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Nuclear Business Unit

OCT 2 1997

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U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

LER 311/97-013-00  
SALEM GENERATING STATION - UNIT 2  
FACILITY OPERATING LICENSE NO. DPR-75  
DOCKET NO. 50-311

Gentlemen:

This Licensee Event Report entitled "Unplanned Entry into 3.0.3  
Due to Two Inoperable Pressurizer Level Channels" is being  
submitted pursuant to the requirements of the Code of Federal  
Regulations 10CFR50.73(a)(2)(i)(B).

Sincerely,

A. C. Bakken III  
General Manager  
Salem Operations

Attachment

MKG/tcp

C Distribution  
LER File 3.7

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The power is in your hands.

**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of  
digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-8 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

<b>FACILITY NAME (1)</b> SALEM GENERATING STATION, UNIT 2	<b>DOCKET NUMBER (2)</b> 05000311	<b>PAGE (3)</b> 1 of 4
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**TITLE (4)**  
UNPLANNED ENTRY INTO 3.0.3 DUE TO TWO INOPERABLE PRESSURIZER LEVEL CHANNELS

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	02	97	97	013	00	10	02	97	FACILITY NAME	DOCKET NUMBER
<b>OPERATING MODE (9)</b>		1	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)</b>							
<b>POWER LEVEL (10)</b>		39%	20.2201(b)	20.2203(a)(2)(v)		x	50.73(a)(2)(i)		50.73(a)(2)(viii)	
			20.2203(a)(1)	20.2203(a)(3)(i)			50.73(a)(2)(ii)		50.73(a)(2)(x)	
			20.2203(a)(2)(i)	20.2203(a)(3)(ii)			50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(ii)	20.2203(a)(4)			50.73(a)(2)(iv)		OTHER	
			20.2203(a)(2)(iii)	50.36(c)(1)			50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)	50.36(c)(2)			50.73(a)(2)(vii)			

**LICENSEE CONTACT FOR THIS LER (12)**

<b>NAME</b> Mel Gray, Licensing Engineer	<b>TELEPHONE NUMBER (Include Area Code)</b> 609-339-2191
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**COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS

<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>				<b>EXPECTED SUBMISSION DATE (15)</b>		<b>MONTH</b>	<b>DAY</b>	<b>YEAR</b>
YES (If yes, complete EXPECTED SUBMISSION DATE.)	X	NO						

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**

At the time of occurrence Salem Unit 2 was in Mode 1 at 39% Reactor Power. On August 29, 1997, Salem Unit 2 pressurizer level channel III exceeded the level deviation between channels and was declared inoperable. Channel III was placed in a tripped condition in accordance with Technical Specifications. On September 2, 1997, Maintenance personnel prepared to isolate channel III at the root valve to support troubleshooting. Root valve 2PS9 was shut at 0548 hours and immediately pressurizer level channel I failed low. Since channel I was selected as a controlling channel, pressurizer heaters tripped off, letdown isolation valves closed and maximum charging flow was initiated. TS 3.0.3 was entered for two inoperable pressurizer level channels (I & III). The pressurizer heaters were restored and valve 2PS9 was reopened within approximately 3 minutes. Following a satisfactory channel check, channel I was restored and TS 3.0.3 exited at 0554 hours. Subsequent investigation identified an error in the controlled drawing used to identify the root valve. Corrective actions include revision of drawings to remove this error.

This event is reportable in accordance with 10CFR50.73(a)(2)(i)(B) as a condition prohibited by plant Technical Specifications.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
SALEM GENERATING STATION UNIT 2	05000311	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		97	- 013	- 00	

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

PLANT AND SYSTEM IDENTIFICATION

Westinghouse - Pressurized Water Reactor

Reactor Coolant System {AB/LT}

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

CONDITIONS PRIOR TO OCCURRENCE

At the time of occurrence Salem Unit 2 was in Mode 1 at 39% Reactor Power. At 0650 hours on August 29, 1997, Salem Unit 2 pressurizer level channel III exceeded the 3% level deviation between channels and was declared inoperable. Technical Specification (TS) 3.3.1.1 Action 6 was entered.

TS 3.3.1.1 requires the reactor trip system instrumentation channels and interlocks of Table 3.3-1 to be OPERABLE. The three (3) Pressurizer Water Level channels are identified in Table 3.3-1 with Action #6 applicable. Action #6 allows continued plant operation with one inoperable pressurizer level channel that is placed in the tripped condition. At 0746 hours on August 29, 1997, pressurizer level channel III was placed in the tripped condition as required by TS 3.3.1.1, Action 6.

