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LILCO, December 27, 1984

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
LONG ISLAND LIGHTING COMPANY	)	Docket 50-322-OL
	)	
(Shoreham Nuclear Power Station, Unit 1)	)	
	)	

LILCO'S RESPONSE TO
JOINT MOTION TO ADMIT EDG LOAD CONTENTION

Pursuant to the Board's order of December 4, 1984, Suffolk County and the State of New York submitted a contention on December 17 challenging LILCO's "qualified load" of 3300 KW.[1/] The Board permitted such a submission provided the contention otherwise meets the requirements for a timely contention. In large part, SC's contention does not meet these requirements.

First, the contention as drafted is inadequately particularized, though the additional information provided by Mr. Bridenbaugh's Affidavit and the recent deposition of Messrs.

1/ The contention is styled as a joint contention, but in the past only Suffolk County has had diesel generator contentions admitted. New York State, to the extent it has participated, has done so as an interested state. Thus, this response assumes that this past practice continues.

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Minor and Bridenbaugh on this issue makes this problem remediable. Second, some of the issues the County seeks to raise are untimely; they could have been engaged long ago in this proceeding for they are not matters solely attributable to LILCO's use of a 3300 KW load. And third, despite the volume of information available to the County, parts of the contention lack a reasonable basis.

I. Inadequate Particularization

Section 2.714(b) requires contentions to be reasonably specific. Standing alone, the Emergency Diesel Generator (EDG) Load Contention does not meet this requirement.[2/] For example, subpart (a) of the contention merely states, without further elaboration, that LILCO's 3300 KW qualified load is "inadequate to handle the maximum loads that may be imposed upon the EDG's." Subpart (c) is similarly terse and lacking in specificity: "The EDG qualification test run . . . was inadequate . . . ."

Normally, this lack of specificity would justify rejection of the contention. In this instance, however, the County has provided additional factual information allegedly

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2/ Specificity requirements are more stringent where a party seeking to have a contention admitted has had a significant amount of information available prior to its submission. Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), Order Denying Revised Security Contention [unrestricted version], at 3-4 (Sept. 19, 1984).

supporting the contention (Attachment 1 to Motion, at 2-6 and the Bridenbaugh Affidavit). While this information puts some flesh on the bare bones contention, it is not, by itself, adequate nor is it organized in a way which makes it easy to decipher which facts allegedly support which part of the contention. The requisite specificity is achieved only by combining the information in the factual statements accompanying the contention, the Bridenbaugh Affidavit and the December 18 deposition of Messrs. Bridenbaugh and Minor. Based upon this information, the contention should be restated as follows to avoid the specificity problems found in the County's proposal:[3/]

> Contrary to the requirements of 10 C.F.R. Part 50, Appendix A, General Design Criterion 17 -- Electric Power Systems, the emergency diesel generators at Shoreham ("EDGs") with a maximum "qualified load" of 3300 KW do not provide sufficient capacity and capability to assure that the requirements of clauses (1) and (2) of the first paragraph of GDC 17 will be met, in that
>
> (a) LILCO's proposed "qualified load" of 3300 KW is the maximum load at which the EDG may be operated, but is inadequate to handle the maximum load that may be imposed on the EDGs because:
>
> (i) intermittent and cyclic loads are excluded;

3/ By proposing a restatement of the contention, LILCO does not concede its admissibility. Specific objections are discussed in Section II below.

(ii) diesel load meter instrument error was not considered;

(iii) operators are permitted to maintain diesel load at 3300 KW +/- 100 KW;

(iv) operators may erroneously start additional equipment;

(v) degraded plant conditions (voltage and frequency fluctuations, pump efficiency changes, and changes in flow resistance) were not considered; and

(vi) the actual loads obtained during system testing and used in FSAR Table 8.3.1-1A failed to model accurately system conditions in an accident.

(b) There is little or no margin between 3300 KW and the maximum emergency service loads for the EDGs, in sharp contrast to emergency diesel generators at other nuclear plants where a substantial margin provides adequate assurance of requisite reliability under GDC 17.

