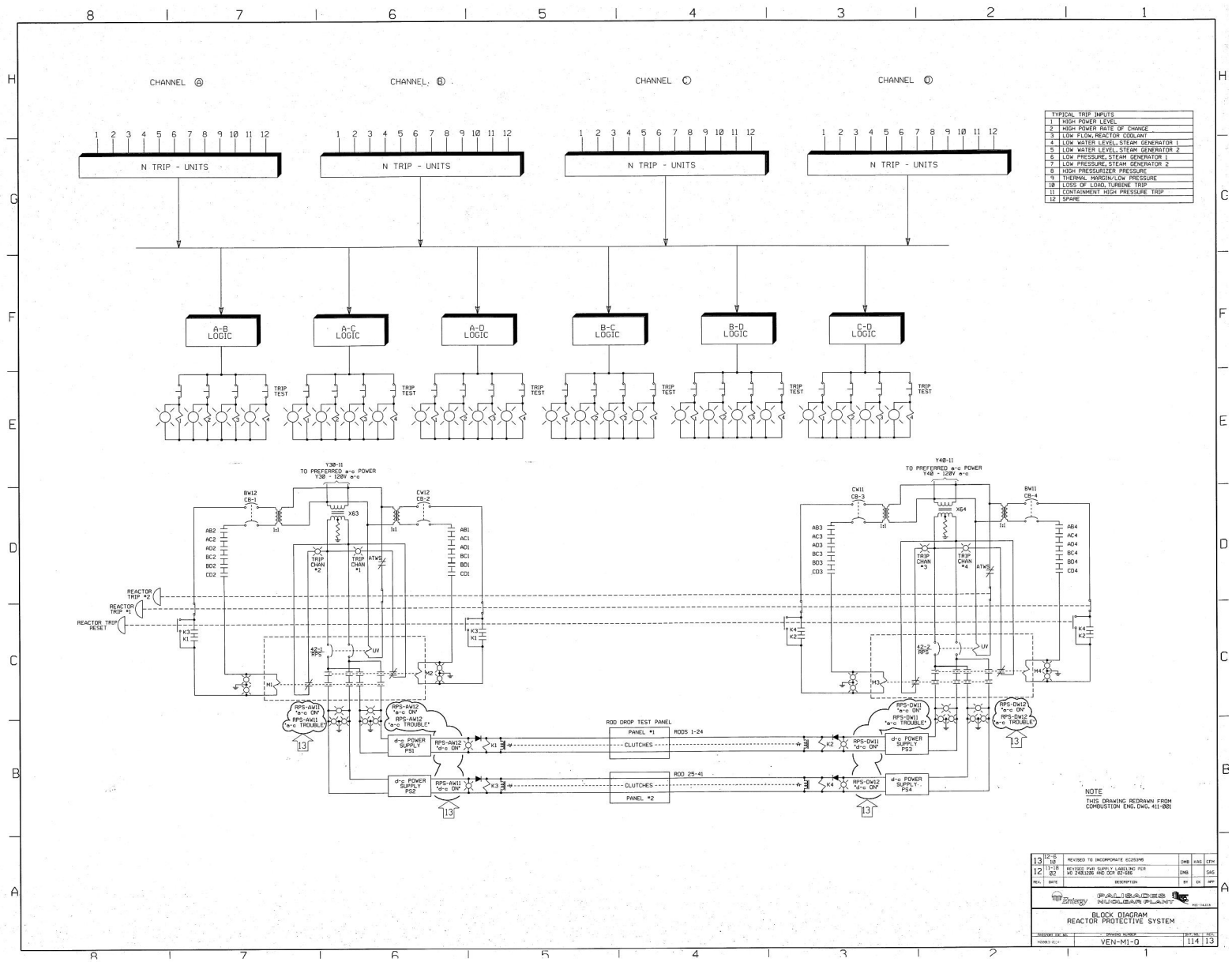
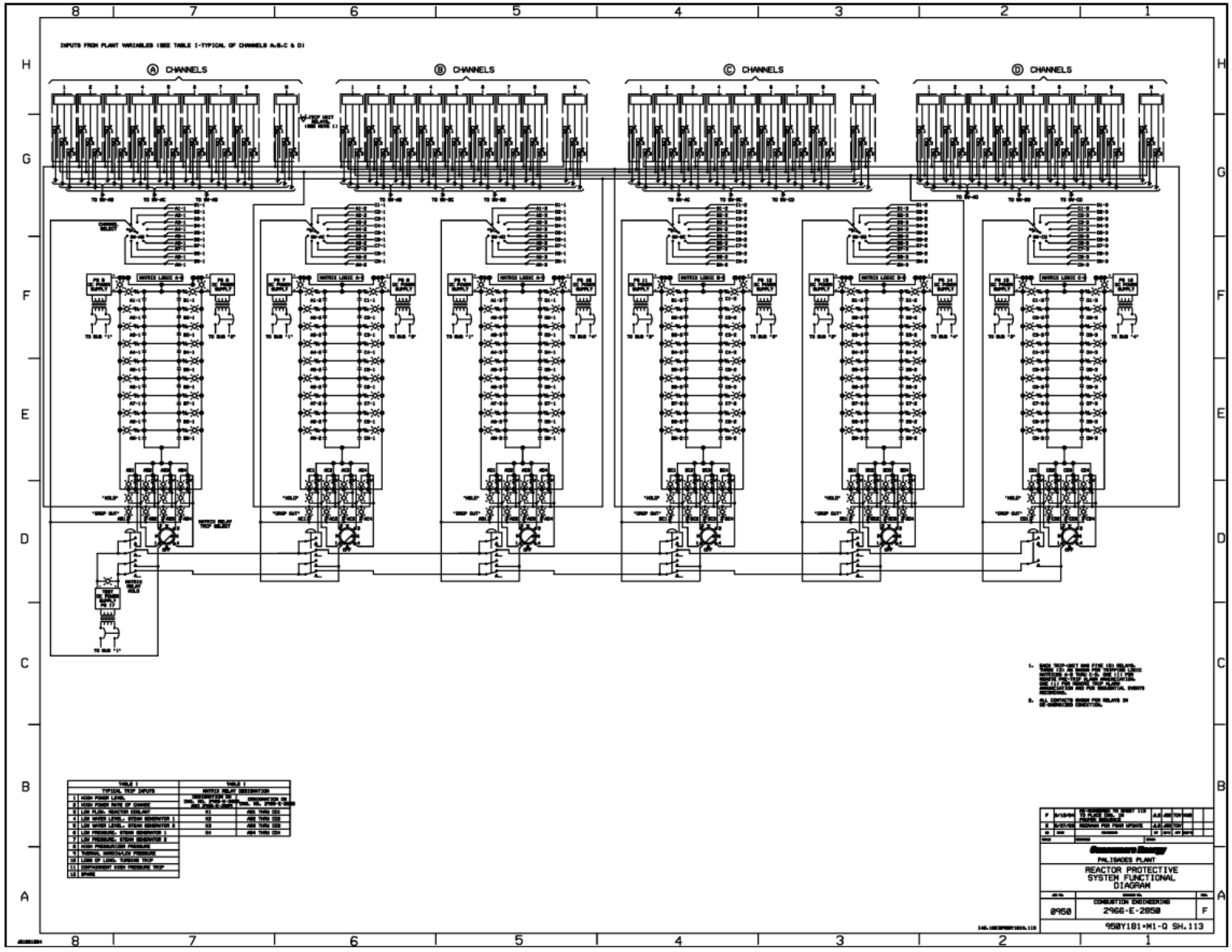
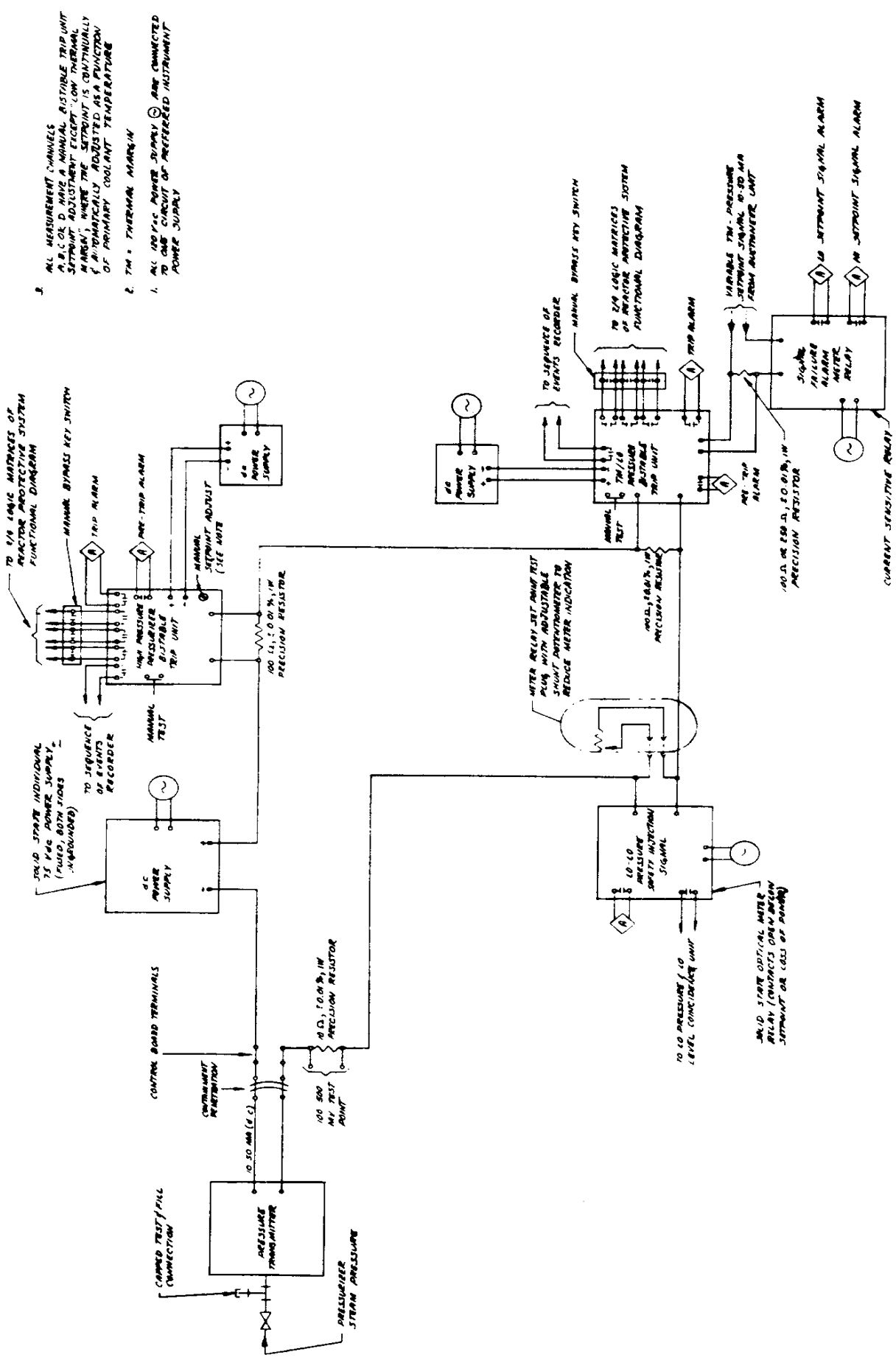
REACTOR PROTECTION SYSTEM BLOCK DIAGRAM



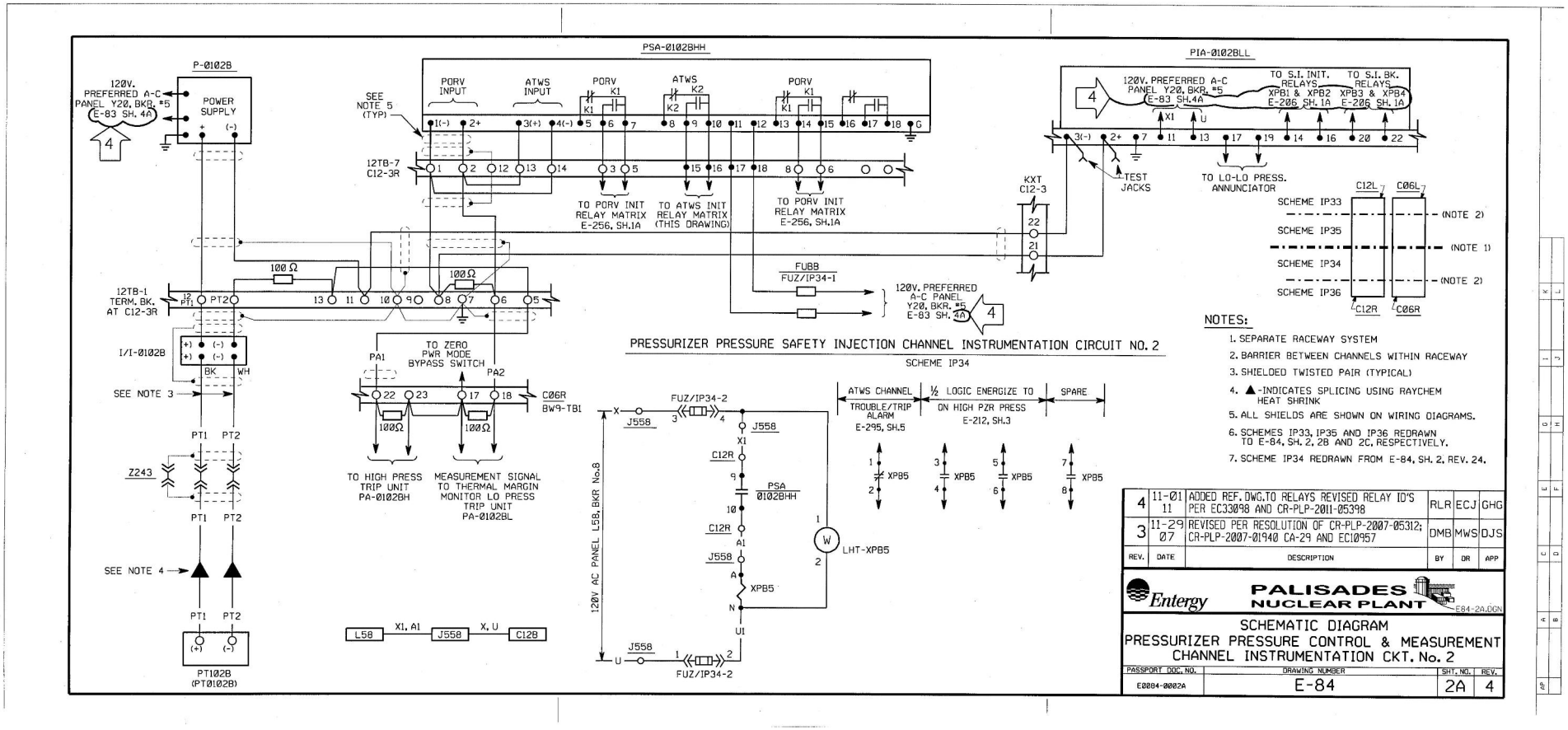
REACTOR PROTECTIVE SYSTEM FUNCTIONAL DIAGRAM



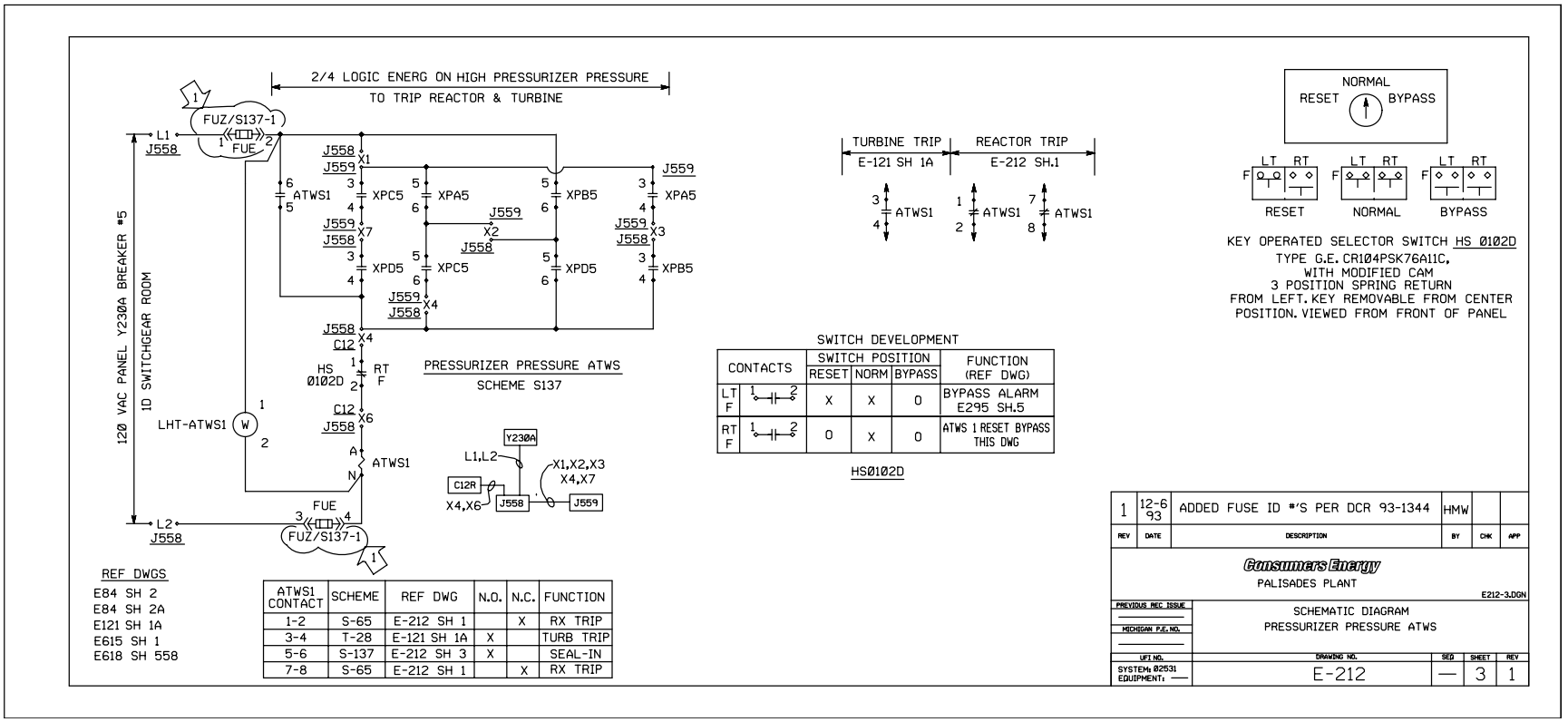
TYPICAL MEASUREMENT CHANNEL FUNCTIONAL DIAGRAM



SCHEMATIC DIAGRAM
PRESSURIZER PRESSURE ATWS

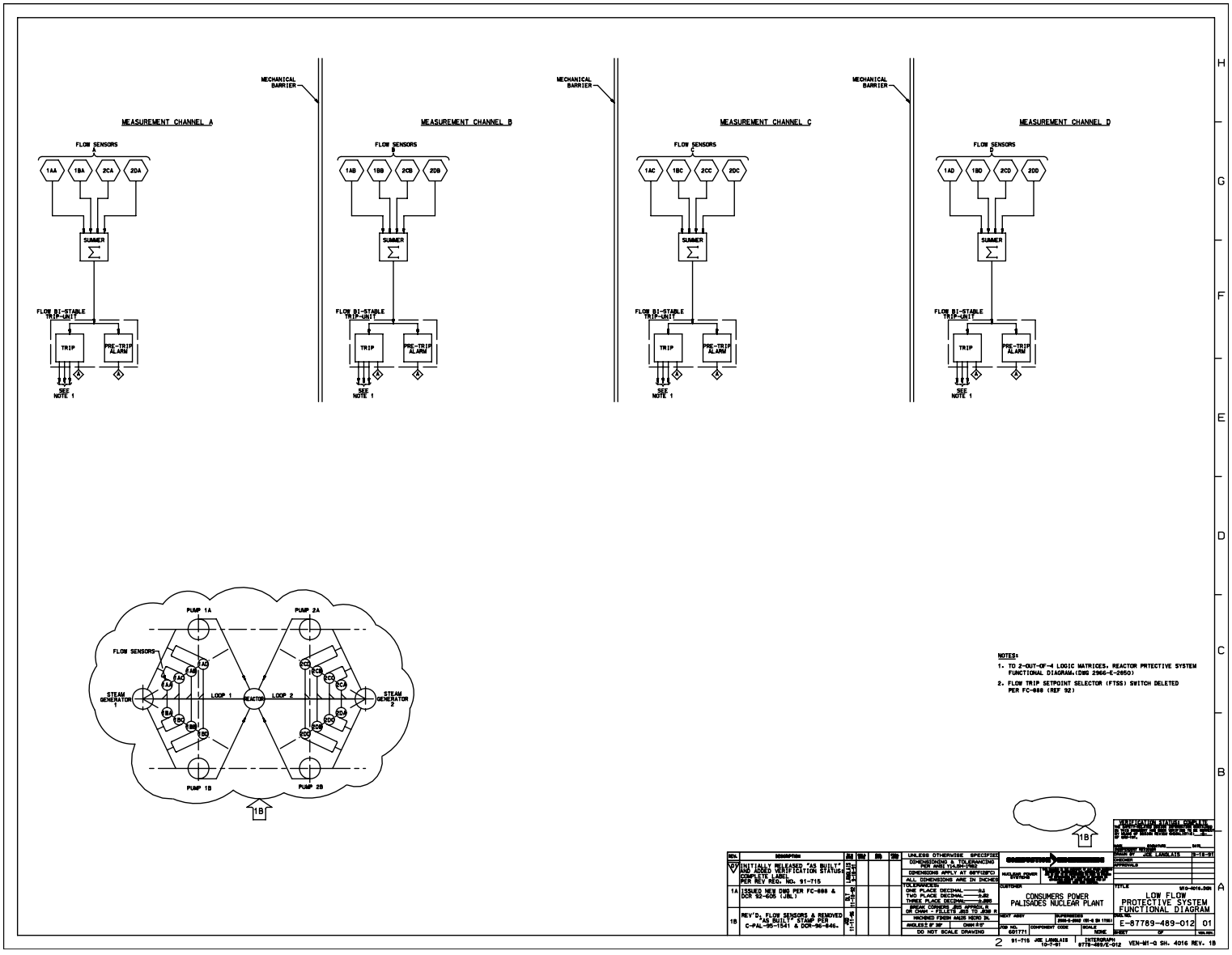


SCHEMATIC DIAGRAM
PRESSURIZER PRESSURE ATWS

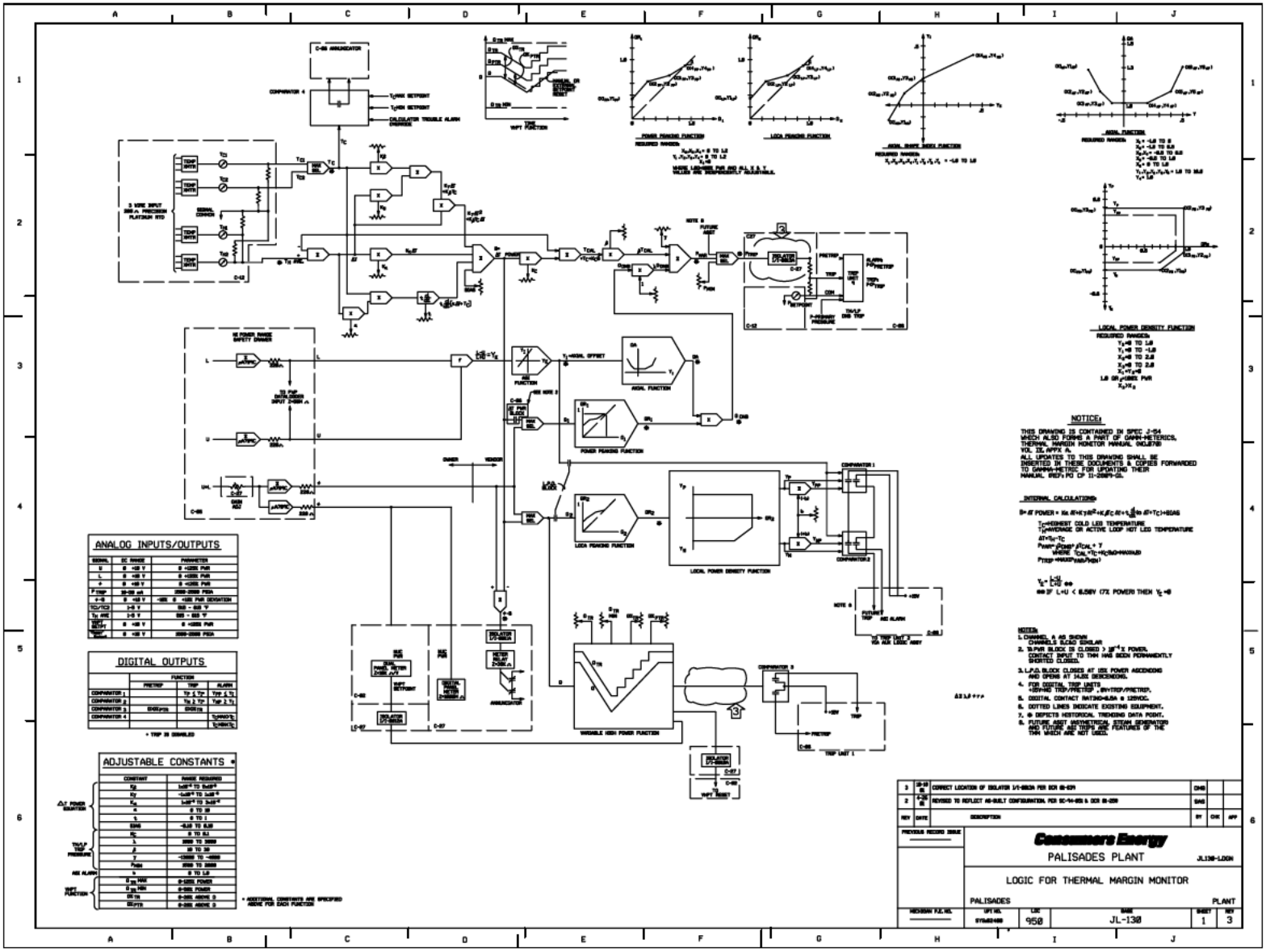


ATWS1 CONTACT	SCHEME	REF DWG	N.O.	N.C.	FUNCTION
1-2	S-65	E-212 SH 1		X	RX TRIP
3-4	T-28	E-121 SH 1A	X		TURB TRIP
5-6	S-137	E-212 SH 3	X		SEAL-IN
7-8	S-65	E-212 SH 1		X	RX TRIP

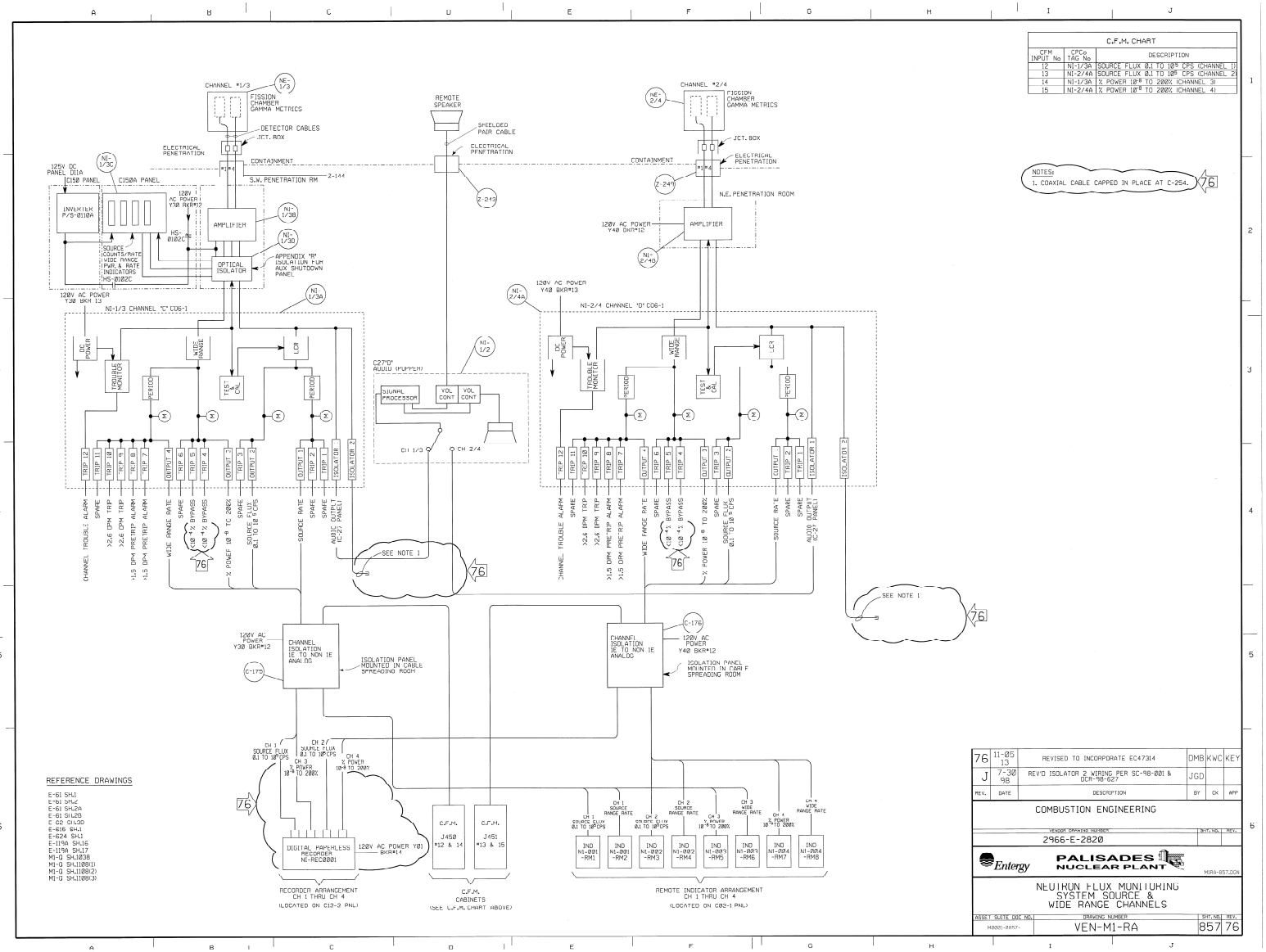
LOW FLOW PROTECTIVE SYSTEM FUNCTIONAL DIAGRAM



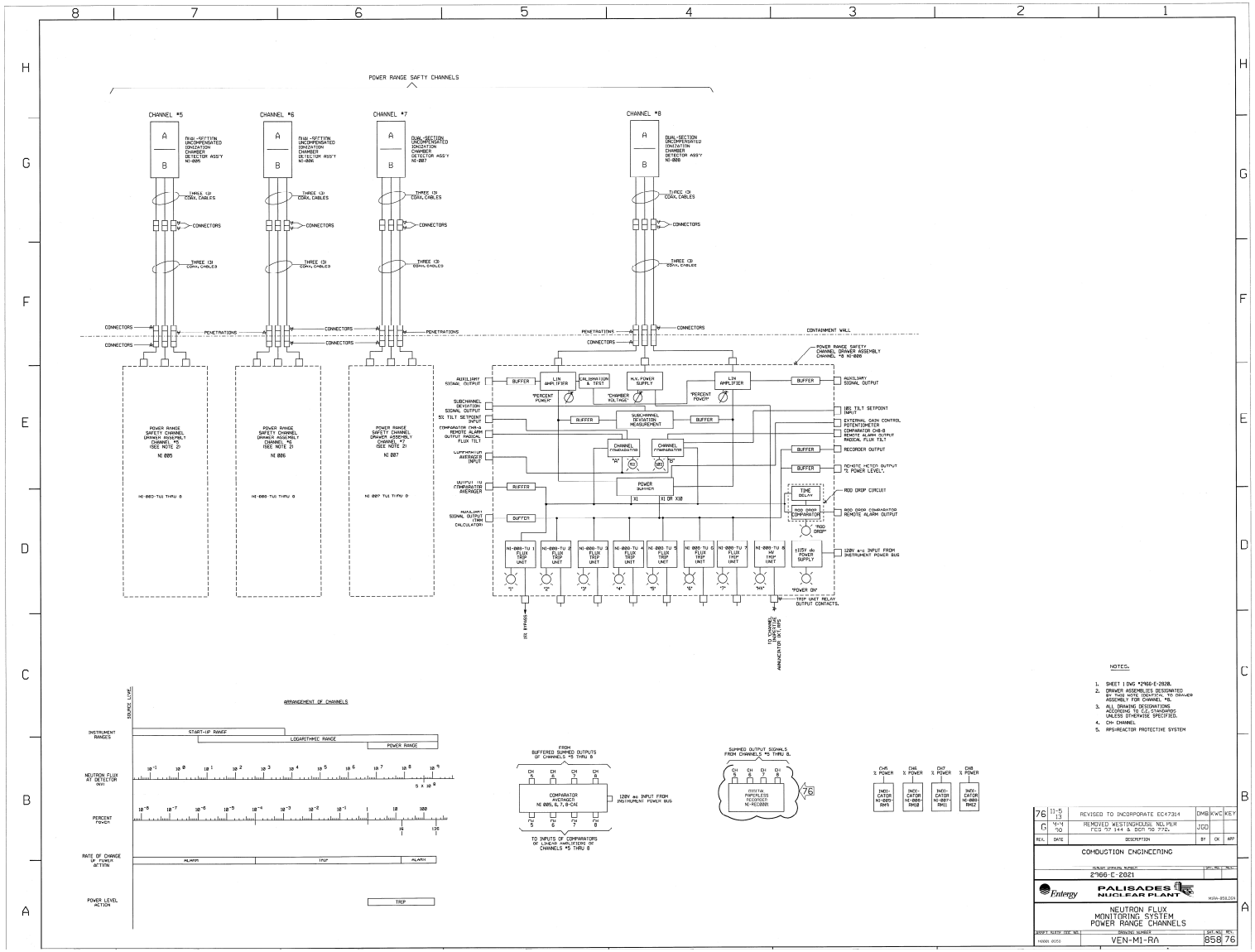
LOGIC FOR THERMAL MARGIN MONITOR



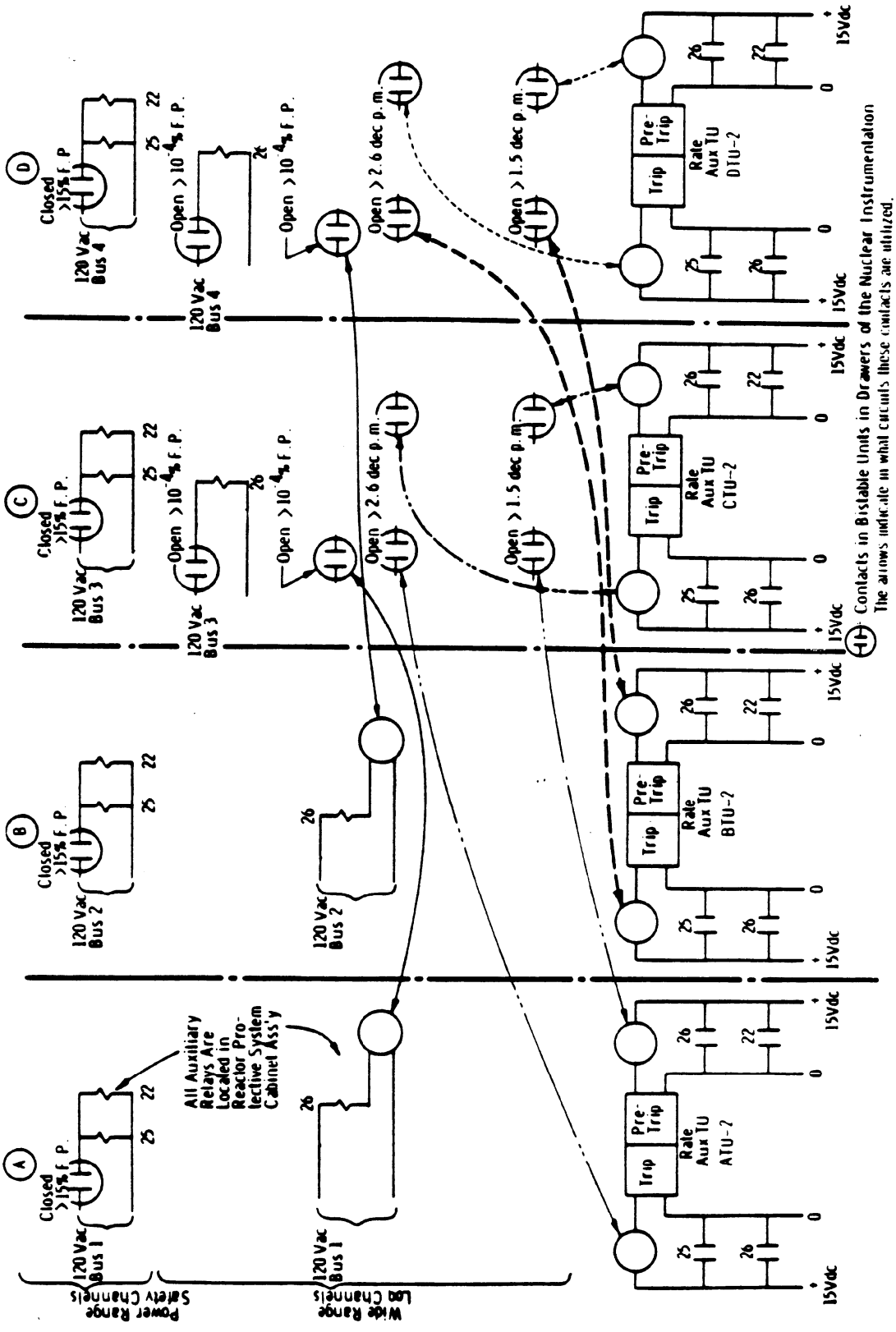
NEUTRON FLUX MONITORING SYSTEM
START-UP AND LOGARITHMIC RANGE CHANNELS



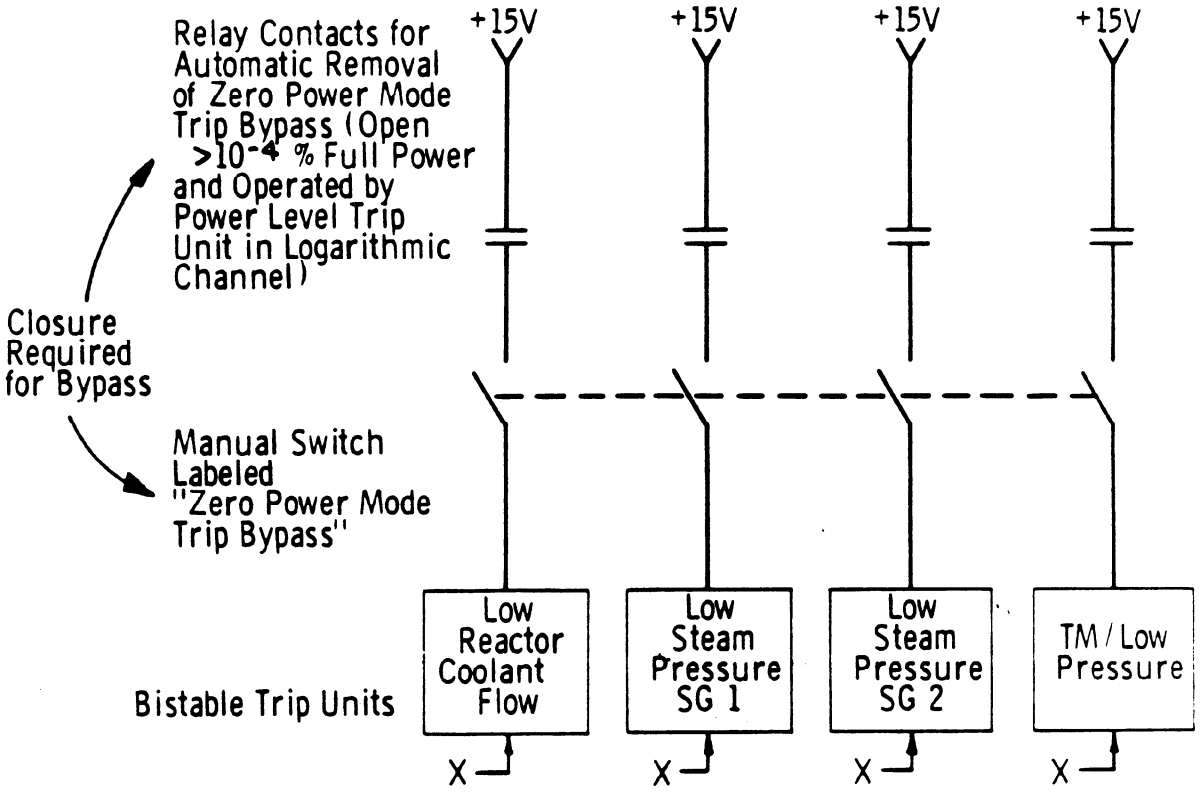
NEUTRON FLUX MONITORING SYSTEM
POWER RANGE CHANNELS



