LILCO, February 7, 1984

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)	)	
	)	

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

INTRODUCTION

The County's proposed diesel contentions are excessively broad. They are deliberately designed to lead to a protracted, unfocused litigation of all components of all Transamerica Delaval (TDI) diesels in nuclear and marine applications. Thus, they include

(i) untimely matters -- matters of public record that occurred in some instances years ago,

(ii) matters concerning TDI diesels of different design at other nuclear stations with no showing of relevance to Shoreham,

(iii) matters concerning TDI diesels in marine and industrial applications

without regard to similarities or dissimilarities in design, construction, maintenance or operation of those diesels,

(iv) matters raised in routine NRC and utility audits of TDI without regard to the substance, significance or relevance of the findings,

(v) matters that have no bearing on the reliable operation of the Shoreham diesels, e.g., modifications for improved maintenance,

(vi) matters without adequate basis or particularization.

If admitted, these proposed contentions will lead to trying "cases within cases," i.e., trying many other collateral cases within the Shoreham diesel litigation. For example, the proposed contentions will require the parties and the Board to devote substantial discovery and hearing time to the operating, maintenance and manufacturing histories of V-16 engines in marine applications, e.g., M. V. Columbia, to determine causes and remedies of various occurrences on those engines and their relevance, if any, to Shoreham's engines. The sum of these collateral cases will surely bid fair to consume more discovery time, more cost and more hearing time than all of the hearings to date before this Board.

The County's indiscriminate, lengthy lists of occurrences or incidents involving marine applications or engines different from those at Shoreham create only the illusion of

specificity. It is apparent from these lists that the County has made no good faith effort to demonstrate whether these matters relate in any way to the Shoreham diesels and to the pertinent issues of this proceeding. This is neither surprising nor accidental for the County's filing reflects, lamentably, that the County's real interest lies not in whether there is reasonable assurance that the Shoreham diesels are adequately reliable. Rather, the County's real interest, manifestly, is to stop Shoreham, to prevent its opening. The proposed contentions reflect the County's intention to use these proceedings for that purpose.

LILCO does not oppose properly focused diesel litigation designed to ascertain first (a) the diesels' adequacy for low power testing and then (b) their adequacy for commercial or full power operation. To achieve these ends, LILCO proposes that the Board, as it has in the past, rewrite the contentions to ensure a focused, efficient litigation. More specifically, LILCO respectfully submits that on the issue of low power testing, the Board admit for litigation particularized contentions on specific major components.1/

1/ Based on a review of the County's contentions (see Attachment A), LILCO believes that the low power litigation should focus on the following components: crankshafts, pistons, cylinder heads, intermediate push rods, turbocharger thrust bearings. Particularized contentions for these components are set forth in Attachment B. Connecting rod bearings are not included in the list because, as is shown in Attachment A, the

(footnote continued)

Litigation of particularized contentions on these components would ascertain whether these items, as now installed, are adequate to perform their intended functions. LILCO believes that litigation of such specific contentions plus successful completion of the much expanded and NRC Staff approved preoperational test program will provide the reasonable assurance of reliable diesel operation required for the issuance of a low power license.

This approach is appropriate because:

(i) it reflects and puts in proper perspective the need for and function of diesels in low power testing,

(ii) it accommodates the thrust and essence of the County's concerns, and

(iii) it avoids endless, unfocused litigation and ensures efficient conduct of the hearings.

Each of these points merits elaboration.

This Board has already distinguished between issues that must be resolved prior to fuel load and low power testing and issues whose resolution can be sought in the longer term. In the case of the diesels, this distinction rests in part on the fact, as the Board has noted, that the diesels

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(footnote continued)

County has not provided any adequate basis for a contention on these components.

> will operate for only relatively short periods (including monthly surveillance tests), even if needed for emergency service, during low power testing.

Board Memorandum and Order at 32 (June 22, 1983).

It is important to be clear that the safety significance of diesels is far less great during low power testing than during full power operation. Although the Technical Specifications require all three diesels to be available for operation during low power testing, there is, as a practical matter, a very limited need for diesels in the fuel load and low power testing phase. Thus, at low power levels, only <u>one</u> of the three diesels is needed to maintain the plant in a safe condition in the event of loss of offsite power and a LOCA. And even in this event, the single diesel will only be required to handle loads substantially below the 3500 KW continuous rating of the engine.

It is also important to understand the high reliability of Shoreham's offsite AC power system. First, LILCO has significant interconnection capacity (i) with the New York Power Pool through Consolidated Edison (three ties totalling 1090 MW) and (iii) with the New England power grid beneath Long Island Sound through Connecticut Light & Power (300 MW). Second, within the LILCO system, there are four 138 KV circuits feeding into the Shoreham 138 KV switchyard on two separate rights-of-way. In addition to the 138 KV system, the Shoreham area is

also supplied with three separate 69 KV circuits. These arrangements render remote a loss of off-site power to Shoreham.

Third, LILCO has taken additional measures to ensure added reliability of offsite AC power. The LILCO system includes ten gas turbines at Holtsville, 50 megawatts per turbine, two of which are equipped with automatic black start capability specifically to support Shoreham. Power from these gas turbines is capable of being supplied to Shoreham within 15 minutes through the alternate transmission lines previously described to increase reliability.2/ Thus, even a failure of the (i) New York power grid, (ii) the New England power grid and (iii) the normal baseload plants on the LILCO system would not prevent rapid restoration of offsite power to Shoreham because either of the two gas turbines with black start capability at Holtsville could supply more than enough AC power to meet all of Shoreham's needs even at full power.3/

2/ There are additional black start gas turbines east of Shoreham that are capable of supplying adequate power to Shoreham. It was these units, in fact, that restored LILCO's Port Jefferson fossil unit following the 1965 blackout.

3/ The LILCO system has experienced only one complete blackout -- the 1965 blackout of the entire Northeast. The gas turbines at Holtsville were installed after that blackout. A recent test demonstrated that these turbines could restore power to Shoreham in less than 10 minutes after system blackout. Also, black start gas turbines have been installed at all of LILCO's major fossil stations since the 1965 blackout.

Further, LILCO is also installing a 20 megawatt gas turbine on the Shoreham site with black start capability in addition to the 50 megawatt gas turbine already on the site (without black start capability). The 20 MW unit is scheduled to be operational in April. Thus, even with the loss of all offsite sources, including the Holtsville gas turbines, more than adequate AC power could be provided by the 20 megawatt gas turbine on the site.4/

In summary, the high reliability of offsite AC power to Shoreham, the fact that only one of three diesel generators would be required to meet plant needs in the event of loss of offsite power at low power testing, and the fact that even this one diesel would be lightly loaded while doing so, all underscore the appropriateness of distinguishing between fuel load/low power diesel litigation issues and commercial power litigation issues.

4/ Shoreham also has redundant DC battery power supplies that permit operation of steam driven HPCI and RCIC pumps to remove decay heat in the event of loss of all AC power sources, including the diesels. LILCO has already demonstrated to the NRC Staff that Shoreham, even at 100% power, can withstand a total loss of AC power, including diesels, without sustaining any core damage for a 24-hour period. In such a scenario, the DC battery powered HPCI and RCIC systems would continue to provide the required water levels. Decay heat would be transmitted to the suppression pool via the safety relief valves. See SNRC-582 dated June 15, 1982.

Next, LILCO's proposed approach to the diesel litigation accommodates the County's concerns. The County's first two proposed contentions reflect a concern about the overall design of the Shoreham diesels.5/ LILCO's proposed approach reaches this concern through the litigation of the adequacy of specific components. For example, litigation of the adequacy of the 13" x 12" crankshaft must include whether it is undersized, i.e., whether its design is adequate for the forces and stresses it experiences given the rating of the diesel. If the record warrants the conclusion that the 13" x 12" shaft is adequate to perform its function, then the concern over design of this component, the concern that it may be undersized or overrated, will have been resolved.

The same is true for the other major components. Thus, litigation focused on the causes of the observed piston cracks will necessarily consider, for example, whether the design of the original Shoreham AF pistons caused or contributed to the observed cracking and whether the new AE piston design eliminates this concern.

