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AUTH.NAME AUTHOR AFFILIATION
CONLEY,W.A. Tennessee Valley Authority
ZERINGUE,O.J. Tennessee Valley Authority
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-003-00:on 921027,discovered failure of reactor zone isolation dampers to close.Caused by failed solenoid operated valve.Outboard damper manually closed by isolating air supply & bleeding air off damper.W/921127 ltr.

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Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

O. J. "Ike" Zeringue
Vice President, Browns Ferry Nuclear Plant

NOV 27 1992

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

Dear Sir:

TVA - BROWNS FERRY NUCLEAR PLANT (BFN) UNITS 1, 2, 3 - DOCKET NOS. 50-259, 260, AND 296 - FACILITY OPERATING LICENSE DPR-33, 52, 68 - LICENSEE EVENT REPORT LER-50-296/92003

The enclosed report provides details concerning the failure of two reactor zone isolation dampers to fully close. Debris in the damper was the apparent cause for the partial closure of one damper. A failed solenoid valve caused the other damper problem. This report is submitted in accordance with 10 CFR 50.73(a)(2)(vi) and 10 CFR 50.73(a)(2)(v)(C).

Sincerely,

O. J. Zeringue

Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

NOV 27 1992

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NRC Form 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

Approved OMB No. 3150-0104
Expires 4/30/92

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Browns Ferry Nuclear Plant (BFN) Unit 3	0 5 0 0 0 2 6 8	0 1 OF 0 6

TITLE (4) Failure of the reactor zone isolation dampers to close.

EVENT DAY (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(S)
									Browns Ferry Unit 1	0 5 0 0 0 2 5 9
1 0	2 7	9 2	9 2	0 0 3	0 0	1 1	2 7	9 2	Browns Ferry Unit 2	0 5 0 0 0 2 6 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)					
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)		50.73(a)(2)(iv)		73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	X	50.73(a)(2)(v)		73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)		50.73(a)(2)(vii)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)(B)		50.73(a)(2)(viii)(A)		
		20.405(a)(1)(iv)	50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
		20.405(a)(1)(v)	50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (AREA CODE)
W. A. Conley, Regulatory Licensing Engineer	2 0 5 7 2 9 - 2 6 9 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
D	V A	B D M P	M 3 7 6	N	A	E D	R L Y	G 0 8 0	N
B	L E	S 0 L	A 2 4 6	N					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On October 27, 1992 at approximately 0028 hours, while performing a scheduled surveillance instruction (SI) to calibrate and functionally test the Browns Ferry Unit 3 reactor building and refueling floor ventilation radiation monitors, the Unit 3 reactor zone outboard exhaust damper failed to close and the inboard exhaust damper failed to close completely in response to a test generated containment isolation signal. This condition was discovered by the Unit 3 operator at 1400 hours. Units 1 and 3 were defueled and Unit 2 was at approximately 89 percent power. This event is reportable in accordance with 10 CFR 50.73(a)(2)(v)(C) and 10 CFR 50.73(a)(2)(vi) due to equipment failures that could cause the release of radioactive material.

The outboard damper failed to close due to a failed solenoid operated valve. The failure of the inboard damper to close completely was apparently caused by debris caught in the damper.

Immediate corrective actions included manual closure of the outboard damper by isolating the air supply and bleeding air off the damper. The inboard damper operator was disconnected and the damper was cycled manually. The failed solenoid will be examined at a TVA laboratory and by the solenoid vendor. TVA will revise damper preventive maintenance activity to include an inspection for debris.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Unit 3	0 5 0 0 0 2 9 6	9 2	0 0 3	0 0	0 2 OF 0 6

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

I. PLANT CONDITIONS

Units 1 and 3 were shutdown and defueled. Unit 2 was in the run mode at approximately 89 percent power.

II. DESCRIPTION OF EVENT

A. Event:

On October 27, 1992 at 0028 hours CST, while performing a routine surveillance instruction (SI) (Unit 3 reactor building and refueling floor ventilation radiation monitor [IL] calibration and functional test), the Unit 3 reactor zone outboard exhaust damper [BDMP] failed to close and the associated inboard exhaust damper [BDMP] failed to close completely in response to a surveillance test generated containment isolation signal. This condition was discovered by the Unit 3 operator at 1400 hours. Limited Condition for Operation (LCO) 3.7.C.2 was entered since the failure of both inboard and outboard dampers to close violates secondary containment requirements. Additionally, refueling zone supply fan 3B failed to trip. All other automatic safety functions performed as expected.

At 1510 hours the 3B refueling zone supply fan was stopped by opening its 480V supply breaker. To restore secondary containment, the inboard and outboard dampers were manually isolated at approximately 1530 hours and LCO 3.7.C.2 was exited.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(v)(C) and 10 CFR 50.73(a)(2)(vi) due to equipment failures that could cause the release of radioactive material.

B. Inoperable Structures, Components, or Systems that Contributed to the Event:

The failure of Unit 3 reactor zone ventilation exhaust inboard isolation damper 3-FCO-64-42 to fully close is believed to have been caused by debris caught in the damper. This could not be conclusively determined. The outboard damper 3-FCO-64-43 failed to close due to its air operated solenoid valve (ASCO MODEL 602-832-3RF) sticking in the open position. Preliminary examination of the solenoid operated valve (SOV) indicates failure may have been caused by a binding valve stem.

