

LIMITORQUE SWITCH CONTACT DEVELOPMENT

CONTACT NUMBER	VALVE POSITION	FUNCTION
	FULL OPEN	FULL CLOSED
LS1		BY-PASS CKT
LS2		SPARE
LS3		IND LIGHT
LS4		SPARE
LS5		BY-PASS CKT
LS6		SPARE
LS7		IND LIGHT
LS8		SPARE
LS9		SPARE
LS10		SPARE
LS11		SPARE
LS12		SPARE
LS13		SPARE
LS14		SPARE
LS15		SPARE
LS16		SPARE

LIMITORQUE SWITCH NOTES

ROTORS 3 & 4 (CONTACTS LSS THRU LS12 & LS13 THRU LS16) CAN BE SET AT VALVE POSITION FULL OPEN, FULL CLOSED OR ANY POSITION IN BETWEEN AS INDICATED BY POINTS A & B.

TS17 - CLOSING TORQUE SWITCH INTERRUPTS CONTROL CIRCUIT IF MECHANICAL OVERLOAD OCCURS DURING CLOSING CYCLE OR FLAT CLOSED VALVES.

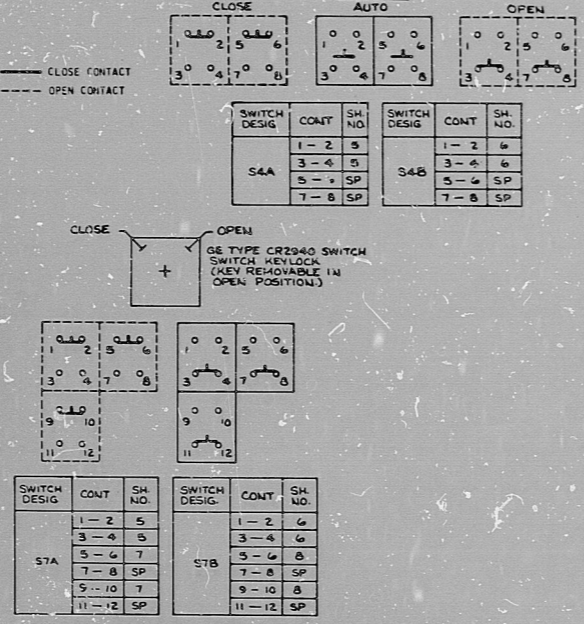
TS18 - OPENING TORQUE SWITCH INTERRUPTS CONTROL CIRCUIT IF MECHANICAL OVERLOAD OCCURS DURING OPENING CYCLE.

COLLAR POSITION

CONTACTS	DISARMED	ARMED
	N	D
1A-1N0	0	X
1B-8N0	0	X
28-2N0	0	X

SWITCH DESIG.

SWITCH DESIG.	CONT.	SH NO.
S16A	1B-1N0	3
LS16	22-2N0	7
S16B	1A-1N0	4
	28-2N0	8



STOP AUTO START

GE TYPE CR240 SWITCH SPRING RETURN TO AUTO.

SWITCH DESIG.	CONT.	SH NO.	SWITCH DESIG.	CONT.	SH NO.
S7A	1-2	5	S7B	1-2	6
	3-4	5		3-4	6
	5-6	7		5-6	8
	7-8	SP		7-8	SP
	9-10	7		9-10	8
	11-12	SP		11-12	SP

