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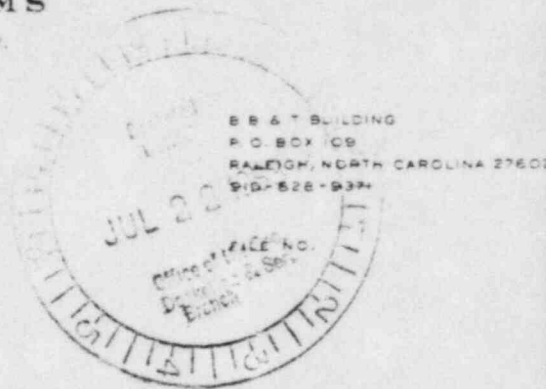
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July 22, 1983

POCKET NUMBER SD-322
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BY HAND

Lawrence Brenner, Esq.
Administrative Judge
Atomic Safety and Licensing
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U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dr. Peter A. Morris
Administrative Judge
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Washington, D.C. 20555

Dr. George A. Ferguson
Administrative Judge
Atomic Safety and Licensing
Board
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Dear Judges Brenner, Morris and Ferguson:

Enclosed is an affidavit by Mr. Edward J. Youngling concerning the questions raised in the Board's July 20 memorandum and order on the diesel generators. The copy submitted today is unexecuted. Mr. Youngling will submit an executed copy to the Board and parties as soon as possible.

As the affidavit indicates, LILCO has decided to implement prior to fuel load its previous commitment to replace the remaining original cylinder heads with new cylinder heads. Although we believe that this decision should resolve the cylinder head issue, particularly with respect to the original heads, Mr. Youngling has provided information concerning the matters raised in the Board's order.

Respectfully submitted,

James F. Bone, Jr. FOR
Anthony F. Earley, Jr.

221/765
Enclosure
cc: All Parties

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)
)
LONG ISLAND LIGHTING COMPANY) Docket No. 50-322 (OL)
)
(Shoreham Nuclear Power Station,)
Unit 1))

AFFIDAVIT OF EDWARD J. YOUNGLING

Edward J. Youngling, being duly sworn, deposes and says
as follows:

1. My name is Edward J. Youngling and I am employed by the Long Island Lighting Company (LILCO) as Startup Manager for the Shoreham Nuclear Power Station. My professional qualifications have been previously submitted to the Board. As Startup Manager, I am responsible for all preoperational test activities. I also coordinate Checkout and Initial Operation (C&IO) testing and preoperational testing. In this role I have been directly involved in the testing of Shoreham's diesel generators and in resolving related issues that developed during testing. Specifically, I am familiar with the County's contention regarding Shoreham's diesel generators.

2. I testified previously in this proceeding as a member of the LILCO panel on the Quality Assurance/Quality Control issues. I have also submitted three previous affidavits to the Board regarding Shoreham's diesel generators dated May 16, 1983, June 3, 1983 and July 7, 1983. On June 10, 1983 I appeared before the Board to answer questions regarding Shoreham's diesel generators.

3. The purpose of this affidavit is to respond to the two questions raised by the Board in its July 20 memorandum and order concerning diesel generators. Before doing so, however, I should report to the Board that LILCO has decided to complete prior to fuel load the planned replacement of the remaining original cylinder heads with the improved, current production model cylinder heads. As my July 7 affidavit demonstrated, the rigorous preoperational testing of the diesel generators has confirmed the reliability of the remaining original cylinder heads. Nonetheless, LILCO has elected to install the improved current production model cylinder heads to further enhance the reliability of the diesel generators. Although LILCO is concerned over the potential impact of this on fuel load, steps will be taken to minimize any such impact.

4. As noted, this affidavit addresses the two questions raised by the Board in its July 20 memorandum.

First, the Board noted that my April 6 memorandum referred to "difficulties with five of the twenty-four cylinder heads" whereas previous information presented to the Board discussed three cracked cylinder heads. Second, the Board indicated that my memorandum made it aware of the possibility of lube oil contamination due to water leakage from the cylinder chamber into the lube oil system. This affidavit shows that

- (a) there have only been three instances of cylinder head cracks which could result in leakage of water into the cylinder,
- (b) the other cylinder head occurrences referred to in the memorandum did not involve cylinder head cracks which could result in leakage into the cylinder chamber, and
- (c) the possible lube oil contamination does not affect the reliable operation of the diesels, but may require more frequent replacement of engine oil to avoid excessive engine wear.