Nor is the County's frequent reference to the interaction of all diesel components a bar to LILCO's approach. Of course, there is interaction among the components, and this

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5/ The contention that the diesels are overrated and undersized is essentially a design concern.

obvious fact must be, and is, taken into account in the approach suggested here. In the case of the crankshaft, for example, it is plain that the forces and stresses on the crankshaft are a function of the operation of other components (e.g., piston firing pressures) and transmitted to the shaft through other components (e.g., connecting rods and connecting rod bearings). It is equally plain that FaAA accounted for this interaction in its analysis of the crankshafts and that a properly focused litigation of the adequacy of the 13" x 12" crankshaft would also cover this. Calculations of crankshaft stresses are in essence calculations of the crankshaft's responses to the forces exerted on it by other components with which it interacts. Interactions, then, are accounted for in LILCO's assessment of the adequacy of each component. In short, the County's vague allusions to "interactivity" or "interrelationship" among all the diesel parts are mere obscurantism and no bar to LILCO's proposed approach.

LILCO recognizes that the County's design/undersized/overrated concern is not limited to the individual component occurrences that LILCO proposes should be litigated for the low power phase. Rather, LILCO understands that the County contends that the individual occurrences, even though remedied, raise questions about the overall design. This more general concern is addressed by LILCO's performance

of the Design Review and Quality Revalidation (DRQR). As the Board knows, LILCO committed to a complete review of the design and quality of the Shoreham diesels in November, 1983.

LILCO's DRQR is a comprehensive program aimed at ascertaining the reliability of the Shoreham diesel generators through reviews of the designs and quality attributes of most of the engine components. As part of the DRQR, every component has been reviewed to determine its function and potential contribution to engine reliability. Included in this review was an assessment of the nuclear and non-nuclear experience with these components. From this review, 171 out of the total of 218 component types on the Shoreham diesels were selected for further evaluation. Design review and quality revalidation teams are currently performing appropriate design analyses, calculations, inspections, nondestructive examinations and, where necessary, destructive testing to confirm, independently of TDI, the adequacy of each component's design and quality. At this time over 100 engineering and technical personnel from LILCO, SWEC, FaAA and other consultants are currently engaged in this effort.6/

6/ The County, in early January, was furnished with a DRQR program description, copies of DRQR procedures and a list of the component types to be reviewed. This program is essentially the same program as that presented by the Diesel Generator Owners Group to the NRC Staff on January 26. The NRC Staff has accepted this program as an appropriate framework for resolving TDI diesel generator issues.

The DRQR is not scheduled for completion until approximately April 1, 1984, and LILCO does not think that hearings aimed at a low power license should or need cover the large number of components (171 component groups) and issues involved in the DRQR. 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. Successful completion of the test program and litigation of known conditions on the major components is sufficient to provide adequate assurance that the diesels will perform any low power testing function. Of course, the County and Staff will have access to the results of the DRQR and may seek to pursue additional design concerns later, if appropriate.

LILCO's proposed approach also accommodates the County's last two concerns, manufacture and quality assurance. Again, litigation of specific conditions on the major components, as LILCO suggests, certainly encompasses quality and manufacturing matters. For example, litigation of the cylinder head issue will involve specific questions concerning the design, manufacture and quality of the cylinder heads. In this regard, it 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.

Again, LILCO recognizes that the County's manufacturing and QA concerns extend beyond the reported occurrences to cast doubt on the entire TDI program. These concerns are addressed by the DRQR program; it is designed to verify key quality attributes independently of the TDI program.7/ Again, however, LILCO does not consider that litigation aimed at fuel load and low power testing should be delayed pending completion and review of the entire DRQR. Such litigation should more appropriately focus, as LILCO suggests, on the adequacy of design, manufacture and quality of specific major components in light of specific findings or occurrences at LILCO.

Finally, considerations of efficiency and conservation of Board and party resources also militate strongly in favor of LILCO's approach. Litigation of specific design manufacturing and quality aspects of specifically identified problems with certain major components is the correct approach for litigation leading to a low power license. In sharp contrast, admission

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7/ While quality issues could also be resolved by litigation concerning the details of TDI's QA program as they relate to Shoreham, LILCO believes such an exercise (requiring inquiry into 10 year old audits, inspections and the like) would be time-consuming, unproductive and neither efficient nor particularly probative. In LILCO's view, a far more productive and probative means of addressing quality and manufacturing concerns is to focus on the diesel engines as they are now, after disassembly, inspection and reassembly by LILCO, and, as in the DRQR, to verify various key quality attributes by appropriate means, including inspections, nondestructive testing and destructive testing, where appropriate.

of the County's excessively broad and open-ended proposed contentions would likely lead to burdensome and unnecessary discovery and unduly lengthy depositions and hearing.

In summary, therefore, LILCO's proposal for focused litigation of particularized contentions for specific components is appropriate because (i) it correctly recognizes the distinction between low power and full power issues; (ii) it adequately addresses the County's legitimate concerns and (iii) it ensures efficient hearings and avoids the protracted litigation certain to accompany the County's proposed contentions.

Legal Principles

The pertinent legal standards for judging the admissibility of late filed contentions were addressed in the Board's Memorandum and Order dated June 22, 1983. Memorandum and Order at 1-17. Consequently, a discussion of those standards is unnecessary. LILCO will proceed to its views on the County's new diesel contentions.

In summary, LILCO believes that:

1. The County may litigate questions concerning the overall design (including whether the machines are overloaded or undersized), manufacture and quality of the Shoreham diesels in the manner suggested by LILCO on pages 8-12 above.

2. For reasons discussed in Attachment A, the County may litigate only specific contentions concerning the following specific diesel generator components.

(a) crankshafts,

(b) pistons,

(c) cylinder heads,

(d) intermediate push rods, and

(e) turbocharger thrust bearings.

3. The County also may litigate as a long-term, post fuel load issue the vibration contention already admitted by the Board. Memorandum and Order at 32-33 (June 22, 1983). The County has not provided any additional new information which would justify changing the Board's prior ruling on this matter.

4. With respect to the litigability of the specific diesel generator issues raised in the County's contentions, LILCO believes that the timeliness factor should be controlling. Given the massive number of items listed in the County's contentions, it is impractical to analyze in detail the five factors that must be considered under 10 CFR § 2.714(a)(1) for each item. Rather, this analysis can be simplified by some general observations.

(a) Based on the Board's analysis of the County's diesel contention filed in May, 1983, LILCO concludes that the Board is likely to find that factors (ii), (iii) and (iv) would generally weigh in the County's favor. This is not LILCO's view, but, for reasons stated below, it is unnecessary to pursue arguments in this regard.

(b) Factor (v), the extent to which the County's participation will broaden the issues or delay the proceeding, will always weigh against the County. Each specific issue admitted by the Board broadens the scope of the proceeding and certainly will delay its completion. Also, since the Shoreham plant is now complete except for diesel generator testing, additional diesel issues will delay fuel load and low power operation of the plant.

(c) Given (a) and (b) above, and the importance of the timeliness factor8/ in performing the balance required by § 2.714, the question of timeliness should be controlling in passing on the admissibility of individual issues unless it appears that special circumstances exist.

(d) Finally, the County must meet the requirements applicable to all contentions whether timely or late filed. They must be relevant, adequately particularized and have an adequate basis.9/

8/ Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), ALAB-743, slip. op. at 17, 27-29 (Sept. 29, 1983); Duke Power Co. (Perkins Nuclear Station, Units 1, 2 and 3), ALAB-431, 6 NRC 460, 462 (1977); Virginia Electric and Power Co. (North Anna Station, Units 1 and 2), ALAB-289, 2 NRC 395 (1975).

9/ Philadelphia Electric Co. (Limerick Generating Station, Units 1 and 2), slip op. at 2-4 (April 12, 1983); Pacific Gas & Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-81-5, 13 NRC 361, 364 (1981). Maine Yankee Atomic Power Co. (Maine Yankee Atomic Power Station), LBP-82-4, 15 NRC 199, 206 (1982); Philadelphia Electric Co. (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-216, 8 AEC 13, 20-21 (1974).

LILCO has applied these standards to each paragraph of the County's four contentions. The results of this analysis are included in Attachment A. As noted, LILCO does not dispute that problems identified with TDI diesels raise questions concerning the overall design, manufacture and quality of the Shoreham diesels beyond the specific problems experienced at Shoreham. Indeed, the Company took steps in October, 1983 to develop the DRQR to resolve these concerns. In LILCO's view, however, fuel load and low power litigation require only litigation of particularized contentions relating to specific key components and successful completion of the enhanced preoperational test program. Moreover, no reason exists to litigate specific alleged problems unless the County shows in an adequate and timely fashion that the problem remains uncorrected. Also important is that while diesel generator problems at other nuclear and marine diesels should not be litigated at Shoreham, these events will be considered in evaluating the Shoreham diesels. In the DRQR program, all available data, including Part 21 and 50.55(e) reports concerning other nuclear utilities, as well as data from marine applications, will be considered in assessing the design and quality of the engines.

Conclusion

For all of the reasons stated above, LILCO urges the Board to accept LILCO's proposal for litigation of diesel generator issues for Shoreham.

Respectfully submitted,

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DATED: February 7, 1984

ATTACHMENT A

LILCO'S RESPONSE TO
SUFFOLK COUNTY SUPPLEMENTAL
DIESEL GENERATOR CONTENTIONS

CONTENTION I.A.

Paragraph 1. The County claims that the replacement crankshafts currently installed in the diesel generators are inadequate. LILCO does not object to litigating the adequacy of the replacement crankshafts.

Paragraph 2. LILCO objects to the admission of this portion of the contention because there is no basis for the County's conclusion that the increased weight of the new crankshafts will cause "excessive wear" on the main bearings. The new crankshaft weighs less than 5% more than the old crankshafts. Moreover, past experience has not indicated any excessive main bearing wear. See Kammeyer Affidavit at 2.

Paragrapn 3. This contention incorrectly states that there was a 96% failure rate for the Shoreham pistons. None of the cracked pistons found at Shoreham had failed nor did the cracked pistons prevent operation of the diesels. In any event, LILCO does not object to litigation of a properly particularized contention concerning the pistons on the Shoreham diesels. The County claims that the replacement model AE pistons are of an "inadequate design" to withstand operating conditions. There is insufficient basis to support such a

generalized claim. Rather, the Board should only admit a piston contention that focuses on actual deficiencies that have been identified in the original Shoreham pistons. Thus, the contention should address whether the new model AE pistons are of an adequate design and manufacture to prevent piston failure due to cracking in the area of the crown to skirt connecting bolts.

Paragraph 4. LILCO does not object to litigation of the adequacy of the design and manufacture of the replacement cylinder heads at Shoreham.

Paragraph 5. This portion of the contention is hopelessly vague and therefore fails to meet the particularization requirements for contentions in NRC proceedings. For example, the contention fails to specify the "interrelationships" to be litigated or the "major components" that have "weaknesses" that may be exacerbated by the unspecified interrelationships. In LILCO's view, where relevant interrelationships between various components of the Shoreham diesels exist, they should be taken into account in the individual component analyses. For example, in the course of litigating the adequacy of the replacement crankshafts, LILCO will demonstrate that all of the pertinent forces on the crankshaft, given the current design and rating of the engines, have been considered. Consequently, the paragraph should not be admitted as a separate contention.

CONTENTION I.B.

Paragraph 1. The County fails to provide an adequate basis for this contention. First, Professor Christensen's statement that exhaust temperatures in the range of 1100° F are excessive is unsupported and unexplained. He provides no basis for the conclusion nor does he indicate what effects such an exhaust temperature will have on the engine. As the attached affidavit reflects, Professor Christensen's factual assertions are not accurate. Kammeyer Affidavit at 2. Moreover, this portion of the contention is too vague to be acceptable since it does not put the parties on notice of precisely what would be litigated if admitted.

Paragraph 2. LILCO objects to the admission of this contention because the County has failed to establish an adequate basis to show that the de-rating of an Alaskan ferry boat is relevant to the Shoreham engines. The County has not addressed a number of important factors crucial to determining whether the Columbia de-rating is applicable to Shoreham: (1) the engines on the M. V. Columbia are V-16 engines while the Shoreham engines are straight 8 diesels; (2) the Columbia engines may have used heavy fuel while the Shoreham engines use light diesel fuel; (3) the Columbia engines are variable speed marine engines rather than constant speed stationary engines;

(4) the maintenance applied to the Columbia engines and the Shoreham engines may be significantly different; (5) the operating loads or operating histories of the engines may be significantly different, and (6) the QA applied to the engines may be significantly different. Moreover, the County failed to disclose significant information to the Board by citing only the "Seaworthy Report" as a basis for this and other contentions related to occurrences on the M. V. Columbia. Another report done for the State of Alaska ("Sharp Report"), not mentioned by the County, contradicts many of the findings in the "Seaworthy Report."1/ In fact, with respect to this particular contention, the "Sharp Report" suggests that the de-rating of the M. V. Columbia engine was done for economic reasons.2/ Consequently, there is not an adequate basis for admitting contentions in the Shoreham proceeding based on occurrences reported on the M. V. Columbia. Similar considerations justify

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1/ This highlights LILCO's view that admission of contentions based on matters arising out of marine applications will result in litigation of many cases within the Shoreham case.

2/ George C. Sharp, Inc., Overview of Reports, Analysis and Recommendations Regarding Main Propulsion Engines M/V Columbia, V 1-2 (July 26, 1983). De-rating allows the owner to increase maintenance intervals and thus have greater engine availability. This is an important consideration for engines that operate continuously for extensive periods of time. As the Board knows, the Shoreham engines will be used, even under emergency conditions, for only short periods of time.

rejection of contentions concerning matters related to other marine engines.

Admission of this contention would improperly focus litigation on the Columbia engines rather than on litigation of the reliability of the Shoreham engines. It is well to note that exclusion of this contention does not mean that problems identified on the M. V. Columbia or any other TDI engine will not be considered for Shoreham. LILCO's DRQR is designed to review all available operating experience from TDI engines in both nuclear and non-nuclear applications. This program will determine whether this operating experience is applicable to Shoreham and, if so, whether any corrective actions are appropriate.

Paragraph 3. This contention is without basis. As LILCO's vibration study (appended to the Diesel Generator Operational Review Report provided the Board and parties in July, 1983) indicates, vibration levels at Shoreham were consistent with vibration levels at other similar TDI engines. Significantly, the engine at Lincoln, Kansas operated at a lower speed (400 RPM vs. 450 RPM), and a lower power rating (2500 KW vs. 3500 KW). Therefore, there is no basis for the County's assertion that the baseline vibration of the Shoreham engines is excessive or that Shoreham's power rating adversely affects vibration.

In any event, the Board admitted a vibration contention in June, 1983 for long-term resolution. The County offers no additional evidence or basis to support changing this contention from a long-term issue to a low power license issue. Thus, it should remain a post-fuel load/low power issue.

CONTENTION II.A.

Paragraph 1. LILCO objects to this portion of the contention because the County has not provided an adequate basis to support its statement that the deficiencies identified in connecting rod bearings have been only "partially" remedied. FaAA's final report on the connecting rod bearing failure, attached for the Board's convenience, indicates that the replacement connecting rod bearings have a predicted life of 38,000 hours. Given the intermittent use of diesel generators in nuclear standby service, the present bearings should last for the life of the plant.3/ In addition, the County provides no basis for its vague claim that the replacement connecting rod bearings "will not ensure correct lubrication and freedom from problems."

3/ It is worth noting that the cracking found in the original connecting rod bearings had not prevented operation of the diesels.

Paragraph 2. LILCO objects to the admission of this portion of the contention because the County has failed to provide an adequate basis for it. As noted in the FaAA jacket water pump inspection document cited by SC and attached to this response, the scoring indications found on the jacket water pump for emergency diesel generator 102 were caused by the crankshaft failure in this diesel generator. The jacket water pumps for the other two diesel engines were inspected and did not exhibit similar problems. Thus, the reference to the FaAA document provides no basis to conclude that the jacket water pump scoring is anything but a consequential result of the crankshaft failure. The County's reference to a July 20, 1983 Part 21 report similarly fails to provide any adequate basis for this contention. The condition reported in this Part 21 report had been previously reported to the NRC by LILCO in a 10 CFR § 50.55(e) report (SNRC-777) dated October 15, 1982. Thus, any attempt to litigate this issue is also untimely.

Paragraph 3. In support of this portion of the contention, the County relies upon a LILCO § 50.55(e) report dated May 4, 1983 (SNRC-883). The County attempted to raise this issue when it moved to reopen the record for consideration of diesel generator issues in May, 1983. The Board previously ruled that:

> the only remaining triable significance of the bolt issue is its possible connection with the vibration contention, and it may be considered under any paragraph 2 litigation.

Memorandum and Order at 34 (June 22, 1983).4/ The County has presented no reasons to change the Board's disposition of this issue.5/

Paragraph 4. The County attempted to raise this issue when it moved to reopen the record in May, 1983. Memorandum and Order at 27-28 (June 22, 1983). The issue was also discussed in the Diesel Generator Operational Review Report (July, 1983). Since the County provides no additional information, the County's attempt to revisit this matter now is untimely.

Paragraph 5. LILCO objects to the admission of this portion of the contention because it is not timely. The County relies on a 10 CFR Part 21 report dated May 13, 1983.

4/ The Board also directed the parties to discuss possible inspection of rocker arm bolts. Id. at 34-35. Attached is a September 22, 1983 letter from T. S. Ellis, III to Messrs. Goddard and Dynner in which LILCO describes the additional inspections performed on the rocker arm shaft bolts.

5/ The County's statement that the design changes in the rocker arm assembly capscrews may overstress the cylinder head subassembly is without any stated basis. Moreover, this point is untimely because it could have been raised when the County moved initially to reopen the record.

Moreover, this matter was discussed in the Diesel Generator Operational Review Report provided to the County in July, 1983. The County has provided no new information that would justify admission of this portion of the contention.

Paragraph 6. This portion of the contention should not be admitted because the County provides no basis to conclude that the condition reported in TDI's September 27, 1983 Part 21 report has not been remedied. As the attached affidavit reflects, this report dealt with cable connected to the electrical overspeed trip. This cable has been replaced by qualified cable for the Shoreham engines. Kammeyer Affidavit at 3.

Paragraph 7. The County has failed to provide any basis to support its claim that the pitting (or as the County calls it, exfoliation) on camshaft lobes of diesel generator 101 is evidence of improper design. First, LILCO inspected the other camshafts and found no similar conditions. Second, as the attached affidavit reflects, the camshaft pitting had no effect on the operation of the DG 101. Nor would there have been any long-term effect on diesel reliability since the camshaft is inspected periodically and replaced if any observed pitting threatens to hinder engine operation. In any event, LILCO replaced the affected camshaft lobes. Kammeyer Affidavit at 3.

Paragraph 8. LILCO does not object to litigation concerning the prelubrication system for the turbocharger thrust bearing. Although this contention is based on a 1981 § 50.55(e) report, recent developments during the preoperational test program at Shoreham indicate that there may be a basis for concern about the turbocharger thrust bearing. On February 1, 1984, diesel generator 101 was noted to have low turbocharger thrust bearing oil pressure. Upon investigation, it was determined that the turbocharger thrust bearing had failed. On February 5, 1984, a failure occurred on the turbocharger for diesel generator 103. LILCO has advised the NRC that these failures are potentially reportable pursuant to § 50.55(e). LILCO's investigation of this matter is continuing.6/

Paragraph 9. As the attached affidavit reflects, all of the tube runs on the Shoreham diesels have since been evaluated and modified as appropriate for proper support. There have been no recurrences of this condition. Kammeyer Affidavit at 3-4. The County does not provide any basis to support a

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6/ In this regard, it is well to recall that the purpose of preoperational testing is to identify and correct problems and the program can be expected to disclose other discrepancies in the future. But LILCO does not believe that every such discrepancy should be litigated in this proceeding. In this instance, however, because of the prior Part 21 report relating to the turbocharger thrust bearings, LILCO cannot, at this time, object to litigation of this issue.

contention that this condition has not been remedied. Thus, this contention should be litigated, if at all, in the context of the long-term vibration issue. Memorandum and Order at 32-33 (June 22, 1983).

Paragraph 10. LILCO objects to this contention because it is not supported by an adequate basis. The indications and cracks found in the baseplates of diesel generators 102 and 103 were identified by LILCO in the course of the disassembly of those diesel generators. The December 7, 1983 FaAA memorandum referenced by the County (attached) states that the cracks and indications in the baseplate of diesel generator 102 were attributable to the crankshaft failure on that machine. The memorandum also indicates that the cracks and indications on the baseplate of diesel generator 103 were not caused by the operation of the diesel. FaAA evaluated the cracks and indications and determined that they will not affect operation of the diesels. The County has provided no information to the contrary and thus provides no basis to support a contention concerning the adequacy of the base plates. 7/

7/ LILCO has very recently received a TDI failure analysis on the base plates dated February 1, 1984. A copy will be sent to the County under separate cover. TDI concludes that the indications are non-relevant grain boundaries of compacted graphite and that the bases are functionally acceptable.

Paragraph 11. LILCO objects to this contention because the County has provided inadequate basis to support its claim of defective design. The cited memorandum indicates that improper installation was the likely cause of the failure. Kammeyer Affidavit at 4.

Paragraph 12. LILCO objects to this contention because the County provides inadequate basis to support a contention that the cylinder liners are defectively designed. Although pitting occurred in three cylinder liners, there is no basis to support a conclusion that this pitting was caused by inadequate design. As the McHugh letter cited by the County reflects, TDI attributes the pitting to faulty operation of the injector tips. As the attached affidavit indicates, it is not unusual to replace cylinder liners as part of a normal maintenance program. Although LILCO did replace the three liners, they were still useable. Kammeyer Affidavit at 4.

Paragraph 13. This paragraph of the contention attempts to sweep into the litigation a laundry list of product improvements or modifications made during the course of the installation of the Shoreham diesels. The County has made no attempt on any of these items to show the basis for a conclusion that the modification represents a design deficiency. Nor does the County attempt to show that the changes are unusual in type

or number from that expected during the installation and testing of any large component. Indeed, modifications or improvements to the diesel generators are not probative of defective design. This paragraph of the County's contention attempts to create the illusion of specificity by submitting a list of modifications but the list reflects instead only the lack of any good faith effort by the County to focus on important concerns. For example, item (b) appears on its face to suggest that the modification was made to facilitate maintenance. In fact, the modification was made to permit removal of the diesels from the diesel generator rooms for crankshaft replacement. Kammeyer Affidavit at 4-5. By no stretch of the imagination does this have anything to do with diesel design. Similarly, items (f), (h) and (i) also were made to improve maintenance requirements. Kammeyer Affidavit at 4-5. Finally, item (g) deals with a recommendation for additional protective circuitry for the diesels beyond the already extensive control systems provided. In short, the County has provided no basis for concluding that the modifications listed reflect inadequate design.

CONTENTION II.B.

This portion of the contention alleges that deficiencies identified at TDI diesel generators at other

nuclear plants demonstrate that the Shoreham diesels have been inadequately designed. This section assumes that TDI diesel generators at other nuclear plants are "essentially identical or similar to the EDG's [at Shoreham]." While there are similarities among the various TDI engines, the relevance of a failure of a component on another diesel generator must be examined on a case-by-case basis. Thus, for example, occurrences on the V-16 engines at Grand Gulf or Perry must be analyzed to determine their applicability to Shoreham. Some V-16 engine components are markedly different in size or design (e.g., connecting rods and crankshafts) and various forces and stresses in that engine may differ substantially from those experienced in the Shoreham engines. Despite this, the County has provided no basis in any of the paragraphs in this portion of the contention for the Board to conclude that the occurrences at other locations apply to Shoreham.

Paragraph 1. If the County intends to litigate the details of the spherical washer failures reported in this November 5, 1981 Part 21 report and the Grand Gulf 10 CFR 50.55(e) report dated April 15, 1982, it is grossly out time. This condition was also discussed in the Diesel Generator Operational Review Report provided to the County in early July. The County omits to mention some pertinent facts:

spherical washers are not used in the AE pistons now installed at Shoreham, nor were they used in the modified AF pistons in which the cracks were found. As already noted, LILCO does not object to the litigation of the piston cracking problem found at Shoreham. Thus, the condition described in this paragraph can be considered as part of the background information relating to the piston contention.

Paragraph 2. LILCO objects to this contention. (1) It is untimely because it is based on a December 9, 1981 Part 21 report. (2) It is irrelevant because the condition reported was not applicable to Shoreham. Kammeyer Affidavit at 5.

Paragraph 3. The condition reported at Grand Gulf, which did not prevent these engines from operating, has not been found at Shoreham. Nonetheless, because the Shoreham and Grand Gulf engines have intermediate push rods in common, LILCO has ordered intermediate push rods of a new design. LILCO does not object to litigation of this issue.

