

RELATED CORRESPONDENCE

LILCO, August 7, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

Before the Atomic Safety and Licensing Board

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

LILCO'S MOTION TO STRIKE PORTIONS OF THE JOINT
DIRECT TESTIMONY OF DR. ROBERT N. ANDERSON,
PROFESSOR STANLEY G. CHRISTENSEN, G. DENNIS ELEY,
ANEESH BAKSHI, DALE G. BRIDENBAUGH AND RICHARD B. HUBBARD

Pursuant to 10 C.F.R. § 2.743(c), the Long Island Lighting Company ("LILCO") moves to strike portions of the Joint Direct Testimony of Dr. Robert N. Anderson, Professor Stanley G. Christensen, G. Dennis Eley, Aneesh Bakshi, Dale G. Bridenbaugh and Richard B. Hubbard ("Joint Testimony") filed in support of Suffolk County's contentions concerning Shoreham's emergency diesel generators. Much of the testimony of these witnesses is beyond the scope of this Board's rulings of July 5, 1984^{1/} and July 17, 1984^{2/} defining the contentions to

^{1/} Transcript of Proceedings, In the Matter of Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1) Docket No. 50-322-OL (July 5, 1984) ("July 5 Ruling") at 21,750-56, 21,878-96.

^{2/} Memorandum and Order Confirming Admission of Suffolk County's Emergency Diesel Engine Contentions and Schedule for Hearings (July 17, 1984) ("July 17 Order") and Attachment.

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be litigated in this proceeding and/or is otherwise irrelevant, incompetent or unsupported.^{3/}

I. OVERVIEW

Several general evidentiary deficiencies warranting the exclusion of proffered testimony pervade the County's submission. In the interest of minimizing repetition and to facilitate the Board's consideration of this Motion, we discuss at the outset the most significant of these deficiencies, as a point of reference for subsequent treatment of specific elements of the County's testimony.

1. **The County insists upon going beyond the scope of the contention admitted for litigation in this proceeding.** The Board has admitted a single contention which alleges inadequacies in four components of the Transamerica Delaval, Inc. ("TDI") emergency diesel generators ("EDGs") installed at

^{3/} LILCO's effort to support fully this Motion to Strike has been severely hampered by Suffolk County's failure to identify by name the individual sponsors of the various discrete elements of the joint testimony of Messrs. Anderson, Christensen, Eley, Bakshi, Bridenbaugh and Hubbard. Since it does not know which of the County's experts is responsible for a particular aspect of the proffered testimony, LILCO has been precluded from challenging the qualifications of the witness to offer the testimony, except in those instances in which none of the witnesses is competent to testify as to a matter. In the absence of a clear indication of sponsorship, moreover, LILCO's ability to test the proffered testimony on cross-examination will be drastically impaired. Therefore, by separate Motion, LILCO has moved the Board to compel the identification of the sponsors of each response offered as testimony by Suffolk County. LILCO may seek the leave of the Board to supplement this Motion to Strike to include additional challenges to the competence of individual witnesses once the County adequately identifies them.

Shoreham. The components at issue are the crankshaft, cylinder blocks, cylinder heads and pistons. July 5 Ruling at 21,878-96; July 17 Order at 2. Allegations of deficiencies in other components which go beyond the scope of the admitted contentions, are irrelevant and should be stricken.^{4/} Arguments drawing on historical experience purportedly relating to components other than the four properly in contention similarly should be stricken, notwithstanding the County's appeal to the need to establish a "context" within which the Board should evaluate the TDI EDGs. July 5 Ruling at 21,696-98, 21,753-55, 21,883-86.^{5/} See Fed. R. Evid. 403 ("evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, . . . or by considerations of undue delay, waste of time . . ."). Such arguments suggest that the reliability of the Shoreham EDGs should be judged on grounds unrelated to the actual characteristics and operating history of the four components at issue as actually installed and operated at Shoreham, and hence is unduly prejudicial (see F.R. Evid. 403 advisory committee note, paragraph 2); at the very least, their admission will waste the time of all parties (see id.).

^{4/} Joint Testimony at 12-14.

^{5/} Joint Testimony at 22-24; 26; 30; 56; 62-65; 76-77; 81; 84; 93; 106-107; 146-147; 155; 178-179.

2. The County's witnesses repeatedly offer testimony for which there is no foundation and which is unrelated to Shoreham's EDGs. Many pages of the proffered testimony concern issues which lack any nexus to the Shoreham EDGs.^{6/} Where the witnesses are unable to point to specific instances of a particular problem encountered by the Shoreham EDGs and are unable to support their predictions that such problems may occur with hard data or calculations subject to independent verification, they fail to establish an essential logical link to the issues under litigation in this proceeding. Absent a showing that a particular deficiency is evident in the Shoreham EDGs or a nexus between the putative deficiency and Shoreham's EDGs, the proffered testimony is irrelevant and inadmissible.

3. The County's experts consistently fail to support their opinions with calculations or other data and hence offer no more than speculation and conjecture. Much of the testimony offered by the County's experts predicts that defects that have not appeared in the Shoreham EDGs can nonetheless be expected to appear in the future.^{7/} Generally, these predictions are premised upon the experts' disagreements with analyses showing that a particular defect does not exist or will not develop,^{8/}

^{6/} Joint Testimony at 18, 37-38, 79, 156-159 [general references]; 48-55 [side thrust]; 65, 69 [heads]; 144-146, 156-159, 178-179 [blocks]; 106-107, 110 [chankshafts]; and 108-109, 111-120, 122 [codes].

