



SEP 04 2012

LR-N12-0233

10CFR 50.73

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

LER 311/2012-002  
Salem Nuclear Generating Station Unit 2  
Facility Operating License No. DPR-75  
NRC Docket No. 50-311

SUBJECT: Auxiliary Feedwater Flow Control Valve Failed Open with Zero Demand

The Licensee Event Report, "Auxiliary Feedwater Flow Control Valve Failed Open on Demand," is being submitted pursuant to the requirements of the Code of Federal Regulations, 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by Technical Specifications" and 10 CFR 50.73(a)(2)(v)(D), "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident."

The attached LER contains no commitments. Should you have any questions or comments regarding the submittal, please contact David Lafleur of Salem Regulatory Assurance at 856-339-1754.

Sincerely,

  
Carl J. Fricker  
Site Vice President – Salem

Attachments (1)

1E22  
NRC

SEP 04 2012

cc

Mr. W. Dean, Administrator – Region 1, NRC  
Mr. John Hughey, Licensing Project Manager – Salem, NRC  
Mr. D. Schroeder, USNRC Senior Resident Inspector, Salem (X24)  
Mr. P. Mulligan, Manager IV, NJBNE  
Mr. T. Joyce, President and Chief Nuclear Officer – Nuclear  
Mr. T. Cachaza, Salem Commitment Tracking Coordinator  
Mr. L. Marabella, Corporate Commitment Tracking Coordinator  
Mr. D. Lafleur, Salem Regulatory Assurance

# 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 Records and 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.

<b>1. FACILITY NAME</b> Salem Generating Station - Unit 2	<b>2. DOCKET NUMBER</b> 05000311	<b>3. PAGE</b> 1 of 4
--	-------------------------------------	--------------------------

**4. TITLE**  
Auxiliary Feedwater Flow Control Valve Failed Open with Zero Demand

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	05	2012	2012	0 0 2	0	09	04	2012		DOCKET NUMBER

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§:</b> <i>(Check all that apply)</i>			
<b>10. POWER LEVEL</b>  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 checked="" 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 David Lafleur, Senior Compliance Engineer, Salem Regulatory Assurance	TELEPHONE NUMBER (Include Area Code) (856) 339-1754
--	--

**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
A	BA	HCV	M120	Y					

<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
--	-------------------------------------	-------	-----	------

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

On July 5, 2012, at approximately 0307 hours while performing in-service testing of the 21 Auxiliary Feedwater (AFW) Pump {BA/P}, 23AF21, the AFW Flow Control Valve {BA/FCV} to the 23 Steam Generator (SG) {SB/SG}, failed open and could not be closed from the control room. The 21 AFW Pump was stopped and the 23AF21 valve closed automatically. The failure of the 23AF21 valve to respond from the control console was due to a mispositioned air supply valve to the 23AF21 valve electro-pneumatic converter.

This report is being made in accordance with 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by Technical Specifications" and 10 CFR 50.73(a)(2)(v)(D), "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident."

**LICENSEE EVENT REPORT (LER)**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Salem Generating Station Unit 2	05000311	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 4
		2012	- 0 0 2 -	00	

**NARRATIVE**

**PLANT AND SYSTEM IDENTIFICATION**

Westinghouse – Pressurized Water Reactor (PWR/4)

Auxiliary Feedwater System (AFW) {BA/-}

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

**IDENTIFICATION OF OCCURRENCE**

Event Date: July 5, 2012

Discovery Date: July 5, 2012

**CONDITIONS PRIOR TO OCCURRENCE**

Salem Unit 2 was in Operational Mode 1 at 100% power with no other structures, systems or components inoperable at the time of the discovery that contributed to the event.

**DESCRIPTION OF OCCURRENCE**

On July 5, 2012, Salem Unit 2 was in Mode 1, operating at 100% power and steady state conditions. In-service testing of the 21 AFW Pump was in progress in accordance with station surveillance testing procedure S2.OP-ST.AF-0001. At approximately 0307 hours upon start of the 21 AFW Pump, 23AF21, the AFW Flow Control Valve to the 23 SG was observed to be open. Flow to the 23 SG was observed along with an increase in 23 SG level. Normal in-service testing of the 21 AFW Pump aligns the pump discharge for recirculating flow back to the AFW Storage Tank {BA/TK} and flow to a SG is not an expected condition for this test. The control room operator attempted to manually close the valve from the control panel but the valve would not respond to valve controller demand. At approximately 0308 hours the 21 AFW Pump was stopped from the control room and the 23AF21 valve was verified to have closed automatically.