POWER RATE-OF-CHANGE TRIP AND PRETRIP INTERFACE WITH RPS



ZERO POWER MODE BYPASS



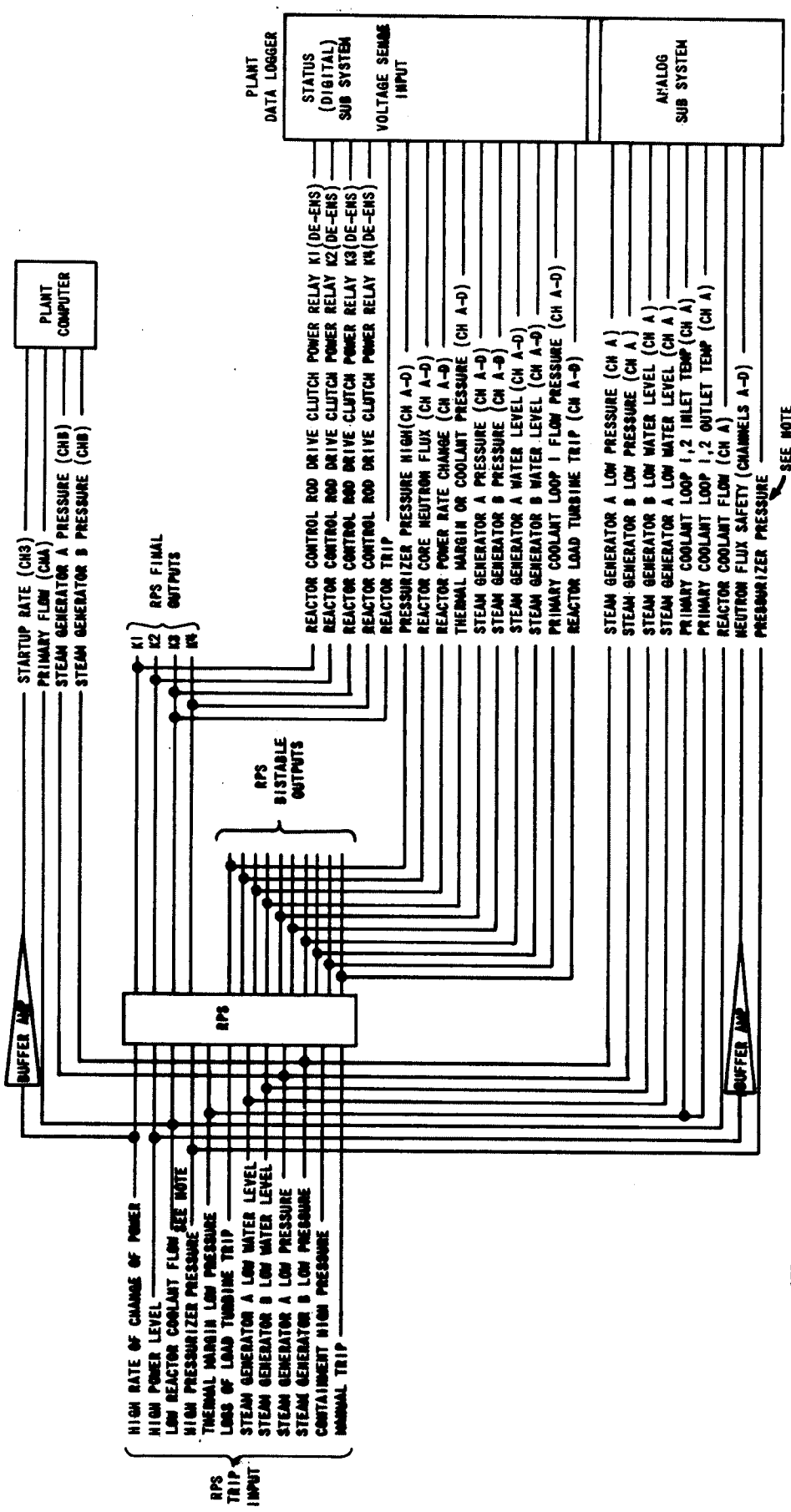
X = Analog Input Signal

With +15V Applied to Bistable Trip Unit: No Trip Regardless To Level of Input Analog Signal

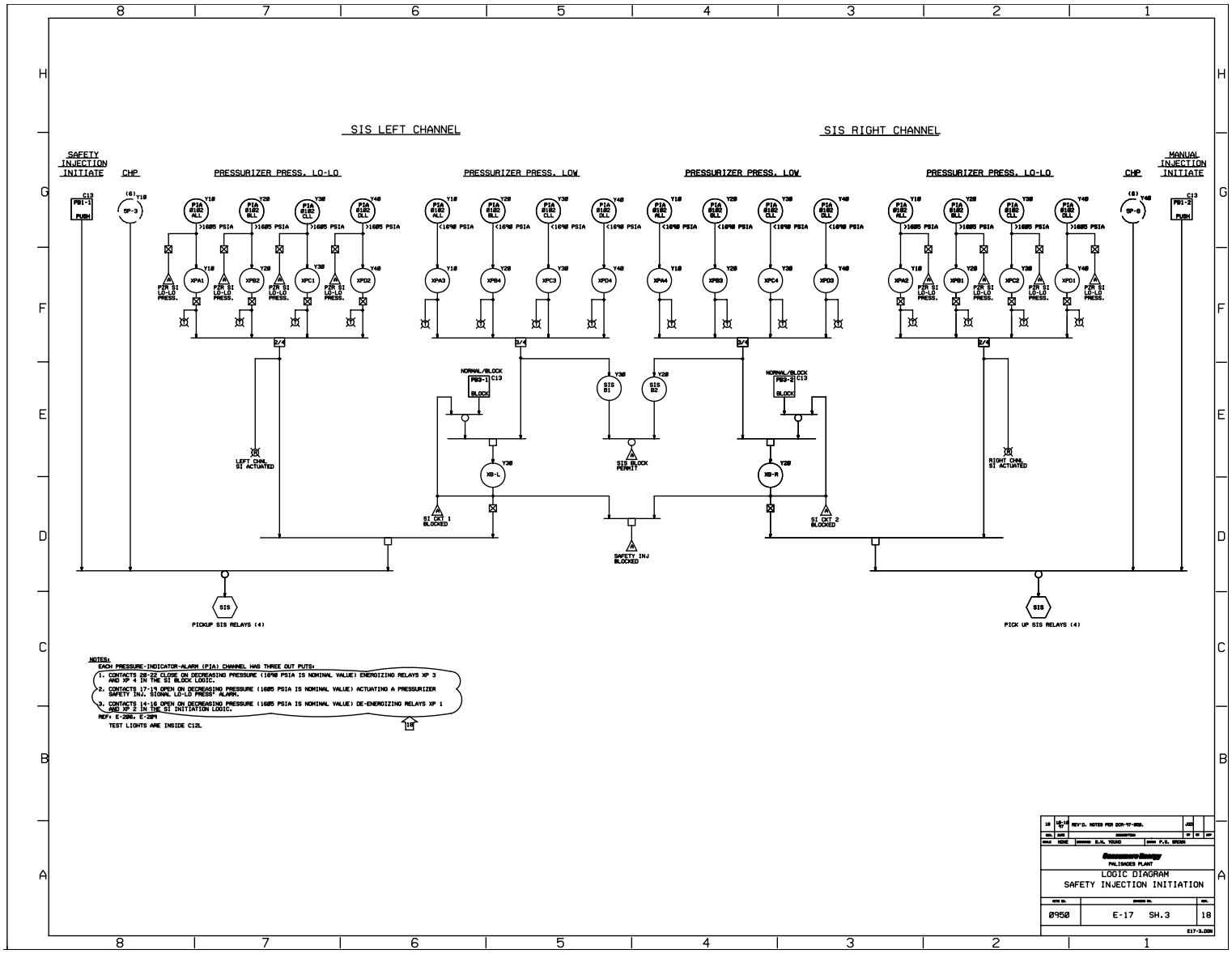
Without +15V Applied to Bistable Trip Unit: Trip According to Level of Input Analog Signal

Same Arrangement for Other 3 Channels

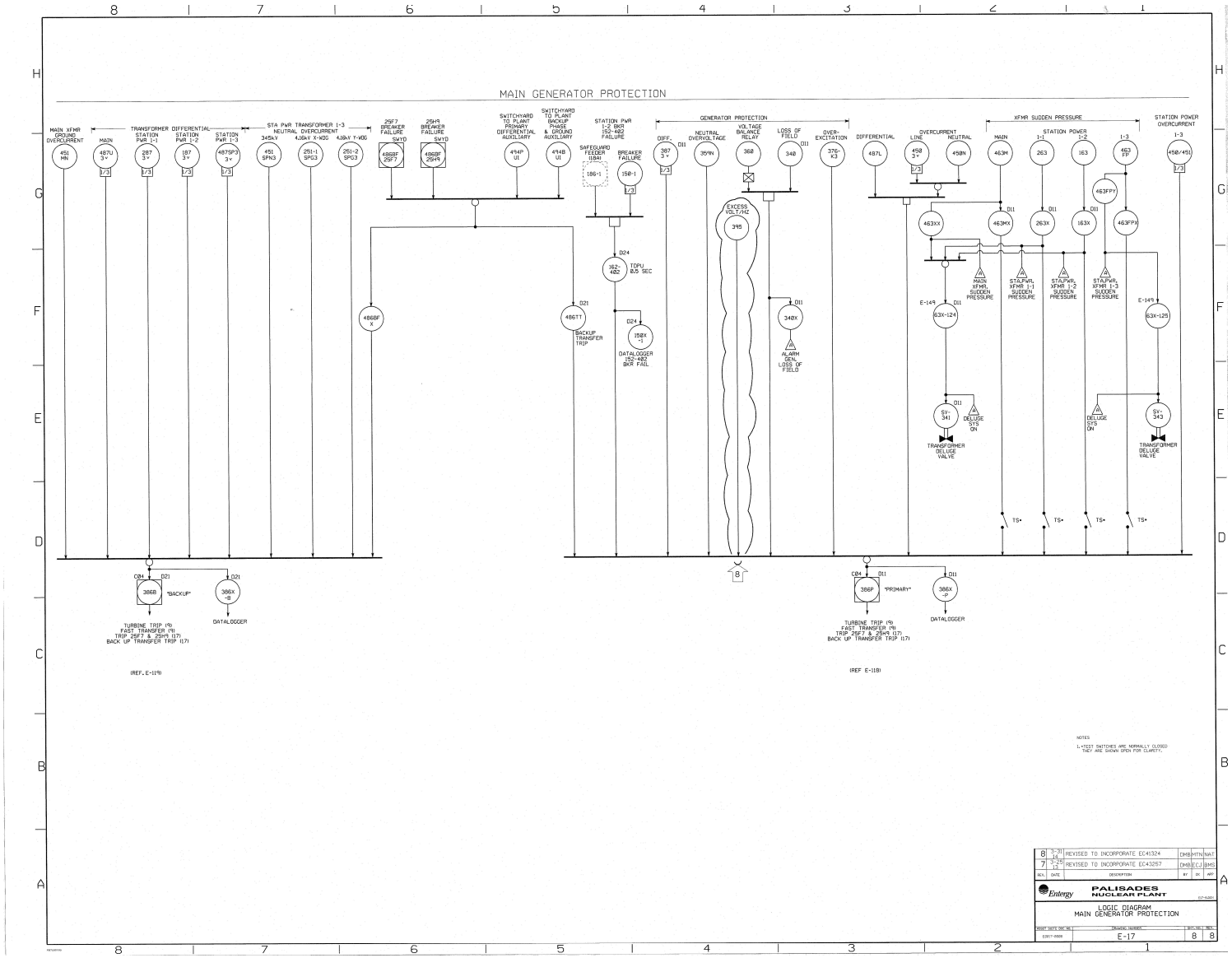
REACTOR PROTECTIVE SYSTEM INTERFACES



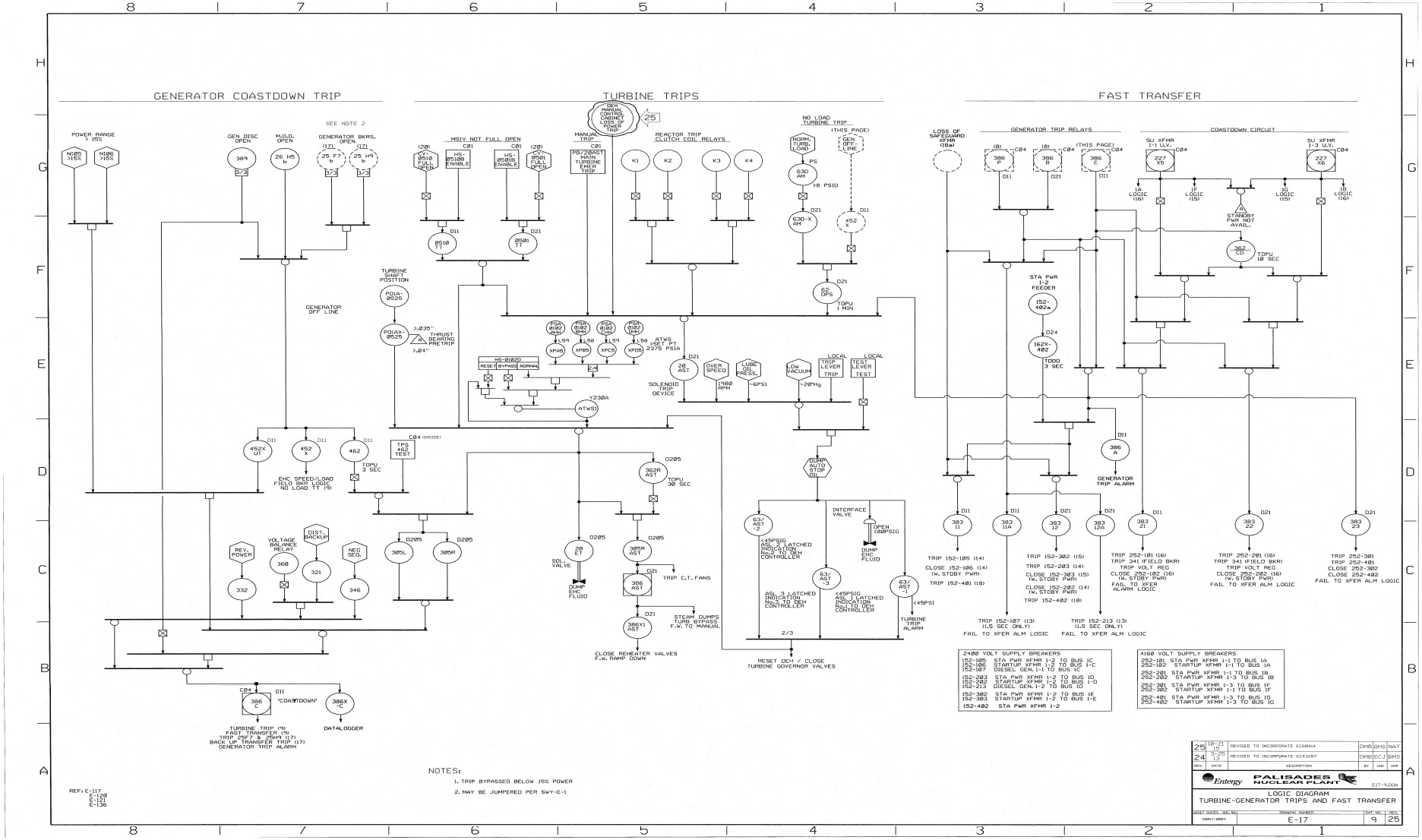
LOGIC DIAGRAM
SAFETY INJECTION INITIATION



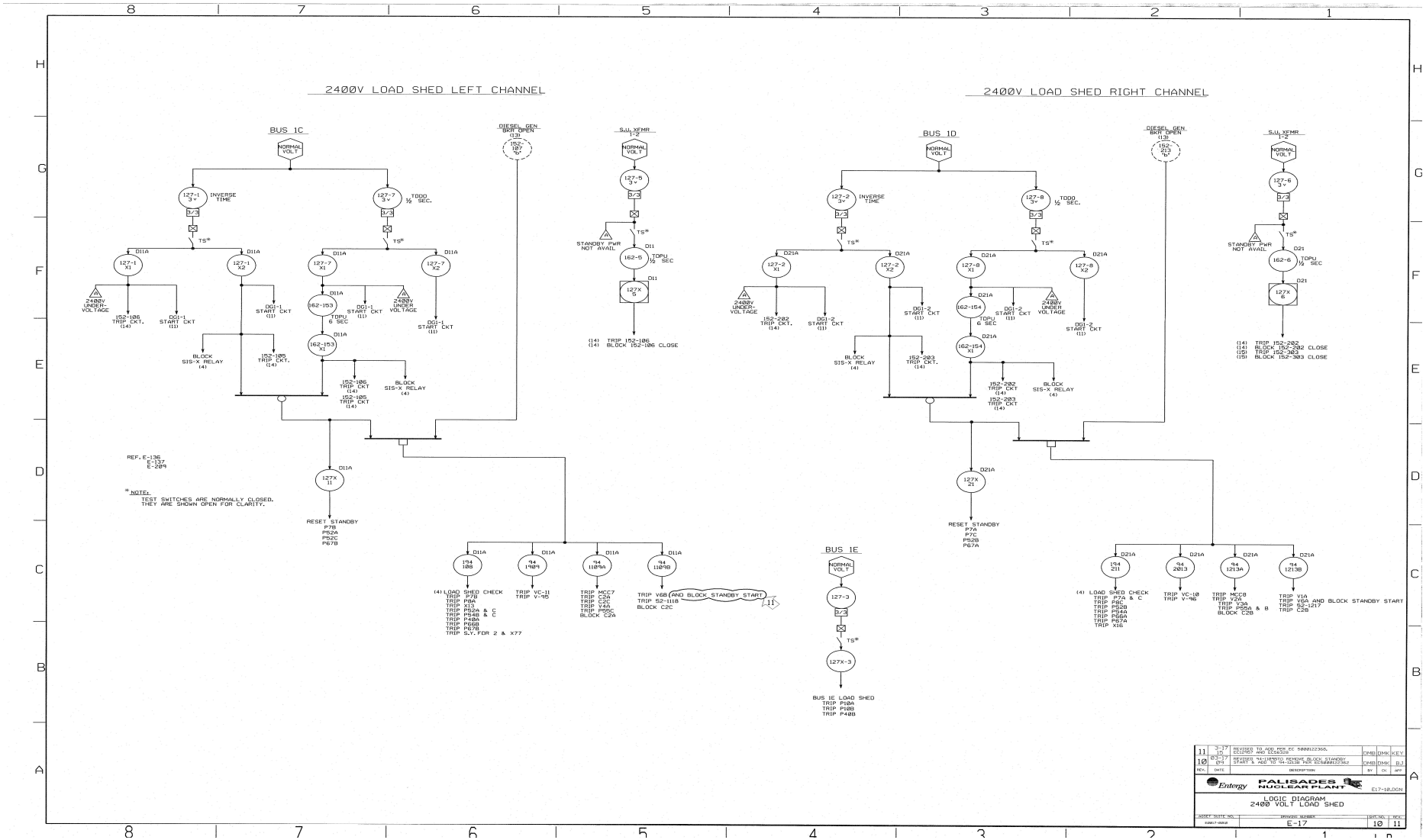
LOGIC DIAGRAM
MAIN GENERATOR PROTECTION



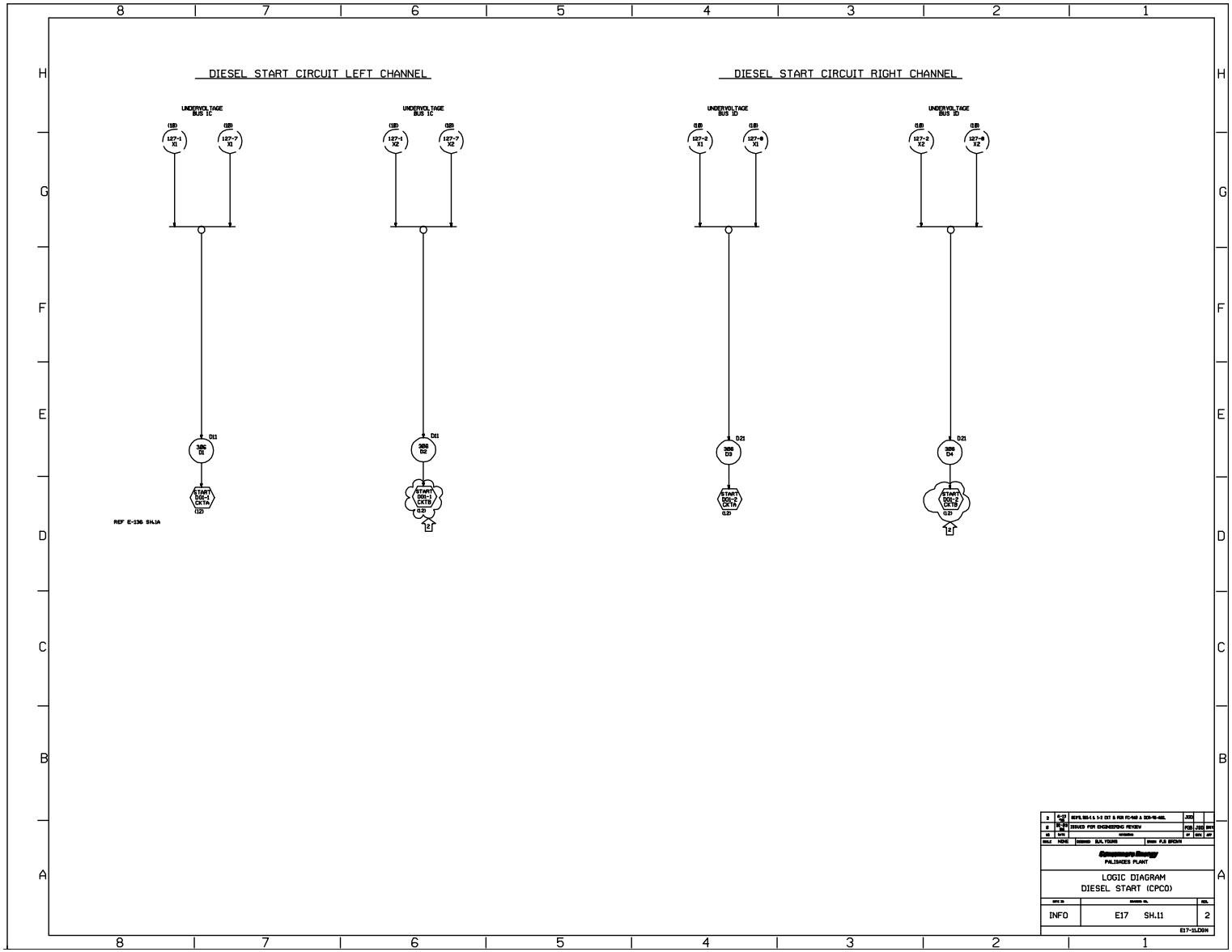
LOGIC DIAGRAM
TURBINE-GENERATOR TRIPS AND FAST TRANSFER



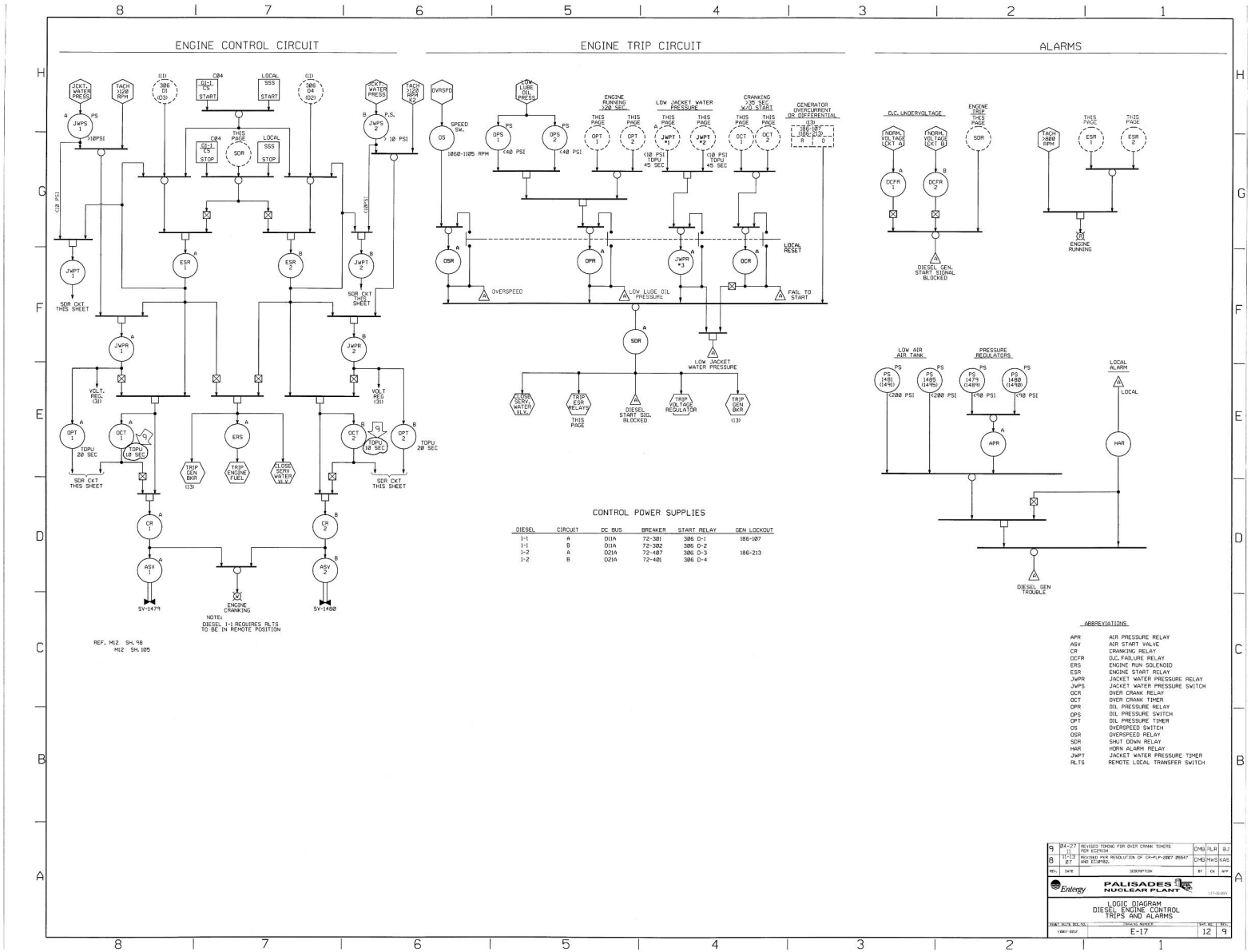
LOGIC DIAGRAM
2400 VOLT LOAD SHED



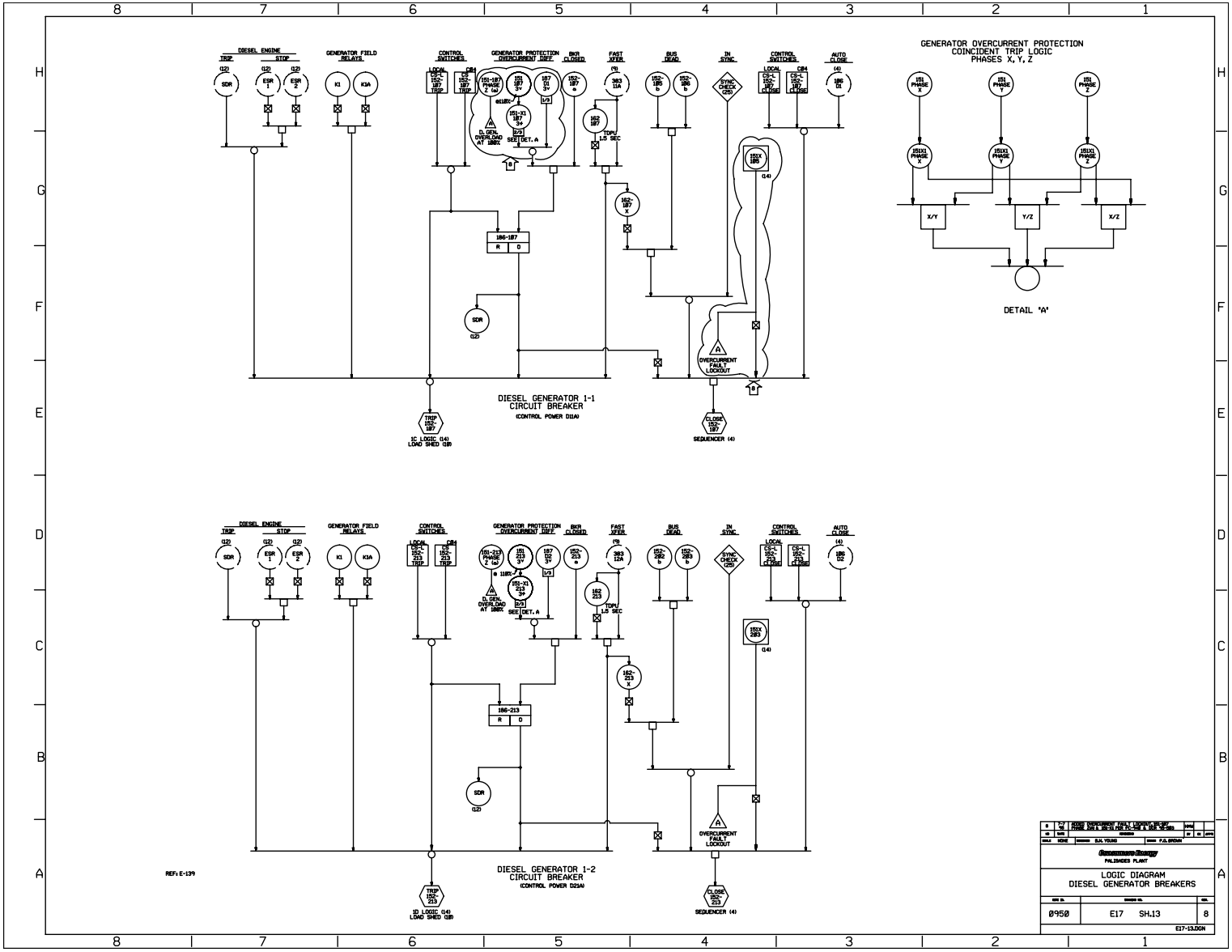
LOGIC DIAGRAM
DIESEL START



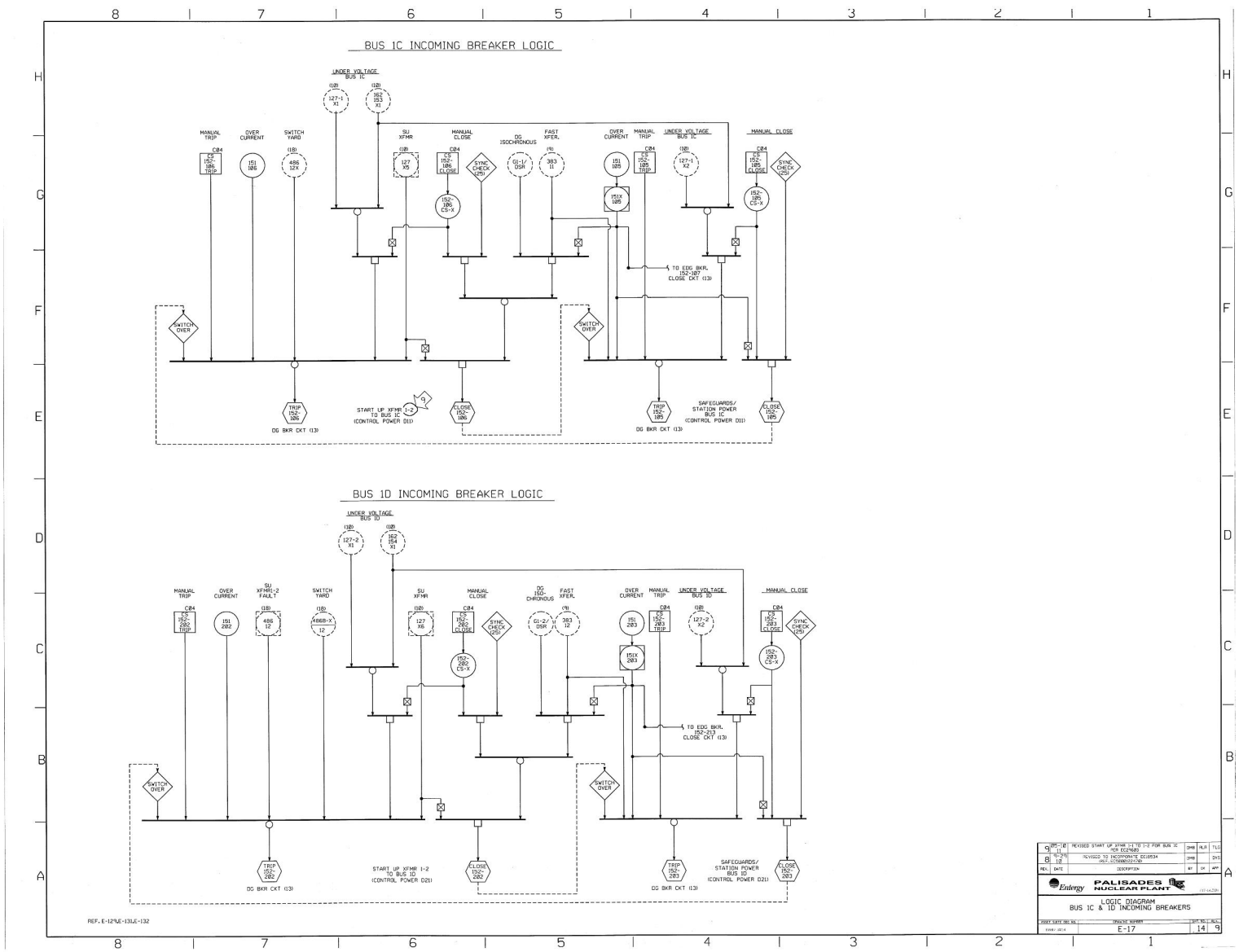
LOGIC DIAGRAM
DIESEL ENGINE CONTROL, TRIPS AND ALARMS



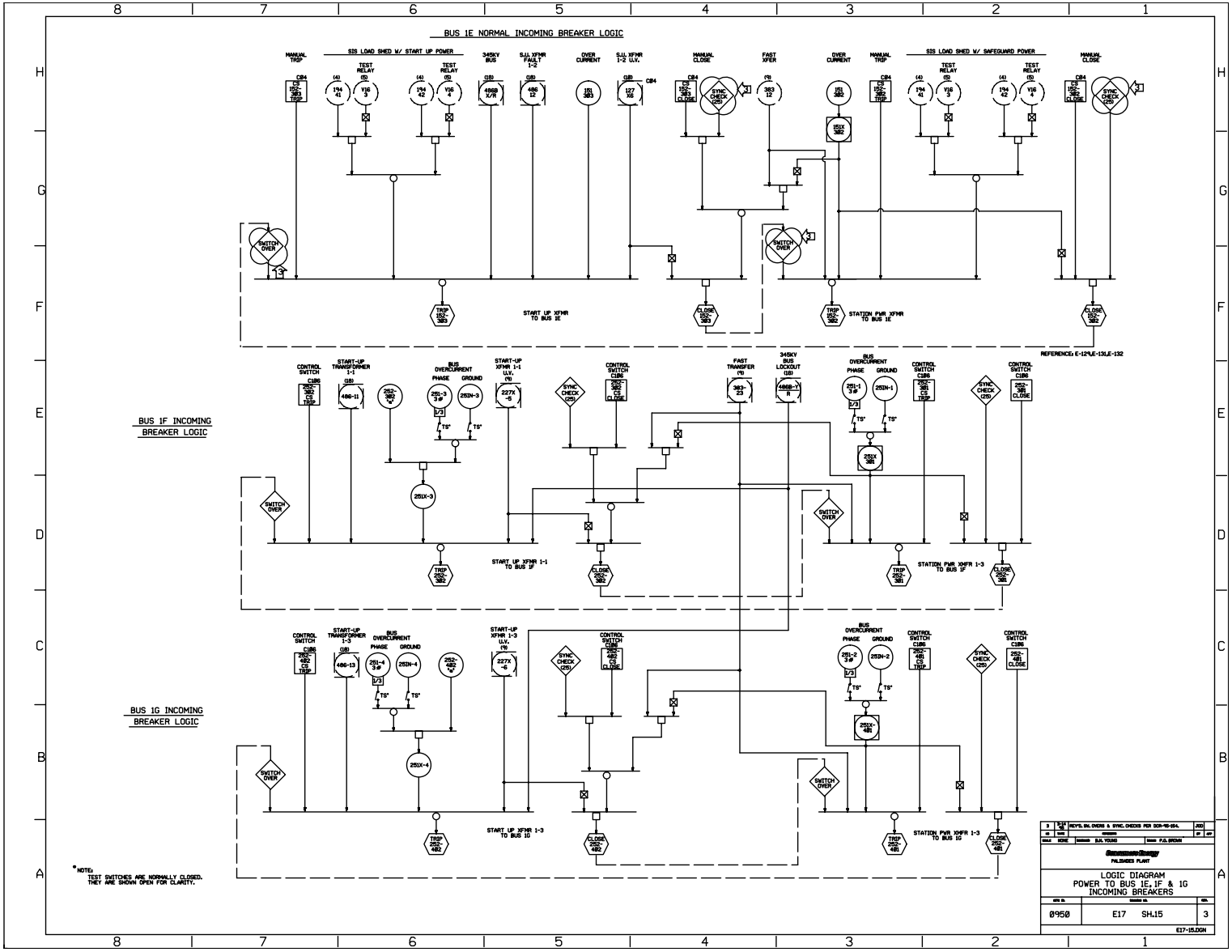
LOGIC DIAGRAM
DIESEL GENERATOR BREAKERS



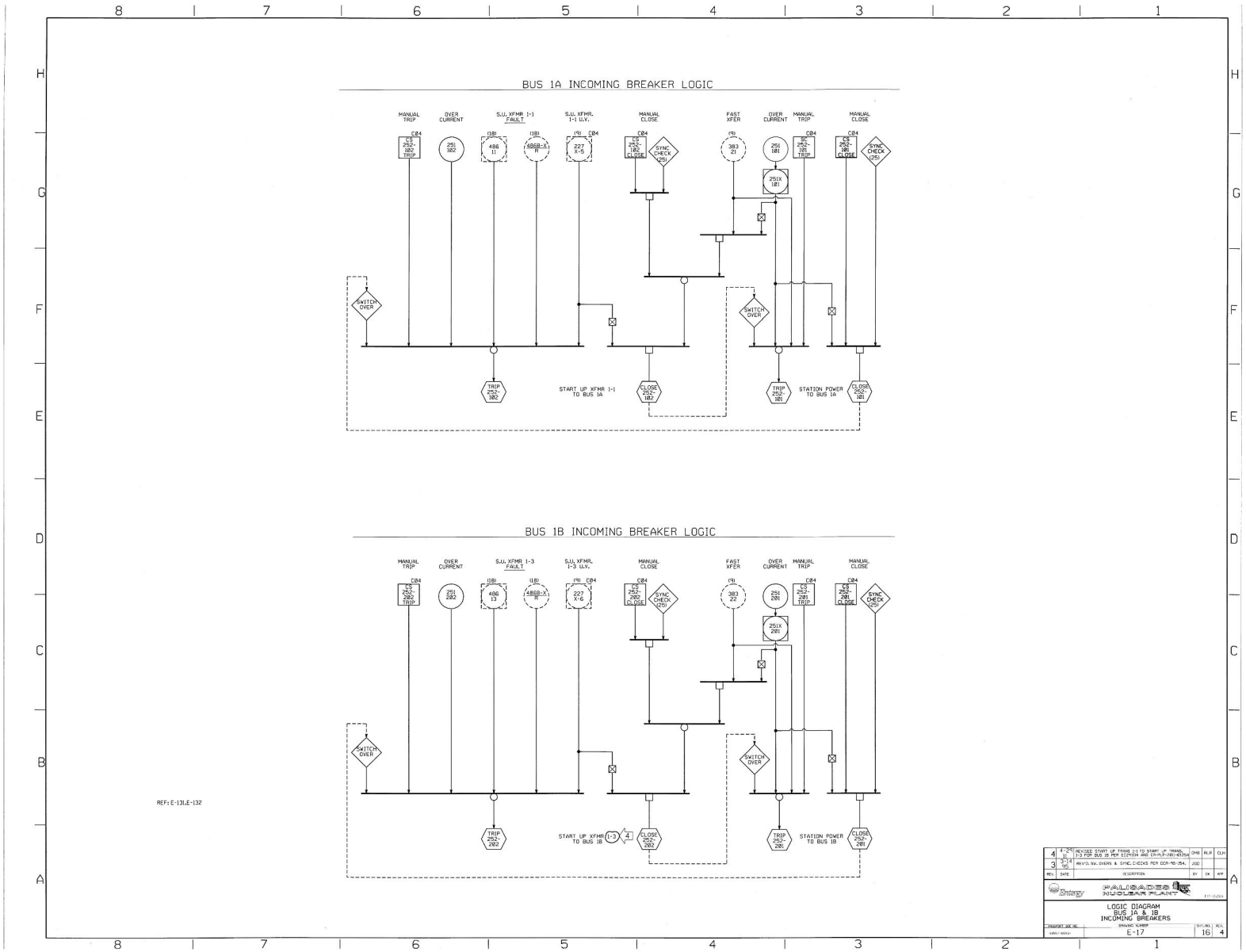
LOGIC DIAGRAM
BUS 1C AND 1D INCOMING BREAKERS



