NRC FORM 366
(7-77)

UPDATE REPORT - PREVIOUS REPORT DATE 1/2/81

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

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

01 | LICENSEE CODE: A L B R F 2 ② | LICENSE NUMBER: 0 0 - 0 0 0 0 0 - 0 0 ③ | LICENSE TYPE: 4 1 1 1 1 ④ | CAT ⑤

CON'T

01 | REPORT SOURCE: L ⑥ | DOCKET NUMBER: 0 5 0 0 0 2 6 0 ⑦ | EVENT DATE: 1 2 0 5 8 0 ⑧ | REPORT DATE: 0 5 1 1 8 1 ⑨

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES ⑩

02 With unit in steady state operation it was found during TI-36A that there was leak on

03 the 2C heat exchanger. Redundant systems were available. There was no public health

04 hazard. See technical specification 3.5.B.5. Previous occurrences: BFRO-50-259/7823,

05 8043; 260/8033, 8034, 8035.

06

07

08

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
09	C F ⑪	X ⑫	Z ⑬	H T E X C H ⑭	X ⑮	Z ⑯

⑰ LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
8 0	—	0 5 3	/	0 3	X	—	1

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS ㉒	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
Z ⑱	X ⑲	Z ⑳	Z ㉑	0 0 0 0	Y ㉓	Y ㉔	N ㉕	P 1 6 0 ㉖

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS ㉗

10 Cause was a leaking inner head gasket on the RHR heat exchanger due to loose flange

11 nuts resulting from thermal cycling and vibration. The gasket was replaced, and

12 new nuts with locking tabs were installed. The heat exchanger was then satisfactorily

13 tested per MMI-49. The addition of locking tabs was the recurrence control. (See

14 attachment 2.)

	FACILITY STATUS	% POWER	OTHER STATUS ㉚	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION ㉜
15	E ㉘	0 9 7 ㉙	NA	B ㉛	Routine test

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY ㉟	LOCATION OF RELEASE ㊱
16	Z ㉝	Z ㉞	NA	NA

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION ㊴
17	0 0 0 ㊲	Z ㊳	NA

PERSONNEL INJURIES

	NUMBER	DESCRIPTION ㊶
18	0 0 0 ㊵	NA

LOSS OF OR DAMAGE TO FACILITY ㊸

	TYPE	DESCRIPTION
19	Z ㊷	NA

PUBLICITY

	ISSUED	DESCRIPTION ㊺	NRC USE ONLY
20	N ㊹	NA	

8105180318

NAME OF PREPARER ______________________ PHONE: ______________________

Tennessee Valley Authority
Browns Ferry Nuclear Plant

Form BF-17
BF 15.2
3/24/81

LER SUPPLEMENTAL INFORMATION

BFRO-50- 260 / 80053R1 Technical Specification Involved 3.5.B.5

Reported Under Technical Specification 6.7.2.b (2)

Date of Occurrence 12/5/80 Time of Occurrence 1240 Unit 2

Identification and Description of Occurrence:

During routine test TI-36A, it was found that RHR heat exchanger 2C was leaking.

Conditions Prior to Occurrence:

Unit 1 at 99% steady state power.

Unit 2 at 97% steady state power

Unit 3 refuel outage

Action specified in the Technical Specification Surveillance Requirements met due to inoperable equipment. Describe.

Performed testing required by Tech. Spec. 4.5.B.5

Apparent Cause of Occurrence:

Leaking inner head gasket due to loose flange nuts caused by thermal cycling and vibration.

Analysis of Occurrence:

There was no danger to the health or safety of the public, no damage to plant or equipment and no resulting significant chain of events.

Corrective Action:

The gasket was replaced and new nuts with locking tabs were used to hold the gasket in place. The heat exchanger was then tested per MMI-49.

Failure Data:

259/8043, 259/7823, 260/8033, 260/8034, 260/8035.

*Retention: Period - Lifetime; Responsibility - Document Control Supervisor

*Revision: ____

ATTACHMENT 2

BFRO-50-260/8053 R1

Recurrent problems have been evident concerning leaking floating head gaskets on the RHR heat exchangers. Apparently thermal cycling and vibration caused loosening of the lock nuts.

Corrective action has consisted of increasing the torque applied to the nuts, installing half size lock nuts, monitoring the RHR system for radiation present, and installing locking tabs.

A report dated February 5, 1981 entitled, "Browns Ferry Nuclear Plant RHR Heat Exchanger Floating Head Stud Tensioning Investigation Report and Recommendations," proposes the following conclusions and recommendations.

Conclusions:

1. The 750 ft-lb torque applied to the nuts does not exert consistent uniform seating stress to the existing gaskets.
2. There is a possibility of exceeding stud yield tension if the torque is increased above 750 ft-lbs unless stud elongation is monitored.
3. RHR heat exchanger floating heads should be reassembled using stud elongation as the acceptance criteria rather than torque value. Accuracy of the elongation measuring device must be ± .001 in. or less to assure proper stress levels and to detect any relaxation of stress over operating periods.

Recommendations:

1. Develop an elongation measuring tool and stud end design capable of measuring elongation with a repeatable accuracy of ± .001 inch.
2. Perform 100% baseline measurement on the next convenient heat exchanger to verify stressed and unstressed stud elongation measurement of 0.025 ± .002 inches.
3. Remeasure elongation after a minimum of one shutdown cooling cycle comparing measurements to the original stressed condition.
4. Reassemble RHR heat exchangers 2D and 3C using lock tabs and 0.25 ± .002 inches stud elongation.
5. Revise MMI-49 to reflect these procedures.