Paragraph 4. LILCO objects to this contention because the County provides no basis to conclude it is applicable to Shoreham. Moreover, the Board has already admitted a long-term vibration contention for Shoreham.

Paragraph 5. LILCO objects to the admission of this contention because the County provides no basis to conclude that it is a design deficiency or that it is applicable to Shoreham. In fact, the Shoreham diesels have had an excellent air start record. Diesel Generator Operational Review Report at 9.

Paragraph 6. LILCO objects to the admission of this contention. (1) It is irrelevant; Shoreham uses Class IE power for diesel generator control circuits. (2) There is no basis to conclude that the problem at Perry was attributable to TDI. Kammeyer Affidavit at 5.

Paragraph 7. LILCO objects to this contention because the County fails to provide any basis to conclude that a design defect is involved. In addition, LILCO has already taken steps to ensure that the problem at Grand Gulf does not occur at Shoreham. Kammeyer Affidavit at 6.

Paragraph 8. LILCO objects to this contention because it is irrelevant to Shoreham. The fuel oil line arrangement at Grand Gulf is different from the fuel oil line arrangement used at Shoreham. Kammeyer Affidavit at 6.

Paragraph 9. LILCO objects to this contention. (1) It is untimely because it is based on Part 21 and § 50.55(e)

reports that were issued almost two years ago. (2) It is irrelevant because the condition identified in the reports is not applicable to SNPS. Kammeyer Affidavit at 6.

Paragraph 10. LILCO objects to this contention; it involves the same concerns raised in contention II.A.6. Kammeyer Affidavit at 3.

Paragraph 11. LILCO objects to this contention. (1) It is untimely because it is based upon a September 19, 1980 Part 21 report. (2) It is irrelevant because the Shoreham diesels do not have the link rod assemblies that are used on "V" engines. Kammeyer Affidavit at 7.

Paragraph 12. LILCO objects to this contention. (1) It is untimely because it is based upon Part 21 and § 50.55(e) reports that are over a year old. (2) The issue is irrelevant to Shoreham. The Catawba flexible drive coupling used an isoprene material which deteriorated. The Shoreham flexible drive coupling is made of neoprene which will not deteriorate rapidly. Kammeyer Affidavit at 7.

Paragraph 13. LILCO objects to this contention because it fails to provide any basis to conclude that the generator at Shearon Harris is made by the same manufacturer and is of the same design as the Shoreham generator. At a minimum, the

Shearon Harris diesels were purchased to different specifications. Moreover, the contention is vague in that it purports to include unspecified "dimensional, electrical and specification deficiencies."

Paragraph 14. LILCO objects to this contention. (1) It is untimely because it is based upon a November 5, 1981 Part 21 report. (2) It is irrelevant because Shoreham uses different check valves and thus the condition described in that Part 21 report is not applicable to Shoreham. Kammeyer Affidavit at 10.

Paragraph 15. LILCO objects to this contention. (1) It is untimely because it relies on a February 1, 1982 § 50.55(e) report. (2) It is inapplicable to Shoreham because Shoreham's pneumatic logic is of a different design than Grand Gulf's. Kammeyer Affidavit at 7.

Paragraph 16. LILCO objects to this contention. (1) It is untimely because it relies upon a Grand Gulf August 9, 1982 § 50.55(e) report concerning a relay tachometer. (2) The County provides no basis to conclude that it is applicable to Shoreham.

CONTENTION II.C.

LILCO objects to the admission for litigation in the Shoreham proceeding the problems listed in this section. These matters are based on occurrences on marine diesel engines. For the reasons stated in response to Contention I.B.2 above, they should not be admitted by the Board.

CONTENTION III.A.

Paragraph 1. Questions concerning the manufacture of the cylinder heads should be litigated in the context of the already admitted cylinder head contention.

Paragraph 2. LILCO objects to this contention because it has inadequate basis. SC claims that the "[f]ailure of the connecting rod bearings was caused in part by voids due to improper manufacturing techniques," citing as a basis FaAA's interim (10/31/83) and final (12/5/83) reports on the bearings. Although the interim report lists the voids as a potential cause, the final bearing report indicates that subsequent analysis showed that the voids were not atypical of cast aluminum bearings and that in the absence of abnormally high stresses they would not be detrimental to bearing life. Moreover, the final report predicted a 38,000 hour bearing life for the new connecting rod bearings, well in excess of the number of hours

likely to be put on the diesels during the 40 year life of the Shoreham plant. The County has asserted no basis for challenging this conclusion.

Paragraph 3. Any manufacturing defects which contributed to the piston cracking observed at Shorenam should be litigated as part of the piston contention. LILCO notes that the documents cited by the County do not support its claim that manufacturing defects caused the conditions found at Shoreham.

Paragraph 4. See LILCO's Response to II.B.8 above.

Paragraph 5. LILCO objects to this contention because it is without adequate basis. First, the generator was manufactured by Parsons-Peebles, not TDI. (A copy of the failure analysis is attached.) Second, a letter from the manufacturer (attached), of which the County was aware, indicated that the problem was an isolated occurrence. Consequently, there is insufficient basis to admit a contention on this issue.

Paragraph 6. LILCO objects to this contention. LDR 1642 and the "McHugh letter" cited by SC indicate that the groove on the liner was a machining mark of no significance. As the McHugh letter states, the groove was on the outside of the liner and, thus, would have no effect on piston operation. In addition, the letter indicates that the groove had been

noted during the installation inspection and was deemed acceptable. Thus, the County has provided insufficient basis to support its allegation that the mark was caused by "improper machine shop processes." The County also has not provided any basis to indicate that this condition could have any effe on diesel operation.

Paragraph 7. LILCO objects to this contention. The County was aware of the cracked subcover assemblies prior to the crankshaft failure. The County made no effort to raise the issue at that time. Moreover, the documentation cited by the County does not support a contention because it indicates that the cracks in the subcover assembly were in a nonsupporting member and thus had no impact on diesel operation.

Paragraph 8. LILCO objects to this contention because the County has not provided an adequate basis to litigate the issue. The memorandum cited by the County indicates that the cylinder head nuts in question would fail, if at all, only when being torqued during installation. Thus, the condition has no impact on operation since nuts that do not fail during torquing will not fail during operation. Kammeyer Affidavit at 7-8.

Paragraph 9. LILCO objects to this contention because the County has not provided an adequate basis to litigate the

issue. The condition noted was found and corrected in the normal course of LILCO's initial check-out program. Kammeyer Affidavit at 8. The County has not provided information which suggests anything to the contrary.

Paragraph 10. LILCO objects to litigation of this issue for the reasons stated in response to Contention II.A.7.

Paragraph 11. LILCO objects to the litigation of this issue because the County has failed to provide an adequate basis for the admission of a contention. The paragraph refers to injector tips that were allegedly improperly designed but the reports cited, which deal with connecting rod bearings, do not mention injector tips.

Paragraph 12. LILCO objects to this contention, which incorporates by reference the items covered in Contentions II.A.9, 10 and 12, for the reasons stated in LILCO's responses to those items.

CONTENTION III.B.

See LILCO's general comments on Contention II.B above.

Paragraph 1. The condition identified in the Part 21 report cited by the County is inapplicable to Shoreham. That report involved the heat treating of certain AN type pistons.

LILCO originally used type AF pistons and now has installed AE type pistons. In any event, the role of residual stresses on piston cracking may be litigated as part of the piston contention.

Paragraph 2. See LILCO's response to Contention II.B.1 above.

Paragraph 3. LILCO objects to this contention. (1) It is untimely because it is based upon a July 30, 1981 Part 21 report. (2) It is irrelevant because the condition identified is not applicable to Shoreham. Affidavit at 8.

Paragraph 4. This paragraph incorporates by reference the items listed in Contention II.B.1, 4, 7, 8 and 14. LILCO's response to II.B.1 indicates that this concern should be litigated as part of the piston contention. With respect to the balance of the items, LILCO objects to them for the reasons stated in the corresponding paragraphs of LILCO's response to Contention II.B.

CONTENTION III.C.

LILCO objects to the admission of this section of Contention III for the reasons stated in response to Contention I.B.2 above.

CONTENTION IV

In essence, this contention alleges that the Shoreham diesels (including components and replacement components) were not manufactured under a properly implemented Appendix B QA program at TDI. Consequently, the County concludes that LILCO must replace the engines with non-TDI engines. This County contention, however, is structured in a way which invites virtually endless litigation on the issue. LILCO's views on the most productive approach to diesel QA matters are set out in LILCO's Response.