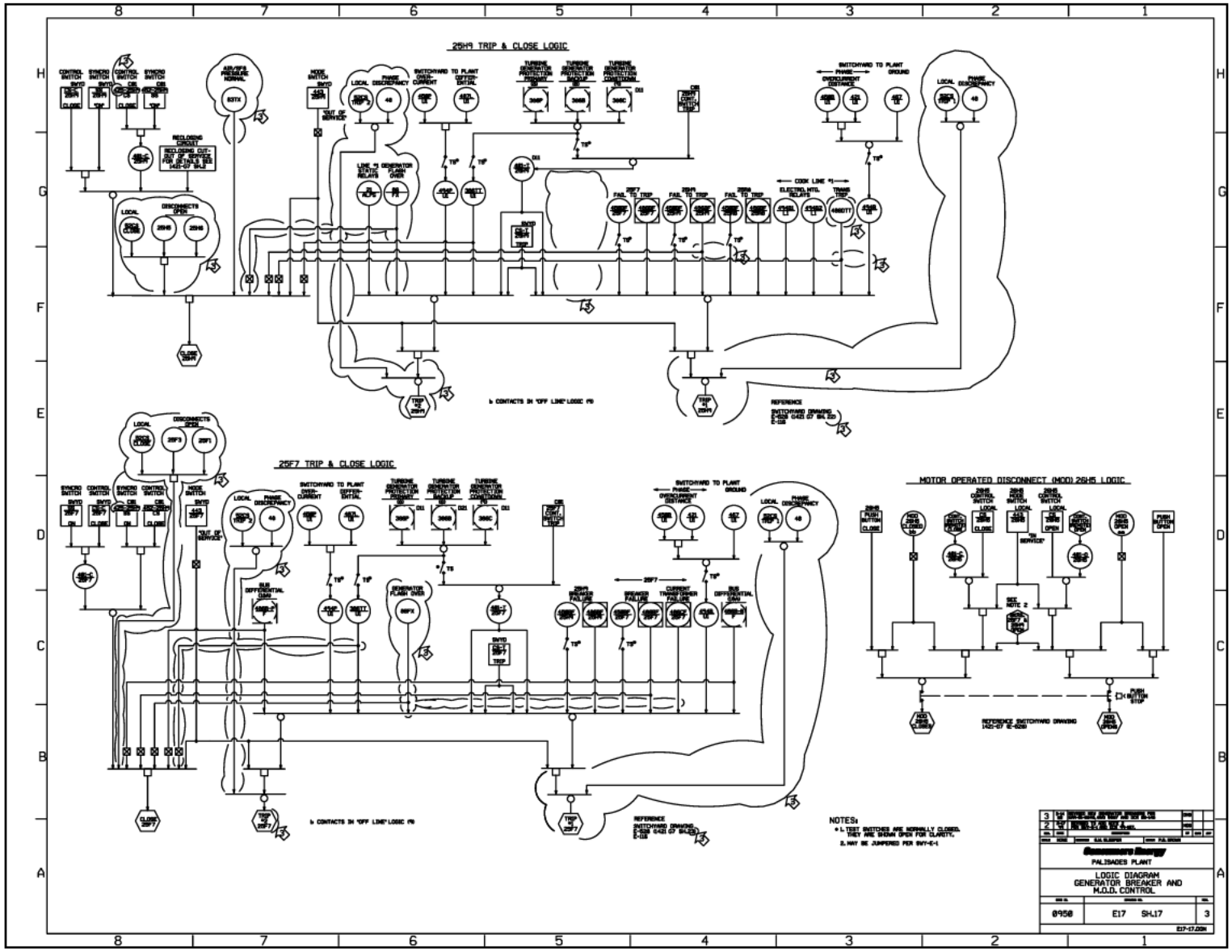
LOGIC DIAGRAM
POWER TO BUS 1E, 1F, AND 1G INCOMING BREAKERS



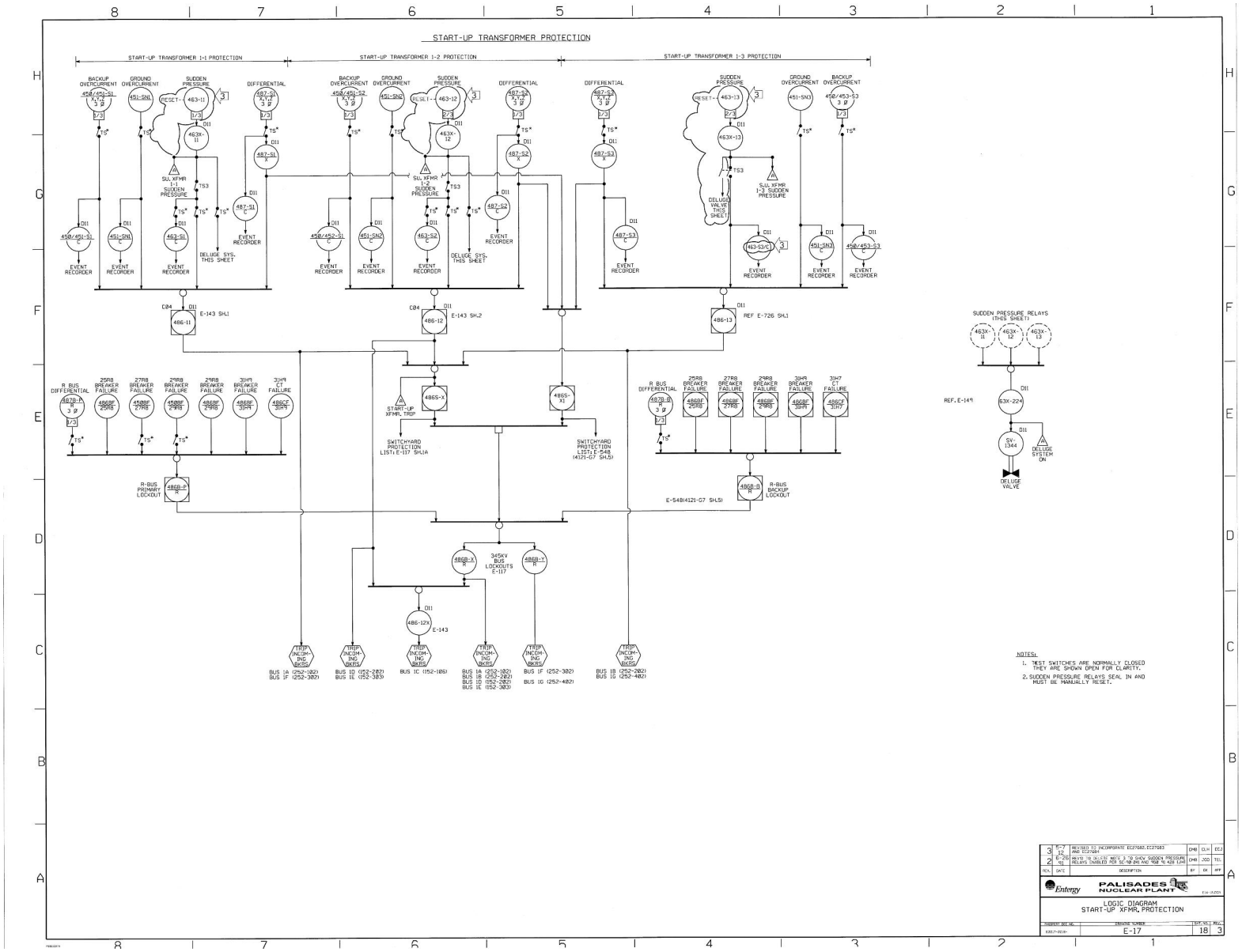
LOGIC DIAGRAM
BUS 1A & 1 B INCOMING BREAKERS



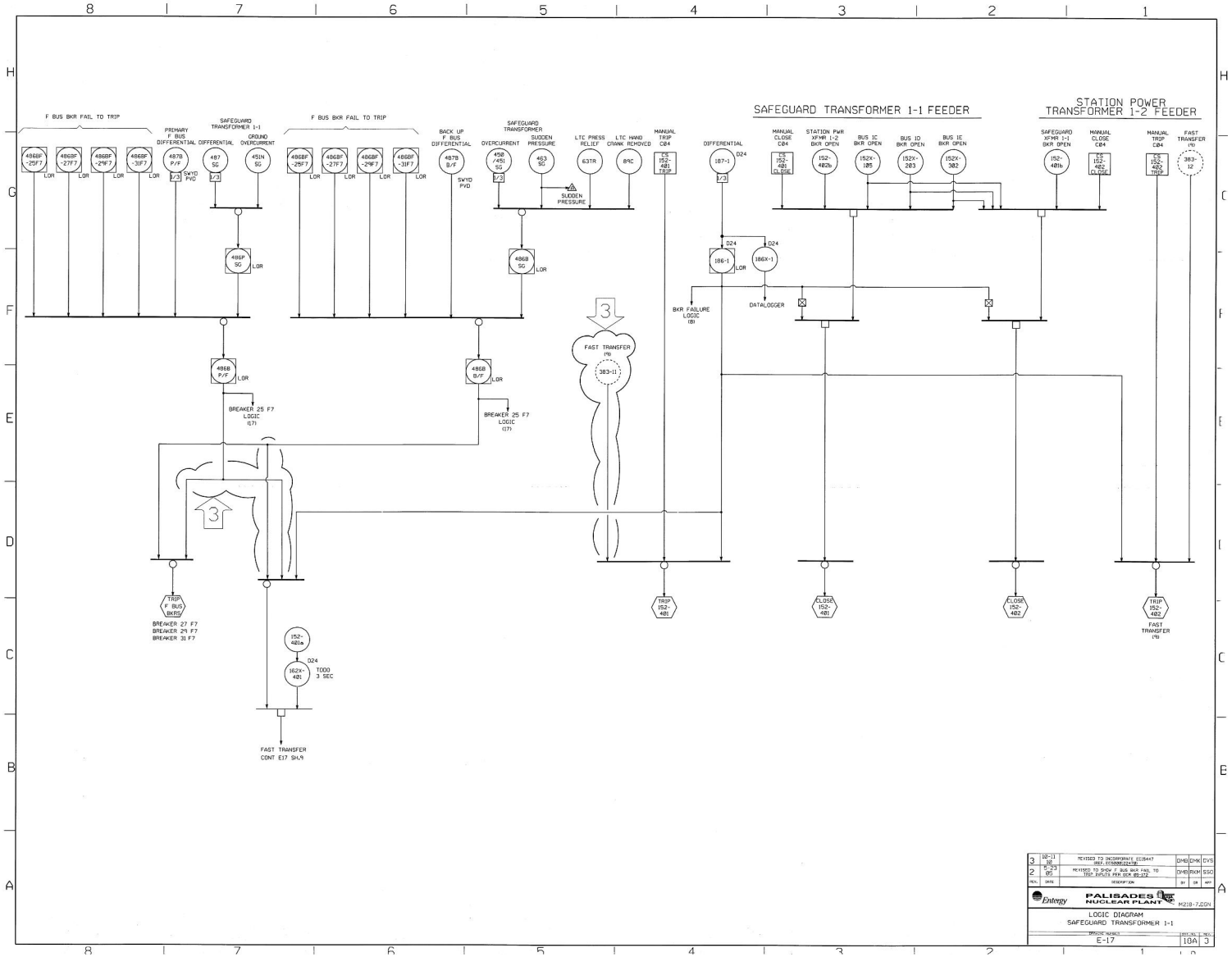
LOGIC DIAGRAM
GENERATOR BREAKER AND M.O.D. CONTROL



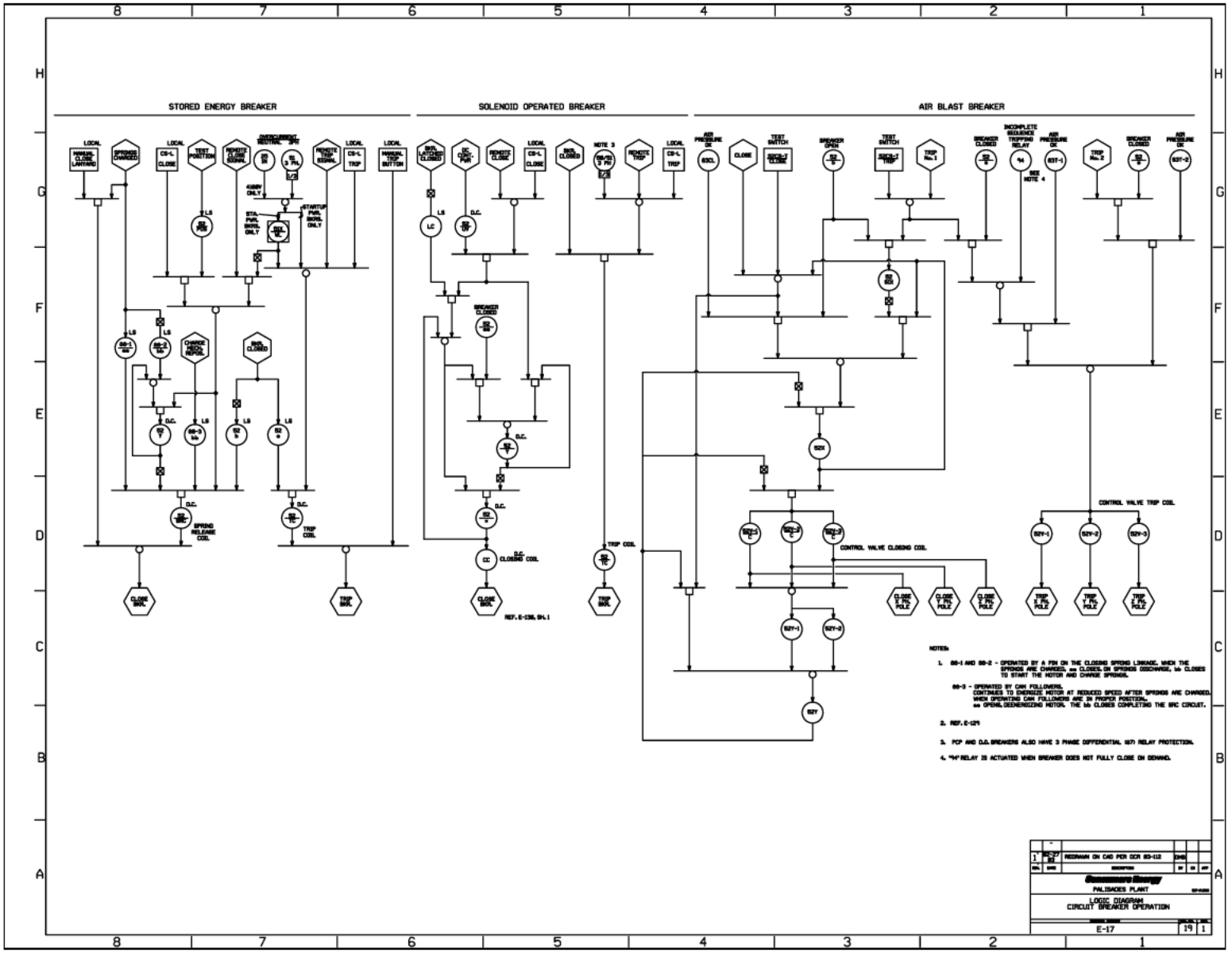
LOGIC DIAGRAM
START-UP XFMR PROTECTION



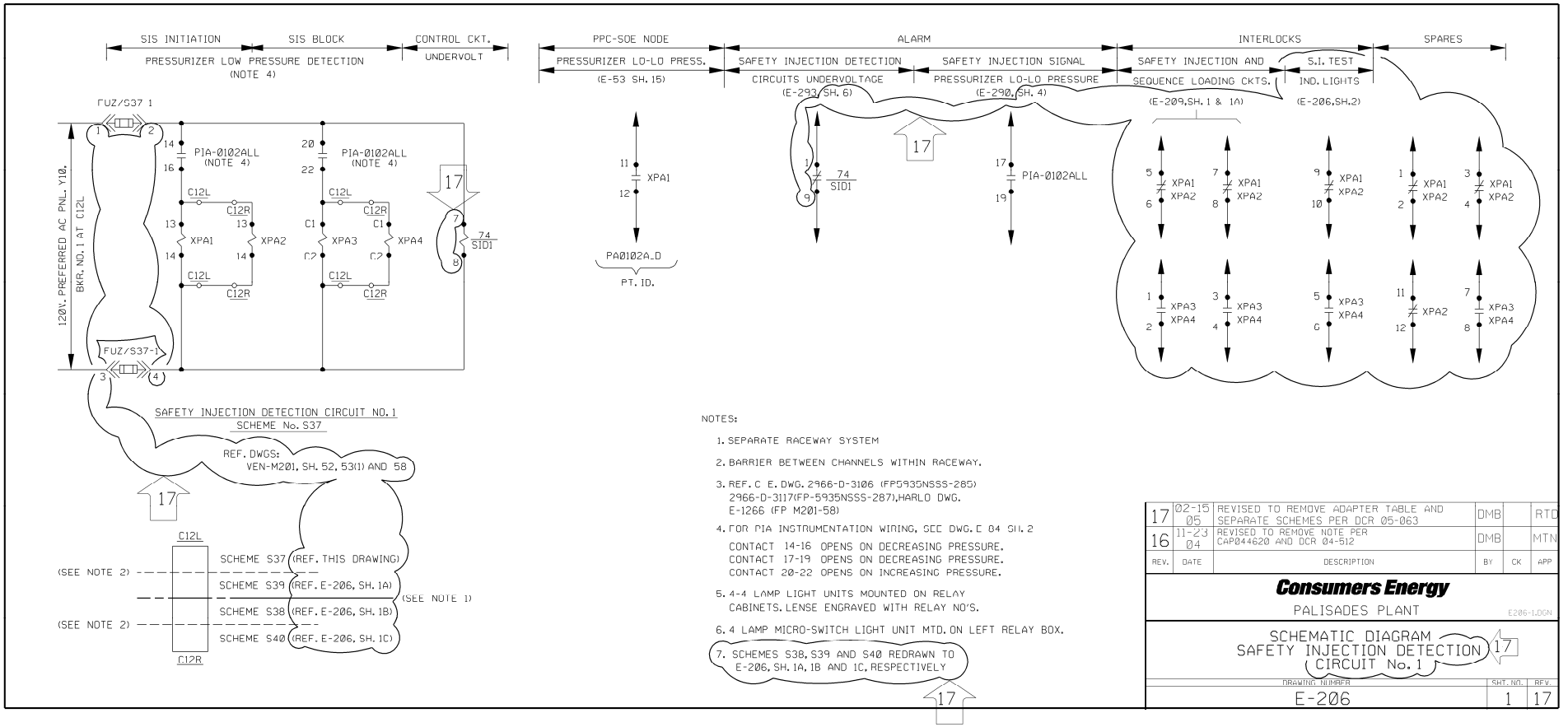
LOGIC DIAGRAM
SAFEGUARD TRANSFORMER 1-1



LOGIC DIAGRAM
CIRCUIT BREAKER OPERATION



SCHEMATIC DIAGRAM
SAFETY INJECTION SIGNAL AUXILIARY CIRCUITS



NOTES:

1. SEPARATE RACEWAY SYSTEM
2. BARRIER BETWEEN CHANNELS WITHIN RACEWAY.
3. REF. C E. DWG. 2966-D-3106 (FP5935NSSS-285) 2966-D-3117(FP-5935NSSS-287), HARLO DWG. E-1266 (FP M201-58)
4. FOR PIA INSTRUMENTATION WIRING, SEE DWG. E 04 SH. 2
   CONTACT 14-16 OPENS ON DECREASING PRESSURE.
   CONTACT 17-19 OPENS ON DECREASING PRESSURE.
   CONTACT 20-22 OPENS ON INCREASING PRESSURE.
5. 4-4 LAMP LIGHT UNITS MOUNTED ON RELAY CABINETS. LENSE ENGRAVED WITH RELAY NO'S.
6. 4 LAMP MICRO-SWITCH LIGHT UNIT MTD. ON LEFT RELAY BOX.
7. SCHEMES S38, S39 AND S40 REDRAWN TO E-206, SH. 1A, 1B AND 1C, RESPECTIVELY

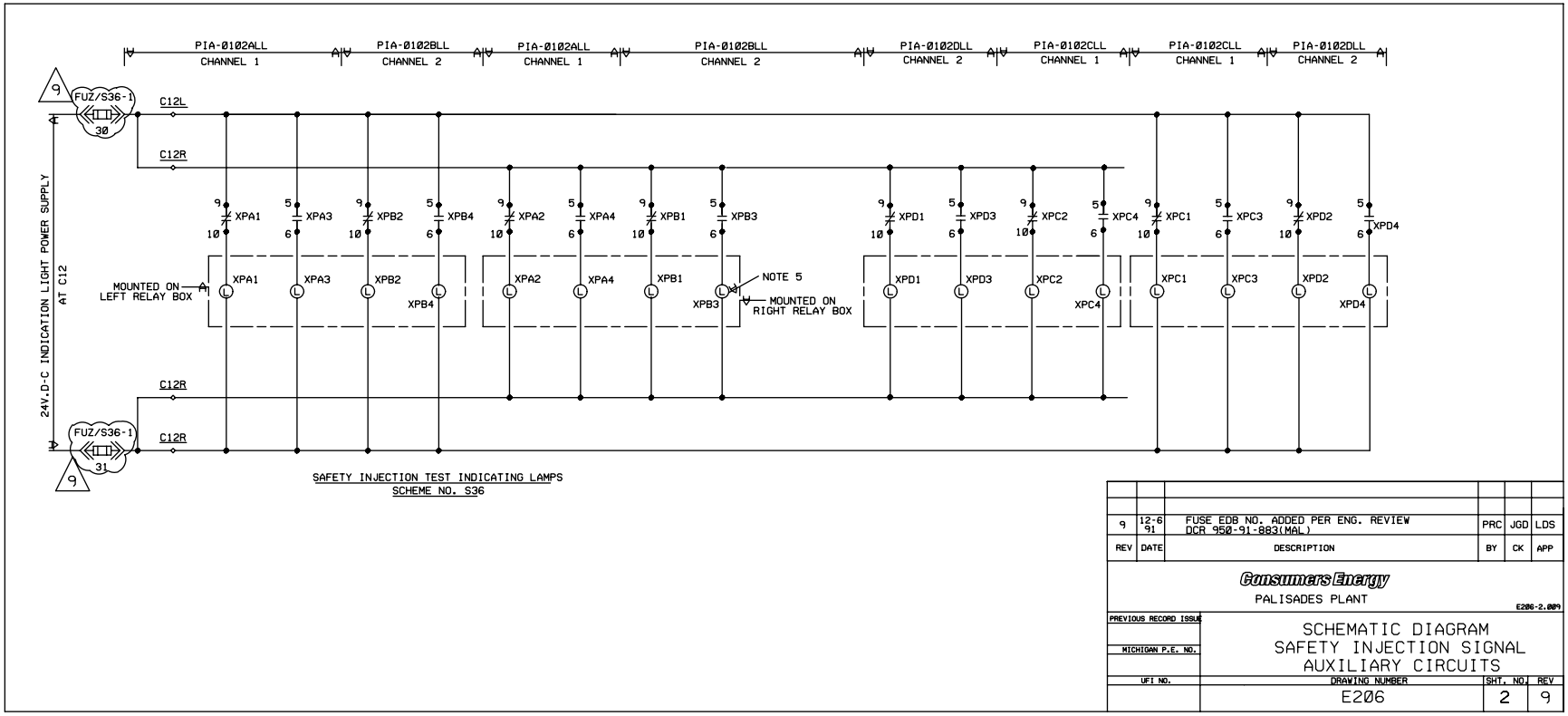
REV.	DATE	DESCRIPTION	BY	CK	APP
17	02-15 05	REVISED TO REMOVE ADAPTER TABLE AND SEPARATE SCHEMES PER DCR 05-063	DMB		RTD
16	11-23 04	REVISED TO REMOVE NOTE PER CAP044620 AND DCR 04-512	DMB		MTN

Consumers Energy
PALISADES PLANT
E206-1.DGN

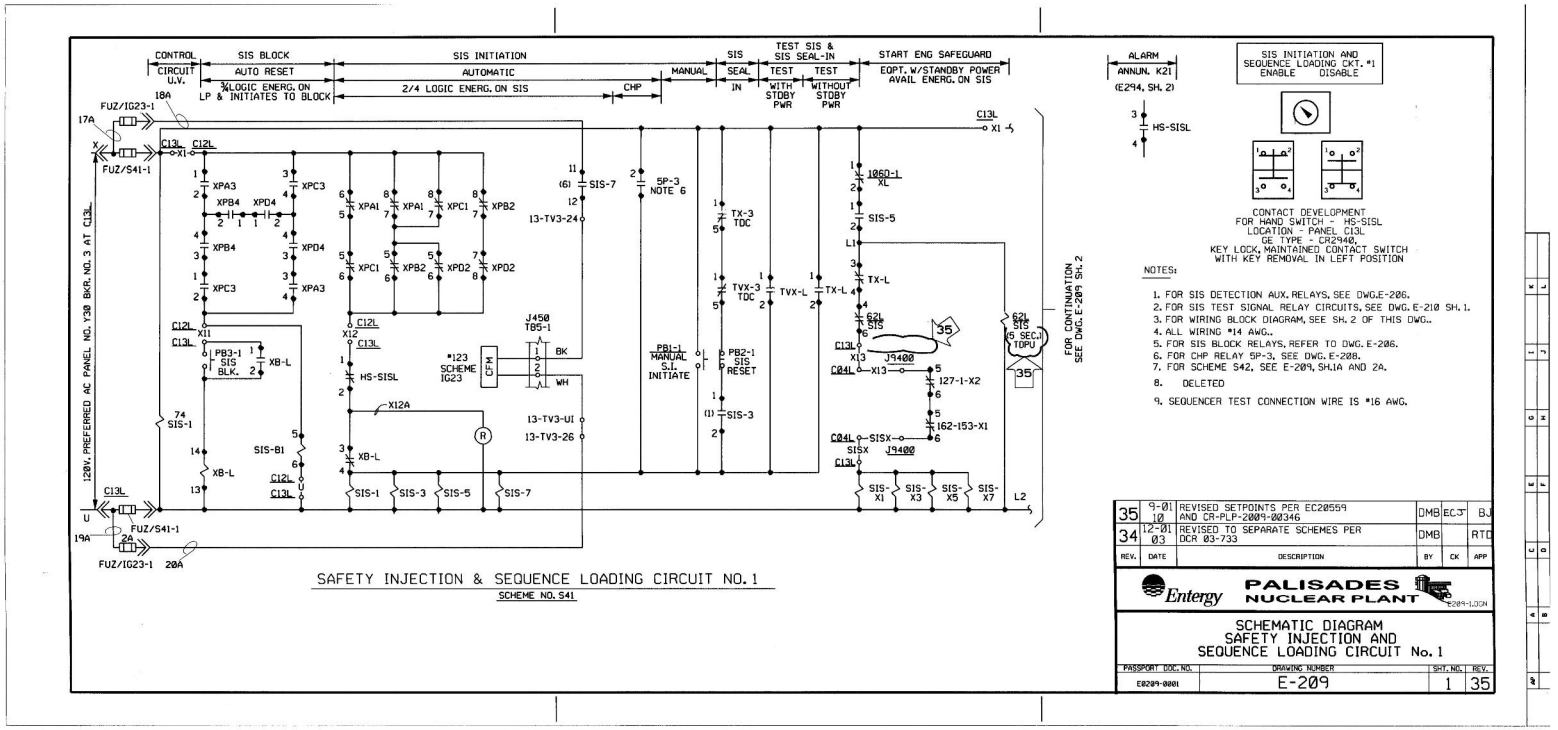
SCHEMATIC DIAGRAM
SAFETY INJECTION DETECTION CIRCUIT No. 1 (17)

DRAWING NUMBER	SHT. NO.	REV.
E-206	1	17

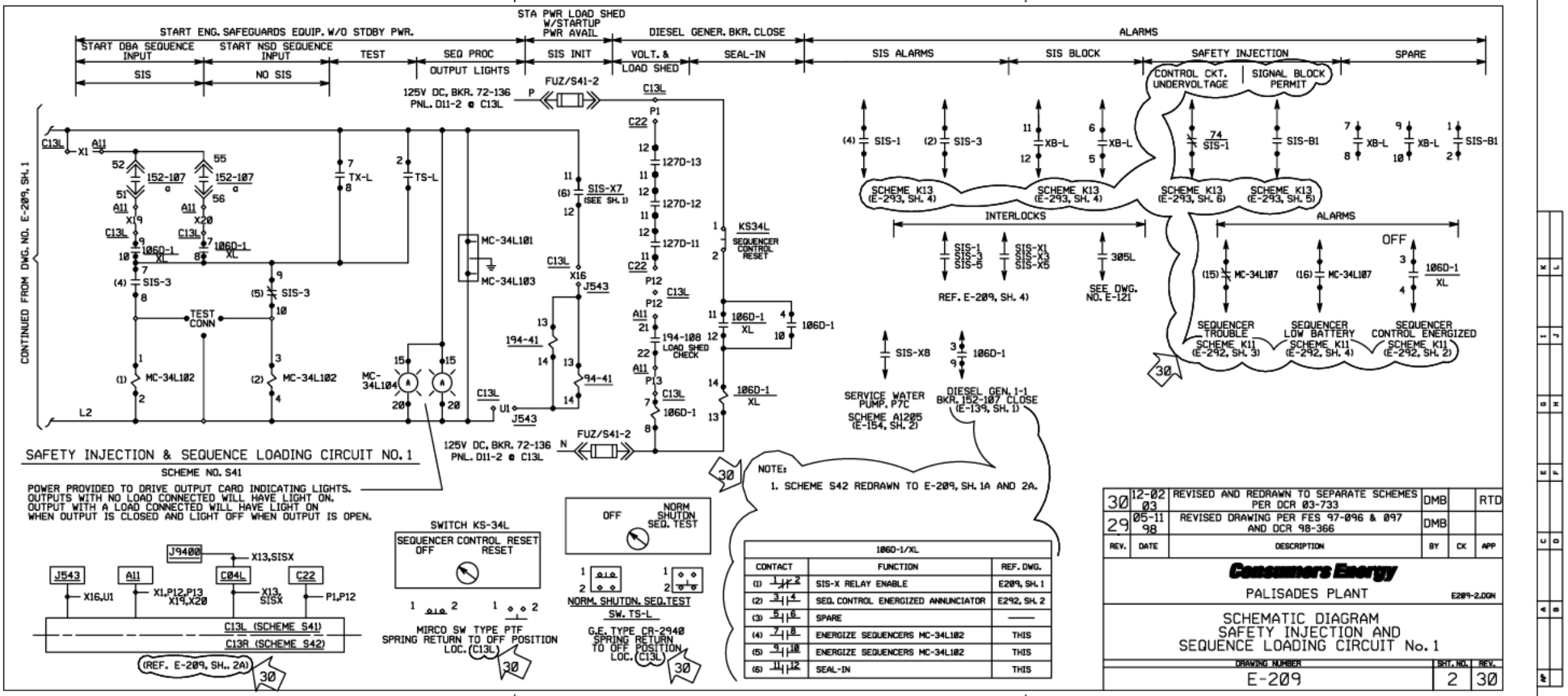
SCHEMATIC DIAGRAM
SAFETY INJECTION SIGNAL AUXILIARY CIRCUITS



SCHEMATIC DIAGRAM
SAFETY INJECTION AND SEQUENCE LOADING CIRCUITS



SCHEMATIC DIAGRAM
SAFETY INJECTION AND SEQUENCE LOADING CIRCUITS



106D-1/XL		
CONTACT	FUNCTION	REF. DWG.
(1) 1 2	SIS-X RELAY ENABLE	E209, SH. 1
(2) 3 4	SEQ. CONTROL ENERGIZED ANNUNCIATOR	E292, SH. 2
(3) 5 6	SPARE	——
(4) 7 8	ENERGIZE SEQUENCERS MC-34L102	THIS
(5) 9 10	ENERGIZE SEQUENCERS MC-34L102	THIS
(6) 11 12	SEAL-IN	THIS

REV.	DATE	DESCRIPTION	BY	CK	APP
30	12-02 03	REVISED AND REDRAWN TO SEPARATE SCHEMES PER DCR 03-733	DMB		RTD
29	05-11 98	REVISED DRAWING PER FES 97-096 & 097 AND DCR 98-366	DMB		

Consumers Energy
PALISADES PLANT
E209-2.DGN

SCHEMATIC DIAGRAM
SAFETY INJECTION AND
SEQUENCE LOADING CIRCUIT No. 1

DRAWING NUMBER	SHT. NO.	REV.
E-209	2	30

SCHEMATIC DIAGRAM
SAFETY INJECTION AND SEQUENCE LOADING CIRCUITS

MC-34L102 (B817-116) SEQUENCER FUNCTIONS-LEFT CHANNEL

INPUT CONTACT NUMBER	INTER INPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	10001	INPUT FOR DBA (10001)	E-209 SH.2	(REF)	NA
2	10002	INPUT FOR NSD (10002)	E-209 SH.2	NA	(REF)
3	10003	SPARE			
4	10004	SPARE			
5	10005	SPARE			
6	10006	SPARE			
7	10007	SPARE			
8	10008	SPARE			
9	10009	SPARE			
10	10010	SPARE			
11	10011	SPARE			
12	10012	SPARE			
13	10013	SPARE			
14	10014	SPARE			
15	10015	SPARE			
16	10016	SPARE			

MC-34R102 (B817-116) SEQUENCER FUNCTIONS-RIGHT CHANNEL

INPUT CONTACT NUMBER	INTER INPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	10001	INPUT FOR DBA	E-209 SH.2	(REF)	NA
2	10002	INPUT FOR NSD	E-209 SH.2	NA	(REF)
3	10003	SPARE			
4	10004	SPARE			
5	10005	SPARE			
6	10006	SPARE			
7	10007	SPARE			
8	10008	SPARE			
9	10009	SPARE			
10	10010	SPARE			
11	10011	SPARE			
12	10012	SPARE			
13	10013	SPARE			
14	10014	SPARE			
15	10015	SPARE			
16	10016	SPARE			

MC-34L103 (B818-008) SEQUENCER FUNCTIONS-LEFT CHANNEL

OUTPUT CONTACT NUMBER	INTER OUTPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	00001	OPEN HPSI VOP-3809	E-244 SH.1	0±0.3-0	NA
2	00002	OPEN HPSI VOP-3811	E-244 SH.4	0±0.3-0	NA
3	00003	OPEN LPSI VOP-3810	E-244 SH.1	0±0.3-0	NA
4	00004	CLOSE VOL CONT TANK VOP-2867	E-242 SH.1	0±0.3-0	NA
5	00005	START BORIC ACID PUMP P-56B	E-283	2±0.3	NA
6	00006	SPARE			
7	00007	SPARE			
8	00008	SPARE			

MC-34R103 (B818-008) SEQUENCER FUNCTIONS-RIGHT CHANNEL

OUTPUT CONTACT NUMBER	INTER OUTPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	00001	OPEN HPSI VOP-3864	E-244 SH.1	0±0.3-0	NA
2	00002	OPEN HPSI VOP-3866	E-244 SH.4	0±0.3-0	NA
3	00003	OPEN LPSI VOP-3812	E-244 SH.1	0±0.3-0	NA
4	00004	OPEN BORIC ACID FEED MV VOP-2A9	E-241	0±0.3-0	NA
5	00005	START BORIC ACID PUMP P-56A	E-283	2±0.3	NA
6	00006	SPARE			
7	00007	SPARE			
8	00008	SPARE			

MC-34L104 (B818-008) SEQUENCER FUNCTIONS-LEFT CHANNEL

OUTPUT CONTACT NUMBER	INTER OUTPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	00009	OPEN HPSI VOP-3807	E-244 SH.1	0±0.3-0	NA
2	00010	OPEN HPSI VOP-3813	E-244 SH.4	0±0.3-0	NA
3	00011	OPEN LPSI VOP-3808	E-244 SH.1	0±0.3-0	NA
4	00012	OPEN BORIC ACID TANK VOP-2A9	E-241	0±0.3-0	NA
5	00013	OPEN BORIC ACID TANK VOP-2A8	E-241	0±0.3-0	NA
6	00014	SPARE			
7	00015	SPARE			
8	00016	SPARE			

MC-34R104 (B818-008) SEQUENCER FUNCTIONS-RIGHT CHANNEL

OUTPUT CONTACT NUMBER	INTER OUTPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	00009	OPEN HPSI VOP-3862	E-244 SH.1	0±0.3-0	NA
2	00010	OPEN HPSI VOP-3868	E-244 SH.4	0±0.3-0	NA
3	00011	OPEN LPSI VOP-3814	E-244 SH.1	0±0.3-0	NA
4	00012	SPARE			
5	00013	SPARE			
6	00014	SPARE			
7	00015	SPARE			
8	00016	SPARE			

MC-34L105 (B836-016) SEQUENCER FUNCTIONS-LEFT CHANNEL

OUTPUT CONTACT NUMBER	INTER OUTPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	00017	START SERVICE WATER PUMP P-7B	E-154 SH.1	10±0.3	10±0.3
2	00018	*START CCW PUMP P-52C	E-259	40±0.3	40±0.3
3	00019	START CHARGING PUMP P-55C	E-257 SH.2	2±0.3	2±0.3
4	00020	START LPSI PUMP P-67B	E-248	13±0.3	NA
5	00021	SPARE			
6	00022	SPARE			
7	00023	SPARE			
8	00024	SPARE			
9	00025	SPARE			
10	00026	SPARE			
11	00027	SPARE			
12	00028	SPARE			
13	00029	SPARE			
14	00030	SPARE			
15	00031	SPARE			
16	00032	SPARE			

MC-34R105 (B836-016) SEQUENCER FUNCTIONS-RIGHT CHANNEL

OUTPUT CONTACT NUMBER	INTER OUTPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	00017	START SERVICE WATER PUMP P-7A	E-154 SH.1	10±0.3	10±0.3
2	00018	START CHARGING PUMP P-55B**	E-257 SH.1	19±0.3	19±0.3
3	00019	START CHARGING PUMP P-55A	E-257 SH.1	2±0.3	2±0.3
4	00020	LPSI PUMP P-67A	E-247	13±0.3	NA
5	00021	SPARE			
6	00022	SPARE			
7	00023	SPARE			
8	00024	SPARE			
9	00025	SPARE			
10	00026	SPARE			
11	00027	SPARE			
12	00028	SPARE			
13	00029	SPARE			
14	00030	SPARE			
15	00031	SPARE			
16	00032	SPARE			

MC-34L106 (B836-016) SEQUENCER FUNCTIONS-LEFT CHANNEL

OUTPUT CONTACT NUMBER	INTER OUTPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	00033	START AUX FDWTR PUMP P-8A	E-196 SH.2	45±0.3	45±0.3
2	00034	START CCW PUMP P-52A	E-259	23±0.3	23±0.3
3	00035	START CONT SPRAY PUMP P-54C	E-251	19±0.3	NA
4	00036	START CONT SPRAY PUMP P-54B	E-251	2±0.3	NA
5	00037	SPARE			
6	00038	SPARE			
7	00039	SPARE			
8	00040	SPARE			
9	00041	SPARE			
10	00042	SPARE			
11	00043	SPARE			
12	00044	SPARE			
13	00045	SPARE			
14	00046	SPARE			
15	00047	SPARE			
16	00048	SPARE			

MC-34R106 (B836-016) SEQUENCER FUNCTIONS-RIGHT CHANNEL

OUTPUT CONTACT NUMBER	INTER OUTPUT CONT NO	DESCRIPTION	DRAWING	TIME DBA	TIME NSD
1	00033	START AUX FDWTR PUMP P-8C	E-196 SH.9	45±0.3	45±0.3
2	00034	START CC PUMP P-52B	E-259	23±0.3	23±0.3
3	00035	START SERVICE WTR PUMP P-7C	E-154 SH.2	26±0.3	26±0.3
4	00036	START CONT SPRAY PUMP P-54A	E-251	2±0.3	NA
5	00037	SPARE			
6	00038	SPARE			
7	00039	SPARE			
8	00040	SPARE			
9	00041	SPARE			
10	00042	SPARE			
11	00043	SPARE			
12	00044	SPARE			
13	00045	SPARE			
14	00046	SPARE			
15	00047	SPARE			
16	00048	SPARE			

NOTES

1. THE FOLLOWING CONVENTION WAS USED FOR EQUIPMENT NUMBERS.

MC- 3 4 X X XX
CHANNEL (LEFT OR RIGHT)
CHASSIS # (ALWAYS 1)
SLOT # (01-07)

2. SEQUENCERS ARE GOULD MODEL 984-388 WITH 888 SERIES INPUT/OUTPUT MODULES.
3. FOR SEQUENCER INITIATION SCHEME SEE E-209 SH.2.

