

2/14/84

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of )

LONG ISLAND LIGHTING COMPANY )

(Shoreham Nuclear Power Station,  
Unit 1) )

Docket No. 50-322-OL

SUFFOLK COUNTY'S REPLY TO LILCO'S RESPONSE  
TO SUFFOLK COUNTY'S MOTION TO ADMIT  
SUPPLEMENTAL DIESEL GENERATOR CONTENTIONS

On February 7, 1984, LILCO filed its Response to Suffolk County's Motion to Admit Supplemental Diesel Generator Contentions (the "LILCO Response"). The LILCO Response is highly unusual. While it contains language which appears not to oppose litigation of the issues raised by the County's supplemental emergency diesel generator ("EDG") contentions, in reality it seeks to destroy those contentions and block the litigation of those issues. This Reply highlights significant aspects of the LILCO Response.

1. LILCO Improperly Urges That Reliability Standards Be Lowered For The Shoreham EDGs. LILCO argues that in order to quickly permit LILCO to obtain a license for low power operation of Shoreham, this Board should apply standards for the performance and reliability of the Shoreham EDGs which are different and lower than those required by the technical specifications, the Shoreham FSAR, NRC regulations and the NRC Staff's interpretation of those

requirements. There is nothing in those requirements, and LILCO cites not a single regulation or case, which suggests that lower EDG reliability standards apply for low power licenses.<sup>1/</sup>

LILCO's arguments in support of lower standards are, first, that only a single EDG operating at less than full power is needed during low power operation,<sup>2/</sup> and second, that LILCO's offsite power system is so reliable that concern over the onsite EDG system is unjustified. Without dignifying these arguments by a detailed technical rebuttal, we make the following points:

(a) LILCO is currently required to have three EDGs of appropriate capacity and reliability. Those requirements are based upon technical matters, such as the different equipment powered by the different EDGs and NRC single failure and other technical criteria. Those requirements should not be changed by this Board, nor on the basis of unsubstantiated lawyers' arguments that proper contentions be denied.<sup>3/</sup>

(b) NRC regulations (10 C.F.R. Part 50, Appendix A, Criterion 17) clearly state that the onsite power system must be

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1/ LILCO erroneously interprets a quotation from this Board's Memorandum and Order of June 22, 1983 (17 NRC 1132) as supporting this proposition. It is clear from the context of that quotation that this Board was simply explaining why a particular vibration problem, which testimony indicated was thought to be a long-term failure mechanism, need not be resolved prior to low power testing. The EDG problems addressed by the County's supplemental EDG contentions are so serious and pervasive that they clearly have a direct impact upon low power operation.

2/ LILCO even argues that no EDGs are necessary. See LILCO Response, footnote at 7.

3/ It should be noted that the arguments in the LILCO Response about technical matters concerning EDG requirements are completely unsupported by affidavits of qualified experts, by other documentary evidence, or by reference to any applicable regulations.

independent from the offsite system. Nothing in the regulations permits lower standards for the onsite EDG system based upon predictions of the likelihood of an offsite power failure. Therefore, the state of LILCO's offsite power system is irrelevant to the quality and reliability requirements for the EDGs.

Finally, the NRC Staff, having reviewed the many problems with the EDGs and similar diesels manufactured by Transamerica Delaval, Inc. ("TDI"),<sup>4/</sup> has expressly and unequivocally stated that unless and until those problems are adequately addressed, it will not recommend any license for Shoreham, including a low power license. See Transcript of Meeting on TDI Diesel Generators, January 26, 1984 ("Meeting Transcript") at 8 (Denton), 95-96 (Eisenhut). Clearly the Staff interprets the NRC regulations and other requirements for EDG capability and reliability to be the same for a low power license as for a full power license.

