TRAIN A REACTOR SHUNT TRIP SIGNALS

MANUAL REACTOR TRIP SIGNAL (SHEET 3)
MANUAL SAFETY INJECTION SIGNAL (SHEET 8)

LOGIC TRAIN A REACTOR TRIP SIGNALS

SEISMIC TRIP SIGNAL (SHEET 18)
MANUAL TRIP SIGNAL (SHEET 3)

NEUTRON FLUX TRIP SIGNALS (SHEET 3)
- SOURCE RANGE, HIGH FLUX (INTERLOCKED BY P-6 & P-10)
- INTERMEDIATE RANGE, HIGH FLUX (INTERLOCKED BY P-10)
- POWER RANGE
  - HIGH FLUX, LOW SETPOINT (INTERLOCKED BY P-10)
  - HIGH FLUX, HIGH SETPOINT
  - HIGH FLUX RATE

PRIMARY COOLANT SYSTEM TRIP SIGNALS (SHEET 5)
- OVERTEMPERATURE ΔT
- OVERPOWER ΔT
- LOW PRIMARY COOLANT FLOW
  - LOW FLOW IN ANY 1 OF 4 LOOPS (INTERLOCKED BY P-8)
  - LOW FLOW OR REACTOR COOLANT PUMP BREAKERS OPEN IN ANY 2 OF 4 LOOPS (INTERLOCKED BY P-7)
- UNDERVOLTAGE (INTERLOCKED BY P-7)
- UNDERFREQUENCY (INTERLOCKED BY P-7)

PRESSURIZER TRIP SIGNALS (SHEET 6)
- HIGH PRESSURE
- LOW PRESSURE (INTERLOCKED BY P-7)
- HIGH LEVEL (INTERLOCKED BY P-7)

STEAM GENERATOR TRIP SIGNAL (SHEET 7) — LOW-LOW STEAM GENERATOR WATER LEVEL
SAFETY INJECTION SIGNAL (SHEET 8) — AUTOMATIC SIGNAL
TURBINE TRIP SIGNAL (SHEET 16) — LOW AUTO STOP OIL PRESSURE OR ALL STOP VALVES CLOSED (INTERLOCKED BY P-9)

LOGIC TRAIN A

LOGIC TRAIN B REACTOR TRIP SIGNALS

MANUAL TRIP SIGNAL (SHEET 3)

NEUTRON FLUX TRIP SIGNALS (SHEET 3)
- SOURCE RANGE, HIGH FLUX (INTERLOCKED BY P-6 & P-10)
- INTERMEDIATE RANGE, HIGH FLUX (INTERLOCKED BY P-10)
- POWER RANGE
  - HIGH FLUX, LOW SETPOINT (INTERLOCKED BY P-10)
  - HIGH FLUX, HIGH SETPOINT
  - HIGH FLUX RATE

PRIMARY COOLANT SYSTEM TRIP SIGNALS (SHEET 5)
- OVERTEMPERATURE ΔT
- OVERPOWER ΔT
- LOW PRIMARY COOLANT FLOW
  - LOW FLOW IN ANY 1 OF 4 LOOPS (INTERLOCKED BY P-8)
  - LOW FLOW OR REACTOR COOLANT PUMP BREAKERS OPEN IN ANY 2 OF 4 LOOPS (INTERLOCKED BY P-7)
- UNDERVOLTAGE (INTERLOCKED BY P-7)
- UNDERFREQUENCY (INTERLOCKED BY P-7)

PRESSURIZER TRIP SIGNALS (SHEET 6)
- HIGH PRESSURE
- LOW PRESSURE (INTERLOCKED BY P-7)
- HIGH LEVEL (INTERLOCKED BY P-7)

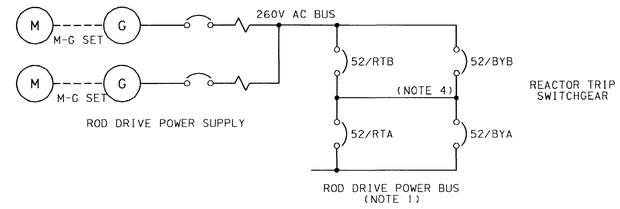
STEAM GENERATOR TRIP SIGNAL (SHEET 7) — LOW-LOW STEAM GENERATOR WATER LEVEL
SAFETY INJECTION SIGNAL (SHEET 8) — AUTOMATIC SIGNAL
TURBINE TRIP SIGNAL (SHEET 16) — LOW AUTO STOP OIL PRESSURE OR ALL STOP VALVES CLOSED (INTERLOCKED BY P-9)
SEISMIC TRIP SIGNAL (SHEET 18)

