

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

Browns Ferry Nuclear Plant
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August 22, 1989

U.S. Nuclear Regulatory Commission
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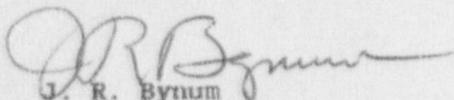
Dear Sir:

TVA - BROWNS FERRY NUCLEAR PLANT UNIT 2 - DOCKET NO. 50-260 - FACILITY
OPERATING LICENSE DPR-52 - REPORTABLE OCCURRENCE REPORT BFRO-50-260/89023

The enclosed report provides details concerning a technical specification violation involving the loss of secondary containment due to the loss of two trains of standby gas treatment system. This report is submitted in accordance with 10 CFR 50.73 (a)(2)(i).

Very truly yours,

TENNESSEE VALLEY AUTHORITY



J. R. Bynum
Vice President
Nuclear Power Production

GGC:FDK:JRB:SJL
Enclosures

cc (Enclosures):

Regional Administration
U.S. Nuclear Regulatory Commission
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Region II
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Atlanta, Georgia 30303

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Atlanta, Georgia 30339

NRC Resident Inspector, Browns Ferry Nuclear Plant

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) BROWNS FERRY UNIT 2	DOCKET NUMBER (2) 0500026101	PAGE (3) 1 OF 04
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TITLE (4) LOSS OF SECONDARY CONTAINMENT DUE TO LOSS OF TWO TRAINS OF STANDBY GAS TREATMENT SYSTEM

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(S)
07	23	89	89	023	0	08	22	89	BROWNS FERRY UNIT 1		050002519
									BROWNS FERRY UNIT 3		050002916

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)

OPERATING MODE (9) N	20.402(b)	20.405(c)	50.73(e)(2)(iv)	73.71(b)
POWER LEVEL (10) 0.010	20.405(a)(1)(i)	50.36(c)(1)	50.73(e)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(e)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(e)(2)(viii)(A)	
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(e)(2)(viii)(B)	
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Jeffrey R. Baxter, Engineer, Compliance Licensing	TELEPHONE NUMBER 205729-2070
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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
X	E K	R L Y	S 3 4 5	N	X	B H	B K R	G O 8 0	Y
X	E K	R L Y	E 1 4 7	N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On July 23, 1989, at 0920 hours, Standby Gas Treatment (SGT) train C became inoperable because of the 3D diesel generator (DG) becoming inoperable. SGT train A was previously declared inoperable on July 23, 1989, at 0230 hours because of problems with the relative humidity heater breaker. The combination of these two events constitute a violation of technical specifications which require a minimum of two trains of SGT operable under the existing plant conditions.

The 3D DG was declared inoperable due to observed arcing and smoke from inside the engine control panel and the inability to shut down the DG by normal means. The failure to stop the DG was attributed to normally open contacts on one of the pinion failure relays, which became stuck in the closed position. The diode installed across the operating coil of the start failure auxiliary (SFA) relay failed, causing the observed arcing and smoke. This arcing produced a voltage transient of sufficient magnitude to fuse the pinion failure relay contacts in the closed position. The diode failure was considered an end of life failure.

The SFA relay and the faulty contacts on the pinion failure relay were replaced. The operability SI for the 3D DG was successfully completed and SGT train C was returned to operable status at 1000 hours on July 24, 1989.

A failure investigation into the cause of the failure of the pinion failure relay contacts has been initiated. The investigation of the SGT train A inoperability is being conducted and tracked under BFRO-50-260/89022.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 9	- 0 2 3	- 0 0	0 2	OF 0 4

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

DESCRIPTION OF EVENT

On July 23, 1989, at 0920 hours, BFN unit 2 exceeded the technical specifications covering SGT (EIIS Code BH) and secondary containment (EIIS Code NG) when the C train of SGT became inoperable. SGT train A was previously declared inoperable on July 23, 1989, at 0230 hours.

At 0920 hours on July 23, 1989, during performance of Surveillance Instruction (SI) 3-SI-4.9.A.3.a, "Common Accident Signal Logic," the 3D DG (EIIS Code EK) was declared inoperable because of observed arcing and smoke and due to the inability of operations personnel to shut down the DG by normal means. As a result of the 3D DG being inoperable, the SGT train C was declared inoperable since the 3D DG is the onsite emergency power supply to SGT train C. The technical specification definitions of Operability and Limiting Condition of Operability require both normal and emergency power when the plant is shut down.