*IF PUMPS P-52A AND P-52B FAIL TO START.
**IF PUMPS P-55A AND P-55C FAIL TO START.

REV	DATE	DESCRIPTION	BY	CK	APP
25	11-1 '96	REV MC-34L&R103, 104, 105 & 106 PER 950-96-818.	JGD		

APP. C.J. MCDONALD (SECTION HEAD)	4/18/83	DR. R.M. SATTERELLI	CK. T.D. VOGT 4/18/83
APP. P. LOLICH (DIVISION HEAD)	4/18/83	Consumers Energy PALISADES PLANT E209-3.DGN	SCHEMATIC DIAGRAM SAFETY INJECTION & SEQUENCER LOADING CIRCUITS
APP. D.C. TARSI (DEPARTMENT HEAD)	4/18/83		NO. E-209 SHEET 3 REV. 25

SCHEMATIC DIAGRAM
SAFETY INJECTION AND SEQUENCE LOADING CIRCUITS

SIS (SAFETY INJECTION SIGNAL) RELAY TABLE

FUNCTIONS OF SIS RELAYS

CONTACTS	SIS RELAYS-LEFT (ODD NUMBERS)										SIS RELAYS-RIGHT (EVEN NUMBERS)											
	SIS-1	REF. DWG.	SIS-3	REF. DWG.	SIS-5 (SEE NOTE 4)	REF. DWG.	CONTACTS	SIS-7	REF. DWG.		SIS-2	REF. DWG.	SIS-4	REF. DWG.	SIS-6	REF. DWG.	CONTACTS	SIS-8	REF. DWG.	SIS-10 (SEE NOTE 4)	REF. DWG.
1	CLOSE CONT'MT SUMP DRAIN ISOL. SV1103 **	E-235 SH. 1	SEAL-IN CONTACT	E-209 SH. 1	SIS WITH STANDBY PWR. AVAILABLE CKT. NO. 1	E-209 SH. 1		OPEN COMP. CLG. WTR. SEAL CLG. SUCTION VALVES SV8913	E-239 SH.2		CLOSE CONT'MT SUMP DRAIN ISOL. SV1104 **	E-235 SH. 1	SEAL-IN CONTACT	E-209 SH. 1A	SIS WITH STANDBY PWR. AVAILABLE CKT. NO. 2	E-209 SH. 1A		OPEN SERV.WTR. DISCH. VALVE SV8867	E-217	OPEN SERV. WTR. DISCH. SV8861 **	E-216
2	CLOSE SERVICE WATER TO NON-CRITICAL ITEMS SV-1359	E-219 SH.3	S.I. INITIATION ALARM (SIGNAL A) *	E-243 SH.4	CLOSE BORIC ACID MAKE-UP STOP VALVE SV2155	E-234 SH. 1		OPEN COMP. CLG. WTR. DISCH. FROM SEAL CLG. SV8958	E-239 SH.2		SPARE		S.I. INITIATION ALARM (SIGNAL B) *	E-243 SH.4	OPEN COMP. CLG. WTR. TO SEAL CLG. SUCTION VA. SV8913	E-239 SH.2		CLOSE SERV. WTR. SUPPLY VALVE SV8869	E-217	SPARE *	
3	TRIP BLOCK CHARGING PUMP P55C	E-257 SH.2	CLOSE BORIC ACID RECIRC. VALVE FOC2130	E-98	CLOSE S.I. TANK RELIEF VALVE SV0347	E-245 SH.3		OPEN SERV. WTR. DISCH. VALVE SV8867	E-217		CLOSE SERVICE WTR. TO NON-CRITICAL ITEMS SV1359	E-219 SH.3	CLOSE BORIC ACID RECIRC. VALVE FOC2136	E-98 SH.3	CLOSE COMP. CLG. WTR. TO FUEL POOL HEAT EXCH. SV8944A	E-239 SH.2		TRIP BLOCK CHARGING PUMP P55B	E-257 SH. 1	SPARE *	
4	S.I. INITIATION ALARM	E-243 SH.4	START DBA SEQUENCER	E-209 SH.2	CLOSE S.I. TANK RELIEF VALVE SV0338 **	E-245 SH.3		CLOSE S.I. TANK LEAKAGE VALVE SV3869	E-245 SH.3		CLOSE S.I. TANK LEAKAGE VALVE SV3869 **	E-245 SH.3	START DBA SEQUENCER	E-209 SH.2A	ENABLE OPENING COMP. CLG. WTR. TO FUEL POOL HEAT EXCH.	E-239 SH.2			E-239	CLOSE COMP. CLG. WTR. TO RADWASTE EVAPS SV8944 **	E-239
5	CLOSE BLOCK CHARGING PUMP P55C	E-257 SH.2	NO. SIS TO START NORMAL SHUT DN. SEQUENCER	E-209 SH.2	OPEN COMPONENT CLG. WTR. TO SHUT DN. HEAT EXCH. SV8938			CLOSE SERV. WTR. SUPPLY VALVE SV8869	E-217		OPEN COMPONENT CLG. WTR. DISCH. FROM SEAL CLG. SV8958	E-239 SH.2	NO. SIS TO START NORMAL SHUT DN. SEQ	E-209 SH.2A	S.I. INITIATION ALARM *	E-243 SH.4		OPEN SERV. WTR. DISCH. SV8864	E-216 SH. 1	CLOSE COMP. CLG. WTR. TO RADWASTE EVAPS SV8977B	E-239
6	CLOSE S.I. TANK RELIEF VALVE SV0342	E-245 SH.3	CLOSE S.I. TANK RELIEF VALVE SV0346	E-245	CLOSE HPSI HOT-LEG PRESSURE LETDOWN VALVE CV3085	E-245 SH.4		CFM INPUT *123	E-209 SH. 1		CLOSE S.I. TANK RELIEF VALVE SV0347	E-245 SH.3	CLOSE S.I. TANK RELIEF VALVE SV0338	E-245 SH.3	OPEN SERV. WTR. DISCH. SV8873	E-216 SH. 1		CLOSE BLOCK CHARGING PUMP P55B	E-257 SH. 1	SPARE *	E-257 SH. 1
7	ENABLE OPENING COMP. CLG. WTR. TO FUEL POOL HEAT EXCH.	E-239 SH.2															7	CFM INPUT *124			E-209 SH. 1A
8	CLOSE COMP. CLG. WTR. TO FUEL POOL HEAT EXCH. SV8944A	E-239 SH.2															8	CLOSE HPSI HOT-LEG PRESSURE LETDOWN VALVE CV3084			E-245
9	CLOSE COMP. CLG. WTR. TO RDWST EVAPS SV8944, SV8977B	E-239 SH.2															9	LOCKOUT TURNING GEAR OIL PUMP P-26			E-105 SH.1
10	SPARE																10	SPARE			
11	SPARE																11	CLOSE S.I. TANK RELIEF VALVE SV0342			E-245 SH.3
12	SPARE																12	CLOSE S.I. TANK RELIEF VALVE SV0346			E-245 SH.3

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SIS-X (SAFETY INJECTION SIGNAL AUXILIARY) RELAY TABLE

FUNCTIONS WITH SIS & STANDBY POWER AVAILABLE

CONTACTS	SIS-X RELAYS-LEFT (ODD NUMBERS)								SIS-X RELAYS-RIGHT (EVEN NUMBERS)							
	SIS-X1	REF. DWG.	SIS-X3	REF. DWG.	SIS-X5	REF. DWG.	SIS-X7	REF. DWG.	SIS-X2	REF. DWG.	SIS-X4	REF. DWG.	SIS-X6	REF. DWG.	SIS-X8	REF. DWG.
1	START L.P. INJ. PUMP P67B	E-248	OPEN H.P. INJ. LINE MOV 3011	E-244 SH.4	CLOSE VOLUME CONTROL TANK OUTLET MOV2007	E-242 SH. 1	START SERV. WTR. PUMP P7B	E-154 SH. 1	START L.P. INJ. PUMP P67A	E-247	OPEN H.P. INJ. LINE MOV 3062	E-244 SH. 1	OPEN BORIC ACID PUMPED FEED MOV2140	E-241	START SERV. WTR. PUMP P7C	E-154 SH.2
2	START L.P. INJ. PUMP P66B	E-249	OPEN L.P. INJ. LINE MOV 3008	E-244 SH. 1	START BORIC ACID PUMP P56B	E-203	START COMP. CLG. PUMP P52A	E-259	START H.P. INJ. PUMP P66A	E-249	OPEN H.P. INJ. LINE MOV 3066	E-244 SH. 1	START BORIC ACID PUMP P56A	E-203	START COMP. CLG. PUMP P52B	E-269 SH. 1
3	CONT. SPRAY PUMP P54B ON STAND BY	E-251	OPEN H.P. INJ. LINE MOV 3018	E-244 SH. 1	OPEN BORIC ACID GRAVITY FEED MOV2169	E-241	START COMP. CLG. PUMP P52C	E-259	SPARE		OPEN H.P. INJ. LINE MOV 3068	E-244 SH.4	START CHG. PUMP P55A	E-257 SH. 1	SPARE	
4	OPEN H.P. INJ. LINE MOV 3007	E-244 SH. 1	TRIP CONT. CLG. UNIT V4B **	E-218	OPEN BORIC ACID GRAVITY FEED MOV2170	E-241	SPARE		CONT. SPRAY PUMP P54A ON STAND BY	E-251 SH. 1	OPEN L.P. INJ. LINE MOV 3012	E-244 SH. 1	START CHG. PUMP P55B	E-257 SH. 1	SPARE	
5	OPEN H.P. INJ. LINE MOV 3009	E-244 SH. 1	SPARE		SPARE		SPARE		TRIP CONT. CLG. UNIT V1B **	E-218	TRIP CONT. CLG. UNIT V2B **	E-218	START SERV. WTR PUMP P7A	E-154 SH. 1	SPARE	
6	OPEN H.P. INJ. LINE MOV 3013	E-244 SH.4	CONT. SPRAY PUMP P54C ON STAND BY	E-251	START CHG. PUMP P55C	E-257 SH.2	INITIATE STARTUP POWER LOAD SHED SYSTEM	E-209 SH. 2	OPEN H.P. INJ. LINE MOV 3064	E-244 SH. 1	OPEN H.P. INJ. LINE MOV 3014	E-244	TRIP CONT. CLG. UNIT V3B **	E-218	INITIATE STARTUP POWER LOAD SHED SYSTEM	E-209 SH. 2A

REV.	DATE	DESCRIPTION	BY	CK	APP
31	10-26 10	REVISED TO INCORPORATE EC19665	RLR	DMK	ECJ
30	12-02 03	REVISED PER SC-95-090 AND DCR 98-340	DMB		RTD

Entergy PALISADES NUCLEAR PLANT

E209-4.DGN

SCHEMATIC DIAGRAM
SAFETY INJECTION & SEQUENCE
LOADING CIRCUITS

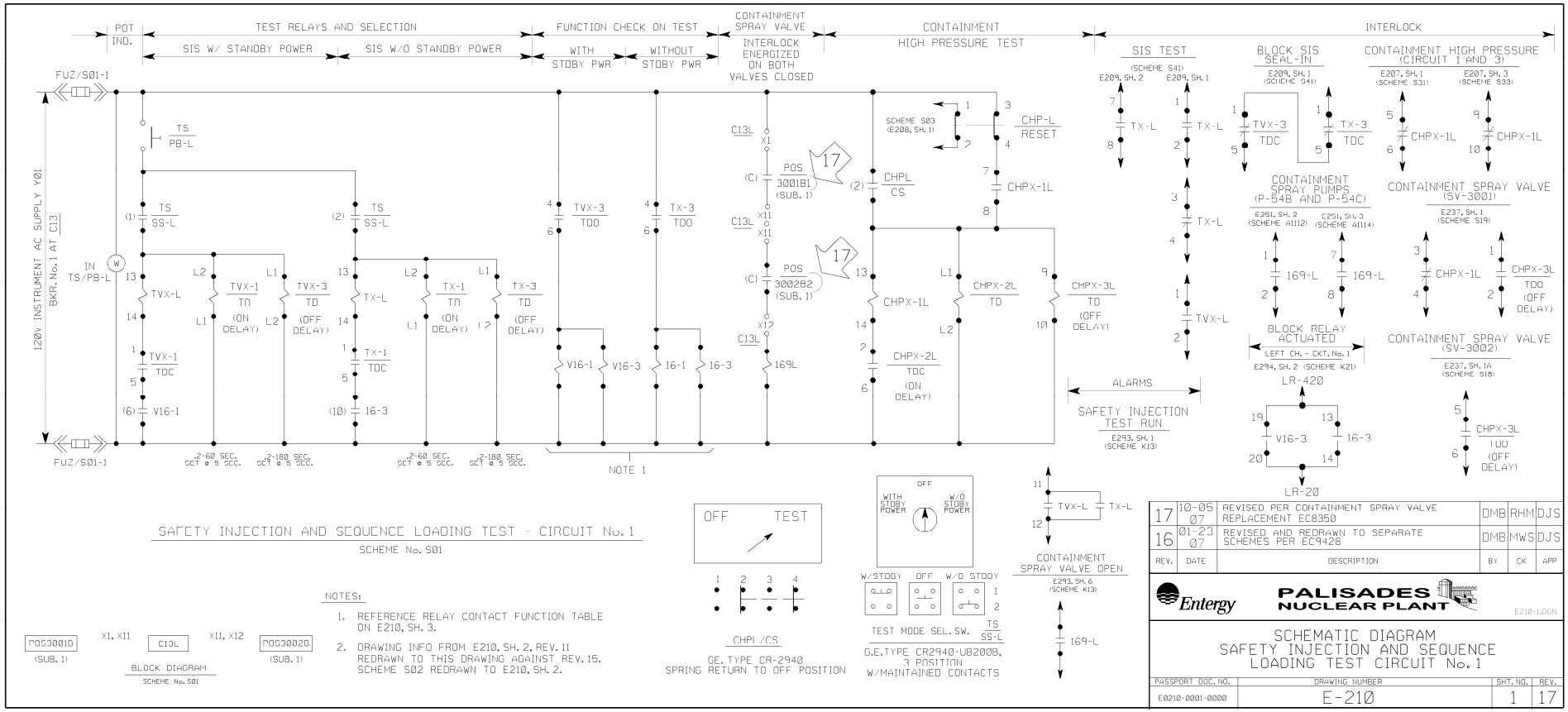
DRAWING NUMBER	SHT. NO.	REV.
E-209	4	31

GWO 8428
SUBMERGED ELECT. EQUIP. MOD.

NOTES

1. * N.O.CONTACT
2. ** N.C. CONTACT-OPENS ON SIS
3. FOR RELAY CIRCUITS, SEE E-209, SH. 1
4. SIS-10 & SIS-5 RELAYS HAVE 12 CONTACTS

SCHEMATIC DIAGRAM
SAFETY INJECTION AND SEQUENCE LOADING TEST CIRCUITS



SAFETY INJECTION AND SEQUENCE LOADING TEST - CIRCUIT No. 1

SCHEME No. S01

NOTES:

1. REFERENCE RELAY CONTACT FUNCTION TABLE ON E210, SH. 3.
2. DRAWING INFO FROM E210, SH. 2, REV. 11 REDRAWN TO THIS DRAWING AGAINST REV. 15. SCHEME S02 REDRAWN TO E210, SH. 2.

POS3001D (SUB. 1) — X1, X11 — C13L — X11, X12 — POS3002D (SUB. 1)

BLOCK DIAGRAM
SCHEME No. S01

OFF TEST

CHPI /CS

GE, TYPE CR-2940
SPRING RETURN TO OFF POSITION

OFF
WITH STDBY POWER
W/O STDBY POWER
W/STDBY OFF W/O STDBY

TEST MODE SEL. SW. TS SS-L

G.E.TYPE CR2940-UB200B, 3 POSITION W/MAINTAINED CONTACTS

REV.	DATE	DESCRIPTION	BY	CK	APP
17	10-05 07	REVISED PER CONTAINMENT SPRAY VALVE REPLACEMENT EC8350	DMB	RHM	DJS
16	01-23 07	REVISED AND REDRAWN TO SEPARATE SCHEMES PER EC9428	DMB	MWS	DJS

Entergy — PALISADES NUCLEAR PLANT — E210-1.DGN

SCHEMATIC DIAGRAM
SAFETY INJECTION AND SEQUENCE LOADING TEST CIRCUIT No. 1

PASSPORT DOC. NO.	DRAWING NUMBER	SHT. NO.	REV.
E0210-0001-0000	E-210	1	17

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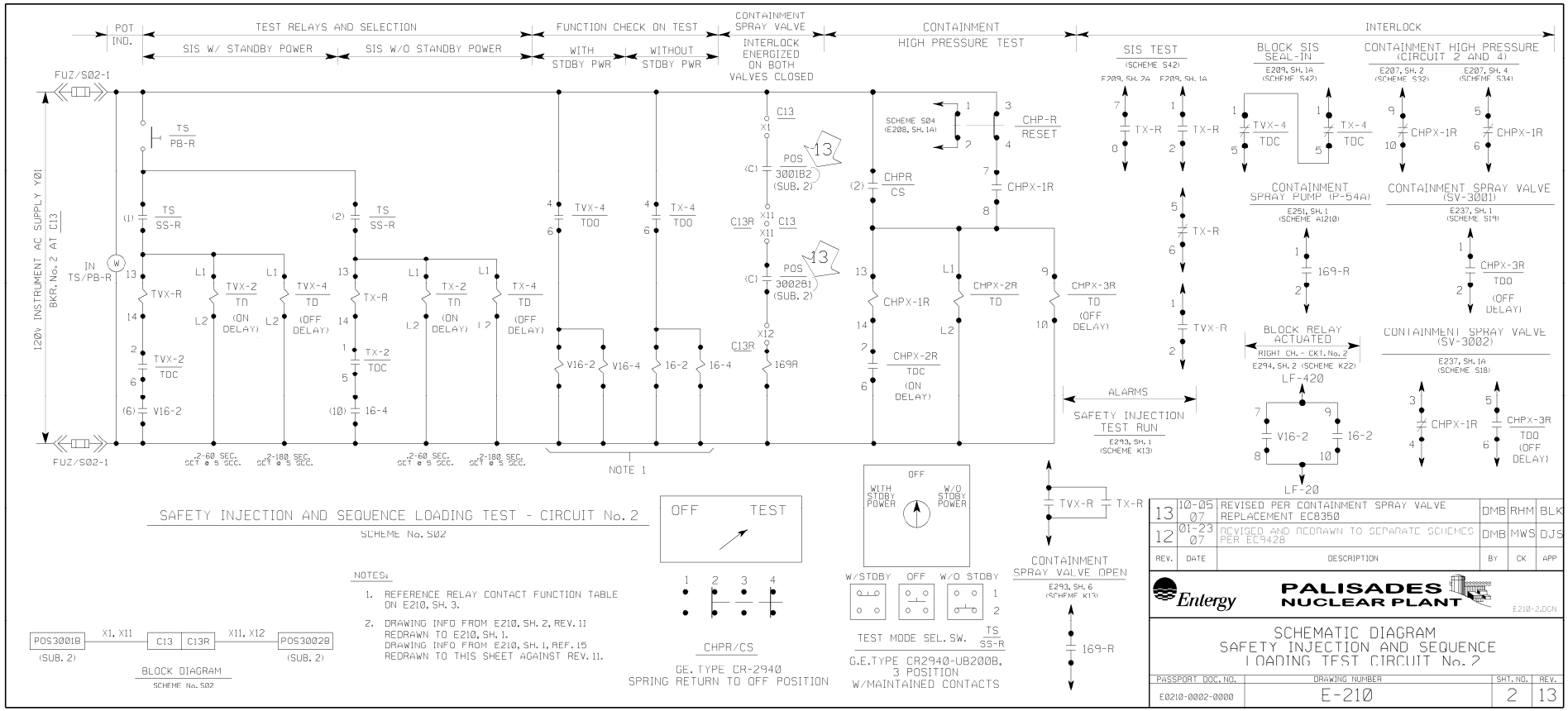
SCHEMATIC DIAGRAM
SAFETY INJECTION AND SEQUENCE LOADING TEST CIRCUITS



SCHEMATIC DIAGRAM
SAFETY INJECTION AND SEQUENCE LOADING TEST CIRCUITS

DWG. NO. _____

TEST RELAY TABLES

FUNCTION ON TEST WITH STAND-BY POWER

CONTACT NO.	CONTACT	LEFT (ODD NUMBERS) RELAY V16-1	REF. DWG.	LEFT (ODD NUMBERS) RELAY V16-3	REF. DWG.	RIGHT (EVEN NUMBERS) RELAY V16-2	REF. DWG.	RIGHT (EVEN NUMBERS) RELAY V16-4	REF. DWG.
1	●⊣⊢●	LOW PRESSURE SAFETY INJECTION PUMP P67B	E-248	●⊣/● BLKS BKR 52-7804 ⊕	E-135 SH.1	LOW PRESSURE SAFETY INJECTION PUMP P67A	E-247	CHARGING PUMP P55A	E-257 SH 1
2	●⊣/⊢●			●⊣/● BLKS BKR 152-303 ⊕	E-132 SH.1			CHARGING PUMP P55B	E-257 SH 1
3	●⊣/⊢●	BORIC ACID GRAVITY FEED VALVE ⊕ MOV 2169	E-241	●⊣/● BLKS BKR 152-102 ⊕	E-151	BORIC ACID PUMPED FEED VALVE MOV 2140 ⊕	E-241	BLOCK 30-1359	E-219 SH 3
4	●⊣/⊢●	BORIC ACID GRAVITY FEED VALVE ⊕ MOV 2170 ⊕	E-241	●⊣/● BLKS BKR 152-302 ⊕	E-131 SH.1	BLOCKING RELAYS ACTUATED SEE NOTE1	E-210 SH. 2	MAINTAIN OPEN CV-1359 ⊕ SEE NOTE 2	E-219 SH 3
5	●⊣/⊢●	MAINTAIN OPEN VOLUME CONTROL TANK MOV 2087 ⊕	E-242	●⊣/● BLKS BKR 52-7701 ⊕	E-135 SH.1			●⊣/● BLKS BKR 152-302 ⊕	E-131 SH.1
6	●⊣⊢●	TEST START CIRCUIT NO 1	E-210	BORIC ACID PUMP P56B	E-203	TEST START CIRCUIT NO 2	E-210	●⊣/● BLKS BKR 152-303 ⊕	E-132 SH.1
7	●⊣⊢●	SERVICE WATER PUMP P7B	E-154 SH 1	HIGH PRESSURE INJECTION PUMP P66B	E-249	SERVICE WATER PUMP P7A	E-154 SH 1	HIGH PRESSURE INJECTION PUMP P66A	E-249
8	●⊣⊢●	CHARGING PUMP P55C	E-257 SH 2	MAINTAIN OPEN CV-1359	E-219 SH.3	SERVICE WATER PUMP P7C	E-154 SH 2	●⊣/● BLKS BKR 52-7701 ⊕	E-135 SH.1
9	●⊣⊢●	COMPONENT COOLING PUMP P52A	E-259	●⊣/● BLOCK 30-1359	E-219 SH.3	BORIC ACID PUMP P56A	E-203	●⊣/● BLKS BKR 52-7804 ⊕	E-135 SH.1
10	●⊣⊢●	COMPONENT COOLING PUMP P52C	E-259	BLOCKING RELAYS ACTUATED	E-210 SH. 2	COMPONENT COOLING PUMP P52B	E-259	●⊣/● BLKS BKR 152-102 ⊕	E-151

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FUNCTION ON TEST WITHOUT STAND-BY POWER

CONTACT NO.	CONTACT	LEFT (ODD NUMBERS) RELAY 16-1	REF. DWG.	LEFT (ODD NUMBERS) RELAY 16-3	REF. DWG.	RIGHT (EVEN NUMBERS) RELAY 16-2	REF. DWG.	RIGHT (EVEN NUMBERS) RELAY 16-4	REF. DWG.
1	●⊣⊢●	LOW PRESSURE SAFETY INJECTION PUMP P67B	E-248	BORIC ACID PUMP P56B	E-203	LOW PRESSURE SAFETY INJECTION PUMP P67A	E-247	CHARGING PUMP P55A	E-257 SH 1
2	●⊣⊢●	CONTAINMENT COOLER RECIRC. FAN V4A	E-217	HIGH PRESSURE SAFETY INJECTION PUMP P66B	E-249	HIGH PRESSURE SAFETY INJECTION PUMP P66A	E-249	MAINTAIN OPEN CV-1359 ⊕	E-219 SH 3
3	●⊣⊢●	SERVICE WATER PUMP P7B	E-154 SH 1			SERVICE WATER PUMP P7A	E-154 SH 1	SERVICE WATER PUMP P7C	E-154 SH 2
4	●⊣/⊢●			BLOCK 30-1359	E-219 SH.3				
5	●⊣⊢●	COMPONENT COOLING PUMP P52A	E-259	MAINTAIN OPEN CV-1359	E-219 SH.3	BLOCKING RELAYS ACTUATED	E-210 SH. 2	CONTAINMENT COOLER RECIRC. FAN V2A	E-216
6	●⊣⊢●	COMPONENT COOLING PUMP P52C	E-259	CHARGING PUMP P55C	E-257 SH 2	CONTAINMENT COOLER RECIRC. FAN V1A	E-216	CONTAINMENT COOLER RECIRC. FAN V3A	E-216
7	●⊣⊢●			BLOCKING RELAYS ACTUATED	E-210 SH. 2	BORIC ACID PUMP P56A	E-203	CHARGING PUMP P55B	E-257
8	●⊣/⊢●	MAINTAIN OPEN VOLUME CONTROL TANK MOV 2087 ⊕	E-242	BORIC ACID GRAVITY FEED VALVE MOV 2169 ⊕	E-241	SPARE		BORIC ACID PUMPED FEED MOV 2140 ⊕	E-241
9	●⊣/⊢●			BORIC ACID GRAVITY FEED VALVE MOV 2170 ⊕	E-241	SPARE		BLOCK 30-1359	E-219 SH 3
10	●⊣⊢●			TEST START CIRCUIT NO. 1	E-210 SH. 1	COMPONENT COOLING PUMP P52B	E-259	TEST START CIRCUIT NO 2	E-210

⊕ BLOCKS OPERATION ON TEST

NOTES:

1. RELAY V-16-2 CONTACT GROUP #4 IS CHANGED TO NORMALLY OPEN.
2. CONTACTS CHANGED TO NORMALLY OPEN.

REV.	DATE	DESCRIPTION	BY	CK	APP
19	01-23 07	REVISED TO REFLECT AS-BUILT PER EC9428	DMB		DJS
18	11-4 93	REVISED RELAY V16-1 CONTACT 3 TO MOV 2169 PER DCR 93-1297	JFM	HE	

Consumers Energy

PALISADES PLANT E210-3.DGN

SCEMATIC WIRING DIAGRAM
SAFETY INJECTION & SEQUENCE
LOADING TEST CIRCUIT

DRAWING NUMBER	SHT. NO.	REV.
E-210	3	19

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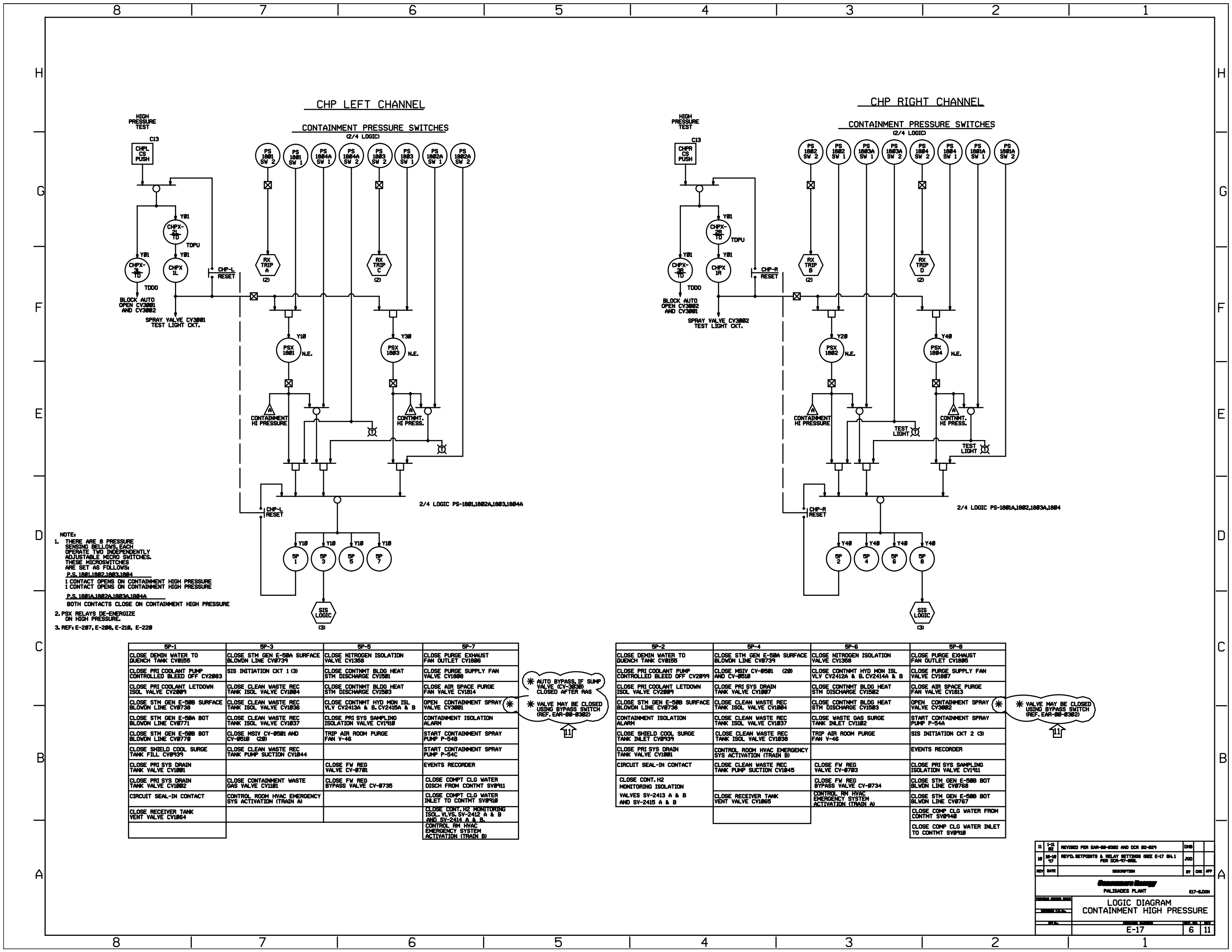
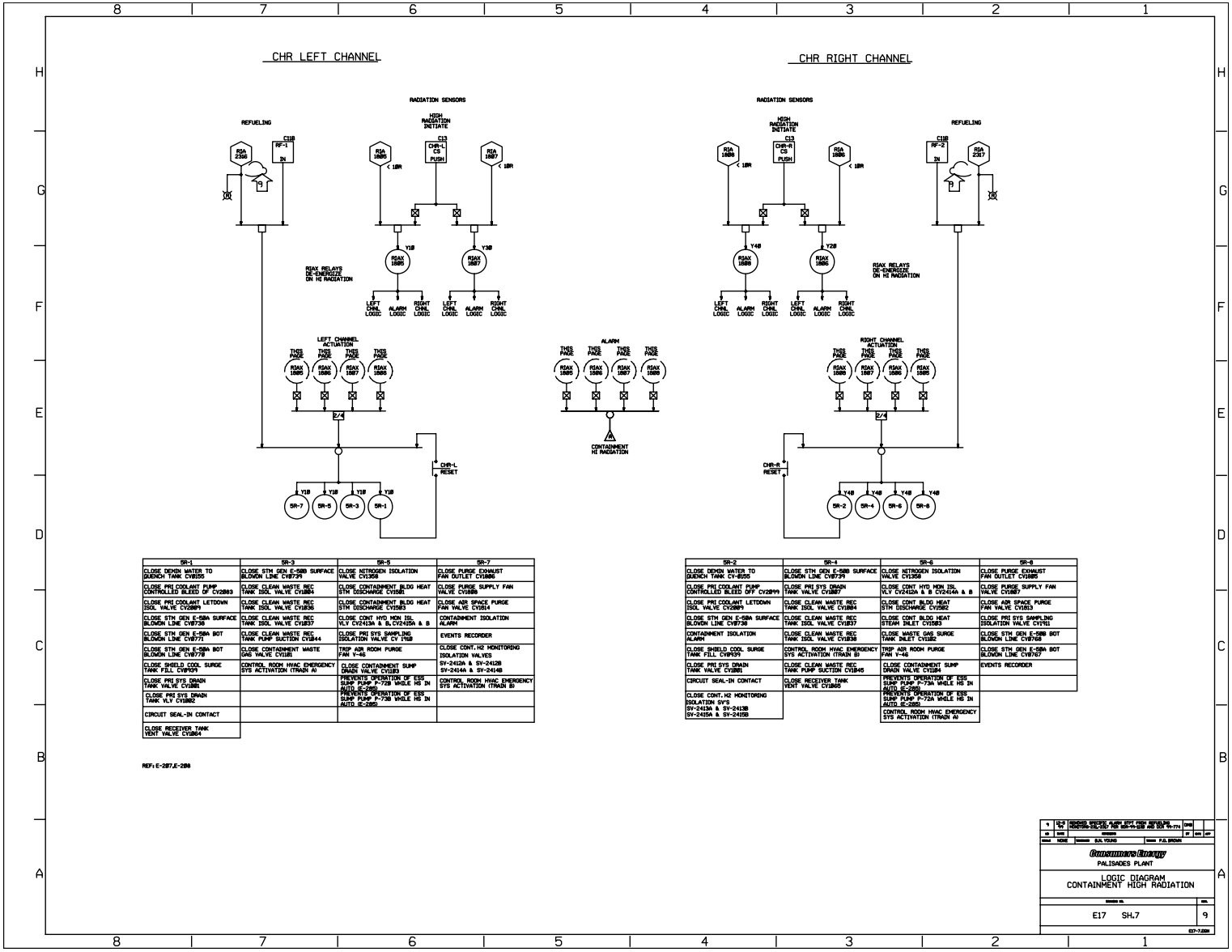
LOGIC DIAGRAM
CONTAINMENT HIGH PRESSURE SIGNAL



5P-1	5P-3	5P-5	5P-7
CLOSE DEMIN WATER TO QUENCH TANK CV0155	CLOSE STM GEN E-50A SURFACE BLOWDN LINE CV0739	CLOSE NITROGEN ISOLATION VALVE CV1358	CLOSE PURGE EXHAUST FAN OUTLET CV1806
CLOSE PRI COOLANT PUMP CONTROLLED BLEED OFF CV2083	SIS INITIATION CKT 1 (3)	CLOSE CONTNMT BLDG HEAT STM DISCHARGE CV1501	CLOSE PURGE SUPPLY FAN VALVE CV1808
CLOSE PRI COOLANT LETDOWN ISOL VALVE CV2009	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1004	CLOSE CONTNMT BLDG HEAT STM DISCHARGE CV1503	CLOSE AIR SPACE PURGE FAN VALVE CV1814
CLOSE STM GEN E-50B SURFACE BLOWDN LINE CV0738	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1036	CLOSE CONTNMT HYD MON ISL VLV CV2413A & B, CV2415A & B	OPEN CONTAINMENT SPRAY VALVE CV3001 *
CLOSE STM GEN E-50A BOT BLOWDN LINE CV0771	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1037	CLOSE PRI SYS SAMPLING ISOLATION VALVE CV1910	CONTAINMENT ISOLATION ALARM
CLOSE STM GEN E-50B BOT BLOWDN LINE CV0770	CLOSE MSIV CV-0501 AND CV-0510 (20)	TRIP AIR ROOM PURGE FAN V-46	START CONTAINMENT SPRAY PUMP P-54B
CLOSE SHIELD COOL SURGE TANK FILL CV0939	CLOSE CLEAN WASTE REC TANK PUMP SUCTION CV1044		START CONTAINMENT SPRAY PUMP P-54C
CLOSE PRI SYS DRAIN TANK VALVE CV1001		CLOSE FW REG VALVE CV-0701	EVENTS RECORDER
CLOSE PRI SYS DRAIN TANK VALVE CV1002	CLOSE CONTAINMENT WASTE GAS VALVE CV1101	CLOSE FW REG BYPASS VALVE CV-0735	CLOSE COMPT CLG WATER DISCH FROM CONTMT SV0911
CIRCUIT SEAL-IN CONTACT	CONTROL ROOM HVAC EMERGENCY SYS ACTIVATION (TRAIN A)		CLOSE COMPT CLG WATER INLET TO CONTMT SV0910
CLOSE RECEIVER TANK VENT VALVE CV1064			CLOSE CONT. H2 MONITORING ISOL. VLVS. SV-2412 A & B AND SV-2414 A & B.
			CONTROL RM HVAC EMERGENCY SYSTEM ACTIVATION (TRAIN B)

