

**LICENSEE EVENT REPORT**

CONTROL BLOCK: 

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0	1	N	J	S	G	S	2	2	0	0	-	0	0	0	0	0	-	0	0	3	4	1	1	1	1	4			5
7	8	9						14	15	25										26	30					57	58		
		LICENSEE CODE								LICENSE NUMBER											LICENSE TYPE								

CON'T

REPORT SOURCE 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

0 1 L 6 0 5 0 0 0 3 1 1 7 0 8 1 1 8 3 8 0 8 2 2 8 3 9

DOCKET NUMBER EVENT DATE REPORT DATE

## EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 On August 11, 1983, during investigation of a reactor trip which had occurred earlier  
0 3 that day, the vital bus "sustained degraded" undervoltage relays were all found to be  
0 4 slightly below the minimum value required by the Technical Specifications. Due to a  
0 5 somewhat low load on the group buses and the slightly low relay setpoints, the relays  
0 6 had not acutated during the group bus transfer at the time of the trip. Evaluation  
0 7 showed no adverse safety consequences from operation with the setpoint deviations. The  
0 8 event is reportable in accordance with Technical Specification 6.9.1.8i.

09		SYSTEM CODE E B		11	CAUSE CODE D		12	CAUSE SUBCODE Z		13	COMPONENT CODE R E L A Y X				14	COMP. SUBCODE J		15	VALVE SUBCODE Z		16		
7	8	9	10		11		12		13					14		15		16					
17		LER RO REPORT NUMBER		EVENT YEAR 8 3		21	22	SEQUENTIAL REPORT NO. 0 4 4		24	25	26	OCCURRENCE CODE 0 1		28	29	REPORT TYPE T		30	31	REVISION NO. 0		32
ACTION TAKEN		FUTURE ACTION		EFFECT ON PLANT		SHUTDOWN METHOD		HOURS		22	ATTACHMENT SUBMITTED		NPRD-4 FORM SUB.		PRIME COMP. SUPPLIER		COMPONENT MANUFACTURER						
X		Z		Z		Z		0 0 0 0		22	Y		N		L		W 1 2 0						
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	

## CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 Investigation revealed the procedure for the monthly functional check of the relays

1 1 utilized the Technical Specification limit for an acceptance criterion. Thus normal

1 2 really setpoint drift and testing error could account for the observed setpoint deviations.

1 3 The relays were recalibrated; a review of the system design, calibration procedures and

1 4 testing procedures and frequency is underway.

FACILITY STATUS				% POWER			OTHER STATUS (30)		METHOD OF DISCOVERY		DISCOVERY DESCRIPTION (32)	
1	5	E	(28)	1	0	0	(29)	NA	C	(31)	Post-trip Testing	
2	8	9		10	12		13	44	45	46	80	

ACTIVITY CONTENT  
RELEASED OF RELEASE

1 6 2 33 10 11 NA

AMOUNT OF ACTIVITY (35)

LOCATION OF RELEASE (36)

NA

PERSONNEL EXPOSURES										
NUMBER			TYPE	DESCRIPTION (39)						
1	7		0 0 0 (37)	Z (38)	NA					

PERSONNEL INJURIES		DESCRIPTION
NUMBER		
1	H	NA

11		12	
LOSS OF OR DAMAGE TO FACILITY			
TYPE	DESCRIPTION		
1 9	2 42 NA	(43)	

10  
 PUBLICITY  
 ISSUED DESCRIPTION (45)  
 2 0 N (44) NA  
 7 8 9 10  
 8309070364 830822  
 PDR ADOCK 05000311  
 S PDR  
 NRC USE ONLY  
 68 69 70

NAME OF PREPARER

R. Frahm

PHONE

(609) 339-4309

NRC USE ONLY



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

Salem Generating Station

August 22, 1983

Dr. Thomas E. Murley  
Regional Administrator  
USNRC  
Region 1  
631 Park Avenue  
King of Prussia, Pennsylvania 19406

Dear Dr. Murley:

LICENSE NO. DPR-75  
DOCKET NO. 50-311  
REPORTABLE OCCURRENCE 83-044/01T

Pursuant to the requirements of Salem Generating Station  
Unit No. 2, Technical Specifications, Section 6.9.1.8i,  
we are submitting Licensee Event Report for Reportable  
Occurrence 83-044/01T. This report is required within  
fourteen (14) days of the occurrence.

Sincerely yours,

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

RF:k11 *JMZ*

CC: Distribution

*IE22*  
*11*

Report Number: 83-044/01T

Report Date: 08-22-83

Occurrence Date: 08-11-83

Facility: Salem Generating Station Unit 2  
Public Service Electric & Gas Company  
Hancock's Bridge, New Jersey 08038

IDENTIFICATION OF OCCURRENCE:

Engineered Safety Feature Actuation System - Vital Bus Undervoltage Relays - Setpoint Out-of-Specification.

This report was initiated by Incident Report 83-141.

CONDITIONS PRIOR TO OCCURRENCE:

Unit 2 - Mode 3 - Rx Power 0 % - Unit Load 0 MWe.