The 3B refueling zone supply fan failed to trip due to a piece of cable tie cord stuck in the breaker control relay plunger.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Unit 3	0 5 0 0 0 2 9 6	9 2	— 0 0 3	— 0 0	0 3 OF 0 6

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

C. Dates and Approximate Times of Major Occurrences:

October 27, 1992 at 0028 hours CST	Instrumentation personnel performing an SI placed U-3 reactor zone exhaust radiation monitor CH A in the trip test position per the SI which initiated a PCIS group 6 isolation.
October 27, 1992 at 1400 hours CST	LCO for TS 3.7.C.2 was entered upon discovery of the damper failures.
October 27, 1992 at approximately 1530 hours CST	Secondary containment was established and the LCO exited.
October 27, 1992 at 1750 hours CST	A 4-hour report was made to the NRC as required by 10 CFR 50.72(b)(2)(iii)(C).

D. Other Systems or Secondary Functions Affected:

None.

E. Method of Discovery:

The failures of the inboard and outboard dampers to close and the refuel zone supply fan to trip was discovered by the unit operator when he noticed both red and green indicating lights lit on control panel 3-9-25 for 3-FCO-64-42 damper. The operator then checked all other components for proper isolation and found 3-FCO-64-43 in the open position and the 3B refueling zone supply fan still operating.

F. Operator Actions:

The Shift Operations Supervisor was notified and personnel were dispatched to physically verify positions of the inboard and outboard isolation dampers. LCO 3.7.C.2 was entered.

G. Safety System Responses:

The reactor zone inboard and outboard dampers failed to close and the 3B refueling zone supply fan did not trip. All other safety components/systems operated as designed.

III. CAUSE OF THE EVENT

A. Immediate Cause:

The damper isolation failures were caused by two unrelated equipment malfunctions.

B. Root Cause:

At this time, the root cause of the failed SOV is believed to be a defective valve stem. Further laboratory analysis by TVA and the vendor will be performed to better characterize the problem. The failure of the inboard damper to fully close is believed to have been caused by debris stuck in the damper. This could not be fully verified.

IV. ANALYSIS OF THE EVENT

This event occurred with units 1 and 3 defueled. No activities were in progress on these units that required secondary containment (i.e., no fuel handling activities in progress). Unit 2 was operating at power and required the secondary containment system to be intact as a secondary barrier to the primary containment barrier to prevent the uncontrolled release of radioactive material into the environment surrounding the plant.

The inboard and outboard dampers are redundant to each other for secondary containment isolation purposes and the simultaneous failure resulted in secondary containment requirements not being met.

Technical Specifications (TS) section 3.7.C.1 requires secondary containment integrity be maintained in the reactor zone at all times except as specified in section 3.7.C.2. TS section 3.7.C.2.b required the reactor zone secondary containment integrity to be restored within 4 hours or all reactors to be placed in a hot shutdown condition within the next 12 hours and in a cold shutdown condition within the following 24 hours. Secondary containment integrity was restored in less than 1.5 hours following the discovery of the 3-FCO-64-42 & 43 failures and LCO 3.7.C.2 was exited.

Based on an inspection of the partially closed inboard damper position, it was calculated that the opening size area was at most 480 square inches. Based on the last secondary containment test data and data taken for the standby gas treatment (SBGT) preoperational test with three trains of SBGT running, secondary containment could be maintained at a 1/4 inch of water with a 1100 square inch boundary breach. This exceeds the high side estimate of hole size of 480 inches square.

During this event, plant safety was not adversely affected and the safety of plant personnel and the public was not compromised.

V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

The refueling zone supply fan 3B 480V power supply breaker was opened to stop the fan. Reactor zone inboard and outboard isolation dampers were manually closed.

B. Corrective Actions to Prevent Recurrence:

1. TVA will replace the secondary containment outboard damper solenoids.

2. The failed 3-FSV-64-43 solenoid will be examined at a TVA laboratory and by ASCO. A sample of solenoids removed as part of corrective action 1 above will also be examined.

3. The preventative maintenance (PM) activity on secondary containment dampers will be revised to include an inspection for debris to reduce the risk of debris being caught in the dampers.

4. The radiation monitor calibration and functional test SI will be revised to require verification of damper positions.

VI. ADDITIONAL INFORMATION

A. Failed Components:

No additional equipment failed other than the components identified in section II.B.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Unit 3	0 5 0 0 0 2 9 6	9 2	— 0 0 3	— 0 0	0 6 OF 0 6

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

B. Previous LERs on Similar Events:

TVA reviewed previous reported events to determine if similar past events had occurred. Based on this review there have been no LERs on a similar event. NPRDS, related industry events, and Browns Ferry maintenance history were also reviewed for similar occurrences. Numerous problems have been reported with solenoid valves (Ref. NUREG-1275 & Generic Letter 91-15).

Corrective action for generic concerns on solenoid operated valves is being addressed by TVA per Generic Letter 91-15 and NUREG-1275 which is currently under evaluation.

VII. COMMITMENTS

1. TVA will replace the secondary containment outboard damper solenoids by July 30, 1993.

2. TVA will examine the failed 3-FSV-64-43 solenoid at its laboratory. TVA will also have the vendor, ASCO, examine the solenoid to determine the cause of the failure. This corrective action will be completed by July 30, 1993.

3. TVA will revise PM activity on secondary containment dampers to include an inspection for debris to reduce the risk of debris affecting damper operation by June 30, 1993.

4. TVA will revise the radiation monitor calibration and functional test SI to require damper position verification by February 15, 1993.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].