5P-2	5P-4	5P-6	5P-8
CLOSE DEMIN WATER TO QUENCH TANK CV0155	CLOSE STM GEN E-50A SURFACE BLOWDN LINE CV0739	CLOSE NITROGEN ISOLATION VALVE CV1358	CLOSE PURGE EXHAUST FAN OUTLET CV1805
CLOSE PRI COOLANT PUMP CONTROLLED BLEED OFF CV2099	CLOSE MSIV CV-0501 (20) AND CV-0510	CLOSE CONTNMT HYD MON ISL VLV CV2412A & B, CV2414A & B	CLOSE PURGE SUPPLY FAN VALVE CV1807
CLOSE PRI COOLANT LETDOWN ISOL VALVE CV2009	CLOSE PRI SYS DRAIN TANK VALVE CV1007	CLOSE CONTNMT BLDG HEAT STM DISCHARGE CV1502	CLOSE AIR SPACE PURGE FAN VALVE CV1813
CLOSE STM GEN E-50B SURFACE BLOWDN LINE CV0738	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1004	CLOSE CONTNMT BLDG HEAT STM DISCHARGE CV1503	OPEN CONTAINMENT SPRAY VALVE CV3002 *
CONTAINMENT ISOLATION ALARM	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1037	CLOSE WASTE GAS SURGE TANK INLET CV1102	START CONTAINMENT SPRAY PUMP P-54A
CLOSE SHIELD COOL SURGE TANK INLET CV0939	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1038	TRIP AIR ROOM PURGE FAN V-46	SIS INITIATION CKT 2 (3)
CLOSE PRI SYS DRAIN TANK VALVE CV1001	CONTROL ROOM HVAC EMERGENCY SYS ACTIVATION (TRAIN B)		EVENTS RECORDER
CIRCUIT SEAL-IN CONTACT	CLOSE CLEAN WASTE REC TANK PUMP SUCTION CV1045	CLOSE FW REG VALVE CV-0703	CLOSE PRI SYS SAMPLING ISOLATION VALVE CV1911
CLOSE CONT. H2 MONITORING ISOLATION VALVES SV-2413 A & B AND SV-2415 A & B		CLOSE FW REG BYPASS VALVE CV-0734	CLOSE STM GEN E-50B BOT BLWDN LINE CV0768
	CLOSE RECEIVER TANK VENT VALVE CV1065	CONTROL RM HVAC EMERGENCY SYSTEM ACTIVATION (TRAIN A)	CLOSE STM GEN E-50B BOT BLWDN LINE CV0767
			CLOSE COMP CLG WATER FROM CONTMT SV0940
			CLOSE COMP CLG WATER INLET TO CONTMT SV0910

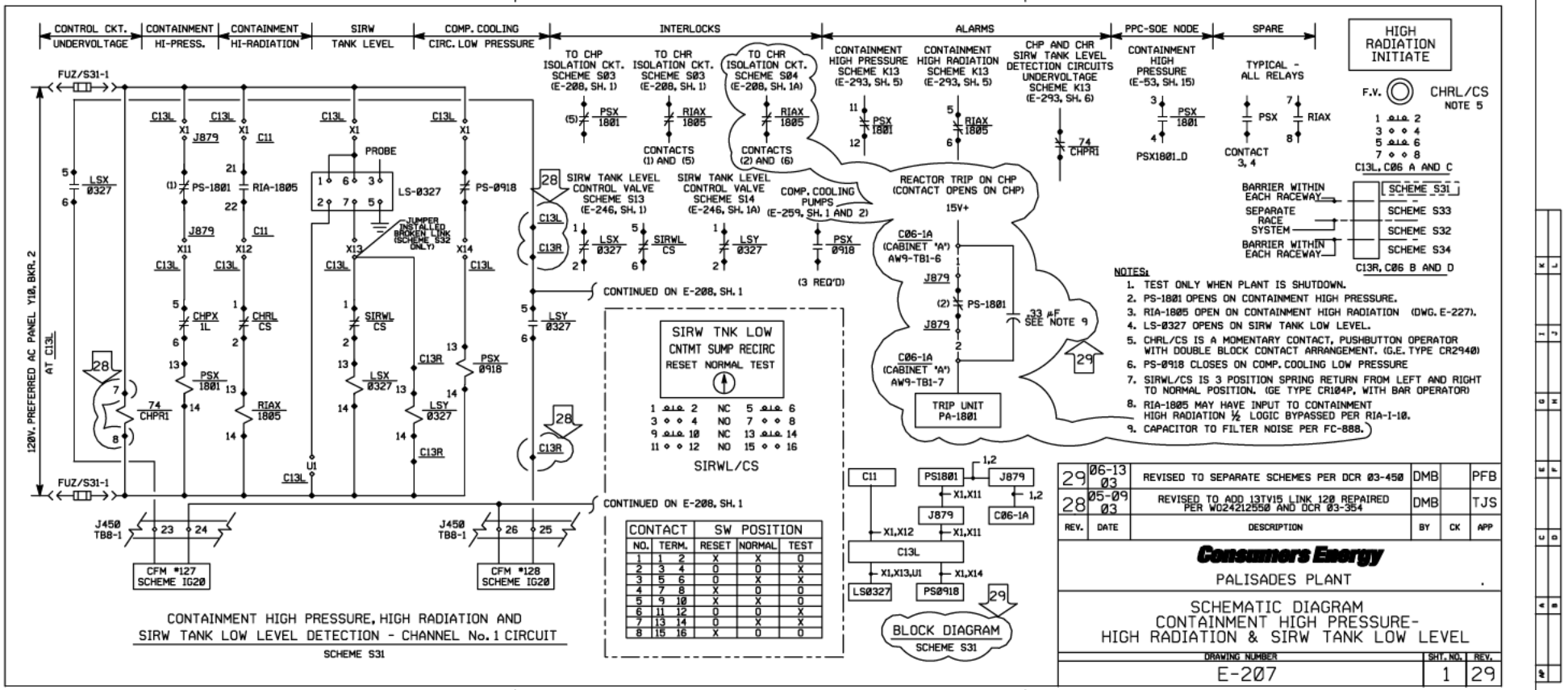
LOGIC DIAGRAM
CONTAINMENT HIGH RADIATION



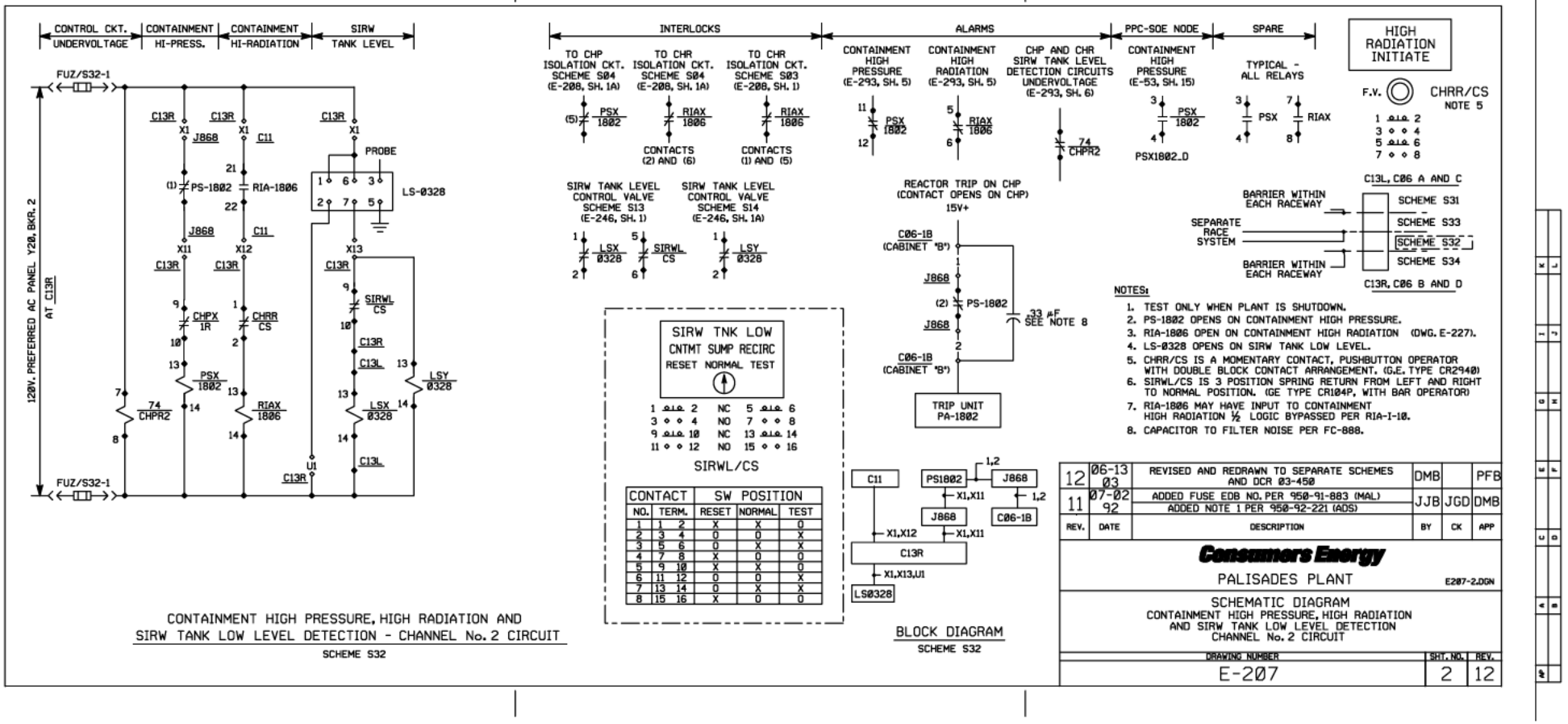
SR-1	SR-3	SR-5	SR-7
CLOSE DEMIN WATER TO QUENCH TANK CV8155	CLOSE STM GEN E-50B SURFACE BLOWDN LINE CV8739	CLOSE NITROGEN ISOLATION VALVE CV1358	CLOSE PURGE EXHAUST FAN OUTLET CV1886
CLOSE PRI COOLANT PUMP CNTLD BLEED OF CV2883	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1884	CLOSE CONTAINMENT BLDG HEAT STM DISCHARGE CV1581	CLOSE PURGE SUPPLY FAN VALVE CV1888
CLOSE PRI COOLANT LETDOWN ISOL VALVE CV2889	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1836	CLOSE CONTAINMENT BLDG HEAT STM DISCHARGE CV1583	CLOSE AIR SPACE PURGE FAN VALVE CV1814
CLOSE STM GEN E-50A SURFACE BLOWDN LINE CV8738	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1837	CLOSE PRI SYS SAMPLING ISOLATION VALVE CV 1938	CONTAINMENT ISOLATION ALARM
CLOSE STM GEN E-50A BOT BLOWDN LINE CV8773	CLOSE CONTAINMENT WASTE GAS VALVE CV1181	TRIP AIR ROOM PURGE FAN V-46	EVENTS RECORDER
CLOSE STM GEN E-50A BOT BLOWDN LINE CV8778	CONTROL ROOM HVAC EMERGENCY SYS ACTIVATION (TRAIN A)	CLOSE CONTAINMENT SUMP DRAIN VALVE CV1183	CLOSE CONT.H2 MONITORING ISOLATION VALVES SV-2412A & SV-2412B SV-2414A & SV-2414B
CLOSE SHIELD COOL SURGE TANK FILL CV8939		PREVENTS OPERATION OF ESS SUMP PUMP P-72B WHILE HS IN AUTO. (E-288)	CONTROL ROOM HVAC EMERGENCY SYS ACTIVATION (TRAIN B)
CLOSE PRI SYS DRAIN TANK VALVE CV1881		PREVENTS OPERATION OF ESS SUMP PUMP P-73B WHILE HS IN AUTO. (E-288)	
CLOSE PRI SYS DRAIN TANK VLV CV1882			
CIRCUIT SEAL-IN CONTACT			
CLOSE RECEIVER TANK VENT VALVE CV1864			

SR-2	SR-4	SR-6	SR-8
CLOSE DEMIN WATER TO QUENCH TANK CV-8155	CLOSE STM GEN E-50B SURFACE BLOWDN LINE CV8739	CLOSE NITROGEN ISOLATION VALVE CV1358	CLOSE PURGE EXHAUST FAN OUTLET CV1885
CLOSE PRI COOLANT PUMP CONTROLLED BLEED OFF CV2899	CLOSE PRI SYS DRAIN TANK VALVE CV1887	CLOSE CONT HYD MON ISL VLV CV2412A & B CV2414A & B	CLOSE PURGE SUPPLY FAN VALVE CV1887
CLOSE PRI COOLANT LETDOWN ISOL VALVE CV2889	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1884	CLOSE CONT BLDG HEAT STM DISCHARGE CV1582	CLOSE AIR SPACE PURGE FAN VALVE CV1813
CLOSE STM GEN E-50A SURFACE BLOWDN LINE CV8738	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1837	CLOSE CONT BLDG HEAT STEAM INLET CV1583	CLOSE PRI SYS SAMPLING ISOLATION VALVE CV1761
CONTAINMENT ISOLATION ALARM	CLOSE CLEAN WASTE REC TANK ISOL VALVE CV1838	CLOSE WASTE GAS SURGE TANK INLET CV1582	CLOSE STM GEN E-50B BOT BLOWDN LINE CV8768
CLOSE SHIELD COOL SURGE TANK FILL CV8939	CONTROL ROOM HVAC EMERGENCY SYS ACTIVATION (TRAIN B)	TRIP AIR ROOM PURGE FAN V-46	CLOSE STM GEN E-50A BOT BLOWDN LINE CV8767
CLOSE PRI SYS DRAIN TANK VALVE CV1881	CLOSE CLEAN WASTE REC TANK PUMP SUCTION CV1845	CLOSE CONTAINMENT SUMP DRAIN VALVE CV1184	EVENTS RECORDER
CIRCUIT SEAL-IN CONTACT	CLOSE RECEIVER TANK VENT VALVE CV1865	PREVENTS OPERATION OF ESS SUMP PUMP P-73A WHILE HS IN AUTO.E-288)	
CLOSE CONT.H2 MONITORING ISOLATION SYS SV-2413B & SV-2415A & SV-2415B		PREVENTS OPERATION OF ESS SUMP PUMP P-72A WHILE HS IN AUTO.E-288)	
		CONTROL ROOM HVAC EMERGENCY SYS ACTIVATION (TRAIN A)	

SCHEMATIC DIAGRAM
CONTAINMENT HIGH PRESSURE, HIGH RADIATION AND SIRW TANK LOW LEVEL



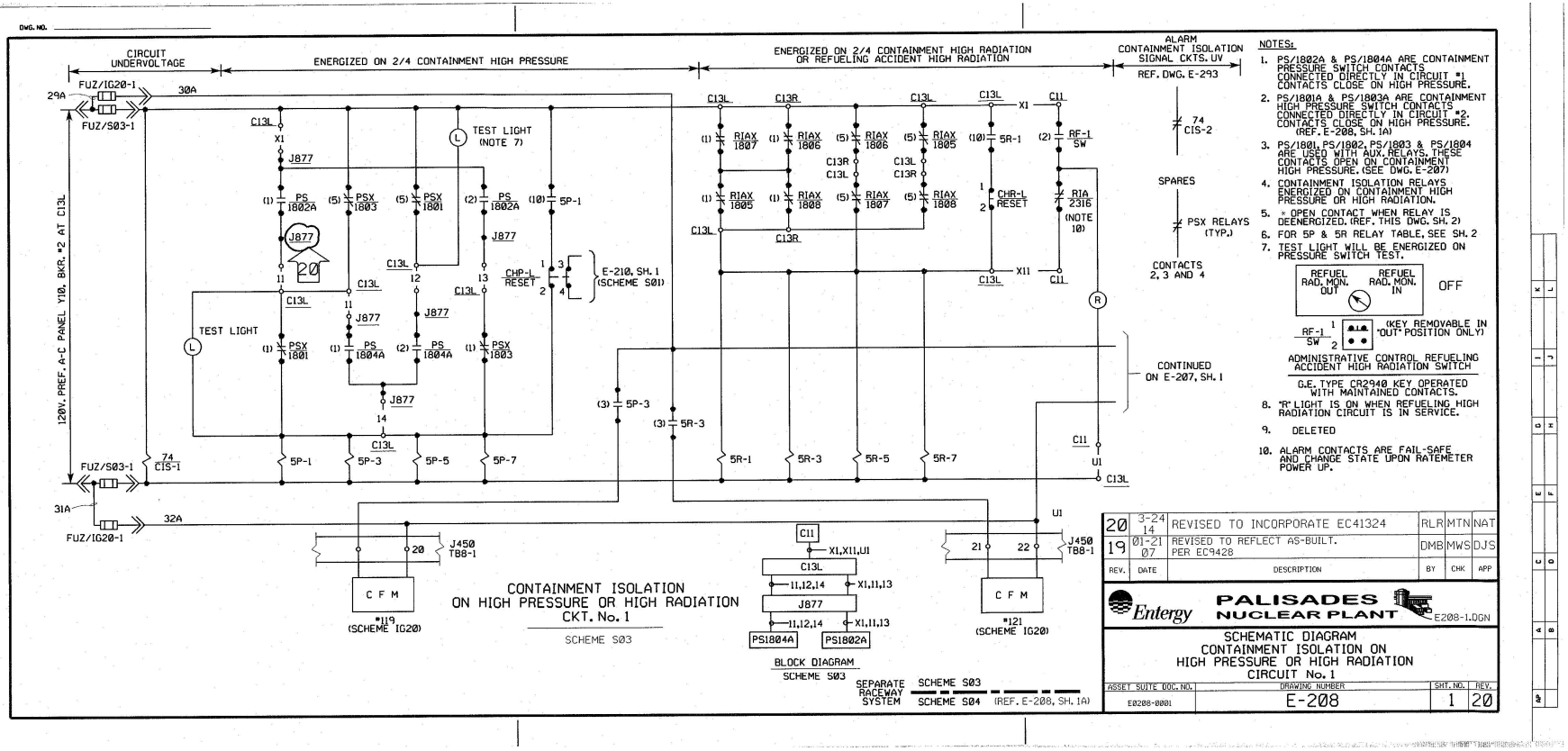
SCHEMATIC DIAGRAM
CONTAINMENT HIGH PRESSURE, HIGH RADIATION AND SIRW TANK LOW LEVEL



CONTACT NO.	TERM.	SW POSITION RESET	NORMAL	TEST
1	1 2	X	X	0
2	3 4	0	0	X
3	5 6	0	X	X
4	7 8	X	0	0
5	9 10	X	X	0
6	11 12	0	0	X
7	13 14	0	X	X
8	15 16	X	0	0

REV.	DATE	DESCRIPTION	BY	CK	APP
12	06-13 03	REVISED AND REDRAWN TO SEPARATE SCHEMES AND DCR 03-450	DMB		PFB
11	07-02 92	ADDED FUSE EDB NO. PER 950-91-883 (MAL) ADDED NOTE 1 PER 950-92-221 (ADS)	JJB	JGD	DMB

SCHEMATIC DIAGRAM
CONTAINMENT ISOLATION ON HIGH PRESSURE OR HIGH RADIATION



SCHEMATIC DIAGRAM
CONTAINMENT ISOLATION ON HIGH PRESSURE OR HIGH RADIATION

CONTAINMENT ISOLATION RELAY TABLE

CONTACTS	RELAYS 5P-1 & 5R-1	REF. DWG.	RELAYS 5P-3 & 5R-3	REF. DWG.	RELAYS 5P-5 & 5R-5	REF. DWG.	RELAYS 5P-7 & 5R-7	REF. DWG.
1	CLOSE DEMIN. WATER TO QUENCH TANK SV0155	E-235 SH. 2	CLOSE STM. GEN. E-50A TOP BLOWDN. LINE SV0739	E-235 SH. 3	DISABLE AUTO START OF ENG SFGRDS SUMP PUMP P-72B (5R-5 ONLY)	E-285	CLOSE PURGE EXHAUST FAN OUTLET SV1806	E-221
2	CLOSE PRI. COOLANT PUMP CONTROLLED BLEED OFF SV2083	E-235 SH. 2	•SIS INITIATION CKT. 1 (5P-3 ONLY)	E-209 SH. 1	CLOSE NITROGEN ISOLATION VALVE SV1358	E-235 SH. 3	CLOSE PURGE SUPPLY FAN VALVE SV1808	E-221
3	CLOSE PRI. COOLANT LETDOWN ISOL. VALVE SV2089	E-235 SH. 2	• CRITICAL FUNCTION MON. INPUTS: *119 (FOR 5P-3), *121 (FOR 5R-3)	E-208 SH. 1	CLOSE CONTAINMENT BLDG. HEAT STM. DISCHARGE SV1501	E-235 SH. 1	CLOSE AIR SPACE PURGE FAN VALVE SV1814	E-221
4	CLOSE STM. GEN. E-50B TOP BLOWDN. LINE SV0738	E-235 SH. 3	CLOSE CLEAN WASTE REC. TANK ISOL. VALVE SV1024	E-235 SH. 3	•CLOSE CV-0701 FW REG VLV (5P-5 ONLY)	E-69 SH. 1	OPEN CONTAINMENT SPRAY VALVE SV3001 (5P-7 ONLY)	E-237
5	CLOSE STM. GEN. E-50A BOT. BLOWDN. LINE SV0771	E-235 SH. 4	CLOSE CLEAN WASTE REC. TANK ISOL. VALVE SV1036	E-235 SH. 1	CLOSE CONTAINMENT BLDG. HEAT STM. INLET SV1503	E-235 SH. 3	• CONTAINMENT ISOLATION ALARM K11 *26	E-292 SH. 2
6	CLOSE STM. GEN. E-50B BOT. BLOWDN. LINE SV0770	E-235 SH. 4	CLOSE CLEAN WASTE REC. TANK ISOL. VALVE SV1037	E-235 SH. 3	CLOSE CONT. HYD. MON. ISL. V.V. SV-2413A & B, SV-2415A & B	E-916 SH. 1	•START CONTAINMENT SPRAY PUMP P-54B (5P-7 ONLY)	E-251
7	CLOSE SHIELD COOL SURGE TANK INLET SV0939	E-235 SH. 3	•CLOSE MSIV CV-0501 & CV-0510 (5P-3 ONLY)	E-238 SH. 1	CLOSE CONTAINMENT SUMP DR. VALVE SV1103 (RELAYS 5R-5 ONLY)	E-235 SH. 1	•START CONTAINMENT SPRAY PUMP P-54C (5P-7 ONLY)	E-251
8	CLOSE PRI. SYS. DRAIN TANK VALVE SV1001	E-235 SH. 3	CLOSE CLEAN WASTE REC. TANK PUMP SUCTION SV1044	E-235 SH. 1	•CLOSE CV-735 FW REG BYPASS V.V. (5P-5 ONLY)	E-69 SH. 1	CLOSE CONT. H_2 MONT. ISOL. VLV. SV-2412A & B & SV-2414A & B	E-916 SH. 2
9	CLOSE PRI. SYS. DRAIN TANK VALVE SV1002	E-235 SH. 1	•SPARE		CLOSE PRI. SYS. SAMPLING ISOLATION VALVE SV1910	E-235 SH. 1	CONTROL ROOM HVAC EMERGENCY SYSTEM ACTIVATION (TRAIN B)	E-271 SH. 8
10	•CIRCUIT SEAL-IN CONTACT	E-208 SH. 1	CLOSE CONTAINMENT WASTE GAS INLET VALVE SV1101	E-235 SH. 1	TRIP AIR ROOM PURGE FAN V-46	E-222	•CLOSE COMP CLG WTR DISCHE FROM CONT SV0911(5P-7ONLY)	E-235 SH.4
11	CLOSE RECEIVER TANK VENT VALVE SV1064 (30)	E-235 SH. 1	CONTROL ROOM HVAC EMERGENCY SYS. ACTIVATION (TRAIN A)	E-271 SH.8	DISABLE AUTO START OF ENG SFGRDS SUMP PUMP P-73B (5R-5 ONLY)	E-285	•CLOSE COMP CLG WTR INLET TO CONT SV-0910(5P-7ONLY)	E-235 SH.4
12	SPARE		•SPARE		•SPARE		PPC-SOE NODE PT. ID. KS5P_5R_D	E-53 SH. 8

CONTACTS	RELAYS 5P-2 & 5R-2	REF. DWG.	RELAYS 5P-4 & 5R-4	REF. DWG.	RELAYS 5P-6 & 5R-6	REF. DWG.	RELAYS 5P-8 & 5R-8	REF. DWG.	RELAY 5P-6 (CON'T)	REF. DWG.
1	CLOSE DEMIN. WATER TO QUENCH TANK SV0155	E-235 SH. 2	CLOSE STM. GEN. E-50A TOP BLOWDN. LINE SV0739	E-235 SH. 3	CLOSE CONTAINMENT SUMP DR. VALVE SV1104 (RELAYS 5R-6 ONLY)	E-235 SH. 1	CLOSE PURGE EXHAUST FAN OUTLET SV1805	E-221		
2	CLOSE PRI. COOLANT PUMP CONTROLLED BLEED OFF SV2099	E-235 SH. 2	•CLOSE MSIV CV-0550 & CV-0510 (5P-4 ONLY)	E-238 SH. 1	CLOSE NITROGEN ISOLATION VALVE SV1358	E-235 SH. 3	CLOSE PURGE SUPPLY FAN VALVE SV1807	E-221		
3	CLOSE PRI. COOLANT LETDOWN ISOL. VALVE SV2089	E-235 SH. 2	CLOSE PRI. SYS. DRAIN TANK VALVE SV1007	E-235 SH. 1	CLOSE CONT. HYD. MON. ISL. V.V. SV-2412A & B, SV-2414A & B	E-916 SH. 2	CLOSE AIR SPACE PURGE FAN VALVE SV1813	E-221		
4	CLOSE STM. GEN. E-50B TOP BLOWDN. LINE SV0738	E-235 SH. 3	CLOSE CLEAN WASTE REC. TANK ISOL. VALVE SV1024	E-235 SH. 3	CLOSE CONTAINMENT BLDG. HEAT STM. DISCHARGE SV1502	E-235 SH. 1	OPEN CONTAINMENT SPRAY VALVE SV3002 (5P-8 ONLY)	E-237		
5	•CONTAINMENT ISOLATION ALARM K11 *26	E-292 SH. 2	•SPARE		CLOSE CONTAINMENT BLDG. HEAT STM. INLET SV1503	E-235 SH. 3	•CLOSE COMP CLG WTR DISC CONMT SV-0340 (5P-8 ONLY)	E-235 SH. 4A		
6	CLOSE CONT. H_2 MONT. ISOL. VLV. SV-2413A & B & SV-2415A & B	E-916 SH. 1	CLOSE CLEAN WASTE REC. TANK ISOL. VALVE SV1037	E-235 SH. 3	CLOSE WASTE GAS SURGE TANK INLET SV1102	E-235 SH. 1	•START CONTAINMENT SPRAY PUMP P-54A (5P-8 ONLY)	E-251		
7	CLOSE SHIELD COOL SURGE TANK INLET SV0939	E-235 SH. 3	CLOSE CLEAN WASTE REC. TANK ISOL. VALVE SV1038	E-235 SH. 1	DISABLE AUTO START OF ENG SFGRDS SUMP PUMP P-72A (5R-6 ONLY)	E-285	•SIS INITIATION CKT. 2 (RELAYS 5P-8 ONLY)	E-209 SH. 1	•CLOSE FW REG VLVE CV-0703	E-69 SH.1
8	CLOSE PRI. SYS. DRAIN TANK VALVE SV1001	E-235 SH. 3	CONTROL ROOM HVAC EMERGENCY SYS. ACTIVATION (TRAIN B)	E-271 SH.8	CONTROL ROOM HVAC EMERGENCY SYSTEM ACTIVATION (TRAIN A)	E-271 SH. 8	•CLOSE COMP CLG WTR INLET CONMT SV-0910 (5P-8 ONLY)	E-235 SH. 4		
9	•SPARE		CLOSE CLEAN WASTE REC. TANK PUMP SUCTION SV1045	E-235 SH. 1C	•CRITICAL FUNCTION MON. INPUTS: *120 (FOR 5P-6, *122 (FOR 5R-6)	E-208 (SH. 1A) (30)	CLOSE PRI. SYS. SAMPLING ISOLATION VALVE SV1911	E-235 SH. 1		
10	•CIRCUIT SEAL-IN CONTACT	E-208 (SH. 1A)	•SPARE		TRIP AIR ROOM PURGE FAN V-46	E-222	CLOSE STM. GEN. E-50B BOT. BLOWDN. LINE SV0769	E-235 SH. 4		
11	• SPARE	(30)	CLOSE RECEIVER TANK VENT VALVE SV1065	E-235 SH. 1	SPARE		CLOSE STM. GEN. E-50A BOT. BLOWDN. LINE SV0767	E-235 SH. 4		
12	•SPARE		SPARE		DISABLE AUTO START OF ENG SFGRDS SUMP PUMP P-73A (5R-6 ONLY)	E-285	PPC-SOE NODE PT. ID. KS5P_5R_D	E-53 SH. 8	•CLOSE FW REG BYPASS VALVE CV-0734	E-69 SH.1

NOTES:

1. RELAYS WITH 8 OR LESS NC CONTACTS SHALL UTILIZE COIL TB113-3. RELAYS WITH 9 OR MORE NC CONTACTS SHALL UTILIZE COIL TB113-61.

•-NORMALLY OPEN CONTACT

REFERENCE DWGS:

LOGIC DIAGRAM	JLG-121(Q) SH. 2
SCHEMATIC DIAGRAMS	E-271 SH. 8
	E-271 SH. 1
	E-223
	E-224
	E-916
	E-69 SH. 1

SPARE CONTACTS

RELAY	NORMALLY OPEN	NORMALLY CLOSED
5R-1	———	• 12
5P-3	• 9, 12	———
5R-3	• 2, 7, 9, 12	———
5P-5	•1., 7, 11, 12	———
5R-5	• 4, 8, 12	———
5R-7	• 4, 6, 7, 10, 11	———
5P-2	• 9, 11, 12	———
5R-2	• 9, 11, 12	———
5P-4	• 5, 10	• 12
5R-4	• 2, 5, 10	• 12
5P-6	• 11	• 1
5R-6	• 11	———
5R-8	• 4, 5, 6, 7, 8	———
5P-1	———	• 12

REV.	DATE	DESCRIPTION	BY	CK	APP
30	06-13 03	REVISED TO SEPARATE SCHEMES PER DCR 03-450	DMB		PFB
29	07-31 95	SPARED CONTACT NO.12, RELAYS 5P-1, 5P-3, 5P-5, 5R-5 , 5P-4 & 5R-4 & CONTACT NO.11 RELAYS 5P-6 & 5R-6 PER FC-949 & DCR 95-688	DMB		
		REMOVED EVENTS RECORDER, ADDED PPC-SOE NODE PER FC-133-86 AND DCR 95-528		FCM	

Consumers Energy

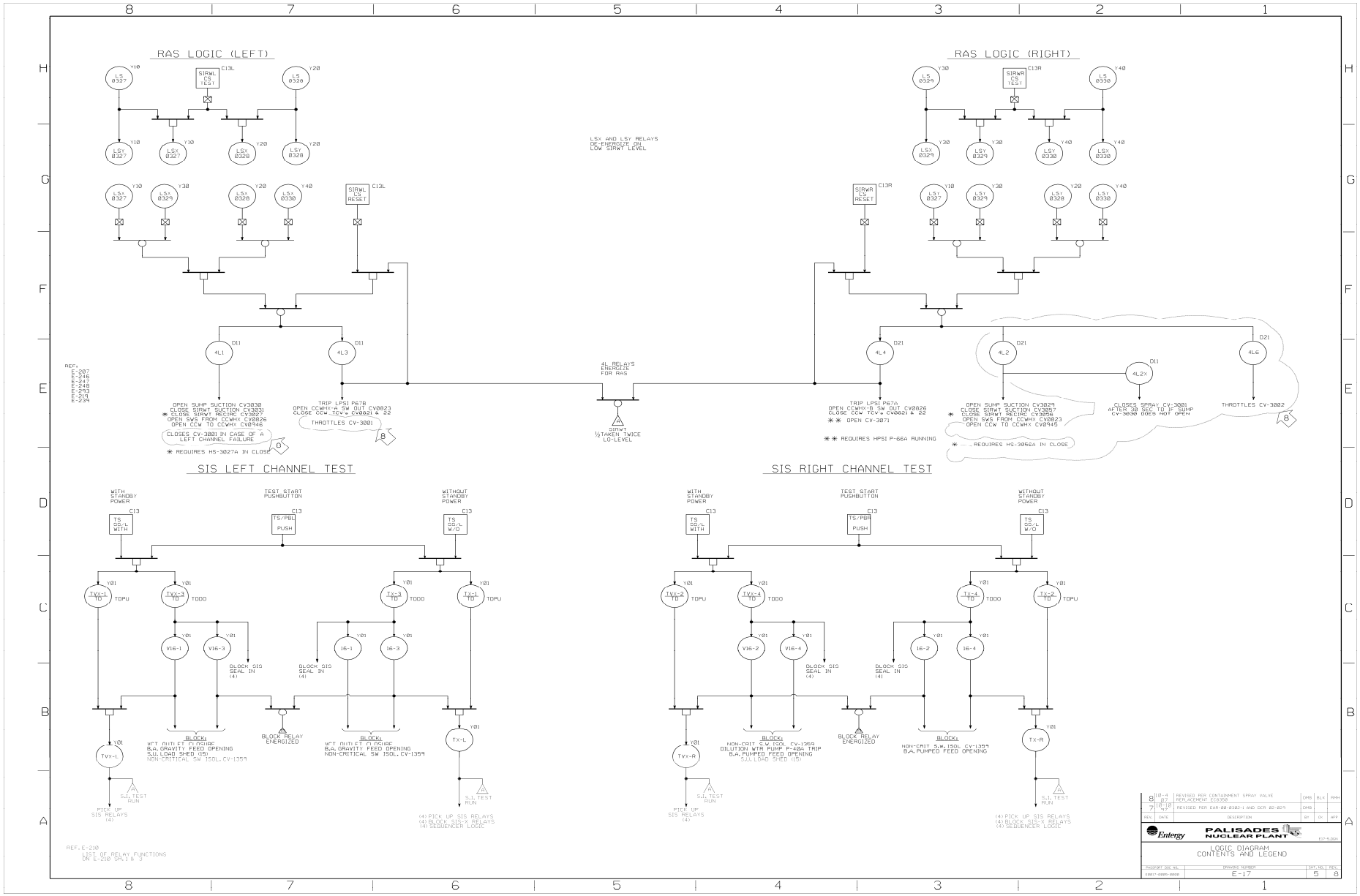
PALISADES PLANT

E208-2.DGN

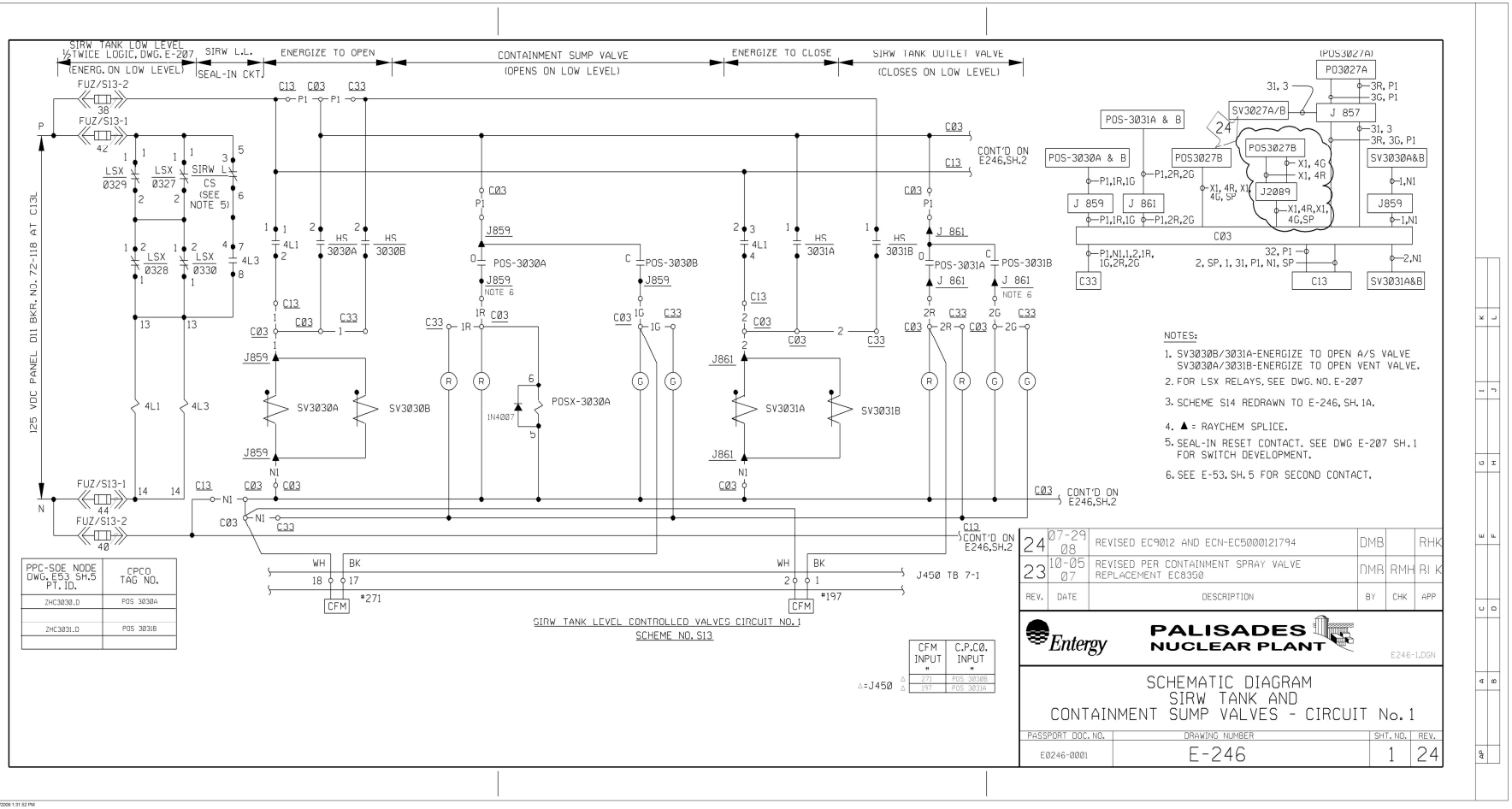
SCHEMATIC DIAGRAM
CONTAINMENT ISOLATION ON
HIGH PRESSURE OR HIGH RADIATION

DRAWING NUMBER	SHT. NO.	REV.
E-208	2	30

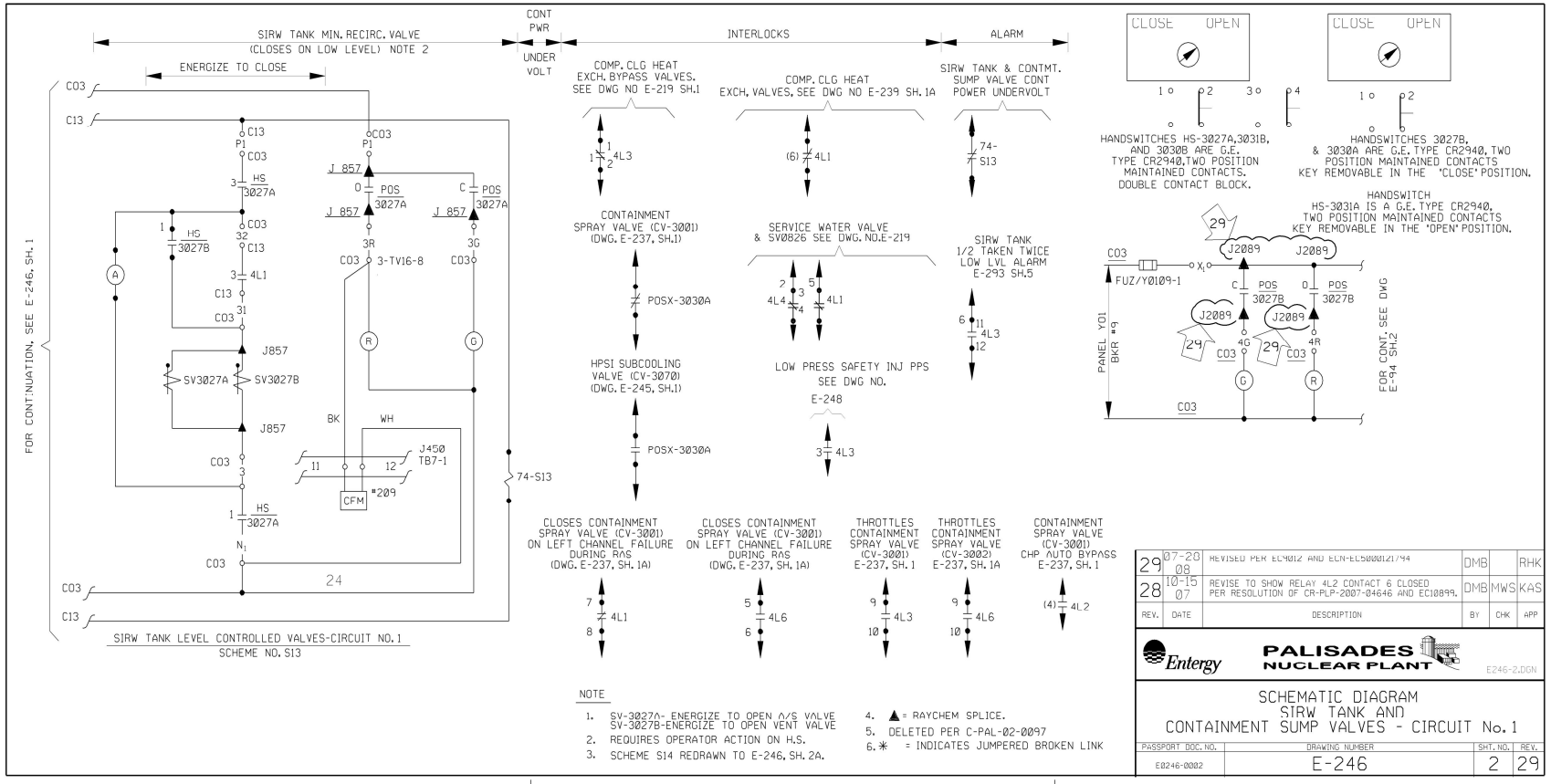
LOGIC DIAGRAM
SIS TEST AND RAS



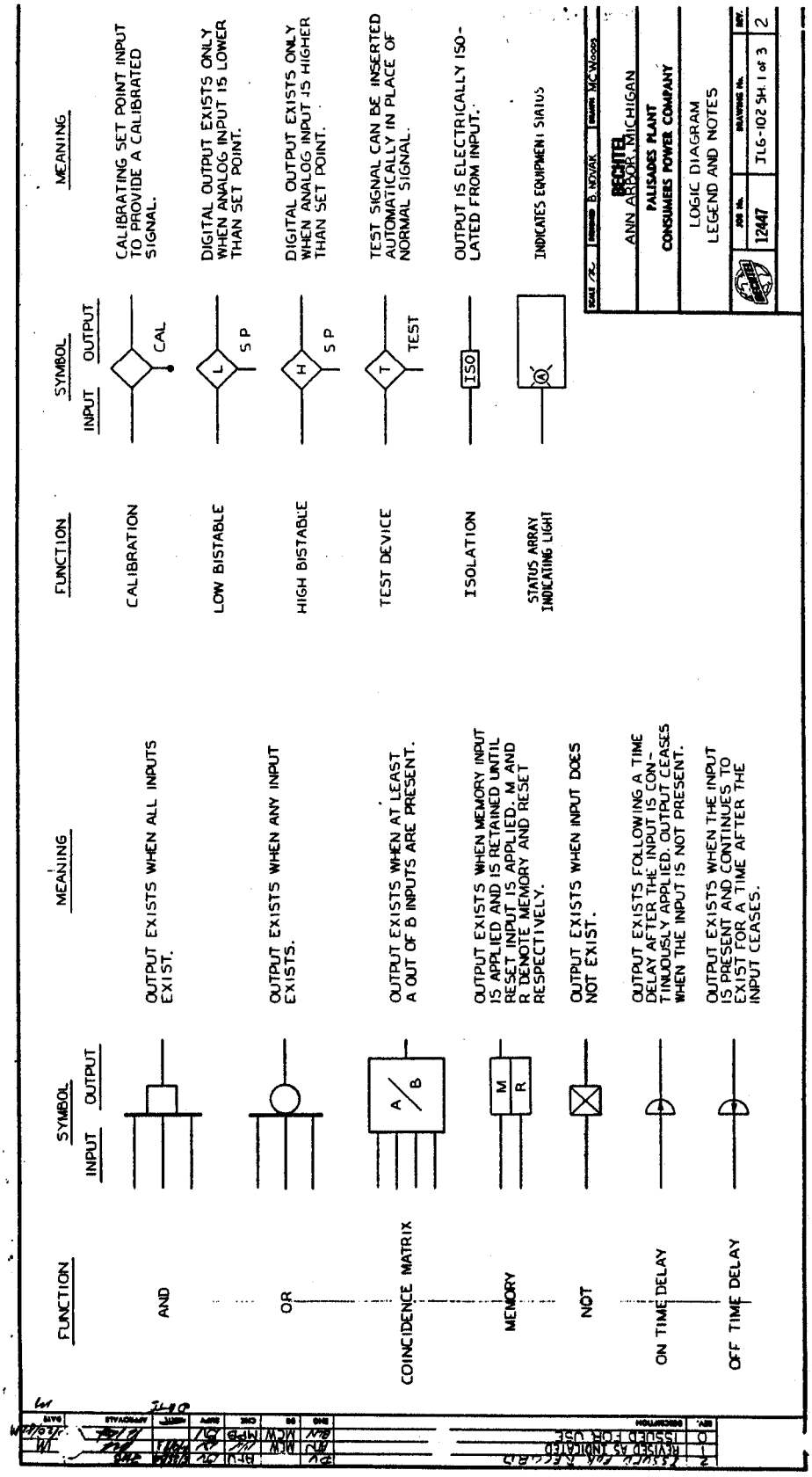
SCHEMATIC DIAGRAM
SIRW TANK AND CONTAINMENT SUMP VALVES



