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SUBJECT: Special rept: on 920424, EDG 1B failed due to failed fan idler shaft. Caused by inadequate design. Radiation fan idler shaft on both 1A & 1B EDG replaced.

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March 1, 1994

L-94-056

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: St. Lucie Unit No. 1
Docket No. 50-335
Special report
Date of Event: April 24, 1992
1B Emergency Diesel Generator Failure

On April 24, 1992, the 1B Emergency Diesel Generator(EDG) failed due to a failed fan idler shaft . Technical Specification 4.8.1.1.3 requires that a special report be written for all diesel generator failures. The attached special report is submitted to meet this requirement.

After a recent review of plant records, it was discovered that the above failure had not been reported. The failure was accounted for in the EDG reliability program and in implementation of EDG surveillance requirements.

Very truly yours,

D. A. Sager
Vice President
St. Lucie Plant

DAS/LLM/kw

Attachment

cc: Stewart D. Ebnetter, Regional Administrator, USNRC Region II
Senior Resident Inspector, USNRC, St. Lucie Plant

DAS/PSL #1080-94

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SPECIAL REPORT

I. TITLE

1B Emergency Diesel Generator failure due to a failed radiator fan idler shaft

II. INITIAL CONDITIONS

St. Lucie Unit 1 was at 100% power and St. Lucie Unit 2 had entered into a refueling outage on 4/21/92.

III. EVENT SEQUENCE

On 4/24/92 the 1B Emergency Diesel Generator (EDG) was started to perform a surveillance in accordance with Technical Specifications Table 4.8-1. Surveillance testing of the 1B EDG was then required every 7 days. The 1B EDG surveillance began at 1019. The 1B EDG automatically tripped at 1059 on high water jacket temperature. The radiator fan idler shaft on the 1B1 (16 cylinder) engine was found sheared. The 1B EDG was out of service for approximately 23 hours for repairs to the sheared idler shaft.

A new fan idler shaft, of modified design, was installed in the 16 cylinder engines of the 1B EDG and the 1A EDG radiator fan assemblies. The idler shafts on the 12 cylinder engines were replaced in October 1991.

IV. CAUSE OF THE EVENT

The 1B EDG tripped due to a valid high water jacket temperature caused by the failure of the 16 cylinder engine radiator fan idler shaft. The fan shaft failed due to an inadequate design which created a stress riser where the shaft keyway was cut across a shaft diameter change.

V. CORRECTIVE ACTIONS

- 1) The replacement of radiator fan idler shafts on both the 1A and 1B Emergency Diesel Generators was completed.
- 2) The 1B Emergency Diesel Generator was test run to verify the effectiveness of the repair.
- 3) The 1B Emergency Diesel Generator was declared back in service at 0830 on 4/25/92 following the successful completion of the surveillance run.



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SPECIAL REPORT

V. CORRECTIVE ACTIONS (cont)

This replacement of the radiator fan idler shafts on the 16 cylinder engines completed the changeout of those shafts that contained the stress riser caused by the keyway design. The reliability of the Unit 1 EDG's has been increased with the idler shaft redesign.

VI. SUPPORTING INFORMATION

- This was the 2nd valid failure of the 1B EDG in the previous 20 valid tests and the 5th valid failure in the previous 44 starts (EDG run counts began 6/12/90 when Reg. Guide 1.108 was implemented into the St. Lucie Unit 1 Technical Specifications). The current number of valid tests for the 1B EDG is now 81.
- The 1B EDG was out of service for approximately 23 hours until the repair could be completed and a successful surveillance test was performed.
- The surveillance schedule required because of this failure was every 7 days. That requirement was satisfied on 8/7/92. Since 8/7/92, periodic surveillance requirements have remained at once per 31 days.



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