2. LILCO Proposes That A Low Power License Be Granted After Inadequate Litigation of EDG Issues. The nature of LILCO's proposed lower standards for quickly obtaining a low power operating license is revealed by LILCO's proposal that litigation be limited to only 5 particular components of the EDGs, selected by LILCO: replacement crankshafts, replacement pistons, replacement cylinder heads, replacement intermediate push rods, and the turbocharger thrust bearings. Thus, LILCO's standard is that if these 5 particular components, all of which have suffered past failures,<sup>5/</sup>

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4/ See Addendum to Suffolk County's Motion to Admit Supplemental Die el Generator Contentions, January 27, 1984.

5/ In Appendix A, p. 10 of the LILCO Response, LILCO disclosed  
(footnote continued)

have been adequately repaired or replaced, the EDGs will be deemed sufficiently capable and reliable to justify a low power operating license.

This standard, in view of the history of the EDGs, is woefully inadequate. There is substantial evidence, as shown by the affidavits and voluminous detailed bases set forth in the County's Motion to Admit Supplemental Diesel Generator Contentions, that the EDGs are undersized and over-rated, poorly designed, and unsatisfactorily manufactured, and that because neither the EDGs nor replacement parts for them were manufactured under a required effective quality assurance program, there can be no confidence in EDG reliability. EDG failures could occur, and are likely to occur, at unpredictable times. Accordingly, the EDGs cannot simply be repaired; they must be replaced. These substantiated contentions are not addressed by LILCO's proposal to litigate whether 5 selected components (out of 218 component types) will work.

LILCO is thus proposing that this Board preclude a hearing of substantial safety issues. In the face of the evidence of EDG deficiencies and failures to date, is this Board prepared to guarantee that during low power operation the EDGs will not fail for reasons other than failures of those 5 components? That is the gamble that LILCO is asking this Board to take.

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(footnote continued from previous page)  
that on February 1 and February 5, turbocharger thrust bearings failed on two of the three EDGs. These latest EDG failures are presumably the reason LILCO has not made its list of particular components even shorter.



It is also a gamble which LILCO is likely to lose. By letter of February 10, 1984, LILCO informed this Board that after EDG 102 "successfully completed its 7-day endurance run," inspection disclosed "linear indications . . . in the engine block." At a meeting between the TDI Owners' Group and the NRC Staff on February 10, 1984, Mr. Museler of LILCO, in response to questions, stated that these "linear indications" were found by visual inspection, consisted of 9 cracks in the cylinder block about one inch long each in the area of 3 cylinders, and are similar to cracks found in the cylinder block of the TDI diesel on the ship M.V. Columbia. LILCO is inspecting the other two EDGs for cylinder block cracks.

Besides limiting litigation to only 5 components, LILCO has proposed contentions for the 5 components (Attachment B to the LILCO Response) which are completely unrealistic and designed to eliminate a fair hearing concerning each component. For example, LILCO's first proposed substitute contention is

Whether there is adequate assurance that the replacement crankshafts for the Shoreham diesels will not fail due to torsional stresses imposed during anticipated normal and emergency conditions.

Apparently LILCO believes it is acceptable if the replacement crankshafts fail for reasons other than torsional stress. LILCO's proposed piston contention is whether the replacement pistons "will not fail due to cracking in the area of the crown to skirt connecting bolts." LILCO would bar litigation of whether the design and manufacture of the pistons might result in other problems or failures.

LILCO's standard for a low power license -- that five selected EDG components are not likely to fail again in the same way as they did previously -- is totally unacceptable and unsupported.

3. LILCO Has Adopted An Unrealistic Piecemeal Single Component Approach To EDG Problems. Despite the evidence that the EDGs are complex machines with dynamic inter-related parts and must be addressed as a totality,<sup>6/</sup> LILCO's approach is to review the EDGs on a component-by-component basis only. Thus, as discussed above, to obtain a low power license LILCO argues that it need only show that 5 particular components will not fail in exactly the same way. LILCO makes the argument, which we find incomprehensible, that concern about the overall design of the EDGs is adequately addressed by the litigation of 5 individual parts, and later by LILCO's design review of particular parts. The County has submitted evidence that such an approach is not adequate. LILCO has submitted no affidavits or other documentary evidence to substantiate its claim that its piecemeal component approach will ensure the reliability of the EDGs as a whole.