(c) The EDG qualification test run performed by LILCO was inadequate to assure that the EDGs are capable of reliable operation at 3300 KW because:

(i) DG 103 block was not subjected to the entire 740 hours of testing;

(ii) the test results on the DG 103 block are not transferable to the DG 101 and 102 blocks;

(iii) operators were permitted to control the diesel generators at 3300 KW +/- 100 KW during the test;

(iv) instrument accuracy was not considered; and

(v) DG 103 was connected to the LILCO grid during the test rather than supplying only emergency loads as it would in an accident.

This restatement of the contention, LILCO believes, accurately reflects the sworn deposition testimony of Suffolk County's witnesses concerning the meaning of the contention. See Bridenbaugh/Minor Deposition at 115-125. Its adoption in lieu of the existing broad and vague language will ensure a more focused litigation and avoid disputes concerning its proper scope.

The County cannot escape a restatement simply by pointing to the factual statements accompanying the contention, the affidavit and the deposition. The parties are entitled to a clear statement of the issues without having to wade through multiple documents in the hope of learning what is to be litigated. Equally important, unless a more specific contention is adopted, the County may attempt to sweep new issues under the broad umbrella of its proposed contention. The risk of this happening is not insubstantial given the admittedly incomplete status of the work by SC's consultants.[4/] In accordance with § 2.714(c), therefore, the Board should adopt a specific

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4/ In their deposition, SC's consultants repeatedly stated that they had not started work on issues they intended to pursue. E.g., Bridenbaugh/Minor Deposition at 75 (uncertainties on electrical line losses); 77 (review of integrated electrical test); 113 (manual operation of equipment); 120 (use of grid in endurance test).

contention along the lines suggested here. In any event, for the purposes of clarity, LILCO will refer to the various portions of the contention proposed above in stating its objections concerning untimeliness and lack of basis.

II. Objections to the Contentions

LILCO's objections fall into two categories. First, a number of the issues raised by the County are not related solely to LILCO's use of the qualified load concept. As such, they are not based upon any new information or developments, could have been raised long ago, and are, therefore, untimely.[5/] The County, however, has wholly ignored the requirements of § 2.714(a) for filing such untimely contentions. Consequently, the offending portions of the contentions should not be admitted. Second, contrary to § 2.714(b), a number of the issues raised have inadequate basis in either law or fact. Specific objections to each portion of the contention, as stated on pages 3-5 above, are as follows:

5/ SC witnesses conceded that the County had not challenged the adequacy of the pre-Revision 34 version of Table 8.3.1-1. Bridenbaugh/Minor Deposition at 32. Yet, as explained below, some of the conditions now challenged were present prior to Revision 34. SC made no effort to limit its contention to matters affected by Revision 34. See Bridenbaugh/Minor Deposition at 46-47 (concerns with Table 8.3.1-1A not limited to changed entries).

(a)(i)

no objection

(a)(ii)

Instrument error is not unique to the use of the qualified load. No new instrumentation to monitor diesel load has been installed since the "qualified load" concept was introduced, a fact SC does not dispute. See Minor/Bridenbaugh Deposition at 107; see also id. at 100 (normal plant instrumentation used). Thus, instrument error before the adoption of the qualified load, as now, could theoretically be as much as +/- 112 KW. See LILCO Deposition at 73.

Nor has the advent of a qualified load made this alleged instrument error more significant. Prior to submission of Revision 34 of the Shoreham FSAR, Table 3.8.1-1 predicted that the most heavily loaded diesel (DG 103) would carry a load of 3881 KW for a short period of time. This load is 19 KW below the pertinent two hours overload rating for the diesels (3900 KW). The pre-Revision 34 table also predicted a maximum continuous load of 3409, which is 91 KW below the 3500 KW continuous load rating of the diesels. See FSAR Table 8.3.1-1, Revision 31. Consequently, any real concerns about the accuracy of the control room diesel load meter could have, and should have, been raised years ago. Indeed, as the above numbers reflect, the situation is essentially unchanged: the 47 KW

difference between maximum load currently predicted in the FSAR (3253 KW) and the 3300 KW qualified load falls almost squarely between the differences noted above that existed prior to Revision 34. Clearly, therefore, any attempt to litigate the effect of instrument error now is untimely, but SC has wholly ignored the standards for late filing contention. It follows that this portion of the contention should be denied.