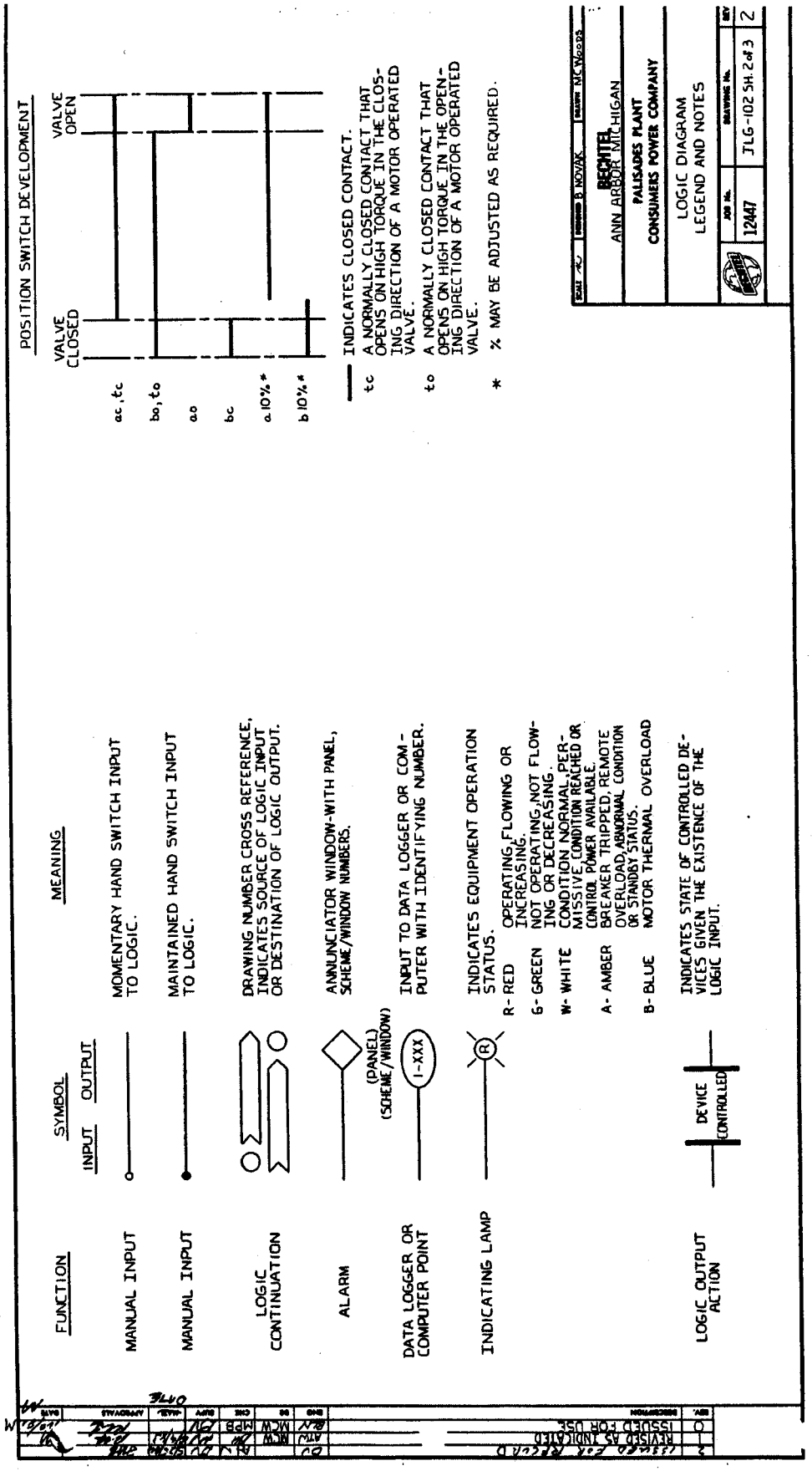
SCHEMATIC DIAGRAM
SIRW TANK AND CONTAINMENT SUMP VALVES



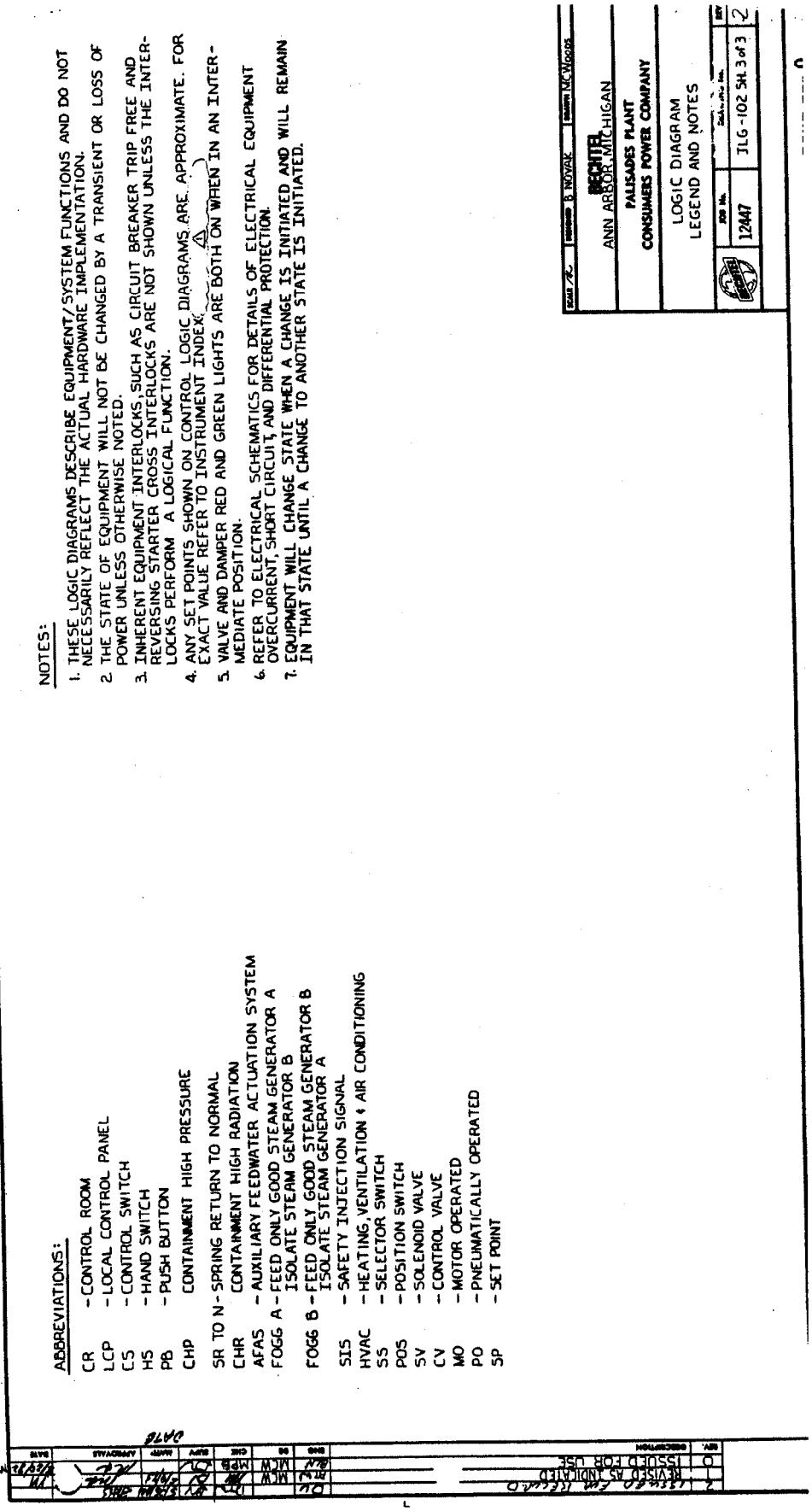
LOGIC DIAGRAM
LEGEND AND NOTES



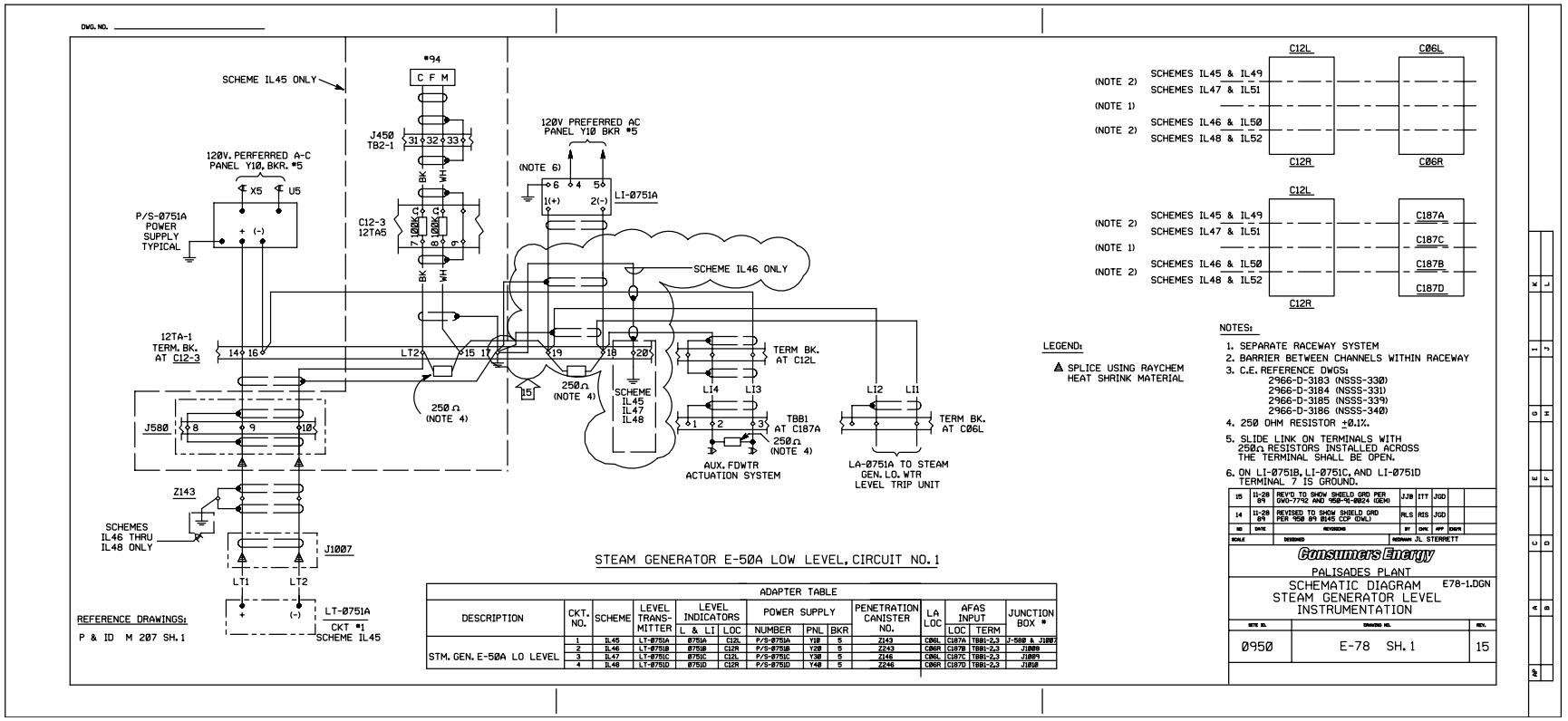
LOGIC DIAGRAM
LEGEND AND NOTES



LOGIC DIAGRAM
LEGEND AND NOTES



SCHEMATIC DIAGRAM
STEAM GENERATOR LEVEL INSTRUMENTATION

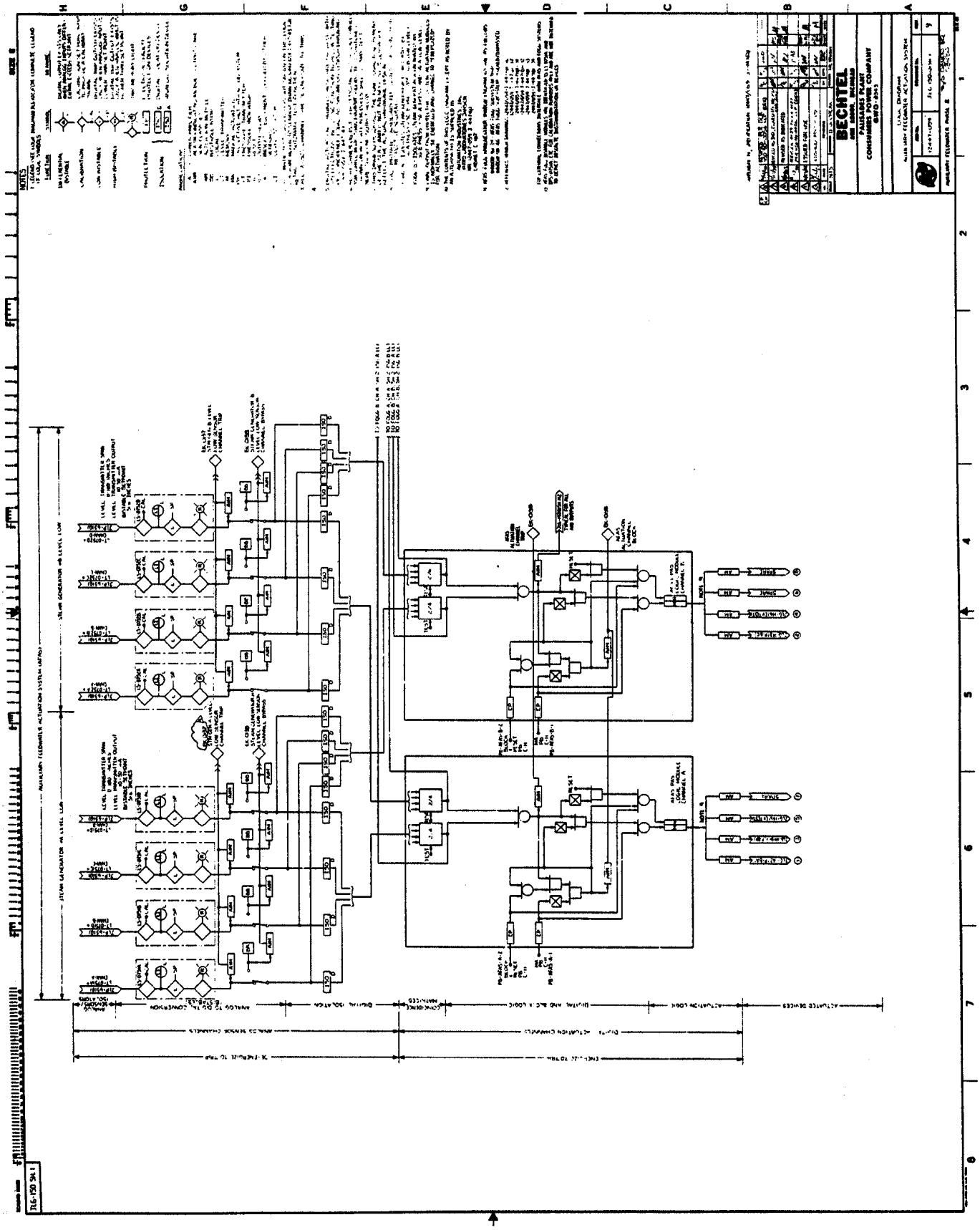


STEAM GENERATOR E-50A LOW LEVEL, CIRCUIT NO. 1

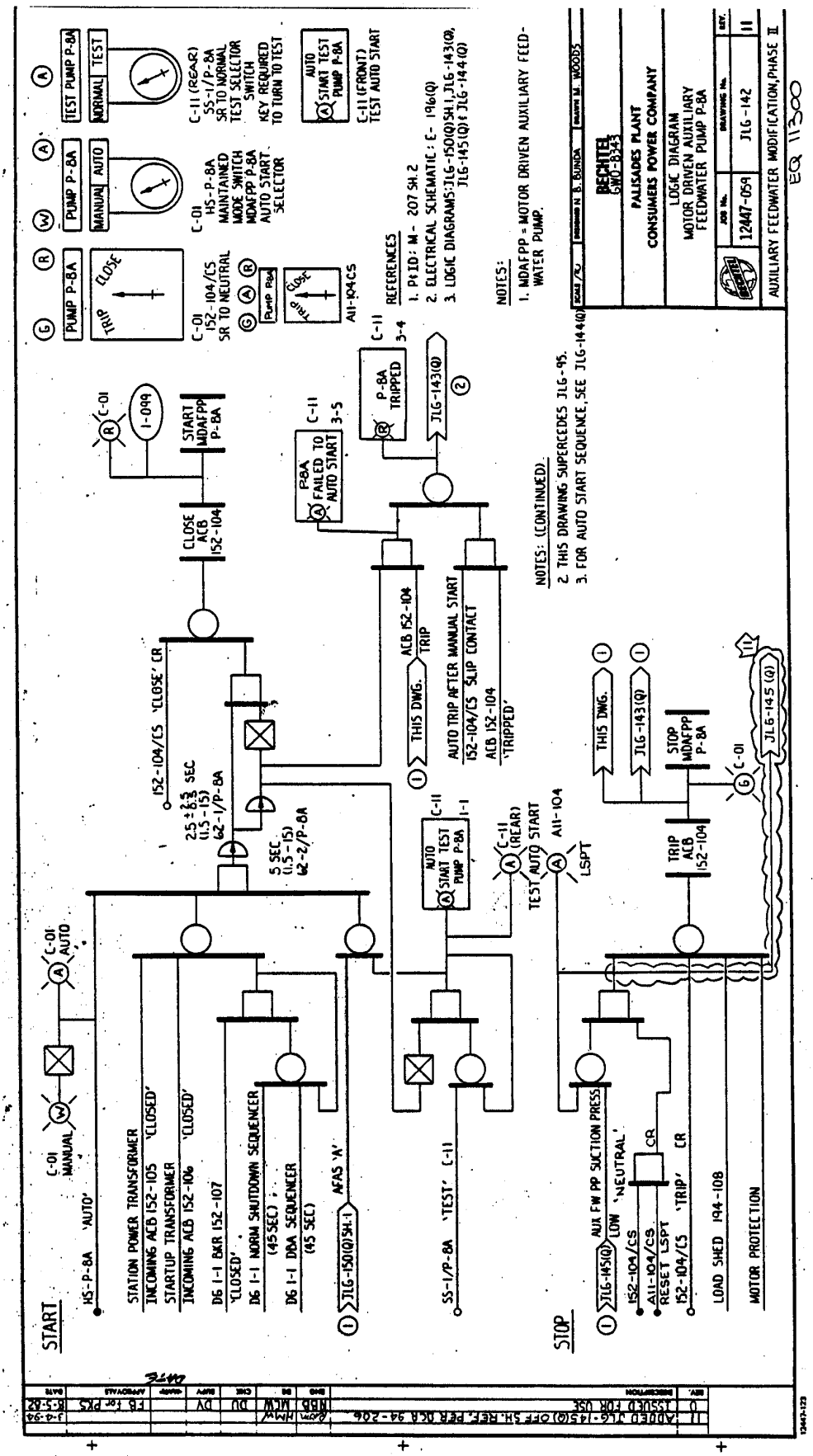
ADAPTER TABLE

DESCRIPTION	CKT. NO.	SCHEME	LEVEL TRANS-MITTER	LEVEL INDICATORS		POWER SUPPLY			PENETRATION CANISTER NO.	LA LOC	AFAS INPUT		JUNCTION BOX #
				L & LI	LOC	NUMBER	PNL	BKR			LOC	TERM	
STM. GEN. E-50A LO LEVEL	1	IL45	LT-0751A	0751A	C12L	P/S-0751A	Y10	5	Z143	C06L	C187A	TBB1-2,3	J-580 & J1007
	2	IL46	LT-0751B	0751B	C12R	P/S-0751B	Y20	5	Z243	C06R	C187B	TBB1-2,3	J1088
	3	IL47	LT-0751C	0751C	C12L	P/S-0751C	Y30	5	Z146	C06L	C187C	TBB1-2,3	J1089
	4	IL48	LT-0751D	0751D	C12R	P/S-0751D	Y40	5	Z246	C06R	C187D	TBB1-2,3	J1010

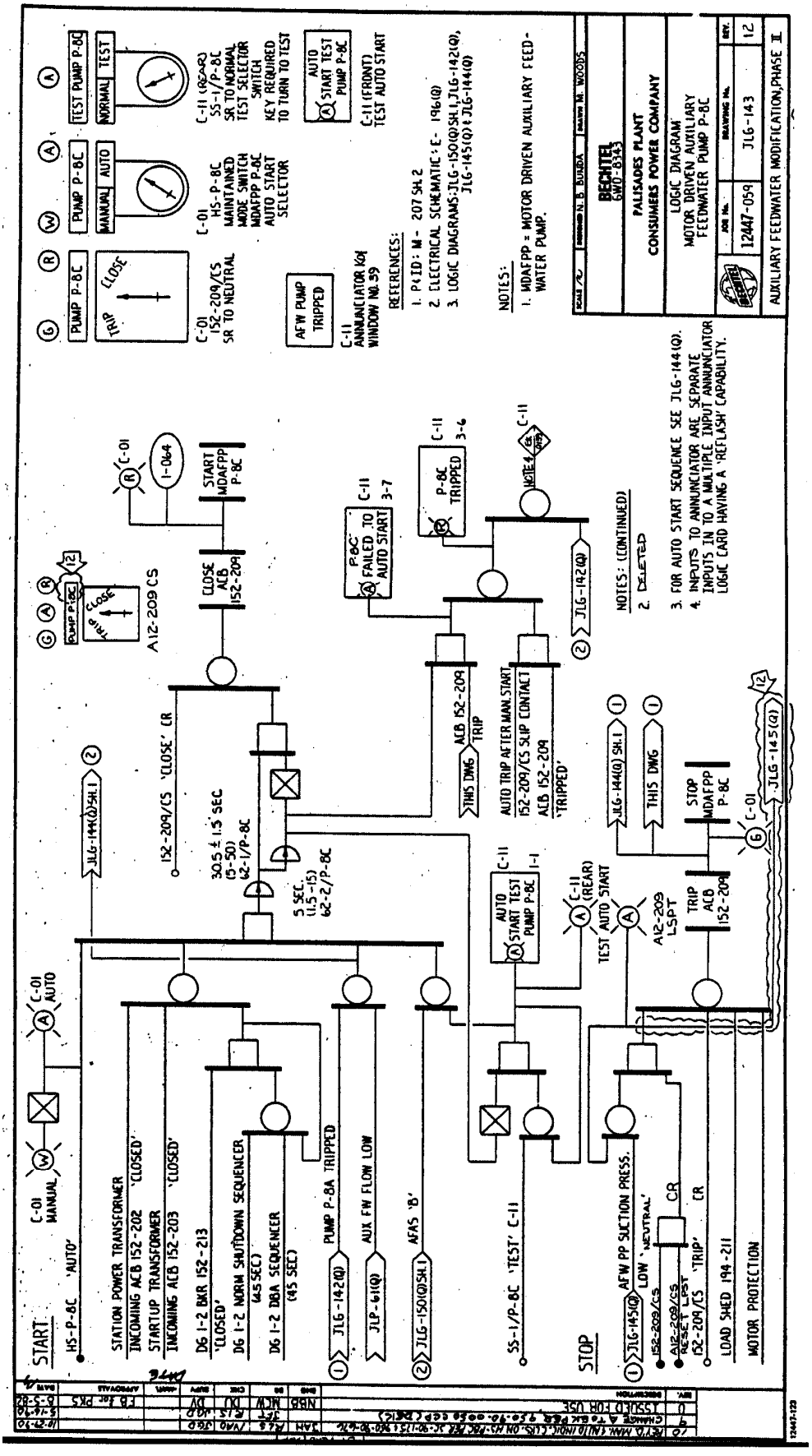
LOGIC DIAGRAM
AUXILIARY FEEDWATER ACTUATION SYSTEM



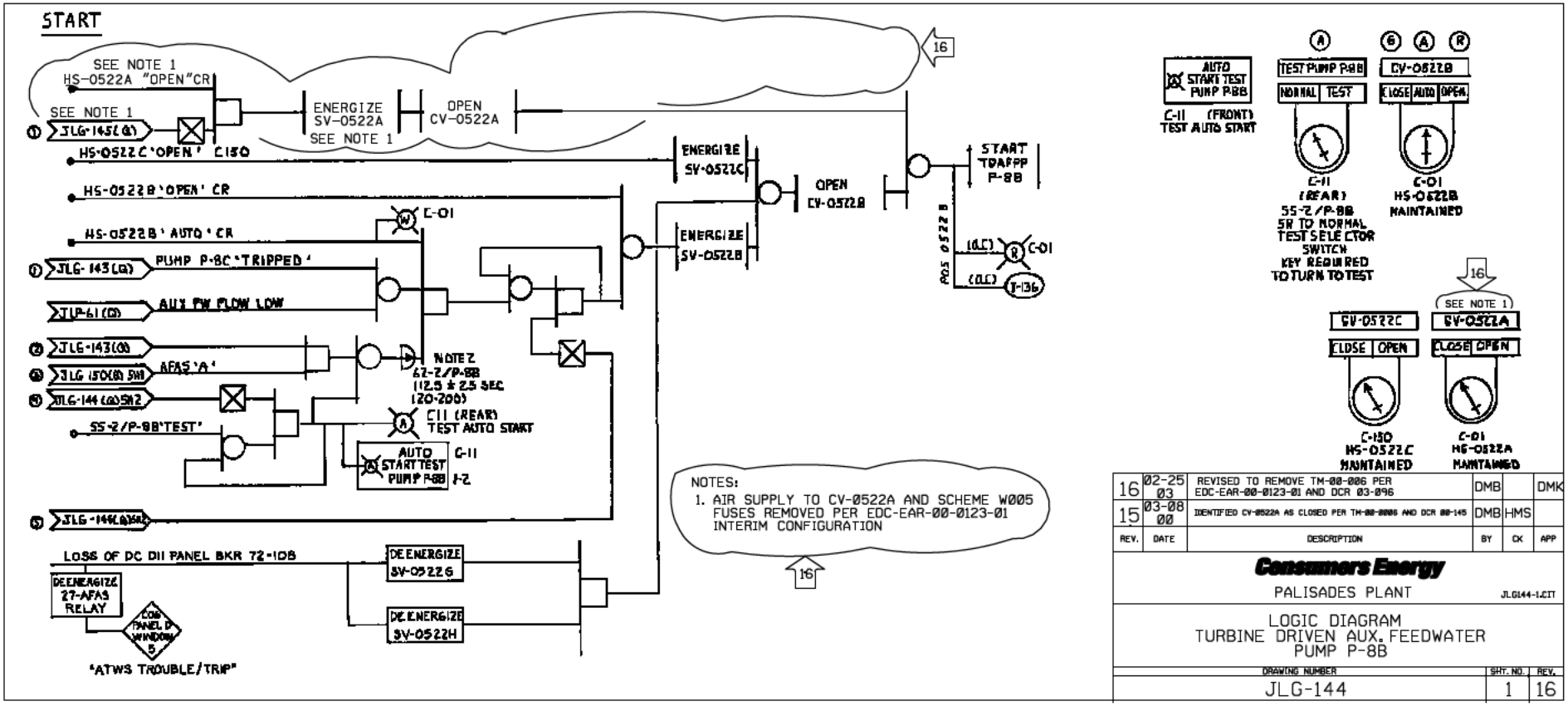
LOGIC DIAGRAM
MOTOR DRIVEN AUXILIARY FEEDWATER PUMP P-8A



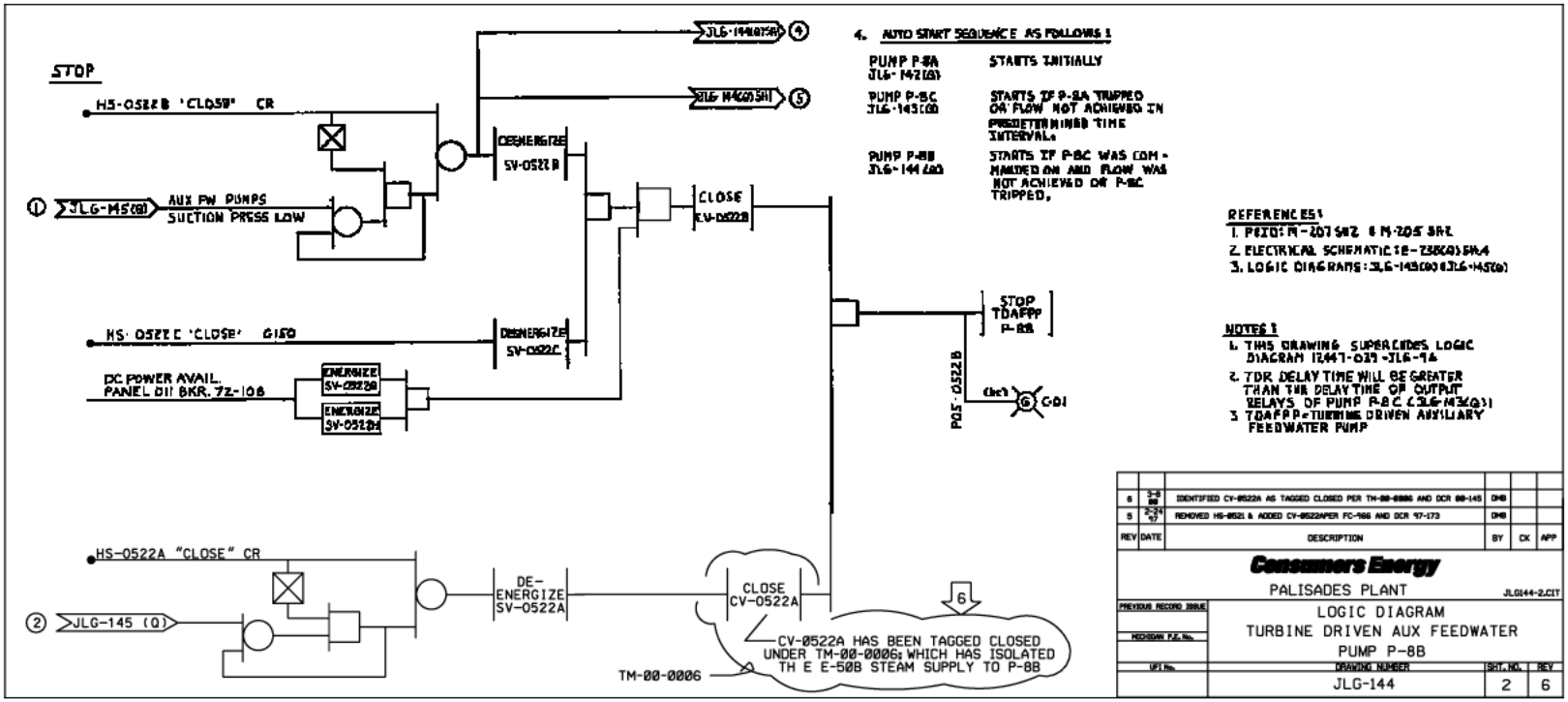
LOGIC DIAGRAM
MOTOR DRIVEN AUXILIARY FEEDWATER PUMP P-8C



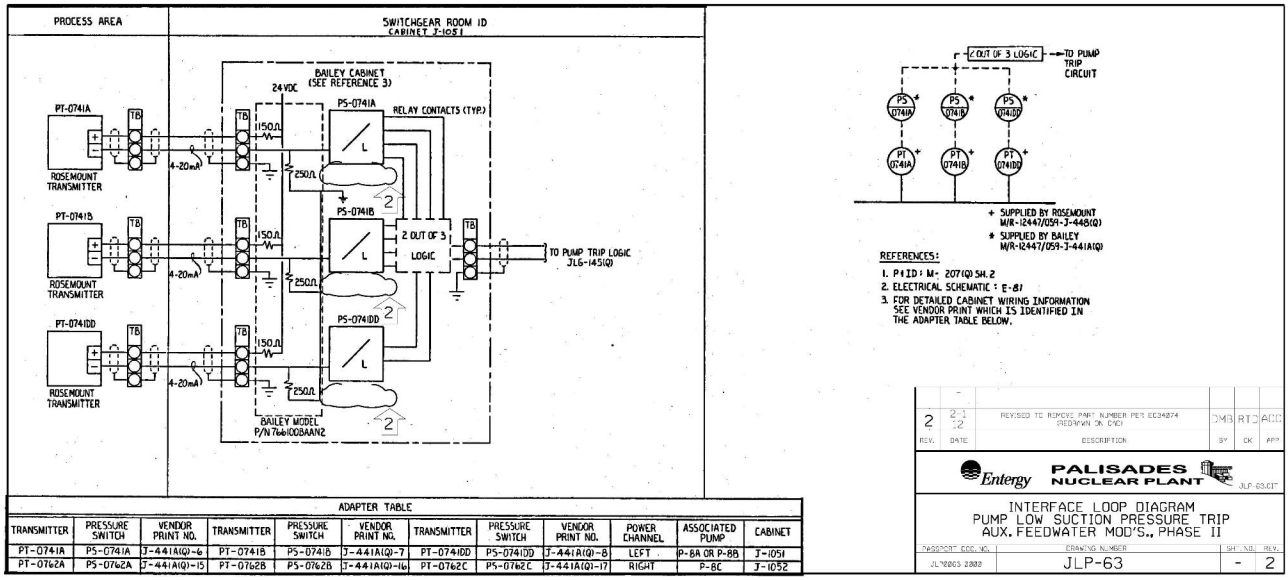
LOGIC DIAGRAM
TURBINE DRIVEN AUXILIARY FEEDWATER PUMP P-8B



