ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM
REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8901270386 DOC.DATE: 89/01/20 NOTARIZED: NO DOCKET #
FACIL:50-296 Browns Ferry Nuclear Power Station, Unit 3, Tennessee 05000296
AUTH.NAME AUTHOR AFFILIATION
WILLARD,S.C. Tennessee Valley Authority
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-008-00:on 881221,unplanned ESF actuations.Caused by erratic voltage regulation due to lack of maint.
W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:1 Copy each to: S. Black, J.G.Partlow,S.Richardson 05000296
B.D.Liaw,F.McCoy.

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	SIMMS,M	1	1	PD	1	1
	GEARS,G	1	1			
INTERNAL:	ACRS MICHELSON	1	1	ACRS MOELLER	2	2
	ACRS WYLIE	1	1	AEOD/DOA	1	1
	AEOD/DSP/TPAB	1	1	AEOD/ROAB/DSP	2	2
	ARM/DCTS/DAB	1	1	DEDRO	1	1
	NRR/DEST/ADE 8H	1	1	NRR/DEST/ADS 7E	1	0
	NRR/DEST/CEB 8H	1	1	NRR/DEST/ESB 8D	1	1
	NRR/DEST/ICSB 7	1	1	NRR/DEST/MEB 9H	1	1
	NRR/DEST/MTB 9H	1	1	NRR/DEST/PSB 8D	1	1
	NRR/DEST/RSB 8E	1	1	NRR/DEST/SGB 8D	1	1
	NRR/DLPQ/HFB 10	1	1	NRR/DLPQ/QAB 10	1	1
	NRR/DOEA/EAB 11	1	1	NRR/DREP/RAB 10	1	1
	NRR/DREP/RPB 10	2	2	NRR/DRIS/SIB 9A	1	1
	NUDOCS-ABSTRACT	1	1	~~REG FILE~~ 02	1	1
	RES/DSIR/EIB	1	1	RES/DSR/PRAB	1	1
	RGN2 FILE 01	1	1			
EXTERNAL:	EG&G WILLIAMS,S	4	4	FORD BLDG HOY,A	1	1
	H ST LOBBY WARD	1	1	LPDR	1	1
	NRC PDR	1	1	NSIC HARRIS,J	1	1
	NSIC MAYS,G	1	1			
NOTES:		5	5			

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 20079) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 50 ENCL 49

A/04 cc

RIDS/ADDS RIDS/ADDS

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
BROWNS FERRY UNIT 3	0 5 0 0 0 2 9 6	1 OF 0 4

TITLE (4) UNPLANNED ENGINEERED SAFETY FEATURE ACTUATIONS CAUSED BY ERRATIC VOLTAGE REGULATION DUE TO LACK OF PREVENTIVE MAINTENANCE

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)
									BROWNS FERRY UNIT 1	0 5 0 0 0 2 5 9
1 2	2 1	8 8	8 8	— 0 0 8	— 0 0	0 1	2 0	8 9	BROWNS FERRY UNIT 2	0 5 0 0 0 2 6 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
0 1 0		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)	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
Stephen C. Willard, Engineer, Plant Reporting Section	2 0 5 — 7 2 9 — 2 5 3 6

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	
E	J C	I 9 1 0	0 0 2 6	No							

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 December 21, 1988, at 2005 hours, the unit 3 3B1 and 3B2 Reactor Protection System (RPS) circuit protector tripped deenergizing the 3B RPS bus and completing the initiation logic for engineered safety features (ESF), including a half scram, primary and secondary containment isolations, Standby Gas Treatment and Control Room Emergency Ventilation.

After switching to the alternate supply the unit operator reset the isolations and returned the systems to standby readiness by 2022 hours.

The circuit protectors tripped as designed because of brief voltage fluctuations in the output of the 3B RPS MG set which were caused by pitting on the contact surfaces of the voltage adjustment potentiometer in the MG set voltage regulation circuit.

Preventive maintenance (PM) practices in the past did not specifically address cleaning the voltage adjustment potentiometer and did not incorporate the vendor recommended discontinuity check.

The procedures covering this potentiometer and similar potentiometers will be reviewed and revised as necessary to include cleaning and discontinuity checks.

IE22

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	8 8	— 0 0 8	— 0 0	0 2 OF 0 4

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

Description of Event

Browns Ferry units 1, 2, and 3 were defueled during this event and no fuel handling was in progress. Unit 3 and common ventilation systems were involved.

On December 21, 1988 at 2005 hours the 3B1 and 3B2 Reactor Protection System (RPS) (EIIS code JC) circuit protector tripped deenergizing the 3B RPS bus and completing the initiation logic for the following engineered safety features (ESF).

