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)

10CFR 50 Appendix R Cable Design Deficiency Due To Design Error

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 3	1 8	8 8	8 8	— 0 0 6	— 0 0	0 4	1 4	8 8	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)			
POWER LEVEL (10)	N/A	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)	X 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)	10CFR50.73(a)(2)(vi)
		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
M. J. Pollack - LER Coordinator	AREA CODE 6 0 9 — 3 3 9 - 4 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 March 18, 1988, PSE&G engineers identified a design deficiency concerning the cable (CDC22-CT) which provides an alternate source of control and field flashing power to the three Diesel Generators (D/Gs) during a postulated fire that requires alternate shutdown measures. This cable originates from the "C" train 125 Volt Vital Bus, runs through a ceiling cable tray in the 460V Switchgear Room, and terminates in the 1C Diesel Generator Control Room. The Nuclear Regulatory Commission (NRC) requirements in the Code of Federal Regulations 10CFR 50 Appendix R Section III.G.3, state that the required alternate shutdown capability is to be "independent of cables, systems or components in the area, room or zone under consideration". However, contrary to this requirement, the CDC22-CT cable is not physically independent of the ceiling area which is the "zone under consideration". The root cause of this event has been attributed to a design error. Corrective action includes re-routing the CDC22-CT cable in accordance with 10CFR Appendix R criteria during the next refueling outage. An hourly roving fire watch (previously established for the area for other fire protection concerns) will be continued until completion of cable re-routing and satisfaction of the other concerns.

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:

10CFR 50, Appendix R Cable Design Deficiency Due To Design Error

Event Date: 03/18/88

Report Date: 04/14/88

This report was initiated by Incident Report No. 88-104.

CONDITIONS PRIOR TO OCCURRENCE:

N/A

DESCRIPTION OF OCCURRENCE:

On March 18, 1988, PSE&G engineers identified a design deficiency concerning the cable (CDC22-CT) which provides an alternate source of control and field flashing power to the three Diesel Generators (D/Gs) {EK} during a postulated fire that requires alternate shutdown measures. This cable originates from the "C" train 125 Volt Vital Bus, runs through a ceiling cable tray in the 460V Switchgear Room, and eventually terminates in the 1C Diesel Generator Control Room. The Nuclear Regulatory Commission (NRC) requirements in the Code of Federal Regulations 10CFR 50 Appendix R Section III.G.3, state that the required alternate shutdown capability is to be "independent of cables, systems or components in the area, room or zone under consideration". However, contrary to this requirement, the CDC22-CT cable is not physically independent of the ceiling area which is the "zone under consideration".

A review of Salem Unit 2 has shown that this identical design deficiency also exists for this area.

This event was reported to the NRC on March 18, 1988 at 1340 hours in accordance with Code of Federal Regulations 10CFR 50.72(b)(ii).

APPARENT CAUSE OF OCCURRENCE:

The root cause of this event has been attributed to a design error.

The alternate power cabling was installed per a design change, issued in May 1983. However, the design did not fully meet the alternate shutdown requirements as indicated in the Description of Occurrence section.

ANALYSIS OF OCCURRENCE:

Salem Units 1 and 2 each have power feed cabling (three independent trains) from the 125V Vital Bus (EF) to the 125V Vital Distribution Cabinet (EF). The normal control and field flashing power cabling to the Diesel Generators is run from the 125V Vital Distribution Cabinet. The power feed cabling from the 125V Vital Busses to the 125V Vital Distribution Cabinets run through the ceiling area of the 460V Switchgear Room along with the CDC22-CT cable.

The cables supplying normal power to the "A" and "B" Distribution Cabinets are routed in fire wrapped conduit. The cable supplying normal power to the "C" Distribution Cabinet is not fire protected. In addition, cable CDC22-CT is routed in the ceiling area of the Switchgear Room and is also not fire protected.

If a fire is postulated at the location of the "B" 125V Vital Switchgear, the "B" Diesel Generator would be rendered inoperable due to the loss of field flashing and control power. This fire could also impact the unprotected CDC22-CT cable. If the fire is postulated to spread beyond the boundary of the Marinite Wall surrounding the "B" Switchgear, it is possible to cause damage to the normal "C" train 125V power feed. Therefore, only the "A" D/G would remain operable. Safe shutdown during blackout conditions requires two D/Gs as per the Updated Final Safety Analysis Report (UFSAR).

In assessing the impact to safe shutdown the following factors should also be considered. First, the switchgear compartments in the 460V Switchgear Room are separated by a labyrinth of eight foot high Maranite wall fire barriers. A fire in a compartment would be unlikely to spread to an adjacent area through combustion on the floor area. Second, the fire loading in the area is due almost entirely to cable insulation (IEEE 383 insulation). Third the area is provided with full area detection. Fourth, the area is provided with fixed suppression in the form of a manually actuated CO_2 flooding system. Fifth, the normal train "A" and train "B" power feeds are fire wrapped throughout the area. Sixth, although the Gas Turbine is not normally taken credit for, a set of power feeds (via the normal offsite power) is located outside the Switchgear Room. These design features make it highly unlikely that a fire in the area would prevent safe shutdown of the plant. However, this event is reportable to the NRC in accordance with Code of Federal Regulations 10CFR 50.73(a)(2)(vi).

It should be noted that an hourly roving fire watch has been assigned to the area, in support of other fire protection concerns, since March 1987.

While the 10CFR 50 Appendix R criteria was not strictly complied with, in this case, the existing plant features support a conclusion that a safe shutdown can be achieved.

CORRECTIVE ACTION:

The CDC22-CT cable will be re-routed in accordance with 10CFR Appendix R criteria. The Unit 1 cable re-route will be completed during the

CORRECTIVE ACTION:

next refueling outage, currently scheduled to begin in April 1989. The Unit 2 cable re-route will be completed during its fourth refueling outage, currently scheduled to begin in September 1988.

The hourly roving fire watch will be continued until completion of cable re-routing and satisfaction of the other fire protection concerns.

General Manager -
Salem Operations

MJP:pc

SORC Mtg. 88-029

PSEG

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

Salem Generating Station

April 14, 1988

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 88-006-00

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

Sincerely yours,

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

MJP:pc

Distribution

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