

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Salem Generating Station DOCKET NUMBER (2) 05000272 PAGE (3) 1 OF 04

TITLE (4) Foreign Material in Charging Pump Suction Lines

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)
07	16	84	84	017	00	08	16	84		05000
										05000

OPERATING MODE (9) 6

POWER LEVEL (10) 0.00

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

20.402(b)	20.408(c)	50.73(a)(2)(iv)	73.71(b)
20.408(a)(1)(i)	50.36(a)(1)	X 50.73(a)(2)(v)	73.71(a)
20.408(a)(1)(ii)	50.36(a)(2)	50.73(a)(2)(vi)	
20.408(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.408(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.408(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME J. L. Rupp TELEPHONE NUMBER 609 339-4309

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	C B P		P 0 2 5	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15) MONTH 10 DAY 18 YEAR 84

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

On July 16, 1984, No. 12 Charging Pump was disassembled for inspection and repair, due to seizure of the pump during surveillance testing on July 13, 1984. A small amount of resin particles and metal filings were discovered in the pump casing. Further inspection revealed similar material in the suction lines to all charging pumps. Because of the extremely close internal tolerances of the centrifugal charging pumps, it is felt that the metal filings probably caused the seizure of the pump. If this was actually the cause, and not an isolated case of pump failure, it is reasonable to assume that if the redundant centrifugal charging pump had been operating, it could possibly have experienced a similar failure. Since this event could be interpreted as a condition which alone could have prevented the fulfillment of the safety function of a system to mitigate the consequences of an accident, the occurrence is being conservatively reported in accordance with 10CFR 50.73(a)(2)(v)(D). It is felt that the metal filings originated from maintenance activities, and were entrained in the Spent Fuel Pit Demineralizer or the Mixed Resin Bed Demineralizer. These were then released (along with resin particles) during previous resin flushing operations. An investigation is continuing, and a supplemental report will be issued, identifying the cause and corrective actions taken.

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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:**

Foreign Material in Charging Pump Suction Lines

Discovery Date: 07/16/84

Report Date: 08/16/84

This report was initiated by Incident Report No. 84-113

**CONDITIONS PRIOR TO OCCURRENCE:**

Mode 6 - Rx Power 000 % - Unit Load 0000 MWe

**DESCRIPTION OF OCCURRENCE:**

On July 13, 1984, during a refueling outage, while performing surveillance testing of No. 12 Charging Pump [CB], the pump seized after running for approximately thirty (30) seconds. No. 12 Charging Pump was declared inoperable. The redundant charging pumps remained in an operable status, and the Unit was in Mode 6; therefore, entering into an action statement was not required.

Upon disassembly of the pump, on July 16, 1984, a small amount of resin particles and metal filings were discovered in the pump casing. As a result of these findings, an investigation ensued to determine the source and extent of the problem. On July 19, 1984, similar material was found in the common suction line of all charging pumps.

**APPARENT CAUSE OF OCCURRENCE:**

The resin originated from either the Spent Fuel Pit Demineralizer or the Mixed Resin Bed Demineralizer during previous resin flushing operations. The metal filings, entrained in the resin and released to the system during the resin flushes, apparently entered the system from maintenance activities. Due to the close internal tolerances of the centrifugal charging pumps, and the lack of any other positive findings upon inspection of the pump, it is felt that the metal filings (although a very small amount) could possibly have contributed to the seizure of No. 12 Charging Pump. In addition, inspections of the Refueling Water Storage Tank revealed that it contained a significant amount of resin.

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ANALYSIS OF OCCURRENCE:

If the failure of No. 12 Charging Pump was actually caused by the metal filings introduced into the Charging System, it is reasonable to assume that if the redundant centrifugal charging pump (No. 11) had been operating, it could possibly have experienced a similar failure. If this was actually the cause, and not an isolated case of pump failure, the event could be interpreted as a condition which alone could have prevented the fulfillment of the safety function of a system to mitigate the consequences of an accident. For this reason, the occurrence is being conservatively reported in accordance with the Code of Federal Regulations, 10CFR 50.73(a)(2)(v)(D), and an analysis of the occurrence follows.

Since the positive displacement type pump (No. 13 Charging Pump) had been operated on numerous occasions since the suspected intrusion of the resins and metal filings, it appears that the clearances in that pump were sufficient to allow the material to pass without causing damage. However, had that pump also failed, the charging pumps and boration flow paths required by Technical Specification 3.1.2.1 and 3.1.2.3 would not have been available. This is an acceptable condition during Mode 5 and 6 operation, provided there are no evolutions in progress which would result in a positive reactivity addition to the core. This is not an acceptable condition during Modes 1 through 4 operation, since the loss of the charging pumps would also result in a loss of seal injection to the Reactor Coolant Pumps and the inoperability of both Emergency Core Cooling System trains. The loss of both centrifugal charging pumps during an accident is not an analyzed condition.

As previously stated, No. 12 Charging Pump failed while the Unit was in Mode 6, and operability of the pump was not required. In addition, the problem was discovered during a routine pump surveillance. We feel confident that if the pump failure was, in fact, due to the metal filings, it would most likely have failed (and been discovered) prior to Mode 1 or 2 operation. This is due to the additional required surveillances to prove pump and system operability prior to changing operational modes.

Although the Refueling Water Storage Tank contained a significant amount of resin, a minimal amount was actually located in the charging pump suction lines. The recent undercore support plate inspection of the reactor vessel revealed no foreign material; i.e., resin, metal filings or any other contaminants. This inspection was performed with the reactor core empty, prior to the fuel reload. In addition, no resin or metal filings have ever been discovered during any maintenance activities performed on Reactor Coolant System components.

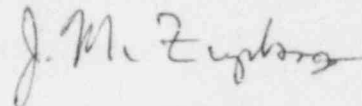
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**CORRECTIVE ACTION:**

The rotating element in No. 12 Charging Pump is being replaced. Inspections of No. 11 Charging Pump revealed wear; therefore, as a precautionary measure, the rotating element of that pump is also being replaced. Boroscope inspections and extensive cleaning of the charging pump suction lines has been performed. The horizontal portion of the suction header was hydrolazed, and the Refueling Water Storage Tank was cleaned. Temporary strainers were installed in the suction to the charging pumps. These strainers will be utilized during the final flushes of the Charging System.

Due to this occurrence, Unit 2 Refueling Water Storage Tank was also inspected. The tank bottom was vacuumed, and a minimum amount of debris was removed, indicating that the problem was unique to Unit 1. An investigation is continuing, and a Safety Evaluation is being prepared. The Safety Evaluation will address the cause of the resin and metal filing contamination. Based on the findings, system, quality control during maintenance and/or procedural changes will be made, as necessary, to preclude recurrence. A Safety Evaluation is also being prepared.



General Manager-  
Salem Operations

JLR:tns

SORC Mtg 84-103



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

Salem Generating Station

August 16, 1984

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 84-017-00

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

Sincerely yours,

A handwritten signature in cursive script that reads "J. M. Zupko, Jr." with a flourish at the end.

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

JR:k11

CC: Distribution

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