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) Lack Of Backup Overcurrent Protection For 37 Electrical Circuits Penetrating Containment Due To Inadequate Design Review

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 9	8 8	8 8	— 0 1 0	— 0 0	0 6	0 8	8 8	Salem - Unit 1	0 5 0 0 0 2 7 2
										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)		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)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	X	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
D. Dodson - Licensing Engineer	6 0 9 3 3 9 - 4 1 2 9

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	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 May 9, 1988 at 1500 hours, it was identified that for thirty-seven (37) electrical circuits penetrating Containment, the backup overcurrent protection device would not operate in sufficient time to preclude thermal damage to the penetration assembly in the event of a failure of the primary device. Subsequently, Technical Specification 3.8.3.1 was entered. This was discovered as part of the Salem Station Electrical Distribution System design basis review. The root cause of this event is attributed to inadequate design review. Corrective actions include preparation of a detailed calculation for containment electrical penetration overcurrent protection. Additionally, a complete review of the balance of the circuits penetrating containment but not listed in the Technical Specifications has been initiated. The Salem Unit 2 circuits will be analyzed and necessary modifications will be completed prior to returning the Unit to service following the upcoming refueling outage. Five of the affected circuits, essential to continued operation of the Unit, have been modified by installation of an additional overcurrent protection device in series with the existing primary overcurrent protection device. Although not part of the Salem Unit 1 design basis, PSE&G will conduct a similar evaluation of the Salem Unit 1 circuits and complete any required modifications prior to returning the unit to service following its next scheduled refueling outage.

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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:

Lack of backup overcurrent protection for 37 electrical circuits penetrating containment due to inadequate design review

Event Date: 5/09/88

Report Date: 6/08/88

This report was initiated by Incident Report No. 88-172.

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 Reactor Power 100% - Unit Load 1160 MWe

DESCRIPTION OF OCCURRENCE:

On May 9, 1988 at 1500 hours, it was identified that for thirty-seven (37) electrical circuits penetrating Containment, the backup overcurrent protection device would not operate in sufficient time to preclude thermal damage to the penetration assembly in the event of a failure of the primary device. Subsequently, Technical Specification 3.8.3.1 was entered. This was discovered as part of the Salem Station Electrical Distribution System design basis review.

PSE&G identified this concern during a detailed review of the circuits listed in Technical Specification Table 3.8-1 for compliance with its commitments to Regulatory Guide 1.63 relative to redundant overcurrent protection for containment electrical penetrations. The requirement to provide redundant overcurrent protection was imposed during the Unit 2 licensing process and is therefore part of the plant design basis.

Technical Specification 3.8.3.1 states:

> "All containment penetration conductor overcurrent protective devices shown in Table 3.8-1 shall be OPERABLE."

Technical Specification Action Statement 3.8.3.1 states:

> "With one or more of the containment penetration conductor overcurrent protective device(s) shown in Table 3.8-1 inoperable:
>
> a. Restore the protective device(s) to OPERABLE status or de-energize the circuit(s) by tripping the associated backup circuit breaker within 72 hours and verify the

DESCRIPTION OF OCCURRENCE: (cont'd)

backup circuit breaker to be tripped at least once per 7 days thereafter; the provisions of Specification 3.0.4 are not applicable to overcurrent devices in circuits which have their backup circuit breakers tripped, or

b. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours."

On May 9, 1988 at 1532 hours, the Nuclear Regulatory Commission (NRC) was notified of this event in accordance with Code of Federal Regulations 10CFR 50.72(b)(1)(ii).

APPARENT CAUSE OF OCCURRENCE:

The root cause of this event is attributed to inadequate design review.

Investigation of the circumstances leading to the inadequate backup protection of the 37 electrical penetrations revealed that in 1978, PSE&G performed a bounding analysis of selected containment electrical penetration circuits. This was done in response to an NRC requirement that backup overcurrent protection be provided in order to maintain penetration integrity in the event of a single random failure of a primary overcurrent protection device. As a result of that analysis, fuses were installed in series with the primary devices on 16 circuits during the first refueling outage at Salem Unit 2.

Upon identification of the present condition, a review of the 1978 analysis was conducted. It was determined that relay/breaker setpoints and circuit configurations, assumed in the analysis, did not in all cases bound the as built condition.

ANALYSIS OF OCCURRENCE:

The Technical Specification Action Statement requires that repairs be made to affected overcurrent protection devices within 72 hours or that the circuit be de-energized by tripping the backup device, or that the plant be shutdown within 6 hours. In many cases the backup device is a bus in-feed breaker. As a result, multiple loads are lost when the backup device is tripped impairing the ability to maintain power operation. The intent of the Action Statement is to remove the possibility of an electrical penetration failure by isolating the circuit with a breaker upstream of the penetration assembly. In all cases, the primary device provides the required isolation. In order to prevent an unnecessary shutdown resulting from the tripping of the affected circuits' backup device, PSE&G elected to request an emergency license amendment to allow tripping the primary device as the preferred means of isolation. At the same time repair activity was initiated on five (5) of the affected circuits which were determined to be essential to continued operation of the Unit.

ANALYSIS OF OCCURRENCE: (cont'd)

The request for license amendment was subsequently granted and all affected circuits, with the exception of the 5 which were under repair, were declared inoperable and isolated by tripping the primary device.

CORRECTIVE ACTION:

A detailed calculation has been prepared and entered into the Engineering Document Control Program.

The modification to the five affected circuits essential to continued operation of the Unit has been completed. The modification included installation of an additional overcurrent protection device in series with the existing primary overcurrent protection device.

A complete review of the balance of the circuits penetrating containment but not listed in the Technical Specifications has been initiated. The Salem Unit 2 circuits will be analyzed and modifications completed prior to returning the Unit to service following the upcoming refueling outage. Although not part of the Salem Unit 1 design basis, PSE&G will conduct a similar evaluation of the Salem Unit 1 circuits and complete any required modifications prior to returning the unit to service following its next scheduled refueling outage.

General Manager -
Salem Operations

MJP:pc

SORC Mtg. 88-050

PSE&G

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

Salem Generating Station

June 08, 1988

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 88-010-00

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

Sincerely yours,

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

MJP:pc

Distribution

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