Unit 2 declared entry into two Technical Specification (TS) Action Statements at 0307 hours. TS 3.7.1.2 was entered for inoperability of the 21 AFW Pump and TS 3.6.3 was entered for inoperability of Containment Isolation Valve 23AF21.

At 0325 hours the AFW flow path to the 23 SG was manually isolated in compliance with TS Action Statement 3.6.3. At 1000 hours, troubleshooting identified the cause of the failure to be the

**LICENSEE EVENT REPORT (LER)**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Salem Generating Station Unit 2	05000311	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 of 4
		2012	- 0 0 2 -	00	

**NARRATIVE**

misposition of an air supply valve to the 23AF21 electro-pneumatic converter. The valve was returned to its normally open position. Valve 23AF21 was retested successfully and the unit exited TS 3.6.3 at 1220 hours. A successful retest of the 21 AFW Pump was performed and the 21 AFW Pump was declared operable. TS 3.7.1.2 was exited at 1349 hours.

An 8 hour report to the NRC was made at 1745 hours under 10 CFR 50.72(b)(3)(v)(D), "Any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems needed to mitigate the consequences of an accident."

**CAUSE OF OCCURRENCE**

Troubleshooting identified the cause of the failure to be the misposition of air supply valve 2FA3957 IV to the 23AF21 electro-pneumatic converter. The air supply valve was in the closed position instead of its normal open position. Valve 2FA3957 IV is located in local AFW system air control panel 205-2. The 23AF21 valve is an air to close actuating valve and a loss of air to the flow control valve electro-pneumatic converter caused 23AF21 to fully open on the start of the 21 AFW Pump.

A review of work history in the area which might have affected the 23AF21 air supply valve could not identify the cause of the mispositioned valve. The likely cause of this event was inadvertent valve manipulation of 2FA3957 IV sometime between the time of discovery and the previously performed AFW surveillance test on April 5, 2012. A causal evaluation of this event is in progress.

**PREVIOUS OCCURRENCES**

A review of LERs for Salem Units 1 and 2 for the previous three years did not identify any similar events.

**SAFETY CONSEQUENCES AND IMPLICATIONS**

This event did not adversely affect the ability of the AFW system to deliver AFW flow to the SGs. The 21 AFW Pump was capable of performing its design function of providing AFW flow to the 23 and 24 SGs.

This event is reported under 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications." The mispositioning of the air supply valve to 23AF21 may have placed the 21 AFW Pump in an inoperable status as early as the last in-service test of the 21 AFW Pump which occurred on April 5, 2012 (91 days). This would have made the AFW Pump inoperable for a period greater than the AFW TS 3.7.1.2 Allowed Outage Time of 72 hours for single pump inoperability. Further investigation of maintenance and testing history indicated that the 23 AFW Pump was also inoperable due to scheduled maintenance for approximately 29 hours during this period. This could have created a

**LICENSEE EVENT REPORT (LER)**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Salem Generating Station Unit 2	05000311	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 of 4
		2012 - 0 0 2 - 00			

**NARRATIVE**

condition in which two AFW Pumps were inoperable for a time exceeding the 6 hour AFW TS 3.7.1.2 Allowed Outage Time for two pump inoperability. The Containment Isolation function of 23AF21 would also have been inoperable during this 91, day period exceeding the Containment Isolation Valve TS 3.6.3 isolation requirement of 4 hours.

This event is also reported under 50.73(a)(2)(v)(D), "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident." The Salem Updated Final Safety Analysis Report (UFSAR) assumptions for a postulated Steamline Break and Main Feedline Break allow only 10 minutes for operators to perform necessary actions to terminate AFW flow to a faulted SG. In the case of a steamline or main feedline break, blow down of the affected SG could cause a Lo-Lo SG Level AFW Pump auto-start actuation signal to lock-in preventing the stopping of the AFW Pump from the control room panel and continue to feed the SG. Emergency Operating Procedures provide continuous action steps for isolating a faulted SG. A failed open 23AF21 which could not be closed from the control room would need to be locally closed, isolated, or it's associated 21 AFW Pump breaker would need to be tripped. Subsequent steaming through the SG fault greater than the 10 minute time could result in higher containment design pressure and temperature.

A review of this event determined that a Safety System Functional Failure as defined in Nuclear Energy Institute (NEI) 99-02 did occur.

**CORRECTIVE ACTIONS**

1. An extent of condition component lineup verification was performed on both Salem Units 1 and 2 for the AFW system air control panels. No other issues were identified.
2. A causal evaluation is in progress to determine root causes and any further corrective actions.

**COMMITMENTS**

No commitments are made in this LER