



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

June 27, 2011

10 CFR 50.73

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Browns Ferry Nuclear Plant, Unit 1
Facility Operating License No. DPR-33
NRC Docket No. 50-259

Subject: **Licensee Event Report 50-259/2011-005-00**

On April 27, 2011, severe weather in the Tennessee Valley service area caused grid instability and a significant loss of offsite power that resulted in a scram of all three units at Browns Ferry Nuclear Plant.

At 2120 hours, Unit 1 experienced a low reactor water level scram due to the reactor water level lowering to +2 inches. The Tennessee Valley Authority is submitting this report in accordance with 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of any of the systems listed in 10 CFR 50.73(a)(2)(iv)(B), except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation.

There are no new regulatory commitments contained in this letter. Should you have any questions concerning this submittal, please contact J. E. Emens, Jr., Nuclear Site Licensing Manager, at (256) 729-2636.

Respectfully,

K. J. Polson
Vice President

Enclosure: Licensee Event Report - Reactor Water Level Scram Due to Distracted Operations Crew

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NRR

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cc (w/ Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant

ENCLOSURE

**Browns Ferry Nuclear Plant,
Unit 1**

Licensee Event Report - Reactor Water Level Scram Due to Distracted Operations Crew

See Attached

LICENSEE EVENT REPORT (LER)

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 FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@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.

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4. TITLE
Reactor Water Level Scram Due to Distracted Operations Crew

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	DOCKET NUMBER
04	27	2011	2011	005	00	06	27	2011	N/A	05000
									FACILITY NAME	DOCKET NUMBER
									N/A	05000

9. OPERATING MODE 3	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
10. POWER LEVEL 000	<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 checked="" 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 type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A						

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Paul Herrmann III, Sr. Licensing Programs Manager	TELEPHONE NUMBER (Include Area Code) 256-729-7479
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

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

On April 27, 2011, at 2120 hours Central Daylight Time, the Unit 1 reactor water level system generated a low reactor water level scram due to a distracted operations crew allowing reactor water level to lower below +2 inches; the Low Level 3 reactor vessel level setpoint. The cause of the event was an operations crew error, because operations personnel did not perform in accordance with accepted or approved practice. At the time of this event, the Reactor Core Isolation Cooling (RCIC) and the Control Rod Drive Systems were injecting into the vessel and the reactor water level band was specified between +2 to +51 inches. The low level scram generated a valid Containment Isolation signal and Groups 2, 3, 6, and 8 isolated as designed. Water level was immediately restored by the operations crew to the specified band using RCIC.

This condition is reportable in accordance with 10 CFR 50.72(b)(3)(iv)(A) for any event or condition that results in a valid actuation of any of the systems listed in paragraph 10 CFR 50.73(a)(2)(iv)(B), except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation.

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NARRATIVE

I. PLANT CONDITIONS

At the time of the event, Browns Ferry Nuclear Plant (BFN) - Unit 1 was in Mode 3, (Hot Shutdown) at zero (0) percent power. The other units were also in Mode 3 from the severe weather event that caused the Loss of Offsite Power (LOSP) that occurred earlier in the day.

II. DESCRIPTION OF THE EVENT

A. Event

On April 27, 2011, at 2120 hours CDT, the Unit 1 reactor water level system generated a low reactor water level scram due to a distracted operations crew allowing reactor water level to lower below +2 inches; the Low Level 3 reactor vessel level setpoint. The cause of the event was an operations crew error in that operations personnel did not perform in accordance with accepted or approved practice. At the time of this event, Reactor Core Isolation Cooling System (RCIC) [BN] and the Control Rod Drive [AA] (CRD) Systems were injecting into the vessel and the reactor level band was specified between +2 to +51 inches. The low level scram generated a valid Containment Isolation signal and Group 2 (Primary Containment Isolation System [JE, JM]), Group 3 (Reactor Water Cleanup Supply Isolation Valves [CE, JM]), Group 6 (Secondary Containment Isolation System [NG, JM]), and Group 8 (Traversing Incore Probe Guide Tubes [IG, JM]) isolated as designed. Water level was immediately restored to the specified band using RCIC and the CRD System.

The Tennessee Valley Authority is submitting this report in accordance with 10 CFR 50.73(a)(2)(iv)(A), any event or condition that results in a manual or automatic actuation of any of the systems listed in paragraph 10 CFR 50.73(a)(2)(iv)(B), except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation.

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

None

C. Dates and Approximate Times of Major Occurrences

April 27, 2011, at 1401 hours	Operations personnel were notified that BFN was under a tornado warning. The actions of procedure 0-AOI-107, "Severe Weather," were addressed.
at 1539 hours	A 500-kV transmission line was lost. Other 500-kV were subsequently lost, followed by the loss of the seventh and last 500-kV line being lost at 1636 hours.

