

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) SALEM GENERATING STATION - UNIT 1	DOCKET NUMBER (2) 0 5 0 0 0 2 7 2	PAGE (3) 1 OF 0 4
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TITLE (4)
REACTOR TRIP FROM 93% DUE TO PARTIAL CLOSURE OF 11BF19

EVENT DATE (6)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)												
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES			DOCKET NUMBER(S)									
1	23	1	8	4	8	4	0	2	9	0	0	0	1	3	0	8	5				0 5 0 0 0

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)									
POWER LEVEL (10) 0 9 3	20.402(b)	20.405(a)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)					
	20.406(a)(1)(i)	50.36(a)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	73.71(e)					
	20.406(a)(1)(ii)	50.36(a)(2)	<input type="checkbox"/>	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 308A)					
	20.406(a)(1)(iii)	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(vii)(A)						
	20.406(a)(1)(iv)	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(vii)(B)						
20.406(a)(1)(v)	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER (12)

NAME J. L. Rupp	TELEPHONE NUMBER 6 0 9 3 3 9 - 4 3 1 0 9
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS
B	J E L S V	A 6 0 9	Y						

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15) MONTH: DAY: YEAR:
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

At 2130 hours, December 31, 1984, a reactor trip occurred due to No. 11 Steam Generator steam flow/feed mismatch, coincident with a low steam generator water level. The feedwater transient which initiated the event was the result of the partial closure of No. 11 Steam Generator Feedwater Regulating Valve (11BF19). The partial closure of 11BF19 was caused by a combination of an intermittent connection to one of the two series isolation solenoid valves (associated with 11BF19), coupled with seat leakage to atmosphere from the same valve. The leaking series isolation valve was replaced, and the loose solenoid connection was tightened. The remaining series isolation valves were inspected; no leakage was observed, and all connections were found to be tight. 11BF19 and its associated control circuitry were tested with satisfactory results. No. 11 Steam Generator feedwater control loop was instrumented for startup. Unit 1 was returned to service at 2017 hours, January 1, 1985, and the Steam Generator Feedwater Level Control System has continued to function satisfactorily since that time. The Reactor Protection System functioned as designed, and the event involved no undue risk to the health or safety of the public. Due to the automatic actuation of the Reactor Protection System, the event is reportable in accordance with 10CFR 50.73(a)(2)(iv).

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PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

IDENTIFICATION OF OCCURRENCE:

Reactor Trip From 93% - No. 11 Steam Generator Steam Flow/Feed Flow Mismatch Coincident With Low Steam Generator Water Level

Event Date: 12/31/84

Report Date: 01/30/85

This report was initiated by Incident Report No. 84-221

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 - Rx Power 093 % - Unit Load 1051 MWe

DESCRIPTION OF OCCURRENCE:

At 2122 hours, December 31, 1984, while investigating the cause of a feedwater transient which had occurred approximately one hour earlier, "No. 11 Steam Generator Steam Flow/Feed Flow Mismatch" alarm was received in the control room. Observing No. 11 Steam Generator feedflow dropping rapidly with a corresponding steam generator level decrease, operators immediately took manual control of 11BF19 (No. 11 Steam Generator Feedwater Regulating Valve) and attempted to open the valve fully. Valve demand was at one-hundred percent (100%); however, 11BF19 did not reach the fully open position, as indicated by the lack of the open light on the control room bezel. Feed flow continued to drop, and at 2123 hours a reactor trip occurred due to No. 11 Steam Generator steam flow/feed flow mismatch, coincident with a low steam generator water level signal.

The Unit was stabilized in Mode 3, and at 2146 hours, in accordance with the requirements of the Code of Federal Regulations, 10CFR 50.72(b)(2)(ii), the Nuclear Regulatory Commission was notified of the automatic actuation of the Reactor Protection System [JC].

APPARENT CAUSE OF OCCURRENCE:

The root cause of the feedwater transient and reactor trip associated with No. 11 Steam Generator was determined to be the partial closing of 11BF19. The partial closing of 11BF19 was caused by a combination of an intermittent 125VDC connection to one of the two series isolation solenoid valves (located between 11BF19 valve positioner and diaphragm), coupled with seat leakage to atmosphere from the same valve.

