



Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038-0236

Nuclear Business Unit

SEP 28 1998

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U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

**LER 272/97-010-00
SALEM GENERATING STATION - UNIT 1
FACILITY OPERATING LICENSE NO. DPR-70
DOCKET NO. 50-272**

This Licensee Event Report entitled "Past Operation of the Emergency Diesel Generators in a degraded but operable condition" is being voluntarily submitted.

Sincerely,

A. C. Bakken III
General Manager -
Salem Operations

Attachment

/JCN

C Distribution
LER File 3.7

EEG/

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PDR ADOCK 05000272
S PDR

The power is in your hands.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) SALEM GENERATING STATION UNIT 1		DOCKET NUMBER (2) 05000272	PAGE (3) 1 OF 3
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TITLE (4)
Past Operation of the Emergency Diesel Generators in a degraded but operable condition.

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 NAME	DOCKET NUMBER
12	19	94	97	010	00	09	28	98	SALEM 2	05000311
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9) 4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 0	20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)						
	20.2203(a)(1)	20.2203(a)(3)(l)	50.73(a)(2)(ii)	50.73(a)(2)(x)						
	20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71						
	20.2203(a)(2)(ii)	20.2203(a)(4)	50.73(a)(2)(iv)	<input checked="" type="checkbox"/> OTHER						
	20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A						
	20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)							

LICENSEE CONTACT FOR THIS LER (12)	
NAME Brian J. Thomas, Licensing Engineer	TELEPHONE NUMBER (Include Area Code) 609-339-2022

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).	<input checked="" type="checkbox"/>	NO						

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

During performance of 18-month surveillance testing of the Emergency Diesel Generators (EDGs) in December of 1994, the output breaker for the 2C EDG closed prior to the generator achieving 90% of nominal bus voltage. Public Service Electric & Gas (PSE&G) investigation into this event concluded that the cause of the 2C EDG breaker closing early is attributed to an improperly set voltage-sensing relay. The slow generator voltage rise was due to a broken voltage regulator. PSE&G also concluded that the rate of rise of the EDG voltage during the test provided reasonable assurance that the EDG would have been able to carry the design basis loads without stalling. Thus the equipment required to mitigate the consequences of a DBA accident would have performed their safety function. Corrective actions taken were installing new EDG output breaker voltage closing permissive relays and the replacement of the 2C EDG voltage regulator.

This event is being reported in a voluntary basis.

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SALEM GENERATING STATION UNIT 1	05000272	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 3
		97	010	00	

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

PLANT IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

Emergency Diesel Generators (EDGs) {EK/-}*

* Energy Industry Identification System (EIIS) codes and component function identifier codes appear as {SS/CCC} in the text.

CONDITIONS PRIOR TO OCCURRENCE:

Unit 2 was in Mode 5 when the event was originally discovered in December 1994. This report addresses the cause of the 2C EDG breaker closure deficiency.

DESCRIPTION OF OCCURRENCE:

In December 1994 and while performing the 18-month surveillance testing for the 2C Emergency Diesel Generator {EK/-} (EDG), PSE&G discovered that the 2C EDG output breaker closed earlier than expected during Loss of Offsite Power (LOOP) coincident with Loss of Coolant Accident (LOCA) and LOOP sequencing tests. Specifically, the 2C EDG breaker closed when generator voltage was 2200 VAC and 2900 VAC, respectively. These values equate to approximately 53% and 70% of nominal bus voltage. The Salem Updated Final Safety Analysis Report (UFSAR) states that the EDG output breaker should close after the unit comes up to rated speed and voltage. The Technical Specifications (TS) state that the EDG shall energize the vital bus with permanently connected loads within 13 seconds after receipt of the start signal.

Investigation determined that the 2C EDG voltage regulator was degraded. Specifically, a resistor was missing from the voltage regulator, which caused the regulator to respond slower. The investigation also determined that the voltage sensing relay was enabling the EDG breaker to close earlier (before achieving 900 rpm). A Deficiency Report (DR) was generated in December 1994 and a 10CFR50.59 Safety Evaluation was issued to evaluate the closing of EDG output breakers with the low voltage. The DR concluded that the EDG was operable with the EDG breaker closing before rated voltage was achieved based on satisfactory loading of the EDG during the 18-month surveillance testing.

On February 1, 1995, an engineering discrepancy report was written due to the 2C EDG breaker closing with a voltage below 90%. Based on the disposition of the above DR, PSE&G engineering and licensing concluded that there was no operability impact to 2C EDG as a result of this event.

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		97	010	00		

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

DESCRIPTION OF OCCURRENCE (cont'd):

PSE&G concluded that although the voltage regulator deficiency was a contributing cause of the event, the rate of rise of the EDG voltage during the test provided reasonable assurance that the EDG would have been able to carry the design basis loads without stalling. Thus the equipment required to mitigate the consequences of a DBA accident would have performed their safety function. However, due to the potential for challenging the ability of the EDGs to perform their function, PSE&G opted to issue a voluntary LER.

CAUSE OF OCCURRENCE:

The cause of the 2C EDG breaker closing early is attributed to a deficient voltage regulator and a prematurely actuating voltage-sensing relay.

PRIOR SIMILAR OCCURRENCES:

A review of LERs for Salem Units 1 and 2 submitted in the past two years did not identify any prior similar events relative to the technical issues described in this report.

SAFETY CONSEQUENCES AND IMPLICATIONS:

Prior to the modification, if the 2C EDG would have been required to load during a DBA, PSE&G concluded that the rate of rise of the EDG voltage during the test provided reasonable assurance that the EDG would have been able to carry the design basis loads without stalling. Thus the equipment required to mitigate the consequences of a DBA accident would have performed their safety function.

Therefore, there was no impact to the health and safety of the public.

CORRECTIVE ACTIONS:

1. Modifications were implemented in 1996 and 1997 to change the EDG output breaker voltage closing permissive to $\geq 90\%$ for the Unit 1 and 2 EDGs. This was accomplished by installing new voltage sensing relays to provide the input to the EDG breaker closure scheme.
2. The 2C EDG degraded voltage regulator was replaced.
3. The other EDG voltage regulators were inspected and verified to have the resistors installed.