

BASTER-495850.DGN  
DGN-495850.DGN  
06-20-2013  
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### NOTES

- STEAM DUMP IS BLOCKED BY BLOCKING AIR TO THE DUMP VALVES AND VENTING THE DIAPHRAGMS. THE REDUNDANT LOGIC OUTPUT OPERATES 2 SOLENOID VENT VALVES IN SERIES TO REDUNDANTLY INTERLOCK THE AIR LINE BETWEEN EACH VALVE DIAPHRAGM AND ITS ASSOCIATED POSITIONER. THE SOLENOID VALVES ARE DE-ENERGIZED TO VENT, CAUSING THE MAIN DUMP VALVE TO CLOSE IN FIVE SECONDS.
- CIRCUITRY ON THIS SHEET IS NOT REDUNDANT EXCEPT WHERE INDICATED REDUNDANT.
- SELECTOR SWITCH WITH THE FOLLOWING 3 POSITIONS:  
ON - STEAM DUMP IS PERMITTED  
BYPASS - T AVG INTERLOCK IS BYPASSED FOR LO-LO T AVG. SPRING RETURN TO "ON" POSITION.  
OFF - STEAM DUMP IS NOT PERMITTED AND RESET T AVG BYPASS.
- THE REDUNDANT INTERLOCK SELECTOR SWITCH CONSISTS OF TWO CONTROLS ON THE CONTROL BOARD, ONE FOR EACH TRAIN.
- THIS MEDIAN SIGNAL SELECT AND T-REFERENCE IS DERIVED FROM SOFTWARE FUNCTION BLOCKS IN PCS SET 1. MEDIAN SIGNAL SELECT AND T-REFERENCE FOR ROD CONTROL (REF. 9) IS DERIVED FROM SOFTWARE FUNCTION BLOCKS IN PCS SET 1V. THIS PROVIDES A FAULT TOLERANT SYSTEM FOR SINGLE INPUT FAILURES.
- THE RELIEF VALVES START MODULATING OPEN AT POINT WHERE ALL DUMP VALVES SHOULD BE FULLY OPEN.
- THE REDUNDANT LOGIC OUTPUT OPERATES 2 SOLENOID VALVES IN SERIES IN THE AIR LINE BETWEEN MAIN AIR SUPPLY AND EACH RELIEF VALVE DIAPHRAGM. THE SOLENOID VALVES ARE DE-ENERGIZED TO CLOSE, WHICH REDUNDANTLY STOPS THE TRIP OPEN FUNCTION.
- THE CONDENSER AVAILABLE SIGNAL LOGIC IS TYPICAL. ACTUAL IMPLEMENTATION MAY BE DIFFERENT.
- THE REDUNDANT T AVG INTERLOCK CONSIST OF 2 CONTACTS IN SERIES TO REDUNDANTLY STOP THIS TRANSFER SIGNAL.
- LIGHTS SHOULD BE PROVIDED IN THE CONTROL ROOM FOR EACH DUMP VALVE TO INDICATE WHEN THE VALVE IS FULLY CLOSED OR FULLY OPEN.
- THE STEAMLINE PRESSURE SIGNAL ORIGIN MUST BE DIFFERENT FROM THAT WHICH IS USED FOR STEAMLINE DIFFERENTIAL PRESSURE SAFETY INJECTION SIGNAL SHOWN ON SHEET 7 TO MEET THE SINGLE FAILURE CRITERION.
- SHEET NUMBERS REFER TO THE REFERENCE NUMBERS BELOW.
- WHenever a PROCESS SIGNAL IS USED FOR CONTROL AND IS DERIVED FROM A PROTECTION CHANNEL, ISOLATION MUST BE PROVIDED.
- 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).
- ONCE BORATED TO COLD SHUTDOWN CONDITIONS AND IN MODE 3, THE P-12 INTERLOCK CAN BE BYPASSED AT EACH PROTECTION SET.