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APPARENT CAUSE OF OCCURRENCE: (cont'd)

The resultant drop in feed flow to No. 11 Steam Generator caused an initial spike in feed flow to the remaining three steam generators, followed by a drop in feed flow to all steam generators. This drop in total feed flow was caused by the steam generator feed pump control circuit responding to an increased regulating valve differential pressure, which was initiated by the partial closure of 11BF19. The subsequent steam generator level drop to twenty-five percent (25%), coincident with steam flow greater than feed flow resulted in the reactor trip.

ANALYSIS OF OCCURRENCE:

This reactor trip, on steam flow/feed flow mismatch with low steam generator water level, is an anticipatory trip. Its function is to prevent a loss of heat sink capability, by sensing conditions which would eventually result in a dry steam generator. By tripping the reactor prior to reaching the low-low level setpoint in the steam generator, the required starting time and capacity requirements for the Auxiliary Feed System [BA] are reduced; thereby, minimizing the thermal transient on the steam generators and the Reactor Coolant System [AB]. The Reactor Protection System [JC] functioned as designed. This occurrence involved no undue risk to the health or safety of the public. Because of the automatic actuation of the Reactor Protection System, the event is reportable in accordance with the Code of Federal Regulations, 10CFR 50.73(a)(2)(iv).

CORRECTIVE ACTION:

11BF19 was stroke tested with satisfactory results. The valve positioner calibration was checked; calibration was satisfactory. The valve was inspected for diaphragm leakage; no leakage was found. 11BF19 current/pneumatic converter was calibrated; a minor adjustment was necessary. No. 11 Steam Generator feedwater control loop calibration was checked; calibration was satisfactory.

The leaking series isolation solenoid valve associated with 11BF19 was replaced, and the loose connection to the valve solenoid was tightened. The remaining seven (7) series isolation solenoid valves (two per feed regulating valve, four feed regulating valves) were inspected for similar problems; however, the valves were verified not to be leaking, and all connections were tight. A review of the valve history revealed no recent maintenance activities which could account for the loose connection. Since this was the only valve affected, and because this problem has not been previously encountered, this was considered an isolated event with no further corrective actions (involving the series isolation solenoid valves) required.

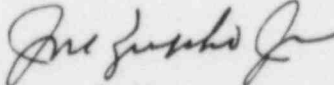
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CORRECTIVE ACTION: (cont'd)

A brush recorder was installed on No. 11 Steam Generator feedwater control loop to monitor system operation during and following the subsequent startup. Unit 1 was returned to operation at 2017 hours, January 1, 1985, and the Steam Generator Feedwater Level Control System [JB] has continued to function satisfactorily since that time.

Although a separate issue, a comparison of the initial feedwater transient, which occurred approximately one hour prior to the reactor trip, with the transient immediately preceding the trip was performed. This comparison revealed that although they were similar in many respects, there were some differences between the two transients. Even though the root cause of the transient which resulted in the reactor trip has been determined and corrected, further evaluation of the initial transient is being performed to ensure that no underlying problems associated with the Steam Generator Feedwater Level Control System are present.


General Manager-
Salem Operations

JLR:tns

SORC Mtg 85-021



Public Service Electric and Gas Company P.O. Box E Hancocks Bridge, New Jersey 08038

Salem Generating Station

January 30, 1985

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

Dear Sir:

SALEM GENERATING STATION
LICENSE NO. DPR-70
DOCKET NO. 50-272
UNIT NO. 1
LICENSEE EVENT REPORT 84-029-00

This Licensee Event Report is being submitted pursuant to the requirements of 10CFR 50.73(a)(2)(iv). This report is required within thirty (30) days of discovery.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "J. M. Zupko, Jr.", written in dark ink.

J. M. Zupko, Jr.
General Manager -
Salem Operations

JR:tcs *JMJ*

CC: Distribution

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