ORIGINAL

UNITED STATES
NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF: **DOCKET NO:** 50-322-OL

LONG ISLAND LIGHTING COMPANY

(Shoreham Nuclear Power Station,
Unit No. 1)

LOCATION: BETHESDA, MARYLAND **PAGES:** 27080 - 27247

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the matter of: :

LONG ISLAND LIGHTING COMPANY : Docket No. 50-322-1 (OL)

(Shoreham Nuclear Power Station): :

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Nuclear Regulatory Commission

Fifth Floor Hearing Room

4350 East-West Highway

Bethesda, Maryland

Tuesday, February 12, 1985.

The hearing in the above-entitled matter was reconvened, pursuant to adjournment, at 10:30 a.m.

BEFORE:

JUDGE LAWRENCE BRENNER, