



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

February 11, 2009

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop: OWFN, P1-35
Washington, D. C. 20555-0001

10 CFR 50.73

Dear Sir:

**TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT (BFN) -
UNIT 1 - DOCKET 50-259 - FACILITY OPERATING LICENSE DPR - 33 - LICENSEE
EVENT REPORT (LER) 50-259/2008-003**

The enclosed report provides details of a failure to meet the requirements of the Technical Specifications (TS) Limiting Condition for Operation (LCO) 3.4.3 concerning the main steam relief valve operability.

TVA is reporting this in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation or condition prohibited by the plant's TS. There are no commitments contained in this letter.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. G. West'.

R. G. West
Site Vice President, BFN

cc: See page 2

Handwritten initials 'JESS' above 'WRR' in black ink.

U.S. Nuclear Regulatory Commission
Page 2
February 11, 2009

Enclosure

cc (Enclosure):

Ms. Eva A. Brown, Project Manager
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NRC FORM 366 (9-2007)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104		EXPIRES 08/31/2010												
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)										Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.									
1. FACILITY NAME Browns Ferry Unit 1					2. DOCKET NUMBER 05000259			3. PAGE 1 of 5											
4. TITLE: Main Steam Relief Valve As Found Setpoint Exceeded Technical Specification Lift Pressure																			
5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED										
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME None		DOCKET NUMBER N/A								
12	12	2008	2008	003	00	02	11	2009	FACILITY NAME None		DOCKET NUMBER N/A								
9. OPERATING MODE 1			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)																
10. POWER LEVEL 100			<input type="checkbox"/> 20.2201(b) <input type="checkbox"/> 20.2203(a)(3)(i) <input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> 50.73(a)(2)(vii) <input type="checkbox"/> 20.2201(d) <input type="checkbox"/> 20.2203(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(A) <input type="checkbox"/> 20.2203(a)(1) <input type="checkbox"/> 20.2203(a)(4) <input type="checkbox"/> 50.73(a)(2)(ii)(B) <input type="checkbox"/> 50.73(a)(2)(viii)(B) <input type="checkbox"/> 20.2203(a)(2)(i) <input type="checkbox"/> 50.36(c)(1)(i)(A) <input type="checkbox"/> 50.73(a)(2)(iii) <input type="checkbox"/> 50.73(a)(2)(ix)(A) <input type="checkbox"/> 20.2203(a)(2)(ii) <input type="checkbox"/> 50.36(c)(1)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(iv)(A) <input type="checkbox"/> 50.73(a)(2)(x) <input type="checkbox"/> 20.2203(a)(2)(iii) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.73(a)(2)(v)(A) <input type="checkbox"/> 73.71(a)(4) <input type="checkbox"/> 20.2203(a)(2)(iv) <input type="checkbox"/> 50.46(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(v)(B) <input type="checkbox"/> 73.71(a)(5) <input type="checkbox"/> 20.2203(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(i)(A) <input type="checkbox"/> 50.73(a)(2)(v)(C) <input type="checkbox"/> OTHER <input type="checkbox"/> 20.2203(a)(2)(vi) <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) <input type="checkbox"/> 50.73(a)(2)(v)(D)																
12. LICENSEE CONTACT FOR THIS LER																			
NAME Steve Austin, Licensing Engineer								TELEPHONE NUMBER (Include Area Code) 256-729-2070											
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT																			
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX										
B	SB	RV	T020	Y															
14. SUPPLEMENTAL REPORT EXPECTED								15. EXPECTED SUBMISSION DATE			MONTH	DAY	YEAR						
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO											N/A	N/A	N/A						
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)																			
<p>On December 12, 2008, TVA determined that 10 of the 13 Main Steam Relief Valves (MSRVs) removed from Unit 1 following Cycle 7 operation mechanically actuated at pressures greater than 3 percent above their Technical Specifications (TS) setpoint, thus inoperable. Unit 1 TS limiting condition for operation (LCO) 3.4.3 requires that twelve (12) MSRVs are operable in reactor modes 1, 2, and 3. If less than twelve MSRVs are operable, the unit is to be placed in Mode 3 hot shutdown within 36 hours. As such, it is probable that Unit 1 operated outside the TSs longer than allowed by the TSs. Therefore, TVA is submitting this report in accordance with 10 CFR 50.73(a)(2)(i)(B), as any operation or condition prohibited by the plant's Technical Specifications.</p>																			

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 1	05000259	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 5
		2008	-- 003	-- 00	

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

I. PLANT CONDITION(S)

At the time the inoperability condition was identified, Units 1, 2, and 3 were at 100 percent power (3458 Megawatts thermal) and unaffected by the event.

