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FACIL:50-260 Browns Ferry Nuclear Power Station, Unit 2, Tennessee 05000260
AUTH.NAME AUTHOR AFFILIATION
HSIEH,C.S. Tennessee Valley Authority
MACHON,R.D. Tennessee Valley Authority
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 95-003-00:on 950207,test results showed that SRVs failed setpoint test acceptance criteria.Caused by corrosion bond of SRV pilot disc/seat interface.Two out-of-tolerance target rock valves being refurbished & retested.W/950307 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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P R I O R I T Y 1 D O C U M E N T

Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

R. D. (Rick) Machon
Vice President, Browns Ferry Nuclear Plant

March 7, 1995

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

10 CFR 50.73

Dear Sir:

BROWNS FERRY NUCLEAR PLANT (BFN) - UNITS 1, 2, AND 3 - DOCKET NOS. 50-259, 50-260, AND 296 - FACILITY OPERATING LICENSE DPR-33, 52, AND 68 - LICENSEE EVENT REPORT 50-260/95003

The enclosed report provides details concerning the Unit 2 main steam safety/relief valves (SRVs) exceeding the technical specifications setpoint limit during tests. A supplemental report will be submitted after the test results of all 13 SRVs have been received.

This report is submitted in accordance with 10 CFR 50.73 (a)(2)(i)(B) as a condition prohibited by the plant's technical specifications.

Sincerely,

R. D. Machon
Site Vice President

Enclosure
cc: See page 2

IE22
1/1

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Browns Ferry Nuclear Plant (BFN) Unit 2	05000260	1 OF 5

TITLE (4) Main Steam Safety/Relief Valves Exceeded the Technical Specifications Required Setpoint Limit as a Result of Disc/Seat Bonding

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 NAME NA	DOCKET NUMBER
02	07	95	95	003	00	03	07	95	FACILITY NAME NA	DOCKET NUMBER

OPERATING MODE (9): N
POWER LEVEL (10): 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.402(b)		20.405(c)		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
	20.405(a)(1)(iii)	X	50.73(a)(2)(i)(B)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
	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 (Include Area Code)
Clare S. Hsieh, Compliance Licensing Engineer	(205)729-2635

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	SB	RV	T020	Y					

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE).	NO		04	10	95

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On February 7, 1995, Wyle Laboratories notified TVA that tests had been completed for 2 of the 13 Unit 2 main steam safety/relief valves (SRVs). The results of the tests showed that the SRVs failed the setpoint test acceptance criteria. The SRV setpoints were found outside the Technical Specification (TS) limit of +/- one-percent setpoint tolerance. This condition is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's TS. The apparent cause was attributed to corrosion bonding of the SRV pilot disc/seat interface resulting in an upward setpoint drift. TVA will submit a supplemental report following receipt of the test results of the remaining SRVs. TVA has implemented one of the Boiling Water Reactor Owners Group's recommendations to reduce corrosion. During the Unit 2 Cycle 7 refueling outage, TVA removed the SRV pilot cartridges from the main steam SRVs and replaced them with cartridges refurbished with a 0.3 percent platinum alloyed stellite pilot disc.

I. PLANT CONDITIONS

Unit 2 was operating at approximately 100 percent power. During the Unit 2 Cycle 7 refueling outage, the safety/relief valve (SRV) pilot cartridges were removed from the Unit 2 main steam [SB] SRVs [RV] for testing. Units 1 and 3 were shutdown and defueled.

II. DESCRIPTION OF EVENT

A. Event:

On February 7, 1995, Wyle Laboratories notified TVA that the tests on the first 2 of the 13 Unit 2 main steam SRVs (Target Rock Two-Stage SRV Model No. 7576F) had been completed. The results of the tests showed that the SRVs failed the setpoint test acceptance criteria.

During the Unit 2 Cycle 7 refueling outage, the SRV pilot cartridges were removed from the Unit 2 main steam SRVs and sent to Wyle Laboratories for testing. On February 7, 1994, the first two SRV pilot cartridges were bench tested, and the test results showed that the pilot cartridges caused the SRVs to open outside the Technical Specifications (TS) limit of +/- one-percent of setpoint tolerance (i.e., the test results were +3.85 percent and +1.95 percent, respectively).

The above condition is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's TS.

B. Inoperable Structures, Components, or Systems that Contributed to the Event:

None.

