



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

Salem Generating Station

February 9, 1993

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 93-001-00

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

Sincerely yours,

C. A. Vondra
General Manager -
Salem Operations

MJP:pc

Distribution

9302170241 930209
PDR ADOCK 05000311
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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) **Salem Generating Station - Unit 2** DOCKET NUMBER (2) **0 5 0 0 0 3 1 1 1** PAGE (3) **1 OF 0 4**

TITLE (4) **2H 4KV Group Bus UF Protection Inop. Due To Mispositioned Relay Test Switch**

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	2	09	9	3	001	0	2	09		0 5 0 0 0
										0 5 0 0 0

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

OPERATING MODE (8) <input checked="" type="checkbox"/> X	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 1 0 0	20.405(a)(1)(i)	50.38(c)(1)	50.73(a)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	50.38(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	<input checked="" type="checkbox"/> X 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: **M. J. Pollack - LER Coordinator** TELEPHONE NUMBER: **6 0 9 3 3 9 1 2 0 2 2**

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)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO X

EXPECTED SUBMISSION DATE (15) MONTH: _____ DAY: _____ YEAR: _____

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

From 12/9/92, until discovery at 1100 hours on 1/12/93, under-frequency (UF) protection for 2H 4KV Group Bus was unknowingly inoperable due to the bus UF relay test (knife) switch being left in the "OPEN" position following the monthly under-voltage (UV)/UF surveillance test of the bus. The Technical Specification (T/S) Action Statement was entered. The subject relay test switch is located in locked electrical cubicle 2HAD. The 2H 4KV Group Bus monthly surveillance was completed at 1317 hours (same day) (including closure of the test switch); thereby, the Action Statement was exited. The root cause of this event is personnel error due to a technician's failure to comply with a surveillance procedure. The procedure requires closing the subject test switch following testing and to "ENSURE" that all 2H Group Bus UV and UF test switches are closed. Disciplinary action has been taken with the technician involved with the 12/9/92 surveillance of the 2H Bus UF relay. This event has been reviewed by Maintenance Department management and will be reviewed with applicable department personnel. The Group Bus UV and UF monthly functional test surveillance procedures will be revised to provide for independent verification of the test switch closure.

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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:

INOPERABILITY OF 2H 4KV GROUP BUS UNDER-FREQUENCY PROTECTION DUE TO MISPOSITIONED (OPEN) UNDER-FREQUENCY RELAY TEST SWITCH

Event Date: 12/09/92

Discovery Date: 01/12/93

Report Date: 02/9/93

This report was initiated by Incident Report No. 93-024.

CONDITIONS PRIOR TO OCCURRENCE:

Mode 1 Reactor Power 100% - Unit Load 1170 MWe

DESCRIPTION OF OCCURRENCE:

From December 9, 1992, until January 12, 1993, under-frequency (UF) protection for 2H 4KV Group Bus was unknowingly inoperable. This occurred due to the bus UF relay test (knife) switch being left in the "OPEN" position following the monthly under-voltage (UV)/UF surveillance test of the bus, performed under procedure S2.MD-FT.4KV-0007(Q), "REACTOR TRIP SYSTEM MONTHLY FUNCTIONAL TEST - 2H GROUP BUS RCP (Reactor Coolant Pump) UNDER VOLTAGE & UNDER FREQUENCY". Event discovery occurred on January 12, 1993, at 1100 hours, during the subsequent performance of the surveillance. The subject relay test switch is located in locked electrical cubicle 2HAD.

Immediately after event discovery, Operations supervision was notified and Technical Specification (T/S) 3.3.1.1 Action 6 was entered. The 2H 4KV Group Bus monthly surveillance was then completed at 1317 hours (same day) (including closure of the test switch); thereby, the Action Statement was exited. T/S 3.3.1.1 Action 6 requires the following:

"With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

- a. The inoperable channel is placed in the tripped condition within 1 hour.

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DESCRIPTION OF OCCURRENCE (continued):

- b. The Minimum Channel OPERABLE requirement is met: however, one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1."

