

TENNESSEE VALLEY AUTHORITY

Browns Ferry Nuclear Plant
Post Office Box 2000
Decatur, Alabama 35609-2000
April 19, 1990

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

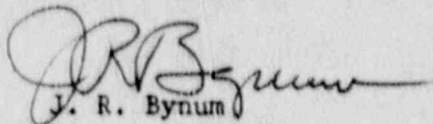
Dear Sir:

TVA - BROWNS FERRY NUCLEAR PLANT (BFN) UNIT 2 - DOCKET NO. 50-260 - FACILITY
OPERATING LICENSE DPR-52 - REPORTABLE OCCURRENCE REPORT BFRO-50-260/90001

The enclosed report provides details concerning the unplanned engineered safety
feature actuations due to a failed radiation detector caused by frequent
disconnection of detector connector. This report is submitted in accordance
with 10 CFR 50.73(a)(2)(iv).

Very truly yours,

TENNESSEE VALLEY AUTHORITY


J. R. Bynum
Vice President
Nuclear Power Production

Enclosures

cc (Enclosures):

Regional Administration
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II
101 Marietta Street, Suite 2900
Atlanta, Georgia 30323

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

NRC Resident Inspector, BFN

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Browns Ferry Unit 2										DOCKET NUMBER (2) PAGE (3) 00500002 06 00 01 OF 03																																							
TITLE (4) Unplanned Engineered Safety Feature Actuation Due to a Failed Radiation Detector Caused by Frequent Disconnection of the Detector Connector																																																	
EVENT DAY (5)					LER NUMBER (6)					REPORT DATE (7)					OTHER FACILITIES INVOLVED (8)																																		
					SEQUENTIAL NUMBER					REVISION NUMBER					FACILITY NAMES Browns Ferry Unit 1					DOCKET NUMBER (5) 015010121519																													
MONTH DAY YEAR					YEAR					MONTH DAY YEAR					Browns Ferry Unit 3					015010121916																													
0 3 2 0 9 0					9 0 0 0 1 0					0 4 1 9 9 0																																							
OPERATING MODE (9) N										THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following)(11)																																							
										20.402(b)										20.405(c)										X 50.73(a)(2)(iv)										73.71(b)									
POWER										20.405(a)(1)(i)										50.36(c)(1)										50.73(a)(2)(v)										73.71(c)									
LEVEL										20.405(a)(1)(ii)										50.36(c)(2)										50.73(a)(2)(vii)										OTHER (Specify in									
(10) 0 0 0										20.405(a)(1)(iii)										50.73(a)(2)(i)										50.73(a)(2)(viii)(A)										Abstract below and in									
										20.405(a)(1)(iv)										50.73(a)(2)(ii)										50.73(a)(2)(viii)(B)										Text, NRC Form 366A)									
										20.405(a)(1)(v)										50.73(a)(2)(iii)										50.73(a)(2)(x)																			

LICENSEE CONTACT FOR THIS LER (12)

NAME Clare S. Hsieh, Engineer, Compliance Licensing										TELEPHONE NUMBER AREA CODE 2 0 5 7 2 9 - 2 0 4 6									
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On March 20, 1990 at 0528 hours, the Unit 2 radiation monitor (2-RM-90-141) on the refuel zone ventilation exhaust received a high radiation trip signal resulting in actuations of engineered safety features (ESFs), including standby gas treatment system, control room emergency ventilation system, and primary containment and refueling zone isolations. The affected components responded as expected to the high radiation signal. The radiation monitor trip indication was verified to be erroneous through comparison with other refuel zone radiation monitor readings and local radiological surveys. The radiation monitor was declared inoperable.

Investigation of this event determined that the radiation detector for 2-RM-90-141 had failed causing the high radiation signal. A connector pin on the radiation detector was found to be loose.

The root cause of this event was due to frequent disconnection of the detector connector for calibration. This resulted in a loose connector pin on the radiation detector. Contributing to this event was the isolation logic which required only a single radiation monitor to fail to actuate ESFs.

The failed radiation detector was replaced. The radiation monitor was declared operable on March 23, 1990 at 1930 hours. TVA has committed in LER 296/89005 to replace the refuel zone and reactor zone radiation monitors. The new radiation monitors will require less frequent calibration, will be powered from redundant power supplies, and will have a revised logic (one out of two taken twice).

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	NUMBER	REVISION	NUMBER		
Browns Ferry Unit 2	0500026090	00	01	00	02	OF	03

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

Description of Event

On March 20, 1990 at 0528 hours, the Unit 2 radiation monitor [IL] (2-RM-90-141) on the refuel zone ventilation exhaust received an erroneous high radiation trip signal resulting in actuations of several engineered safety features (ESFs). ESFs affected by this event include standby gas treatment system [BH], control room emergency ventilation system [VI], primary containment isolation [JM], and refueling zone isolation [VG]. The affected components responded as expected to the high radiation signal. The radiation monitor trip indication was verified to be erroneous through comparison with other refuel zone radiation monitor readings and local radiological surveys. These methods indicated normal radiation level in the refuel zone. The radiation monitor was declared inoperable, and troubleshooting of the monitor was initiated.

Investigation of this event determined that the radiation detector for 2-RM-90-141 had failed causing the high radiation signal. A connector pin on the radiation detector was found to be loose which ultimately caused the failure of the radiation detector. Investigation of the radiation detector determined the cause of the loose pin was due to frequent disconnection of the detector connector for the purpose of calibration. On March 23, 1990, the failed radiation detector was replaced, and the radiation monitor was declared operable at 1930 hours following recalibration.

All three units were shutdown and defueled at the time of this event. No fuel handling or operations over spent fuel were in progress during this event. The unplanned actuations of the ESF systems are reportable in accordance with 10 CFR 50.73(a)(2)(iv).

Analysis of Event

By design, a refuel zone radiation monitor will cause the completion of actuation logic for certain ESF systems on a high radiation trip signal. Since the actuation logic of the ESF systems performed as designed, there were no significant safety concerns associated with the event.

Cause of Event

The root cause of this event was due to frequent disconnection of the detector connector for calibration. This resulted in a loose connector pin on the radiation detector. Contributing to this event was the isolation logic which required only a single radiation monitor to fail to actuate ESFs.

Corrective Actions

As a result of this event, the failed detector was replaced. The radiation monitor was recalibrated and declared operable. In order to minimize the potential for unplanned ESF actuation, TVA has committed in LER 296/89005 to replace the refuel zone and reactor zone radiation monitors. The new radiation monitors will require less frequent calibration, will be powered from redundant power supplies, and will have a revised logic (one out of two taken twice).

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)						PAGE (3)			
				SEQUENTIAL		REVISION					
Browns Ferry Unit 2			YEAR		NUMBER		NUMBER				
	05000261090001000003 OF 03										

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

Previous Similar Events

Actuations of the Browns Ferry refuel and reactor zone radiation monitors in the past have been attributed to electromagnetic interference, failure of undersized relays, and personnel error, but not for degraded connections. However, a poor detector cable connection on a refuel zone ventilation exhaust radiation monitor was the cause of a refuel zone isolation in July 26, 1989 (BFRO-50-259/89019). The connection problem in that event was due to a lack of conductor support during cable movement, which caused the cable for the detector to pull loose from its associated pin. This condition is not believed to have existed for the March 20, 1990 event.

Commitment

None

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