^{7/} Joint Testimony at 28-29.

^{8/} Joint Testimony at 29, 34, 47-48.

or upon the experts' determination that characteristics found by other analyses to present no significant problems bearing on adequacy and reliability are, in fact, significant.^{9/}

Virtually nowhere in the joint testimony, however, do Suffolk County's experts offer calculations, data or authorities other than themselves to support their predictions. They speak in terms such as "quite likely" (e.g., Joint Testimony at 33), "could be" (e.g., id. at 40) and "it is unlikely that" (e.g., id. at 88), without providing any basis in fact, borne out by calculations or analyses offered in evidence, to support these characterizations. They are, accordingly, no more than sheer speculation unsupported by any probative evidence. As such, these predictions and analyses should be stricken as lacking the requisite foundation.^{10/}

4. The County's experts have not established that they are qualified to testify as to matters figuring prominently in their testimony. Although LILCO is not yet in a position to assess fully the competence of the County's witnesses to testify to matters they seek to establish,^{11/} it is evident

^{9/} Joint Testimony at 37, 44-46.

^{10/} This lack of foundation is not cured by the oft-repeated complaint that Suffolk County's experts have not had sufficient time to perform analyses they feel would be useful. E.g., Joint Testimony at 52, 168, 183. No support is offered for these statements. In fact, they are inaccurate. In any event, they are irrelevant to the issues under litigation.

^{11/} See n.3, supra.

that the witnesses as a group are not competent to testify as to certain issues (for example, none are experts in the field of finite element analysis, yet they offer testimony in this area, e.g., Joint Testimony at 28) and may not be competent to testify to others. Unless the witness sponsoring each element of the Suffolk County testimony can establish that he is "qualified by knowledge, skill, experience, training or education" to express an expert opinion, Fed. R. Evid. 702, he is not competent to offer such opinions, they are unlikely to "assist the trier of fact to understand the evidence or determine a fact in issue," cf. id., and they must be excluded. See Fed. R. Evid. 701. Whenever the County has not indicated the identity of the witness sponsoring testimony as to a particular issue, it has not established the witness' qualifications to testify on the issue. LILCO believes that it is entitled to a specification of the sponsor of each element of testimony and an opportunity to test the qualifications of that sponsor as an expert. Accordingly, it may seek leave to submit challenges to an expert's qualifications to provide a particular response when the identity of the witness (or witnesses) providing it becomes known.

5. The County repeatedly insists on improperly using partial extracts from depositions of non-parties in support of its case. Much of the support for propositions advanced in the proffered testimony is derived from selective quotations from depositions of persons not parties to this proceeding taken by

Suffolk County.^{12/} Such use of depositions to support the County's affirmative case is improper, and in fact is barred by Rule 32(a), Fed. R. Civ. P. With one possible exception, none of the depositions are of an officer of LILCO. Cf. Fed. R. Civ. P. 32(a)(2). Therefore, since the depositions are not offered for the purpose of impeaching the deponent, cf. Fed. R. Civ. P. 32(c)(1), and there has been no showing as to the unavailability of any witness, cf. Fed. R. Civ. P. 32(a)(3), they are not admissible. See C. Wright & A. Miller, Federal Practice & Procedure § 2142 (1970) (the conditions set forth in Rule 32(a) must exist before a deposition can be used at all). Accordingly, all such deposition references should be stricken. In the alternative, the County should be required to supply the complete text of all depositions from which it has taken extracts.

6. Discussion of the TDI Owners' Group Program, including the Phase I and Phase II reports, should be excluded except to the extent that it is specifically related to one of the four components being litigated in this proceeding. The Owners' Group reports attached by the County to their testimony are not admissible in their entirety. See 10 C.F.R. § 2.743(c). These reports go beyond the scope of the contentions admitted in this litigation and should be stricken as filed by the County.

^{12/} See Attachment A.

7. The FaAA reports are not admissible in their entirety. The FaAA reports were prepared for the TDI Owners' Group and make reference to problems at other nuclear power stations that are unrelated and irrelevant to problems experienced at Shoreham. The reports as a whole are therefore inadmissible in their entirety. Phase I and Phase II reports, like the portions of the reports offered by the County, should be admitted only to the extent they relate to the four components involved in this litigation, and then only after a proper foundation is laid.

8. All references to the Task Descriptions for the Component Design Review should be stricken. These Task Descriptions are irrelevant to whether the Shoreham EDGs will reliably perform their intended function. The County shows no nexus between an alleged failure to address a functional attribute listed in the Task Descriptions and the reliability of the engines. Accordingly, all references to the Task Descriptions should be stricken.

