

LER SUPPLEMENTAL INFORMATION

BFRO-50- 260 / 83074 R3 Technical Specification Involved 3.5.E

Reported Under Technical Specification 6.7.2.a.(5)* Date Due NRC _____

Event Narrative:

Units 1 and 3 were in refueling outages; unit 2 was operating normally at 98 percent power. Unit 2 was the only unit affected by this event. On November 10, 1983, unit 2 scrambled and the high pressure cooling injection system (HPCI) received an auto initiation signal to inject water into the vessel. The HPCI responded to the signal but isolated immediately due to a blown inner turbine exhaust rupture diaphragm which caused an inoperable condition (T.S. 3.5.E). The rupture diaphragm is a Fike, Model 16-CPV-CBT. The rupture diaphragm was replaced and surveillance instructions (SI) 4.5.E.1.d and e (HPCI Turbine and Pump Flow Test) and SI 4.5.E.1.c (HPCI MOV Operability) were successfully performed and the HPCI system returned to service. The HPCI system was inoperable for approximately 13 hours. Redundant systems were available and subsequently tested, as required by T.S. 3.5.E. T.S. 3.5.E allows seven days operation with HPCI inoperable. There was no effect on public health and safety.

This report is to identify the present status of the investigation into the November 5, 1983 and November 10, 1983 failures of the unit 2 HPCI inner turbine exhaust rupture diaphragm. In both cases, the rupture pattern for the failed diaphragms was similar. One of the rupture diaphragms was returned to the manufacturer, Fike Metal Products Corporation, for analysis. Their analysis indicated no evidence of improper installation, no significant corrosion, and no evidence of any other factors which would have contributed to a premature failure. All indications were that a normal rupture had occurred at design operating temperature and pressure.

The initial report indicated that on the November 5 incident, the improper operation of the gland seal condenser level switch may have been a factor. However, this was not a factor in the November 10 incident. Based on this, it is believed that the level switch may have been a contributing factor to the November 5 incident, but it was not the only problem. In addition, the initial report indicated that Special Test 8211 was in progress during the November 5 incident. Data obtained during this test indicates that stop valve motion was erratic during two cold-start initiations. The second cold start was when the rupture diaphragm failed. As a result of this data analysis, additional testing is to be performed on the unit 2 HPCI in early February 1984. This additional testing will verify correct stop valve balancing chamber pressure and correct operation of valves and switches for the turbine steam supply drain pot.

Additional testing was performed on HPCI during special test (stear) 8211 from February 4 - 9, 1984. General Electric HPCI Technical Representative along with Terry Turbine Controls Engineer were on site during test program. In a "normal" start transient, the pressure adjustment in the turbine stop valve balance chamber is critical in assuring controlled opening of the valve. However, it was demonstrated with the modified control system that these conditions effectively eliminate the necessity for balance chamber adjustment. This modification virtually closes the turbine control valves during the initial portion of start transient, thus steam pressure is equalized across the turbine

Retention: Period - Lifetime; Responsibility - Document Control Supervisor

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stop valve. With the new control modification, the acceleration transient is under total control of the turbine governor system which in effect reduces the turbine exhaust extreme pressure transients. This improvement, along with recommended procedure changes by General Electric should eliminate the inboard rupture disc damage in the turbine exhaust line.

Previous Similar Events - BFRO-50-259/79027, 80029; 260/80017, 80032; 296/81015, 81016

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*Revision: JRP

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant
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February 4, 1985

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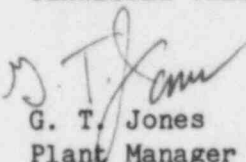
Dear Sir:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 2 -
DOCKET NO. 50-260 - FACILITY OPERATING LICENSE DPR-52 - REPORTABLE
OCCURRENCE REPORT BFRO-50-260/83074 R3

The enclosed report provides details concerning the High Pressure Cooling
Injection turbine exhaust inner rupture diaphragm rupture. This report
is submitted in accordance with Technical Specification 6.7.2.a.(5).

Very truly yours,

TENNESSEE VALLEY AUTHORITY


G. T. Jones
Plant Manager
Browns Ferry Nuclear Plant

Enclosures

cc (Enclosures):

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