5. My July 7 affidavit discussed the three cylinder head cracks found in the original cylinder heads which resulted in leakage of water from the jacket water system into the cylinder chamber. These three cracked heads were the subject of SNRC-873. These three affected cylinder heads were also discussed in my prior affidavits and at the June 10, 1983 conference of the Board and parties. They are the subject of the contention admitted by the Board.

6. My April 6 memorandum to Mr. Rivello states that LILCO experienced difficulties with five cylinder heads. Three of these five were the cylinder heads that were the subject of SNRC-873. The other two cylinder heads were occurrences not involving leakage into the cylinder chamber. In fact, at the present time there have been a total of six such occurrences not involving leakage into the cylinder chamber. All of these involved the original heads. Even though all of the original heads will be replaced before fuel load, for the Board's information, I will discuss each of these other occurrences below.

7. Two of these occurrences were the result of mechanical damage incurred during the removal and reinstallation of the cylinder heads for other maintenance activities. The first was a scrape on the cylinder head gasket mating surface which we believe was caused by the impact of a tool or other device. This scrape was detected by LILCO personnel and the head was replaced. The second instance involved bolt hole thread damage encountered during the removal of exhaust flange bolts. This problem was identified and the head was replaced.

8. Two other occurrences resulted in very minor water leakage external to the cylinder chamber. The first was the result of a pinhole size sand hole on a non-machined, external surface which resulted in a very small water leakage onto

external portions of the diesel engine. The second occurrence involved leakage at a subcover assembly bolt hole which also resulted in a very small amount of external water leakage detectable only upon removal of the bolt. The water leakage in both of these instances was external to the cylinder chamber and thus had no impact on the ability of the diesels to perform their function. The amount of leakage in both cases was very small and well within the make-up capability of the jacket water system. Although these occurrences did not affect operation, both were corrected by replacing the cylinder heads.

9. The final two cylinder head occurrences related to components contained in the cylinder head assembly. In one instance, a noisy valve was detected by LILCO personnel. The second instance occurred when the rocker arm shaft bolt failed and damaged a valve stem. Both situations were remedied by replacing the entire head assembly.

10. The second question raised by the Board concerns the possibility of lube oil contamination due to water leakage past the piston rings. When the engines are not in operation, if there is a large amount of cylinder head leakage, water would overflow the dished piston head and would likely flow past the piston rings into the lube oil sump. This increases our confidence that a leak in a cylinder head, should one

occur, would not affect the rapid start capability of the diesels. The concern expressed in my April 6, 1983 memorandum regarding the possible contamination of the lube oil was not concern with the reliable operation of the diesel; rather, it was a concern relating to maintenance because water contamination of the lube oil system could increase maintenance requirements. Under LILCO's preventive maintenance program, diesel generator lube oil quality is sampled on a periodic basis. Water contamination would require replacement of the oil. In addition, substantial amounts of water leakage into the lube oil could result in excessive wearing of components over the long term if undetected and uncorrected. It is unlikely, however, that large amounts of water leakage into the lube oil system via a cracked cylinder head would go undetected. The level of the jacket water system is monitored during operation and standby of the diesels and substantial decreases in water inventory would be detected. The barring over procedure, which is no longer necessary because the new heads will be installed, also would have detected any leakage. Thus, although lube oil contamination was a concern to me, that concern did not compromise the ability of the diesels to perform their safety functions.

11. Finally, I would like to correct a statement made in my July 7 affidavit. Footnote 2 of paragraph 9 of that affidavit mistakenly states that "during low power testing, only two diesel generators are required to be operable under Shoreham Technical Specification § 3.8.1.2." While only two diesel generators are required to be operable under the Shoreham Technical Specifications for loading of fuel, low power testing requires operability of all three diesel generators.

Edward J. Youngling

Subscribed and sworn to before
me this ____ day of July, 1983.

Notary Public

LILCO, July 22, 1983

CERTIFICATE OF SERVICE

In the Matter of
LONG ISLAND LIGHTING COMPANY
(Shoreham Nuclear Power Station, Unit 1)
Docket No. 50-322 (OL)

I hereby certify that copies of the Affidavit of Edward J. Youngling dated July 22, 1983 were served this date upon the following by first-class mail, postage prepaid, or by hand as indicated by an asterisk:

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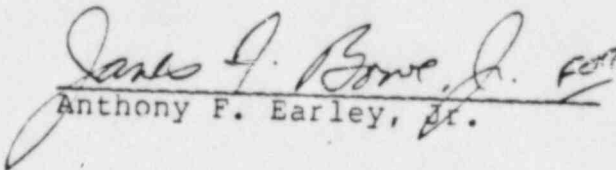
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DATED: July 22, 1983