Not only has LILCO misunderstood supplemental EDG Contention I, which contends that the EDGs are undersized and over-rated; it also has not grasped the express meaning of Contention II. Contention II not only states that various components of the EDGs are improperly designed and, in specified cases, the design deficiencies have not been cured. It also shows, by reference to over

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<sup>6/</sup> See, e.g., Affidavit of Professor Stanley G. Christensen, Attachment 1 to the County's Motion to Admit Supplemental Diesel Generator Contentions.

50 cases of design deficiencies in the EDGs and in similar TDI diesels, that TDI's design work is so inadequate that

There can be no reasonable assurance that the EDGs will perform satisfactorily in service and that there are not additional design deficiencies which will result in failures of other parts or components of the EDGs.

That is one reason the EDGs must be replaced, and cannot simply be patched up again. LILCO's proposed component review does not address the fundamental concerns expressed in Contention II.

4. LILCO Urges That EDG Litigation Proceed Without Important Evidence. LILCO's proposal is to litigate whether or not 5 particular components are likely to fail again, without waiting for the completion of the so-called LILCO Design Review and Quality Revalidation ("DRQR") or the NRC Staff's evaluation of the EDGs. LILCO and the other members of the TDI Owners' Group have a strong, if puzzling, certainty that the outcome of the DRQR will show that the County's contentions are incorrect. As the TDI Owners' Group chairman has stated:

[W]hen we are finished with this program, we feel we will be able to defend the reliability of these engines to anyone.

Meeting Transcript at 94 (McGaughy). But, if the DRQR is properly performed, it may find that the design and quality of EDG components are inadequate. A finding that, for example, the model "AE" piston (or some other component) is badly designed could be dispositive of the case. Thus, proceeding with the litigation before completion of the DRQR could be wasteful, inefficient and even useless.

Even if no findings of the DRQR prove that the EDGs are inadequate, the DRQR and the Staff's EDG evaluations are certain to result in important evidence, either supporting or questioning the design or quality of the particular components being reviewed. No doubt each party will want to reopen the hearing record to introduce such evidence which supports its positions, and will seek to relitigate issues affected by that evidence. In these circumstances a reopening and retrial would be totally justified, and in fact is inevitable. There is no legitimate reason not to defer litigation until all appropriate evidence has been developed, thereby eliminating the waste and inefficiency of forcing the parties to litigate important safety issues with insufficient information.

5. Contrary To LILCO's Assertions, Preoperational Tests Are Inadequate to Disclose EDG Problems. In total disregard of recent experience, LILCO asserts that hearings for a low power license can be restricted to the 5 LILCO-selected components because

LILCO believes that the prior extensive preoperational test program plus its new, enhanced preoperational test program will ensure that any problems that might affect diesel operation during low power testing will be identified[!]

LILCO Response at 11. LILCO will be unable to convince the County to share LILCO's new-found confidence in preoperational testing. One need only recall that (to give only a few examples) LILCO's preoperational test program failed to identify the cracks in the crankshafts. It failed to identify the cracks in 23 of 24 pistons. It did not disclose design and manufacturing flaws in the



connecting rod bearings. Accordingly, there is no reason to believe that preoperational testing is adequate to reveal additional flaws in the EDGs.

6. LILCO Fails To Address TDI Manufacturing And Quality Assurance Inadequacies. LILCO's proposal to obtain a low power license ignores the County's Contentions III and IV. LILCO asserts that litigation of the 5 components selected by LILCO would adequately address the issues of unsatisfactory manufacturing and quality assurance of those components. That is simply not the case. Even if LILCO's narrow, self-serving proposed component contentions were broadened, Contentions III and IV could not be addressed in the context of 5 individual components.

