

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) **BROWNS FERRY UNIT 1** DOCKET NUMBER (2) **050002519** PAGE (3) **1 OF 03**

TITLE (4) **UNPLANNED ISOLATION OF SECONDARY CONTAINMENT DUE TO ACTUATOR DIAPHRAM RUPTURE AND SUBSEQUENT SUPPLY DAMPER CLOSURE**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER (9)
08	28	88	88	024	00	09	22	88	BROWNS FERRY UNIT 2		050002610
									BROWNS FERRY UNIT 3		050002915

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.71 (Check one or more of the following) (11)

OPERATING MODE (8) <b>N</b>	20.402(b)	20.406(a)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) <b>01010</b>	20.406(a)(1)(iii)	50.73(a)(1)	<input type="checkbox"/>	50.73(a)(2)(iv)	73.71(c)
	20.406(a)(1)(iii)	50.73(a)(2)	<input type="checkbox"/>	50.73(a)(2)(iv)	OTHER (Specify in Abstract below and in Text, NRC Form 305A)
	20.406(a)(1)(iii)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(iv)(A)	
	20.406(a)(1)(iii)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(iv)(B)	
	20.406(a)(1)(iii)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(ix)	

NAME **Stephen C. Willard, Engineer, Plant Operations Review Staff** TELEPHONE NUMBER **71291-25136**

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (12)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
BD	VAC	BILIP13211		No					

SUPPLEMENTAL REPORT EXPECTED (14) YES (if yes, complete EXPECTED SUBMIT IN DATE)  NO

EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On August 28, 1988, at 0210 hours with all three units defueled, a refueling zone isolation occurred when the pressure differential between the refuel zone and atmospheric exceeded the negative pressure setpoint of one-half inch water gauge. The large pressure differential was caused by the closure of a unit 1 secondary containment isolation damper in the refuel zone ventilation supply line. The damper was closed, as designed by spring force upon loss of air pressure in the actuators air chamber when the actuator diaphragm ruptured. Refuel zone ventilation was returned to service at 0230 hours.

The isolation was caused by the rupture of the diaphragm in the damper actuator. The diaphragm had been in service for over four years. The current preventative maintenance program has set the frequency for replacement of the diaphragms at once per refueling outage. Unit 1 has been shutdown since early 1985 and the preventative maintenance on these dampers has been deferred until a time closer to unit startup. This is considered an end-of-life failure.

The preventative maintenance frequency for the secondary containment isolation dampers will be revised to once every 24 months.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
BROWNS FERRY UNIT 1	0   5   0   0   0   2   5   9	8   8	-   0   2   4	-   0   0	0   2	OF 0   3

TEXT (If more space is required, use additional NRC Form 3054's) (17)

Description of Event

Browns Ferry units 1, 2, and 3 were defueled during this event. The refuel zone ventilation systems (EIIS system code VG) were affected on all three units.

On August 28, 1988, at 0210 hours, a refueling zone isolation occurred when the pressure differential between the refuel zone and atmospheric exceeded the negative pressure setpoint of one-half inch water gauge. The large pressure differential was caused by the closure of a Unit 1 secondary containment isolation damper (EIIS component code DMP, in the refuel zone ventilation supply line while the exhaust fans (EIIS component code FAN) were running. The damper is controlled by a spring-loaded air-operated operated actuator and is designed to fail in the closed position upon loss of air pressure. The damper was closed by spring force upon loss of air pressure in the actuators air chamber when the actuator diaphragm (EIIS component code BLL) ruptured. The isolation signal stopped the normal zone supply and exhaust fans and closed the remaining zone isolation dampers.

An attempt was made to realign the normal ventilation paths. It was discovered at this time that the damper in question would not respond to an open signal. Refuel zone ventilation was returned to service at 0230 hours using the unit 2 and 3 ventilation equipment. The unit 1 refuel zone supply and exhaust fans were left out of service. Operators were dispatched to the damper to investigate. Air was heard and felt escaping from the actuator. Corrective maintenance was initiated which replaced the diaphragm and stroked the damper. The unit 1 refuel zone supply and exhaust fans were returned to service August 30, 1988, at 2155 hours.

