

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Salem Generating Station - Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 1 1	PAGE (3) 1 OF 0 4
--	--------------------------------------	----------------------

TITLE (4)
Reactor Trip From 5% Due to Steam Flow/Feed Flow Mismatch

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		
0 4	2 4	8 4	8 4	0 1	2 0	0 5	2 4	8 4			
									DOCKET NUMBER(S) 0 5 0 0 0		
									0 5 0 0 0		

OPERATING MODE (9) 2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)										
POWER LEVEL (10) 0 0 5	20.402(b)	20.406(a)(1)(i)	20.406(a)(1)(ii)	20.406(a)(1)(iii)	20.406(a)(1)(iv)	20.406(a)(1)(v)	20.406(a)(1)(vi)	20.406(a)(1)(vii)	20.406(a)(1)(viii)	20.406(a)(1)(ix)	20.406(a)(1)(x)
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	80.73(a)(2)(iv)	80.73(a)(2)(v)	80.73(a)(2)(vi)	80.73(a)(2)(vii)(A)	80.73(a)(2)(vii)(B)	80.73(a)(2)(viii)	80.73(a)(2)(ix)	80.73(a)(2)(x)	80.73(a)(2)(xi)	80.73(a)(2)(xii)	80.73(a)(2)(xiii)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

LICENSEE CONTACT FOR THIS LER (12)

NAME J. L. Rupp	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	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	S B V		W 1 2 0	N					

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On April 24, 1984, unit startup operations were in progress. Upon latching the turbine, No. 21 Turbine Stop Valve failed to open. Personnel were immediately dispatched to investigate. The stop valve was subsequently opened, resulting in an increase in turbine speed, followed by a reactor/turbine trip. This was caused by the setting of a terminal speed into the Setter Display Unit, and placing the Turbine Control System in the automatic mode of operation prior to having all four turbine stop valves opened. This resulted in a turbine governor valve demand signal, which, upon opening of the stop valve, caused a large in-rush of steam to the turbine. The reactor trip occurred as the result of a steam flow/feed flow mismatch, caused by the sudden steam demand when the turbine stop valve was opened, coincident with a twenty-five percent level in No. 21 Steam Generator. The turbine stop valve did not open upon latching the turbine due to the inoperability of the bypass valve pilot valve. The pilot valve stroke was adjusted, and the valve was satisfactorily tested. A change was made to the turbine operating instruction to ensure that all turbine stop valves are open prior to increasing the speed of the turbine. This occurrence involved no undue risk to the health or safety of the public. The Reactor Protection System functioned as designed.

8405300065 840524
PDR ADOCK 05000311
S PDR

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station Unit 2	DOCKET NUMBER 05000311	LER NUMBER 84-012-00	PAGE 2 OF 4
------------------------------------	---------------------------	-------------------------	----------------

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 Protection System [JC] - Reactor Trip From 5% - Steam Flow/Feed Flow Mismatch With Concurrent 25% Level in No. 21 Steam Generator - (Reactor Trip #84-08)

Event Date: 04/24/84

Report Date: 05/24/84

This report was initiated by Incident Report No. 84-059

CONDITIONS PRIOR TO OCCURRENCE:

Mode 2 - Rx Power 005 % - Unit Load 0000 MWe

DESCRIPTION OF OCCURRENCE:

On April 24, 1984, unit startup operations were in progress. Reactor power level was approximately five percent (5%). The turbine was latched, and the Turbine Control System (EHC) was placed in the "AUTO" mode of operation, with "GO" initiated. When the turbine was latched, No. 21 Turbine Stop Valve (21MS28) failed to open. Personnel were immediately dispatched to investigate and remedy the problem with the stop valve. 21MS28 was subsequently opened, which was followed by a turbine speed increase. The EHC System tripped to "MANUAL", followed almost immediately (at 0927 hours) by a reactor trip and turbine trip. Other indications were as follows:

1. Overhead annunciator alarm F-5 (Steam Flow/Feed Flow Mismatch).
2. Overhead annunciator alarm F-30 (Turbine Trip & P-7).
3. No. 21 Steam Generator Level (Channels III and IV) low level bistables tripped, as indicated on 2RP5 Status Panel.
4. A large in-rush of steam to the turbine was heard upon the opening of 21MS28.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station Unit 2	DOCKET NUMBER 05000311	LER NUMBER 84-012-00	PAGE 3 OF 4
------------------------------------	---------------------------	-------------------------	----------------

APPARENT CAUSE OF OCCURRENCE:

Investigation revealed that 21MS28 failed to open, upon turbine latching, due to a failure of the equalizing valve pilot valve to operate. The pilot valve allows air to open the equalizing valve (21MS901), which, in turn, reduces the differential pressure across 21MS28; thereby allowing it to open.

The cause of the high steam flow condition was apparently due to the setting of a terminal speed of five-hundred and twenty (520) RPM in the Setter Display Unit prior to all four stop valves being open. This caused a generated turbine governor valve demand signal, which, upon the opening of 21MS28, resulted in a large in-rush of steam to the turbine. This sudden steam supply to the turbine increased the turbine speed. The EHC System tripped to "MANUAL" due to the deviation between the setter unit reference and the actual speed of the turbine.

The reactor trip occurred as the result of a steam flow/feed flow mismatch, caused by the sudden steam demand when the turbine stop valve was opened, coincident with a twenty-five percent (25%) level in No. 21 Steam Generator.

The overhead annunciator alarm F-30 (Turbine Trip & P-7) was caused by the turbine being tripped by the reactor, and then "seeing" that it was greater than P-7, due to the turbine impulse pressure spike (yielding P-13 an input to P-7).

ANALYSIS OF OCCURRENCE:

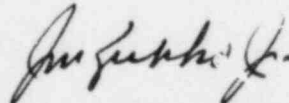
As stated, this reactor trip occurred as a result of increasing turbine speed, while efforts were in progress to open one of the turbine stop valves, which had not opened when the turbine was latched. When the stop valve was opened, a steam flow spike occurred. Since the level in one steam generator had been allowed to drift below twenty-five percent (25%) prior to the latching operation, a reactor trip occurred when the steam flow exceeded feed flow by 1.4×10^6 lbm/hr. 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).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Salem Generating Station Unit 2	DOCKET NUMBER 05000311	LER NUMBER 84-012-00	PAGE 4 OF 4
------------------------------------	---------------------------	-------------------------	----------------

CORRECTIVE ACTION:

The stroke of 21MS901 pilot valve was adjusted, and the valve was tested for proper operation. An "On-The-Spot" change was made to the turbine operating instruction; a note was added, stating that all four (4) turbine stop valves should be open prior to setting a terminal speed of five-hundred and twenty (520) RPM in the Setter Display Unit. In accordance with recommendations by the Station Operations Review Committee, a news letter item was issued on April 24, 1984, stating that operators should not latch the turbine when any steam generator low level bistable is actuated on any steam generator. All turbine stop valves operated satisfactorily on the subsequent unit startup.



General Manager-
Salem Operations

JLR:tns

SORC Mtg 84-062



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

Salem Generating Station

May 24, 1984

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

Dear Sir:

SALEM GENERATING STATION
LICENSE NO. DPR-75
DOCKET NO. 50-311
UNIT NO. 2
LICENSEE EVENT REPORT 84-012-00

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

JR:k11 *Jaf*

CC: Distribution

IE22
1/1