Contention III does not only demonstrate that enumerated EDG components are poorly manufactured. It also shows, by reference to over 40 cases of manufacturing defects in the EDGs and in similar TDI diesels, that TDI's manufacturing is so inadequate that

There can be no reasonable assurance that the EDGs will perform satisfactorily in service and that there are not additional manufacturing defects in the EDGs which will result in failures of other parts or components of the EDGs.

That is another reason why the EDGs must be replaced. LILCO's DRQR does not address this concern.

LILCO's position regarding the failure of TDI to manufacture the EDGs and their replacement parts under an effective Appendix B quality assurance program is equally startling. LILCO states

[I]t is important to note that all three Shoreham diesel generators were disassembled, inspected and reassembled by

LILCO; thus many concerns about TDI's QA programs may not now be relevant[!]

LILCO Response at 11 (emphasis added). We submit that this statement proves the opposite.

The County does not have any detailed information about LILCO's self-inspection of the disassembled EDGs. We do not know who conducted the inspections and how they were qualified, what was inspected and how, who witnessed the inspections, what inspection records were maintained, or what the precise results of the inspections were. We do know that defective cylinder heads are apparently still installed in the EDGs. See Christensen Affidavit at 6-8. We do know that earlier this month, after LILCO's inspections, the turbocharger thrust bearings failed in two of the three EDGs. LILCO Response, Attachment A at 10. We do know that despite its earlier inspections, LILCO anticipates that additional problems with the EDGs will be disclosed during preoperational testing (but for unexplained reasons, LILCO does not believe such anticipated problems should be litigated). Id. We do know that last week, despite its earlier inspections, LILCO found cracks in the cylinder block.

This record makes the County's concerns about TDI's unsatisfactory manufacturing and inadequate quality assurance more relevant than ever. If EDG components are continuing to fail even after LILCO's disassembly and inspection of each EDG, and even with the meticulous care with which LILCO is no doubt now operating the EDGs, then there must indeed be either design deficiencies or manufacturing defects, or both, which LILCO and all of

its consultants and contractors were unable to detect. There must indeed be a serious quality assurance problem with the EDGs that cannot be cavalierly dismissed.

But the LILCO Response does just that, arguing in a footnote that the issues of quality assurance and poor manufacturing are adequately resolved by LILCO's previous inspections (as described above) and by the DRQR. See LILCO Response at 12. In fact, the DRQR will not adequately address the quality assurance issue by verifying "key quality attributes." Contention IV states, in part, that because TDI did not have an effective Appendix B quality assurance program

[T]here can be no adequate confidence  
that the EDGs will operate reliably  
. . . and that additional parts and  
components of the EDGs will not fail.

That is another reason why the EDGs must be replaced. "Adequate confidence" cannot be manufactured by a review of "key quality attributes;" if that were all that was necessary, why bother with the regulatory requirements of Appendix B?

Moreover, the lack of an effective Appendix B program at TDI raises the question of whether the DRQR can even validly verify "key quality attributes." Ineffective QA means that one component will not necessarily be identical to another component of the same type. Thus, the inspection or testing of "attributes" one will not necessarily indicate the nature of the same "attributes" in another. Moreover, the lack of quality in the EDGs means that there are likely to be latent defects in EDG components which would not be revealed even by a 100% physical inspection. The

post-inspection failures of the turbocharger thrust bearings and cylinder block demonstrates the likelihood of latent defects.

7. LILCO Has Misunderstood The County's EDG Contentions And Has Applied Incorrect Standards Of Admissibility. In Appendix A LILCO has hopelessly confused the County's supplemental EDG contentions with the specified bases supporting those contentions. These bases are the factual reasons for the County's belief that its contentions are true. It is well established that the County need not state in its contentions the underpinnings or bases of the bases for its contentions. See Houston Lighting and Power Company (Allens Creek Nuclear Generating Station, Unit 1), AIAB-590, 11 NRC 542 (1980); Mississippi Power and Light Company (Grand Gulf Nuclear Station, Units 1 and 2), ALAB-130, 6 AEC 423 (1973).

