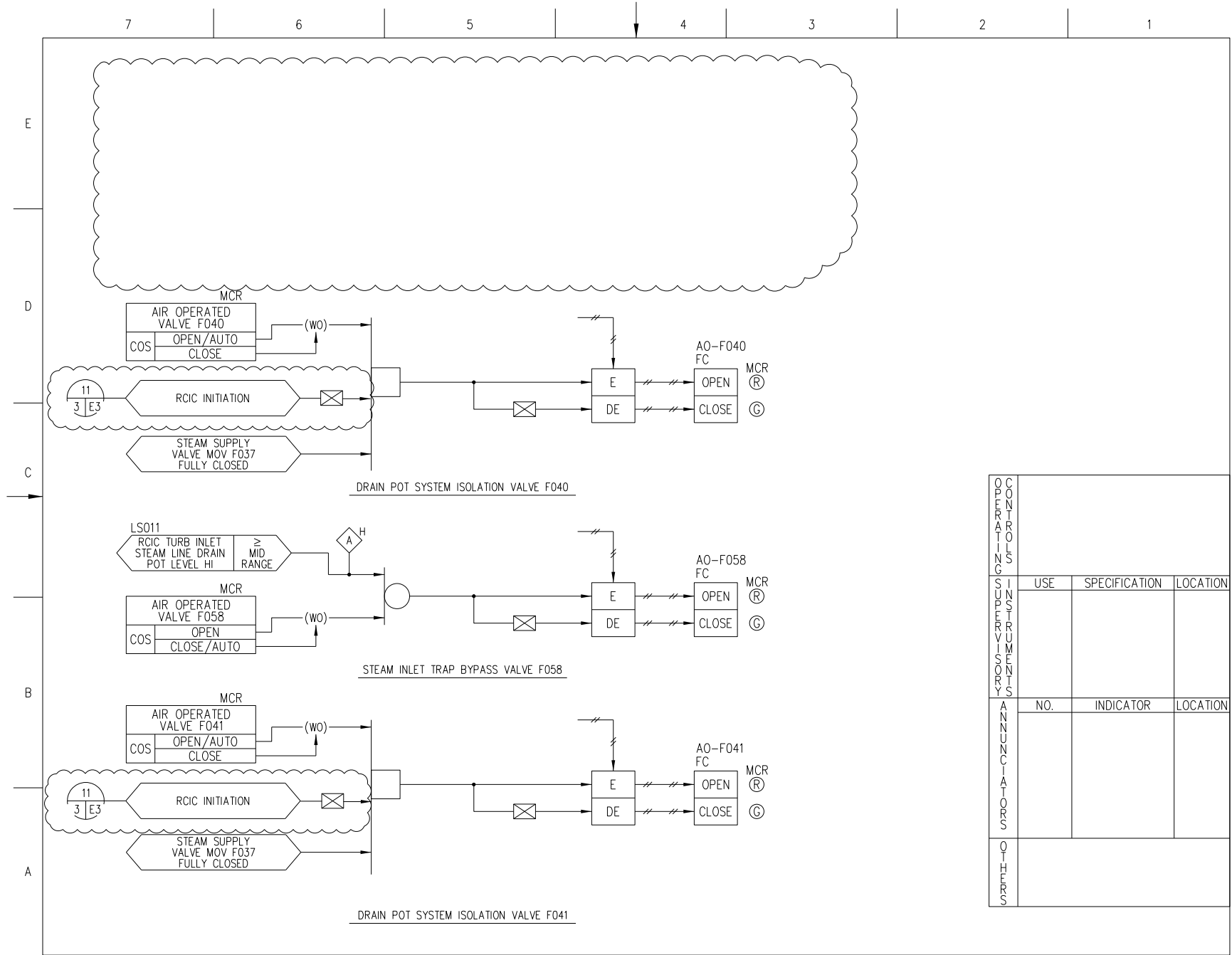


Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 5 of 17)

CONTROL SIGNALS	USE	SPECIFICATION	LOCATION
NON-CONTROL SIGNALS	NO.	INDICATOR	LOCATION
ANNUNCIATORS			
OTHERS			

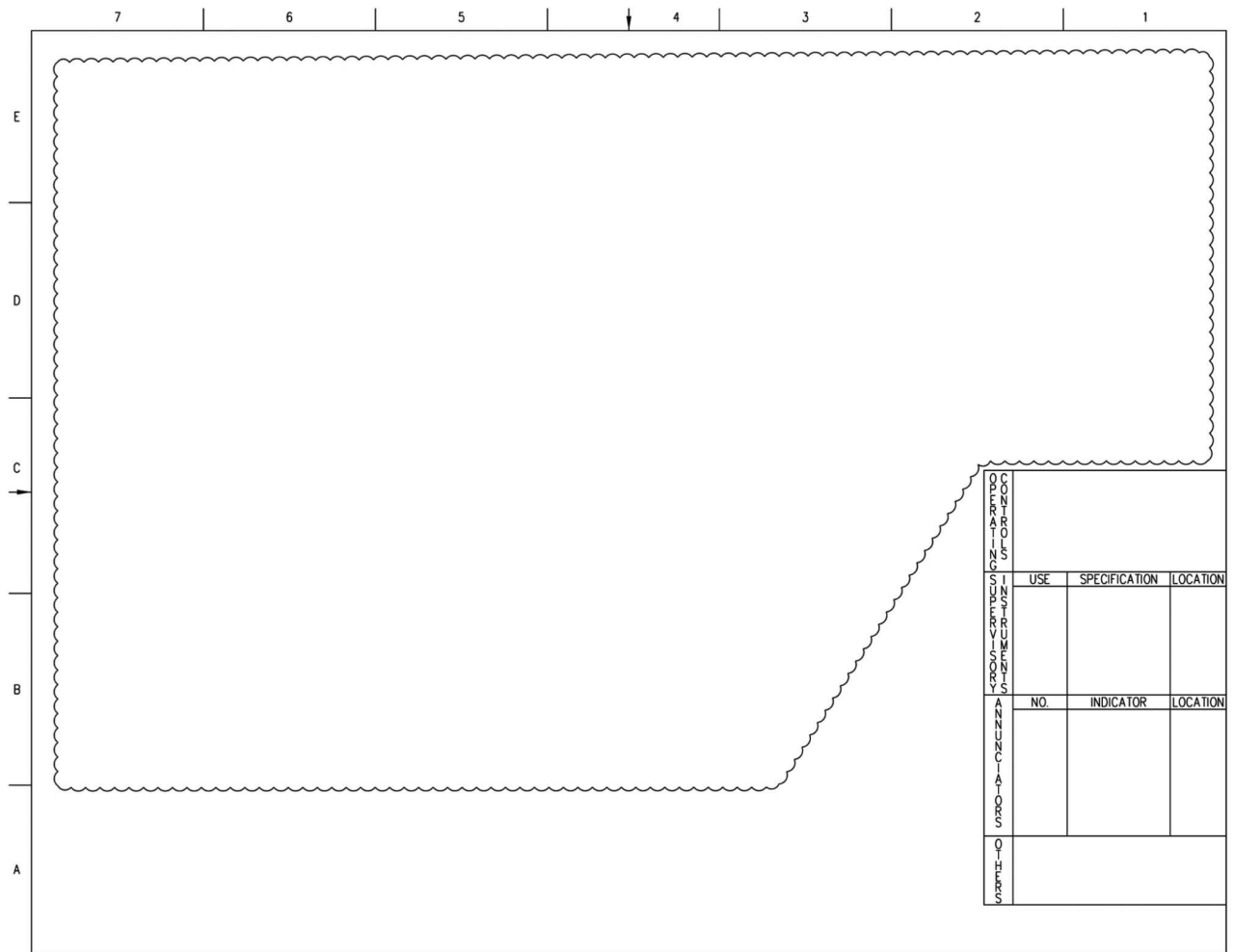


Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 6 of 17)

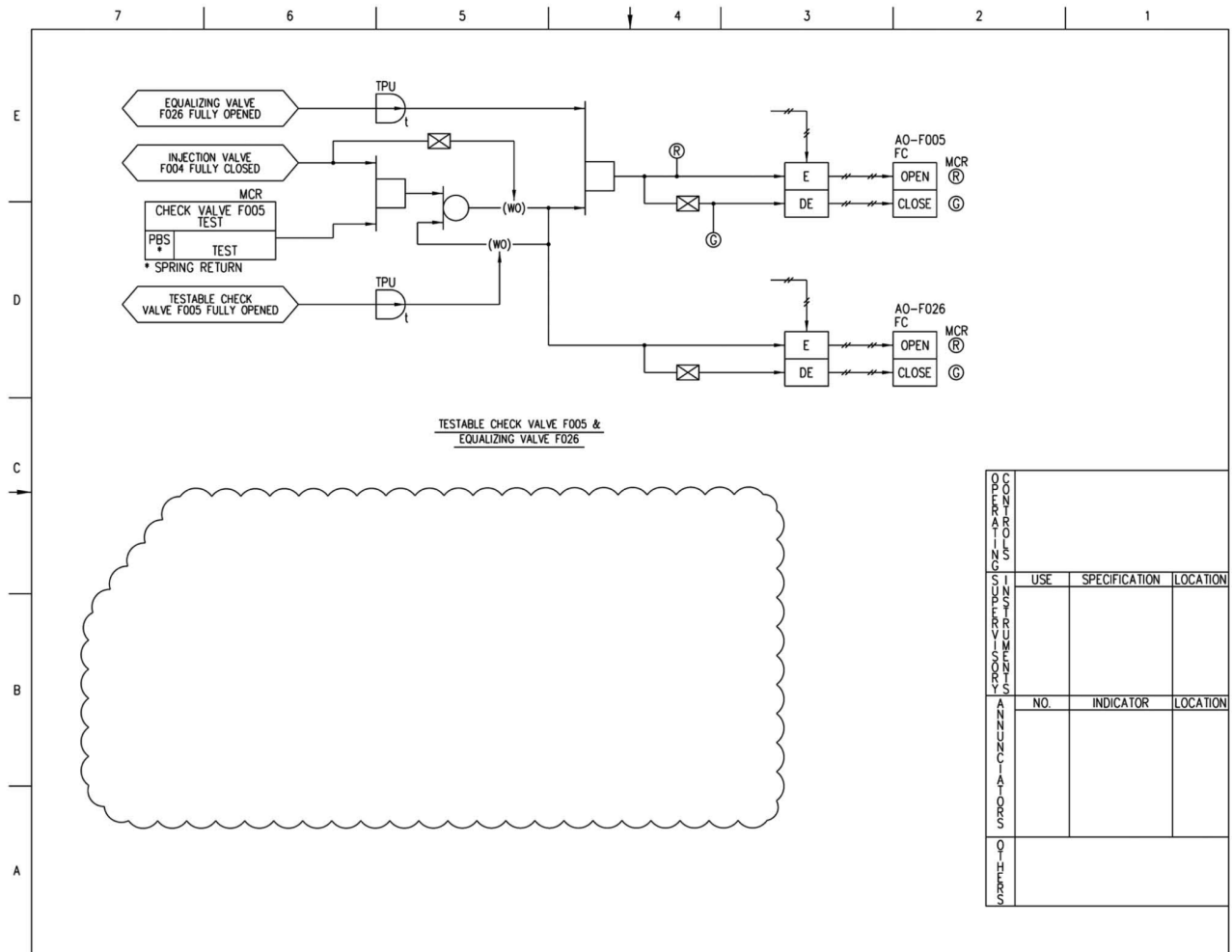


Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 7 of 17)