LOGIC TRAIN B

TRAIN B REACTOR SHUNT TRIP SIGNALS

MANUAL REACTOR TRIP SIGNAL (SHEET 3)
MANUAL SAFETY INJECTION SIGNAL (SHEET 8)

ROD DRIVE SUPPLY ONE LINE DIAGRAM



NOTES

1. TRIPPING EITHER REACTOR TRIP BREAKER 52/RTA OR 52/RTB REDUNDANTLY DE-ENERGIZES THE ROD DRIVES. ALL FULL LENGTH CONTROL RODS AND SHUTDOWN RODS ARE THEREBY RELEASED FOR GRAVITY INSERTION INTO THE REACTOR CORE.
2. NORMAL REACTOR OPERATION IS TO BE WITH REACTOR TRIP BREAKERS 52/RTA AND 52/RTB IN SERVICE AND BYPASS BREAKERS 52/BYA AND 52/BYB WITHDRAWN. DURING TEST, ONE BYPASS BREAKER IS TO BE PUT IN SERVICE AND THEN THE RESPECTIVE REACTOR TRIP BREAKER IS OPERATED USING A SIMULATED REACTOR TRIP SIGNAL. IN THE TRAIN UNDER TEST, THE REACTOR WILL NOT BE TRIPPED BY THE SIMULATED SIGNAL SINCE THE BYPASS BREAKER IS CONTROLLED FROM THE OTHER TRAIN. ONLY ONE REACTOR TRIP BREAKER IS TO BE TESTED AT A TIME.
3. ALL CIRCUITS ON THIS SHEET ARE NOT REDUNDANT BECAUSE BOTH TRAINS ARE SHOWN.
4. OPEN/CLOSED INDICATION FOR EACH TRIP BREAKER AND EACH BYPASS BREAKER IN CONTROL ROOM.
5. SHEET NUMBERS REFER TO THE REFERENCE NUMBERS BELOW.
6. WHENEVER A PROCESS SIGNAL IS USED FOR CONTROL AND IS DERIVED FROM A PROTECTION CHANNEL, ISOLATION MUST BE PROVIDED.
7. THIS DRAWING ILLUSTRATES THE FUNCTIONAL REQUIREMENTS OF THE REACTOR CONTROL AND PROTECTION SYSTEM. THIS DRAWING DOES NOT REPRESENT ACTUAL HARDWARE IMPLEMENTATION. FOR HARDWARE IMPLEMENTATION, REFER TO THE APPLICABLE SCHEMATIC DIAGRAM(S).

