



LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION

P.O. BOX 618, NORTH COUNTRY ROAD • WADING RIVER, N.Y. 11792

Direct Dial Number

October 15, 1982

SNRC-777

Mr. Ronald C. Haynes
Office of Inspection & Enforcement
Region 1
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Long Island Lighting Company
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-322

Dear Mr. Haynes:

On September 17, 1982, in accordance with 10CFR50.55(e), we reported verbally to Region I a potential deficiency concerning Jacket Water Pump Shaft failures on the Shoreham Emergency Standby Diesel Generators. This letter serves as our thirty-day written report on this deficiency.

Description of the Deficiency

The three diesel generators which are affected were manufactured by the Transamerica DeLaval Company of Oakland, California. These diesel generators, 1R43*G-101, 1R43*G-102, and 1R43*G-103, in the Diesel Emergency Power System are designed to provide standby emergency power for multiple plant safety related systems. The problem was discovered during routine performance testing of Diesel Generator 103 (1R43*G-103). The operator received a Jacket Water Low Pressure Alarm and, upon observing an increase in jacket water temperature, initiated a manual shutdown of the generator. Examination of the Jacket Water Pump revealed that a shaft failure had occurred where the shaft meets the pump impeller. This failure occurred, with 170 hours of elapsed running time, after the shaft and impeller had been modified with a tapered fit in accordance with vendor recommendations. This

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modification had been performed to prevent occurrence of a fatigue type failure which was being experienced by similar units operating in Saudi Arabia. It should be pointed out that this failure on Diesel Generator 103 appeared to be very similar to a failure that occurred on Diesel Generator 102 (1R43*G-102) on May 28, 1982 after approximately 50 hours of operation. At that time, the failed components were shipped to the vendor for analysis. The preliminary field inspection performed on May 28, 1982 determined that the components failed in a catastrophic manner rather than by fatigue. Consequently, this was considered an isolated failure.

Since the occurrence of the second failure, detailed inspections have been conducted by vendor representatives, as well as by LILCO and Stone & Webster pump and metallurgy specialists. In addition, the results of the failure analysis performed by DeLaval on the shaft from Diesel Generator 102 have been obtained and indications are that the failure of that shaft was due to a fatigue crack starting at the small keyway bottom radius on the driven side. This resulted in the impeller end of the shaft twisting off in a conical fracture at about three inches from the end. The initiation of the fatigue crack has been attributed to cyclic movement of the impeller on an improperly tightened impeller hub nut.

Corrective Action

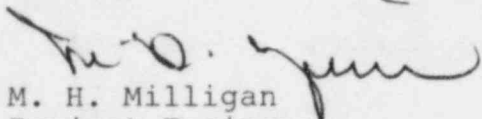
At present, engineering of design modifications to the Jacket Water Pump shaft-impeller assembly is actively underway at Transamerica DeLaval. It is expected that these modifications will involve slight alterations to the shaft, changing the impeller material from bronze to cast iron, and removing the shaft key at the impeller. Possible alterations to the assembly procedure and the size of the impeller hub washer are also being considered. Current plans are that all modifications will be completed and implemented by the end of November, 1982.

If during the course of performing this work, it is determined that any major modifications, not discussed in this letter, are

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necessary, we will notify your office. If you have any questions relative to this matter, please do not hesitate to contact us.

Very truly yours,



M. H. Milligan
Project Engineer
Shoreham Nuclear Power Station

WMJ/law

cc: Mr. Richard DeYoung, Director
NRC Office of Inspection & Enforcement
Division of Reactor Operating Inspection
Washington, D.C. 20555

Mr. J. Higgins, Site NRC

All Parties