

TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE
37401



February 5, 1974



Mr. John F. O'Leary, Director
Directorate of Licensing
Office of Regulation
U.S. Atomic Energy Commission
Washington, DC 20545

Dear Mr. O'Leary:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 1 -
DOCKET NO. 50-259 - FACILITY OPERATING LICENSE DPR-33 - ABNORMAL
OCCURRENCE REPORT BFAO-747W

The enclosed report is to provide details concerning the HPCI
failure to pump to the vessel, which occurred on Browns Ferry
Nuclear Plant unit 1 on January 26, 1974, and is submitted in
accordance with Appendix A to Regulatory Guide 1.16, Revision 1,
October 1973.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

E. F. Thomas
Director of Power Production

Enclosure
CC (Enclosure):

Mr. Norman C. Moseley, Director
Region II Regulatory Operations Office, USAEC
230 Peachtree Street, NW., Suite 818
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ABNORMAL OCCURRENCE REPORT

Report No.: BFAO-747W
Report Date: February 5, 1974
Occurrence Date: January 26, 1973
Facility: Browns Ferry Nuclear Plant unit 1

Identification of Occurrence

HPCI failure to pump to vessel.

Condition Prior to Occurrence

The reactor was operating at approximately 45-percent thermal power during startup testing.

Description of Occurrence

At approximately 7:15 p.m., the HPCI system was initiated to pump to the vessel as required by Startup Test Instruction No. 15. The pump flow and turbine speed were very unstable and the test was aborted. During initiation, arcing was observed coming from the limit switch housing of motor-operated valve FCV 73-16, HPCI Steam Supply Valve to Turbine, although the valve operated as required. The motor fault was repaired, and a pump operability and flow rate test was initiated. The pump flow went to 6,000 gpm, but no indication of speed was received in the control room. The operator immediately tripped the turbine. Repairs were made to the EGM governor control box to restore the speed indication. Surveillance testing was initiated with satisfactory results, and HPCI was declared operable. At approximately 3:15 p.m. on January 28, a HPCI vessel injection was initiated. The response was the same as the first vessel injection on January 26.

Designation of Apparent Cause of Occurrence

The instability during vessel injection was a result of a high gain setting on the flow controller making the turbine response too sensitive.

The arcing observed coming from the limit switch housing of the steam supply valve, FCV 73-16, was caused by a motor lead going to ground.

The loss of speed indication and governor response during surveillance testing after repair of the valve was a result of defective components, R21 and CR1, inside the EGM governor control box. This was caused by the signal to the EGM control box being shorted by transient recorder leads installed during the interim between the first vessel injection test and the first surveillance test.

Analysis of Occurrence

This test marked the first time the HPCI had pumped to the pressurized reactor. It was necessary to desensitize the turbine control to achieve pump stability. Although actual flow was not measured during the aborted tests, water was delivered to the reactor vessel; and it is probable that, if called upon in an accident condition, the HPCI would have performed its intended function. In any case, the other safeguard systems were demonstrated operable immediately following the occurrence and would have been available if needed.

Corrective Action

The instability was corrected by decreasing the gain of the flow controller. The vessel injection for STI-15 was then performed with satisfactory results.

The motor leads were re-spliced and taped, the limit switch housing cleaned, and the cover repaired. The valve operated satisfactorily during subsequent surveillance testing.

The defective components in the EGM governor control box were replaced and the shorted test leads removed. The governor performed satisfactorily during subsequent surveillance testing.

Failure Data:

The EGM governor control box, part number 8C70-811, is manufactured by Woodward Governor Corporation. Components replaced were as follows.

1. R21: Resistor, Dale, RH-25, 25 watt, 10 ohm, 3 percent
2. CR1: Klipvolt Transient Voltage Suppressor, Polarized type, Sarkes Tarzian, part number S-240