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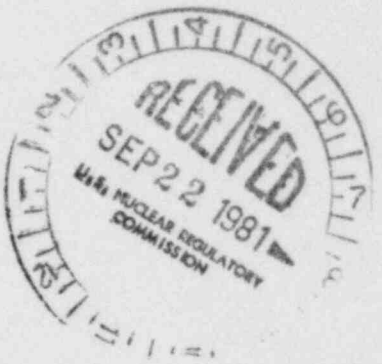

Mr. Spottswood Burwell
Licensing Project Manager
U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
CPSES TO INFORMAL NRC QUESTION ON ECCS
SWITCHOVER

Dear Mr. Burwell:

Please find attached a response to the subject concern raised by RSB.

If you have any questions, please call.

Sincerely,

H C Schmidt

H. C. Schmidt

AND:tls
Attachment
cc: R. D. Calder
J. T. Merritt
J. C. Kuykendall
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NRC REACTOR SYSTEMS BRANCH QUESTION
ON REACTOR OPERATOR FAILURE TO COMPLETE
ECCS SWITCHOVER FOLLOWING A LOCA

Question: Will the Reactor Operators' failure to complete manual operations (following LOCA) to switchover the ECCS from the injection to the recirculation mode jeopardize the recirculation mode?

Answer: We have completed a calculation which shows that a Reactor Operators' failure to manually switchover the ECCS does not jeopardize the recirculation mode. During the injection phase of ECCS the RHR pumps are taking suction from the RWST. At the low-low level (829'2") in the RWST the sump valve in the line from the sump to the RHR pump suction, open automatically so that the RHR pump is taking suction from both the RWST and the sump. The operator close a valve in the line from the RWST to the RHR pump suction. Our calculation shows that failure to close this valve has no effect on the RHR pump operation, hence the recirculation mode of ECCS, because an adequate water leg exists in the piping line from the RWST to the RHR pump suction. The calcualtion is presented here.

Calculation: A schematic diagram of one RHR train is provided in Figure 1.

Assumptions

1. The motor operated valve in the piping line from the RWST to the RHR pump suction is open.
2. Piping losses are based on RHR system runout flowrate (4500 gpm).
3. The water level in the sump is at the bottom elevation of the sump.
4. Containment pressure is atmospheric (0.0 psig).
5. Sump water temperature is $212^{o}F$; RWST water temperature is $32^{o}F$.

The pressure at point A (see Figure 1) is given by (1) and (2).

$$P_A = P_{sump} + \frac{\rho_{sump}}{144} (Z_{sump} - Z_A) - h_{pipe}$$

where: P_A - pressure at point A
P_{sump} - sump pressure
ρ_{sump} - water density in the sump
Z_{sump} - sump water elevation
Z_A - elevation at point A
h_{pipe} - head loss due to friction

$$P_A = P_{RWST} + \frac{\rho_{RWST}}{144} Z_1 \quad (2)$$

where: P_{RWST} - RWST pressure
ρ_{RWST} - water density in the RWST
Z_1 - water leg above point A

therefore

$$P_{sump} + \frac{\rho_{sump}}{144} \left[(Z_{sump} - Z_A) - h_{pipe}\right] = P_{RWST} + \frac{\rho_{RWST}}{144} Z_1 \quad (3)$$

Equilibrium is reached when

$$P_{sump} = P_{RWST} \quad (4)$$

Substituting (4) into (3) and solving for Z_1 yields

$$Z_1 = \frac{\rho_{sump}}{\rho_{RWST}} \left[(Z_{sump} - Z_A) - h_{pipe}\right] \quad (5)$$

