TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
1750 Chestnut Street Tower II

March 16, 1983

Mr. James P. O'Reilly, Director
U.S. Nuclear Regulatory Commission
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 2 - DOCKET NO. 50-260 - FACILITY OPERATING LICENSE DPR-52 - REPORTABLE OCCURRENCE REPORT BFRO-50-260/82021 - REVISION 1

The enclosed report is a supplement to my letter to you dated August 12, 1982 concerning the inoperability of "B" hydrogen analyzer due to the torus hydrogen sample valve 2-FSV-76-65. This report is submitted in accordance with Browns Ferry unit 2 Technical Specification 6.7.2.b(2).

Very truly yours,

TENNESSEE VALLEY AUTHORITY

H. J. Green
Director of Nuclear Power

Enclosure
cc (Enclosure):
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Washington, D.C. 20555

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NRC Inspector, Browns Ferry

IE 22

UPDATE REPORT

LICENSEE EVENT REPORT

PREVIOUS REPORT DATE 8/12/82

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

Field	Value
LICENSEE CODE (2)	A L B R F 2
LICENSE NUMBER (3)	0 0 - 0 0 0 0 0 - 0 0
LICENSE TYPE (4)	4 1 1 1 1
CAT (5)	
REPORT SOURCE (6)	L
DOCKET NUMBER (7)	0 5 0 0 0 2 6 0
EVENT DATE (8)	0 7 2 0 8 2
REPORT DATE (9)	0 3 1 6 8 3

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

During normal operation, while performing SI4.7.D.1.B-1(A), (H_2O_2 sys. isol. vlv. operability) "B" hydrogen analyzer became inoperable (T.S.3.7.H.2) due to the failure of the torus hydrogen sample valve 2-FSV-76-65. There was no effect on public health and safety. "A" hydrogen analyzer was available and operable. T.S.3.7.H.2 permits operation for 30 days with one hydrogen analyzer inoperable. "B" hydrogen analyzer was inoperable for about 10 days, until the refueling outage began.

Field	Value
SYSTEM CODE (11)	S E
CAUSE CODE (12)	E
CAUSE SUBCODE (13)	A
COMPONENT CODE (14)	V A L V O P
COMP SUBCODE (15)	E
VALVE SUBCODE (16)	Z
LER/RO REPORT NUMBER (17) – EVENT YEAR	8 2
SEQUENTIAL REPORT NO.	0 2 1
OCCURRENCE CODE	0 3
REPORT TYPE	X
REVISION NO.	1
ACTION TAKEN (18)	A
FUTURE ACTION (19)	D
EFFECT ON PLANT (20)	Z
SHUTDOWN METHOD (21)	Z
HOURS (22)	0 0 0 0
ATTACHMENT SUBMITTED (23)	Y
NPRD-4 FORM SUB. (24)	Y
PRIME COMP. SUPPLIER (25)	L
COMPONENT MANUFACTURER (26)	V 0 3 0

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

Solenoid valve failed due to Valcor Engineering Corporation Zener P/N V52676-529 failure. The zeners were removed from the unit 2 valves and SI4.7.D.1.B.1-(A) was successfully completed. Zeners will be removed from units 1 and 3 during the next refueling outage for each unit.

Field	Value
FACILITY STATUS (28)	E
% POWER (29)	0 7 9
OTHER STATUS (30)	NA
METHOD OF DISCOVERY (31)	B
DISCOVERY DESCRIPTION (32)	Surveillance testing
ACTIVITY CONTENT – RELEASED OF RELEASE (33)	Z
ACTIVITY CONTENT – AMOUNT (34)	Z
AMOUNT OF ACTIVITY (35)	NA
LOCATION OF RELEASE (36)	NA
PERSONNEL EXPOSURES – NUMBER (37)	0 0 0
PERSONNEL EXPOSURES – TYPE (38)	Z
DESCRIPTION (39)	NA
PERSONNEL INJURIES – NUMBER (40)	0 0 0
DESCRIPTION (41)	NA
LOSS OF OR DAMAGE TO FACILITY – TYPE (42)	Z
DESCRIPTION (43)	NA
PUBLICITY – ISSUED (44)	N
DESCRIPTION (45)	NA

8303220324 830316
PDR ADOCK 05000260
S PDR

NRC USE ONLY

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Tennessee Valley Authority
Browns Ferry Nuclear Plant