II. OBJECTIONS TO SPECIFIC TESTIMONY

A. Preliminary Matters (Joint Testimony 1-25)

LILCO moves to strike the final question and answer and accompanying footnote 1 on page 12. The question calls for, and the answer provides, a response that goes well beyond the scope of the single contention admitted in this proceeding. The response is not limited to the four components put at issue

by the admitted contention, and indeed does not even specify the "critical diesel engine components" to which it refers, but rather is a broad condemnation of TDI diesels and their manufacturer. Because the response lacks any specificity and is devoid of any showing of nexus to the particular components at issue in this proceeding, it is precluded by the Board's July 5 Ruling on admissibility of evidence purporting to establish "context" (July 5 Ruling at 21,691-98, 21,829 (specifically declining to admit a contention concerning "other components")), is therefore irrelevant and should be stricken.^{13/}

The questions and answers set forth on page 13 and continuing on page 14 are similarly beyond the scope of the admitted contention and must be stricken. The first answer is not probative of anything having to do with the four components at issue in this proceeding and is, therefore, irrelevant.^{14/}

^{13/} Even if the generalized references contained in the last question appearing on page 12 were somehow relevant to the issues being litigated in this proceeding, they would nonetheless be objectionable under Fed. R. Evid. 403. The probative value, if any, of this response is substantially outweighed by the unfair prejudice that would flow from admission of vague, generalized allegations concerning TDI, its diesels and the opinion of those diesels held by NRC staff that are not susceptible of challenge through cross-examination or submission of opposing evidence. Introduction of such testimony would, moreover, waste the time of all parties to this proceeding concerning issues the Board has previously excluded. See, e.g., July 5 Ruling at 21,829 (declining to admit contention concerning "other components").

^{14/} See Fed. R. Evid. 401, 402 (evidence which has no tendency to make existence of a fact of consequence to the determination of the action more probable or less probable than it would be without the evidence is not admissible).

In fact, litigation of questions concerning the TDI diesel generator Owners' Group Program Plan was specifically precluded by the Board's rejection of a contention concerning that plan on July 5. July 5 Ruling at 21,891-93. See Overview Point 6, supra. The second question and answer are likewise beyond the scope of the admitted contention and thus fly in the face of the Board's July 5 Ruling.^{15/}

LILCO moves to strike the second question and answer appearing on page 17 and continuing to page 18, and the associated footnote 9 (Exhibit 1),^{16/} because they constitute nothing more than unfounded speculation and conjecture. The basis for the proponents' view that LILCO's proposal to reduce the maximum load on EDGs "would be detrimental for providing

^{15/} Discussion of the Owners' Group Program Plan would be relevant, if at all, only as specifically related to one of the four components subject to litigation in this proceeding. If, notwithstanding the Board's determination not to admit a contention concerning the Owners' Group Program Plan, the Board determines to permit discussion of portions of the Program Plan related to the four challenged components, it should nonetheless strike from the second answer appearing on page 13 and continuing to page 14 the phrase "and that additional parts and components of the EDGs will not fail" as beyond the scope of the admitted contention. LILCO urges the Board to confine admission of the Owners' Group Program Plan, if admitted at all, solely to portions specifically relating to the four components at issue in this proceeding. See 10 C.F.R. § 2.743(c) (immaterial or irrelevant portions of admissible documents are to be segregated and excluded).

^{16/} When moving to strike testimony incorporating a footnote reference to a proffered Exhibit, LILCO moves as well to strike and exclude the referenced Exhibit. LILCO should also be understood to object to the admission of such Exhibits into evidence.

confidence that the EDGs can operate reliably" depends on the proponents' conjecture as to the "possibility" of a number of events occurring in a given sequence. The probability of this sequence of events occurring is not stated, nor is there any support offered for the conclusion that LILCO's proposed action would result in a "further reduction in the margin of confidence intended to be supplied by the current EDG rating." In the absence of such support, the first portion of the response should be stricken as lacking foundation and any indicia of reliability. The reference to "the usual practice for diesel engines in non-nuclear electric generating plants and in marine applications" is independently objectionable because such references were specifically excluded by the Board's July 5 Ruling as lacking adequate nexus to Shoreham.^{17/} It follows that the subsequent reference to "a similar safety margin" is irrelevant.

The testimony commencing with the question set forth on page 18 and continuing through the first full answer on page 25 must be stricken because it treats issues that have been specifically excluded from this proceeding. In its July 5 Ruling, the Board declined to admit Suffolk County's proposed contention II (6), which contained allegations that Shoreham's TDI diesels were "overrated and undersized." July 5 Ruling at

^{17/} Accordingly, the reference to the deposition of William J. Mussler of May 22, 1984, and Exhibit 1, must be stricken.

21,847-58, 21,890-91. The testimony set forth on pages 18 through 25 addresses precisely these questions. The testimony is, moreover, plagued by the same lack of specificity and failure to link general allegations of deficiencies to the four specific components at issue that led the Board to decline to admit the general "oversized/underrated" issues the County now seeks to reinject into this proceeding. The testimony should not be permitted to stand.

Even if the testimony contained on pages 18 through 25 had not been specifically excluded by the Board, it should nonetheless be stricken as unsupported, speculative and generally unreliable. The County's experts provide no independent support for their "opinion" that the test employed by TDI to rate its engines "is grossly inadequate." To the extent that the experts present any basis for their opinion, they rely on the deposition testimony of non-party witnesses -- a practice which neither provides the requisite support for an expert opinion nor complies with the requirements of Rule 32 of the Federal Rules of Civil Procedure. See Overview point 5. All such efforts to provide support for proffered testimony through reliance on partial extracts of non-party depositions should accordingly be stricken (i.e. footnotes 10-15 and referenced Exhibits 2 and 3). Likewise, no support is provided for the statement that "it is imperative to adequately test the engine as a whole" (Joint Testimony at 20-21) or for the proponents' belief that "[no] engine can be properly rated when

its crankshaft and cylinder block have not been sufficiently tested" (id. at 21). Such statements must also be stricken.