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- at 1622 hours The first 161-kV line was lost. The other 161-kV line did not trip and provided the only sustained source of offsite power to the station during the event and recovery.
- at 1636 hours Units 1, 2, and 3 automatically scrammed due to power load unbalance and prompt turbine trips. Units 1, 2, and 3 entered Mode 3 (Hot Shutdown).
- at 1701 hours BFN declared a Notification of Unusual Event (NOUE) in accordance with Emergency Implementing Procedure (EPIP) 1, "Emergency Classification Procedure," Emergency Action Level 5.1.U - Loss of normal and alternate supply voltage to all unit-specific 4-kV [EA] shutdown boards for greater than 15 minutes and at least two Emergency Diesel Generators [EK] (EDGs) supplying power to unit-specific 4-kV shutdown boards.
- at 2120 hours Unit 1 received a low reactor water level scram due to reactor water level lowering to +2 inches. At the time of this event, RCIC and CRD were injecting to the vessel and the reactor level band specified was +2 to +51 inches. A valid containment isolation signal was received and Groups 2, 3, 6, and 8 isolated as expected.
- at 2238 hours Operations personnel notified NRC of the low level reactor water level scram in accordance with 10 CFR 50.72(b)(3)(iv)(A).
- April 28, 2011, at 1337 hours Unit 1 entered Mode 4.

D. Other Systems or Secondary Functions Affected

None

E. Method of Discovery:

The event was immediately discovered by operations personnel.

F. Operator Actions

Operations personnel immediately increased the RCIC flow controller output that increased the flow of water into the reactor vessel.

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G. Safety System Response

The Unit 1 RCIC turbine governor control system operated as designed. The governor control system responded properly during manual starts on April 27, 2011, at 1639 hours and on April 28, 2011, at 0104 hours. The ramp generator signal converter (RGSC) responded properly and trended with the flow controller output during RCIC System operation. The Electric Governor-Magnetic Pickup (EG-M) Control Box responded properly and trended with the flow controller output during RCIC System operation. The flow controller output and EG-M Control Box output both reached their peak values on April 27, 2011, at 2124 hours following the reactor scram. Based on the above discussion, the Unit 1 RCIC turbine governor system operated as designed.

III. CAUSE OF THE EVENT

A. Immediate Cause

Reactor water level lowered below +2 inches.

B. Root Cause

The cause is Operations leadership not consistently driving and reinforcing standards.

C. Contributing Factors

One of the significant contributing factors is:

- Operations managers and supervisors do not consistently identify and correct gaps in performance.

IV. ANALYSIS OF THE EVENT

The operations crew became distracted due to other events and lost track of water level.

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V. ASSESSMENT OF THE SAFETY CONSEQUENCES

The function of the RCIC System is to provide makeup coolant to the reactor to respond to transient events. The RCIC System is not an Engineered Safety Features system and no credit is taken in the safety analyses for the RCIC System operation. Based upon its overall contribution to the reduction of overall plant risk, the system and its instrumentation meet Criterion 4 of the NRC Policy Statement. The RCIC System provides makeup water to the reactor. The system initiates if vessel level drops to the low level initiation point (Level 3; + 2 inches). The system provides makeup water to the reactor until the reactor vessel water level reaches the high water level (Level 8) trip. In this event, Operations personnel promptly restored water level. Based on the information provided in the LER, the Unit 1 RCIC turbine governor system operated as designed and there were no safety consequences associated with this event.

VI. CORRECTIVE ACTIONS

A. Immediate Corrective Action

The Operations crew involved in this event received coaching.

B. Corrective Actions to Prevent Recurrence

Significant corrective actions taken to prevent recurrence include:

1. Conducted training on transient mitigation strategies.
2. Establish weekly shift manager meetings to focus on performance improvement.
3. Establish the expectation that a Human Performance review board is conducted for each department clock reset and that at a minimum a Senior Reactor Operator (SRO) and Shift Manager (SM) will be in attendance for each board.
4. Operations Manager or Operations Superintendent to conduct board walk downs with each SRO to ensure expectations are being met.
5. Schedule and conduct individual meetings for SMs and Unit Supervisors with Operations management.
6. Establish monthly Unit Supervisor leadership meetings to focus on performance improvement.

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VII. ADDITIONAL INFORMATION

A. Failed Components

None

B. Previous LERs or Similar Events

None

C. Additional Information

The corrective action documents for this report are specified in PER 335574 and PER 363784.

D. Safety System Functional Failure Considerations

The 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