

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Salem Generating Station - Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 2 1 7 2	PAGE (3) 1 OF 0 3
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TITLE (4)
Reactor Trip From 100% Caused by The Closure of 14BF19

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 NAMES		DOCKET NUMBER(S)
0 2	2 0	8 6	8 6	0 0 6	0 0	0 3	2 1	8 6			0 5 0 0 0 0

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)																						
POWER LEVEL (10) 1 0 0	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.406(c)	50.36(c)(1)	50.36(c)(2)	50.73(a)(2)(i)	50.73(a)(2)(ii)	50.73(a)(2)(iii)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vi)	50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(ix)	73.71(b)	73.71(e)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)	
										<input checked="" type="checkbox"/>													

LICENSEE CONTACT FOR THIS LER (12)											
NAME J. L. Rupp - Operations Licensing Engineer								TELEPHONE NUMBER 6 0 9 3 3 9 - 4 3 0 9			

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUF. TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUF. TURER	REPORTABLE TO NPRDS	
B	J B C B L		X 9 9 9	Y						

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On February 20, 1986, a reactor trip occurred due to No. 14 Steam Generator steam flow/feed flow mismatch, coincident with a low steam generator water level signal. This occurred when 14BF19 (No. 14 Steam Generator Feedwater Regulating Valve) drifted closed and failed to respond to the full open demand signal in the automatic or manual mode of operation. The Reactor Protection System functioned as designed, and this occurrence involved no undue risk to the health or safety of the public. The "root" cause was determined to be a broken wire which supplies a series isolation solenoid valve associated with 14BF19. The wire was apparently damaged during original installation when the insulation was removed to make a crimped connection. The normal vibration experienced in the area of the BF19 valves ultimately caused the damaged wire to break. When the solenoid valve de-energized, air was bled from the diaphragm of 14BF19 causing the valve to close. The damaged portion of the wire was removed, and a new lug was installed and properly crimped. As a preventative measure, the similar connections on the remaining three steam generator feedwater regulating valves were replaced. The Unit was returned to service on February 21, 1986, and the Steam Generator Water Level Control System has continued to function satisfactorily since that time.

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PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

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

IDENTIFICATION OF OCCURRENCE:

Reactor Trip From 100% - No. 14 Steam Generator Steam Flow/Feed Flow Mismatch Coincident With Low Steam Generator Water Level

Event Date: 02/20/86

Report Date: 03/21/86

This report was initiated by Incident Report No. 86-048

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 - Rx Power 100 % - Unit Load 1115 MWe

DESCRIPTION OF OCCURRENCE:

On February 20, 1986, during routine power operation, the Unit experienced a sharp decrease in feedwater flow, followed by a rapidly lowering water level in No. 14 Steam Generator. The Steam Generator Water Level Control System [JB] was in automatic at the time of the occurrence, and the demand signal for 14BF19 (No. 14 Steam Generator Feedwater Regulating Valve) was indicating 100%. However, 14BF19 was not responding to the full open demand signal, and operators took manual control of the valve. The valve also failed to respond in the manual mode of operation, and at 0142 hours a reactor trip occurred due to No. 14 Steam Generator steam flow/feed flow mismatch, coincident with a low steam generator water level signal.

The Unit was stabilized in Mode 3 (Hot Standby), and at 0202 hours, in accordance with the requirements of the Code of Federal Regulations, 10CFR 50.72(b)(2)(ii), the Commission was notified of the automatic actuation of the Reactor Protection System [JC].

APPARENT CAUSE OF OCCURRENCE:

The cause of the feedwater transient associated with No. 14 Steam Generator was determined to be the closing of 14BF19. The "root" cause was determined to be a broken wire which supplies one (1) of the two (2) series isolation solenoid valves associated with 14BF19. This multi-strand wire was broken at the point where it entered a crimped lug. Examination revealed that several of the strands had been broken for some time, with only a few of the strands indicating a recent break. The initial damage most likely occurred during original installation when the insulation was removed to make the crimped connection.

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APPARENT CAUSE OF OCCURRENCE: (cont'd)

This remained undetected due to the protective sleeving which covered the damaged area. It appears that the few remaining strands finally parted due to the vibration which is normally experienced in the area of the BF19 valves.

The series isolation solenoid valves are located between the 14BF19 valve positioner and valve diaphragm. The broken wire caused one (1) solenoid valve to de-energize which, in turn, caused air to bleed off of the diaphragm resulting in the closure of 14BF19. The subsequent steam generator level drop to twenty-five percent (25%), coincident with steam flow greater than feed flow, resulted in the reactor trip.

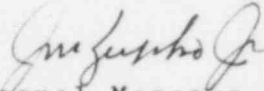
ANALYSIS OF OCCURRENCE:

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 functioned as designed, and this occurrence involved no undue risk to the health or safety of the public. However, 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:

The damaged portion of the wire was removed, and a new lug was installed and properly crimped. As a preventative measure, this same procedure was performed for the similar connections on the remaining steam generator feedwater regulating valves (11, 12 and 13BF19). Additionally, the Engineering and Plant Betterment Department is performing an investigation for possible methods of reducing the vibration in the area of the BF19 valves. This item is being addressed by SORC Open Item number 86-011-02.

The Unit was returned to service at 1718 hours, February 21, 1986. The Steam Generator Water Level Control System has continued to function satisfactorily since that time.


General Manager-
Salem Operations

JLR:tns

SORC Mtg 86-016



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

Salem Generating Station

March 21, 1986

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 86-006-00

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.".

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

JLR:ama

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The Energy People