

TENNESSEE VALLEY AUTHORITY  
CHATTANOOGA, TENNESSEE  
37401



July 18, 1973

50-259-268-296

Mr. F. E. Kruesi, Director  
Directorate of Regulatory Operations  
U.S. Atomic Energy Commission  
Washington, DC 20545

Dear Mr. Kruesi:

On June 19, 1973, TVA made an initial report to AEC-DRO Inspector W. S. Little of the failure of the level switches LS-73-56A and LS-73-56B at the Browns Ferry Nuclear Plant unit 1. In accordance with paragraph 50.55(e) of 10 CFR 50, we submit the enclosed final report of the failure.

Very truly yours,

*J. E. Gilleland*

J. E. Gilleland  
Assistant to the Manager of Power

Enclosure

CC (Enclosure):

Mr. Norman C. Moseley, Director  
Directorate of Regulatory Operations  
U.S. Atomic Energy Commission  
Region II - Suite 818  
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ENCLOSURE

BROWNS FERRY NUCLEAR PLANT UNIT 1  
FINAL REPORT ON FAILURE OF HPCI LEVEL SWITCHES  
LS-73-56A AND LS-73-56B ON CONDENSATE RING HEADER (DDN 150)

An initial report of the failure of the level switches LS-73-56A and LS-73-56B at the Browns Ferry Nuclear Plant unit 1 was made verbally by M. M. Price, Construction Engineer, at the plant site to W. S. Little, AEC-DRO Region II Inspector, on June 19, 1973, in compliance with 10CFR50.55(e). This letter constitutes our final written report pursuant to 10CFR50.55(e).

These two switches were reported as being defective following a scheduled test; and upon investigation, the contacts of the switches were found to be badly burned. The function of the switches is to initiate transfer of the HPCI suction from the condensate ring header to the torus. The burned contacts were stuck in a closed position which in turn transferred the HPCI suction to the torus permanently.

The switches were Robertshaw Model 83481 Levelac level switches with a 1/4-ampere rating at 250 volts DC. A failure analysis revealed that these switches were undersized; that is, their rating should have been 1/2 ampere at 250 volts DC.

The pertinent pieces of equipment associated with the two redundant level switches are: (1) two valves on the torus, (2) one valve on the condensate ring header, and (3) an alarm that annunciates in the control room upon low water level in the condensate ring header. The power supply to the two level switches, the alarm, and the three valves is 250 volts DC. Either switch will initiate transfer of the HPCI water supply from the condensate ring header to the torus. When the transfer occurs, the alarm is also annunciated in the control room.

The safety implications associated with the switches are as follows:

1. The switches are redundant such that either switch will initiate the transfer and actuate the alarm.
2. The contacts on the level switches close on falling level in the condensate ring header; thus, transfer and annunciation would occur if the switch contacts stick when closing.
3. If the DC power fails to both switches, the transfer and annunciation will not occur.

Failure of both switches to close or loss of the DC power will not prevent the safe shutdown of the plant because the operator can manually initiate blowdown of the reactor through the power relief valves as a backup to the HPCI. After depressurization, both low-pressure core injection and core spray can maintain water inventory in the reactor vessel.

The corrective action taken was to replace the two failed switches with switches having a rating of 1/2 ampere at 250 volts DC. This replacement was completed on June 18, 1973. In addition to replacing the switches, it was necessary to adjust the linkage mechanism to accommodate the larger switches.