### REFERENCES

	WE DWG	PG&E DWG
1. FUNCTIONAL LOGIC DIAGRAM INDEX AND SYMBOLS	5653074-1	495841
2. FUNCTIONAL LOGIC DIAGRAM REACTOR TRIP SIGNALS	5653074-2	495842
3. FUNCTIONAL LOGIC DIAGRAM NUCLEAR INSTR AND MANUAL TRIP SIGNALS	5653074-3	495843
4. FUNCTIONAL LOGIC DIAGRAM NUCLEAR INSTR PERMISSIVES AND BLOCKS	5653074-4	495844
5. FUNCTIONAL LOGIC DIAGRAM PRIMARY COOLANT SYSTEM TRIP SIGNALS	5653074-5	495845
6. FUNCTIONAL LOGIC DIAGRAM PRESSURIZER TRIP SIGNALS	5653074-6	495846
7. FUNCTIONAL LOGIC DIAGRAM STEAM GENERATOR TRIP SIGNALS	5653074-7	495847
8. FUNCTIONAL LOGIC DIAGRAM SAFEGUARDS ACTUATION SIGNALS	5653074-8	495848
9. FUNCTIONAL LOGIC DIAGRAM ROD CONTROLS AND ROD BLOCKS	5653074-9	495849
10. FUNCTIONAL LOGIC DIAGRAM STEAM DUMP CONTROL	5653074-10	495850
11. FUNCTIONAL LOGIC DIAGRAM PRESSURIZER PRESSURE AND LEVEL CONTROL	5653074-11	495851
12. FUNCTIONAL LOGIC DIAGRAM PRESSURIZER HEATER CONTROL	5653074-12	495852
13. FUNCTIONAL LOGIC DIAGRAM FEEDWATER CONTROL AND ISOLATION	5653074-13	495853
14. FUNCTIONAL LOGIC DIAGRAM FEEDWATER CONTROL AND ISOLATION	5653074-14	495854
15. FUNCTIONAL LOGIC DIAGRAM AUXILIARY FEEDWATER PUMPS STARTUP	5653074-15	495855
16. FUNCTIONAL LOGIC DIAGRAM TURBINE TRIPS, RUNBACKS & SIGNALS	5653074-16	495856
17. FUNCTIONAL LOGIC DIAGRAM AMSAC SIGNALS	5653074-17	495857
18. FUNCTIONAL LOGIC DIAGRAM SEISMIC TRIP	879077	495858
19. FUNCTIONAL LOGIC DIAGRAM DIGITAL FW CONT SYS INPUT SIGNAL VALIDATION	5653074-18	495859
20. FUNCTIONAL LOGIC DIAGRAM DIGITAL FW CONT SYS FW FLOW CONTROLLER & C <sub>0</sub> DEMAND	5653074-19	495860
21. FUNCTIONAL LOGIC DIAGRAM DIGITAL FW CONT SYS CONT VCV SED & TRACKING LOGIC	5653074-20	495861
22. FUNCTIONAL LOGIC DIAGRAM DIGITAL FW CONT SYS SIGNAL SELECTOR LOGIC	5653074-21	495862
23. FUNCTIONAL LOGIC DIAGRAM REACTOR-TURBINE-GENERATOR PROTECTION	500825	495863
24. SCHEMATIC DIAGRAM STEAM DUMP SOLENOID VALVES		437648

### NUCLEAR SAFETY RELATED

KEY DWG. SECTION 3		UNIT 1	
DATE 06-20-2013		REVISION DESCRIPTION REVISED PER DFT-74222	
D.D. ZNS4		ELECTRICAL FUNCTIONAL DIAGRAM STEAM DUMP CONTROL	
R.E. RK02		DWG SCALE BILL OF MATERIALS	
I.V. KJ03		SUPD BY DRAWING	
P.E. N/A		SHEET 1 OF 3	
PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		495850	