DESCRIPTION OF OCCURRENCE:

At approximately 1900 hours, August 11, 1983, during investigation of a reactor trip which had occurred earlier that day (see Salem Unit 1 LER 83-033/01T), the vital bus "sustained degraded" undervoltage relays (second level of undervoltage protection) were all found to be slightly below the minimum value required by the Technical Specifications (90% or 107.0 volts). The relay settings were as follows: No. 2A Vital Bus - 105.9 volts, No. 2B Vital Bus - 106.8 volts, and No. 2C Vital Bus - 105.8 volts.

The relay setpoints being low rendered the Engineered Safety Feature Actuation System "sustained degraded" vital bus undervoltage channels inoperable, and Technical Specification Limiting Condition for Operation 3.3.2, including its related action requirements, could not be met. Accordingly, Limiting Condition for Operation 3.0.3 applied. Immediate notification of the NRC was performed, with written confirmation transmitted on August 15, 1983.

During the previous trip, voltage on all vital buses had decreased, associated with the transfer of the group buses back to the station power transformers. Due to a somewhat low load on the group buses and the slightly low relay setpoints, the relays were not actuated and no blackout sequence occurred. The first level of undervoltage protection (70%) was operable and engineering evaluation showed that no adverse impact on safety related equipment would result from operation with the observed second level relay setpoint deviations.

APPARENT CAUSE OF OCCURRENCE:

A similar trip had occurred on Salem Unit 1 shortly before the Unit 2 trip. Following the transfer of buses to the station power transformers, due to a higher load on the buses, voltage had decreased further and caused the second level relays to actuate; a blackout sequence therefore had occurred. Investigation revealed that the

APPARENT CAUSE OF OCCURRENCE: (cont'd)

transformer voltage would not be expected to return to the relay reset setpoint within the relay time delay interval, and the blackout sequence occurred as designed.

The second level protection had been installed in response to NRC concerns over the adequacy of station vital bus undervoltage protection (outlined in a letter to the licensee dated August 8, 1979). The design change had been implemented on Unit 1 during the third refueling; problems had not been encountered during previous Unit 1 fuel cycles due to measures taken in response to the unavailability of the auxiliary power transformer. The "sustained degraded" relay protection had been installed in Salem Unit 2 during the most recent refueling outage.

Calibration of the Unit 2 relays was last performed earlier in the year (No. 2A - June 2, 1983; No. 2B - March 14, 1983; and No. 2C - March 29, 1983); the relays had all been set to 91% at that time. Proper operation of the relays had been checked during monthly surveillance on July 22, 1983, however the functional test utilized an acceptance criteria of a minimum of 107.0 volts, or 90%, for proper relay operation. Thus normal relay setpoint drift and testing error could have resulted in the settings of the relays at the time of the incident.

ANALYSIS OF OCCURRENCE:

The operability of the Reactor Trip and Engineered Safety Feature Actuation System instrumentation and interlocks insure that the associated action or trip will be initiated when the parameter monitored reaches its setpoint, the specified coincidence logic is maintained, sufficient redundancy is maintained to permit a channel to be out of service, and sufficient system functional capability is available from diverse parameters.

The setpoint specified for the second level undervoltage relays provides protection against damage of safety related loads during extended periods of operation with lowered bus voltage. As noted, evaluation of the setpoint deviations showed no adverse safety consequences, and the nature of the problem was such as to constrain any deviation to only the slight amount involved. The incident therefore involved no undue risk to the health and safety of the public. The event constituted performance of safety related components which required corrective measures to prevent operation in a manner less conservative than assumed in the accident analyses. As such, the occurrence is reportable in accordance with Technical Specification 6.9.1.8i.

Limiting Condition for Operation 3.0.3 requires:

When a limiting condition for operation cannot be met except as provided in the associated action requirements, within one hour action shall be initiated to place the unit in a mode in which the specification does not apply by placing it, as applicable, in at least hot standby within the next 6 hours, at least hot

- shutdown within the following 6 hours, and at least cold shutdown within the subsequent 24 hours.

CORRECTIVE ACTION:

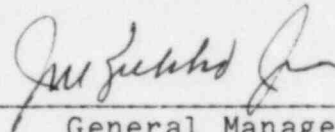
The relays were immediately reset to 91%; compliance with Limiting Condition for Operation 3.3.2 was regained and Limiting Condition for Operation 3.0.3 no longer applied. A review of the circuit design, as well as relay calibration and surveillance procedures and frequency, is in progress to determine appropriate changes to prevent future problems of this type.

As an interim measure, to prevent unnecessary initiations of blackout sequences, the no-load tap setting on the station power transformer and the tap changer balance voltage have been readjusted to elevate the bus voltages to approximately 4300 volts. This will provide additional margin for voltage transients associated with the fast transfer of the group buses to the transformers. Salem Unit 2 was returned to operation on August 16, 1983.

FAILURE DATA:

Westinghouse Electric Corp.  
Time Delay Relay  
Type TD-5 Style 293B301A16A

Prepared By R. Frahm



General Manager -  
Salem Operations

SORC Meeting No. 83-111B