For the Board's information, the question of instrument error raises no substantive safety concern. First, as Mr. Youngling testified in his deposition, the meter in question is included in LILCO's calibration program. See LILCO Deposition at 72. Second, substantial conservatisms still exist in FSAR Table 8.3.1-1A. A large majority of the loads listed continue to be generally conservative nameplate values. In addition, the table conservatively assumes simultaneous operation of all automatic loads at their peak load values. The Integrated Electrical Test (IET), which simulated LOOP/LOCA operation, demonstrated that actual peak loads would be hundreds of KW below the predicted load.[6/] Third, instrument error may well

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6/ The IET conducted in August 1984 resulted in a peak load of less than 3100 KW on DG 103. LILCO Deposition at 79. This test included operation of two service water pumps on DG 103. Id. at 80. Given that one of these pumps will now be locked out, actual DG 103 loads would be substantially lower. DG 101 and DG 102 experienced peak loads of approximately 2800 KW. See SNRC-1074 (Aug. 22, 1984) (IET results). Although the IET does not provide a precise measure of post-LOOP/LOCA loads, it gives assurance that there is significant conservatism in Table 8.3.1-1A. See LILCO Deposition at 76; Berlinger Deposition at 22; see also Bridenbaugh/Minor Deposition at 117 (the IET gives some assurance of conservatism).

be in the conservative direction. Bridenbaugh/Minor Deposition at 100. And finally, even in the unlikely event that instrument error did cause the load to exceed 3300 KW, it would only be for a short period of time because operators will reduce diesel loads after the first ten to twenty minutes of an accident. See FSAR at 8.3-6b (Rev. 34); Bridenbaugh/Minor Deposition at 86. These short excursions above 3300 KW do not present a safety concern.7/

In sum, the issue of instrument error is not unique to LILCO's use of the 3300 KW qualified load and therefore is inappropriate for litigation now. Moreover, the issue raises no substantive safety issue that would justify litigation.

(a)(iii)

no objection

(a)(iv)

As already noted, prior to Revision 34, the predicted short term and continuous loads on the diesel following an

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7/ The concept of "qualified load" was introduced by the NRC Staff to provide assurance that high cycle fatigue of certain components will not occur. See TDI Diesel Generator Owners' Group Program Plan SER (Aug. 13, 1984), at 13-14. Short term excursions above 3300 KW will not result in high cycle fatigue. Moreover, the replacement crankshafts have been tested extensively at or above 3500 KW, and no evidence of cracking has been found. See Supplemental Safety Evaluation Report, at 3-4 (Dec. 3, 1984).

accident were close to the two hour and continuous ratings of the diesel respectively. The concern now raised by the County that an operator might erroneously start a piece of equipment and exceed the qualified load could very well have been raised prior to Revision 34 with respect to the overload or continuous load rating. Nothing LILCO has done in implementing the qualified load concept has made such an error any more likely than before the revision. Nor is the impact or significance of such an error greater now that the qualified load is in place. To the contrary, the significance is reduced. Prior to Revision 34, if the operator made the worst case error, loads on DG 103 (with a peak load of 3881 KW) might have exceeded 3900 KW, a load beyond which the diesels had not been tested. After Revision 34, the worst case error might cause load to exceed 3300 KW, but the peak load would still be within the levels at which the diesels have been tested.[8/] Consequently, this issue is not new and its significance is not increased by the adoption of a qualified load; it is, therefore, untimely. Again, the County has failed to demonstrate that the standards for a late filed contention are met.

8/ In the unlikely event of a worst case operator error, DG 103 could be loaded to 3583 KW in a LOOP/LOCA, and DG 101 could be loaded to 3784 KW in a LOOP. SNRC-1104 (Sept. 19, 1984). In either event, the load would be below 3900 KW, a load at which the diesels have been tested.

In addition, this subpart goes beyond the NRC's regulations by seeking to substitute multiple independent failures for the single failure criterion in the design basis of the plant. Presumably, the County wants to litigate the effect on the plant of an operator error after one diesel has already failed.[9/] The failure of one diesel, however, constitutes the single failure that must be considered under the NRC's regulations. The operator error would constitute an additional independent multiple failure that need not be considered. Indeed, Mr. Bridenbaugh concedes this point in his affidavit:

> I am aware that under normal interpretation of the single failure criteria, such operator errors are not required to be considered in the review.

