PSEG

Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038

Salem Generating Station

December 17, 1990

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 90-037-00

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

Sincerely yours,

S. LaBruna
General Manager -
Salem Operations

MJP:pc

Distribution

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 1	0 5 0 0 0 2 7 2	1 OF 0 4

TITLE (4)

ESF Signal Actuation; 1R41C Failed Low Due To Design Concern (Cont. Ventilation Isolation)

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)
1 1	1 7	9 0	9 0	— 0 3 7	— 0 0	1 2	1 7	9 0	Salem Unit 2	0 5 0 0 0 3 1 1
										0 5 0 0 0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
1	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 1 0 0	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
	AREA CODE
M. J. Pollack - LER Coordinator	6 0 9 3 3 9 - 2 0 2 2

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 11/17/90, during normal power operation, the Radiation Monitoring System (RMS) 1R45 RMS channels (medium and high range plant vent noble gas RMS monitors) spiked high. Subsequently, by design, the Plant Vent Radioactive Noble Gas Monitor, 1R41C, channel deenergized and failed low resulting in a Containment Purge/Pressure-Vacuum Relief System (CP/P-VRS) isolation signal and a closure signal for the 1WG41 valve (Waste Gas Decay Tank Vent Control Valve). After receipt of the CP/P-VRS signal, the signal was reset. All channels returned to normal operation. The CP/P-VRS isolation signal is considered an Engineered Safety Feature (ESF). This event occurred during investigation of a 1R45 channel printer failure alarm. Prior to determining the cause of the 1R45 channel spike, a second 1R45 channel spike occurred, on 11/18/90, also resulting in deenergization of the 1R41C RMS channel with a subsequent CP/P-VRS signal actuation and closure signal for the 1WG41 valve. The root cause of the CP/P-VRS actuation is attributed to a design/equipment deficiency. Investigation revealed that insulation on several conductors of a ribbon cable had been damaged. Close inspection revealed that the wire supplying power to the 1R45 printer controls drawer had been partially severed. The ribbon cable was too long and had gotten pinched between the cabinet and the drawer. The wire harnesses (ribbon cables), are not arranged so as to preclude their being pinched between the cabinet and the drawer. The damaged section of the subject 1R45 printer ribbon cable was removed and the overall length of the wire shortened. The wire harnesses have been supported.

PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as {xx}

IDENTIFICATION OF OCCURRENCE:

Engineered Safety Feature Actuation: Containment Purge/Pressure-Vacuum Relief System Isolation Due To Equipment/Design Concern

Event Dates: 11/17/90 and 11/18/90

Report Date: 12/17/90

This report was initiated by Incident Report Nos. 90-877 and 90-880.

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 Reactor Power 100% Unit Load 1145 MWe

DESCRIPTION OF OCCURRENCE:

On November 17, 1990 at 0445 hours, during normal power operation, the Radiation Monitoring System (RMS) {IL} 1R45 RMS channels (medium and high range plant vent noble gas RMS monitors) spiked high. Subsequently, by design, the Plant Vent Radioactive Noble Gas Monitor, 1R41C, channel deenergized and failed low resulting in a Containment Purge/Pressure-Vacuum Relief System (CP/P-VRS) {BF} isolation signal and a closure signal for the 1WG41 valve (Waste Gas Decay Tank Vent Control Valve). After receipt of the CP/P-VRS signal, the signal was reset. All channels returned to normal operation.

This event occurred during investigation of a 1R45 channel printer failure alarm.

The CP/P-VRS isolation signal is considered an Engineered Safety Feature (ESF). Subsequently, at 0631 hours on November 17, 1990, the Nuclear Regulatory Commission was notified of the automatic actuation of CP/P-VRS as required by Code of Federal Regulations 10CFR 50.72(b)(2)(ii).

Prior to determining the cause of the 1R45 channel spike, a second 1R45 channel spike occurred, on November 18, 1990 at 1625 hours, also resulting in deenergization of the 1R41C RMS channel with a subsequent CP/P-VRS signal actuation and 1WG41 valve closure signal. The NRC was notified of this second actuation at 1706 hours on November 18, 1990 in accordance with Code of Federal Regulations 10CFR 50.72(b)(2)(ii). This second actuation occurred during a required 1R45 channel check, prior to the discovery of the root cause of the first event.

APPARENT CAUSE OF OCCURRENCE:

The root cause of the CP/P-VRS actuation is attributed to a design/equipment deficiency. Investigation revealed that insulation on several conductors of a ribbon cable had been damaged. Close inspection revealed that the wire supplying power to the 1R45 printer controls drawer had been partially severed. The ribbon cable was too long and had gotten pinched between the cabinet and the drawer.

The wire harnesses (ribbon cables), located behind the 1R45 controls drawer are not arranged so as to preclude their being pinched between the cabinet and the drawer. The drawer must be routinely slid out in order to access a controls key pad (in support of channel checks). Therefore, when the drawer was moved, the wire shorted to ground resulting in the 1R45 channel spike. Both ESF actuations occurred during drawer movement.

The physical location of the ribbon cable, in the back of the drawer, is such that it cannot be easily observed.

ANALYSIS OF OCCURRENCE:

Isolation of the CP/P-VRS is part of the design Engineered Safety Features (ESFs). It mitigates the release of excessive quantities of radioactive material to the environment after a design base accident.

The 1R45B channel is interlocked with the 1R41 detectors and sample pump causing them to deenergize upon reaching the high radiation level setpoint. This is designed to protect the 1R41 channel detectors. With the detectors deenergized, a CP/P-VRS isolation signal is generated, by design.

The 1R41C channel monitors the plant vent effluent releases for radioactive noble gas via representative sampling. The ESF actuation feature of CP/P-VRS isolation, associated with this channel, is of conservative design. It is redundant to the 1R12A channel. In addition to its ESF function, the channel isolates the 1WG41 valve (Waste Gas Decay Tank Vent Control Valve). During the 1R41C CP/P-VRS isolation signal events, the 1R12A monitor remained operable.

At the time of these events, neither containment purge, containment pressure/vacuum relief or waste gas decay tank release was in progress. The associated valves with these functions were in the closed position during both events.

The 1R45B and C channel detectors are Eberline SA-14 and SA-15 (respectively) energy compensated GM tubes.

The inadvertent actuation of the CP/P-VRS isolation signal was caused by an equipment/design concern, not high activity. Therefore, this event did not affect the health or safety of the public. However, due to the actuation of an ESF function, this event is reportable in accordance with Code of Federal Regulations 10CFR 50.73(a)(2)(iv).

ANALYSIS OF OCCURRENCE: (cont'd)

On March 1, 1990 this same event occurred on the Salem Unit 2 2R45 printer (reference LER 311/90-011-00). The Unit 2 2R45 channel printer is the same printer used by the 1R45 channel. As a result of the Unit 2 event, the printer quarterly preventive maintenance requirements (for both Units) were modified to include inspection of the printer wiring. The last Unit 1 printer inspection was completed in October 1990. No wiring concerns were noted as a result of that inspection.

CORRECTIVE ACTION:

The damaged section of the subject 1R45 printer ribbon cable was removed and the overall length of the wire shortened. The wire harnesses (for the Salem Unit 1 and Salem Unit 2 R45 channel printers) have been supported to prevent them from being pinched between the drawer and the cabinet.

General Manager -
Salem Operations

MJP:pc

SORC Mtg. 90-160