



MAR 14 2005

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U. S. Nuclear Regulatory Commission  
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Washington, DC 20555

LER 311/04-006-01  
SALEM - UNIT 2  
FACILITY OPERATING LICENSE NO. DPR-75  
DOCKET NO. 50-311

This supplement to License Event Report, "Salem Unit 2 Reactor Trip Due to a Malfunction of Main a Feedwater Regulating Valve (21BF19)," is being submitted to incorporate the failed equipment model number.

The attached LER contains no commitments.

Sincerely,

A handwritten signature in black ink, appearing to read "C. Fricker".

Carl Fricker  
Salem Plant Manager

Attachment

/EHV

C Distribution  
LER File 3.7

IE22

# 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: 50 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](mailto: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.

<b>1. FACILITY NAME</b> Salem Generating Station Unit 2	<b>2. DOCKET NUMBER</b> 05000311	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Salem Unit 2 Reactor Trip Due to a Malfunction of a Main Feedwater Regulating Valve (21BF19)

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
07	13	2004	2004	- 006 -	01	03	14	2005		

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)</b>									
	<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)						
<b>10. POWER LEVEL</b>  100	<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 E. H. Villar, Licensing Engineer	TELEPHONE NUMBER (Include Area Code) 856-339-5456
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**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	JB	FCV	Bailey Controller	Yes					

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b>	MONTH	DAY	YEAR
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**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On Tuesday July 13, Salem Unit 2 tripped due to a malfunction of the 21BF19 valve, while Maintenance/I&C personnel were in the process of testing the Digital Feedwater System. Specifically, the Steam Generator Feed Pump differential pressure input to the feedwater system (PT 508) was being tested in accordance with plant procedures. Initially, all the feedwater regulating valves (21-24BF19s) responded as expected. At approximately 1300 hours, the 21BF19 valve stopped responding. The Licensed Nuclear Control Operator placed the controller for the 21BF19 valve in manual and attempted to open the valve. The valve did not respond and the reactor automatically tripped on low steam generator level within approximately 45 seconds of the valve going to 31% open.

The failure of the 21BF19 valve positioner (Bailey model number AV2320200) was due to the failure of the I/P that resulted in a sudden drop from 60% to 30% valve position.

Some of the corrective actions taken were: (1) The 21BF19 positioner was replaced, (2) The digital feed QAM card was replaced, (3) The bezel control for the 21BF19 was removed and the contacts cleaned, and (4) An air operated valve diagnostic test was satisfactorily performed. This report is being made in accordance with 10CFR50.73(a)(2)(iv)(A), "any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)."

**LICENSEE EVENT REPORT (LER)**

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

**PLANT AND SYSTEM IDENTIFICATION**

Feedwater Steam Generator level Control {JB/FCV}{BF}  
Steam Generator Feed Pump {BF/P} (SGFP)

\* Energy Industry Identification System {EIS} codes and component function identifier codes appear as {SS/CCC}

**IDENTIFICATION OF OCCURRENCE**

Event Date: July 13, 2004

Discovery Date: July 13, 2004

**CONDITIONS PRIOR TO OCCURRENCE**

Salem Unit 2 was in Mode 1 (POWER OPERATION) at 100% power at the time of the event. No structures, systems or components were inoperable at the time of the occurrence that contributed to the event.

**DESCRIPTION OF OCCURRENCE**

On Tuesday July 13, maintenance/I&C personnel were in the process of testing the Digital Feed System. Specifically the Steam Generator Feed Pump {BF/P} (SGFP) differential pressure input to the feedwater system (PT 508) was being tested. Initially, all the feedwater regulating valves {JB/FCV} (21-24BF19s) responded as expected. At approximately 1300 hours, the 21BF19 valve stopped responding. The Licensed Nuclear Control Operator (NCO) placed the 21BF19 valve controller in manual and attempted to open the valve. The valve did not respond.

With 21BF19 valve demand at about 60% and increasing, the valve was still indicating approximately 31% open position and not responding. With Salem Unit 2 at 100% power, this difference between valve demand and actual valve position caused the level in the 21 Steam Generator to drop rapidly. The reactor automatically tripped within approximately 45 seconds of the valve going to 31% open.

Subsequent to the trip, a feedwater isolation signal caused the 21BF19 valve to go closed, as designed. Closure of the 21BF19 valve as a result of the reactor trip and the low reactor coolant average temperature signal (feedwater interlock), demonstrated that the 21BF19 valve was not stuck and was capable of performing its design safety function. All other feedwater regulating valves (22,23 and 24BF19s) closed as designed as a result of the feedwater interlock signal. The plant was stabilized in Mode 3 at normal operating pressure and temperature.

This report is being made in accordance with 10CFR50.73(a)(2)(iv)(A), "any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)."

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**CAUSE OF OCCURRENCE**

The apparent cause of this event was attributed to a failure of the 21BF19 valve positioner (Bailey model number AV2320200) due to the failure of the I/P that resulted in a sudden drop from 60% to 30% valve position.

The initial drop in position from 60% to 30% is most likely a result of a failure of the I/P, although testing by the manufacturer did not identify a defect with the I/P. If water or particulate had contaminated the I/P, this moisture would have dried in short order and if particulate contamination occurred, the particulate would have passed when the control signal was disconnected and the I/P reset itself.

Additionally, a functional test and a response test were performed at the manufacturer. The positioner passed both these tests with only drifting of the Linear Variable Differential Transformer (LVDT) noted. The LVDT provides a position backfeed to the digital system and does not affect the response of the valve. Inspection of the positioner at the manufacturer found the shuttle to have a pinhead indication on an outer land. This indication was a result of hard contact with the block and could restrict valve movement by not allowing the positioner output to respond to a change in demand.

**PREVIOUS OCCURRENCES**

A review of reportable events for Salem and Hope Creek in the last two years identified the following events involving the steam generator feedwater control system.

LER 272/2003-003 issued on December 5, 2003, described a Salem Unit 1 Shutdown as a result of 14BF19 failing to control level because of being immovable. The root cause of this event was determined to be foreign material lodged between the valve plug and the inside diameter of the cage.

LER 272/2002-004 issued on January 13, 2003, described a Salem Unit 1 manual reactor trip as a result a Steam Generator Feedwater Pump (SGFP) runback resulting from voltage decrease in the control power to its governor.

The root causes for these events were different than the apparent cause for the event being reported in this LER; therefore the corrective actions taken for these previous events would not have prevented this occurrence.

**SAFETY CONSEQUENCES AND IMPLICATIONS**

There were no safety consequences associated with this event.

As stated in the description of event, the 21BF19 valve fully closed as a result of the reactor trip and the low reactor coolant average temperature signal (feedwater interlock), demonstrating that the valve was not stuck and therefore capable of performing its design safety function

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

**SAFETY CONSEQUENCES AND IMPLICATIONS (cont'd)**

A review of this event determined that a Safety System Functional Failure (SSFF) as defined in NEI 99-02 did not occur.

**CORRECTIVE ACTIONS**

1. The 21BF19 positioner was replaced.
2. The digital feed QAM card (auto/manual station interface) was replaced.
3. The bezel control for the 21BF19 was removed and the contacts cleaned.
4. An air operated valve diagnostic test was satisfactorily performed.
5. LER 311/2004-007 issued September 13, 2004, documents additional corrective actions taken relative to this event.

**COMMITMENTS**

This LER contains no Commitments.