Other material contained in testimony set forth on pages 18 through 25 should be stricken because it is beyond the limited scope of this proceeding. The statement concerning "extensive cracking of components" in the Shoreham EDGs goes beyond the scope of the admitted contention by failing to specify a relationship to the four specific components at issue. The "FaAA Block Report" referenced in footnote 22 (and Exhibit 7) should be admitted only to the limited extent that it goes directly to the block issues admitted for litigation. See 10 C.F.R. § 2.743(c). The first question and answer appearing on page 24, referring to "other safety functions of the EDGs," likewise do not adequately relate to the four components under litigation and accordingly must be stricken.

B. Model AE Pistons (Joint Testimony 25-59)

1. Preliminary Matters (Joint Testimony 25-27)

The FaAA Piston Report referenced in footnote 23 (Exhibit 8) must be stricken except as it relates specifically to the issues concerning pistons admitted in this proceeding. See Overview Point 7.

2. Cracking of AE Piston Skirts (Joint Testimony 27-48)

The witness' reference to the "Initial FaAA Piston Report" in footnote 27, page 27, should be stricken because it is a preliminary report and lacks probative value. The Board has previously found value in limiting the scope of the

proceeding, e.g., discovery, to final reports. Transcript of Proceedings, In the Matter of Long Island Lighting Co.

(Shoreham Nuclear Power Station, Unit 1), Docket No. 50-322-OL (Feb. 22, 1984) at 21,625-26.

The testimony concerning finite element analysis and the disparity between such analysis and experimental results should be stricken. In the first place, the testimony is incompetent. None of the witnesses sponsored by the County have expertise in finite element analysis, and accordingly are not qualified to offer their opinion on the subject. Cf. Fed. R. Evid. 702. In any event, the testimony lacks any factual support. No support is provided for the experts' disagreement with FaAA's characterization of a 28% disparity as "quite good." The witnesses similarly fail to support the conjectural statements contained in the next answer ("it would appear to us that the experiments were inadequate;" "we believe that this conflict has not been adequately investigated;" "we believe that the greater weight must be given the results of the finite element analysis"). Without specific support for these conclusions, their reliability cannot be tested. They must, therefore, be excluded.

A major portion of the testimony commencing on page 31 and continuing through page 36 must also be stricken as speculative and unsupported. No support is offered for the conclusion that "cracks are more likely to initiate in the AE piston skirts in the EDGs than FaAA predicts." No basis for

the statement that FaAA "underestimates the crack initiation in three respects" is provided, nor is the extent to which this estimate is too low calculated. There is thus no basis for assessing the reliability of the statement, and the response should be stricken.

The same objection applies to the testimony following the block quotation on page 33. The sentence beginning "Based upon . . ." and concluding ". . . exceeded" is bare speculation and inadmissible. The proponent of this testimony as much as admits that he lacks any factual support for his attacks on FaAA's conclusions concerning AE piston cracking: he has not performed the actual measurements of AE piston gaps which he believes "would be useful in testing FaAA's assumption that all AE pistons have gaps within TDI's tolerances," id., and, therefore, is himself unable to test that assumption. Similarly, he does "not know the actual tensile properties of the AE skirts at Shoreham," id., and, therefore, has no basis for drawing any conclusions depending on an analysis of tensile properties. The same lack of support infects the first full sentence on page 36: there have been no measurements to quantify the dimensional differences alleged to exist in the skirt assembly and the degree to which such differences "could influence results" is nowhere specified. For these reasons, the testimony commencing on page 33 and concluding on page 34 as well as the final sentence preceding the first full paragraph on page 36 should be stricken.

The discussion of TDI casting practices appearing on page 36, beginning with the phrase "TDI does not use . . ." through "was 'ineffective'" on page 37 should be stricken as beyond the scope of the admitted contention. TDI's manufacturing processes and its quality assurance programs are excluded as independent issues from this proceeding. July 5 Ruling at 21,613-14. The remainder of this response should be stricken as speculative and unsupported for the same reasons discussed above. The testimony is phrased entirely in the conditional, with no basis given for assuming the conclusions championed. Consequently, the entirety of response (2) (beginning on page 36 with the "TDI does not . . ." and concluding with ". . . analysis is invalid" on page 37) should be stricken.

Unsupported speculation continues on page 37. There is no basis for the statement beginning "corrosion products form . . ." and concluding with ". . . additional crack growth" on pages 37 and 38. It should accordingly be stricken. The same reasoning requires striking the entirety of response (5) beginning on page 38 and concluding on page 39. The testimony incorporates no basis for the statements concerning the lack of uniformity of skirt temperatures other than the bare assertions offered by the witnesses themselves. Its reliability consequently cannot be demonstrated and it should therefore be excluded. With the elimination of this testimony, there is no basis for admitting the reference to the "FaAA Piston Thermal Distortion Report" in footnote 46.

The absence of anything other than unsupported speculation also requires the striking all of the response beginning on page 39 and continuing on page 40. This testimony essentially summarizes the objectionable portions of the testimony which precedes it concerning the AE piston skirts. It is probative of nothing on to the question of the adequacy and reliability of the AE piston skirts, and provides no support for the ultimate conclusion that analyses other than those performed by FaAA "would give a far better prediction of crack propagation than the idealized study performed by FaAA."^{18/} Furthermore, as indicated previously, the witnesses have demonstrated no competence to testify regarding finite element analysis.

