



Auxiliary Feedwater System

Section 5.8

Objectives

- State the purposes of the Auxiliary Feedwater System (AFW).
- List all suction sources for the AFW pumps and under what conditions each is used.
- List the five plant conditions that will result in an automatic start of the AFW system.
- Explain how decay heat is removed following a plant trip and loss of offsite power.
- Explain how the availability of other decay heat removal methods limits the AFW system's contribution to core damage frequency.

Purpose OBJ-1

- The purpose of the Auxiliary Feedwater System (AFW) is to automatically supply feedwater to the steam generators when the main feedwater system is unavailable.

Such as the following transients:

- Loss of all main feedwater
- Turbine trip and loss of offsite power
- Small break loss of coolant accident

Figure 5.8-1 Auxiliary Feedwater System

Start-up Feed Pump Flow Path

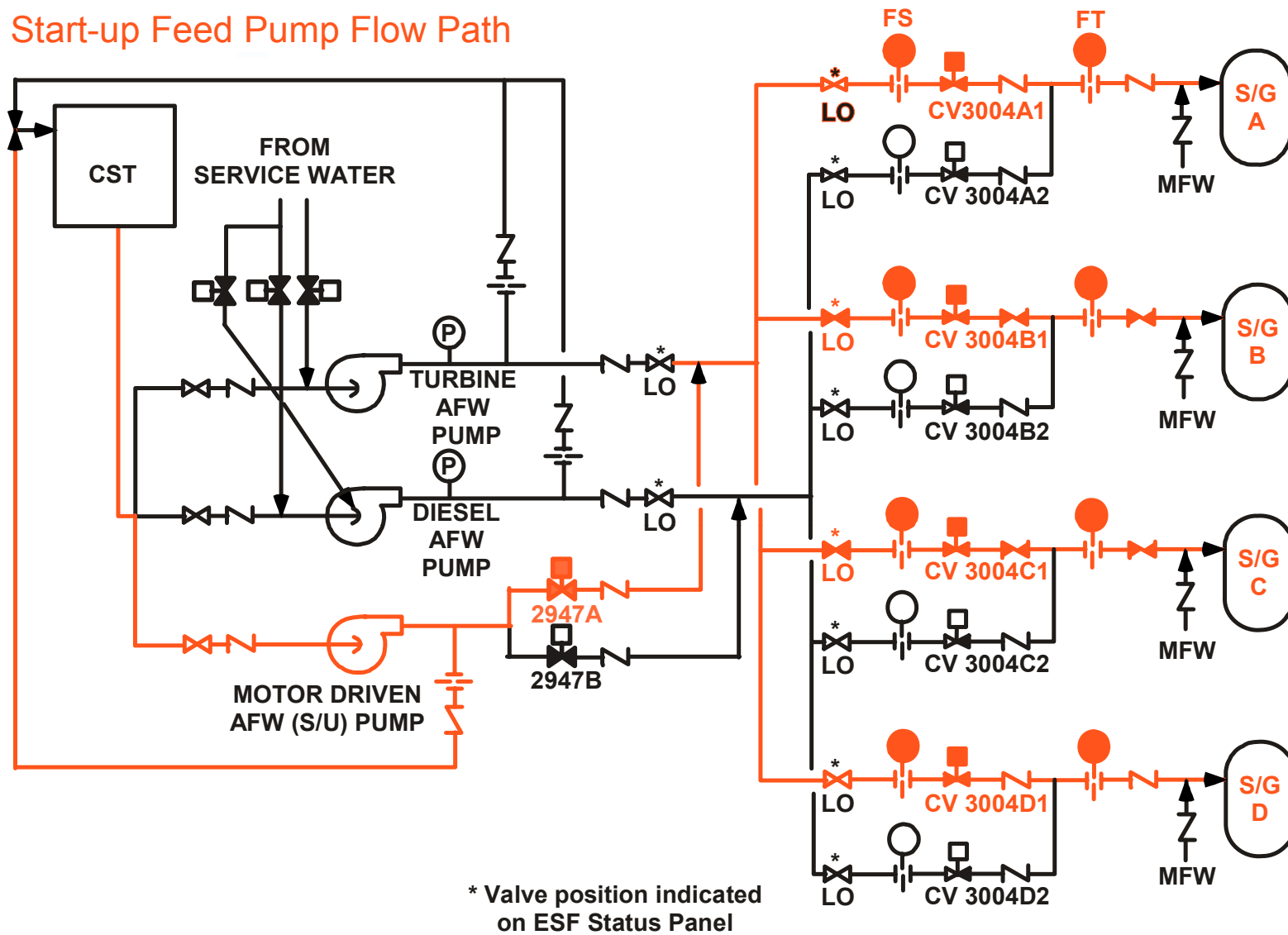


Figure 5.8-2 Electric Auxilliary Feedwater Pump

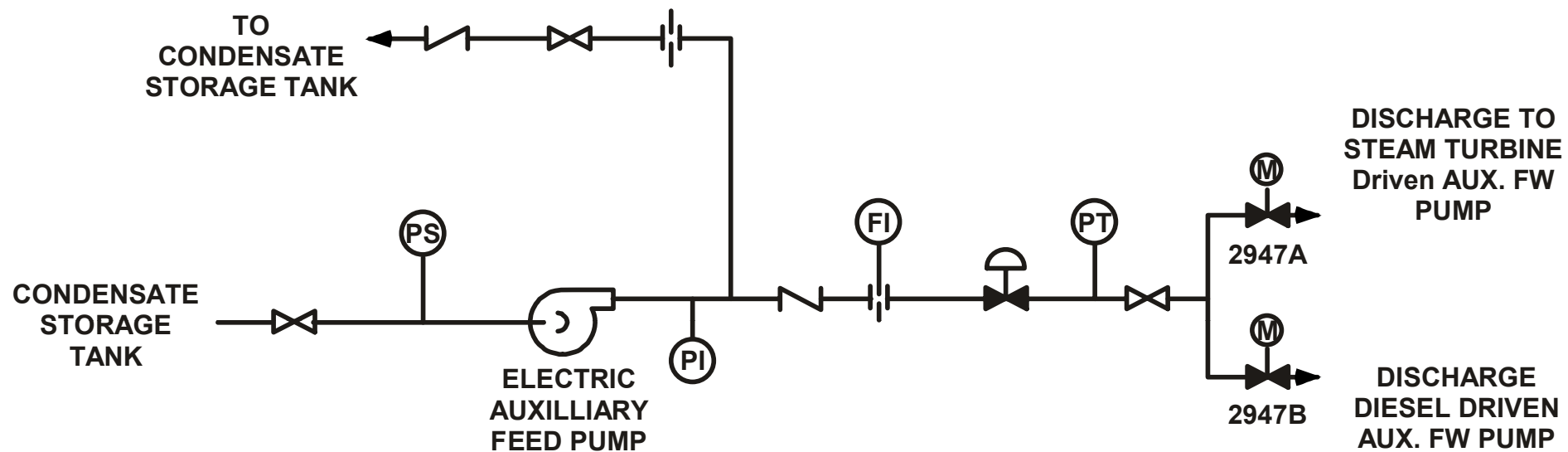


Figure 5.8-6 AFW Pump ΔP Control

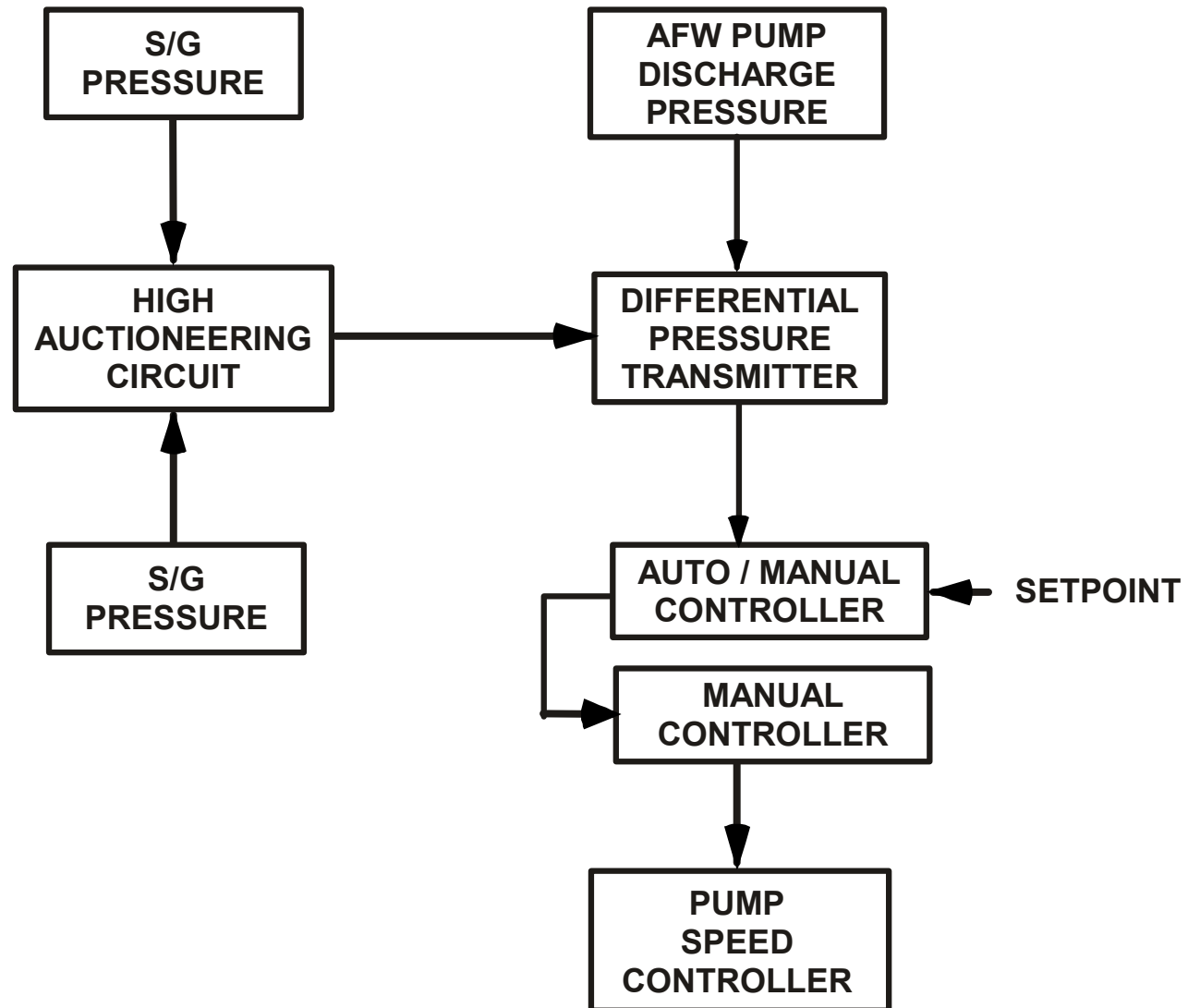
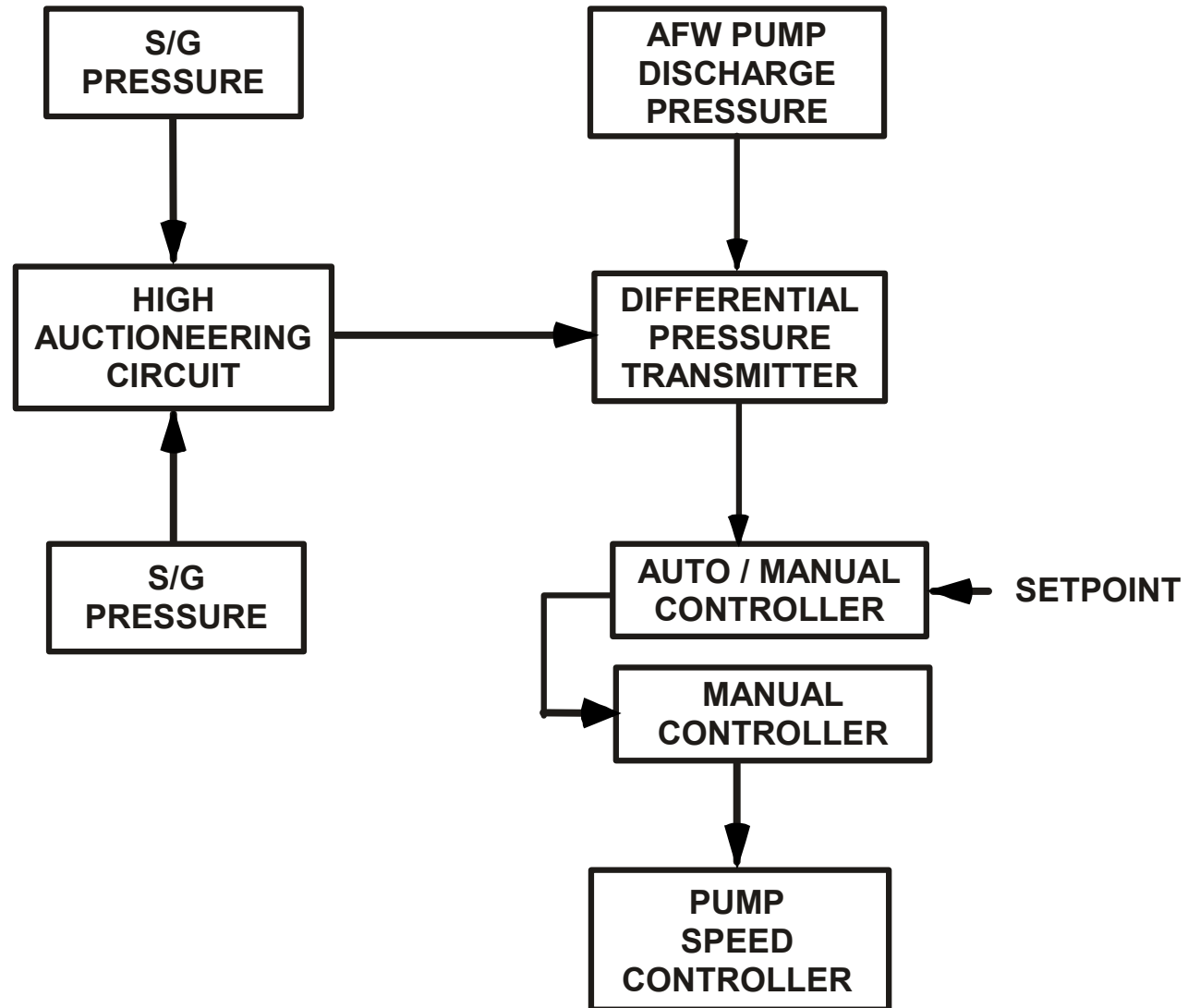