Cause of Event

The isolation was caused by the rupture of the diaphragm in the damper actuator. The diaphragm had been in service for over four years. The current preventative maintenance program has set the frequency for replacement of the diaphragms at once per refueling outage. Unit 1 has been shutdown since early 1985 and the preventative maintenance on these dampers has been deferred until a time closer to unit startup. This is considered an end-of-life failure.

It was determined also that the diaphragm had been installed backwards which, from discussions with the manufacturer, could accelerate the failure due to induced stresses caused by bending the diaphragm in the opposite direction from that intended. The diaphragm has a preformed shape which requires installation in only the intended orientation. At the time the diaphragm was originally installed, a detailed procedure specifying the proper orientation for installation did not exist. Even though the improper installation may have accelerated the diaphragm failure, the length of service exceeded the current expected lifetime and the failure is still considered an end-of-life failure.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 8	— 0 2 4	— 0 0	0 3	OF	0 3

TEXT (If more space is required, use additional NRC Form 366A (17))

Corrective Action

The preventative maintenance frequency for the secondary containment isolation dampers will be revised to once every 24 months. A maintenance procedure was issued October 9, 1986 which provides a detailed description for diaphragm installation. Included in that procedure is a description of proper diaphragm orientation for installation.

Analysis of Event

Secondary containment is designed to contain and allow for a controlled release of radioactive materials to the environment following an accident. The standby gas treatment (SBGT) (EIIS system code BH) system does not receive a start signal from the refuel or reactor zone differential pressure instrumentation. This isolation function is not nuclear safety related and is not needed for safe shutdown during an accident. The isolation is used to prevent building damage during an equipment malfunction such as fan or damper failure. The system responded correctly to the large differential pressure condition. This isolation condition is covered in the plants operating procedures such that regaining normal ventilation is immediately attempted. Should normal ventilation not be able to be restored SBGT will be manually started as necessary.

Plant response would have been the same had the unit been at power, however; this same type of isolation could have occurred because of a reactor zone isolation damper which would have isolated the normal reactor zone ventilation (EIIS system code VA). If the unit were at power and received a reactor zone isolation, the main steam tunnel would lose ventilation. Main steam line area temperature would rise. If ventilation were not restored the main steam isolation valves (MSIVs) (EIIS component code ISV) would receive an isolation signal due to high area temperature and the unit would scram. While these events would significantly disrupt normal plant operation and unnecessarily challenge and cycle safety systems they do not prevent safe shutdown of the unit.

Previous Similar Events - No previous LERs

Commitments - Revise the preventative maintenance frequency for the secondary containment isolation dampers to once every 24 months.

TENNESSEE VALLEY AUTHORITY

Browns Ferry Nuclear Plant  
Post Office Box 2000  
Decatur, Alabama 35602

SEP 23 1988

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

Dear Sir:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 1 - DOCKET  
NO. 50-259 - FACILITY OPERATING LICENSE DPR-33 - REPORTABLE OCCURRENCE REPORT  
BFRO-50-259/88024

The enclosed report provides details concerning the unplanned isolation of  
secondary containment due to actuator diaphragm rupture and subsequent supply  
damper closure. This report is submitted in accordance with 10 CFR 50.73  
(a)(2)(iv).

Very truly yours,

TENNESSEE VALLEY AUTHORITY

*D. McKee for*

Guy G. Campbell  
Plant Manager  
Browns Ferry Nuclear Plant

Enclosures  
cc (Enclosures):

Regional Administration  
U.S. Nuclear Regulatory Commission  
Office of Inspection and Enforcement  
Region II  
101 Marietta Street, Suite 2900  
Atlanta, Georgia 30303

INPV Records Center  
Suite 1500  
1100 Circle 75 Parkway  
Atlanta, Georgia 30339

NRC Resident Inspector, Browns Ferry Nuclear Plant

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