Lack of support renders the response that follows beginning on page 40 and continuing to page 41 inadmissible as well. The response contains nothing more than a series of speculative statements, backed up with no references to any authorities for the propositions set out. The response is nothing more than a "wish list" of test procedures that could be applied to piston skirts, and does nothing to establish the reliability or unreliability of the AE piston skirts in place

^{18/} This conclusion is contradicted by the statement that "[i]t is not possible to make accurate predictions of crack propagation in the AE skirts" on page 39 used to introduce the response. If accepted, this introductory sentence calls into question the reliability and probative value of all that follows.

at Shoreham. The County fails to state precisely what should have been done or the results that would have been obtained. It should, therefore, be stricken. An additional reason for striking this response is its reference to the need for additional testing procedures which do not fall within the expertise of the witnesses purporting to comment upon them. Thus, there is no foundation for admission of the reference to finite element analysis.

All of the questions and responses beginning with the first full question and answer on page 41 and continuing to the first question on page 46 amount to no more than an elaboration on Suffolk County's proposed contention II(6) (the County's requested revision to the piston contention filed with the Board on July 10, 1984). The testimony relates to alleged inadequacies of the testing and inspection of the Shoreham EDGs. These issues were expressly excluded by the Board's July 5 Order and the Board's July 11 Ruling as confirmed in its Order of July 17. July 5 Ruling at 21,847-58, 21,890-91; July 17 Order at 5. The Contention, as admitted, is the validity of FaAA's analysis, not inspection and testing of AE skirts. FaAA's analysis showing (i) that the AE piston skirts might not crack, and (ii) that, if cracking did occur, the cracks would not propogate, is premised on the results of FaAA's fracture analysis and stands on that basis alone. The Board stated in its July 17 Order that the parties could use the testing and inspection to show "whether Shoreham operating

conditions would cause cracks contrary to the analysis and whether there would be an excessive side thrust problem." July 17 Order at 5. The FaAA analysis is not contradicted by the testing and inspection discussed on pages 41 to 46 of the Joint Testimony.

The conclusion of the testimony concerning "Model AE Piston Skirts" beginning on page 46 with the first full response and concluding at the top of page 48 should be stricken for the same reasons that apply to the earlier testimony from which it is derived. The discussion of the possible results of crack propagation beginning on page 46 and running through page 47 is entirely speculative unsupported by any calculations, examples or other authorities. The discussion beginning on page 47 and concluding on page 48 suffers from the same deficiency, and is additionally flawed by reference to comparisons involving finite element analysis, a discipline in which none of the Suffolk County witnesses is expert. Probabilities of the projected occurrences are not provided, and thus there is no way to judge the reliability of the proffered conclusions. Lacking the requisite reliability, this testimony must be stricken.

3. Excessive Piston Side Thrust (Joint Testimony 48-56)

LILCO moves to strike all testimony concerning excessive piston side thrust (pages 48-56). The testimony establishes no basis for concluding that excessive piston side thrust occurs in the Shoreham EDGs. The testimony itself

acknowledges that Suffolk County's experts are unable to call into question the conclusion that there is no excessive side load in the Shoreham EDGs. Joint Testimony 52. It goes on to acknowledge that the witnesses "cannot be absolutely certain" that a piston skirt they had examined had been damaged by excessive piston side thrust, id. at 53, rather, they opine only that such thrust "is the probable cause." Id. This admission establishes that the testimony concerning the possibilities of excessive piston side thrust and its consequences is purely hypothetical, premised on speculation unsupported by facts. In fact, unable to find evidence of excessive side thrust in the Shoreham EDG cylinder liners, they "surmise that side thrust markings" made necessary a maintenance operation which obliterates such markings. Id. at 54 (emphasis added). Surmise has no place in a line of reasoning ostensibly relating an observed phenomenon to an alleged defect at issue in this proceeding, and demonstrates the pervasive absence of factual support for the theoretical ramblings spread throughout pages 48 to 56.

Individual portions of the excessive side thrust testimony are also objectionable. The witnesses' claim that they "have not yet had an adequate opportunity to examine LILCO's deficiency and disposition reports," id. at 52, is irrelevant, as is the statement of their intention to file supplemental testimony if the review they have not yet completed "discloses significant information." Id. See

Overview point 3, note 10. The response to the question, "What is the effect of excessive AE piston side thrust on FaAA's analyses?" provided on page 55 is nothing more than a theoretical discourse replete with conjecture and unsupported by any facts, calculations or authorities. Reference to excessive side thrust in AE skirts found in TDI R-5 and DSRV-16-4 engines is irrelevant as beyond the scope of the admitted contention. Finally, the conclusion that piston side thrust is excessive in the Shoreham EDG, lacks any factual support in the testimony which precedes it and, together with the further conclusion that the "EDGs have not been shown to be adequately designed to satisfactorily perform the service intended" on page 56 should be stricken.

4. Tin Plating of the AE Piston Skirt
(Joint Testimony 56-59)

For the reasons set out immediately above, the phrase beginning "where the piston . . ." and ending ". . . on the skirt" appearing on page 58 should be stricken. This statement assumes a fact -- excessive piston side thrust -- that has not been established with respect to the Shoreham EDGs. The following two sentences should be stricken as being unsupported by any facts. The conjecture that "catastrophic failure could occur" appearing on page 58 is similarly unsupported and should likewise be stricken.

The first full response on page 59 should be stricken as unresponsive to the question as well as unsupported by the testimony which precedes it. It simply does not follow from the testimony concerning tinning of piston skirts that the EDG rating is "well in excess of the design limitation of the AE piston." Id. at 59. The conclusion lacks any evidentiary support, is vague and cannot be tested for reliability. It should be stricken.