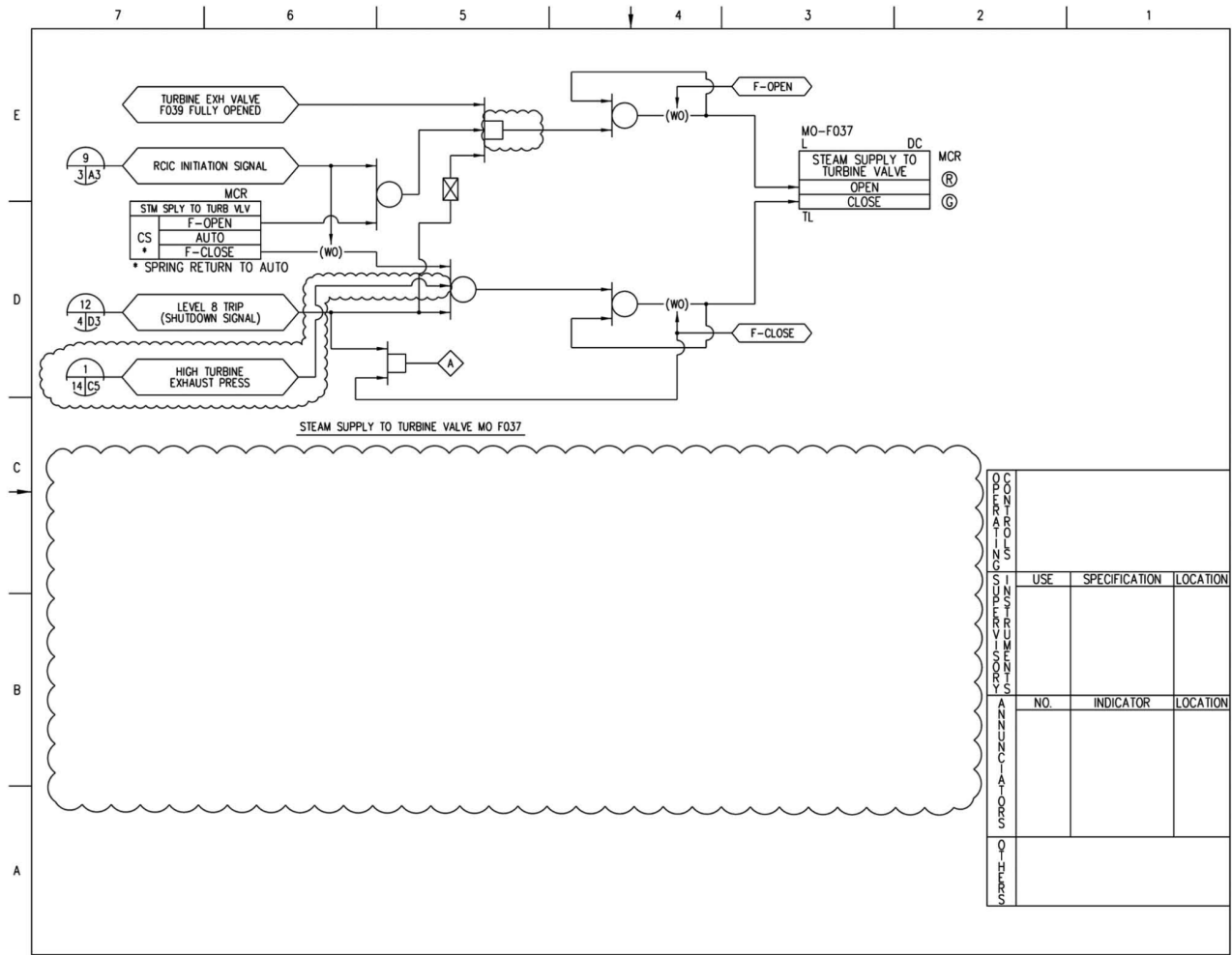


Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 10 of 17)



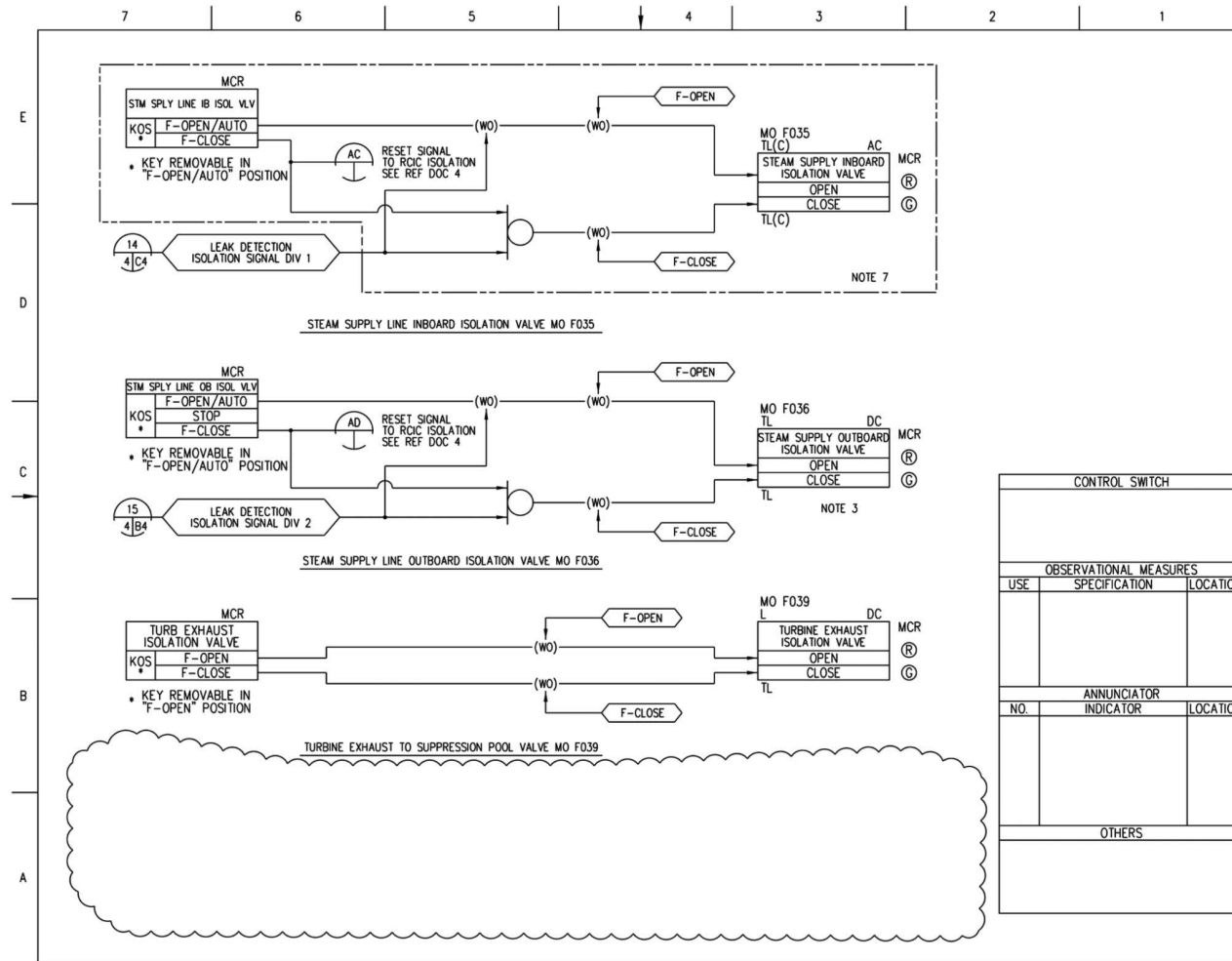


Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 12 of 17)