In nearly every case in Appendix A LILCO objects to a basis for a contention, and not to the contention itself. LILCO thus challenges the correctness of the factual assertion which forms the basis of a contention or argues that the County has not adequately explained the underpinnings for the specified bases. For example, LILCO argues that Professor Christensen is incorrect in or has not fully explained assertions set forth in his affidavit (see, e.g., Attachment A at 1-2) or that the County is incorrect in the interpretation it has given to a particular factual matter (see, e.g., Attachment A at 19, para. 2, where LILCO argues that the County must be bound by FaAA's interpretation of a defect). These challenges go to the merits of the contentions and are irrelevant to the issue of admissibility. Whether or not a



specified basis is correct is decided either through summary disposition or at the evidentiary hearing.

In other objections to bases for the County's contentions, LILCO has simply misunderstood what is written in the contentions. For example, in Attachment A at 15 LILCO objects to bases 2 and 4 of Contention II.B because the design deficiencies were not found in the Shoreham EDGs. Contention II.B expressly states that the listed bases were design deficiencies "in TDI diesel generators (essentially identical or similar to the EDGs) at other nuclear plants." They provide further support for Contention II, that TDI's dismal diesel design record shows "there can be no reasonable assurance that the EDGs will perform satisfactorily in service and that there are not additional design deficiencies . . . ." Each basis set forth by the County is relevant to and supports a contention, and each contention is relevant to the Shoreham EDCs.

LILCO also objects to some bases for the County's contentions because they state a defect which LILCO claims has been remedied. See, e.g., Attachment A at 9. That a defect has been fixed does not mean it is irrelevant; the occurrence of each design deficiency or manufacturing defect, whether or not remedied, lends support to Contentions II and III -- that TDI's inadequate design and unsatisfactory manufacture of diesel components in the EDGs and in similar TDI diesels indicate that there can be no reasonable assurance that the Shoreham EDGs are properly designed and manufactured.

In summary, LILCO's objections to the specific bases for the County's EDG contentions are either attempts to argue the correctness of factual matters (as evidenced by the Kammeyer affidavit), which may be done only at the summary disposition or hearing stage, or are the result of misreading the contentions. Each of the bases for an EDG contention is evidence supporting that contention. LILCO will have, presumably, a full opportunity to rebut that evidence at the hearing. It cannot, however, have that evidence stricken before the contentions are even admitted.

8. The Operating History Of Marine And Other TDI Diesels Similar To The EDGs Is Relevant. LILCO argues that evidence of problems with TDI diesels of different configurations and in other nuclear, marine and non-nuclear industrial applications must be disregarded as irrelevant. This position is a complete reversal for LILCO, and is without foundation. In his affidavit attached to LILCO's Opposition to Suffolk County's Motion to Add an Emergency Diesel Generator Contention, May 16, 1983 (Attachment 3), Mr. Youngling of LILCO testified:

The vendor has advised LILCO that the basic diesel engine in the Shoreham diesel generators has been in production since the early 1950's. There are 97 diesel engines in this country that are essentially identical or very similar to the Shoreham diesels.

Paragraph 5 (emphasis added). Mr. Youngling later testified to this Board that

Some of the diesels that we have cited in our 97 are marine application diesels, others are stationary application for power production and some are nuclear applications.

Transcript of this proceeding, June 10, 1983 ("Hearing Transcript"), at 21,291.

TDI also has testified that TDI diesels in marine applications referred to in the County's supplemental EDG contentions are essentially the same as the engines at Shoreham. See Deposition of Richard A. Pratt of TDI, August 2, 1983, at 90-92, copies of which are attached.<sup>7/</sup>

Finally, by Board Notification 84-018 dated January 27, 1984, the NRC Staff transmitted to the NRC Commissioners and to appropriate Boards and parties copies of the material concerning TDI diesels in marine applications subpoenaed at the request of the County, stating

This information, which supplements that provided in Board Notifications 83-160 and 83-160a, is relevant to all facilities that have diesel generators manufactured by TDI . . . .

