

TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE
37401

ANNIVERSARY
OF PEOPLE IN
PARTNERSHIP

July 1, 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 PERRY NUCLEAR PLANT UNIT 1 -
DOCKET NO. 50-259 - FACILITY OPERATING LICENSE DPR-33 - ABNORMAL
OCCURRENCE REPORT BPAO-7442W

The enclosed report is to provide details concerning HPCI turbine
which failed to start manually and reach operating speed and is
submitted in accordance with Appendix A to Regulatory Guide 1.16,
Revision 1, October 1973. This event occurred on Browns Perry Nuclear
Plant unit 1 on June 21, 1974.

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, N.W., Suite 618
Atlanta, Georgia 30303

8305040351 740701
PDR ADOCK 05000259
S PDR

COPY SENT REGION 

ABNORMAL OCCURRENCE REPORT

Report No.: BFAO-7442W
Report Date: July 1, 1974
Occurrence Date: June 21, 1974
Facility: Browns Ferry Nuclear Plant unit 1

Identification of Occurrence

HPCI turbine failed to start manually and reach operating speed.

Conditions Prior to Occurrence

Before the occurrence, the unit was operating at rated pressure and temperature on a 300-hour warranty demonstration run at 100-percent power.

Description of Occurrence

The reactor scrammed at 9:54 a.m., June 21, 1974, by low condenser vacuum because of a steam jet air ejector malfunction. The HPCI system was initiated manually to be available if required to control vessel water level, pressure, and temperature. Several manual starts were attempted before the HPCI turbine started. The HPCI was declared inoperable, and the required surveillance on other CSSC systems was conducted while the reactor was in the shutdown mode.

Designation of Apparent Cause of Occurrence

During each manual start attempt, it was observed that the turbine stop valve did not fully open and the turbine failed to reach operating speed. When the stop valve did open fully, the unit operated as designed.

A study of the turbine stop valve assembly indicated that, during the start attempts, the pilot valve was not seating correctly or the operating oil pressure was low. An inspection of the oil system revealed the presence of foreign materials. These particles probably contributed to the pilot valve failure to seat correctly. Subsequent inspection also revealed improper pilot valve seating contact.

Analysis of Occurrence

During the period of time that the HPCI turbine would not start, all remaining safety systems were available, vessel water level was controlled at all times by other systems, and there were no adverse consequences experienced.

Corrective Action

The turbine stop valve pilot piston was removed and disassembled. A contact check was made between the piston and its seat which revealed improper seating contact. The pilot seat was lapped and the piston was machined to fit. A leak check was performed, and the results were satisfactory. The pilot piston ring chamber was honed and polished to reduce sliding friction.

The turbine oil reservoir was drained and oil samples were checked for particulates. Some very small particles were found. The oil reservoir was thoroughly cleaned. The pump gear reducer reservoir was opened and cleaned. Oil drain piping was removed and inspected. Rust blisters were found in some drain piping and were removed. Numerous small lubrication and control oil

Corrective Action (continued)

pipes were removed and inspected for cleanliness. A temporary filter was installed in the oil circuit and the oil system was flushed using new clean oil. The oil was flushed until the temporary filters indicated no dirt was being picked up. Flushing duration was approximately 15 hours. All orifices in the oil lubrication system were inspected to ensure that they were free of foreign material. The turbine thrust and journal bearings were inspected and found in good condition. The oil piping was returned to its normal configuration, and new filtered oil was installed. The auxiliary oil pump was started, and all pressures were found to be satisfactory. The turbine stop valve was stroked nine times and operated satisfactorily on all actuations.

The HPCI unit was started three times using auxiliary boiler steam. The unit performed satisfactorily each time. Startup speeds and stop valve actuation were normal. The HPCI was declared operable on June 28, 1974, at 2:10 a.m.

Failure Data

The valve is a Schutte and Koerting Company inverted oil operated stop valve. A previous failure of this nature was reported in Abnormal Occurrence Report BFAO-7439W dated June 19, 1974.