The SI was initiated at 1900 hours on July 22, 1989. The SI normally extends over two to three shifts. Step 7.2.10.1.4 of the SI provided a fast start signal to DG 3D. The DG fast started as expected. At that time, an operator in the vicinity of the diesel noticed arcing and smoke coming from inside the engine control panel. This occurred simultaneously with a start failure alarm received on the local alarm panel. Attempts to reset the alarm were unsuccessful. When an attempt was made to shutdown the diesel, as required by step 7.2.10.4.3 of the SI, the diesel would coast down, but would immediately return to full speed upon release of the stop signal. Several unsuccessful attempts were made, both locally and at the control room, to stop the diesel. The diesel was finally stopped using the emergency fuel cutoff lever and declared inoperable.

SGT train A had been declared inoperable at 0230 hours on July 23, 1989, which was after initiation of the SI and before the problems with the DG developed. SGT train A was declared inoperable because of unexplained tripping of the train's relative humidity heater circuit breaker. Further details of the circumstances surrounding this breaker trip are provided in BFR0-50-260/89022.

The combination of these two events constitute a violation of technical specifications which require a minimum of two trains of SGT operable under the existing plant conditions.

During this event, unit 2 was in cold shutdown with the vessel head removed and irradiated fuel in the vessel. Units 1 and 3 were defueled. No fuel handling or operations over the spent fuel pools occurred during this event.

The SFA relay is manufactured by Electro-Motive Division (GM) as part number 08411979. The pinion failure relay time delay contacts are manufactured by Square D as part number A0-2.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

ANALYSIS OF EVENT

SGT in conjunction with secondary containment is designed to provide a controlled, filtered, and elevated release path for radioactivity to the environment after an accident so that the resulting exposures are kept to a practical minimum and are within the guidelines of 10 CFR 20 and 10 CFR 100, as applicable.

Under the existing plant conditions the only credible design basis accident that could occur is a fuel handling accident. Since no fuel handling or operations over the spent fuel pools were in progress during this event, a condition requiring operation of SGT is not considered credible.

The pinion failure relay time delay contact sticking in the closed position would not alone have led to the loss of secondary containment. This component failure only caused the 3D DG to be declared inoperable which subsequently caused SGT train C to be declared inoperable. Loss of this train in conjunction with the loss of SGT train A due to an unrelated equipment failure (BFRO-50-260/89022) caused the loss of secondary containment.

CAUSE OF EVENT

The violation of technical specifications was caused by the two unrelated and unforeseen equipment failures.

The root cause of the SGT train A relative humidity heater circuit breaker tripping has not yet been determined.

During troubleshooting of the DG problem, it was determined that the cause of the failure of the diesel to stop was attributed to a normally open time delay contact on the pinion failure relay which became stuck in the closed position due to contact fusing. The pinion failure relay coil, instantaneous contacts, and the timing mechanism were determined to function properly. The failure was in the contact assembly only.

Troubleshooting also revealed that the diode installed across the operating coil of the start failure auxiliary (SFA) relay failed, causing the arcing and smoke observed coming from inside the engine control panel. This arcing produced a voltage transient in the SFA relay circuit of sufficient magnitude to fuse the pinion failure relay time delay contacts in the closed position. The diode failure is considered to be an end of life failure. This diode failed when the SFA relay was energized by the closure of the pinion failure relay.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		8 9	0 2 3	0 0	0 4	OF	0 4

TEXT (If more space is required, use additional NRC Form 386A's) (17)

When the contacts of the pinion failure relay closed, and remained closed, the start failure and SFA relays became energized. This sealed in a fast start signal to the DG logic by energizing the fast start relays. The SFA relay is reset by giving the diesel a stop signal, via local controls or those located in the control room. When the stop push button was released and the stop signal was removed, the SFA relay would reenergize due to the stuck pinion failure relay, thus giving the DG another fast start signal. As a result, the diesel would return to full speed when the stop buttons were released.

CORRECTIVE ACTIONS

A troubleshooting maintenance request was initiated to investigate and repair the cause of the arcing from inside the engine control panel and to perform necessary retesting to return the panel and the 3D DG to an operable status. The SFA relay and the faulty contacts on the pinion failure relay were discovered and replaced during this troubleshooting.

Postmaintenance testing for the 3D DG was successfully completed and returned to operable status at 1000 hours on July 24, 1989. This returned SGT train C to operable status.

A failure investigation was initiated which determined the cause of the failure of the time delay contacts of the pinion failure relay.

The investigation of the SGT train A relative humidity heater circuit breaker tripping is being conducted and tracked under BFRO-50-260/89022.

PREVIOUS SIMILAR EVENTS

BFRO-50-259/89026 and 260/89022 both address equipment failures which reduced the number of operable SGT trains below the technical specification requirements. The equipment failures in this event and the previous events are unrelated.

COMMITMENTS

None