Figure 5.8-6 AFW Pump ΔP Control

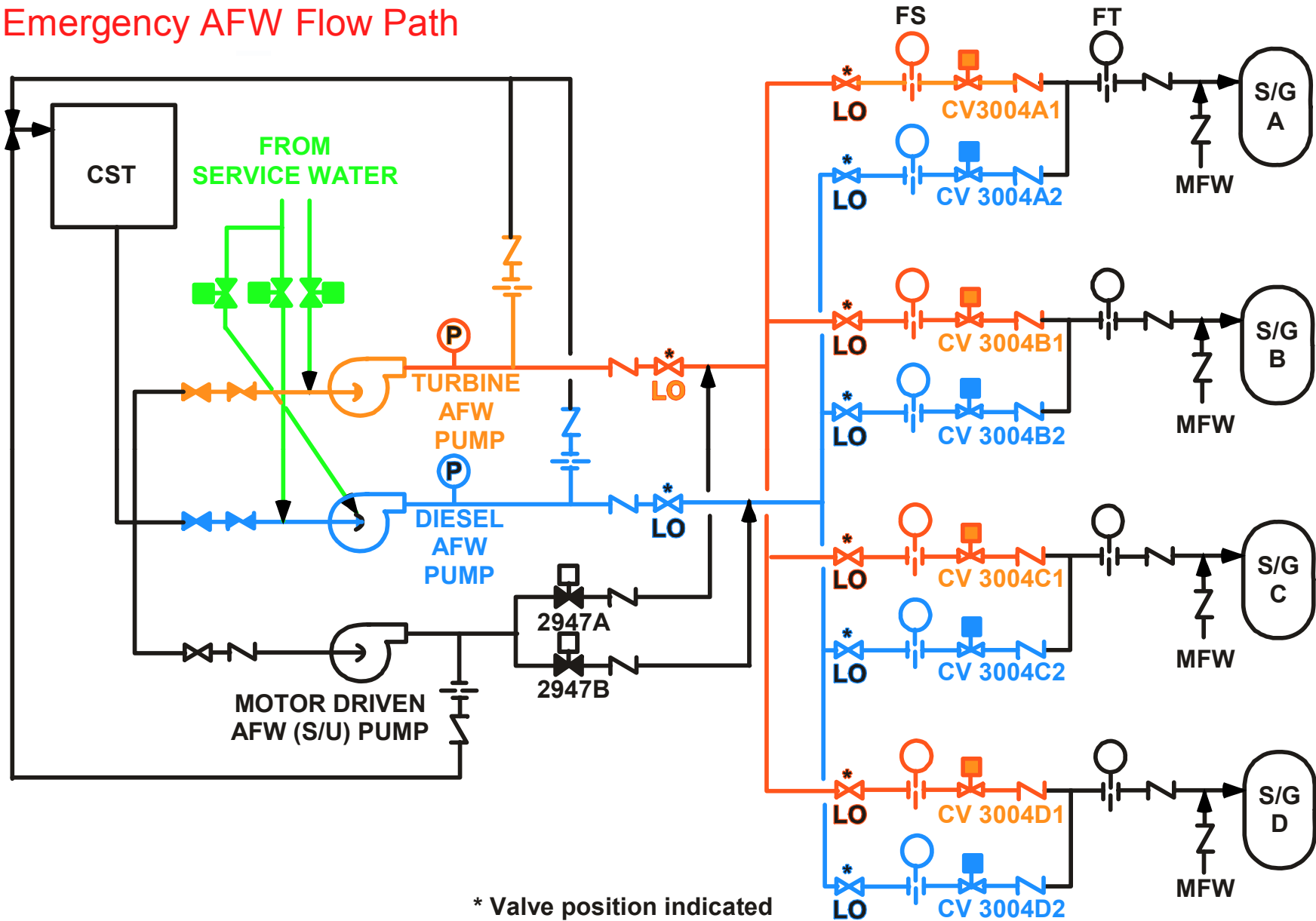


Auto Start

- 1) An under-voltage condition on the ESF 4.16 kV bus A1/A2.
(A1 turbine driven pump, A2 diesel driven pump.)
- 2) Two of three SG level detectors at low-low water level
in any one of the four steam generators ($\leq 11.5\%$)
(can be blocked when SG are drained for maintenance).
- 3) Safety Injection Actuation signal.
- 4) Both main feed pumps tripped. (Can be blocked individually
for either auxiliary feed pump.)
- 5) ATWS Mitigation System Actuation Circuit (AMSAC)