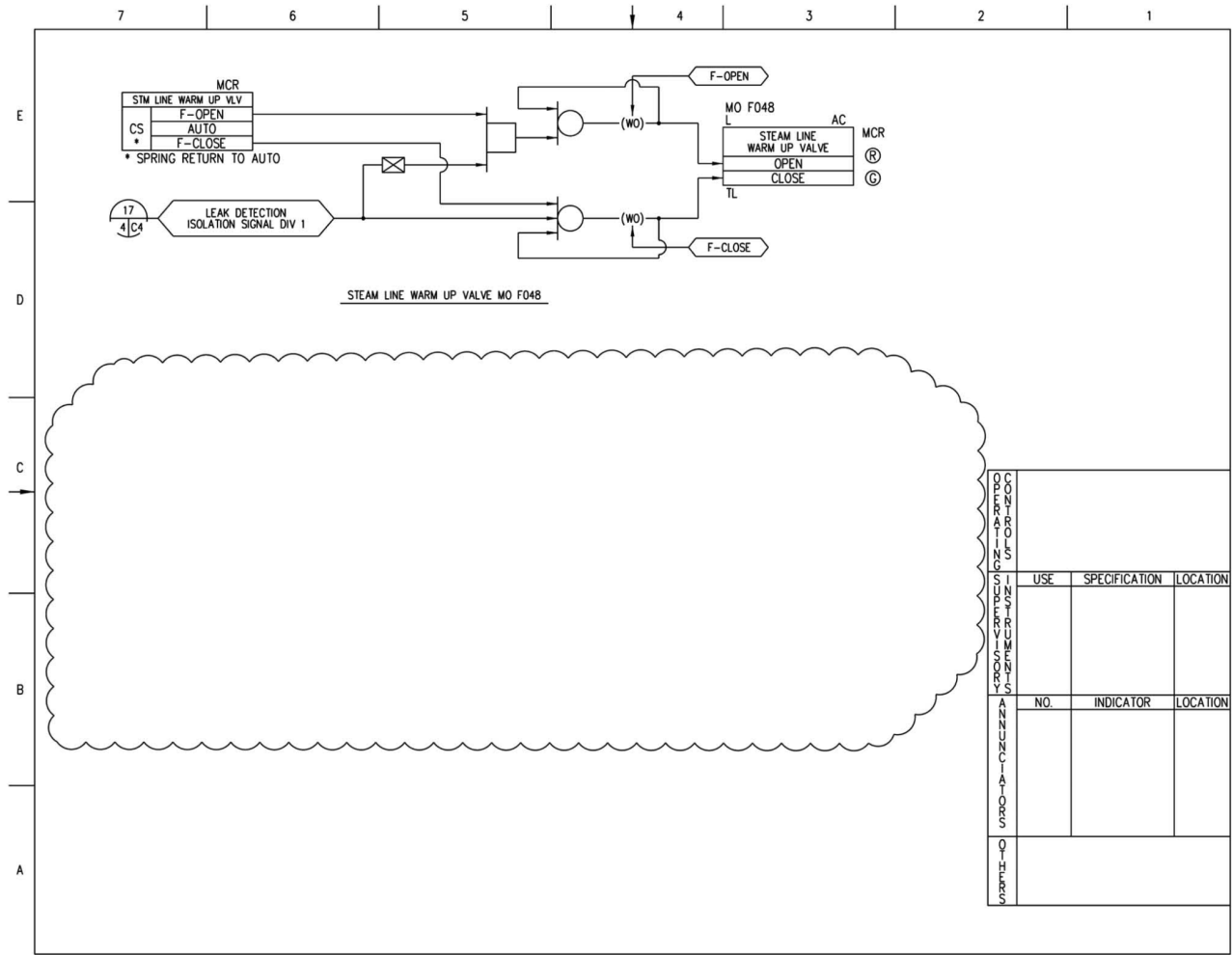


Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 13 of 17)

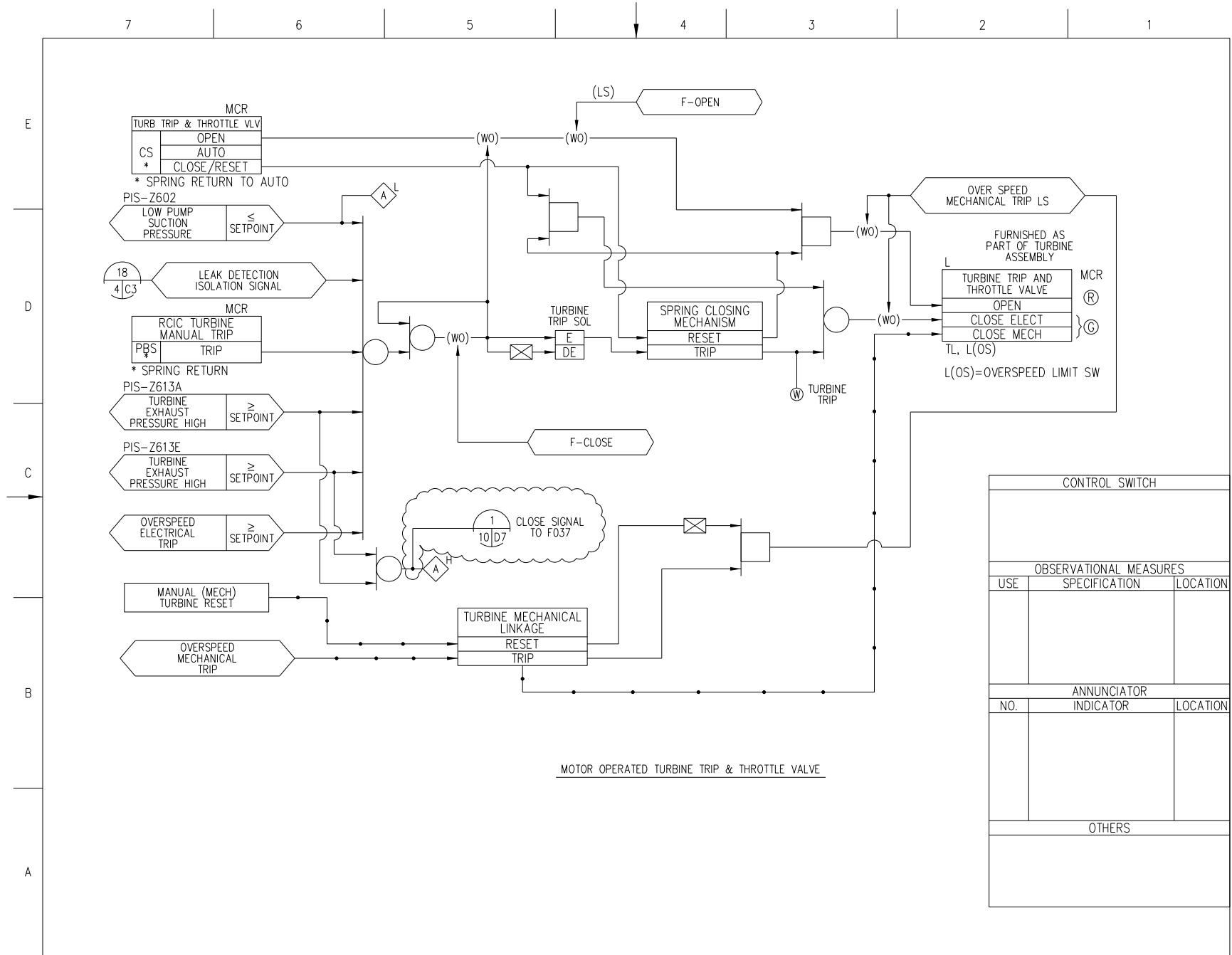
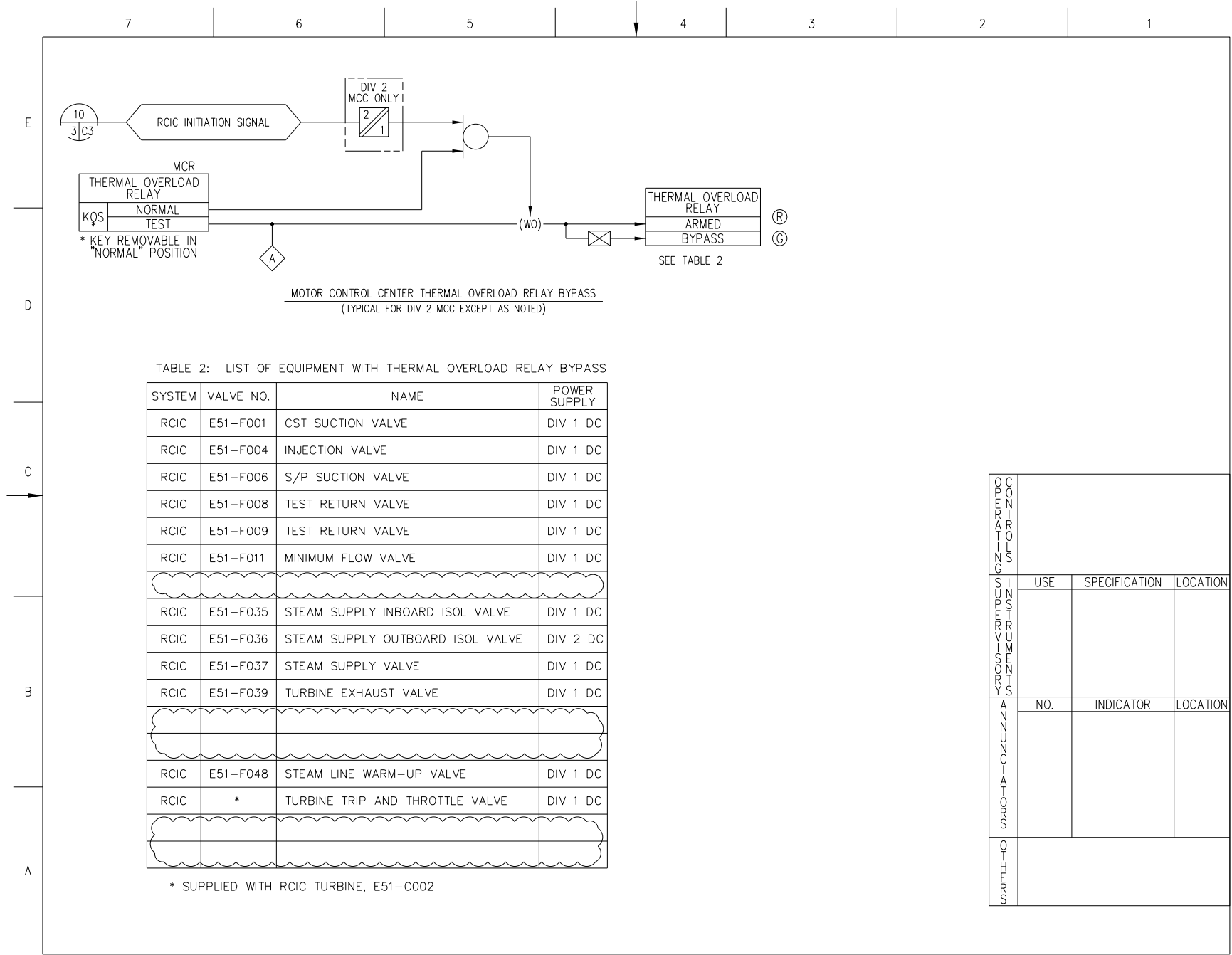