Unquestionably, TDI has an Appendix B QA program in effect.8/ The heart of SC's claim is that the program was not "effective" or properly implemented. LILCO disagrees with the County's view but does not believe that it would be productive to litigate the implementation of the TDI program as reflected, inter alia, in 10 year old audits, inspections and findings. Moreover, such an inquiry might not be particularly probative given that the TDI engines were disassembled, inspected and

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8/ The County, for quite some time, has had documentation relating to LILCO's initial review and approval of TDI's Appendix B program. Thus, the County did not challenge the existence of an Appendix B program. Moreover, the fact that more than ten other nuclear utilities bought TDI diesels for nuclear service and that the NRC has been auditing the TDI program for a number of years indicate that there was and is an Appendix B program in place at TDI.

rebuilt at Shoreham under LILCO's QA program. Since the ultimate purpose of any diesel QA litigation would be to demonstrate that the quality of the diesels is adequate to ensure safe and reliable operation, LILCO's proposal to litigate the adequacy of specific components coupled with completion of the test program accomplishes this goal for fuel load and low power testing. The DRQR addresses the issue for operation beyond low power testing.

The following discussion gives LILCO's position on the litigability of the specific QA concerns raised in Contention IV.

CONTENTION IV.A.

To the extent contentions concerning a component contained in Contentions I, II or III are admitted for litigation, appropriate quality attributes for that component would be addressed.

CONTENTION IV.B.

Paragraph 1. LILCO objects to litigation of this issue. (1) It is untimely because it is based, in part, upon § 50.55(e) reports that are more than a year old; one report is almost two years old. (2) The issue is not relevant because

the Shoreham diesels were not required nor were they purchased to meet ASME III requirements. (3) The County has provided no basis to conclude that Shoreham's pipe welds violated the applicable requirements. Kammeyer Affidavit at 8-9.

Paragraph 2. LILCO objects to the litigation of this issue because there is no basis to conclude that it is not resolved. The purpose of the cam gear bolts is to ensure that the cam gears remain in their proper orientation so that engine timing is maintained. When this condition was dicovered, engine timing was verified and the bolts were installed. Kammeyer Affidavit at 9.

Paragraph 3. LILCO objects to tne litigation of this issue because there is no basis to conclude that the condition has not been corrected. When the condition was discovered, the engine governor drive was repaired and aligned. Kammeyer Affidavit at 9.

Paragraph 4. LILCO objects to this paragraph because there is no basis to conclude that any QA deficiency was involved. Kammeyer Affidavit at 9. Moreover, this paragraph is untimely because the crankshaft thrust clearance problem was noted in the Diesel Generator Operational Review Report provided to the County in early July, 1983.

Paragraph 5. LILCO objects to this contention. (1) It is untimely because it is based on a 1980 § 50.55(e) report. (2) It is irrelevant because Shoreham does not have any battery racks associated with the diesel generators. Kammeyer Affidavit at 10.

Paragraph 6. LILCO objects to this contention. (1) It is untimely because it is based on a 1981 § 50.55(e) report. (2) The County provides inadequate basis to conclude that this is a quality assurance problem that is relevant to Shoreham. In fact, LILCO has confirmed that pump motors at Shoreham do meet applicable requirements. Kammeyer Affidavit at 10.

Paragraph 7. LILCO objects to this contention. (1) It is untimely because it is based on a 1981 Part 21 report. (2) LILCO uses different air check valves on its diesels and therefore the concern is not relevant to Shoreham. Kammeyer Affidavit at 10.

Paragraph 8. LILCO objects to this contention. (1) It is untimely because it is based on a 1980 § 50.55(e) report. (2) The County provides no basis to demonstrate that this condition is applicable to Shoreham. In fact, LILCO has inspected the internal baffling of the heat exchangers and did not find problems of the type noted in this contention. Kammeyer Affidavit at 10.

Paragraph 9. LILCO objects to this contention because the County has failed to provide any basis to conclude that it is applicable to Shoreham. Moreover, thrust bearing clearance must be checked prior to operation and periodically. The thrust bearing checks for the Shoreham diesels have not shown any abnormal conditions. Kammeyer Affidavit at 10-11.

Paragraph 10. LILCO objects to this contention. (1) It is untimely because it is based on a May 27, 1983 § 50.55(e) report. (2) The County has provided inadequate basis to conclude that this condition is a quality deficiency applicable to Shoreham. In fact, the condition appears to refer to switchgear components which, at Shoreham, were not supplied by TDI. Kammeyer Affidavit at 11.

Paragraph 11. LILCO objects to this contention. (1) It is untimely because it is based on a 1980 § 50.55(e) report. (2) The County has provided inadequate basis to conclude that it is a quality deficiency applicable to Shoreham. In fact, pipe supports on the Shoreham diesels are not required to meet the ASME Section III Code. Kammeyer Affidavit at 11.

Paragraph 12. LILCO objects to this contention. The County has provided no basis for concluding that the governor problems reported in this Part 21 report are applicable to Shoreham.

Paragraph 13. LILCO objects to this contention. (1) It is untimely because it is based on a 1981 § 50.55(e) report. (2) It is not applicable to Shoreham. Kammeyer Affidavit at 8.

Paragraph 14. LILCO objects to this contention. (1) It is untimely because it relies upon a February 17, 1983 § 50.55(e) report. (2) The County provides no basis to conclude that this condition is applicable to Shoreham.

Paragraph 15. LILCO objects to this paragraph because it has nothing to do with TDI's quality assurance program. This deficiency occurred because personnel at the Shoreham site had failed to torque certain bolts on the rocker arm assembly. This failure to torque the bolts resulted in operational loads causing damage to the subcover assembly. LILCO identified this matter and has taken appropriate corrective and preventive action. Kammeyer Affidavit at 11.

CONTENTION IV.C.

Paragraph 1. LILCO objects to this paragraph. It is designed to sweep into the Shoreham litigation the results of all of the NRC's inspections at TDI conducted over the last five years. The County has made no good faith effort to cull out those findings which may not be significant or which have no applicability to Shoreham. Indeed, a review of the audits

indicates that very few of the findings were considered violations; most were deviations or non-conformances. The County's attempt to inject all of these NRC inspection reports into the Shoreham litigation reaffirms LILCO's view that the County's sole objective in filing these contentions is delay. It is important to note that if the NRC had found matters of significance during these audits that were applicable to specific Delaval engines, the NRC would have insisted on the issuance of a Part 21 report. Moreover, the NRC inspection findings will be factored into the data base used in the DRQR program. Thus, although the matters raised in the NRC audits should not be litigated in the Shoreham proceeding, they will be considered in the design and quality review of the Shoreham engines.

Paragraph 2. LILCO objects to this contention which references Board Notification 83-160 in support of the County's allegations that there are quality deficiencies relating to TDI diesels. To the extent that the County intends any additional litigation of this Board Notification beyond the individual items mentioned elsewhere in the County's contentions, LILCO objects because the contention is vague and unparticularized. Moreover, as already noted, the question of the overall reliability of the Shoreham diesels will be addressed in the DRQR program.

Paragraph 3. LILCO objects to this contention. (1) It is untimely because it attempts to rely on old NRC I&E inspection reports. In fact, the County attempts to revisit inspection reports it cited when it moved to reopen the record in May, 1983. See, e.g., Memorandum and Order at 21, 22, 27 (June 22, 1983). (2) The paragraph is vague and unspecific. The County has made no effort to discuss the particular details in the inspection reports which it believes are relevant to this litigation. (3) To the extent the citation of these I&E reports is intended to provide support for its broader QA concerns, those concerns will be addressed in the Shoreham DRQR.

Paragraph 4. LILCO objects to this contention because it attempts to litigate matters that were raised in Stone & Webster's audits and reaudits of Delaval in 1975 and 1976. The County has had these audits for almost five months and therefore any effort to raise issues based on these audits is now untimely. Moreover, the County has made no attempt to identify specific items in these audits which indicate that the Shoreham diesels will not operate safely and reliably.

Paragraph 5. LILCO objects to admission of this contention because it is untimely. The County attempts to sweep into the litigation a report by an NRC consultant issued in July, 1983. In addition, many of the items listed in the

report merely repeat matters contained in prior NRC I&E Reports. Moreover, the County has made no effort to identify with specificity which portions of the report it wants to litigate.