PUMP, VALVE AND CONTROL TABULATION

REF DESIG	DEVICE	FUNCTION	SWITCH	INDICATOR LAMPS	LOCATION
				RED AMBER OTHER	MTG LOC SH
E21-F005A	CORE SPRAY INBOARD VALVE		S1A	X	H12-P601HC 5
E21-F005B	CORE SPRAY INBOARD VALVE		S1B	X	H12-P602HC 6,6
E21-F031A	PUMP MIN. FLOW BYPASS VALVE		S3A	X	H12-P601HC 5
E21-F031B	PUMP MIN. FLOW BYPASS VALVE		S3B	X	H12-P601HC 6
E21-F015A	TEST BYPASS VALVE		S4A	X	H12-P601HC 5
E21-F015B	TEST BYPASS VALVE		S4B	X	H12-P601HC 6
E21-C001A	PUMP		S5A	X	H12-P601HC 5
E21-C001B	PUMP		S5B	X	H12-P601HC 6,6
E21-C001C	PUMP		S5C	X	H12-P601HC 5
E21-C001D	PUMP		S5D	X	H12-P601HC 6,6
E21-F006A	TESTABLE CHECK VALVE		S6A	X	H12-P601HC 5
E21-F006B	TESTABLE CHECK VALVE		S6B	X	H12-P601HC 6
E21-F001A	PUMP SUCTION VALVE		S7A	X	H12-P601HC 5
E21-F001B	PUMP SUCTION VALVE		S7B	X	H12-P601HC 6
E21-F007A	MANUAL INJECTION VALVE			X	H12-P601HC 5
E21-F007B	MANUAL INJECTION VALVE			X	H12-P601HC 6
E21-F008A	CORE SPRAY OUT OF SERVICE		S11A	X	H12-P601HB 7
E21-F008B	CORE SPRAY OUT OF SERVICE		S11B	X	H12-P601HB 8
E21-F008C	INITIATION RESET (SYS A)		S17A	X	H12-P601HC 3
E21-F008D	INITIATION RESET (SYS B)		S17B	X	H12-P601HC 4
E21-F004A	CORE SPRAY OUTBOARD VALVE		S2A	X	H12-P601HC 5
E21-F004B	CORE SPRAY OUTBOARD VALVE		S2B	X	H12-P601HC 6
E21-F007C	EMERG POWER TEST		S14A	X	H12-P626 3,7
E21-F007D	EMERG POWER TEST		S14B	X	H12-P627 4,8
E21-C001A	STOP SIG SEALED IN		S5A	X	H12-P601HC 3
E21-C001B	STOP SIG SEALED IN		S5B	X	H12-P601HC 4
E21-C001C	STOP SIG SEALED IN		S5C	X	H12-P601HC 3
E21-C001D	STOP SIG SEALED IN		S5D	X	H12-P601HC 4
E21-F005A	CLOSE SIG SEALED IN		S1A	X	H12-P601HC 3
E21-F005B	CLOSE SIG SEALED IN		S1B	X	H12-P601HC 4
E21-F037A	TESTABLE CHECK VLV BYPASS		S6A	X	H12-P601HC 5
E21-F037B	TESTABLE CHECK VLV BYPASS		S6B	X	H12-P601HC 6
E21-F007A	MANUAL INITIATION		S16A	X	H12-P601HC 3,7
E21-F007B	MANUAL INITIATION		S16B	X	H12-P601HC 4,8
E21-F007C	CORE SPRAY A NOV TEST PREP		S12A	X	H12-P601HC 1
E21-F007D	CORE SPRAY B NOV TEST PREP		S12B	X	H12-P601HC 1
E21-F007E	TEST		S21A	X	H12-P626 3
E21-F007F	TEST		S21B	X	H12-P627 4
E21-F007G	TEST		S22A	X	H12-P626 3
E21-F007H	TEST		S22B	X	H12-P627 4
E21-F007I	REACTOR LOW LEVEL & HIGH DRYWELL PRESS		XXXX	X	H12-P626 3
E21-F007J	REACTOR LOW LEVEL & HIGH DRYWELL PRESS		XXXX	X	H12-P627 4

REFERENCE DOCUMENTS:

- E21-1010 CORE SPRAY SYSTEM - P610.
- E21-1030 CORE SPRAY SYSTEM - FCD.
- A61-0050 SAFEGUARD SYSTEMS, ELECTRICAL EQUIPMENT.
- E21-1010 NUCLEAR BOILER SYSTEM - P610.
- E11-1040 RESIDUAL HEAT REMOVAL - ELEM DIAG (E11A).
- E41-1040 HIGH PRESSURE COOLANT INJECTION SYSTEM - ELEM DIAG (E41A).
- E21-1040 AUTOMATIC DEPRESSURIZATION SYSTEM ELEM DIAG (E21C).
- 13682528 TEST SWITCH ASSEMBLY.
- A61-0010 SPECIAL WIRE CABLE SPECIFICATION.
- M&C STANDARDS.
- E21-1040 LOW INITIATION SIGNALS COMMON BY (AS).
- E21-040 CORE SPRAY SYSTEM - ELEM DIAG UNIT 1.

LEGEND:

- XXXX - LOCATION USED ONLY WHEN NECESSARY.
- XXXX - PART NUMBER OR TERMINAL NUMBER.
- XXXX - SYSTEM NUMBER.
- XXXX - MATCH NUMBER.
- XXXX - ZONE.
- XXXX - SHEET NUMBER.
- XXXX - INDICATES P&CC LINE CODE.
- XXXX - INDICATES P&CC SEPARATION CATEGORY.
- XXXX - TERMINATION CABINET NO.
- XXXX - TERMINATION MODULE NO.

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SH. NO.	CONTENT
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8	ANNUNCIATOR, ALARM LIGHTS & GE/MAC EQUIPMENT

NOTES:

- THE OPERATING SEQUENCE AFTER LOW WATER LEVEL OR HIGH DRYWELL PRESSURE SIGNAL IS AS FOLLOWS:
 CONDITION A WITH PLANT ON NORMAL AUXILIARY POWER.
 ACTIVE PUMPS SYSTEM 1 STARTS -15 SEC. DELAY.
 COOLIA/C SYSTEM 2 STARTS -15 SEC. DELAY.
 COOIB/D
- VALVES (AFTER POWER AVAILABLE)
 F004A SYSTEM 1 - OPENS AFTER REACTOR LOW PRESSURE PERMISSIVE.
 F004B SYSTEM 2 - OPENS AFTER REACTOR LOW PRESSURE PERMISSIVE.
 F005A SYSTEM 1 - OPENS AFTER REACTOR LOW PRESSURE PERMISSIVE.
 F005B SYSTEM 2 - OPENS AFTER REACTOR LOW PRESSURE PERMISSIVE.
 F015A SYSTEM 1 - CLOSING IF OPEN - NO DELAY.
 F015B SYSTEM 2 - CLOSING IF OPEN - NO DELAY.
 F031A SYSTEM 1 - CLOSING AFTER FLOW ESTABLISHED.
 F031B SYSTEM 2 - CLOSING AFTER FLOW ESTABLISHED.
- CONDITION B WITH PLANT ON STANDBY DIESEL POWER.
 ACTIVE PUMPS TIME DELAY 10.5 SEC. AFTER POWER AVAILABLE.
 COOLIA/C TIME DELAY 10.5 SEC. AFTER POWER AVAILABLE.
 COOIB/D