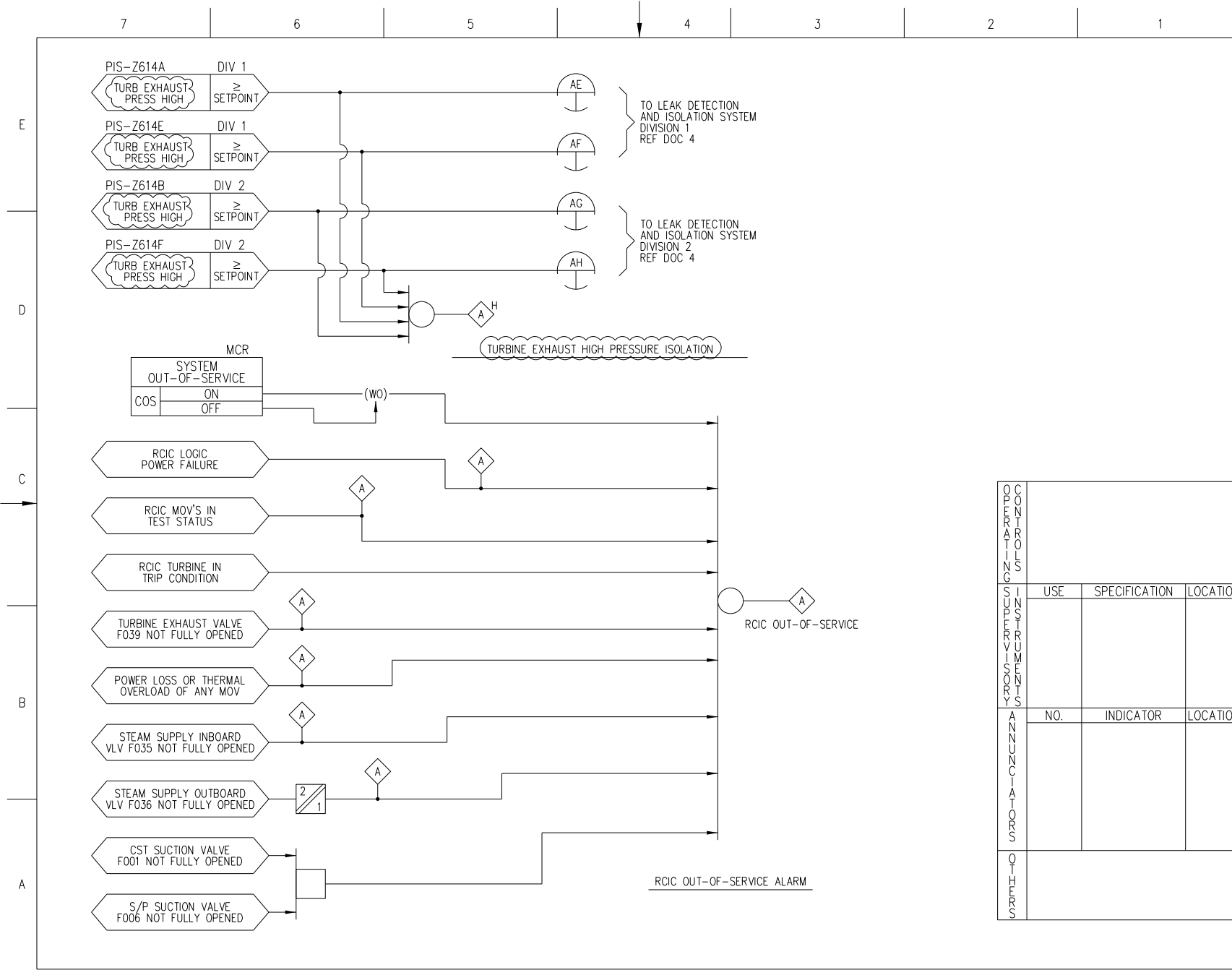
Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 14 of 17)

CONTROL SWITCH		
OBSERVATIONAL MEASURES		
USE	SPECIFICATION	LOCATION
ANNUNCIATOR		
NO.	INDICATOR	LOCATION
OTHERS		



CONTROL SIGNALS			
	USE	SPECIFICATION	LOCATION
ANNUNCIATORS	NO.	INDICATOR	LOCATION
OTHERS			

Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 15 of 17)



COMPARISONS	USE	SPECIFICATION	LOCATION
ANNUNCIATORS	NO.	INDICATOR	LOCATION
OTHERS			

Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 16 of 17)

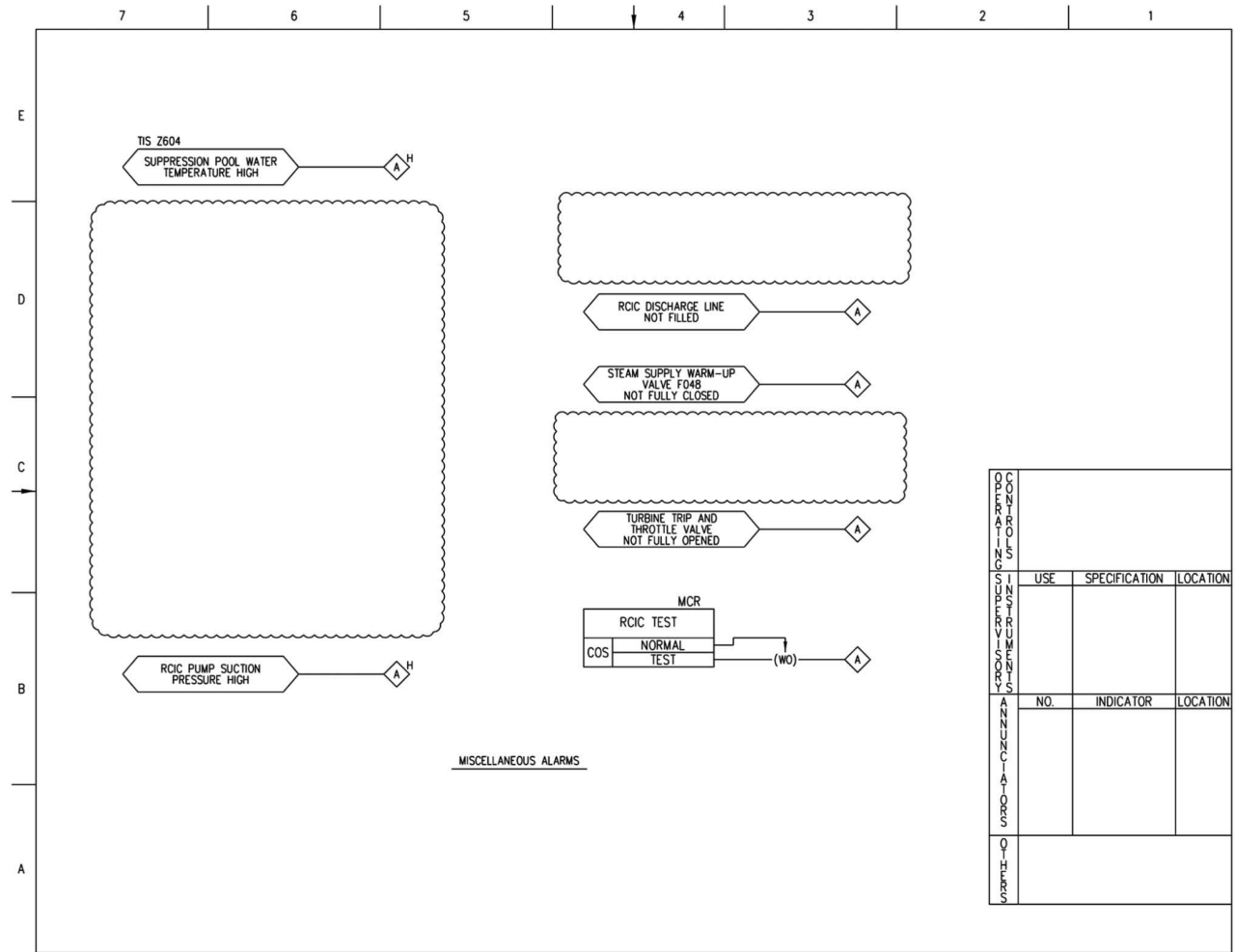
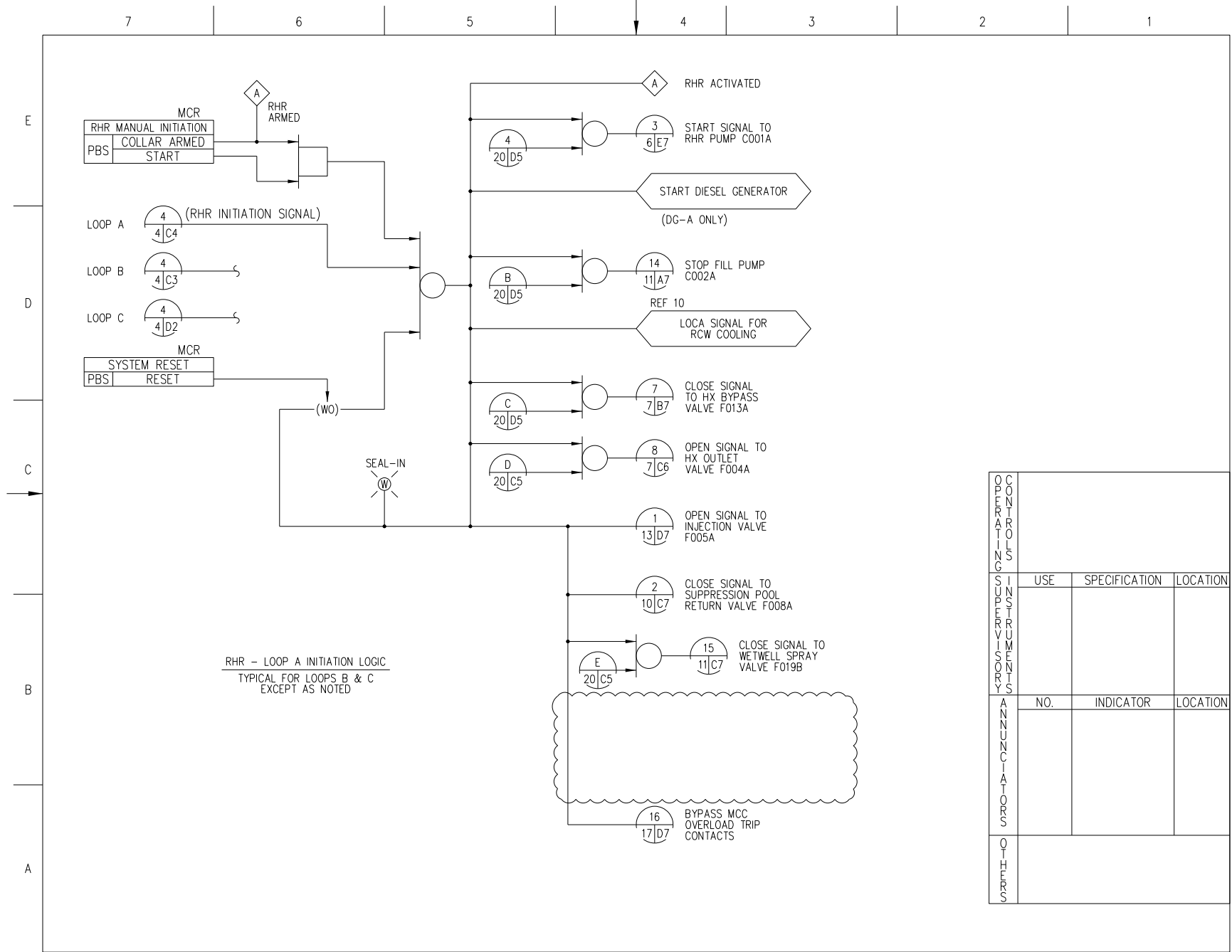