C. Dates and Approximate Times of Major Occurrences:

During the Unit 2 Cycle 7 outage (October 1, 1994 through November 23, 1994), SRVs pilot cartridges were removed from the Unit 2 main steam SRVs and shipped to Wyle Laboratories for testing. On February 7, 1995, TVA was notified on the results of the first two SRVs tested.

D. Other Systems or Secondary Functions Affected:

None.

E. Method of Discovery:

The deviation from the SRV setpoints was identified during bench testing at Wyle Laboratories in Huntsville, Alabama.

F. Operator Actions:

None.

G. Safety System Responses:

None.

III. CAUSE OF THE EVENT

A. Immediate Cause:

The immediate cause was the deviation of SRV setpoints outside the testing setpoint limit of +/- one-percent tolerance required by TS 2.2.A.

B. Root Cause:

The apparent cause of this event was attributed to corrosion bonding at Target Rock two-stage SRV pilot disc/seat interface. Since corrosion bonding caused an increase in the valve opening pressure due to the need for additional opening force above the setpoint value, this resulted in an upward setpoint drift.

IV. ANALYSIS OF THE EVENT

Thirteen main steam relief valves (MSRVs) on the main steam piping perform the safety/relief function for the primary reactor system boundary. Each valve is designed to open at a pressure sensed in the valve body of 1105, 1115, or 1125 psig providing a safety/relief function. The safety/relief function of the MSRVs is to limit primary reactor system pressure to <1375 psig in the event of a pressurization transient resulting from a turbine trip or a main steam isolation valve closure.

TVA has performed a cycle specific limiting pressurization transient analysis assuming a spectrum of MSRV failures and setpoint drifts. Even if four MSRVs completely fail to open and the remainder operating ten percent above setpoint, the analysis conservatively

shows that the primary reactor system pressure would not have exceeded 1355 psig. As this is within the safety limit of 1375 psig given in TS section 1.2.A, the plant and the public safety would not have been adversely affected and the safety of plant personnel was not compromised.

V. CORRECTIVE ACTIONS

A. Immediate Corrective Actions:

The two out-of-tolerance Target Rock valves are currently being refurbished, retested, and recertified by Wyle Laboratories for use as spares.

B. Corrective Actions to Prevent Recurrence:

The setpoint drift is a generic concern experienced by all utilities using this brand of SRV in boiling water reactors (BWR) and is being investigated by the BWR Owners' Group (BWROG) SRV Drift Fix Development Committee and the manufacturer, Target Rock Corporation.

The Committee recommended replacing the existing stellite 6B pilot disc with a 0.3 percent platinum alloyed stellite or installing several parts in the pilot disc/seat area with catalyst plated platinum alloy to act as a recombiner of excess oxygen, thereby reducing the oxygen available for corrosion. (Note: corrosion is being attributed to radiologically produced oxygen collecting at the disc/seat interface.)

The Committee's recommendation on replacing the stellite 6B pilot disc with a platinum alloyed stellite has been implemented at BFN. During the Unit 2 Cycle 7 refueling outage, TVA replaced the Unit 2 main steam SRVs with a 0.3 percent platinum alloyed stellite pilot disc. Per TS requirements, the valves are bench tested and checked for any increased setpoint deviation or drift at the end of each Unit 2 operating cycle. As a SRV Drift Fix Committee member, TVA is continuing to participate in the BWROG evaluation on the long term solution concerning the SRV setpoint drift problem.

TVA will provide a supplemental report after receiving the test results of all 13 Unit 2 SRVs from Wyle Laboratories.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Unit 2	05000260	95	003	00	5 of 5

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

VI. ADDITIONAL INFORMATION

A. Failed Components:

Target Rock Two-Stage SRVs Model No. 7567F.

B. Previous LERs on Similar Events:

Since the early 1980s, TVA has issued several LERs (e.g., 296/81074, 259/83036, 260/87005, 259/88053, 260/93003) regarding MSRV setpoint drift due to disc/seat corrosion bonding. The BWROG and the valve manufacturer are pursuing corrective actions for the disc/seat corrosion bonding problem. TVA expects the corrective action of using platinum alloy for disc/seat interface should help toward reducing corrosion bonding and thus, decreasing setpoint drift problems in the future.

VII. Commitments

None

Energy Industry Identification System (EIIS) system and component codes are identified in the text with brackets (e.g., [XX].