CONTENTION IV.D.

Paragraph 1. This issue will be litigated as part of the existing cylinder head contention.

Paragraph 2. LILCO objects to this contention because the County has provided no basis to support its conclusion that the replacement crankshafts were not manufactured in accordance with the requirements of Appendix B. To the contrary, Appendix B vendors such as TDI are permitted to procure components from qualified subvendors specifying the necessary quality standards and quality measures that should be applied by those subvendors. In the case of the Shoreham replacement crankshafts, Krupp is a qualified manufacturer of crankshafts and was subjected to quality requirements specified in accordance with TDI's Appendix B program. Kammayer Affidavit at 11-12.

Paragraph 3. LILCO objects to this paragraph because it is broad and unspecific. It appears to challenge the adequacy of all of the replacement components used for Shoreham. To the extent that the adequacy of a particular component is

litigated, pertinent quality measures will be considered, if appropriate. LILCO also notes that additional surveillance activities have been conducted for significant replacement components such as the crankshafts and pistons. Kammeyer Affidavit at 11-12.

CONTENTION IV.E.

LILCO objects to this contention. (1) It is untimely because the County has had LILCO's audits of Delaval for almost five months. (2) The contention is without adequate basis. As information provided to the County reflects, LILCO's initial reviews of TDI's QA manual did cover the area of design control. In addition, the DRQR is designed to assess the adequacy of Shoreham diesel generator design as it exists today. Because the DRQR design review is independent of the TDI design control program, it is a more reliable assessment of the existing design than would result from litigation of the design control program in effect at TDI almost ten years ago.

ATTACHMENT B

LILCO'S PROPOSAL FOR
DIESEL GENERATOR ISSUES

Pre-Fuel Load Issues

1. Crankshafts

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.

2. Pistons

Whether there is adequate assurance that the replacement pistons for the Shoreham diesels will not fail due to cracking in the area of the crown to skirt connecting bolts.

3. Cylinder Heads

See the Board's statement of the issues in Memorandum and Order at 4-5 (July 28, 1983).

4. Intermediate Push Rods

Whether there is adequate assurance that the replacement intermediate push rods at Shoreham will not exhibit the push rod weld failures observed at the Grand Gulf plant.

5. Turbocharger Thrust Bearings1/

Whether there is adequate assurance that tne turbocharger thrust bearing and the turbocharger thrust bearing pre-lube system will perform their intended functions.

Long-Term Issues

6. Vibration

See the Board's statement of the issue in Memorandum and Order at 32-33 (June 22, 1983).

7. DRQR

The County will have the opportunity to review the DRQR results and, if appropriate, raise additional issues.

Schedule

LILCO believes that it is appropriate to proceed with litigation of all of the pre-fuel load issues. With respect to the crankshafts and cylinder heads, substantial information has been available to the County for some time. With respect to the pistons, intermediate push rods and turbocharger thrust

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1/ The appropriate wording of this issue may have to be reviewed in light of the results of LILCO's investigation of the recent turbocharger failures.

bearings, LILCO believes that reports on these matters will be available by March 1, though some may be available sooner. LILCO will provide more definitive information on February 22.

Following the conference of the parties on February 22, 1983, LILCO suggests the following schedule for litigation:

March 23	Completion of discovery
April 6	File testimony
April 13	Motions to strike due
April 18	Responses to motions to strike and cross-examination plans due
April 24	Commence hearings

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 JOHN C. KAMMEYER

John C. Kammeyer, being duly sworn, deposes and states as follows:

My name is John C. Kammeyer. I am employed by the Stone & Webster Engineering Corporation as the Assistant Head of the Site Engineering Office at the Shoreham Nuclear Power Station. Among other things, my responsibilities include engineering matters relating to the Shoreham diesel engines. Attached is a copy of my resume.

The purpose of this affidavit is to provide information concerning various matters raised in support of LILCO's response to Suffolk County's proposed supplemental diesel generator contentions.

Contention I.A.2. This Suffolk County contention claims that the greater weight of the replacement crankshafts will cause excessive wear on the main bearings. This statement is based on an incorrect assumption. The original Shoreham crankshafts weighed 6230 kilograms whereas the replacement crankshafts weigh 6500 kilograms, an increase of less than 5%. Given this small increase in weight, there is no basis to conclude that there will be any significant increase in wear on the main bearing between the no. 4 and no. 5 cylinders. Also, LILCO has not observed any abnormal wear on this bearing in the past that would indicate any unusual or excessive forces on the main bearings when the original crankshafts were installed.

Contention I.B.1. This contention claims that exhaust temperatures for the Shoreham diesels are "very high (approximately 1100° F) and indicative of overrating." This is incorrect. During operation of the Shoreham diesels at the rated load of 3500 KW, exhaust temperatures do not exceed 980° F. Operation at the 2-hour rating of the diesels (3900 KW) results in exhaust temperatures which do not exceed approximately 1050° F. The manufacturer permits operation of the Shoreham diesels with exhaust temperatures up to 1100° F. Thus, the exhaust temperatures experienced during operation of the Shoreham diesels are within the limits specified by the manufacturer.

Contention II.A.6; Contention II.B.10. These contentions deal with electrical cables installed on the diesel generator for certain engine and panel circuits that were the subject of a September 27, 1983 Part 21 report by TDI. In response to this report, LILCO replaced the affected cables with appropriately qualified cable. No further action is required in response to this Part 21 report.

Contention II.A.7; Contention III.A.10. These contentions deal with the pitting found on the camshaft lobes for DG 101 during disassembly of the engines for replacement of the crankshafts. LILCO inspected the lobes on the camshafts for the other two diesels and found no similar conditions. The affected lobes on the diesel generator 101 camshaft have been replaced with new lobes. The pitting observed on the camshaft lobes had no effect on the operation of DG 101. In addition, inspection of the camshaft is required as part of the routine periodic inspection program for the diesel engines. Thus, even if the camshaft lobes had not been replaced, this inspection program would have identified any adverse changes in the condition of the camshaft.

Contention II.A.9. The failures of the tubing referenced in this portion of the contention were a result of inadequate tube support. All of the tube runs on Shoreham's diesel

engines have since been evaluated and modified, as appropriate, for proper support and there have been no recurrences of the type referenced in this paragraph of the proposed contention.

Contention II.A.11. The improper clamping force referred to in the letter referenced by the County means that the bolt was not properly torqued. The "bolt seizure" referenced in the letter would also be caused by the installation of the bolt. In either event, these relate to installation, not design.

Contention II.A.12. This contention deals with the pitting observed on three of the cylinder liners during the inspection of the diesel generators. These cylinder liners had been in use on the Shoreham diesels throughout the diesel generator factory test runs and the site preoperational test program without any adverse impact on operation. LILCO elected to replace the affected cylinder liners even though they were adequate for service. It should be noted that replacement of cylinder liners is a normal maintenance item. These components are inspected periodically and replaced as necessary.

Contention II.A.13. This contention lists a number of product improvements incorporated into the Shoreham diesels. A number of the items mentioned in this list, e.g., items (f),

(h), (i) and (j), are designed to improve maintenance on the diesels. One of the items, item (b), was in part a modification made to facilitate the removal of the Shoreham diesels from the diesel generator rooms in preparation for replacement of the crankshafts. Thus, the product improvements or modifications mentioned in this County contention do not necessarily reflect deficiencies in the original TDI design.

Contention II.B.2. The governor lube oil cooler assembly referred to in this County contention is positioned in a location on the Shoreham diesel generators different from that on the engine(s) covered by the referenced Part 21 report. Thus, the problem noted is not applicable to Shoreham.

Contention II.B.6. This contention involves the use of non-Class IE power to operate certain control devices on the diesels at the Perry station. This concern is not applicable to Shoreham because Shoreham uses Class IE power for all safety related diesel generator control circuits. Moreover, the installation of the power supplies to the diesel generator control circuits for Shoreham was not performed by TDI but was performed at the site by LILCO and its contractors.

Contention II.B.7. The concern listed in this contention is not applicable to Shoreham. When LILCO became aware of

the incident at Grand Gulf, LILCO checked the torque on all the crankcase cover bolts to ensure that they had been properly torqued. LILCO also assured that generator guards were in place to prevent any loose objects from entering the generator and causing a problem similar to that experienced at Grand Gulf.