Figure 7.3-3 – Reactor Core Isolation Cooling System IBD (Sheet 17 of 17)

	7	6	5	4	3	2	1
E	<u>NOTES:</u>						
	1. RHR LOOP "A" LOGIC IS SHOWN. RHR LOOP B, & C LOGIC IS IDENTICAL TO "A" EXCEPT AS NOTED.						
	2. ALL EQUIPMENT AND INSTRUMENTS ARE PREFIXED BY SYSTEM NUMBER E11 UNLESS OTHERWISE NOTED.						
	3. VALVES F011A, F011B AND F011C ARE IN ELECTRICAL DIVISION 2, 3 AND 1 RESPECTIVELY. THE MANUAL CONTROL SWITCH FOR VALVES F011A, F011B AND F011C ARE IN ELECTRICAL DIVISIONS 1, 2 AND 3 RESPECTIVELY.						
	4. SYSTEM R10, ELECTRICAL POWER DISTRIBUTION SYSTEM, SHALL PERMIT MOTOR TO START ONLY FOR PUMP VOLTAGE >70 PERCENT OF NOMINAL.						
	5. DIVISIONAL SIGNALS SHALL BE ISOLATED FROM THE NON-IE ALARM.						
	6. THE LOGIC DESIGN SHALL INCORPORATE PROVISIONS TO REVERT 2/4 LOGIC TO 2/3 LOGIC DURING BYPASS OF A SINGLE DIVISION OF SENSORS. ALSO, THE LOGIC DESIGN SHALL NOT PERMIT THE BYPASS OF MORE THAN ONE DIVISION OF SENSORS AT A TIME.						
	7. SETPOINT VALVES ARE PRELIMINARY AND WILL BE FINALIZED IN DETAILED DESIGN.						
	8. UNLESS OTHERWISE SPECIFIED, POWER AND CONTROL CIRCUITS ARE DIVISION 1, 2 AND 3 FOR LOOPS A, B AND C RESPECTIVELY.						
	9. THIS EQUIPMENT IS ALSO CONTROLLED BY REMOTE SHUTDOWN SYSTEM (REFERENCE DOCUMENT 11) FOR RHR LOOPS A AND B ONLY.						
D	10. THE ELECTRICAL POWER DISTRIBUTION SYSTEM SHALL PROVIDE PUMP CO01A,B,C STOP SIGNALS DUE TO BUS UNDER VOLTAGE ( $\leq 30\%$ VOLTAGE) AND ANY OF THE FOLLOWING MOTOR PROTECTIVE RELAY TRIP SIGNALS:						
	A. MOTOR OVERCURRENT						
	B. BUS DIFFERENTIAL CURRENT						
	C. GROUND OVERCURRENT						
	<u>REFERENCE DOCUMENTS</u>						
	1. NUCLEAR BOILER SYSTEM P&ID						
	2. SUPPRESSION POOL TEMPERATURE MONITORING SYSTEM IBD						
	3. RHR SYSTEM P&ID						
	4. LEAK DETECTION & ISOLATION SYSTEM IBD						
	5. DELETED						
C	7. NUCLEAR BOILER SYSTEM IBD						
	8. REACTOR WATER CLEAN-UP SYSTEM IBD						
	9. FUEL POOL COOLING SYSTEM IBD						
	10. REACTOR BLDG COOLING WATER SYSTEM/ REACTOR SERVICE WATER SYSTEM IBD						
	11. REMOTE SHUTDOWN SYSTEM IBD						
	12. CONTAINMENT ATMOSPHERE MONITORING SYSTEM IBD						
	13. INTERLOCK BLOCK DIAGRAM (IBD) STANDARDS						
	14. REACTOR BLDG COOLING WATER SYSTEM P&ID						
	MPL NO.						
	B21-1010						
T53-1030							
E11-1010							
E31-1030							
B21-1030							
G31-1030							
G41-1030							
P21/P41-1030							
C61-1030							
D23-1030							
A10-3070							
P21-1010							
B							
A							

Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 1 of 20)



CONTROL SIGNALS			
	USE	SPECIFICATION	LOCATION
NON-RETURN SIGNALS			
ANNUNCIATORS	NO.	INDICATOR	LOCATION
OTHERS			

Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 3 of 20)



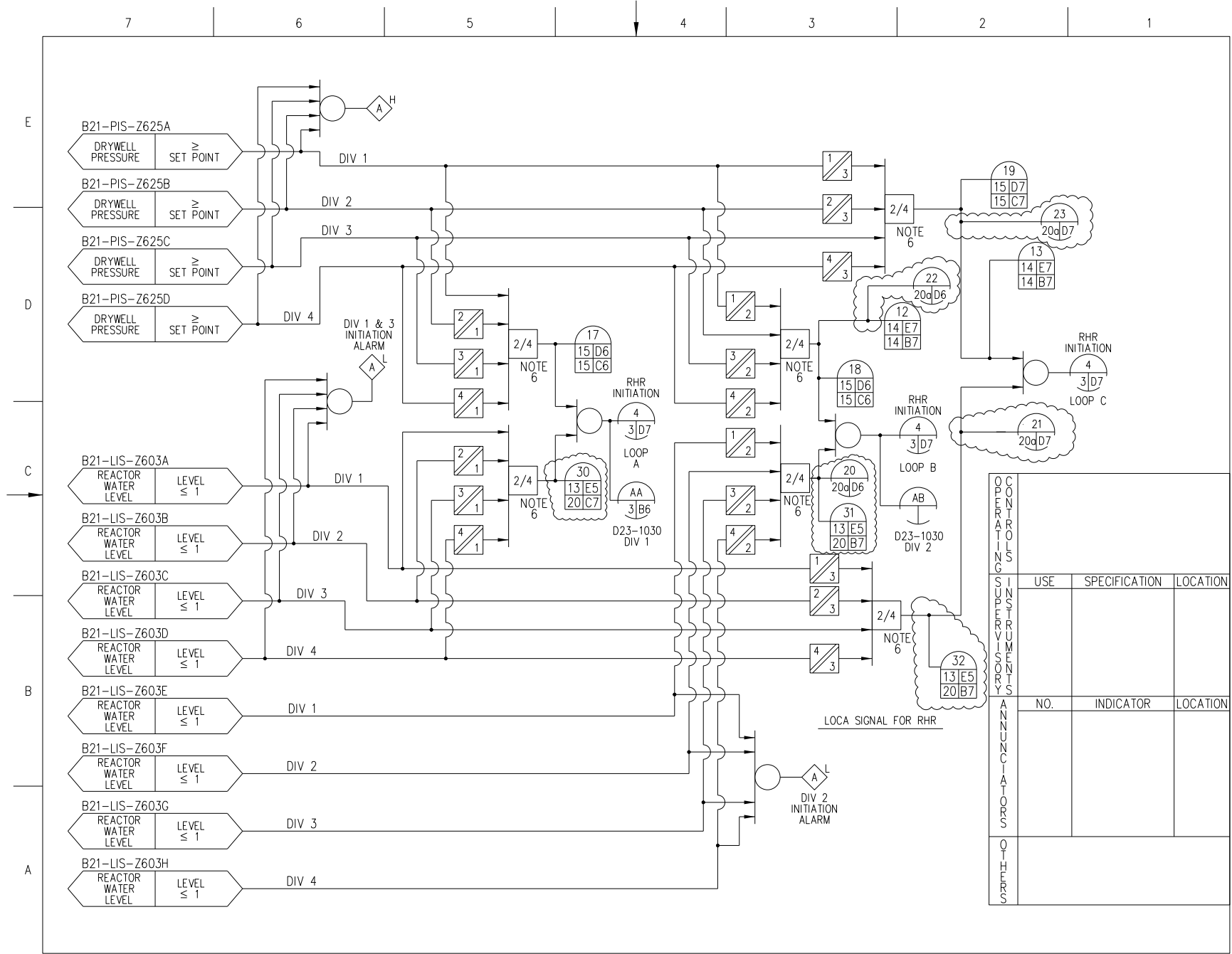


Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 4 of 20)