C. Replacement Cylinder Heads (Joint Testimony 59-105)

1. Preliminary Discussion (Joint Testimony 59-68)

Several of the conclusions concerning the adequacy of the design and manufacture of replacement cylinder heads set forth at pages 62-64 lack support in the testimony that follows and accordingly should be stricken.^{19/} Other preliminary statements are also objectionable. The question and answer set forth on page 64 should be stricken because they refer to original cylinder heads which, pursuant to the Board's July 5 Order, are not at issue in this proceeding. July 5 Ruling at 21,883. The discussion of the history of Suffolk County's concern with cylinder heads is, in any event, not relevant to the question whether cylinder heads now in place at Shoreham are adequate for their intended functions. The attempt at

^{19/} LILCO renews its argument that FaAA and DRQR reports should not be admitted in their entirety, but rather should be admitted only to the limited extent they are directly relevant to the four components at issue in this proceeding. See Overview Points 6 and 7, supra.

pages 65-66 to establish the relevancy of these three old Group I cylinder heads do not establish the relevancy of those heads to the Group III heads now in place at Shoreham. From this it follows that the references to original cylinder heads contained in the first answer on page 65 should be stricken, as should the first question and answer set forth on page 67.

2. Inadequate Design (Joint Testimony 68-76)

LILCO moves to strike the second paragraph of the response commencing on 68, the question set forth on page 69 and the answer which continues from page 69 to page 70 as beyond the scope of the contention admitted in this proceeding. This testimony relates to cylinder heads predating the 1980 date at which production of Group III heads commenced. It is, therefore, precluded by the Board's July 5 Order. July 5 Ruling at 21,883. Moreover, the "surprise" of Suffolk County's witnesses is entirely irrelevant.

The first response on page 71 should be stricken. It is conjectural and lacks support for the predictions it contains. Similar reasons support the striking of the final sentence of the response set forth on page 73 ("the deflection of the head may lead . . . leakage") is likewise unsupported, and the probability of the postulated occurrence is not specified.

The portion of the response set forth on page 74 which begins with "and the TDI Owners' Group . . ." through the conclusion of the response should be stricken as irrelevant.

The beliefs of the TDI Owners' Group have nothing to do with the adequacy and reliability of the Group III cylinder heads; moreover, litigation over Owners' Group issues was specifically barred by the Board. July 5 Ruling at 21,892-94. See Overview Point 6, supra.

3. Changes in Manufacturing Techniques
(Joint Testimony 76-86)

The first question on page 76 once again attempts to interject issues concerning the pre-1980 EDG heads that were excluded by this Board's July 5 Order. There is, moreover, no foundation for the introduction of this testimony, given the failure to establish that there are defects with the Group III heads actually at issue in this proceeding. This objection applies as well to the testimony set forth at pages 77-80. It is devoid of any showing of nexus to the Shoreham Group III heads and is accordingly irrelevant.

Two references on page 84 should be stricken for failure to establish a nexus to the Group III heads in place at Shoreham. The first is the reference set forth in footnote 102 (Exhibit 31) concerning foundry rework on cylinder heads cast in 1982-83. No connection to the heads in place at Shoreham is specified. Similarly, references in the final paragraph on page 84 to Stellite weld deposits in Grand Gulf TDI heads bear no apparent relation to the Group III heads, and the testimony does not provide one.

4. Inspection of Replacement Heads
(Joint Testimony 86-93)

The reference to TDI's "ineffective QA/QC programs" set forth in the final answers at page 90, continuing through a quotation of a letter from V. Potapovas to C. Mathews (Exhibit 33), as well as the exhibit, should be stricken. This discussion bears no relationship to the issue of the inspection of heads in place at Shoreham. The witness' attempt to relate the two on the basis of "the importance of the heads" lacks the requisite specificity and is unsupported.

The first question and answer appearing on page 93 should be stricken because they go beyond the scope of the admitted contention and attempt to encompass matter specifically excluded when the Board rejected Suffolk County's proposed contention III. The response is nothing more than a challenge to practices of the Owners' Group which are not at issue in this proceeding. Even if the response is deemed generally admissible, the final sentence should be stricken because the assumption that cracks or voids will grow upon which it is premised is entirely unsupported.

5. Cracks in Replacement Heads (Joint Testimony
93-105)

LILCO moves to strike the testimony concerning cracks in the replacement heads set forth at pages 93-105 as lacking a necessary foundation. There has been no showing that the Group III replacement heads leak, and consequently the various results of leaks postulated in the testimony are purely

hypothetical. The speculation spread throughout this aspect of the testimony is additionally objectionable because it is unsupported by data or by an assessment of the probability that each of the postulated occurrences will take place. For both of these reasons, the testimony has no probative value and should be excluded.

D. Replacement Crankshafts (Joint Testimony 106-142)

1. Preliminary Matters (Joint Testimony 106-108)

The conclusion that the EDG replacement crankshafts are inadequately designed set out at page 108 lacks support in the testimony offered to support it. A major portion of that testimony is not relevant to the crankshaft issue admitted in this proceeding and much of the rest of it is unreliable. Support for these statements follows.

2. Standards for Crankshaft Designs (Joint Testimony 109-133)

LILCO moves to strike all testimony subsumed within this heading, i.e., pages 109-133, as irrelevant to the issue concerning Shoreham EDG crankshafts admitted in this proceeding. The discussions on design standards and the attempt to relate them to the Shoreham crankshafts spread throughout this aspect of the testimony do not establish that the crankshafts are inadequately designed for the service they are required to perform. At most, the testimony demonstrates that the crankshafts may not meet certain elements of some design codes. In the absence of any adequate indication of the

relationship of these codes to requirements for adequate service at Shoreham, the question of compliance with these codes is irrelevant.

