NRC FORM 366 (12-81) 10 CFR 50	LICENSEE EVENT REPORT	APPROVED BY OMB 3150-0011
CONTROL BLOCK:	(PLEASE PRINT OR TYPE ALL REC	DUIRED INFORMATION)
O 1 A L B R F 2 2 0 0	- 0 0 0 0 - 0 0 3 4 1 1 LICENSE NJMBER 25 3 4 1 1	1 1 1 4 57 CAT 58 6
CON'T 0 1 REPORT L 6 0 5 0 0 7 8 60 61 DOCKE	0 2 6 0 7 1 1 1 0 8 3 8 T NUMBER 66 65 EVENT DATE 74 75	REPORT DATE 80
EVENT DESCRIPTION AND PROBABLE OF During starcup of HPCI	consequences (1), while performing of Special Test 82	211 on 11/5/83, the
0 3 turbine exhaust inner	rupture diaphragm ruptured. On 11/10	1/83, during HPCI
0 4 initiation resulting f	rom a unit scram, the inner diaphragm	n ruptured. There
0 5 was no effect on publi	c health and safety. T.S. 3.5.E.2 pe	rmits operation
0 6 for seven days with HP	CI inoperable. Redundant systems wer	e available and
0 7 operable.		
08		**
SYSTEM CAUSE CODE S F 11 E 1	D D ANAMANA CE	SUBCODE 15 Z 16
Z LER/RO EVENT YEAR	SEQUENTIAL OCCURRENCE REPORT REPORT NC. CODE TYPE	REVISION NO.
17) REPORT 8 3	0 7 4 U 3 X 24 28 27 28 29 30	31 32
TAKEN ACTION ON PLANT MET	DOWN HOURS 22 ATTACHMENT NPRO-4 PR SUBMITTED FORM SUB. 24 27 27 28 29 29 29 29 29 29 29	SUPPLIER COMP. COMPONENT (26) MANUFACTURER (26) IN (25) F 1 0 3 43 44 47
CAUSE DESCRIPTION AND CORRECTIVE Exact cause of inner r	EACTIONS 27 upture diaphragm (Fike, Model 16-CPV-	-CBT) failures has
1 1 not been determined.	Further investigation will be conduct	ed to determine
1 2 rupture causes and a f	inal report will be submitted. Addit	ional testing will
1 3 verify correct stop va	lve balancing chamber pressure and co	rrect operation of
1 4 valves and switches.		80
1 5 E 28 0 9 8 29 NA	n status 30 method of Discovery of Discovery of A 31 Operational Even	
7 6 9 10 12 13 ACTIVITY CONTENT RELEASED OF RELEASE AMOUNT OF AC	TIVITY (35) LOCATION OF	RELEASE 36
7 8 9 10 11 PERSONNEL EXPOSURES	44 45	80
1 7 0 0 0 37 Z 38 NA	•	80
PERSONNEL INJURIES NUMBER DESCRIPTION (41) 1 8 0 0 0 (40) NA		
7 8 9 11 12 LOSS OF OR DAMAGE TO FACILITY TYPE DESCRIPTION (43)		80
1 9 Z 42 NA		80
PUBLICITY ISSUED DESCRIPTION (45) 2 0 N (4) NA		NRC USE ONLY
NAME OF PREPARER	. Widick & J. B. Walker PHONE (
8502130378 850204 PDR ADOCK 05000260 S PDR		IE22,//

LER SUPPLEMENTAL INFORMATION

BFRO-50- 260 / 83074 R3Technical 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
scrammed 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 bu
isolated immediately due to a blown inner turbine exhaust rupture diaphragm which cause
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.l.c (HPCI MOV Operability) were
successfully performed and the HFCI 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) 821; 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 values 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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BFRO-50- 260 / 83074 R3 Technical Specification Involved 3.5.E

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

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.

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

Retention: Period - Lifetime; Responsibility - Document Control Supervisor

*Revision:

TENNESSEE VALLEY AUTHORITY

P. O. Box 2000 Decatur, Alabama 35602

February 4, 1985

U. S. Nuclear Regulatory Commission Document Control Desk Washington, D. C. 20555

Dear Sir:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 2 - DOCKET NO. 50-260 - FACILITY OPERATING LICENSE DPR-52 - REPORTABLE OCCURRENCE REPORT BFR0-50-260/83074 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,

Com

TENNESSEE VALLEY AUTHORITY

G. T. Jones Plant Manager

Browns Ferry Nuclear Plant

Enclosures

cc (Enclosures):

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