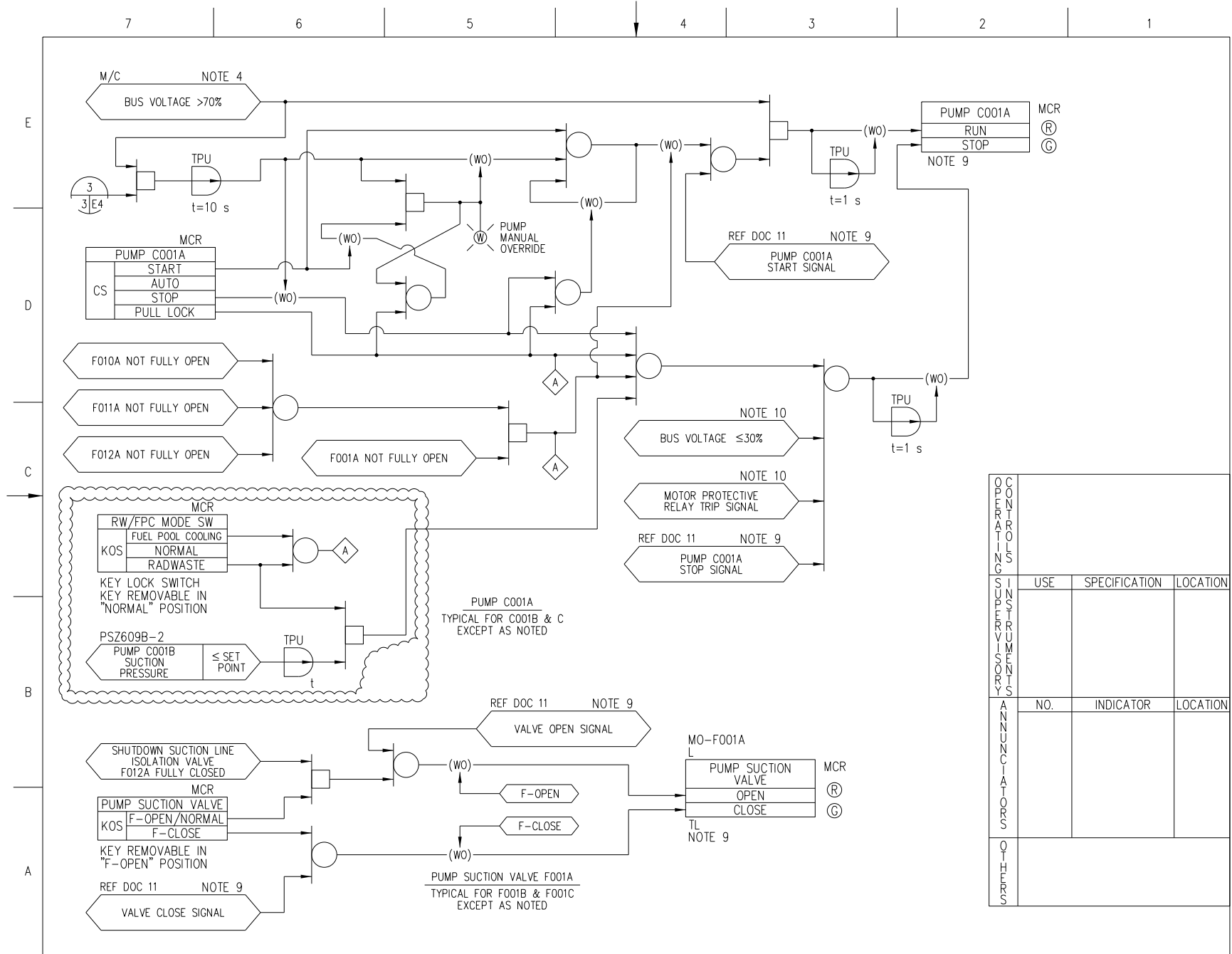


Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 6 of 20)

CONTROLS	USE	SPECIFICATION	LOCATION
ANNUNCIATORS	NO.	INDICATOR	LOCATION
OTHERS			

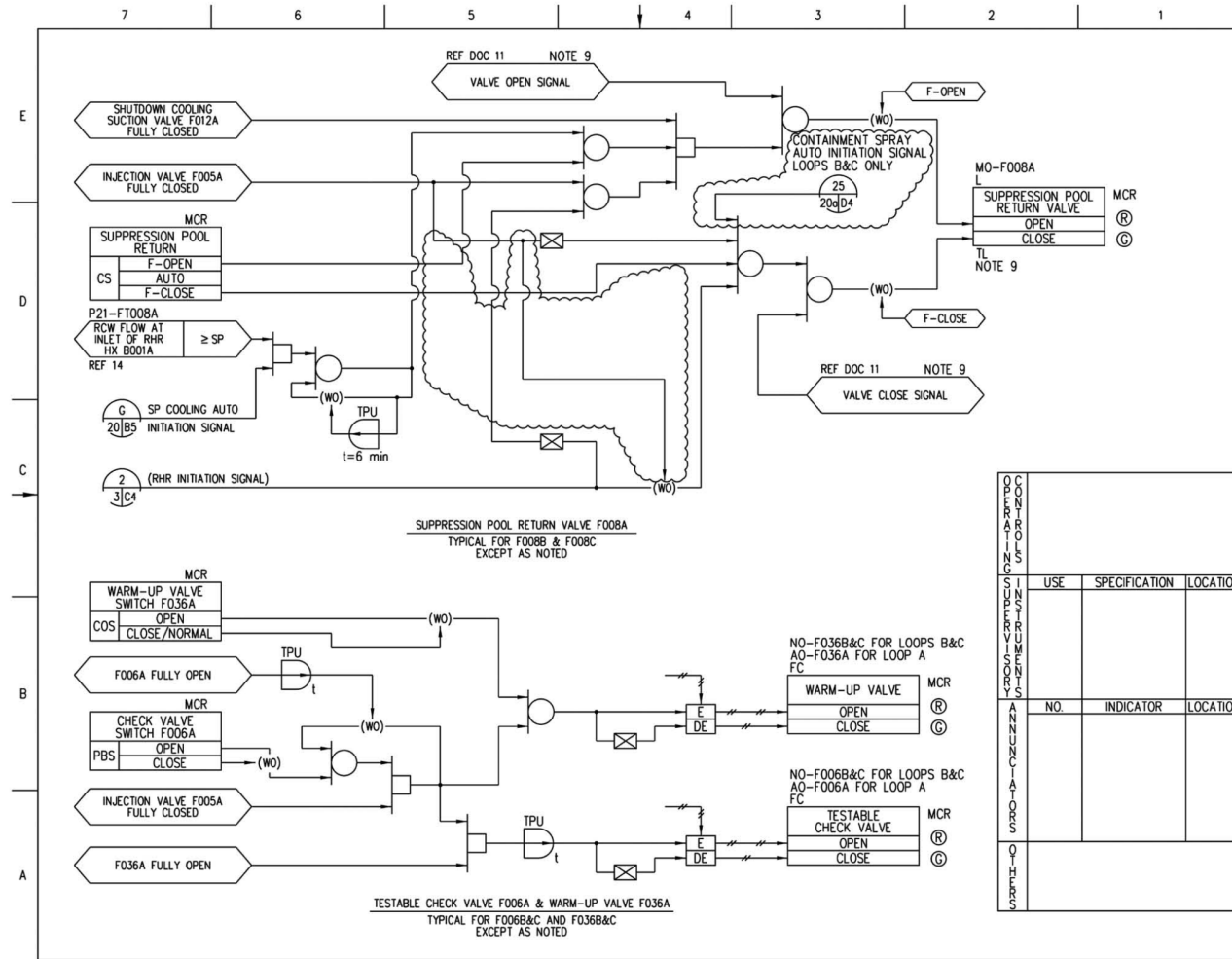


Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 10 of 20)

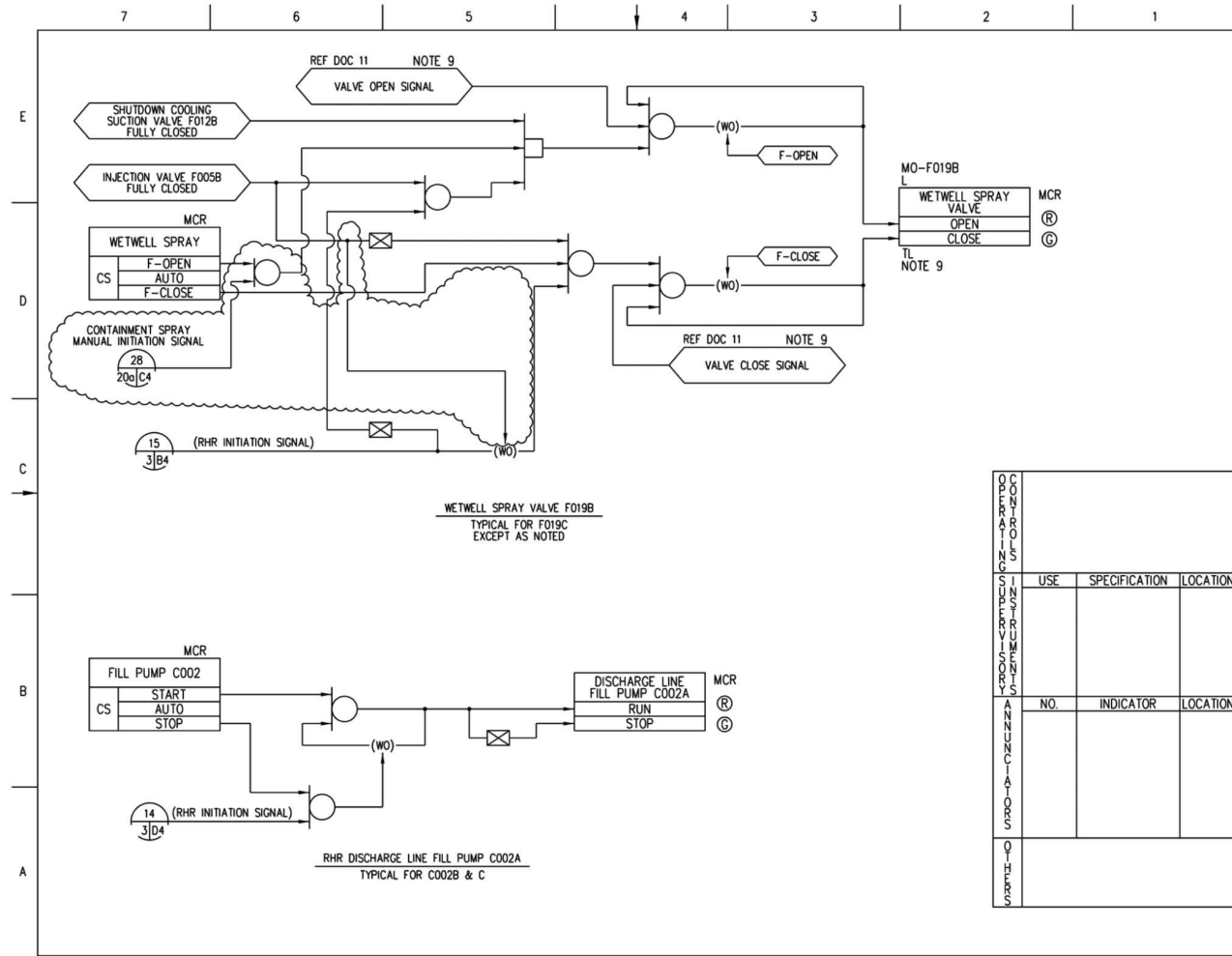


Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 11 of 20)