Particular aspects of the testimony concerning standards for crankshaft design are independently objectionable. The references to Nippon Kaiji Kyokai ("NKK"), Det Norske Veritas and Germanischer Lloyd set out at page 109 go beyond the scope of the admitted contention, which refers only to the American Bureau of Shipping ("ABS"), Lloyd's Register of Shipping and the International Association of Classification Societies ("IACS"). See July 17 Order, Attachment at 1. The discussion of ship classification associations quoted at page 110 suffers from the same defect. The Board intended to preclude precisely the sort of general discussion of design codes included in this quotation and the quotation is accordingly irrelevant. It (and Exhibit 35) should be stricken.

The discussion of the IACS draft rules set forth at page 113 should be stricken as irrelevant. As the testimony itself acknowledges at pages 116-17, the rules are no more than "a proposal" which "is still under discussion among IACS members" As such, they are of no force and consequently have no probative weight. For the same reason, the further reference to the IACS beginning with the final answer on page 116 and continuing to part 117, as well as Exhibit 38, should be stricken.

The references to "other design standards" commencing with the second question on page 120 and continuing through the first response on page 122 should be stricken in their entirety. The Japanese and German standards discussed in these questions and answers are, as indicated above, beyond the scope of the admitted contention. Moreover, the answer set forth on page 121 is not responsive to the question whether the witness has performed any calculations which immediately precedes it. Finally, the substance of the answer set forth on page 121 is objectionable because it is supported only by partial references to the deposition of a non-party and, therefore, should be stricken for the reasons set out supra at Overview Point 5.

The testimony set forth at the conclusion of page 125 and continued to page 126 should be stricken for lack of specificity. The response does not identify the "testimony and documents obtained from TDI and LILCO" on which the witness purports to base his belief that supplemental information provided ABS by TDI was "incomplete and inaccurate." In the absence of such particularization, the reliability of this testimony cannot be tested.

The sentence beginning "in addition . . ." and concluding ". . . at the fillets" on page 128 and the associated reference (footnote 137, Exhibit 48) should be stricken as irrelevant.^{20/} The manufacturer to whom the

^{20/} This objection also applies to the reference to Exhibit 48 set forth at page 134, footnote 148. That reference should likewise be stricken.

testimony attributes a statement concerning the shotpeening of crankshafts is not the manufacturer of the crankshafts installed at Shoreham. The required nexus to Shoreham is, therefore, absent.

The speculation concerning the question whether the ABS will reconsider the conclusions it stated in a May 3 letter (pages 132-33) must be stricken. None of the witnesses is competent to testify as to the possible future course of action of the ABS. Moreover, the testimony assumes that the information that has been submitted to ABS by TDI is "incomplete and inaccurate," a conclusion not supported by testimony which precedes it. In any event, the response is irrelevant. The ABS has certified the Shoreham crankshafts, and speculations as to possible future actions of the ABS do not diminish LILCO's right to rely on that certification.

3. Crankshaft Shotpeening (Joint Testimony
133-142)

The sentence beginning "Second . . ." and concluding ". . . at the fillets" in the first full answer at page 138 should be stricken. The x-ray diffraction process to which it refers relates to the original crankshafts installed in the Shoreham EDGs, not those currently in place. This reference is, therefore, irrelevant. The discussion of a witness' interpretation of photographs of crankshaft shotpeening set forth from "However . . ." on page 138 through "We agree" on page 140 should be stricken as well. The

discussion is rife with speculation as to what the photographs reveal, unsupported by the photographs themselves.

E. Cylinder Blocks (Joint Testimony 143-184)

LILCO moves to strike the FaAA block report attached as Exhibit 7. This report is not admissible in its entirety. The report was prepared for the TDI Owners' Group and makes reference to other nuclear power stations with problems that are not relevant to Shoreham. Accordingly, only portions of the report may be admissible and then only after a proper foundation is laid.

On page 148, the reference to the Task Description for the Component Design Review should be stricken. This is irrelevant to whether the Shoreham EDGs will reliably perform their intended function. The County shows no nexus between an alleged failure to address a functional attribute and the reliability of the engines.

LILCO moves to strike the question, answer and supporting deposition references (footnotes 173-75, Exhibit 57) referring to Colt EDGs that appear at page 149. Such references are irrelevant to the issues admitted in this proceeding.

LILCO also moves to strike the phrase "and could lead to catastrophic failure of the EDG" in the first answer appearing on page 152. Similarly, the questions and answers appearing on pages 152 and 153 should be struck. Each of these questions and answers represent particularly gross examples of

testimony lacking any foundation in fact. First, the testimony does not establish that there has been a leakage of coolant in the cylinder blocks of the Shoreham EDGs. Second, the rate of leakage would depend on the size of the cracks. The County makes no effort to identify how large the cracks would have to be to exceed the make-up capacity of the coolant reservoir or to identify the make-up capacity of the coolant reservoir. Therefore, the County's prediction of "catastrophic failure of the EDG" and the resulting tale of horrors caused by coolant loss is nothing more than sheer speculation unsupported by any calculations. The testimony is, consequently, entirely unreliable.