Figure 5.8-1 Auxiliary Feedwater System

Emergency AFW Flow Path



* Valve position indicated on ESF Status Panel

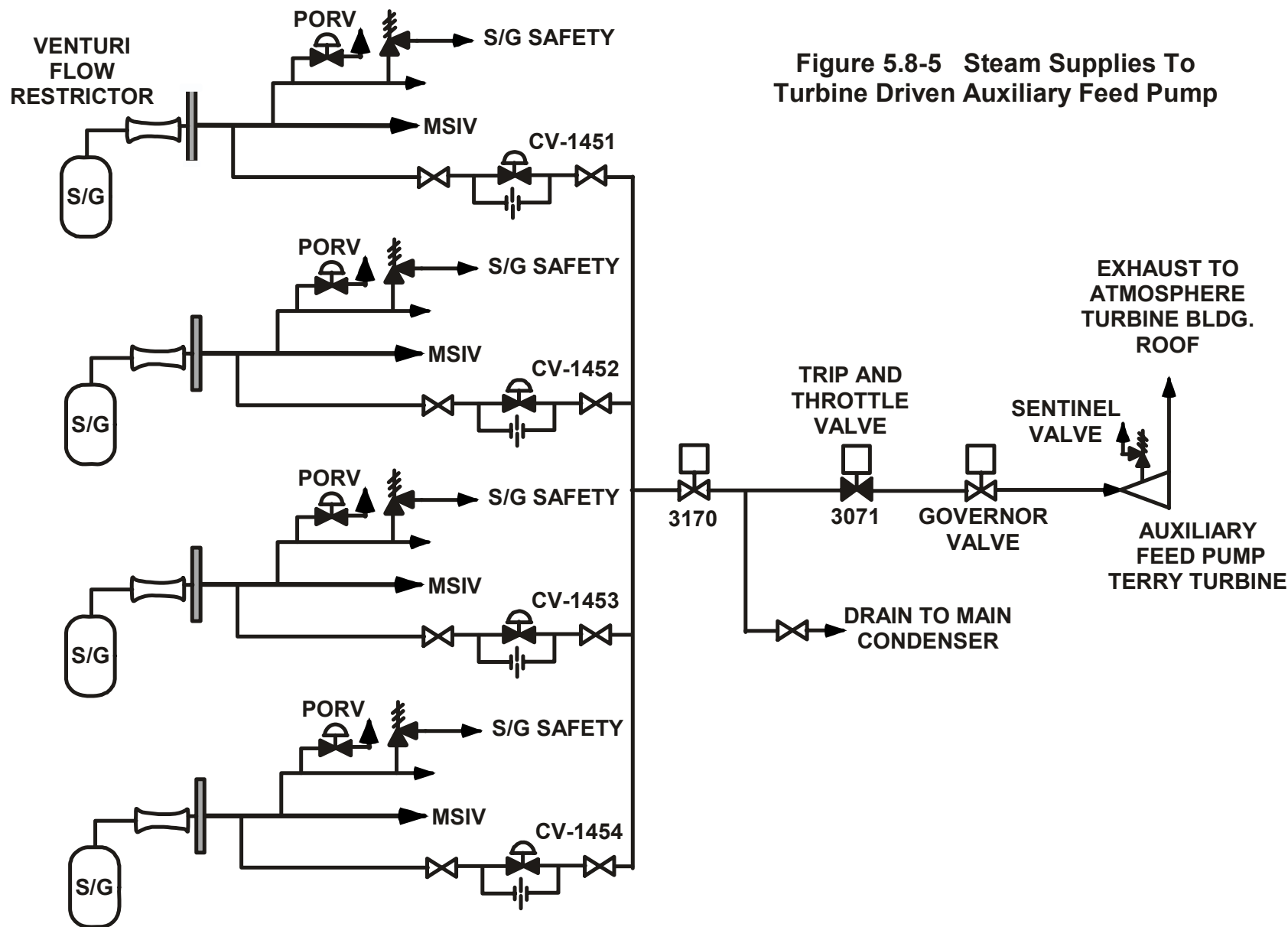


Figure 5.8-4 Condensate Storage Tank

