NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

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

TITLE (4)

Reactor Trip From 17.5% Power During Startup Operations

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 5 0 0 0
0 4	1 7	8 5	8 5	- 0 0 5	- 0 0	0 5	1 7	8 5		0 5 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)	0 1 8	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
J. L. Rupp	AREA CODE 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	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On April 17, 1985, during Unit startup operations, a "water hammer" noise was heard in the reheat steam line associated with No. 21 Steam Generator Feed Pump. An equipment operator opened a steam trap drain valve, a solid stream of water issued from the trap. While in the process of draining water from the reheat steam line, No. 21 Steam Generator Feed Pump speed and discharge pressure decreased sharply. This was followed by decreasing steam generator water levels. The Auxiliary Feedwater Pumps were started, and a Unit load reduction was initiated. The water level in No. 24 Steam Generator reached low-low level setpoint (8%), which resulted in a reactor/turbine trip. The cause of the reactor trip was the inability of the steam traps to adequately remove the condensate which had collected in No. 21 Steam Generator Feed Pump reheat steam supply line. The root cause was attributed to crud and corrosion products (normally found in steam drain piping), which collected in the reheat steam drain line piping following the extended shutdown for refueling. This occurrence involved no undue risk to the health or safety of the public. Because if 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).

IE22
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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 17.5% - No. 24 Steam Generator Low-Low Water Level

Event Date: 04/17/85

Report Date: 05/17/85

This report was initiated by Incident Report No. **85-101**

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 - Rx Power 17.5 % - Unit Load 090 MWe

DESCRIPTION OF OCCURRENCE:

On April 17, 1985, Unit startup operations were in progress. The Unit was sychronized to the grid and reactor power level was increased to 17.5% at 1916 hours. The Steam Generator Feedwater Level Control Systems [JB] were in automatic and controlling satisfactorily. At approximately 1922 hours, a "water hammer" noise was heard in the reheat steam line associated with No. 21 Steam Generator Feed Pump [SJ]. An equipment operator opened a steam trap drain valve, and a solid stream of water issued from the trap. While in the process of draining water from the reheat steam line, No. 21 Steam Generator Feed Pump speed and discharge pressure decreased sharply. This was followed by decreasing steam generator water levels. The Auxiliary Feedwater Pumps [BA] were started, and a Unit load reduction was initiated. However, at 1926 hours, the water level in No. 24 Steam Generator reached the low-low level setpoint (8%), which resulted in a reactor/turbine trip.

The Unit was stabilized in Mode 3, and at 1935 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 cause of the reactor trip was the inability of the steam traps to adequately remove the condensate which had collected in No. 21 Steam Generator Feed Pump reheat steam supply line.

APPARENT CAUSE OF OCCURRENCE: (cont'd)

The root cause was attributed to crud and corrosion products (normally found in steam drain piping), which collected in the reheat steam drain line piping following the extended shutdown for refueling. These corrosion products restricted the lines and caused two (2) of the three (3) steam traps to drain very slowly. One steam trap was not functioning due to blockage of the trap isolation valve (2RS900).

The turbine driven steam generator feed pumps receive steam from the Main and/or Reheat Steam Systems [SB]. The steam is auctioneered by the turbine governor valve, depending upon reheat steam pressure. No. 21 Steam Generator Feed Pump was operating satisfactorily on main steam; however, when power level and reheat steam pressure increased, the feed pump started receiving steam via the Reheat Steam System. The reheat steam supply line contained an excessive amount of condensate, resulting in "water hammer" as moisture entered the feed pump turbine steam chest, feed pump speed and discharge pressure fluctuations, loss of pumping capability, lowering steam generator levels and the resultant reactor trip on a low-low water level signal from No. 24 Steam Generator.

ANALYSIS OF OCCURRENCE:

The purpose of the reactor trip, on low-low steam generator level, is to prevent operation with the steam generator water level below the minimum volume required for adequate heat removal; thereby preventing the loss of the reactor heat sink. The trip is actuated on two out of three low-low water level signals in any steam generator. The setpoint ensures that there is adequate inventory in the steam generators, at the time of the reactor trip, to allow for any possible starting delays of the Auxiliary Feedwater Pumps [BA]; thus preventing steam generator dry-out and the Reactor Coolant System [AB] thermal and hydraulic transients that would be associated with a loss of the heat sink. The Reactor Protection System [JC] functioned as designed, and the heat sink was maintained. Since the Reactor Coolant System has been designed to withstand the thermal and hydraulic effects of four-hundred (400) reactor trips from full power, the reactor trip from 17.5% power resulted in a thermal transient which was well within the design limits of the system. 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:

The valve lineup of each steam trap located in No. 21 Steam Generator Feed Pump reheat steam supply line was checked; the valve lineups were found to be correct. The steam traps were disassembled and inspected for suspected blockage; however, the traps were clean and no blockage was found. One steam trap (which drains to a floor drain) was not draining at all; however, following cycling of the trap isolation valve (2RS900), the trap functioned properly. The reheat steam supply line was drained of all condensate, 2RS900 was then shut (isolating this steam trap), and the two remaining steam traps were bypassed and the lines continuously blown down to the condenser during the subsequent startup.

The corrosion products were apparently removed by a combination of cycling of the trap isolation valves and the continuous blowdown of the lines during the subsequent Unit startup. All three steam traps were returned to service when reactor power reached approximately twenty-five percent (25%), and have continued to function satisfactorily. Although this was the first occurrence of this sort, a procedural review will be performed to determine the necessity of blowing down these lines during steam generator feed pump warmup operations following extended shutdowns, and/or the performance of periodic operability checks on these steam traps. In addition, 2RS900 was added to the forced outage list; i.e., the valve will be disassembled and inspected during the next outage of sufficient duration to ensure that it is completely free of obstructions.

General Manager-
Salem Operations

JLR:tns

SORC Mtg 85-005

PSE&G

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

Salem Generating Station

May 17, 1985

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 85-005-00

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

Sincerely yours,

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

BWS:tcs

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