Affidavit at 10. Mr. Bridenbaugh's attempt to justify this departure is both legally and factually deficient.[10/]

9/ If the operator error is the single failure that must be considered under the single failure criterion, there is nothing to litigate because even assuming this inadvertent loading results in a loss of one diesel, two others remain to shut down the plant safely. As the Board knows, and the County does not dispute, the plant has always been capable of shutting down safely with any two out of three diesels.

10/ As a legal matter, the County has made no attempt to seek a waiver of the single failure criterion by meeting the requirements of § 2.758. As a factual matter, the argument that the LOOP/LOCA and LOOP event will continue for a substantial period of time is flawed. In either event, the diesels only need to be relied upon until offsite power is restored. As the Miller Board found in its Initial Decision, it is extremely unlikely that offsite power will be lost for any appreciable period of time. See Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), Initial Decision at 40-44, 82-85 (October 29, 1984).

Moreover, even if such a multiple failure did occur, it is unlikely that it would cause the loss of a diesel. The largest single error for a LOOP/LOCA or a LOOP would result in a diesel load of 3583 KW or 3784 KW respectively. As the Board knows from previous testimony, the new crankshafts have been successfully tested at or above this load level.

(a)(v)

Suffolk County contends that degraded plant conditions during operation could cause the load placed on the diesel generators following a LOOP/LOCA to exceed 3300 KW. SC's consultants explained that reductions in pump efficiencies might increase the power required to run the pump, Affidavit at 5-6, Bridenbaugh/Minor Deposition at 34, 35, 82-83, that variations in voltage or frequency could cause the loads placed on the diesel to increase, Affidavit at 5-6, Bridenbaugh/Minor Deposition at 34, 35, 120-21, and that flow adjustments may affect the power required of the diesels. Bridenbaugh/Minor Deposition at 81.

Significantly, not one of these variations in system operating parameters has anything to do with the implementation of the qualified load concept. The notion that system parameters may change slightly during operation, that diesel generator voltages may fluctuate, that frequency may vary, or that pump efficiency may change certainly could have been raised

years ago when the County was filing its original contentions. As already noted, the so-called margins between the predicted load levels and the load limits prior to Revision 34 were similar to the difference between the qualified load and the currently predicted FSAR loads. It follows then that the incentive for raising any concern about these matters prior to Revision 34 was at least as great as it is now. Thus, the County's concern that changes in the plant's operating parameters may increase diesel loads is not a newly discovered matter related solely to the 3300 KW qualified load. Rather, it is another example of a tardy attempt to inject old matters into the litigation. Since the County has failed to justify the admission of a late filed contention, this portion of the contention should not be admitted.

In addition, this portion of the contention should be rejected because it has inadequate basis. The Bridenbaugh/Minor Deposition makes clear that they have no specific information to support their allegations:

> MR. EARLEY: Moving over onto the top of Page 6, you reference some variations in voltage and frequency. Have you analyzed what the effect of a variation in voltage will be on power?
>
> MR. BRIDENBAUGH: I wouldn't say that we've analyzed it. We've done some looking at what the effect would be on pump load.
>
> MR. EARLEY: By "looking at," have you produced any calculations of the effect of voltage changes?

MR. BRIDENBAUGH: No, not yet.

MR. EARLEY: Well, what have you done to look at it?

MR. BRIDENBAUGH: Done some looking at characteristic curves in induction motors for variations in frequency and voltage.

MR. EARLEY: And I take it that you have not quantified how voltage and frequency affect power?

MR. BRIDENBAUGH: Not specifically, no. We know, for example, that as an example, that if you're talking about a pump, let's say, that generally speaking, the power goes up with the cube of the speed, so you have to look at what the effect is of the system it's connected to and the system resistance and so on, but the basic phenomena is understood.

. . .

MR. EARLEY: Well, the voltage output on the EDG's is controlled, isn't it?

MR. BRIDENBAUGH: It has a voltage regulator, yes.

MR. EARLEY: So the voltage regulator would tend to minimize any changes in voltage on the system.

MR. BRIDENBAUGH: I think it would certainly limit the changes to a fairly low value. We did talk about that in the depositions of LILCO and have some numbers which I don't recall right at the moment, but I don't think we're talking about tremendously large numbers here, but it doesn't take too much variation to vary a load a little bit.

MR. EARLEY: In that same paragraph that we've been discussing towards the end, you indicate that the variations will not be large. Can you estimate what you mean by not large?

MR. BRIDENBAUGH: I guess if I had to write that sentence again, I'd write it a little

> different. I'd say the variations may not be large. And we wouldn't expect them to be very large. Maybe Mr. Minor can give an appropriate number for that.
>
> MR. MINOR: Clearly, "large" in this context would encompass some of the differences between ratings. By that, I mean we have an MESL rating, and we have what has been called a qualified rating and we have some previous tests on the equipment, and changes in loads that would change those values appreciably -- and I don't know how to quantify "appreciably," but enough that they would begin to reduce further the small margin that is there. I don't have up an exact number or percentage in mind at this time.

Bridenbaugh/Minor Deposition at 83-85.[11/] As this excerpt indicates, the County's allegations concerning the effects of variations in plant parameters are mere speculation. Consequently, this portion of the contention should be rejected because it has no adequate basis.

For the Board's information, subparagraph (a)(v) also presents no substantive concerns. In general, the plant parameters in question are controlled to prevent large fluctuations. For example, diesel generator voltage is controlled by a voltage regulator which maintains voltage. See Bridenbaugh/Minor Deposition at 84-85. Similarly, frequency is controlled by the diesel generator governor. Cf. Bridenbaugh/Minor at 122-23 (voltage and frequency are

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11/ The County consultants were similarly unprepared to discuss the specifics of other alleged changes in plant parameters. Bridenbaugh/Minor Deposition at 82 (no quantification of changes in pump efficiencies).

controlled). Other plant parameters must be controlled as specified in the technical specifications and surveillance procedures. See Bridenbaugh/Minor Deposition at 122 (minimum flows controlled by technical specification).

Even if variations in plant parameters do occur, they will have no effect on the reliable operation of the diesel generators. Mr. Bridenbaugh recognizes that such variations may not have a large effect on the load placed on the diesels. Affidavit at 6. As already explained in detail in response to contention (a)(ii) above, the results of the integrated electrical test give reasonable assurance that ample conservatism still remains in the Table 8.3.1-1A to accommodate any variations in plant parameters that may have an effect on diesel generator load.

(a)(vi)

The County has failed to provide adequate basis to support its contention that the actual loads for certain pieces of equipment measured by LILCO during special testing are incorrect due to modeling inaccuracies. Here again, Suffolk County's arguments are mere speculation. Both Bridenbaugh and Minor conceded that they had only briefly looked at LILCO's test procedures. Bridenbaugh/Minor Deposition at 48. They were unable to identify any specific deficiencies in LILCO's testing that would have any significant impact on the load

levels measured during the test. In fact, the County's witnesses had only taken a preliminary look at one test and had not started their review of the other test. Bridenbaugh/Minor Deposition at 78. Contrary to the County's claims, however, the results of the integrated electrical test demonstrate that actual post-LOOP/LOCA loads will be substantially below the 3300 KW qualified load. LILCO Deposition at 76. Thus, any minor inaccuracies in the load measurement techniques are irrelevant. The Board should reject litigation of such speculative matters as those raised in this portion of the contention.

(b)

Subpart (b) of Suffolk County's contention is really a mirror image of subpart (a). Bridenbaugh/Minor Deposition at 117-118. In subpart (a), the County argues that uncertainties in the load projections for the diesels may cause the actual load to exceed 3300 KW. In subpart (b), the County is saying, in essence, that given the uncertainties discussed in subpart (a), some margin must be provided between the qualified load and the predicted post-LOOP/LOCA loads. Put another way, subpart (b) sets forth the County's remedy for the uncertainties listed in subpart (a). As such, subpart (b) appears to be unnecessarily redundant and should be eliminated to avoid duplicative litigation.

