



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

Salem Generating Station

June 01, 1990

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
SPECIAL REPORT 90-5

This Special Report addresses the circumstances surrounding the valid failure of No. 2B Diesel Generator on May 2, 1990. This report is submitted in accordance with the requirements of Technical Specification Surveillance 4.8.1.1.4. It is being submitted thirty (30) days.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "L. K. Miller".

L. K. Miller
General Manager -
Salem Operations

MJP:pc

Distribution

9006050292 900601
PDR ADOCK 05000311
S PDC

The Energy People

Handwritten initials "LE22" with "11" written below them.

PLANT IDENTIFICATION:

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

IDENTIFICATION OF OCCURRENCE:

2B Diesel Generator; Valid failure due to the loss of ability to adjust speed during surveillance

Event Date(s): 5/02/90

Report Date: 6/01/90

This report was initiated by Incident Report No. 90-289

CONDITIONS PRIOR TO OCCURRENCE:

Mode 6 - Reactor Power 0% - Unit Load 0 MWe

DESCRIPTION OF OCCURRENCE:

This special report describes a valid test failure involving 2B Diesel Generator (D/G) occurring on May 2, 1990. This report is submitted for informational purposes in accordance with Technical Specification Surveillance Requirement 4.8.1.1.4 and contains the information required by Regulatory Guide 1.108, Revision 1, August 1977, Regulatory Position C.3.b.

Surveillance Requirement 4.8.1.1.4 states:

"Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission pursuant to Specification 6.9.1."

On May 2, 1990, at 0617 hours, a 24 hour endurance run was initiated on 2B Diesel Generator (D/G) in accordance with Technical Specification Surveillance 4.8.1.1.2c.7, as per Surveillance Procedure SP(O)4.8.1.1.2c7b, "2B Diesel Generator Endurance Run And Load Rejection Test". As required by the surveillance the D/G was started, paralleled with the 2B 4 KV Vital Bus, and loaded to 2860 kw. After approximately 20 minutes, the D/G load was observed to have decreased to 700 kw by Operations Department personnel. Attempts to raise the load were unsuccessful, therefore, the D/G was ordered to be removed from service. In support of taking the D/G off line, the load must first be removed; however, the attempt to shed the D/G load was unsuccessful. The D/G was subsequently tripped and declared inoperable.

Technical Specification Surveillance 4.8.1.1.2c.7 states:

"Verify the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to greater than or equal to 2860 kw and during the remaining 22 hours of this test, the diesel generator shall be loaded to greater than or equal to 2600 kw. Within 5 minutes

DESCRIPTION OF OCCURRENCE: (cont'd)

after completing this 24-hour test, perform Specification 4.8.1.1.2.c.4. The steady state voltage and frequency shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test."

APPARENT CAUSE OF OCCURRENCE:

The cause of this D/G valid test failure was an equipment failure.

Disassembly of the turbocharger identified a brittle failure of one inlet inducer blade on the compressor section caused by contact with the scroll housing. The root cause of the inducer blade failure is thought to be bearing failure; however, failure of the bearing, inlet inducer and subsequent coastdown and seizure of the turbocharger rotor occurred near simultaneously. Initial laboratory test results show brittle failure of the inlet inducer blade. This supports the conclusion of bearing failure.

No heat discoloration of the inlet inducer blade was present, which would infer proper lubrication.

ANALYSIS OF OCCURRENCE:

Troubleshooting revealed that the turbocharger had seized causing a reduction in air flow resulting in the operation of the engine in an excess fuel condition. Subsequently, control was sluggish with high levels of exhaust fumes. This explains why operations could not raise or lower load.

The failure of the turbocharger, to allow full loading of the D/G, constitutes a valid test failure as described in Regulatory Guide 1.108. This was the third D/G failure in the last 100 starts for all three (3) D/G's. The last 100 valid tests performed date back to March 21, 1989. The other failures included: the valid failure of 2C D/G, occurring on January 9, 1990, (reference Special Report 311/90-1) due to the failure of its Woodward Governor and the other was a valid failure of 2B D/G, occurring on September 9, 1989, (reference Special Report 311/89-3) due to a Jacket Water leak on the turbo boost unit.

In Mode 6, Technical Specifications require only two (2) operable D/Gs. During this event, 2A and 2C D/Gs remained operable. Therefore, this event did not impact the health and safety of the general public.

CORRECTIVE ACTION:

The defective turbocharger was replaced and Surveillance Procedure SP(O)4.8.1.1.2c7b was successfully performed. 2B D/G was declared operable on May 23, 1990 at 1518 hours.

The surveillance test frequency was increased to every seven (7) days in compliance with Regulatory Position C.2.d of Regulatory Guide 1.108.

The failed blade section was submitted for laboratory testing. Initial results show brittle failure.

CORRECTIVE ACTION: (cont'd)

The bearings were damaged beyond the capability of additional investigations to determine their mode of failure. The inlet inducer is being shipped to the PSE&G Testing laboratory for metallurgical examination and evaluation. Results of the evaluation will be reviewed by System Engineering to determine adequacy of the preventive maintenance program.



General Manager -
Salem Operations

MJP:pc

SORC Mtg. 90-063