



OCT 23 2015

LR-N15-0220

10 CFR 50.73

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

Salem Nuclear Generating Station, Units 1 and 2  
Renewed Facility Operating License Nos. DPR-70 and DPR-75  
NRC Docket Nos. 50-272 and 50-311


Subject: Licensee Event Report 272/2015-006-000

In accordance with the requirements of 10 CFR 50.73 (a)(2)(ii)(B), PSEG Nuclear LLC is submitting the enclosed Licensee Event Report (LER) Number 272/2015-006-000, "Pressurizer Power Operated Relief Valves and Block Valves Do Not Meet the Requirements of 10 CFR 50 Appendix R."

If you have any questions or require additional information, please contact Mr. Timothy Sexsmith at 856-339-1611.

There are no regulatory commitments contained in this letter.

Sincerely,

  
John F. Perry  
Site Vice President  
Salem Generating Station

Attachment : Licensee Event Report 272/2015-006-000

OCT 23 2015

10 CFR 50.73

Page 2  
LR-N15-0220

cc: Mr. D. Dorman, Administrator – Region 1, NRC  
Mr. T. Wengert, Licensing Project Manager – Salem, NRC  
Mr. P. Finney, USNRC Senior Resident Inspector, Salem (X24)  
Mr. P. Mulligan, Manager IV, NJBNE  
Mr. R. Braun, 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)**

(See Page 2 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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollections.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 1	<b>2. DOCKET NUMBER</b> 05000272	<b>3. PAGE</b> 1 OF 4
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**4. TITLE** Pressurizer Power Operated Relief Valves and Block Valves Do Not Meet the Requirements of 10 CFR 50 Appendix R.

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
08	26	2015	2015	- 006	- 000	10	23	2015	Salem Generating Station – Unit 2	05000311
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
1	<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)
10. POWER LEVEL  100%	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input checked="" 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 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 Timothy Sexsmith, Compliance Engineer, Salem Regulatory Assurance	TELEPHONE NUMBER (Include Area Code) 856-339-1611
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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
A									

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

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

On August 26, 2015, a fire scenario was identified that could cause spurious operation of the Pressurizer Power Operated Relief Valves (PORVs) and also prevent the ability to manually close the associated PORV Block Valves. The fire scenario would invalidate the assumptions in the Safe Shutdown Analysis with respect to Reactor Coolant System Inventory and Pressure Control.

The cause of this issue was a failure to validate previous corrective actions to ensure compliance with 10 CFR 50, Appendix R. Corrective actions include the development and installation of plant modifications to restore compliance with 10 CFR 50, Appendix R.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(ii)(B), "Any event or condition that results in the nuclear power plant being in an unanalyzed condition."



**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

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 and Information Collections Branch (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.

1. FACILITY NAME	2. DOCKET	6. LERNUMBER			3. PAGE
Salem Generating Station – Unit 1	05000272	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		2015	- 006	- 000	

**NARRATIVE**

**PLANT AND SYSTEM IDENTIFICATION**

Westinghouse - Pressurized Water Reactor {PWR/4}  
 Pressurizer Power Operated Relief Valves (PORVs) {AB/PCV}

Energy Industry Identification System (EIIS) codes and component function identifier codes appear as {SS/CCC}.

**IDENTIFICATION OF OCCURRENCE**

Event Date: August 26, 2015  
 Discovery Date: August 26, 2015

**CONDITIONS PRIOR TO OCCURRENCE**

Salem Units 1 and 2 were in Operational Mode 1, operating at approximately 100 percent power at the time this issue was identified. Since this was an analytical issue, the current status of structures, systems, and components did not impact the evaluation of the issue.

**DESCRIPTION OF OCCURRENCE**

On August 26, 2015, a fire scenario was identified that could cause spurious operation of the Pressurizer Power Operated Relief Valves (PORVs) coincident with loss of power assumptions for Appendix R scenarios, thus preventing the ability to manually close the associated PORV Block Valves. This fire scenario would invalidate the assumptions in the Safe Shutdown Analysis with respect to Reactor Coolant System (RCS) inventory and pressure control.

As documented in the Salem Fire Protection Safe Shutdown Analysis, the current Appendix R strategy for isolation of the High/Low Pressure Interface for a postulated fire in the Control/Relay Rooms is to close the Pressurizer PORVs (PR1/PR2) and Pressurizer PORV Block Valves (PR6/PR7) from the control room prior to evacuation. However, the current Safe Shutdown Analysis does not include the required evaluations to credit these actions.

Following evacuation of the Control Room, plant procedures provide steps to de-energize the DC distribution cabinets, and local closure of the PORV Block Valves by manual operation of the bypass switches located at the associated Motor Control Center (MCC). Since offsite power is assumed to be unavailable and the Emergency Diesel Generators (EDGs) are not available at the beginning of this scenario due to fire induced failures, manual closure of the block valves from the local MCCs will be delayed until the EDGs are restored.