1. Unit 3 RPS half scram, channel B

2. Containment Isolations/Actuations (EIIS code JM)

   - Unit 3

     Group 2 (Residual Heat Removal) isolation, outboard valves (EIIS code BO)
     Group 3 (Reactor Water Cleanup) isolation, outboard valves (EIIS code CE)
     Group 6 (purging and venting) isolation, outboard valves (EIIS code VB)
     Group 8 (Traversing Incore Probe) isolation (EIIS code IG)
     Reactor zone isolation (EIIS code VA)

   - Common

     Standby Gas Treatment trains A, B, and C (EIIS code BH)
     Control Room Emergency Ventilation (CREV), trains A and B (EIIS code VI)
     Units 1, 2, and 3 refuel zone isolations (EIIS code VG)

Groups 3 and 8 were previously removed from service and CREV was already running as part of a surveillance; therefore, these systems did not actuate upon loss of RPS power. The remainder of the systems listed above actuated as designed.

The unit operator acknowledged the alarms and verified the actuations. Another operator went to Battery Board Room 3 and reset circuit protector 3B1 and attempted to reset 3B2 but was unable. The operator then adjusted the voltage regulator for the 3B RPS MG set (cycled the voltage down, up, and back to normal) and was then able to reset the 3B2 circuit protector. The Shift Operations Supervisor directed that the 3B RPS bus be switched to the alternate supply and a troubleshooting maintenance request be written on the 3B RPS power supply. After switching to the alternate supply the unit operator reset the isolations and returned the systems to standby readiness by 2022 hours.

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	8 8	— 0 0 8	— 0 0	0 3 OF 0 4

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

Cause of Event

The ESF actuations occurred when the 3B1 and 3B2 circuit protectors tripped and deenergized the 3B RPS bus. The circuit protectors tripped as designed because of brief voltage fluctuations in the output of the 3B RPS MG set which were caused by pitting on the contact surfaces of the voltage adjustment potentiometer in the MG set voltage regulation circuit. The pitting was caused by arcing across the contact surfaces. Dirt and other contamination on the surfaces allowed the arcing and the constant use at one position allowed that arcing to deteriorate the surfaces to the point of causing erratic voltage regulation.

Preventive maintenance (PM) practices in the past did not specifically address cleaning the voltage adjustment potentiometer and did not incorporate the vendor recommended discontinuity check.

The voltage adjustment potentiometer is manufactured by Ohmite Manufacturing Company; model #H-0156.

Corrective Action

The 3B1 and 3B2 circuit protectors were reset. The 3B RPS bus was put on the alternate supply and the isolations were reset and the systems were returned to standby readiness. A troubleshooting investigation was initiated which checked the performance of the MG set and the circuit protectors and initially found no problems. Continuous monitoring and recording equipment was installed. Short duration voltage fluctuations were detected with an erratic frequency of occurrance. The MG set voltage regulation circuit was again checked and the degraded voltage adjustment potentiometer was identified. The potentiometer was replaced and the monitoring continued to verify MG set performance.

The preventive maintenance program in general has undergone extensive improvements during the past 2 years. The PM procedure covering the potentiometer had been recently revised to include cleaning the potentiometer but did not include the discontinuity check. The procedures covering this potentiometer and similar potentiometers will be reviewed and revised as necessary to include cleaning and discontinuity checks. The potentiometers in the other RPS MG sets and similar potentiometers will be inspected for cleanliness, degradation, and discontinuities.

Analysis of Event

The systems affected are designed to shutdown the reactor or contain and process any radioactive releases. The systems are designed to fulfill their safety functions upon loss of initiation logic power. The systems responded correctly to the loss of power, therefore, plant safety was not adversely affected. The plant's safe shutdown capabilities would not have

Analysis of Event (continued)

been diminished had the unit been at power. With the units defueled and no fuel handling in progress there was little affect on unit operation.

Previous Similar Events - 259/86002 R1
259/86031 R1
259/87003
259/87015
259/87018
259/88018
259/88044
260/88002
260/88006 R1

These LERs addressed circuit protector trips and subsequent ESF actuations, however, no previous events were attributed to the potentiometer degradation.

Commitments

The procedures covering this potentiometer and similar potentiometers will be reviewed and revised as necessary to include cleaning and discontinuity checks by June 1, 1989.

The potentiometers in the other RPS MG sets and similar potentiometers will be inspected for cleanliness, degradation, and discontinuities by June 1, 1989.

TENNESSEE VALLEY AUTHORITY

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

JAN 30 1989

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

Dear Sir:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 3 - DOCKET NO. 50-296 - FACILITY OPERATING LICENSE DPR-68 - REPORTABLE OCCURRENCE REPORT BFRO-50-296/88008

The enclosed report provides details concerning the unplanned engineered safety feature actuations caused by erratic voltage regulation due to lack of preventive maintenance. This report is submitted in accordance with 10 CFR 50.73 (a)(2)(iv).

Very truly yours,

TENNESSEE VALLEY AUTHORITY

Guy G. Campbell

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

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

NRC Resident Inspector, Browns Ferry Nuclear Plant

IE22
1/1