In addition, subpart (b) has several other deficiencies. First, there is insufficient regulatory basis for the contention. Although the County claims that GDC 17 requires that there be some margin between the predicted loads and the qualified load level, Bridenbaugh/Minor Deposition at 58, such an interpretation is entirely without any foundation. There is no discussion whatsoever in GDC 17 of the concept of margin to rated load of a diesel generator. In fact, IEEE 387-1977, which is referenced in Regulatory Guide 1.9 as a standard that should be applied to nuclear diesel generators, does not contain any margin requirements. Bridenbaugh/Minor Deposition at 65-67. Thus, the contention should be rejected as legally insufficient. Moreover, to the extent the contention is based on the margin provided at other nuclear plants, it is irrelevant and invites unnecessary litigation of facts and circumstances surrounding diesel generators at other nuclear power plants.[12/]

12/ The deposition revealed that the margins stated in Table 1 of the Bridenbaugh Affidavit had been incorrectly calculated, thereby overstating them. Bridenbaugh/Minor Deposition at 56-58. The margins also were inflated in some instances by using the 2000 hour rating rather than the continuous rating. Id. at 52. In addition, LILCO has not yet received the documents used by Bridenbaugh in developing his affidavit to determine whether any of the information used may be out of date. Admission of subpart (b) would invite litigation of these highly tangential matters.

(c)(i) and (ii)

In its pleading accompanying the diesel generator load contention, Suffolk County states its view that it was unnecessary to include subpart (c) of the contention. To the extent that subpart (c) was intended to deal with the adequacy of the diesel generator blocks, LILCO agrees. Thus, to avoid any unnecessary confusion, LILCO suggests that contentions (c) (i) and (ii) should not be admitted as separate contentions. This action is also appropriate because the Suffolk County witnesses proffered in support of SC's diesel generator load contention admitted that they have no basis for such a contention on the blocks and have no intention of performing any analyses or calculations on the subject. Bridenbaugh/Minor Deposition at 16, 60-63.

(c)(iii)

no objection

(c)(iv)

no objection

(c)(v)

This portion of the contention was not included in SC's filing or the Bridenbaugh Affidavit. It was mentioned for the first time in the deposition of the County's witnesses:

> MR. MINOR: Mr. Earley, I'd like to add one item to that that I've been concerned about and have meant to look into further, and probably will, and that is whether the test set up with a load partially simulated by the connection to the grid is an accurate representation of the type of variations starting, stopping and so forth, that would be seen by a diesel generator where it is the only source.
>
> I suspect that there would be fewer voltage fluctuations due to the diesel being briefly loaded and unloaded than there would be in the normal configuration. So that part of it I am uneasy about and I want to look into more.
>
> MR. EARLEY: You haven't looked into that yet.
>
> MR. MINOR: No, I have not.

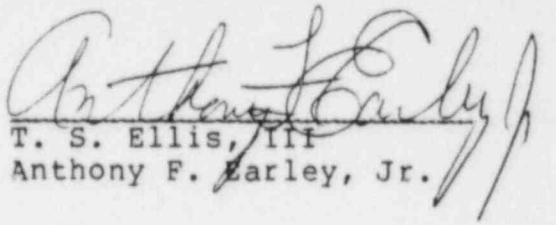
Bridenbaugh/Minor Deposition at 120. As this excerpt reflects, there is absolutely no basis for admission of this portion of the contetion. Moreover, this issue illustrates why it is crucial to restate the County's contention with specificity. In this instance, the County's witness, one day after the submission of the contention, attempted to expand its scope beyond anything that had been mentioned in the County's papers. To prevent litigation by surprise, the Board should only admit a contention similar to that suggested on pages 3-5 above, as further limited by LILCO's objections.

Conclusion

For the reasons given in Section I, Suffolk County's proposed EDG load contention should be rewritten along the lines set on pages 3-5 above. In addition, as explained in Section II, only parts (a)(i), (a)(iii), (c)(iii) and (c)(iv) should be admitted for litigation.

Respectfully submitted,

LONG ISLAND LIGHTING CO.



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DATED: December 27, 1984

LILCO, December 27, 1984

CERTIFICATE OF SERVICE

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

I hereby certify that copies of LILCO'S RESPONSE TO JOINT MOTION TO ADMIT EDG LOAD CONTENTION were served this date upon the following by first-class mail, postage prepaid, by hand, as indicated by one asterisk, or by Federal Express, as indicated by two asterisks.

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