That information is the identical information referred to by the County in its supplemental EDG contentions.

9. The LILCO Response Incorrectly Applies The Timeliness Standard. LILCO objects to many of the bases supporting the EDG contentions on grounds that particular events happened some time ago. However, this evidence forms part of the jigsaw puzzle that has lead to the EDG contentions. A particular defect in a TDI diesel which seemed minor a year ago becomes important when, as

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<sup>7/</sup> In arguing the irrelevancy of the engines on the M.V. Columbia, LILCO states that such engines "may have used heavy fuel." Attachment A to the LILCO Response at 3. In his deposition Mr. Pratt testified that the M.V. Columbia operates on number 2 diesel fuel. Pratt Affidavit at 99. In any case, the County believes the problems with the Columbia engines are extremely relevant.

here, the quantity of defects demonstrates that TDI cannot properly design EDGs.

LILCO places the utmost importance on the timeliness criterion for the admissibility of the supplemental EDG contentions, arguing that "the timeliness factor should be controlling." LILCO Response at 14. On this basis LILCO argues for the denial of many of the bases of the County's contentions. LILCO also admits, however, that the County's contentions raise serious safety issues concerning the overall design, manufacture and quality of the EDGs.

The County agrees with the conclusion about timeliness which LILCO stated to this Board in the context of a discussion about the admission of the County's initial EDG contention. Mr. Ellis, on behalf of LILCO, said:

I think LILCO certainly would agree that while the county has a heavy burden to establish timeliness and we do believe that they are untimely on at least portions of the diesel contention, if not the whole thing, nonetheless (sic), this Board cannot let timeliness stand in the way of a serious problem if it sees a serious problem. The Board cannot of course dismiss a serious new problem or old problem simply because it was not timely raised.

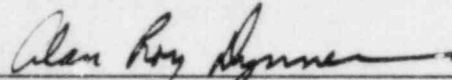
Hearing Transcript at 21,204 (emphasis added).



For the reasons stated herein, Suffolk County requests the Board to reject the proposals and arguments made in the LILCO Response and to grant Suffolk County's Motion to Admit Supplemental Diesel Generator Contentions, as submitted.

Respectfully submitted,

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February 14, 1984

1 UNITED STATES OF AMERICA  
2 NUCLEAR REGULATORY COMMISSION  
3 BEFORE THE ATOMIC SAFETY AND LICENSING BOARD  
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7 In the Matter of

8 LONG ISLAND LIGHTING COMPANY  
9 (SHOREHAM NUCLEAR POWER STATION,  
UNIT 1.)

No. 50-322 O.C.

10 Deposition of  
11 RICHARD A. PRATT

12 August 2, 1983

13 VOLUME I

14 Pages 1 - 157  
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26 Reported by ADELE I. NOLAN, CSR No. 1641,  
27 LESLIE TANIMURA-WONG, CSR No. 5796  
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1 248 BMEP, which is roughly 10 percent more load than the heads  
2 at LILCO will see.

3 Therefore, they are stressed higher than the heads of  
4 LILCO will be stressed, and I will state again that the 19,000  
5 hours that they have accumulated -- now that's 9,000 hours per  
6 hull, per engine, it's not 9,000 hours distributed over two  
7 engines, so that's two engines that have 9,000 hours each on  
8 them.

9 If you are going to distribute it over the entire number  
10 of engines, it would be 38,000 hours total.

11 Q The Pride, you said, had two engines at 9,000?

12 A Right.

13 Q The Star, I think you said, had two engines at 6,000?

14 A Correct.

15 Q The Spirit has two engines at 4,000?

16 A Uh-huh.

17 Q And the --

18 A Columbia.

19 Q And the refitted engine on the M.V. Columbia has about  
20 4,500 hours; is that correct?

21 A Correct.

22 MR. ELLIS: What was that last figure? I'm sorry.

23 THE WITNESS: Forty-five hundred hours.

24 MR. DYNNER: Q Do I take it that, in your view, the  
25 operation of the cylinder heads in the marine application is  
26 relevant to the reliability of the cylinder heads in a nuclear  
27 application?