values used are

$$\rho_{sump} = \rho_{212^oF} = 59.9 \text{ lb/ft}^3$$

$$\rho_{RWST} = \rho_{32^oF} = 62.4 \text{ lb/ft}^3$$

$$Z_{sump} = 806 \text{ ft}$$

$$Z_A = 781.5 \text{ ft}$$

$$h_{pipe} = 3.8 \text{ ft}$$

Substituting these valves into (5) yields

$$Z_1 = 19.9 \text{ ft}$$

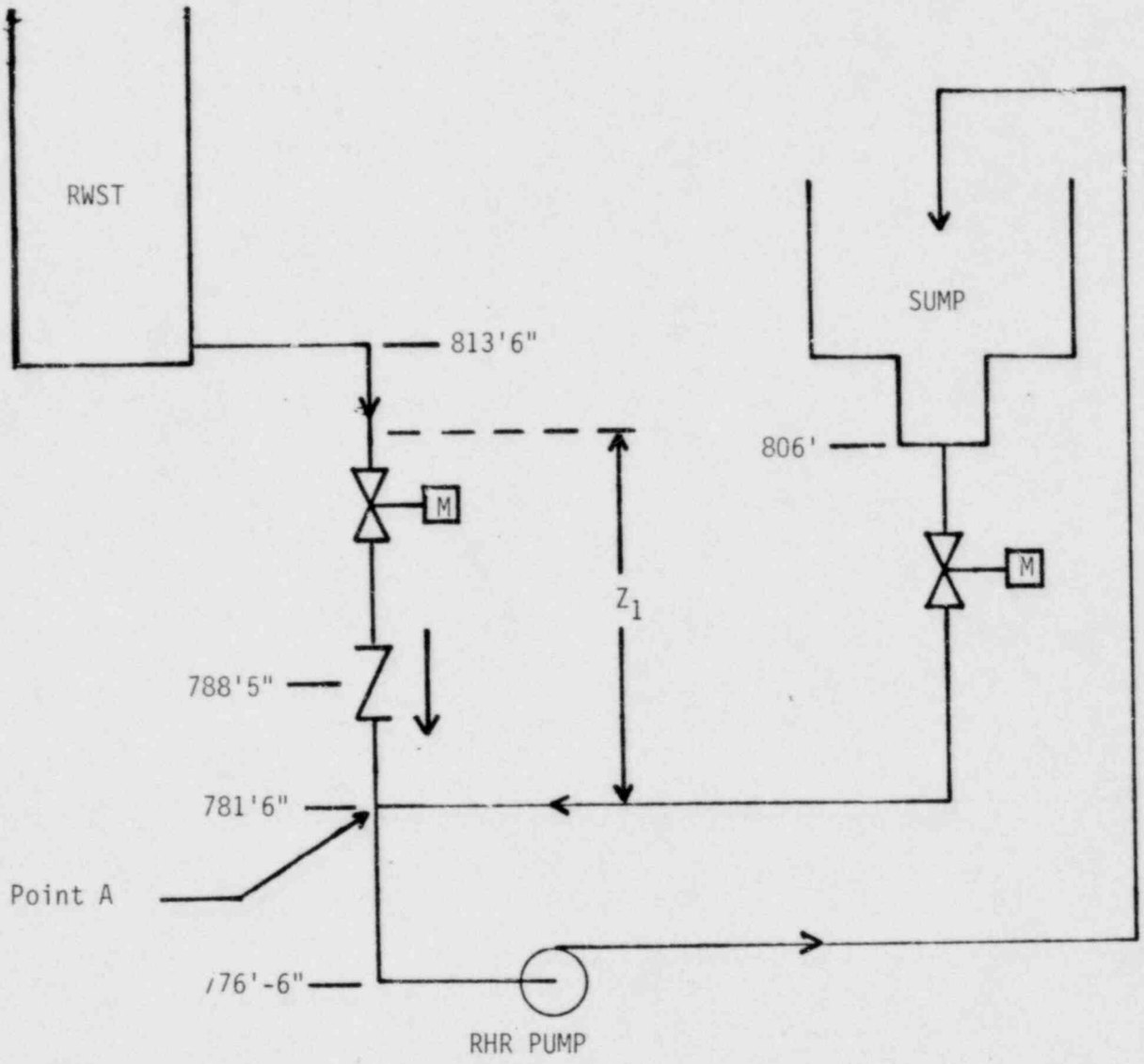

FIGURE 1

CPSES ECCS SWITCHOVER SCHEMATIC