II. DESCRIPTION OF EVENT

A. Event:

On December 12, 2008, TVA determined that 10 of the 13 Main Steam Relief Valves (MSRVs) [SB], removed from Unit 1 following Cycle 7 operation mechanically actuated at pressures greater than 3 percent above their Technical Specifications (TS) setpoint, thus were inoperable for an unknown time frame during Cycle 7 operation. Unit 1 TS limiting condition for operation (LCO) 3.4.3 requires that twelve (12) MSRVs are operable in reactor modes 1, 2, and 3. If less than twelve MSRVs are operable, the unit is to be placed in Mode 3 hot shutdown within 36 hours. As such, it is probable that Unit 1 operated outside the TSs longer than allowed by the TSs. Therefore, TVA is submitting this report in accordance with 10 CFR 50.73(a)(2)(i)(B), as any operation or condition prohibited by the plant's Technical Specifications.

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

None.

C. Dates and Approximate Times of Major Occurrences:

	MSRV pilot cartridges with TS required setpoints were installed on Unit 1 during the Unit 1 recovery effort.
October 25, 2008	Unit 1 Cycle 7 operation is concluded and the refueling outage is commenced.
December 12, 2008	TVA determined that the as-found lift setpoint in 10 valves exceeded the allowable TS value during the operating cycle.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

The out-of-tolerance lift setpoints were identified during the performance of 0-SR-3.4.3.1.b, Bench Test Relief Valves As-Found, at Wyle Laboratories, Huntsville, Alabama.

F. Operator Actions

None.

G. Safety System Responses

None.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Browns Ferry Nuclear Plant Unit 1	05000259	2008	-- 003	-- 00	3 of 5

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

III. CAUSE OF THE EVENT

A. Immediate Cause

The immediate cause for this reportable condition is an undetectable out-of-tolerance high-lift setpoint drift condition on the MSRVs which existed for longer than allowed by the TSs.

B. Root Cause

The root cause of this condition is a generic industry issue, MSRv pilot valve disc-seat corrosion bonding. A metal oxide film that develops during normal reactor operation which results in a bonding between seat and the disc, which adds resistance to the pressure needed to open the relief valve.

C. Contributing Factors

None.

IV. ANALYSIS OF THE EVENT

The condition being reported is the operation of Unit 1 in a manner prohibited by the TSs. The as-found valve lift setpoints following Unit 1 Cycle 7 operation in summarized in the following table.

Unit 1 Cycle 7 As-Found Lift Setpoints ⁽¹⁾					
Valve Position	Serial Number	MSRV TS Setpoint	1st test/dev.	2nd test/dev.	3rd test/dev.
1-PCV-001-0004	1024	1155	1186/2.7%	1185/2.6%	1179/2.1%
1-PCV-001-0005	1268	1145	1177/2.8%	1162/1.5%	1158/1.1%
1-PCV-001-0018	1266	1145	1307/14.1%	1171/2.3%	1160/1.3%
1-PCV-001-0019	1234	1135	1345/18.5%	1151/1.4%	1141/0.5%
1-PCV-001-0022	1070	1145	1196/4.6%	1158/1.1%	1144/-0.1%
1-PCV-001-0023	1022	1135	1181/4.1%	1166/2.7%	1163/2.5%
1-PCV-001-0030	1258	1145	1215/6.1%	1163/1.6%	1155/0.9%
1-PCV-001-0031	1023	1135	1159/2.1%	1141/0.5%	1145/0.9%
1-PCV-001-0034	1084	1135	1187/5.5%	1134/-0.1%	1131/-0.4%
1-PCV-001-0041	1261	1155	1283/11.1%	1195/3.5%	1175/1.7%
1-PCV-001-0042	1064	1155	1224/6.0%	1182/2.3%	1184/2.5%
1-PCV-001-0179	1254	1155	1180/3.03%	1164/0.8%	1153/-0.2%
1-PCV-001-0180	1265	1155	1267/11.4%	1165/0.9%	1158/0.3%

(1) The shaded values indicate test results outside the TSs required 3 percent tolerance.