28 A Yes. That would be my opinion.

1 I base that upon the fact that the strains that a cylinder  
2 head sees are primarily related to firing pressures.

3 The engines at LILCO operate at 225 BMEP, on number 2  
4 diesel -- yes, they do.

5 They are required to start rapidly, but they are also  
6 kept warm and near operating temperature, and the rapid start of  
7 an engine does not impose severe stresses on the heads, in my  
8 opinion.

9 The engines aboard the Spirit of Texas and the other two  
10 Texas class vessels operate at 248 BMEP, roughly 10 percent  
11 greater horsepower than the LILCO engines were.

12 They operate on degraded fuels, residual fuels, which are  
13 hard on an engine.

14 They are overloaded to start with, because the propellers  
15 for those ships are too big and therefore -- I'm sorry, one other  
16 thing -- they are a direct reversing engine, which means every  
17 time that ship has to maneuver, the engine has to stop, reverse  
18 direction, and start rapidly, so they get numerous starts and  
19 stops on these engines, and I would consider that application  
20 to be far more severe, therefore, than the LILCO application  
21 would be.

22 Q Aside from those differences, are these engines  
23 essentially the same as the engines at Shoreham?

24 A Yes. The engines on the Texas class vessels are  
25 V engines.

26 The Shoreham is an in-line; however, they are both  
27 17-inch bore, 21-inch stroke engines that use the same pistons,  
28 the same cylinder heads, and see the same firing pressures and

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1 operating stresses.

2 Q And the cylinder heads on the marine engines, are they  
3 the same as the cylinder heads that are -- the new cylinder heads  
4 that are installed and to be installed at Shoreham?

5 A Yes, they are, with the exception that they have a  
6 built-in relief valve as required by ABSS, will open at 1800  
7 pounds firing pressure.

8 Q When you say "they," you mean the ones at Shoreham?

9 A The ones in marine.

10 Q The ones in marine. And would that change -- have any  
11 impact on the function or operation of the cylinder head --

12 A None.

13 Q -- in terms of its reliability?

14 A None, none.

15 Q Can you estimate for me, or do you know precisely how  
16 many of the 636 cylinder heads have no operating time on them?

17 MR. ALDEN: No operating time?

18 MR. DYNNER: No operating time.

19 THE WITNESS: Well, very few, because even though the  
20 cylinder heads are installed on new construction engines, they  
21 have nevertheless had to go through a four- to six- to eight-hour  
22 factory test, so they at least all have that much operating time  
23 on them, and of that quantity, I would say that 90 percent of  
24 that 636 has at least that many.

25 MR. DYNNER: Q You mentioned that you excluded cylinder  
26 heads with what you, I think, referred to as minimal number of  
27 hours on them?

28 A Yes.

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LONG ISLAND LIGHTING COMPANY )

Docket No. 50-322 O.L.

(Shoreham Nuclear Power Station, )  
Unit 1) )  
\_\_\_\_\_ )

CERTIFICATE OF SERVICE

I hereby certify that copies of SUFFOLK COUNTY'S MOTION FOR LEAVE TO REPLY TO LILCO'S RESPONSE TO SUFFOLK COUNTY'S MOTION TO ADMIT SUPPLEMENTAL DIESEL GENERATOR CONTENTIONS and SUFFOLK COUNTY'S REPLY TO LILCO'S RESPONSE TO SUFFOLK COUNTY'S MOTION TO ADMIT SUPPLEMENTAL DIESEL GENERATOR CONTENTIONS, dated February 14, 1984, have been served to the following this 14th day of February 1984 by U.S. mail, first class, except as otherwise indicated.

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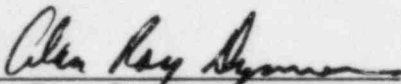
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