Form BF 17
BF 15.2
2/12/82

LER SUPPLEMENTAL INFORMATION

BFRO-50- 260 / 82021 R1 Technical Specification Involved 3.7.H.2

Reported Under Technical Specification 6.7.2.b.(2) * Date Due NRC 3/18/83

Event Narrative:

Unit 1 was operating at 89-percent power and unit 3 was operating at 96-percent power. Both units were unaffected by this event. With unit 2 operating at 79-percent power, during the performance of Surveillance Instruction (SI) 4.7.D.1.B-1(A) (H202 System Isolation Valve Operability), "B" hydrogen analyzer became inoperable due to the failure of torus hydrogen sample valve 2FSV-76-65. There was no effect on public health and safety. "A" hydrogen analyzer was available and operable. Technical Specification 3.7.H.2 allows operation for 30 days with one hydrogen analyzer operable. The solenoid assembly was replaced. The solenoid assembly for 2-FSV-76-65 failed again during the performance of SI 4.7.D.1.B-1(A). Since the unit was to be shut down for refueling in approximately 10 days, the solenoid assembly was not replaced until further investigation could be performed during the refueling outage when the system was not required.

Investigation revealed that zener diode across the solenoid valve failed during both of these failures. Based upon manufacturer's recommendation, the zener diode assembly was removed from the unit 2 H202 analyzer "A" and "B" valves. The bridge rectifier which supplies power to 2-FSV-76-65 was found to have failed during the current cycle 4 refueling outage. The rectifier was replaced and SI 4.7.D.1.B-1(A) was successfully completed when the system was returned to service for unit restart.

See Attachment for conclusions of investigation concerning this LER, BFRO-50-259/82031, and BFRO-50-259/82068.

* Previous Similar Events:

LER BFRO-50-296/82019, 81037
50-259/82022

Retention: Period - Lifetime; Responsibility - Document Control Supervisor

*Revision: JRP

ATTACHMENT

LER SUPPLEMENTAL INFORMATION

BFRO-50-260/82021 R1

Investigation of recent hydrogen oxygen analyzer circuit failures indicates that there is a direct relationship between failures which result in the closure of the hydrogen-oxygen sample return valves and the failure of pump start relay R2 contacts. When the sample line valve closes abnormally, a cycling effect is created. When the upper setpoint for the pressure switch (PS-76-94A) which controls relay R2 is reached the hydrogen sample inlet pump cuts off. However, as soon as the pressure reduces enough to reset the pressure switch, the hydrogen sample inlet pump restarts, thus creating a cycling effect. The cycling effect results in a chattering of relay R2, which causes an arcing of the contacts. According to the manufacturer's analysis, this arcing results in an excessive temperature rise, and the eventual melting of the nylon spanner guide on the contact cartridge. The melted spanner guide then runs onto the contacts, thereby preventing the contacts on relay R2 from closing and starting the hydrogen sample inlet pump motor. Failure of relay R2 does not seem to occur during normal operation of the hydrogen-oxygen analyzers. It is during an abnormal situation (i.e. personnel error or component failure) when the sample return line solenoid valve closes with the sample pump still running that the cycling effect occurs.

During BFRO-50-259/82031 the erratic operation of handswitch HS-76-59 apparently resulted in the above type of failure. During a subsequent problem with the oxygen sample inlet pump it was found that when HS-76-59 was being placed in the "Drywell" position, it was possible to stop the switch at an intermediate position which would allow the sample inlet pumps to operate with the solenoid valves closed. Handswitch HS-76-59 and the relay contacts were replaced and SI 4.7.H and Special Maintenance Instruction 176 were successfully completed.

During BFRO-50-259/82068 personnel inadvertently disconnected power to the sample return valve, while allowing the sample pumps to run. This resulted in a similar abnormal situation, resulting in the cycling effect and eventual failure of relay R2 contacts as described above.

The most common cause of abnormal solenoid valve closure has been the failure of the zener diode assembly across the input power supply lead wires of the solenoids. During the investigation of BFRO-50-260/82021 R1, it was determined from the manufacturer that the solenoid valves are more reliable with the zeners removed from the circuit. Therefore, all zener diodes were removed from the solenoid valves associated with the unit 2 "A" and "B" hydrogen-oxygen analyzers. The zeners will be removed from units 1 and 3 during the next refueling outage for each unit.

Because this cycling and subsequent relay failure does not seem to occur except after the hydrogen-oxygen analyzer system has already failed due to abnormal valve closure, the relay contact failure is an effect and not a root cause of system failure. Because the root causes of all above described events have been determined and addressed, no further recurrence control to prevent this effect is required.