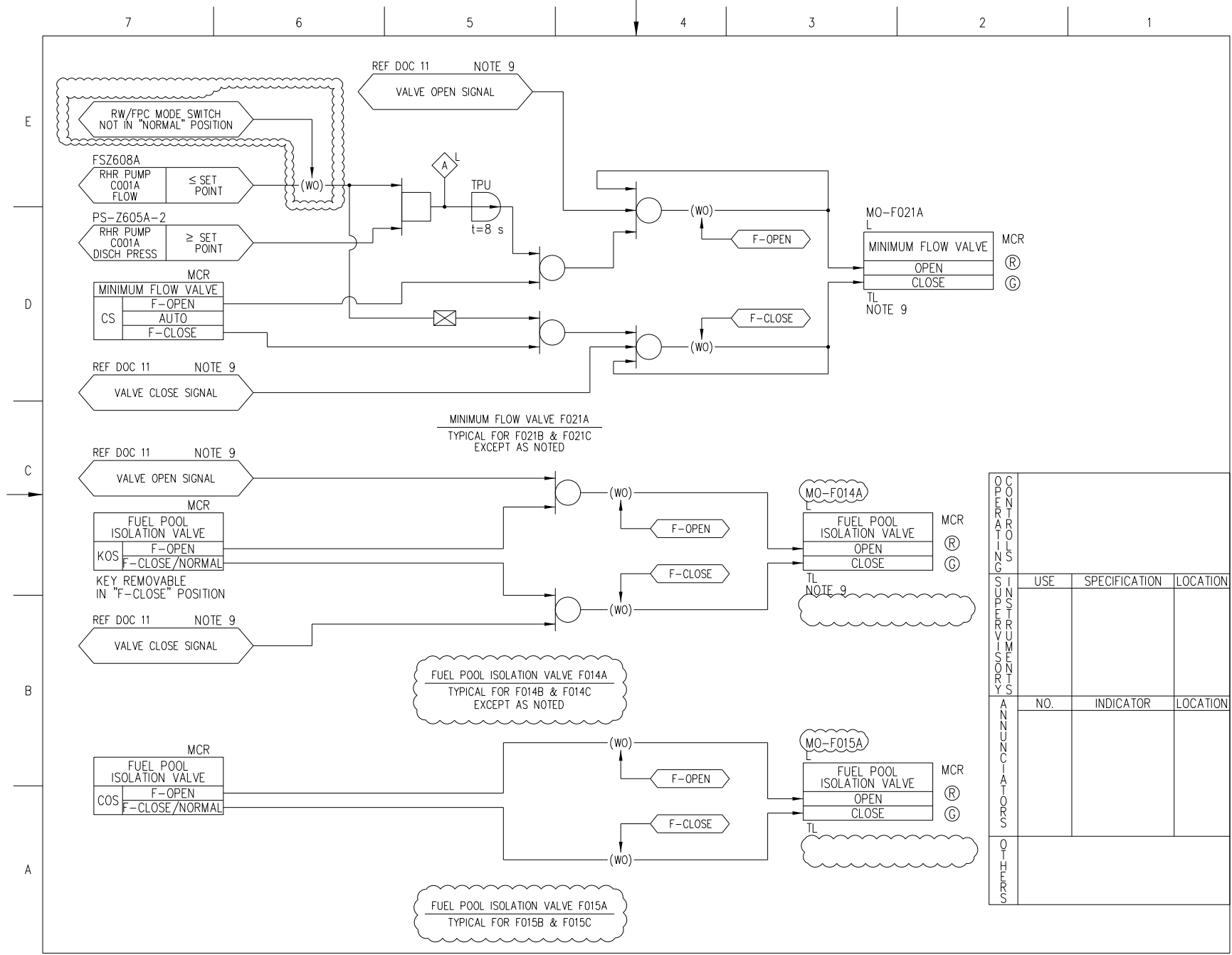


Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 12 of 20)

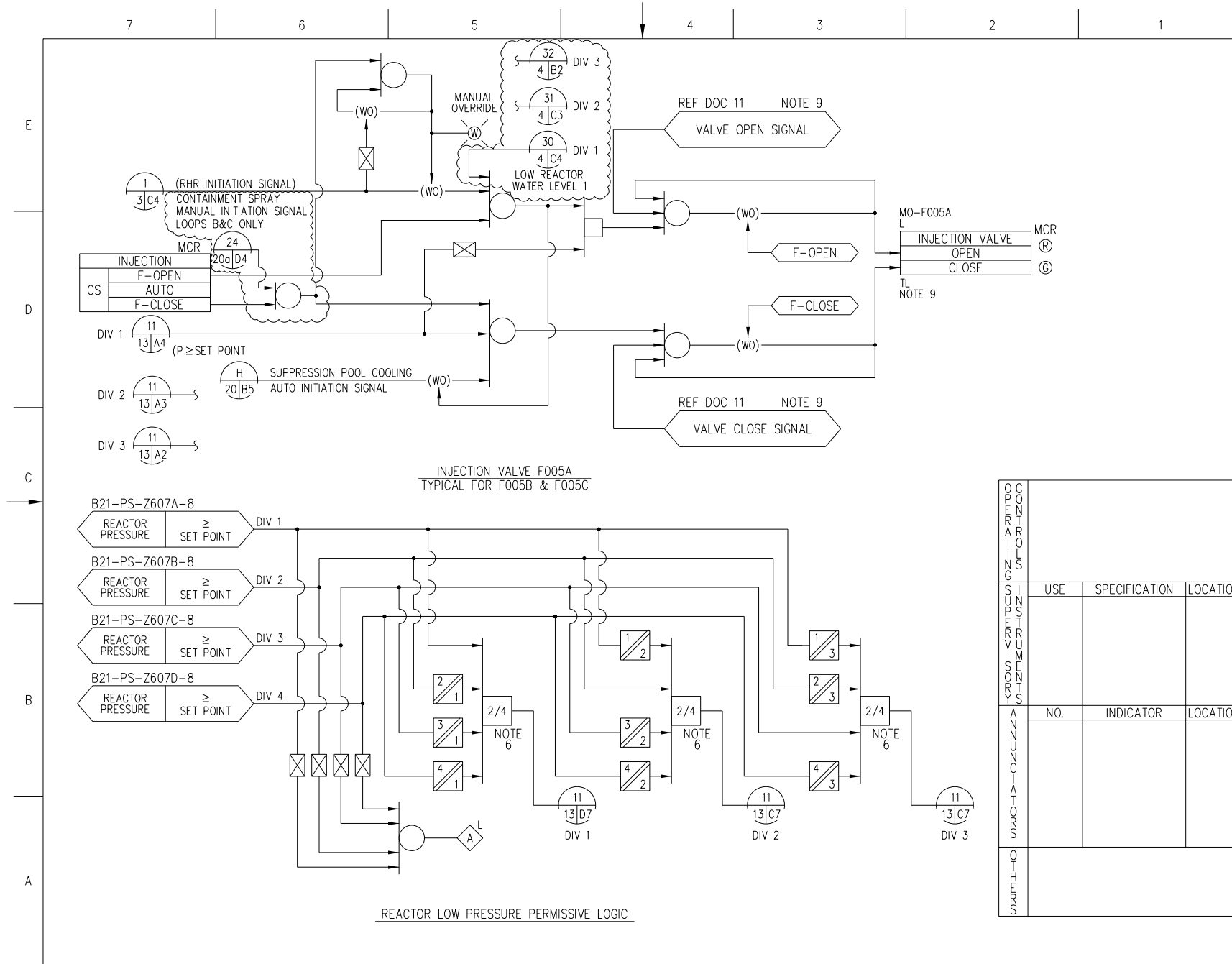


Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 13 of 20)