DESCRIPTION OF OCCURRENCE

Three pressurizer liquid level transmitters {AB/LT} provide signals for use in the Reactor Control and Protection System and the Chemical and Volume Control Systems. Each transmitter provides an independent high water level signal that is used to actuate an alarm and, upon two out of the three transmitter signals, will cause a reactor trip. Two of the three transmitters may be selected to provide an alarm when the liquid level falls to the fixed low level setpoint. The same signal will trip the pressurizer heaters "off" and close the letdown isolation valves. Two transmitters are similarly selected to supply a signal to the liquid level setpoint controller.

On September 2, 1997, Maintenance personnel were preparing to backfill the pressurizer level channel III transmitter (2LT-461) sensing leg in order to restore the channel to within tolerance. The level transmitters are typically isolated by the cabinet isolation valves. For backfilling the lines, the root valves were to be closed to provide isolation.

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

The Reactor Coolant System (RCS) piping and instrumentation (P&ID) drawing, the MMIS computer component identification system and a figure in the applicable I&C procedure indicated that valve 2PS9 was the instrument root valve for the variable leg to pressurizer level channel III transmitter 2LT-461.

Valve 2PS9 was shut at 0548 hours on September 2, 1997 and immediately pressurizer level channel I failed low. Since channel I was selected as a controlling channel, this caused pressurizer heaters to trip off, letdown isolation valves to close and initiated maximum charging flow. TS 3.0.3 was entered for two inoperable pressurizer level channels (I & III) and the pressurizer heaters were restored. Valve 2PS9 was reopened within approximately 3 minutes of closure. Following completion of a satisfactory channel check, pressurizer level channel I was declared OPERABLE, and TS 3.0.3 was exited at 0554 hours. Letdown was restored at 0559 hours.

This event is reportable in accordance with 10CFR50.73(a)(2)(i)(B) as a condition prohibited by plant Technical Specifications.

CAUSE OF OCCURRENCE

Subsequent investigation identified that the cause of occurrence was an error in the Reactor Coolant System P&ID drawing. The drawing shows 2PS9 as the root valve to pressurizer channel level III transmitter 2LT-461; however 2PS9 is the instrument root valve for pressurizer level channel I transmitter 2LT-459. 2PS11 is the correct instrument root valve for 2LT-461. When the operator closed 2PS9, the pressurizer level channel I variable leg was isolated and the channel failed low.

The channel I and channel III instrument root valves (2PS9 and 2PS11) were incorrectly swapped on Salem Unit 2 Reactor Coolant P&ID drawing 205301. Salem Unit 2 arrangement drawings show the correct configuration. This error was introduced over a series of revisions to P&ID drawing 205301 from 1982 to 1986. These revisions incorrectly incorporated the root valve data from instrumentation schematics. A contributing factor may have been that the Salem Unit 1 design has these valves swapped from the Salem Unit 2 design. In 1986, personnel involved may have assumed the Unit 2 configuration was identical to the Unit 1 configuration. It appears that subsequently utilizing the P&ID drawing, the Unit 2 drawing error was propagated to the MMIS database and a figure that appears in an I&C procedure. Discovery of this error was delayed because these instrument root valves are rarely used. As stated previously, the subject transmitters are normally isolated using cabinet isolation valves. This P&ID drawing error is considered to be an isolated configuration issue on the pressurizer instrumentation.

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PRIOR SIMILAR OCCURRENCES

A review of LERs for the past two years did not identify any prior similar occurrences of components rendered inoperable due to drawing deficiencies.

SAFETY SIGNIFICANCE

This event reduced the redundancy in the pressurizer level - high circuit from one out of two to one out of one logic. The event resulted in isolation of letdown flow, shutdown of pressurizer heaters, and initiation of maximum charging, and therefore placed additional thermal and mechanical stresses on primary coolant system components. The pressurizer high level signal and corresponding reactor trip provides protection against RCS overpressurization by limiting pressurizer water level to a volume sufficient to retain a steam bubble and prevent water relief through the pressurizer safety valves. No credit is taken for the operation of this trip in accident analyses. Its functional capability enhances the overall reliability of the reactor protection system. Decreasing the redundancy in the pressurizer - high level signal to one out of one logic decreased the overall reliability of this trip. However considering the prompt operator action taken to stabilize plant conditions and the defense in depth designed into the overall reactor protection system, this event did not impact the health and safety of the public.

CORRECTIVE ACTIONS

1. Pressurizer Channel I was restored within six minutes of the event.
2. Pressurizer Channel III was returned to service on September 17, 1997.
3. PSE&G has reviewed Salem Unit 1 arrangement, I&C, mechanical piping drawings and I&C procedure figures and verified them to be consistent with regard to pressurizer root valve to transmitter configuration.
4. PSE&G has revised the Salem Unit 2 drawings to indicate the correct root valve to transmitter configuration. The MMIS database has also been corrected.
5. PSE&G will revise the figure in the applicable I&C procedure to correct this error by November 15, 1997.