REFERENCES

	WE DWG	PG&E DWG
1. FUNCTIONAL LOGIC DIAGRAM INDEX AND SYMBOLS	5653D74-1	495841
2. FUNCTIONAL LOGIC DIAGRAM REACTOR TRIP SIGNALS	5653D74-2	495842
3. FUNCTIONAL LOGIC DIAGRAM NUCLEAR INSTR AND MANUAL TRIP SIGNALS	5653D74-3	495843
4. FUNCTIONAL LOGIC DIAGRAM NUCLEAR INSTR PERMISSIVES AND BLOCKS	5653D74-4	495844
5. FUNCTIONAL LOGIC DIAGRAM PRIMARY COOLANT SYSTEM TRIP SIGNALS	5653D74-5	495845
6. FUNCTIONAL LOGIC DIAGRAM PRESSURIZER TRIP SIGNALS	5653D74-6	495846
7. FUNCTIONAL LOGIC DIAGRAM STEAM GENERATOR TRIP SIGNALS	5653D74-7	495847
8. FUNCTIONAL LOGIC DIAGRAM SAFEGUARDS ACTUATION SIGNALS	5653D74-8	495848
9. FUNCTIONAL LOGIC DIAGRAM ROD CONTROLS AND ROD BLOCKS	5653D74-9	495849
10. FUNCTIONAL LOGIC DIAGRAM STEAM DUMP CONTROL	5653D74-10	495850
11. FUNCTIONAL LOGIC DIAGRAM PRESSURIZER PRESSURE AND LEVEL CONTROL	5653D74-11	495851
12. FUNCTIONAL LOGIC DIAGRAM PRESSURIZER HEATER CONTROL	5653D74-12	495852
13. FUNCTIONAL LOGIC DIAGRAM FEEDWATER CONTROL AND ISOLATION	5653D74-13	495853
14. FUNCTIONAL LOGIC DIAGRAM FEEDWATER CONTROL AND ISOLATION	5653D74-14	495854
15. FUNCTIONAL LOGIC DIAGRAM AUXILIARY FEEDWATER PUMPS STARTUP	5653D74-15	495855
16. FUNCTIONAL LOGIC DIAGRAM TURBINE TRIPS, RUNBACKS & SIGNALS	5653D74-16	495856
17. FUNCTIONAL LOGIC DIAGRAM AMSAC SIGNALS	5653D74-17	495857
18. FUNCTIONAL LOGIC DIAGRAM SEISMIC TRIP	8759D77	495858
19. FUNCTIONAL LOGIC DIAGRAM DIGITAL FW CONT SYS INPUT SIGNAL VALIDATION	5653D74-18	495859
20. FUNCTIONAL LOGIC DIAGRAM DIGITAL FW CONT SYS FW FLOW CONTROLLER & C_v DEMAND	5653D74-19	495860
21. FUNCTIONAL LOGIC DIAGRAM DIGITAL FW CONT SYS CONT VCV SEQ & TRACKING LOGIC	5653D74-20	495861
22. FUNCTIONAL LOGIC DIAGRAM DIGITAL FW CONT SYS SIGNAL SELECTOR LOGIC	5653D74-21	495862
23. FUNCTION DIAGRAM REACTOR-TURBINE-GENERATOR PROTECTION		500825
24. SCHEMATIC DIAGRAM REACTOR TRIP BREAKERS		437610

NUCLEAR SAFETY RELATED

RM INDEXED REV 3

DWG TYPE 5 | DWG SUBJECT | DRAWING TITLE: REACTOR TRIP SIGNALS | UNIT NO.
PROJECT LOCATION: DIABLO | INSTALLATION TYPE: L | DIVISION NAME: B | MISC | DD CODE: GD | MAN HOURS | CADD: C | DRAWING SOURCE: A

KEY DWG--SECTION 3 UNIT 1

3 | SIMON L. WONG | SIGNATURE | E/3/80 | CA REG NO. | 5/20/93 | EXP DATE | REGISTERED ENGINEER

REVISIONS

NO.	DATE	DESCRIPTION	GM/SPEC	DWN	CHKD	SUPV	APVD BY
3	4-17-91	DEL LOW FEEDWATER FLOW (DCI-EE-41287)	—	WWL	VAR	DJ	
2	7-5-90	ADD STEAM PUMP LOGIC, REV SHUNT TRIP SIGNALS, REV REF 19,20, ADD REF 21-24 (DCI-EE-43064,R3))	169972	WAA	VAL	LCV	SLW
1		SUPERSEDES DWG 663195-2 (UNITS 1&2) FOR UNIT 1; REV P-7 TO P-9 (DCI-EE-37862)	169972	WAA	VAL	JC	SLW
						LCV	KAW

APPROVED BY		
	GM	169972
	SUPV	J.CUENCO
S.L.WONG	DSGN	V.A.LIM
	DWN	W.ALBOVIAS
	CHKD	L.C.VEGA
	OK	LCV
K.A.WITZ	DATE	3-13-90
	SCALES	NONE

FUNCTIONAL LOGIC DIAGRAM
REACTOR TRIP SIGNALS

DIABLO CANYON

DEPARTMENT OF ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

COAST VALLEYS DIVISION

MICROFILM	
BILL OF MATL	
DWG LIST	
SUPSDS	663195-2
SUPSD BY	
SHEET NO.	SHEETS
495842	REV 3

SCALE 3 IC 3

U2-495872

[160,1301495842D.E62 07-15-91 VAL