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 3

TITLE (4)
Reactor Trip From 100% - Dropped Control Rod

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	1 0	8 5	8 5	- 0 0 9	- 0 0	0 6	0 9	8 5		0 5 0 0 0
										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)	1 0 0	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 - LER Coordinator	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	
B	A A	C O N	C 7 2 0	Y							

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 May 10, 1985, during routine power operation, a reactor trip occurred while performing rod control assembly surveillance requirements. The surveillance, which requires the actual movement of the control rods to verify their operability, was completed satisfactorily on all shutdown banks and on both Control Bank "A" and Control Bank "B". The reactor trip occurred immediately upon commencing the surveillance on Control Bank "C", and was caused by power range high negative neutron flux rate signals which resulted from a dropped control rod. The root cause was attributed to a high resistance connection in Rod 2C4 Control Rod Drive Mechanism cable connector which prevented the stationary grippers from energizing, resulting in the dropped control rod. The Reactor Protection System functioned as designed during this event, and this occurrence involved no undue risk to the health or safety of the public. Two cable connector pins located in the stationary gripper coil circuitry for Rod 2C4 were found to be making poor contact and were reworked. The high resistance connection problem with this type of connector has been previously recognized, and a Design Change Request was submitted prior to this occurrence to replace the connectors with an improved design. The connectors presently installed are obsolete and no longer manufactured.

IE22
1/1

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 100% - Dropped Control Rod

Event Date: 05/10/85

Report Date: 06/09/85

This report was initiated by Incident Report No. **85-114**

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 - Rx Power 100 % - Unit Load 1110 MWe

DESCRIPTION OF OCCURRENCE:

At 1712 hours, May 10, 1985, during routine power operation, while performing Rod Control Assembly Surveillance Procedure SP(O) 4.1.3.1.2, a reactor trip occurred. The reactor trip was the result of power range high negative neutron flux rate signals from Power Range Channels N-42 and N-44 (two-out-of-four coincidence). The surveillance procedure, which is performed once every thirty-one (31) days, verifies the operability of all full length control rods which are not fully inserted into the reactor core. The procedure requires the operator to move each shutdown and each control bank (individually) ten (10) steps into the core and then return them to their original position. The surveillance had been completed satisfactorily on all shutdown banks and on both Control Bank "A" and on Control Bank "B". The reactor trip occurred immediately upon commencing the surveillance on Control Bank "C". The Unit was stabilized in Mode 3 (Hot Standby), and at 1733 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 high negative flux rate trip signals and resultant reactor trip was a dropped control rod (Rod 2C4). The root cause was a high resistance connection in Rod 2C4 gripper coil circuitry, caused by Rod 2C4 Control Rod Drive Mechanism [AA] cable connector pins making poor contact. This prevented the stationary grippers from energizing, which, in turn, resulted in the dropped control rod.

ANALYSIS OF OCCURRENCE:

At high power levels, the possibility exists for creating areas of high local flux peaking during rod drop events. This could occur when the rod control system attempts to maintain reactor power level by withdrawing the control rods in response to the power decrease caused by the dropped rod. This would result in exceeding the minimum required Departure from Nucleate Boiling Ratio (DNBR) of 1.30 in the localized flux peaking areas of the core. The power range high negative neutron flux rate trip is designed to prevent this by ensuring that the DNBR is maintained greater than the minimum allowable value of 1.30 for all control rod drop events. The Reactor Protection System functioned as designed during this event, and this occurrence involved no undue risk to the health or safety of the public. However, due to 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 connectors are physically connected to the Control Rod Drive Mechanisms (CRDM's) on the reactor vessel head. As previously mentioned, two cable connector pins located in the stationary gripper coil circuitry for Rod 2C4 were found to be making poor contact. This was caused by the pins being pushed partly back when the connector was coupled following the refueling outage. All CRDM connectors were disassembled and inspected. In addition to the connector problems associated with Rod 2C4, the following connectors required rework: Rods 2B3, 2SA1, 2SA2 and 2SB1 each contained one pin which was not fully seated, and Rod 1SD4 contained two pins which were not completely seated. Rods 1B3 and 2D3 each contained two pins which were required to be replaced because they could not be seated properly. The male pins of all connectors were cleaned, all cables were then reconnected and the circuit resistance readings were verified satisfactory from the relay room.

The CRDM connectors presently installed are obsolete and no longer being manufactured. When the connector is coupled, a possibility exists that the male and female pins will not mate properly. Although circuit resistance readings indicate a satisfactory connection initially, a high resistance connection can develop after a period of time. This type of problem has been previously recognized, and the obsolete connectors will eventually be replaced with an improved design.

General Manager-
Salem Operations

JLR:tns

SORC Mtg 85-092

PSE&G

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

Salem Generating Station

June 7, 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 85-009-00

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

Sincerely yours,

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

JLR:tcs

C Distribution

IE22
1/1