(01-2014)

## LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Salem Generating Station – Unit 1	05000272	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 4
		2015	- 006	- 000	

**NARRATIVE**

This strategy was implemented to resolve spurious operation of the PORVs concurrent with failure of the PORV Block Valves for a fire in the control room and relay rooms that was identified in LER 272/99-009-00 submitted in October 1999. The loss of RCS inventory or impact on pressure control was not accounted for during the delay to close the PORV block valves.

An eight-hour NRC Event Notification (EN) was required by 10 CFR 50.72(b)(3)(ii)(B), "Any event or condition that results in the nuclear power plant being in an unanalyzed condition that significantly degrades plant Safety." EN 51349 was completed on August 26, 2015, at 1630. This LER is being submitted pursuant to the requirements of 10 CFR 50.73 (a)(2)(ii)(B).

**CAUSE OF EVENT**

The cause of this issue was a failure to validate that actions taken in 1999 to correct the issue ensured compliance with Appendix R. A review of the procedure changes did not take into account the regulatory requirements and assumptions of Appendix R, including timelines to implement the procedure actions.

**SAFETY CONSEQUENCES AND IMPLICATIONS**

As a nuclear power plant in operation prior to January 1, 1979, Salem Unit 1 is committed to the Fire Protection Program as described in 10 CFR 50, Appendix R. Even though Salem Unit 2 was licensed after January 1, 1979, it also follows Appendix R through a license condition which endorses the approved fire protection program.

When considering the effects of fire, those systems associated with achieving and maintaining safe shutdown conditions assume major importance to safety because damage to them can lead to core damage resulting from loss of coolant through boil-off. Because fire may affect safe shutdown systems and because the loss of function of systems used to mitigate the consequences of design basis accidents under post-fire conditions does not per se impact public safety, the need to limit fire damage to systems required to achieve and maintain safe shutdown conditions is greater than the need to limit fire damage to those systems required to mitigate the consequences of design basis accidents.

Although this issue was identified as a non-conformance with Appendix R, the likelihood of a fire scenario that could cause spurious operation of the PORVs that results in loss of inventory and pressure control is low due to the following:

- After completion of the current procedure steps for initial fire response, multiple circuit failures would be required for fire induced spurious operation of the PORVs.
- Control cables at Salem are equipped with metal shields which would eliminate the potential circuit failure when cables are located in cable trays. The circuit failure type is still credible inside the control cabinets where the metal shielding is removed.

(01-2014)

## LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Salem Generating Station – Unit 1	05000272	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
		2015	- 006	- 000	

**NARRATIVE**

- In accordance with IEEE Standard 384, the Relay Room is considered a Limited Hazard Area. The standard defines a Limited Hazard Area as a plant area “from which potential hazards such as missiles, non-electrically induced fires, and pipe failure are excluded.” It also states, that in a Limited Hazard Area, the only energy available to damage electrical circuits is that energy associated with failure or faults internal to electrical equipment or cables within the area. Transient combustible loading is strictly controlled in the relay rooms. In addition, the Relay Rooms are inspected by plant operators and fire protection personnel.
- In the 100 foot elevation Relay Room, smoke and thermal detectors are provided. Smoke detectors are provided in the exhaust ventilation duct. Detector alarms are annunciated in the Control Room. Fire suppression is provided by an automatic, total flooding Halon-1301 system automatically actuated by cross-zoned smoke detection. Actuation of the Halon-1301 system is indicated on the fire protection panel in the Control Room.

Even though the consequences of loss of reactor coolant inventory and pressure control are serious, the fire induced spurious operation of the PORVs is a very low probability event. Therefore, this issue has minimal safety significance.

**SAFETY SYSTEM FUNCTIONAL FAILURE**

A review of this event determined that this event was not a Safety System Functional Failure (SSFF) as defined in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline.

**PREVIOUS OCCURRENCES**

A review of Salem Unit 1 and 2 Licensee Event Reports for the previous three years identified one similar occurrence. LER 272/2013-004-000 reported in January 2014, identified the existence of unfused ammeter circuits which also resulted in an unanalyzed condition due to not fully meeting the requirements of 10 CFR 50, Appendix R, Section III.G.

Additionally, this issue was previously identified and reported in October 1999, in LER 272/99-009-000, when a review of the Salem Post-fire Safe Shutdown analysis identified a similar concern with the PORV and associated block valves.

**CORRECTIVE ACTIONS**

- Compensatory actions have been implemented in the affected areas of the plants.
- Develop and install plant modifications to restore compliance with 10 CFR Appendix R.

**COMMITMENTS**

This LER contains no regulatory commitments.