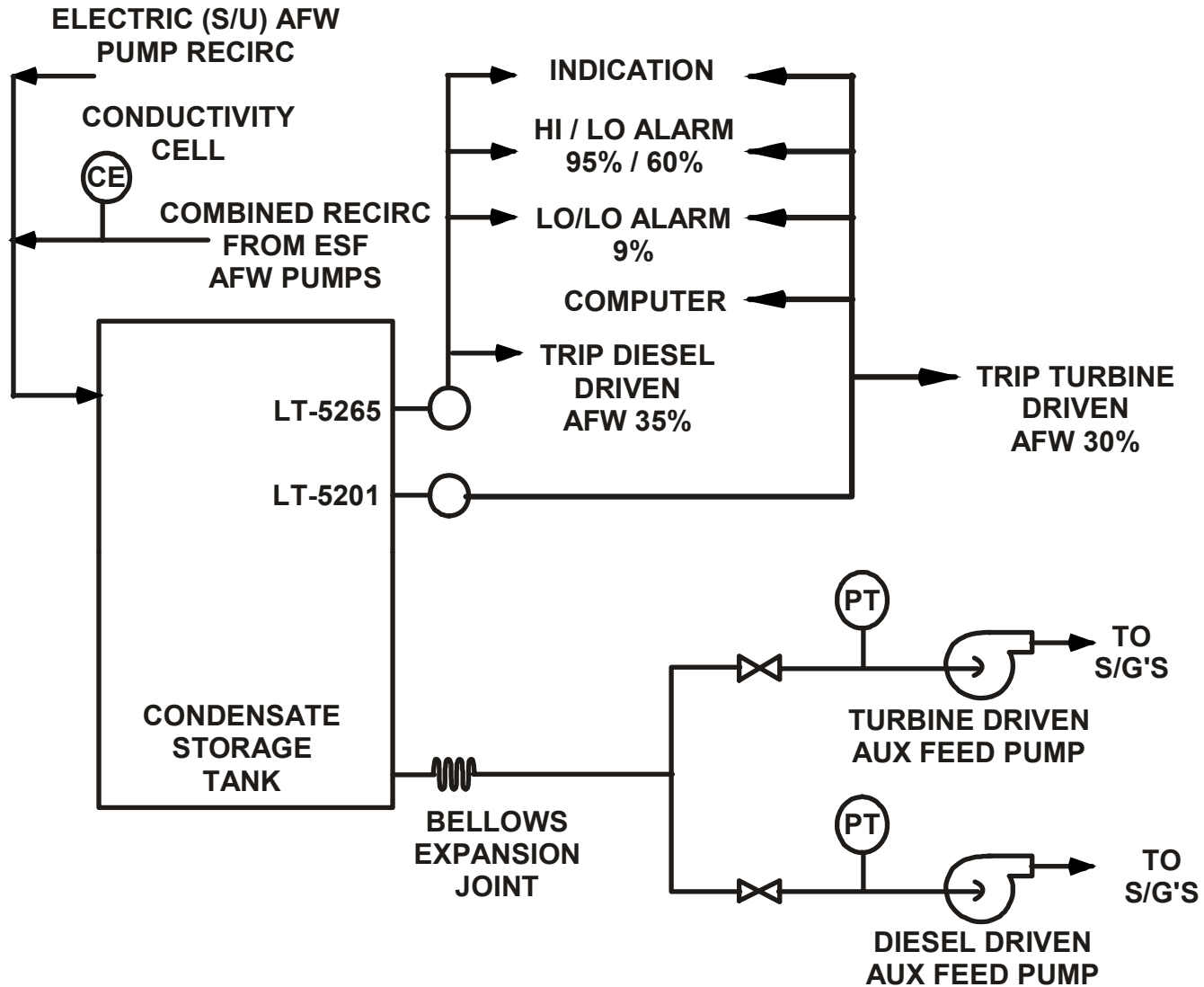


Figure 5.8-4 Condensate Storage Tank

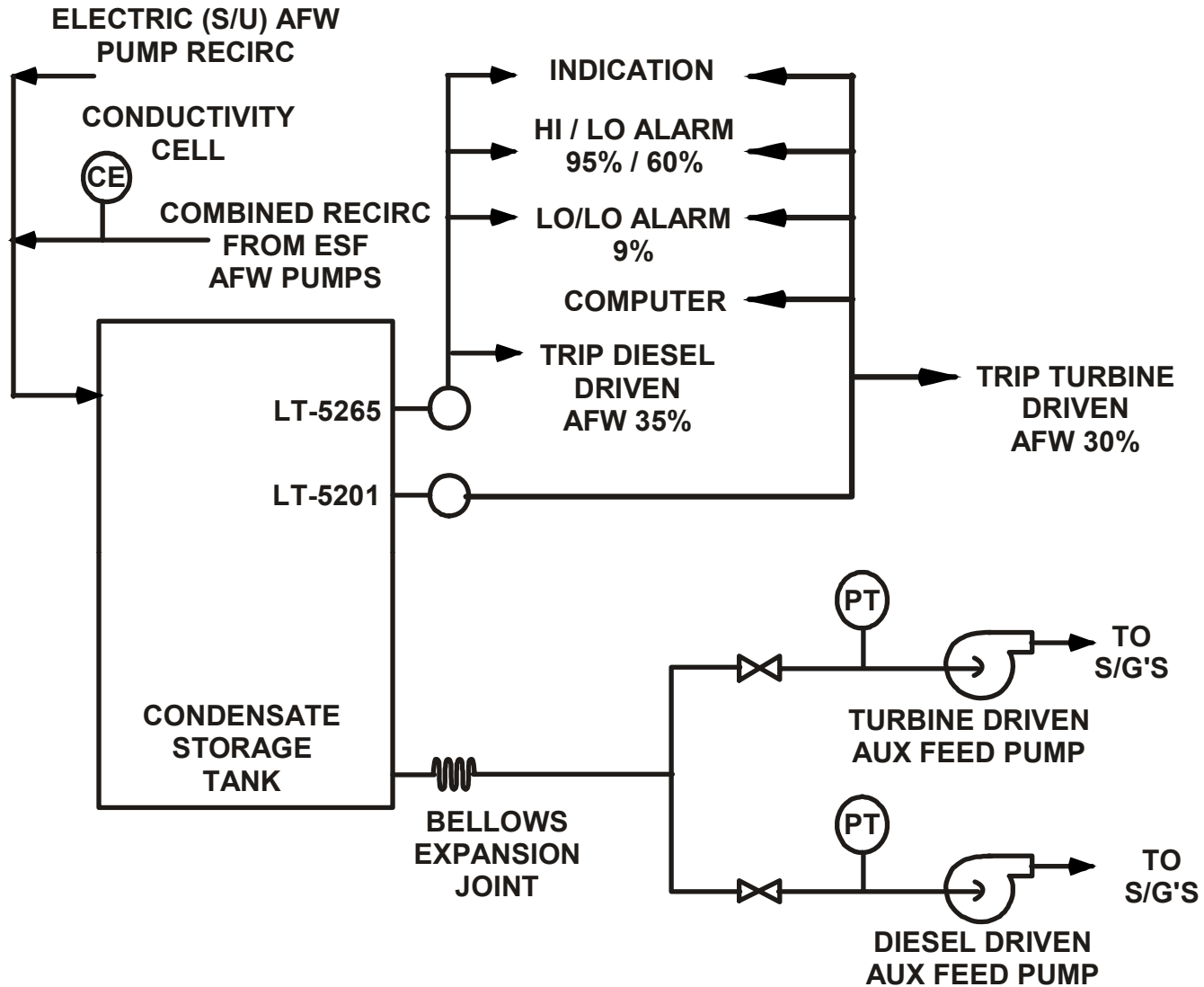


Figure 5.8-3 AMSAC Trip Circuit

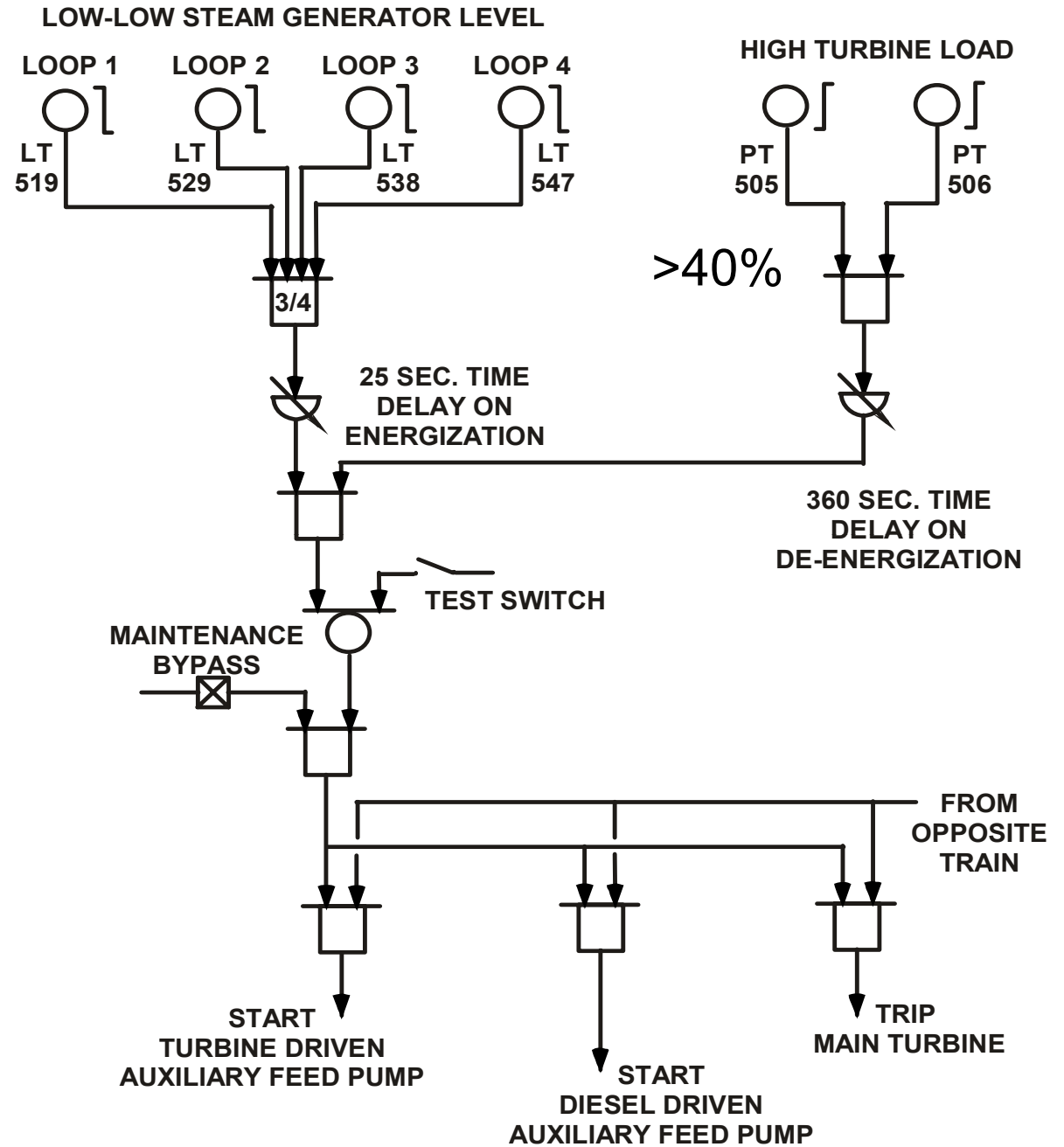
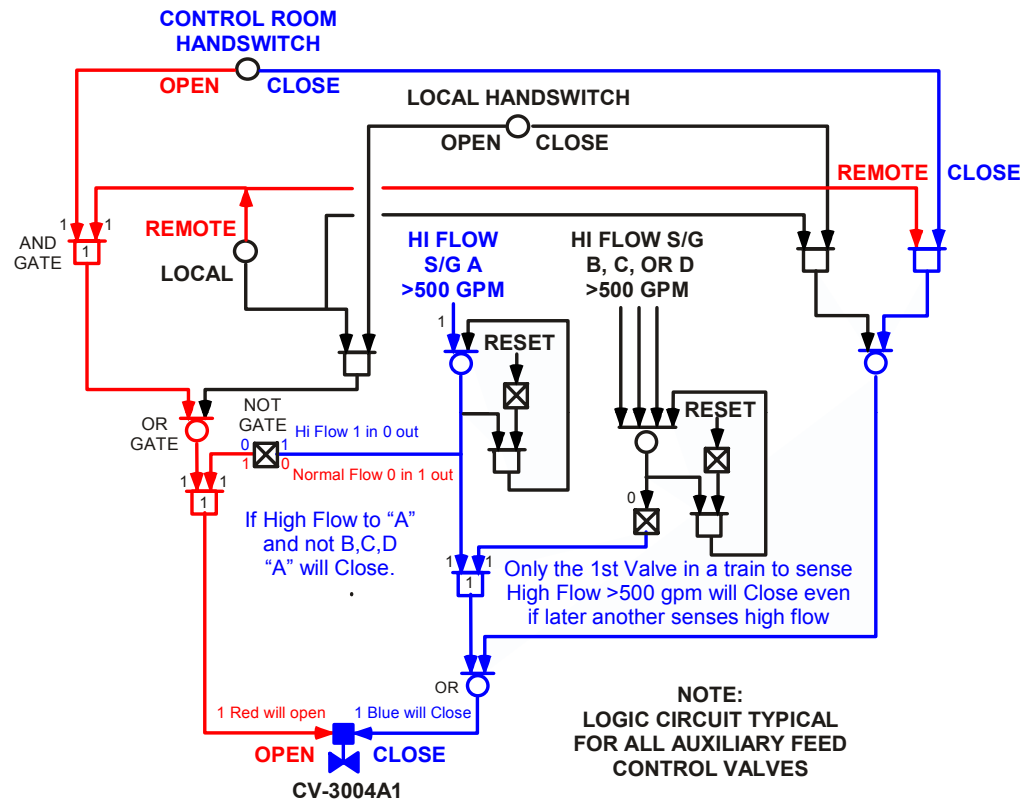


Figure 5.8-7 Auxiliary Feedwater Control Valve CV3004A1



Plant Trip with LOOP OBJ-4

- Rx Trip/Turbine Trip
 - No secondary available on LOOP
- Feedwater Isolation (Rx Trip and $<564^{\circ}\text{F}$)
 - Loss of Air components will drift to fail position
- AFW Starts (Turbine Power Independent)
- Atmospheric Dumps open at 1125 psig to remove decay heat (N2 backup to IA/manual)
- Natural Circulation