Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

Joseph R. Bynum
Vice President, Nuclear Operations

APR 25 1991

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-33 - REPORTABLE OCCURRENCE REPORT BFRO-50-260/91006

The enclosed report provides details concerning an average power range monitor exceeding the hi-hi trip setpoint resulting in an unplanned Reactor Protection System actuation. This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv).

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. R. Bynum

Enclosure
cc: see page 2

IE22
1/1

U.S. Nuclear Regulatory Commission

APR 25 1991

cc (Enclosure):
INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

NRC Resident Inspector, BFN

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

Thierry M. Ross
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

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 Unit 2	0 5 0 0 0 2 6	0 1 OF 0 3

TITLE (4) Unplanned Reactor Protection System Actuation Resulting from Local Power Range Monitor Leakage Current

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)
0 3	2 9	9 1	9 1	0 0 6	0 0	0 4	2 5	9 1		0 5 0 0 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)	X 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	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)	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)
Earl M. Ridgell, Compliance Licensing Engineer	2 0 5 7 2 9 - 2 0 4 7

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	J C	N M	G 0 8 2	N					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	0 6	1 7	9 1

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

At 2139 hours on March 29, 1991, an unplanned Reactor Protection System actuation occurred on Unit 2 when average power range monitor (APRM) B drifted high and exceeded the hi-hi setpoint. The input to the APRM is provided by the local power range monitors (LPRMs). During this event, a single LPRM drifted high due to a high leakage current and this resulted in the associated APRM exceeding its setpoint. This event was terminated at 2330 hours on March 29, 1991 when the LPRM was bypassed and the reactor scram was reset.

The root cause of this event was an unexpected failure of the LPRM due to a high leakage current from either the LPRM detector or the LPRM cable.

The initial corrective action was to troubleshoot the LPRM. This testing showed a high leakage current in either the LPRM cable or the LPRM detector.

Additional corrective actions include diagnostic testing of the Neutron Monitoring system and repair or replacement of any affected components as required.

In addition, BFN will submit a revised Licensee Event Report to address the root cause of the LPRM high leakage current and implementation of corrective actions within 30 days after the restart of Unit 2.

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

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

DESCRIPTION OF EVENT

At 2139 hours on March 29, 1991, a unplanned Reactor Protection System (RPS) actuation occurred on Unit 2 when average power range monitor (APRM) [IG] B drifted high and exceeded the hi-hi setpoint. The APRM is a subsystem of the Neutron Monitoring System (NMS) [IG] and receives inputs from the General Electric local power range monitors (LPRMs) [IG], Model NA-200. During this event a single LPRM drifted high and this resulted in the associated APRM drifting high. The normal APRM logic is one out two taken twice for a RPS [JC] actuation. However, in this event the RPS was in the non-coincident mode since three intermediate range monitors (IRMs) [IG] were out of service. The non-coincident mode of the RPS allows a one out of four APRM logic to produce a RPS actuation. Therefore, a single APRM drifting high could actuate the RPS. This event was terminated at 2330 hours on March 29, 1991 when the LPRM was bypassed and the reactor scram was reset.

Initial testing of the LPRM identified a high leakage current from either the cable or the LPRM detector. Additional diagnostic testing is being performed to determine the cause of the high leakage current and to maximize the availabilty of the NMS.

Unit 2 was in cold shutdown at the time of this event and no fuel handling or other operations over the spent fuel were in progress. This event resulted in an unplanned actuation of the RPS and is reportable in accordance with 10 CFR 50.73(a)(2)(iv).

ANALYSIS OF EVENT

The APRM system receives inputs from the LPRMs, the Recirculation System, and the mode switch position. These inputs are utilized to determine the core bulk thermal power, the flow biased rod blocks and scram trips (with the mode switch in run) and the constant power rod blocks and scram trips (with the mode switch not in run). The APRM system then provides outputs to the rod block monitor system, the reactor manual control system and the RPS. The APRM system is required to be operable in all plant modes except shutdown. Since the plant was in cold shutdown at the time of the event, the APRM system was not required to be operable.

During this event, the LPRM drifted high due to a high leakage current. This failure was in the conservative direction and resulted in a tripped condition on the associated APRM. Since the RPS was in the non-coincident mode, the single failure was sufficient for an RPS actuation. The non-coincident mode is the most conservative for operation of the RPS. At the same time, this mode is the most vulnerable to unplanned RPS actuations.

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

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

Plant safety was not adversely affected by this event, nor would it have been had any or all units been operating at power, since the affected systems operated as designed to place the unit in a safe configuration.

CAUSE OF EVENT

The cause of this event was an unexpected failure of the LPRM due to a high leakage current from either the LPRM detector or the LPRM cable. Additional investigations are underway to determine the the cause of the high leakage current. A revision to this LER will be issued to address the cause of the high leakage current.

CORRECTIVE ACTIONS

The following corrective actions will be [or have been] taken based on this event.

The initial corrective action was to troubleshoot the LPRM. This testing showed a high leakage current on either the LPRM detector or the LPRM cable.

Additional diagnostic testing of the NMS will be performed to determine the cause of the high leakage current and to maximize the availability of the NMS system for the restart of Unit 2. This testing will include the IRMs, LPRMs, and SRMs and corrective actions will be based on the results of this testing.

PREVIOUS SIMILAR EVENTS

None

COMMITMENTS

The following commitments are made in this Licensee Event Report (LER):

BFN will perform additional diagnostic testing of the NMS to determine the cause of the high leakage current and to maximize the availability of the system for the restart of Unit 2. This testing will be complete prior to the restart of Unit 2.

BFN will evaluate the corrective actions based on the results of the diagnostic testing prior to the restart of Unit 2.

BFN will submit a revised LER to address the root cause of the LPRM high leakage current and implementation of corrective actions within 30 days after the restart of Unit 2.

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