The Board should strike the references to the M. V. Gott, M. V. Columbia, St. Cloud, Copper Valley, Homestead and Bhiel engines beginning with the question set forth on page 157 and continuing through the response completed on page 159, including the Exhibits referred to on these pages. This testimony fails to establish the nexus between the alleged failures by FaAA to disclose information concerning the operating history on those engines and the alleged deficiencies of the Shoreham cylinder blocks. Simply put, this alleged failure to disclose says nothing about the reliability of the Shoreham EDG cylinder blocks. On the contrary, the information about derating of the non-nuclear engines is not related to cracks in the cylinder blocks at Shoreham. No showing is made that the engines were derated because of ligament, cam gallery or stud-to-stud cracking of the type that occurred at Shoreham.

The sentence accompanying footnote 199 and the reference to Exhibit 64 should be stricken. The fact that FaAA measured the liner proudness of EDG 103 and that it varied from 1 to 9 mils is irrelevant. EDG 103 has been replaced and the County makes no attempt to show that the same variation of 1 to 9 mils exists on EDG 101, EDG 102 or the replacement EDG 103 block.

On page 168, the phrase beginning "although we have not had . . ." and concluding ". . . a few days ago" should be stricken. For the reasons discussed supra, Overview Point 3, note 10, this response lacks a foundation and is irrelevant.

On pages 169 and 170, the response beginning "Third, while the FaAA analysis . . ." should be stricken as being speculative and lacking a foundation. It is nothing more than a series of questions, for which no supporting calculations are provided. Such questions have no probative value.

The phrase commencing with "First, the abnormal load excursion . . ." and concluding ". . . to be unlikely" at page 173 lacks foundation and probative value. It is irrelevant and should be stricken.

On pages 178 to 180, the material beginning with the question "Aside from the . . ." and concluding with the answer ". . . have not been determined" should be stricken. There are no circumferential cracks in the cylinder blocks at Shoreham. Indeed, circumferential cracks have never been detected in TDI in-line 8 cylinder engines. The County shows no nexus for

relating such cracks to Shoreham. It has no data or calculations showing such cracks will develop at Shoreham. On the contrary, the County makes bald, unsupported statements such as "[Circumferential] cracks could be very dangerous and lead to EDG failure" without providing any foundation, supporting data or calculations. (See Testimony at p. 180). Such testimony must be stricken.

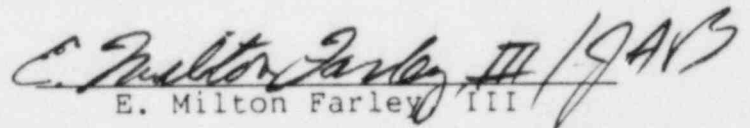
Finally, much of the material set forth on pages 183-184 should be excluded. No foundation has been laid for the discussion of tears, inclusions and degenerate phases set forth at the outset of page 183. Such defects have not been shown to exist at Shoreham and there is no showing of a nexus to EDG 101, EDG 102 and the replacement EDG 103 block. In particular, the sentence containing the phrase "we are not satisfied that TDI can produce a defect-free block" should be stricken.

The remainder of the questions and answers set forth on pages 183 and 184 should be excluded as irrelevant for the reasons stated supra, Overview Point 3, footnote 10. To the extent the testimony can be construed as a motion for leave to file supplemental testimony, the final sentence on page 184 should be stricken as not properly part of testimony and should, in any event, be denied for failure to establish good cause.

III. CONCLUSION

For the reasons stated above, the portions of the Joint Direct Testimony of Dr. Robert N. Anderson, Professor Stanley G. Christensen, G. Dennis Eley, Aneesh Bakshi, Dale G. Bridenbaugh and Richard B. Hubbard regarding Suffolk County's Emergency Diesel Generator Contentions specified in this Motion should be stricken.

Respectfully Submitted,
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Attachment A

Partial Deposition Transcript References

<u>Name</u>	<u>Deposition Date</u>	<u>Joint Testimony Footnote Number</u>	<u>Joint Testimony Page Number</u>
A.B.S. - Woytowich, Blanding, & Giuffra	7/18/84	131	123
		132	124
		133	125
		134	125
		135	127
		141	130
		144	131
		145	132
		147	133
Simon Chen	5/15/84	13	20
		233	181
Edward Dobrec	8/03/83	99	80
William Foster	5/22/84	45	37
		50	42
		51	42
		115	91
David Harris	5/08/84	42	35
Paul Johnston	5/09/84	151	136
Maurice Lowrey	5/11/84	84	71
		154	137
		234	182
Clinton Mathews	5/08/84	10	19
		11	19
		12	19
		14	20
		15	20
		106	86
		110	88
		235	182
236	182		

<u>Name</u>	<u>Deposition Date</u>	<u>Joint Testimony Footnote Number</u>	<u>Joint Testimony Page Number</u>
William Museler	5/22/84	9	18
		173	149
		174	149
		175	149
		224	175
Franz Pischinger	6/21/84	125	121
		126	121
		127	121
		128	121
		129	121
		130	123
		150	135
Robert Taylor	5/10/84	176	150
		177	151
		188	157
		231	180
Gerald Trussell	5/07/84	36	32
		52	43
		53	43
		77	69
		78	69
		79	69
		80	70
		136	128
		149	135
Clifford Wells	5/14/84	93	75
		104	85

Attachment B

List of Exhibits to be Stricken

Exhibit 1

Exhibit 2

Exhibit 3

Exhibit 7

Exhibit 8

Exhibit 31

Exhibit 33

Exhibit 35

Exhibit 38

Exhibit 48

Exhibit 57

Exhibit 59

Exhibit 64