CONNECTIONS TO OTHER SYSTEMS	USE	SPECIFICATION	LOCATION
ANNUNCIATORS	NO.	INDICATOR	LOCATION
OTHERS			

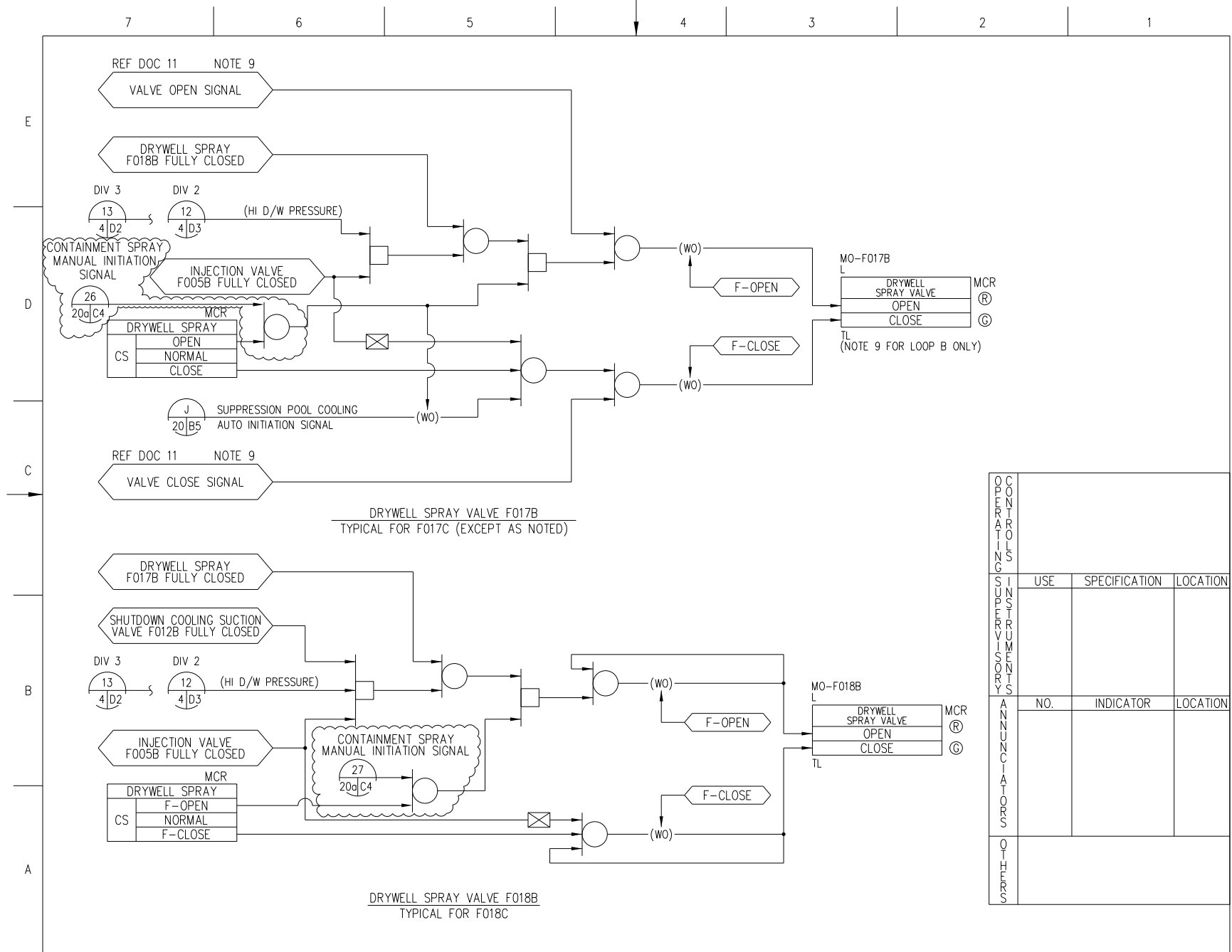


Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 14 of 20)

CONTROL SIGNALS	USE	SPECIFICATION	LOCATION
NON-CONTROL SIGNALS	NO.	INDICATOR	LOCATION
ANNUNCIATORS			
OTHERS			

TABLE 2 ANNUNCIATOR / ALARM LIGHTS / STATUS LIGHTS		
INDICATOR	FUNCTION	INITIATING DEVICE
ALARMS	HIGH DRYWELL PRESSURE	LOGIC OUTPUT
	HIGH SUPPRESSION POOL TEMPERATURE	LOGIC OUTPUT
	LOW REACTOR WATER LEVEL 1	LOGIC OUTPUT
	HIGH WETWELL AIR SPACE TEMPERATURE	LOGIC OUTPUT
	RHR PUMP C001A,B,C HIGH DISCHARGE PRESSURE	PSZ605A-1, B-1, C-1
	RHR LOOP A,B,C ACTIVATED	LOGIC OUTPUT
	RHR PUMP C001A,B,C MOTOR OVERLOAD	METAL CLAD SWITCHGEAR
	LOW REACTOR PRESSURE	LOGIC OUTPUT
	RHR LOOP A,B,C MANUAL INITIATION SWITCH IN ARMED POSITION	PBS
	RHR LOOP A,B,C OUT-OF-SERVICE	COS, LOGIC OUTPUT
	HIGH SHUTDOWN SUCTION PRESSURE LOOP A,B,C	PSZ609A-1, B-1, C-1
	RHR PUMP C001A,B,C DISCHARGE PIPING WATER FILL LOW	PSZ604A, B, C
	RHR LOOP A,B,C LOGIC POWER FAILURE	LOGIC OUTPUT
	POWER LOSS OR THERMAL OVERLOAD OF ANY RHR LOOP A,B,C MOV	MCC
	RHR LOOP A,B,C MOV'S IN TEST STATUS	CS
	RHR C001A,B,C PUMP MOTOR AUTO TRIP	LOGIC OUTPUT
	FILL PUMP C002A,B,C TRIP	MCC
	RHR HEAT EXCHANGER B001A,B,C OUTLET FLOW TEMP HIGH	TIS-Z607A,B,C
	RHR PUMP C001A,B,C OPERATION SWITCH IN PULL-LOCK	PULL LOCK
	RHR PUMPS C001A,B,C SUCTION VALVES CLOSED	LOGIC OUTPUT
MODE SWITCH IN RW/FPC FOR RHR LOOPS B&C	KOS	
MCC EQUIPMENT IN TEST MODE (THERMAL OVERLOAD RELAY NOT BYPASSED)	KOS	
RHR PUMP C001A,B,C FLOW LOW	LOGIC OUTPUT	

TABLE 2 (CON'T) ANNUNCIATOR / ALARM LIGHTS / STATUS LIGHTS		
INDICATOR	FUNCTION	INITIATING DEVICE
WHITE LIGHT	RHR LOOPS A,B,C INITIATION SIGNAL SEALED-IN	LOGIC OUTPUT
WHITE LIGHT	RHR INJECTION VALVE F005A,B,C MANUAL OVERRIDE	CS, LOGIC OUTPUT
WHITE LIGHT	RHR PUMP C001A,B,C MANUAL OVERRIDE	CS, LOGIC OUTPUT
RED LIGHT	SUPPRESSION POOL COOLING INITIATION	LOGIC OUTPUT
RED LIGHT	RCW COOLING OFF FOR TEST OR DRAIN	KOS
RED LIGHT	CONTAINMENT SPRAY INITIATION	LOGIC OUTPUT

Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 19 of 20)



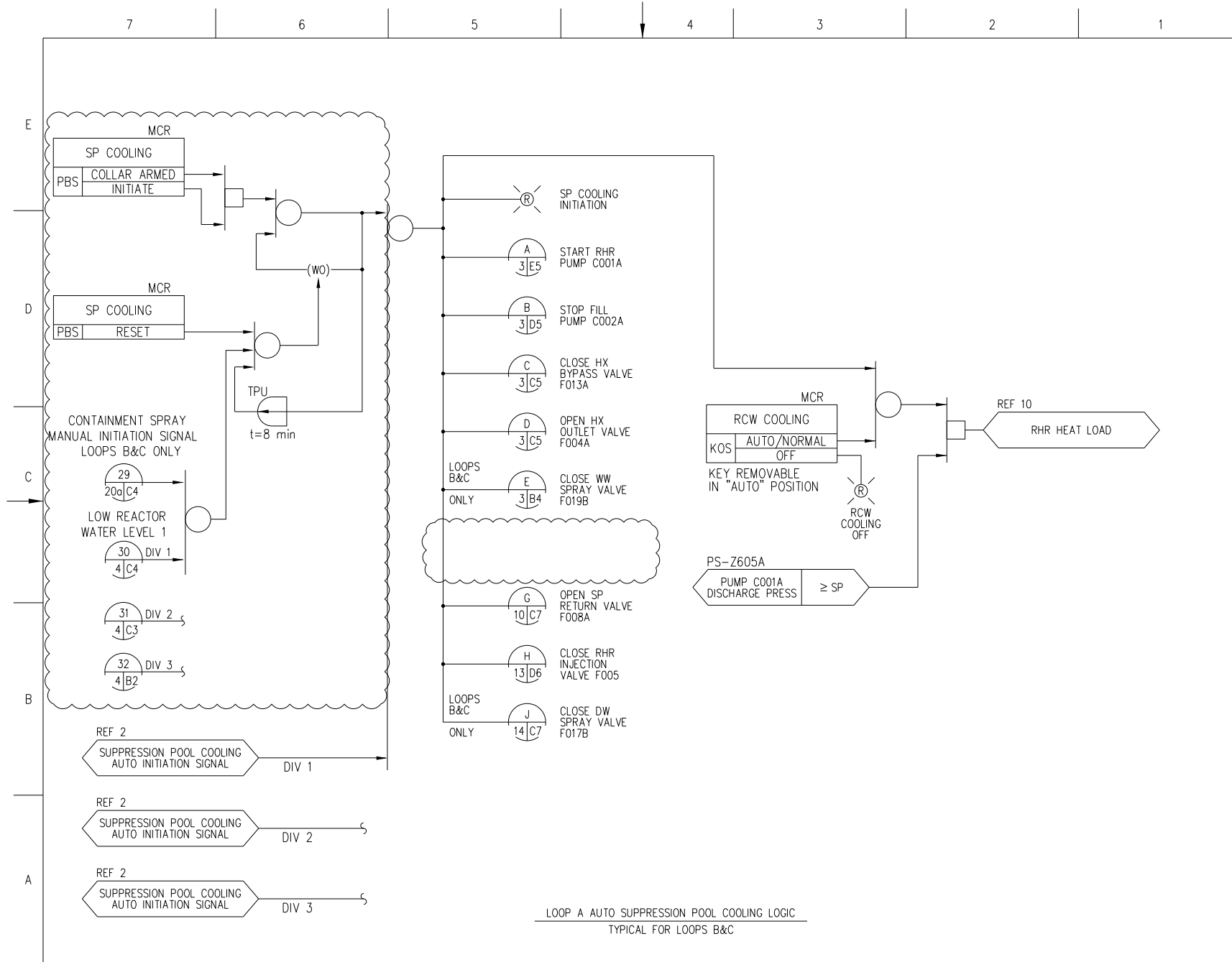


Figure 7.3-4 – Residual Heat Removal System IBD (Sheet 20 of 20)