The setpoint drift is the result of corrosion bonding at the pilot valve disc-seat interface. The material construction of the pilot valve seat and disk is Stellite 6B. This material has exceptional hardness and wear characteristics. However, when placed in an operating environment typical of a Boiling Water Reactor, the steam exposed surfaces can oxidize forming a surface corrosion film. This corrosion forms a bond between the valve seat and disc. The bond adds to the resistance of the setpoint adjustment spring pressure necessary to open the valve and increases the as-left setpoint of the valve. Generally, once the pilot valve is actuated the corrosion bond is broken, subsequent lift setpoints are within the TS required tolerance.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 1	05000259	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 of 5
		2008	-- 003	-- 00	

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

V. ASSESSMENT OF SAFETY CONSEQUENCES

The safety consequences of this event were not significant. Reactor Vessel overpressure evaluation performed for Unit 1 using the Unit 1 Cycle 7 Reload ASME overpressure and plant transient analysis at 3458 MWT demonstrates compliance with the ASME upset limit of 1375 psig for peak vessel pressure and dome pressure Safety Limit of 1325 psig. The evaluation of the as-found data from the Unit 1 Cycle 7 MSRVs realized a peak reactor vessel pressure of 1332 psig and a maximum steam dome pressure of 1304 psig. An anticipated transient without scram overpressure analyses performed using the limiting Unit 1 event resulted in a peak vessel pressure of 1463 psig demonstrated compliance with the ASME Service level C Limit of 1500 psig. As such, the pressure relief safety objective of the MSRVs was satisfied during the operating cycle.

BFN has previously installed an electronic logic which automatically opens the MSRVs as appropriate during pressurization transients. The electronic logic, although not safety related utilizes high-quality instrumentation that has proven to be very reliable, largely negates the impact on safety presented by this condition. Based on the above, TVA concludes that the health and safety of the public was not affected by this event.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Actions

All MSRV pilot cartridges were replaced during the Unit 1 Cycle 7 refueling outage. Each of the replacement cartridges demonstrated a lift setpoint within the TS requirements during bench testing prior to installation.

B. Corrective Actions to Prevent Recurrence ⁽²⁾

The BFN MSRVs are Target Rock Model 7567F two-stage safety/relief valves. The valve is a leak tolerant valve; however, it exhibits significant in-service setpoint drift due to corrosion bonding to the pilot disc to seat. The current pilot valve seats are constructed from erosion and wear resistant Stellite 6B. The Stellite alloy develops a hard, metal-oxide corrosion layer on the pilot disc. The corrosion bonding requires additional force to break the crystalline structure. The additional force adds to the valves mechanical setpoint and is observed as setpoint apparent drift.

To combat the setpoint drift problem, BFN installed platinum coated pilot valves in the discs on the thirteen Unit 1 MSRVs during the fall outage in 2008. TVA plans to install platinum coated discs on Unit 2 in the spring of 2009 and Unit 3 in the spring of 2010 on all MSRVs. Brunswick and Fermi plants have upgraded to the platinum plated pilot disc which has helped mitigate the corrosion bonding between the pilot discs and improved the setpoint lift values.

VII. ADDITIONAL INFORMATION

A. Failed Components

None.

² TVA does not consider the Corrective Actions to Prevent Recurrence regulatory requirements. The completion of the corrective actions is tracked in TVA's Corrective Action Program.

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FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 1	05000259	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 of 5
		2008	-- 003	-- 00	

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B. PREVIOUS LERS ON SIMILAR EVENTS

Numerous previous reports on similar events have been made by BFN. BFN plans to implement corrective actions that have been successful at other boiling water reactors.

C. Additional Information

Corrective action document for this report is PER 159200.

D. Safety System Functional Failure Consideration:

This event is not a safety system functional failure according to NEI 99-02.

E. Scram With Complications Consideration:

This event was not a complicated scram according to NEI 99-02.

VIII. COMMITMENTS

None.