

LICENSEE EVENT REPORT (LER)

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

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.

FACILITY NAME (1) Browns Ferry Nuclear Plant (BFN) Unit 2.	DOCKET NUMBER (2) 05000260	PAGE (3) 1 OF 5
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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	01	05	04	95	FACILITY NAME NA	DOCKET NUMBER

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 100	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)		TELEPHONE NUMBER (Include Area Code)
NAME Clare S. Hsieh, Compliance Licensing Engineer		(205) 729-2635

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYS TEM	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)		
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO		MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)
 On March 1, 1995, Wyle Laboratories notified TVA that 11 of the 13 Unit 2 main steam safety/relief valves (SRVs) failed the setpoint acceptance tests. 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 has implemented the Boiling Water Reactor Owners Group (BWROG) recommendation to replace the main steam SRV pilot cartridges with cartridges that have a 0.3 percent platinum alloyed stellite pilot disc. During the Unit 2 Cycle 7 refueling outage, TVA removed the SRV pilot cartridges from the Unit 2 main steam SRVs and replaced them with the BWROG recommended cartridges. Using the platinum alloyed disc should help to reduce corrosion bonding and decrease setpoint drift problems in the future.

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Browns Ferry Unit 2	05000260	95	003	01	2 of 5

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

I. PLANT CONDITIONS

At the time of the event, Unit 2 was in its Cycle 7 refueling outage. Units 1 and 3 were shutdown and defueled.

II. DESCRIPTION OF EVENT

A. Event:

On March 1, 1995, Wyle Laboratories notified TVA that 11 of the 13 Unit 2 main steam SRVs (Target Rock Two-Stage SRV Model No. 7576F) failed the setpoint acceptance tests. The SRV setpoints were found outside the Technical Specification (TS) limit of +/- one-percent setpoint tolerance.

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, 1995, 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 TS limit (i.e., the test results were +3.85 percent and +1.95 percent, respectively). On March 1, 1995, bench test results on the remaining SRV cartridges indicated 9 more SRVs opened outside the one-percent setpoint tolerance (from +2.93 percent to +9.80 percent). Altogether, 11 valves failed the setpoint test acceptance criteria.

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. On March 1, 1995, Wyle Laboratories notified TVA of the remaining SRV testing results.



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D. Other Systems or Secondary Functions Affected:

None.

E. Method of Discovery:

The deviation from the SRV setpoints was identified during the scheduled performance of valve 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 due to SRV pilot disc/seat bonding resulting in the SRV setpoints deviating outside the TS setpoint limit of +/- one-percent.

B. Root Cause:

The apparent cause of this bonding was attributed to corrosion at the 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



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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 out-of-tolerance valves are currently being retested and recertified by Wyle Laboratories for future use at BFN.

B. Corrective Actions to Prevent Recurrence:

The setpoint drift is a generic concern experienced by 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.)

At this time, TVA has elected to replace the Unit 2 stellite 6B pilot discs with platinum alloyed stellite discs. During the Unit 2 Cycle 7 refueling outage, TVA removed the SRV pilot cartridges from the Unit 2 main steam SRVs and replaced them with cartridges refurbished with a 0.3 percent platinum alloyed stellite pilot disc.

Additionally, per TS requirements, the SRVs are bench tested and checked for any increased setpoint deviation or drift at the end of each 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. Following this Unit 2 operating cycle, TVA plans to evaluate the SRV test results, as well as relevant industry operating experience, to determine future actions for BFN Units 1, 2, and 3.



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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 MSRVS setpoint drift due to disc/seal corrosion bonding. The BWROG and the valve manufacturer are pursuing corrective actions for the disc/seal corrosion bonding problem. TVA expects the corrective action of using platinum alloy for disc/seal 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]).