Contention II.B.8. The fuel oil line arrangement for the V-16 engine at Grand Gulf is different from the fuel oil line arrangement on Shoreham's in-line engines. Also, the fuel oil supply line that failed at Grand Gulf is not the same as the fuel oil high pressure injection tubes that failed at Shoreham. The Grand Gulf fuel oil line failed because of high cycle fatigue due to inadequate support of the line. LILCO has inspected the fuel lines at Shoreham to ensure that they have adequate supports to prevent the Grand Gulf problem from occurring at Shoreham.

Contention II.B.9. The problem identified in the contention is not applicable to Shoreham. Shoreham's pressure sensing line between the starting air storage tank and the starting air compressor is seismically supported.

Contention II.B.11. The link rod assembly mentioned in this contention is only used in Delaval's "V "engines and thus is not applicable to Shoreham.

Contention II.B.12. The concern raised in this contention is not applicable to Shoreham. The governor flexible drive coupling at Catawba used an isoprene material. The Shoreham diesels have a neoprene flexible coupling that is not susceptible to the type of deterioration that occurred at Catawba.

Contention II.B.15. LILCO has a different type of pneumatic logic than that used on the Grand Gulf engines and thus the concerns raised in MP&L's February 1, 1982 § 50.55(e) report are not applicable to Shoreham.

Contention III.A.4. This contention references a failure at the Grand Gulf station which is allegedly similar to the conditions reported by LILCO in SNRC-892. As noted in response to Contention II.B.8 above, the fuel line failure at Grand Gulf was in a different line and that occurrence is therefore not applicable to Shoreham.

Contention III.A.8. FaAA determined that the cylinder head nuts which had not failed during torquing would be acceptable during operation. Nonetheless, LILCO inspected all cylinder head nuts for visual indications. LILCO replaced all existing nuts with new nuts on DG 101 and DG 103 whether or not indications were found. Because DG 102 had already been

reassembled, only those nuts with indications on that engine (3 out of 64) were replaced. The remaining nuts were left in place in accordance with FaAA's recommendations.

Contention III.A.9. The condition referenced in this contention was discovered as part of the normal check-out and initial operation (C&IO) process for the Shoreham diesels. The condition was corrected and no other similar instances have been discovered.

Contention III.B.3; Contention IV.B.13. The valve springs referenced in this contention were deficient because the subvendor supplier had not shot peened the springs in accordance with the specification. This Part 21 report was not applicable to Shoreham because LILCO was not suppplied with valve springs from the defective batch. In addition, LILCO inspected all of its valve springs to insure that the springs on the Shoreham engines had been shot peened and were supplied by TDI in accordance with the applicable specifications.

Contention IV.B.1. Shoreham's diesel engine pipes are not required to meet ASME Section III. Pipe welds on the Shoreham diesels have been inspected and found to meet the applicable requirements.

Contention IV.B.2. The missing bolts identified in this contention are bolts that are used to prevent slippage between the cam gear and its hub in order to maintain proper timing of the engine. LILCO discovered this condition during the routine pre-startup inspection of the engines and then verified the timing of the engine and installed the bolts. In any event, if this condition had not been discovered and the cam gears had slipped, the engines would have remained operable.

Contention IV.B.3. Upon investigation of the condition referenced in this portion of the contention, LILCO determined that it was caused by improper alignment of the engine governor drive. LILCO repaired the governor and assured that it was properly aligned.

Contention IV.B.4. The condition cited in this portion of the contention was discovered by LILCO during inspections of the diesel generator required as part of the routine pre-startup checkout of the diesels. The crankshaft thrust had been checked at the TDI shop in Oakland prior to factory operation and found to be acceptable. The condition was attributed to damage incurred during shipment to the site by rail. Thus, this condition does not reflect QA deficiencies.

Contention IV.B.5. The Shoreham diesel generators do not have and are not required to have any battery racks installed.

Contention IV.B.6. LILCO has verified that all electrical pump motors for the diesels comply with the requirements in the specification and purchasing documents.

Contention IV.B.7; Contention II.B.14. Shoreham diesel generators do not have check valves manufactured by the William Powell Company which were the subject of the Part 21 report referenced in this contention.

Contention IV.B.8. LILCO has inspected the internal baffling of the diesel generator heat exchangers as part of the normal check-out and initial operation process and no problems of the type noted in this contention were found. In addition, as part of the periodic maintenance requirements of the Shoreham engines, inspections are conducted on the heat exchangers' internals.

Contention IV.B.9. The thrust bearing clearance on the Shoreham diesels was checked prior to initial operation of the diesels. It has also been checked periodically since that initial operation, and no abnormal conditions have been noted.

Contention IV.B.10. At Shoreham, the switchgear components that appear to be involved in this contention were not supplied by TDI. Thus, the condition referenced in the Gulf States May 27, 1983 § 50.55(e) report is not applicable to Shoreham.

Contention IV.B.11. Pipe supports on the Shoreham diesels are not required to meet the ASME Section III Code.

Contention IV.B.15. This contention has nothing to do with Delaval's quality assurance program. The condition resulted from the failure to torque certain bolts on the rocker arm assembly during the recent reassembly of the diesels at Shoreham. The inadequate torquing resulted in operational loads causing damage to the subcover assemblies in question. LILCO identified this problem during the operation of the diesel generator and took corrective and preventive action as required by its quality assurance program.

Contention IV.D.2. The Shoreham replacement crankshafts were manufactured by Krupp, a German foundry and manufacturing company. Krupp is qualified to manufacture crankshafts for Delaval's diesels. These crankshafts were manufactured subject to quality requirements specified by Delaval. In addition, during the fabrication of the replacement

crankshafts, LILCO required that additional surveillance activities be conducted by LILCO and Delaval personnel.

Contention IV.D.3. In addition to the normal quality assurance activities conducted by TDI for replacement components used at Shoreham, LILCO and its contractors performed additional inspections and witnessing of quality activities for these components.

_____
John C. Kammeyer

STATE OF NEW YORK)
)
CITY/COUNTY OF)

Subscribed and sworn to before me this ____ day of February, 1984.

My commission expires:

_____
Notary Public

PROFESSIONAL QUALIFICATIONS

JOHN C. KAMMEYER

Engineer - Power Division/Assistant Head,
Site Engineering Office

STONE & WEBSTER ENGINEERING CORPORATION

Education

Ohio State University - Bachelor of Science, Mechanical Engineering 1979.

Appointments

Engineer, Power Division - February, 1981
Career Development Engineer, Power Division - June, 1979

Shoreham Nuclear Power Station, Long Island Lighting Company, (Nov. 1979 to Present)

As ENGINEER (Aug. 1982 to Present) assigned to the Site Engineering Office (SEO) in the capacity of Power Engineer and Assistant Head-SEO, responsible to the Head-SEO for the Power Division effort. Responsible for directing engineers and designers in the resolution of construction and testing problems dealing with fluid systems and related components, such as piping, valves, mechanical equipment, and equipment erection. In addition, in the absence of the Head-SEO, responsible for the operation of the Site Engineering Office.

As ENGINEER (May 1981 - July 1982), assigned to the Site Engineering Office, responsible for resolving various engineering related construction problems, principally with piping and mechanical components, requiring an immediate solution to support the construction schedule. In addition, working directly with the client's start-up organization to resolve system operation deficiencies.

As ENGINEER and CAREER DEVELOPMENT ENGINEER (November 1979 - April 1982) in the Nuclear Engineering Group, responsible for preparing reactor plant flow diagrams, specifications, and FSAR sections. As a Career Development Engineer, spent four months at the Site Engineering Office, responsibilities included maintainability study of the 850 MWe power plant.

North Anna Power Station - Units 3 & 4, Virginia Electric and Power Company (June 1979 - November 1979)

As CAREER DEVELOPMENT ENGINEER, assigned to the Nuclear Engineering Group responsible for preparing reactor plant flow diagrams, specifications and FSAR sections.

U.S. NAVY (September 1969 - July 1975)

USS James K. Polk, SSBN 645 (April 1972 - June 1975)

Responsibilities included reactor operator, reactor instrumentation maintenance, supervision of division training; honorable discharge with ETR-2(SS) rating, commendation from Commander Submarine Squadron Sixteen.

Professional Affiliations

American Society of Mechanical Engineers - Associate Member.