LOGIC DIAGRAM
TURBINE DRIVEN AUXILIARY FEEDWATER PUMP P-8B



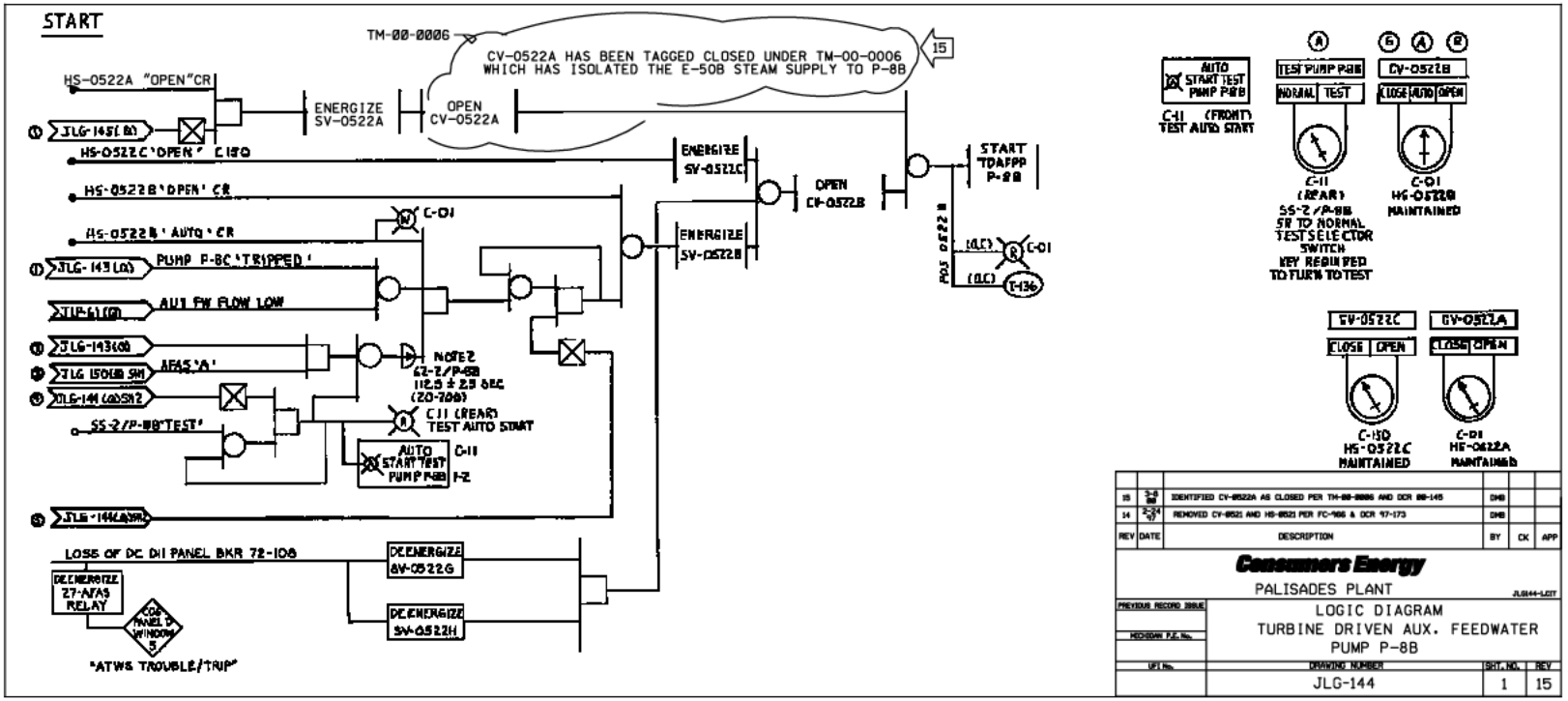
INTERFACE LOOP DIAGRAM
PUMP LOW SUCTION PRESSURE TRIP



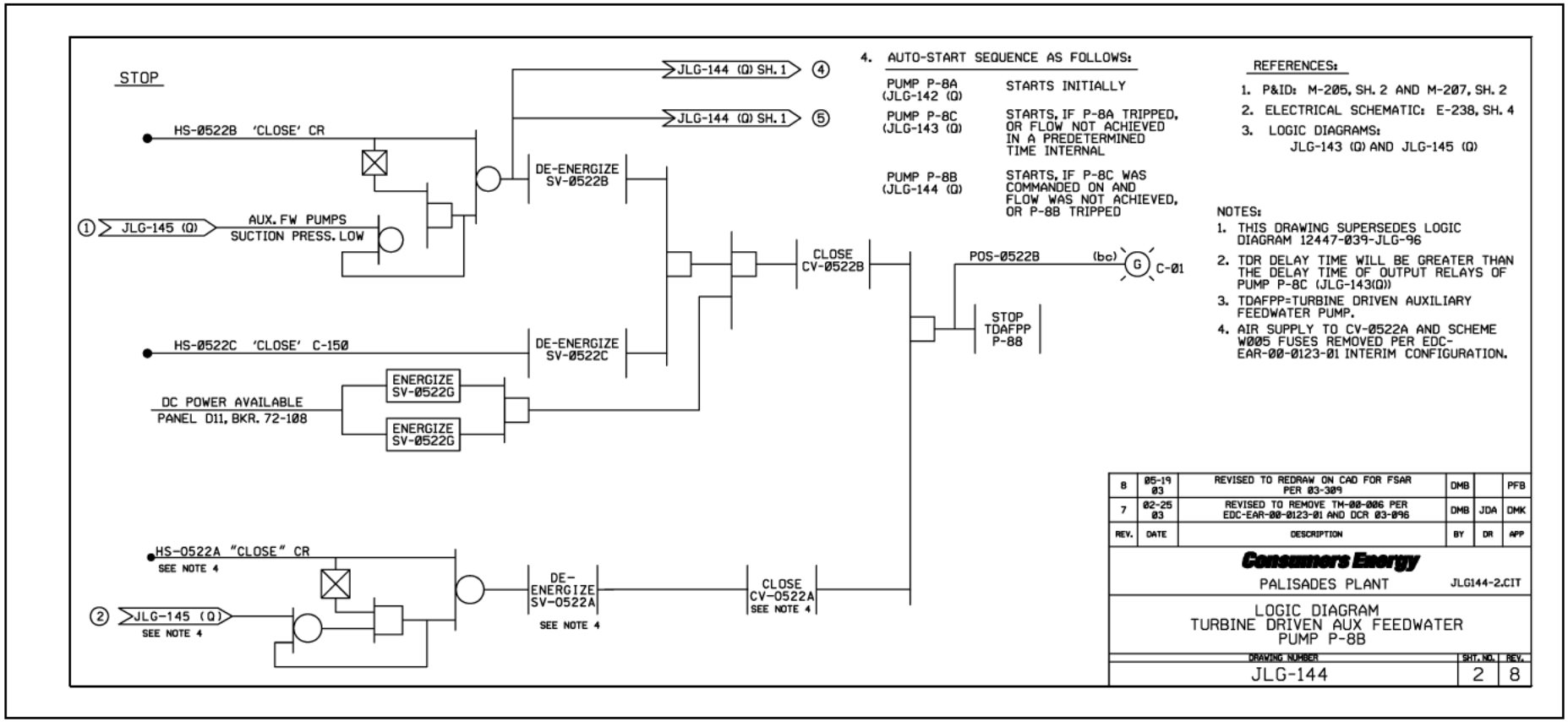
ADAPTER TABLE

TRANSMITTER	PRESSURE SWITCH	VENDOR PRINT NO.	TRANSMITTER	PRESSURE SWITCH	VENDOR PRINT NO.	TRANSMITTER	PRESSURE SWITCH	VENDOR PRINT NO.	POWER CHANNEL	ASSOCIATED PUMP	CABINET
PT-0741A	PS-0741A	J-441A(Q)-6	PT-0741B	PS-0741B	J-441A(Q)-7	PT-0741DD	PS-0741DD	J-441A(Q)-8	LEFT	P-8A OR P-8B	J-1051
PT-0762A	PS-0762A	J-441A(Q)-15	PT-0762B	PS-0762B	J-441A(Q)-16	PT-0762C	PS-0762C	J-441A(Q)-17	RIGHT	P-8C	J-1052

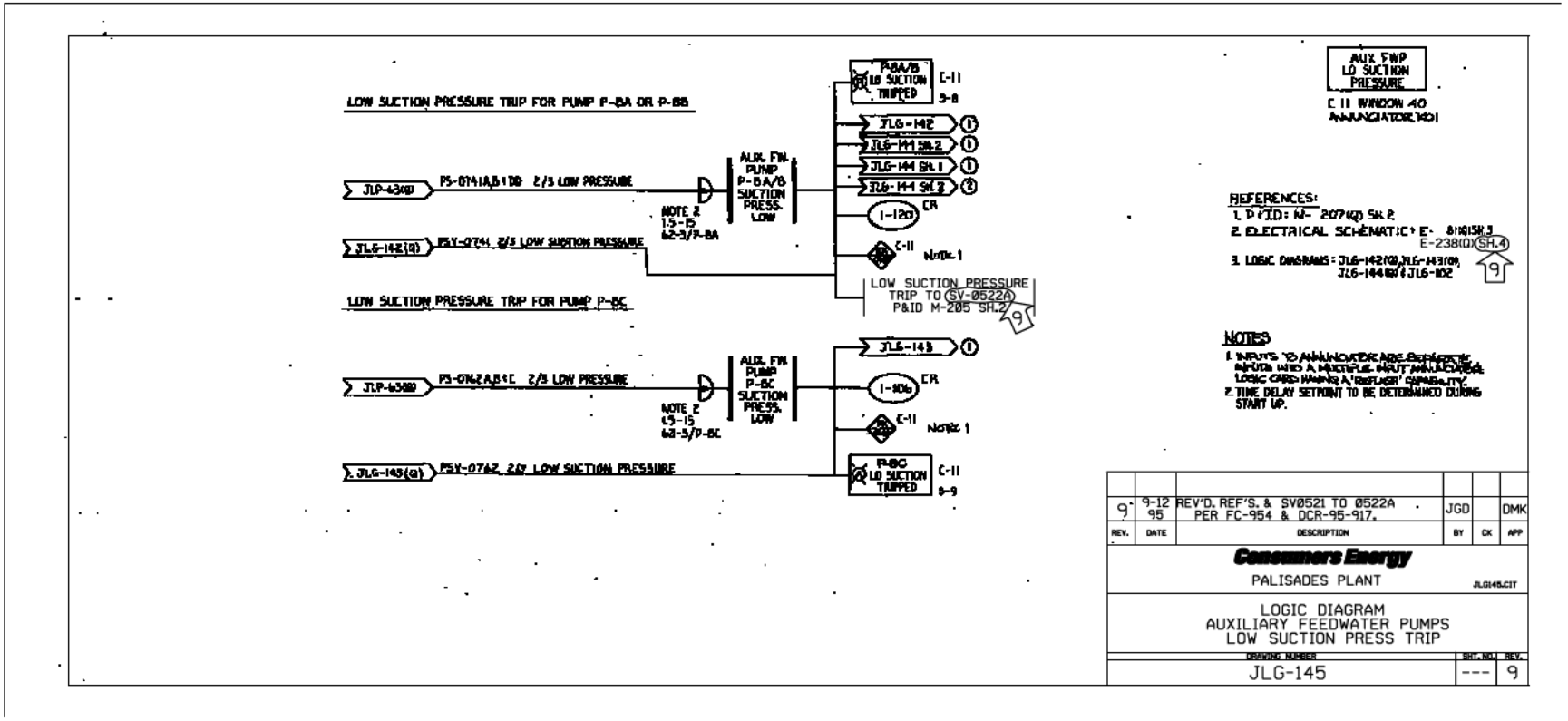
LOGIC DIAGRAM
TURBINE DRIVEN AUXILIARY FEEDWATER PUMP P-8B



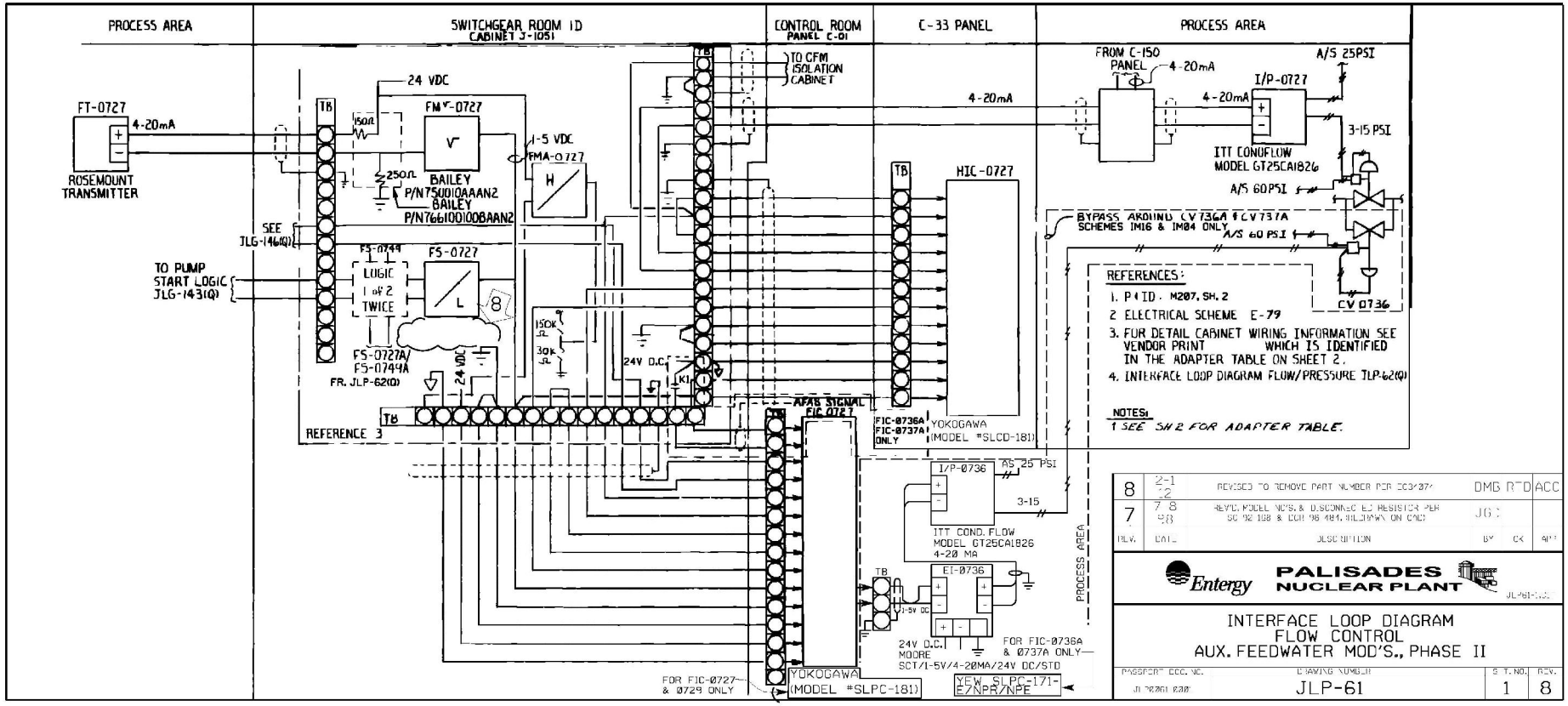
LOGIC DIAGRAM
TURBINE DRIVEN AUXILIARY FEEDWATER PUMP P-8B



LOGIC DIAGRAM
AUXILIARY FEEDWATER PUMPS LOW SUCTION PRESSURE TRIP

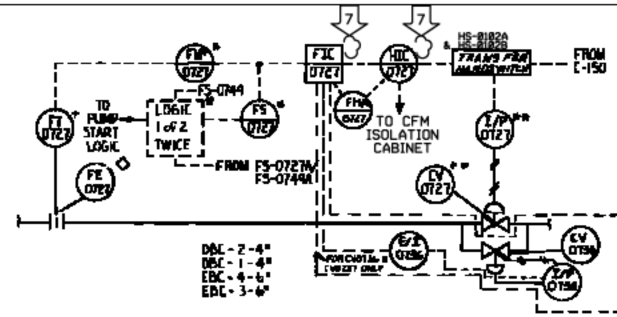


INTERFACE LOOP DIAGRAM
FLOW CONTROL



INTERFACE LOOP DIAGRAM
FLOW CONTROL

- SUPPLIED BY BAILEY M/R-12447/059-J-441A(Q)
** SUPPLIED BY COPES-VULCAN M/R-12447/059-J-436(Q)
+ SUPPLIED BY ROSEMOUNT M/R-12447/059-J-438(Q)
◇ SUPPLIED BY FLOW TECH M/R-12447/059-J-451



ADAPTER TABLE																				
											FIRE PROTECTION									
TRANSMITTER	SQUARE ROOT EXT.	FLOW SWITCH	TO PUMP LOGIC	FLOW INDICATING CONTROLLER	PANEL LOCATION	HAND INDICATING CONTROLLER	PANEL LOCATION	VENDOR PRINT	POWER CHANNEL	INSTR. PANEL	HIC	POWER CHANNEL	PANEL LOCATION	DRAWING REF.	I/P CONVERTER	CONTROL VALVE	PUMP LOGIC INTERFACE	NOTES	HIC MODE MONITOR SWITCH
FT-0727	FMY-0727	FS-0727	P-8C	FIC-0727	C-01	HIC-0727	C-33	J-441A(Q)-10(F)	LEFT	J-1051	HIC-0727C	LEFT	C-150		I/P-0727	CV-0727	JLG-14300	—	FMA-0727
FT-0749	FMY-0749	FS-0749	P-8C	FIC-0749	C-01	HIC-0749	C-33	J-441A(Q)-2(1)(2)	LEFT	J-1051	HIC-0749C	LEFT	C-150		I/P-0749	CV-0749			FMA 0749
FT-0736A	FMY-0736A	FS-0736A	P-8B	FIC-0736A	C-01	HIC-0736A	C-33	J-441A(Q)-9(10)	RIGHT	J-1052	—	—	—	—	I/P-0736A	CV-0736A	JLG-14400		FMA-0736A
FT-0737A	FMY-0737A	FS-0737A	P-8B	FIC-0737A	C-01	HIC-0737A	C-33	J-441A(Q)-11(12)	RIGHT	J-1052	—	—	—	—	I/P-0737A	CV-0737A			FMA-0737A

CRITICAL FUNCTION MONITOR SYSTEM	CONTROL VALVE (BYPASS)	I/P CONVERTER	SIGNAL CONVERTER
PANEL LOCATION			
J450			
J450			
J451	CVO-736	I/P0736	E/I 0736
J451	CVO-737	I/P0737	E/I 0737

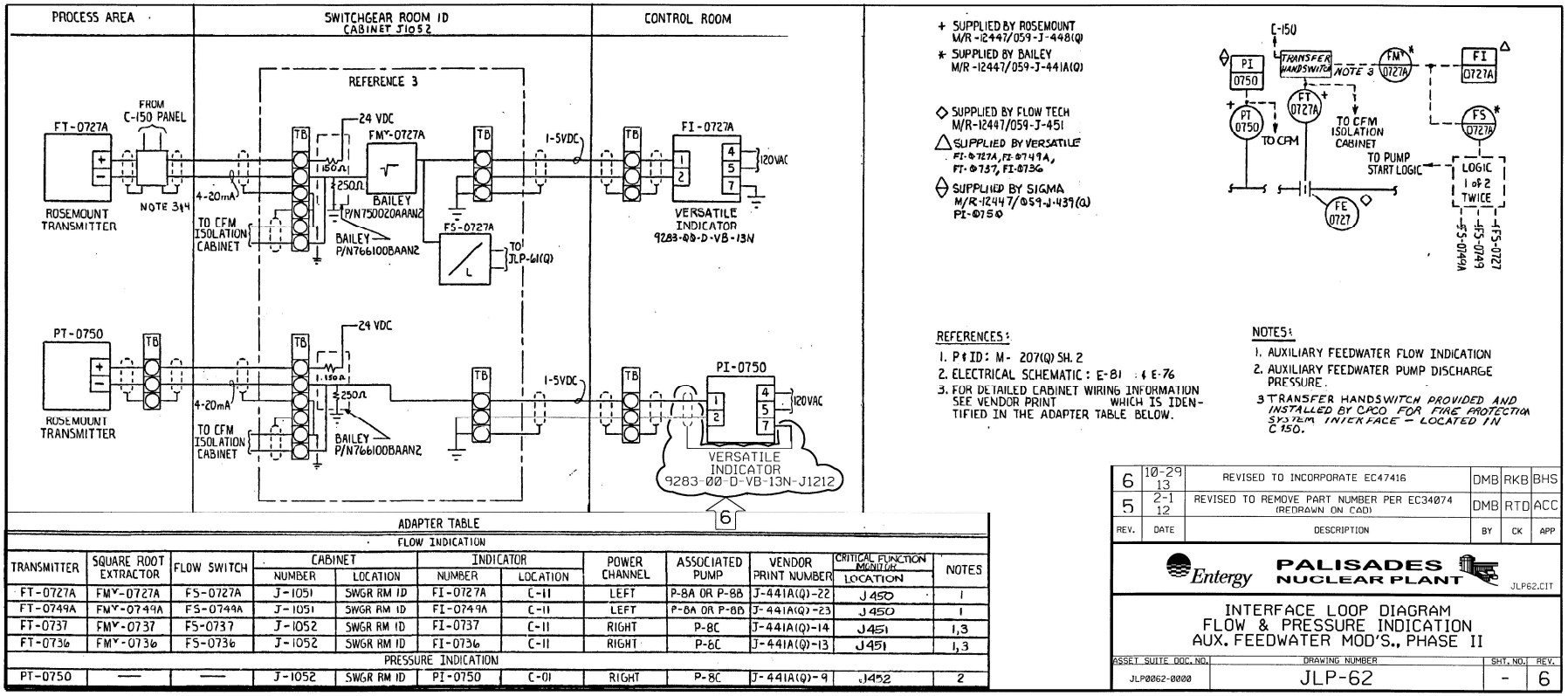
REV.	DATE	DESCRIPTION	BY	CK	APP
7	7-6-98	REV'D. FIC & HIC-0727 PER SC-92-168 & DCR-98-484. (REDRAWN ON CAD)	JGD		

Consumers Energy
PALISADES PLANT
JLP61:2-C1T

INTERFACE LOOP DIAGRAM
FLOW CONTROL
AUX. FEEDWATER MOD'S., PHASE II

DRAWING NUMBER	SHT. NO.	REV.
JLP-61	2	7

INTERFACE DIAGRAM
FLOW AND PRESSURE INDICATION



REFERENCES:

1. P&ID: M- 207(Q) SH. 2
2. ELECTRICAL SCHEMATIC: E-81 & E-76
3. FOR DETAILED CABINET WIRING INFORMATION SEE VENDOR PRINT WHICH IS IDENTIFIED IN THE ADAPTER TABLE BELOW.

NOTES:

1. AUXILIARY FEEDWATER FLOW INDICATION
2. AUXILIARY FEEDWATER PUMP DISCHARGE PRESSURE.
3. TRANSFER HANDSWITCH PROVIDED AND INSTALLED BY CPCO FOR FIRE PROTECTION SYSTEM INTERFACE – LOCATED IN C-150.

ADAPTER TABLE

TRANSMITTER	SQUARE ROOT EXTRACTOR	FLOW SWITCH	CABINET NUMBER	CABINET LOCATION	INDICATOR NUMBER	INDICATOR LOCATION	POWER CHANNEL	ASSOCIATED PUMP	VENDOR PRINT NUMBER	CRITICAL FUNCTION MONITOR LOCATION	NOTES
FLOW INDICATION											
FT-0727A	FMY-0727A	FS-0727A	J-1051	SWGR RM 1D	FI-0727A	C-11	LEFT	P-8A OR P-8B	J-441A(Q)-22	J450	1
FT-0749A	FMY-0749A	FS-0749A	J-1051	SWGR RM 1D	FI-0749A	C-11	LEFT	P-8A OR P-8B	J-441A(Q)-23	J450	1
FT-0737	FMY-0737	FS-0737	J-1052	SWGR RM 1D	FI-0737	C-11	RIGHT	P-8C	J-441A(Q)-14	J451	1,3
FT-0736	FMY-0736	FS-0736	J-1052	SWGR RM 1D	FI-0736	C-11	RIGHT	P-8C	J-441A(Q)-13	J451	1,3
PRESSURE INDICATION											
PT-0750	—	—	J-1052	SWGR RM 1D	PI-0750	C-01	RIGHT	P-8C	J-441A(Q)-9	J452	2

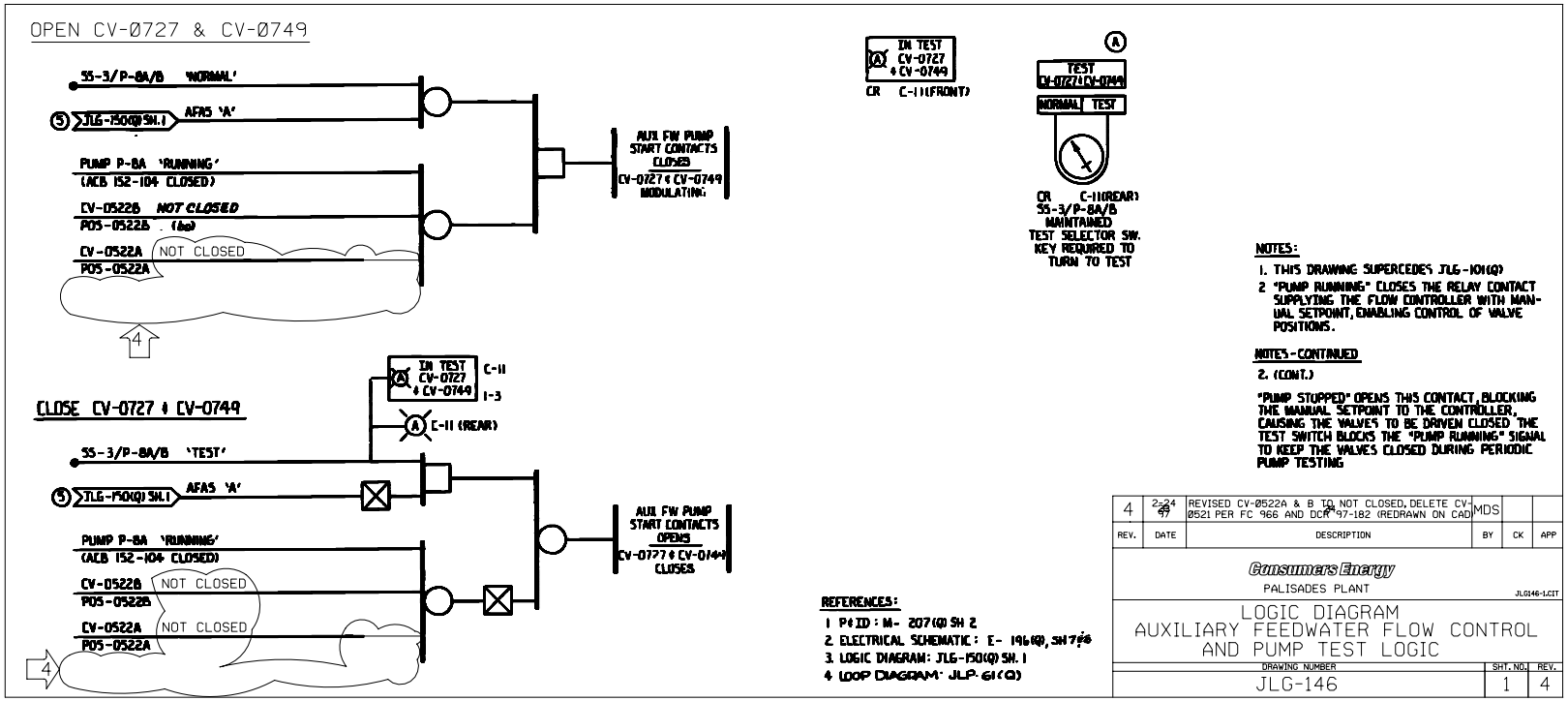
REV.	DATE	DESCRIPTION	BY	CK	APP
6	10-29 13	REVISED TO INCORPORATE EC47416	DMB	RKB	BHS
5	2-1 12	REVISED TO REMOVE PART NUMBER PER EC34074 (REDRAWN ON CAD)	DMB	RTD	ACC

Entergy PALISADES NUCLEAR PLANT JLP62.CIT

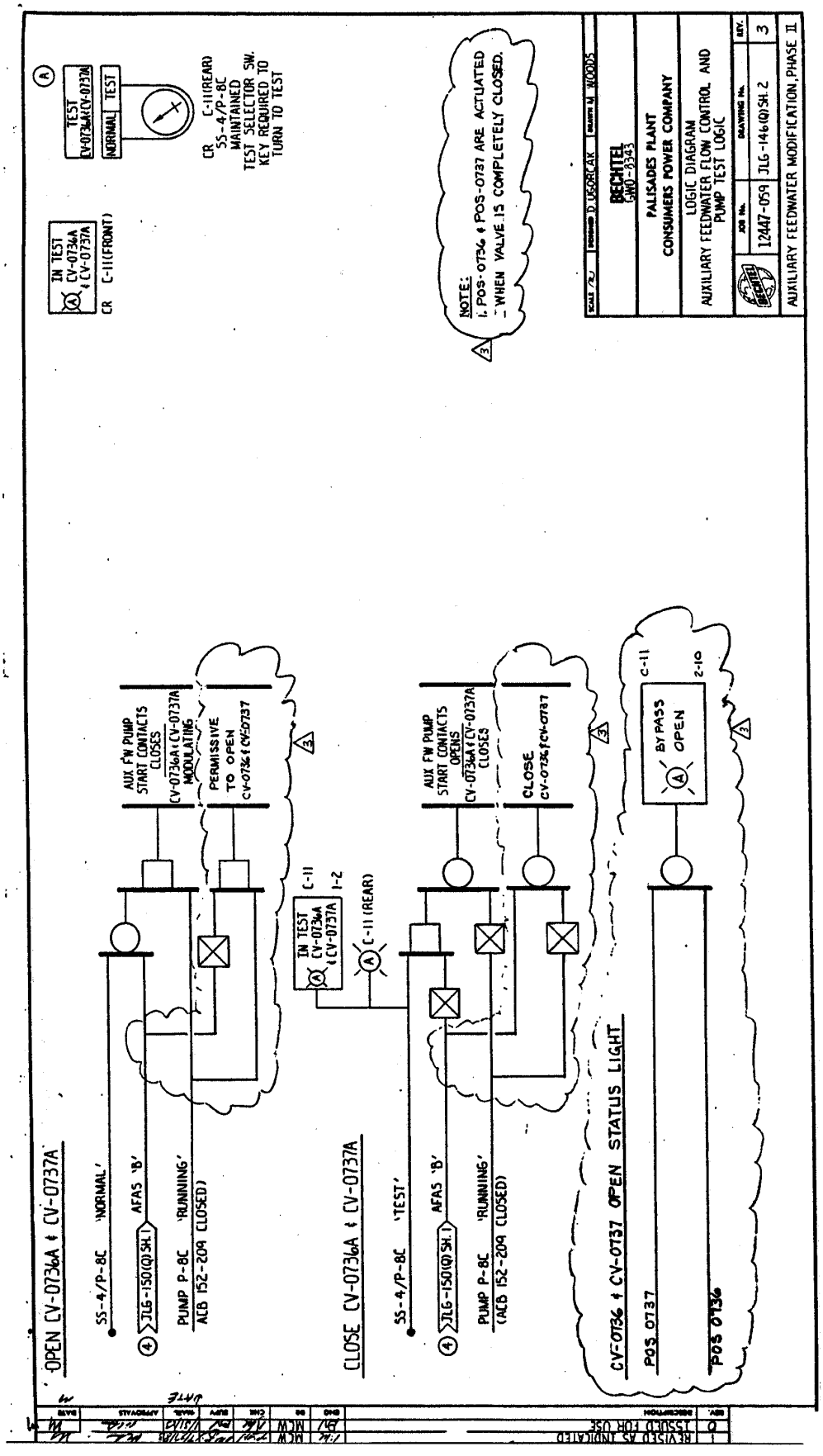
INTERFACE LOOP DIAGRAM
FLOW & PRESSURE INDICATION
AUX. FEEDWATER MOD'S., PHASE II

ASSET SUITE DOC. NO.	DRAWING NUMBER	SHT. NO.	REV.
JLP0062-0000	JLP-62	-	6

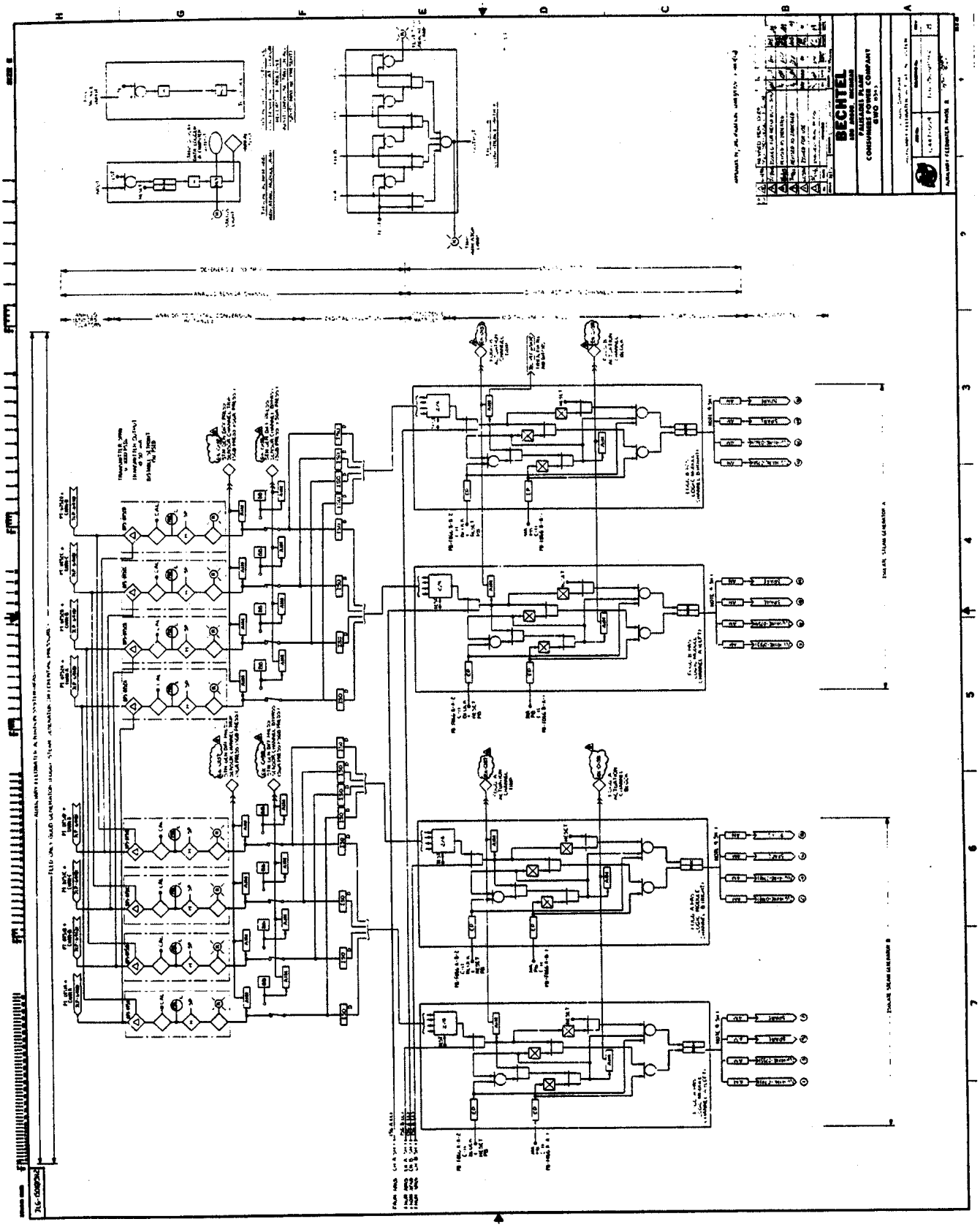
LOGIC DIAGRAM
AUX FEEDWATER FLOW CONTROL AND PUMP TEST LOGIC



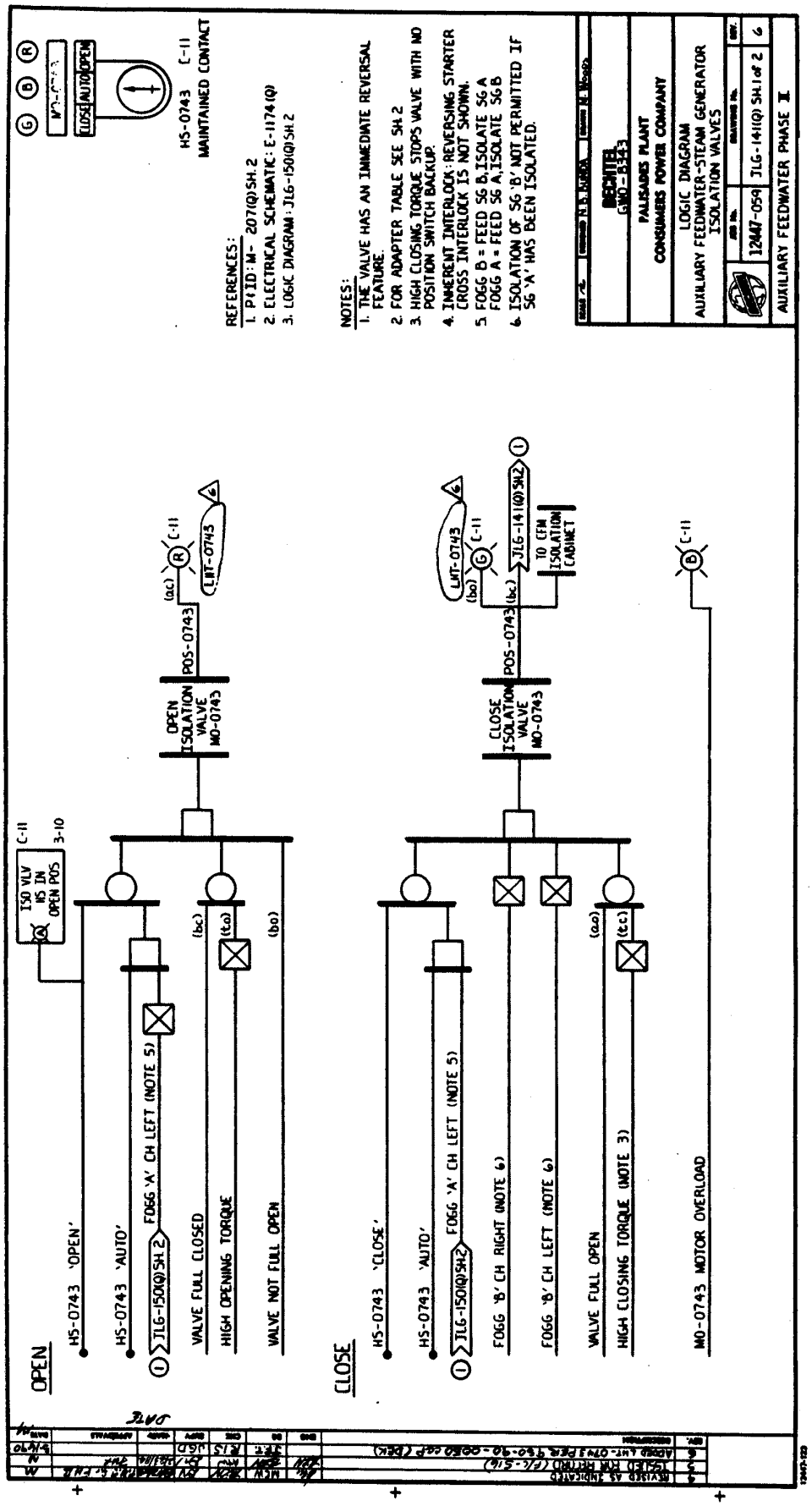
LOGIC DIAGRAM
AUXILIARY FEEDWATER FLOW CONTROL AND PUMP TEST LOGIC



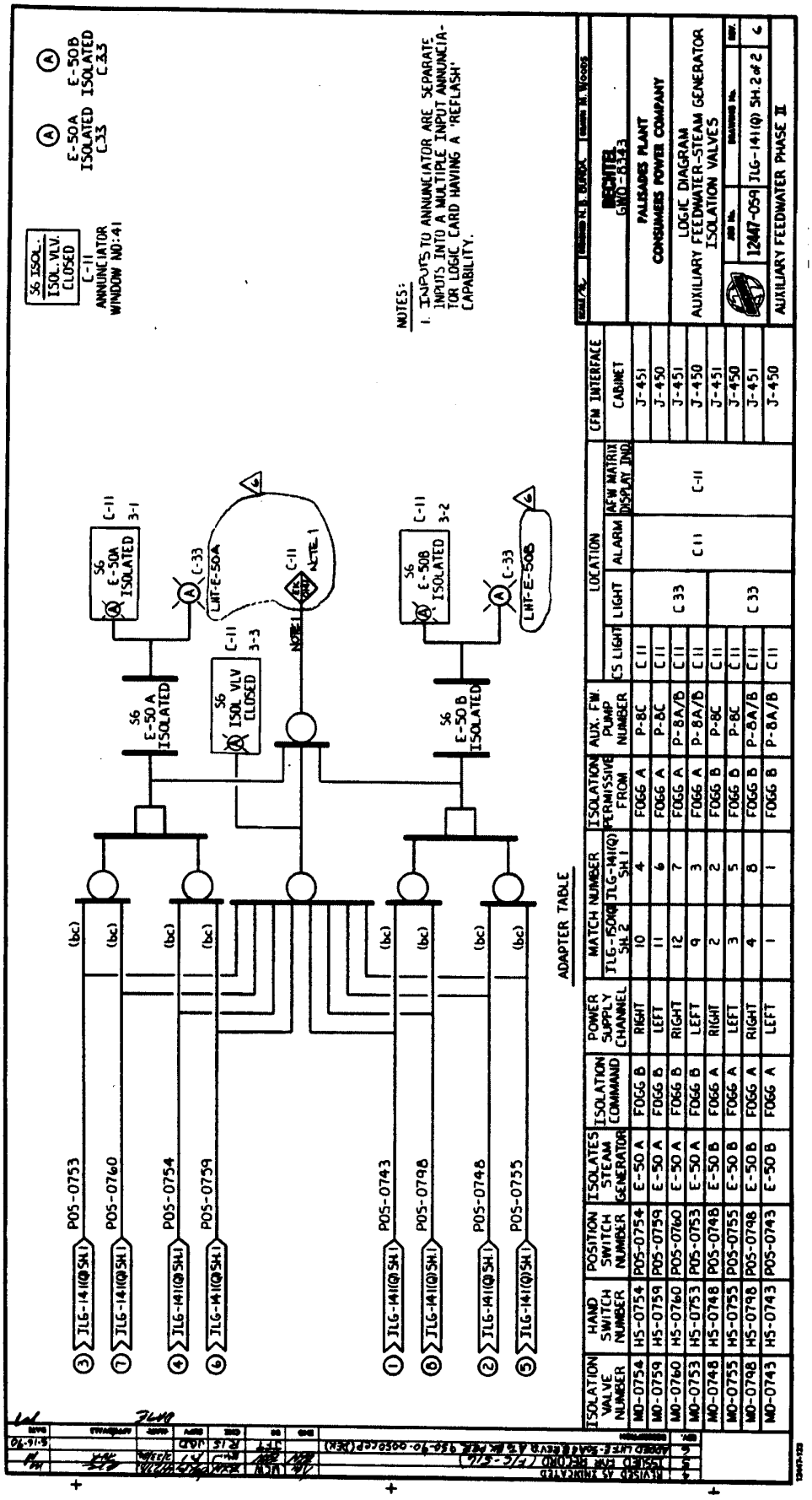
LOGIC DIAGRAM
AUXILIARY FEEDWATER ACTUATION SYSTEM