2. VALVES

A) VALVE MOTORS SHALL BE PROTECTED BY OVERLOAD TRIPS.

B) ALL MOTOR OPERATED VALVES SHALL HAVE STATUS LIGHTS ON THE CONTROL ROOM PANEL. STATUS LIGHTS SHALL BE AS FOLLOWS:
 RED ON FOR OPEN POSITION.
 RED & AMBER ON FOR INTERMEDIATE POSITION.
 AMBER ON FOR CLOSED POSITION.

C) MOTIVE POWER FOR VALVES IN EACH SYSTEM SHALL ORIGINATE FROM THE SAME BUS SUPPLYING PUMP POWER.

3. PUMPS

A) STATUS LIGHTS SHALL BE LOCATED IN THE CONTROL ROOM AND SHALL BE AS FOLLOWS:
 RED ON FOR PUMP RUNNING.
 AMBER ON FOR PUMP STOPPED.

B) PUMP MOTORS SHALL BE PROTECTED WITH OVERLOAD AND UNDERVOLTAGE PROTECTION. OVERLOAD RELAYS TO BE APPLIED SO AS TO MAINTAIN POWER ON MOTOR AS LONG AS POSSIBLE WITHOUT CAUSING DAMAGE TO MOTOR OR HARM TO EMERGENCY POWER SYSTEM.

C) MOTIVE POWER FOR SYSTEM 1 PUMPS SHALL ORIGINATE FROM A DIFFERENT EMERGENCY AC BUS THAN THE PUMPS OF SYSTEM 2. SEE REFERENCE 3 FOR DEVICE AND WIRING SEPARATION REQUIREMENTS.

4. SEE REFERENCE 3 FOR DEVICE AND WIRING SEPARATION REQUIREMENTS.

5. PINS "1" & "11" ARE JUMPERED AT TEST PLUG (REF 8).

6. INTRA-PANEL PROCESS INSTRUMENTATION (4-20 MA) SIGNAL LEADS SHALL BE BUNDLED AND ROUTED SEPARATELY FROM AC AND DC POWER WIRING.

7. UNLESS OTHERWISE INDICATED, THE FOLLOWING REFERENCE DESIGNATIONS SHOWN ON THIS DIAGRAM ARE PREFIXED WITH E21A:

REFERENCE DESIGNATION NAME
 S5A IND LAMP
 F2X FUSE
 R2X RELAY
 S2X SWITCH
 J2X TEST JACK
 L2X LINE CODES (SEE LEGEND)

8. INDIVIDUAL 2 CONDUCTOR CABLE TO BE RUN FOR EACH INSTRUMENT OR RELAY CONTACT.

9. FOR POWER DISTRIBUTION, SEE FIG. 6, SH. 2.

10. FOR POWER DISTRIBUTION, SEE FIG. 7, SH. 2.

11. INDICATING LIGHTS ARE 19509454, EXCEPT THOSE LOCATED IN PANELS H12-P626 AND H12-P627 WHICH ARE GE TYPE ET-10.

12. SEE INDIVIDUAL VALVE CIRCUITS (BACK SHEETS) FOR APPLICATION TO REF ID 10 MCC CONNECTIONS. THESE MUST COMPLY FUNCTIONALLY WITH REQUIREMENTS OF REF ID 10.

13. USE SEPARATE AUXILIARY RELAY ENCLOSED IN A METAL CONTAINER WITH INTRUDING DIVISION WIRING ROUTED A MINIMUM OF 6 INCHES FROM ALL OTHER WIRING IN THE SWITCHGEAR OR ENCLOSED IN A FLEX CONDUIT.

14. ALL P&CC SUPPLIED CABLES ARE E21-1 UNLESS OTHERWISE SPECIFIED.

15. THE STATUS LAMPS ARE JAY-EL MARK II WITH TWO POLE DOUBLE THROW SWITCH CONTACTS.

16. CABLING BETWEEN TERMINATION CABINETS (UNIT 1 TO 2) BY A.E.

17. THESE DEVICES MUST BE WIRED AT THE END OF THE CIRCUIT.

NOTES CONTINUED ON SHEET 2.

RECORD MYLARS UNIT 2
 UNCONTROLLED DOCUMENT FOR REFERENCE ONLY

REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		

APPROVED: [Signature] DATE: [Date]

RIDS

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