The 2H 4KV UF relay is a GE Type SFF21A relay, which detects UF on power circuits. This relay has one Normally Open (NO) (contact used) and one Normally Closed (NC) output contact which changes state only when the relay setpoint is reached (UF condition) and it is sensing at least 50% of rated voltage. When the relay is deenergized (test switch open), the relay output contact will not change state and the 2H RCP Group Bus UF Reactor Trip signal is disabled. In addition, the associated Control Room annunciator for an UF condition on the 2H bus is also disabled when the test switch is open.

This event is reportable due to non-compliance with T/S 3.3.1.1 Action 6, per Code of Federal Regulation 10CFR 50.73(a)(2)(i)(B).

APPARENT CAUSE OF OCCURRENCE:

The root cause of this event is personnel error due to the responsible technician failing to close the relay test switch in accordance with the subject surveillance procedure. Procedure step 5.3.19 requires closing the subject test switch following testing and step 5.4.3 specifies to "ENSURE" that all 2H Group Bus UV and UF test switches are closed. Step 5.4.4 then follows, which requires closure and lockup of the involved 2HAD Group Bus cubicle door. These cubicle doors are maintained locked as a corrective action to a prior similar occurrence on Salem Unit 1 (reference LER 272/87-005-00, dated May 22, 1987).

Investigation of this event included review of the December 9, 1992 surveillance performance documentation as well as interviews with the involved technicians.

ANALYSIS OF OCCURRENCE:

With the subject test switch open, a UF condition on the 2H Group 4KV Bus would not be sensed by the Reactor Protection System {JC}. The UF trip and the UV trip provide core protection against departure from nucleate boiling resulting from a UF condition at more than one Reactor Coolant Pump {AB}. The UF trip assures a Reactor Trip before a low Reactor Coolant System (RCS) flow condition develops. The logic for the trip generation requires a UF condition on either 2F or 2G Group Bus in coincidence with a UF condition on either the 2E or 2H Group Bus. A failure of the 2E bus UF protection with the 2H bus UF protection defeated would have prevented an automatic RCP trip signal upon an UF condition. However, core protection against a loss of flow condition would still be available by the Reactor Coolant System loop flow logic.

With the exception of an approximate 30 minute inoperability of the 2E bus UF relay on January 12, 1993, an UF Reactor Trip signal would have

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ANALYSIS OF OCCURRENCE (continued):

been initiated upon an UF condition as sensed by the 2E, 2F, and 2G bus UF relays. The 2E UF relay inoperability occurred during the respective monthly UV/UF surveillance testing of the 2E bus UF relay per S2.MD-FT.4KV-0004(Q). Had an UF condition occurred on the 2F or 2G buses when the 2E and 2H UF relays were inoperable, an UF alarm annunciation would have actuated to alert the Control Operator to manually initiate a Reactor Trip signal. In addition, the RCP Group Buses are also provided with UV protection. A check of the unit main generator frequency recorder (XA-8846), for the subject time period, did not show evidence of an UF condition.

The PSE&G electrical distribution system is fed from the 500 kV grid (infinite bus) and will automatically (instantaneously) load shed when system frequency drops to 59.3 Hz to maintain normal grid frequency. Should grid frequency decrease to 57.55 Hz, the applicable Abnormal Operating Procedure requires a manual Reactor trip. The 4 kV Group Bus UF relays' setpoint is 57.5 Hz, while the minimum allowable setpoint is 56.4 Hz, as per T/S.


This event did not affect the health and safety of the public. This is based upon the means available for detection of and responding to an UF condition on the RCP Group buses throughout the time period of the 2H Bus UF detection inoperability.

CORRECTIVE ACTION:

Disciplinary action has been taken with the technician involved with the December 9, 1992 surveillance testing of the 2H Bus UF relay.

This event has been reviewed by Maintenance Department management and will be reviewed with applicable department personnel.

The Group Bus UV and UF monthly functional test surveillance procedures will be revised to provide for independent verification of the test switch closure.


General Manager -
Salem Operations

MJPJ:pc

SORC Mtg. 93-013