LOGIC DIAGRAM
AUXILIARY FEEDWATER – STEAM GENERATOR ISOLATION VALVES

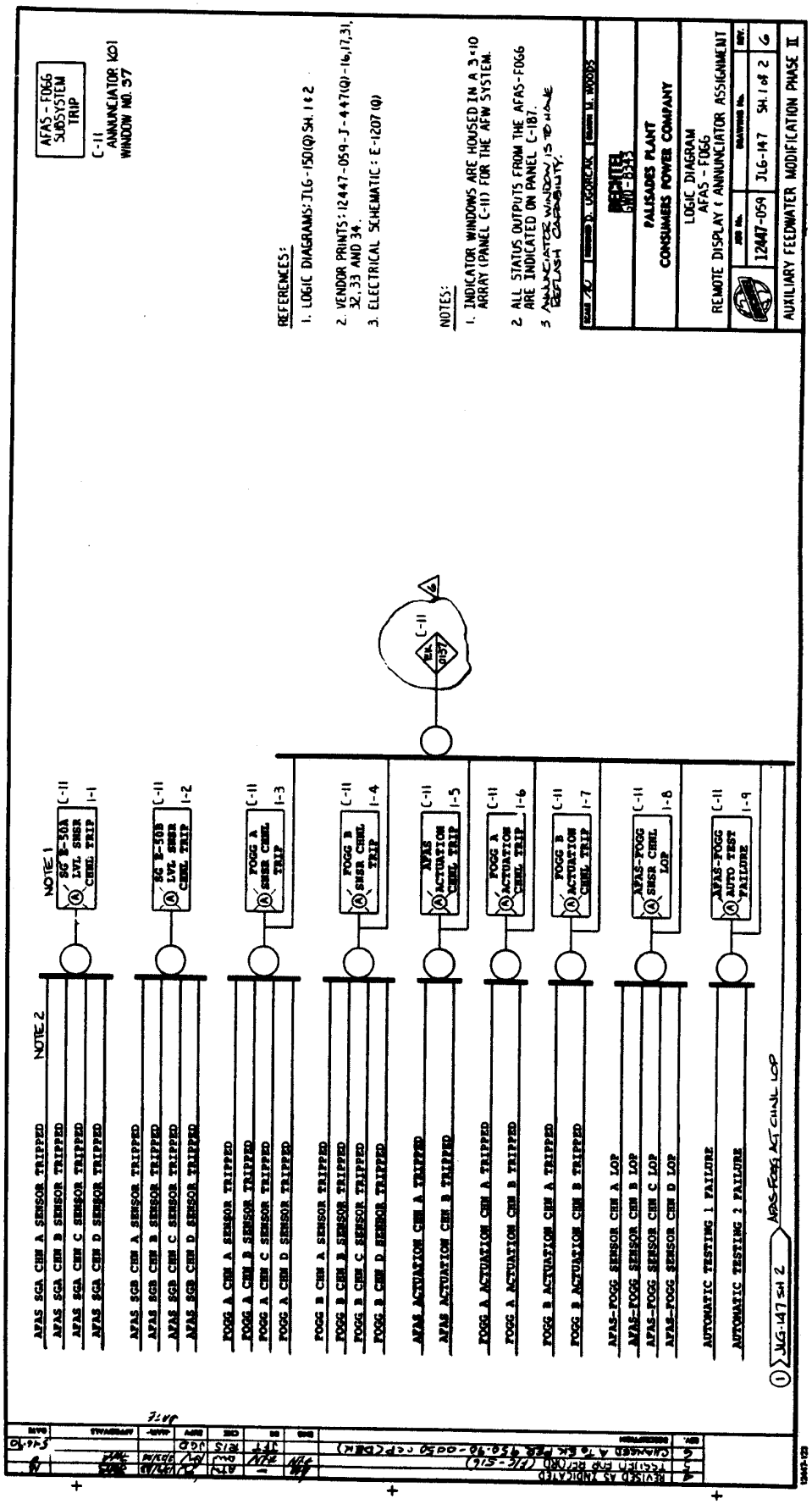


LOGIC DIAGRAM
AUXILIARY FEEDWATER – STEAM GENERATOR ISOLATION VALVES

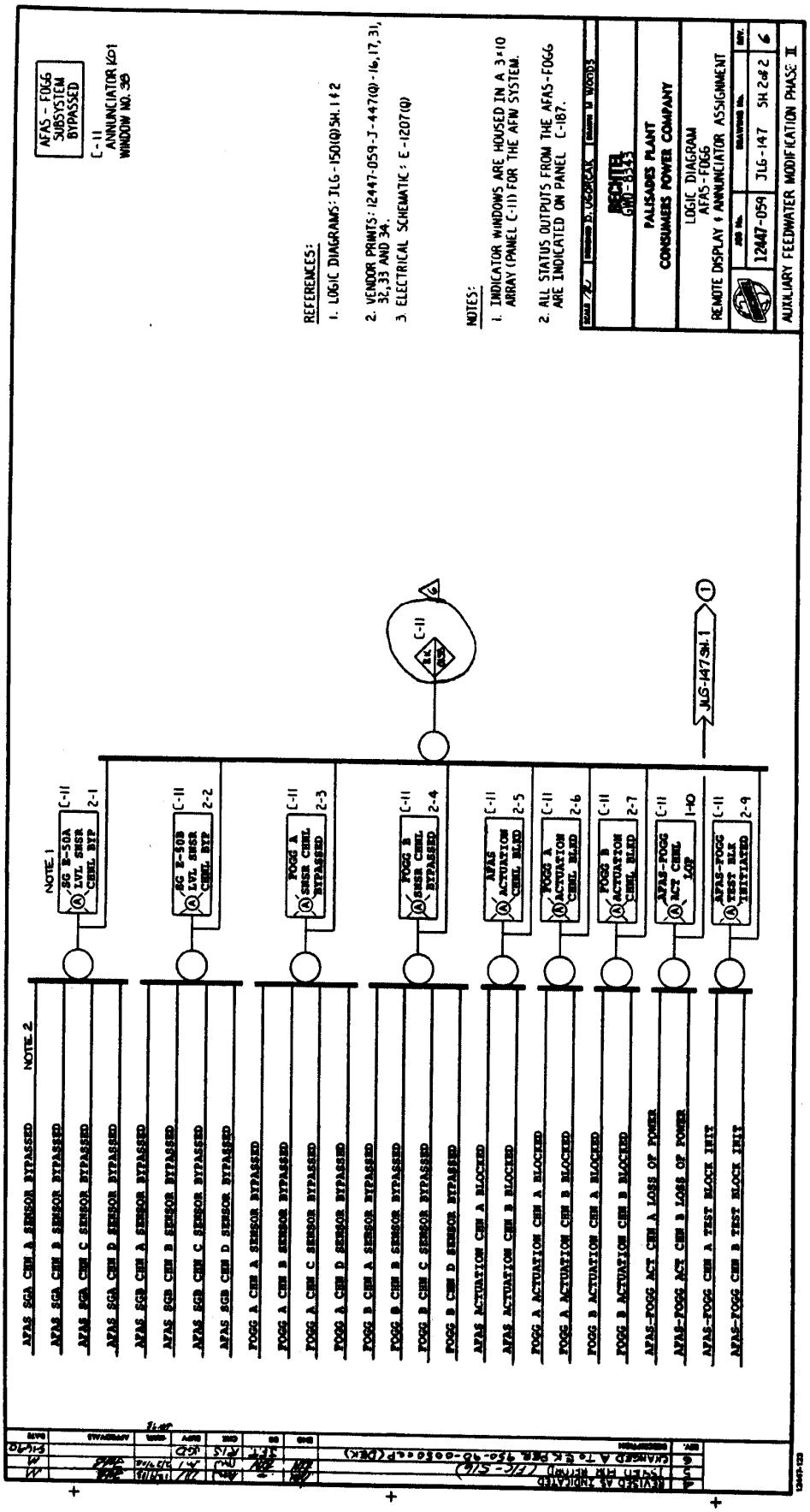


ISOLATION VALVE NUMBER	HAND SWITCH NUMBER	POSITION SWITCH NUMBER	ISOLATES STEAM GENERATOR	ISOLATION COMMAND	POWER SUPPLY CHANNEL	MATCH NUMBER JLG-1500 SH. 2	MATCH NUMBER JLG-1411(Q) SH. 1	ISOLATION PERMISSIVE FROM	AUX. FW. PUMP NUMBER	LOCATION CS LIGHT	LOCATION LIGHT	LOCATION ALARM	LOCATION AFW MATRIX DISPLAY IND.	CFM INTERFACE CABINET
MO-0754	HS-0754	POS-0754	E-50 A	FOGG B	RIGHT	10	4	FOGG A	P-8C	C 11	C 33	C 11	C-11	J-451
MO-0759	HS-0759	POS-0759	E-50 A	FOGG B	LEFT	11	6	FOGG A	P-8C	C 11				J-450
MO-0760	HS-0760	POS-0760	E-50 A	FOGG B	RIGHT	12	7	FOGG A	P-8A/B	C 11				J-451
MO-0753	HS-0753	POS-0753	E-50 A	FOGG B	LEFT	9	3	FOGG A	P-8A/B	C 11				J-450
MO-0748	HS-0748	POS-0748	E-50 B	FOGG A	RIGHT	2	2	FOGG B	P-8C	C 11				J-451
MO-0755	HS-0755	POS-0755	E-50 B	FOGG A	LEFT	3	5	FOGG B	P-8C	C 11				J-450
MO-0798	HS-0798	POS-0798	E-50 B	FOGG A	RIGHT	4	8	FOGG B	P-8A/B	C 11	C 33			J-451
MO-0743	HS-0743	POS-0743	E-50 B	FOGG A	LEFT	1	1	FOGG B	P-8A/B	C 11				J-450

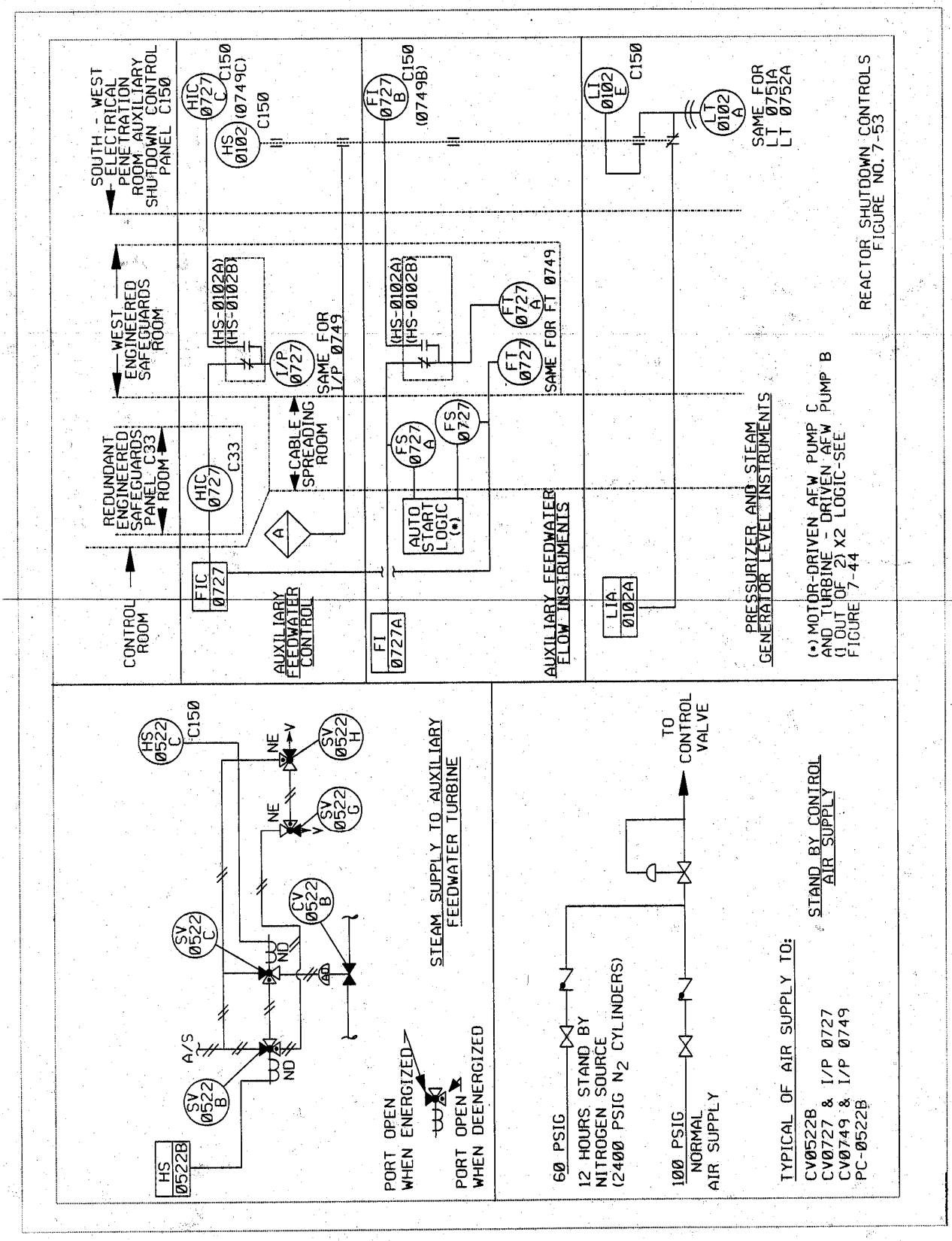
LOGIC DIAGRAM
AFAS-FOGG REMOTE DISPLAY AND ANNUNCIATOR ASSIGNMENT



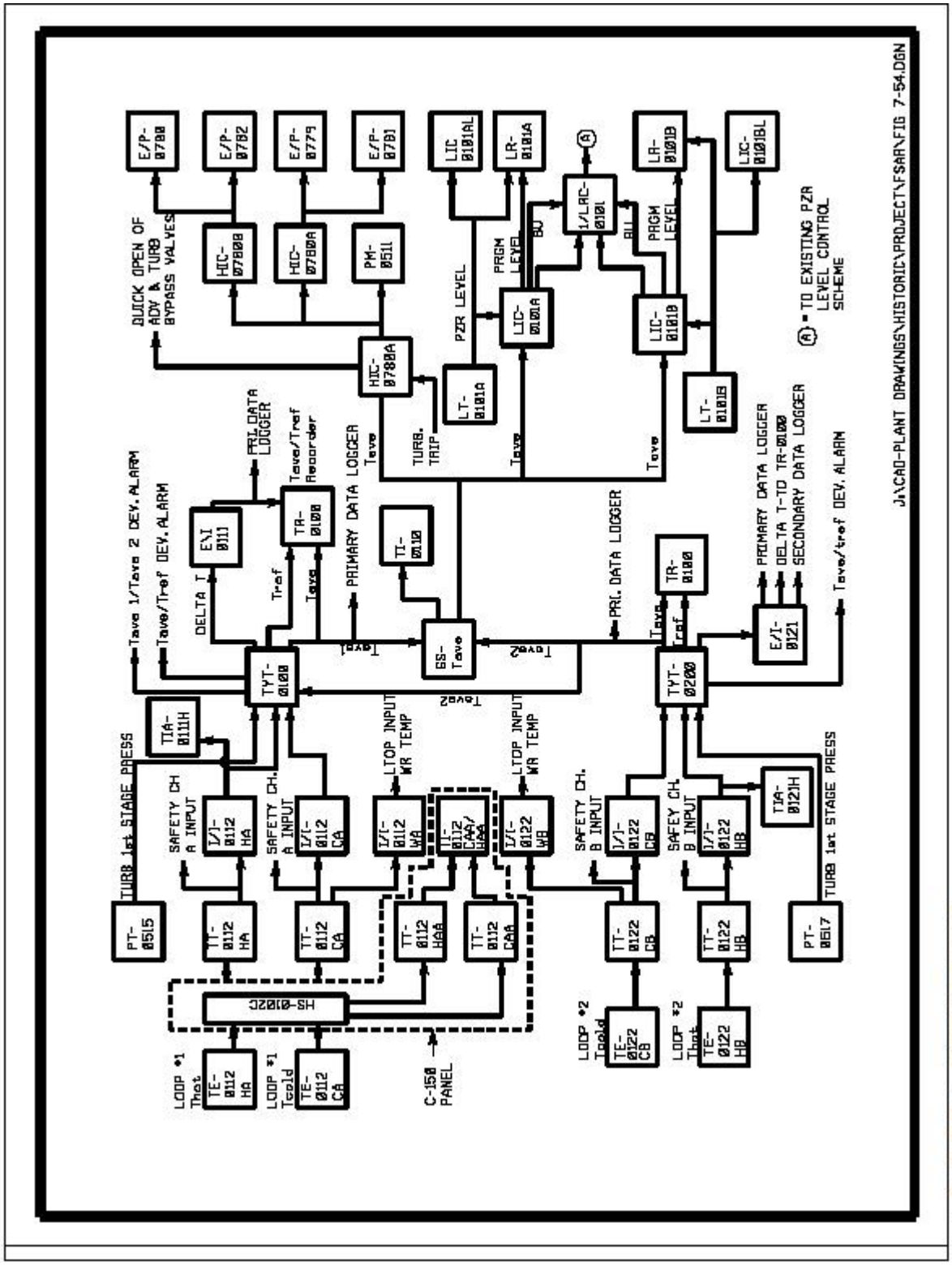
LOGIC DIAGRAM
AFAS-FOGG REMOTE DISPLAY AND ANNUNCIATOR ASSIGNMENT



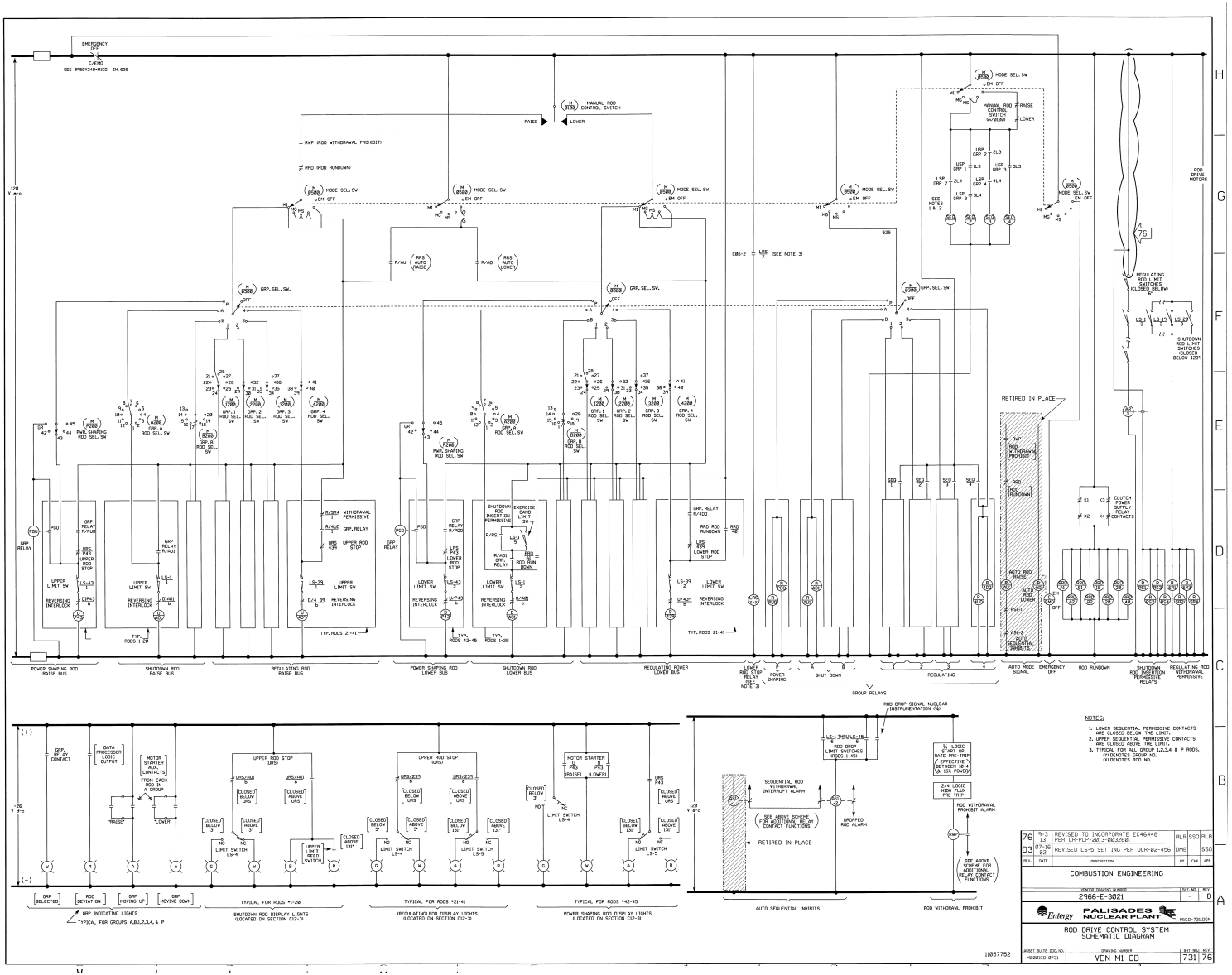
REACTOR SHUTDOWN CONTROLS



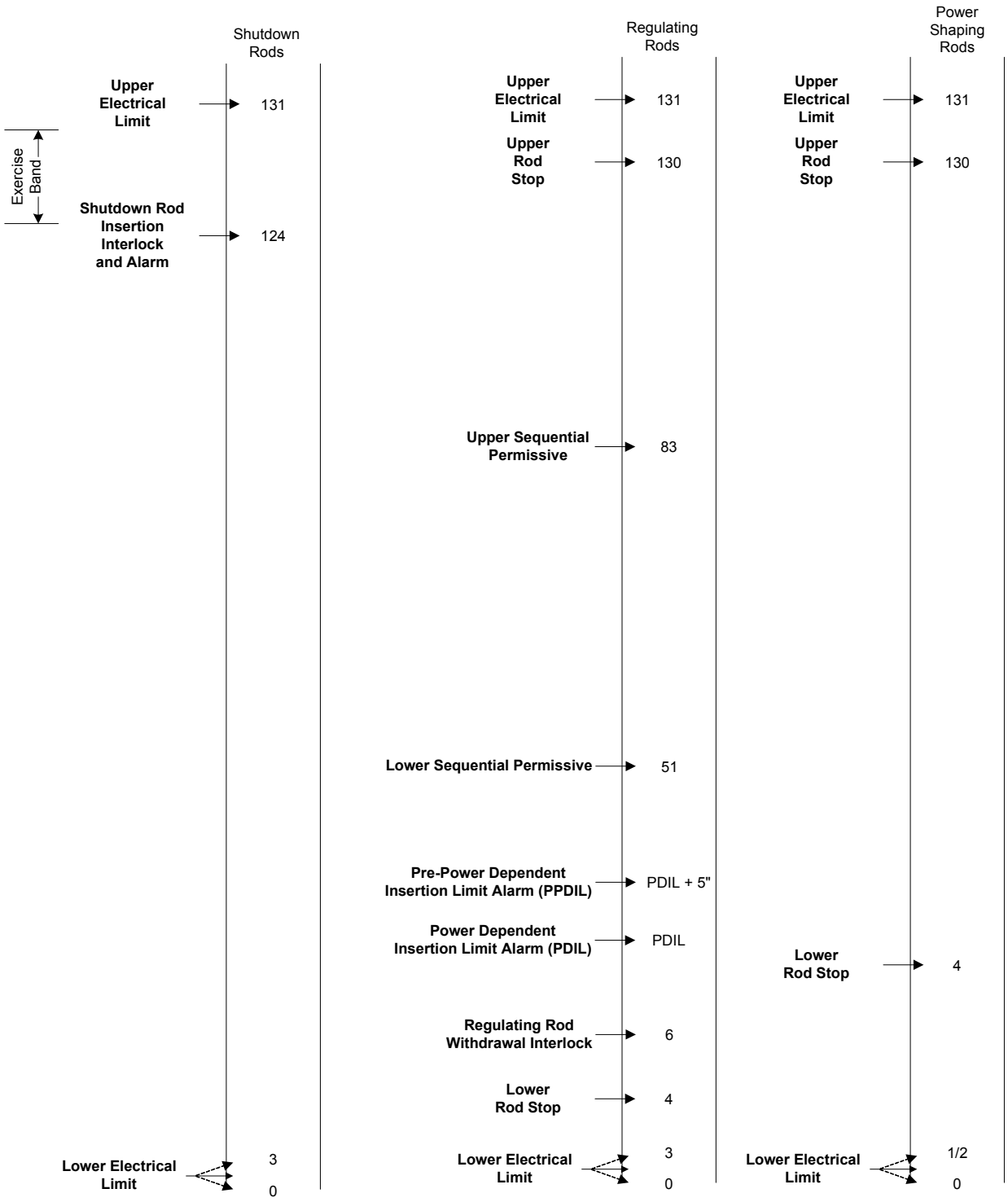
REACTOR REGULATING SYSTEM BLOCK DIAGRAM



ROD DRIVE CONTROL SYSTEM SCHEMATIC DIAGRAM

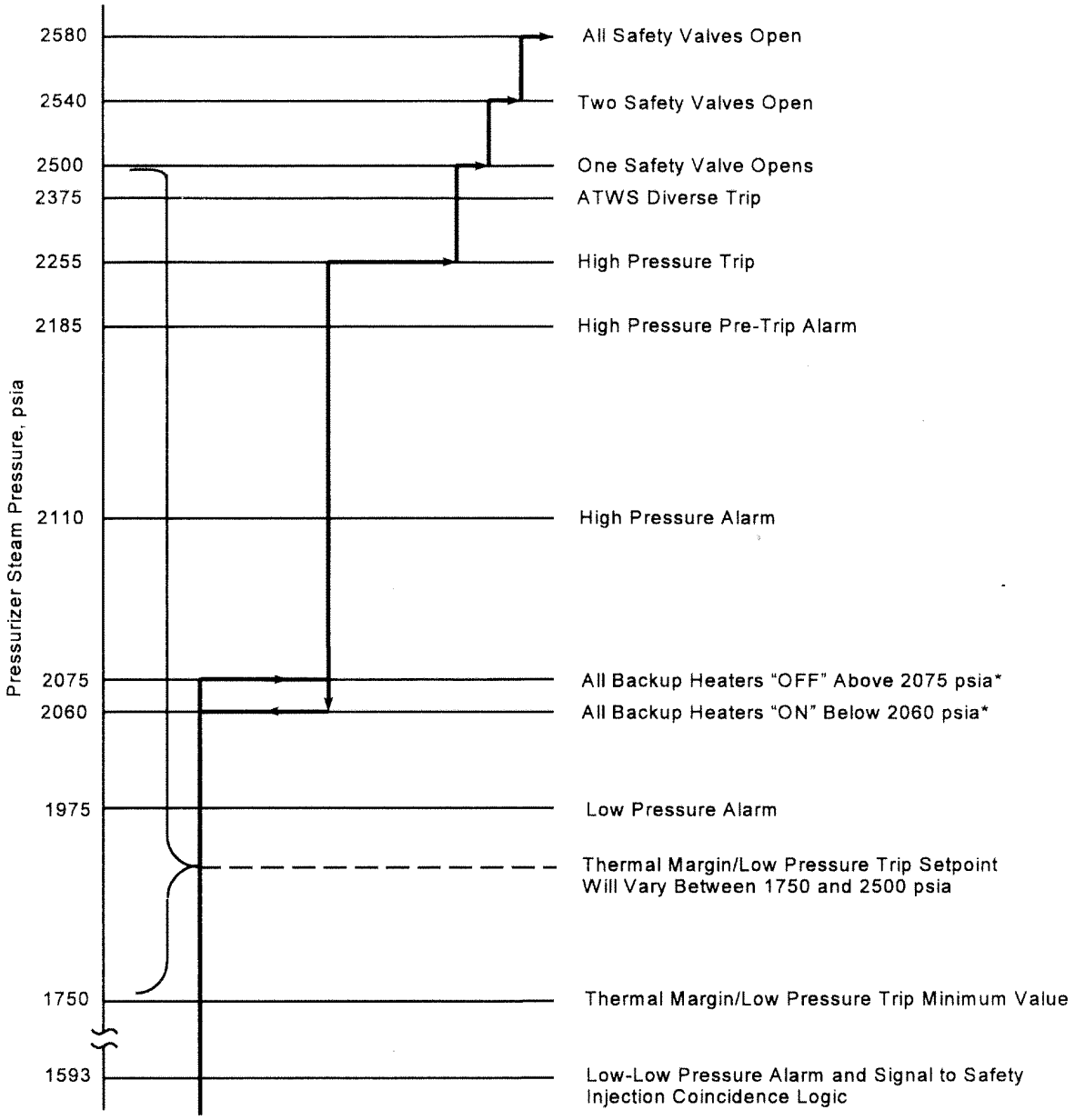


ROD POSITION SETPOINTS



NOTE: All Setpoint are in inches from bottom.

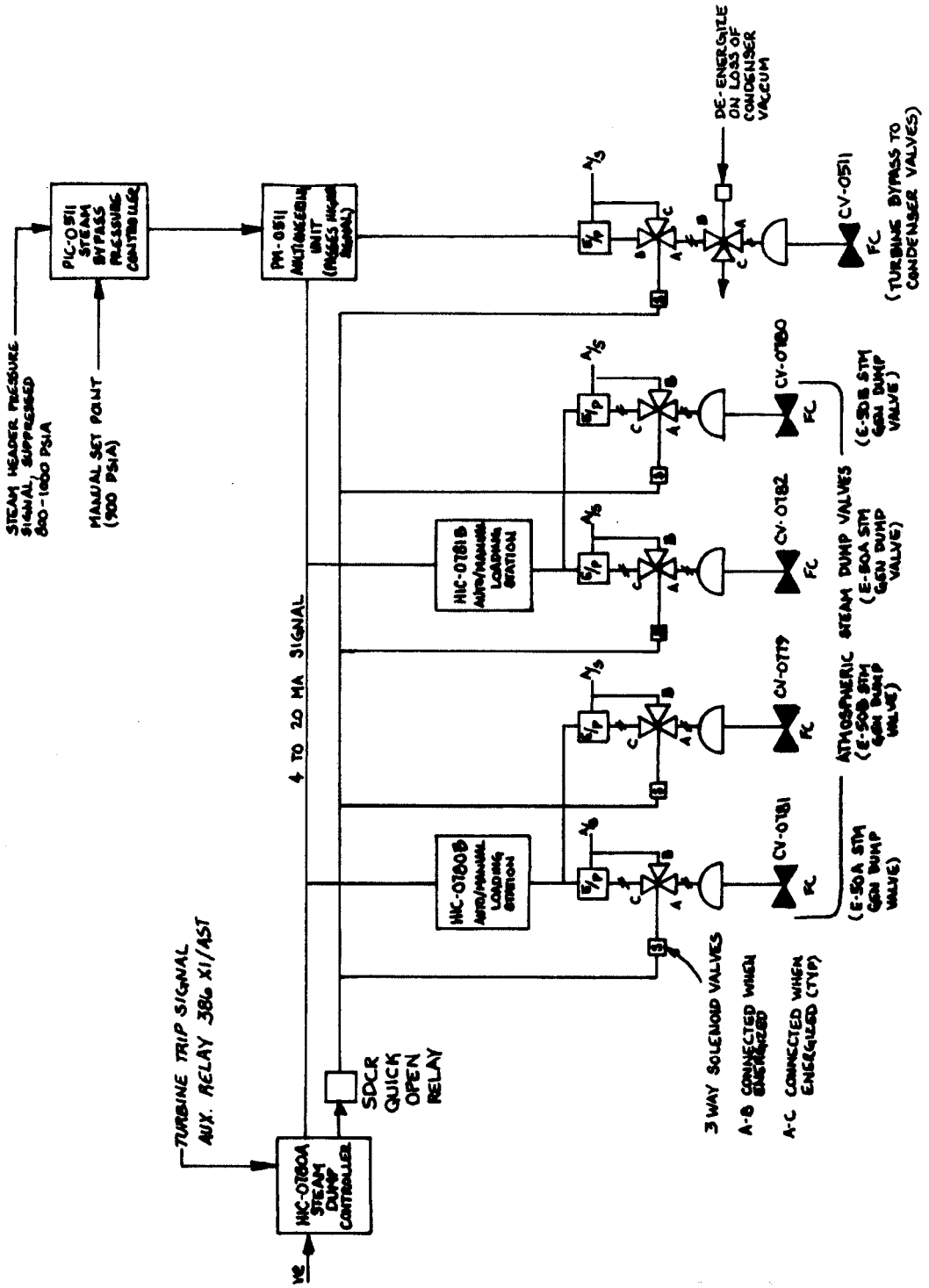
PRESSURE CONTROL PROGRAM



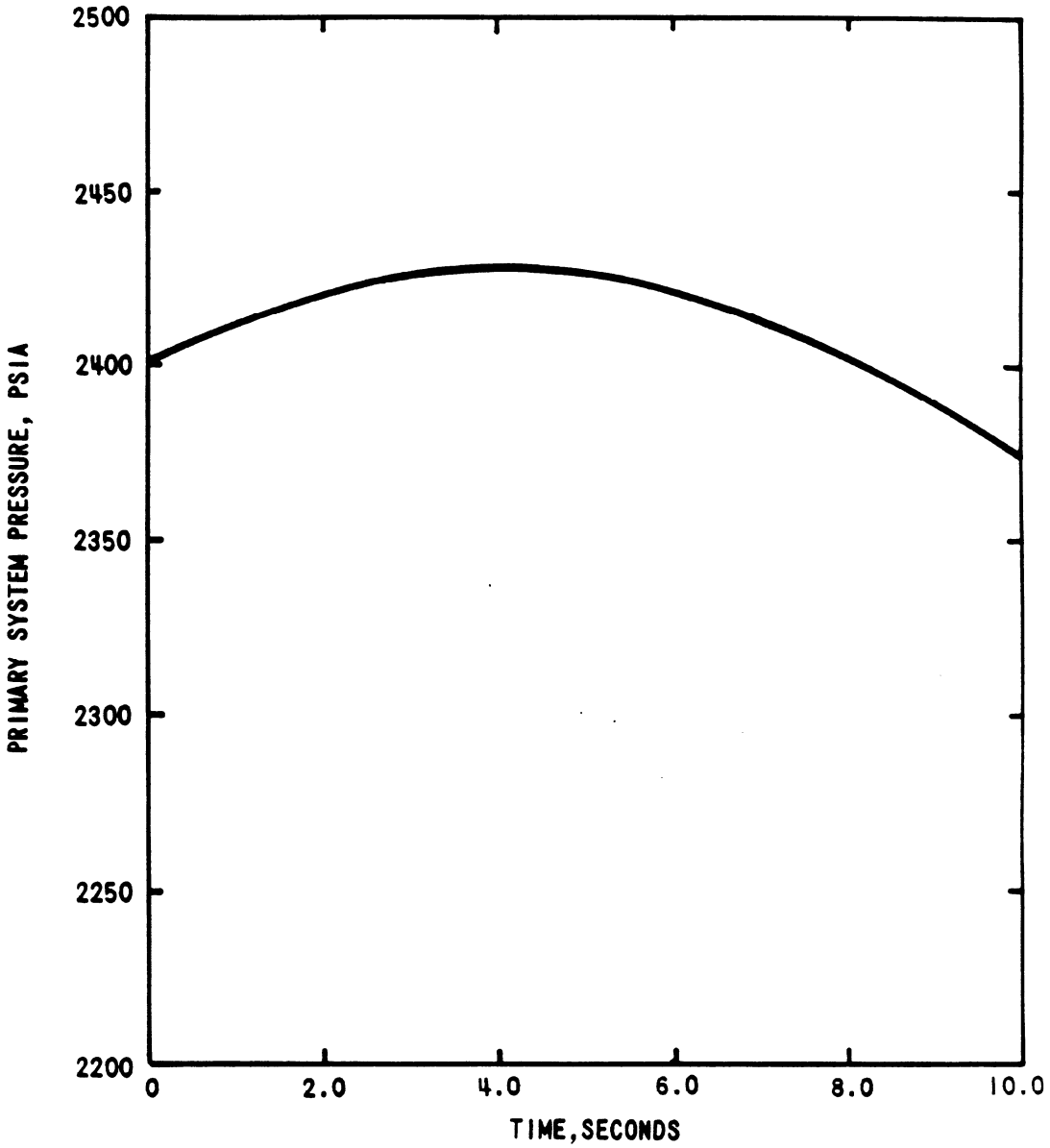
Pressurizer Normal Pressure Control	
Controller Output	Action
100%	Both Spray Valves Open
67%	Both Spray Valves Closed
33%	Proportional Heater "OFF"
0%	Proportional Heater "ON"

* Backup heaters normally operated in manual.

BLOCK DIAGRAM
STEAM DUMP AND BYPASS SYSTEM



PRESSURIZER LEVEL CONTROL SYSTEM FAILURES STUDY
MODE "A" FAILURE



(REF P-ICE-900, 10/9/69)

PIPING DRAWING
NUCLEAR DETECTOR WELLS

Portions of this page have been
redacted per 10 CFR 2.390(d)(1).

BLOCK DIAGRAM
CRITICAL FUNCTIONS MONITOR SYSTEM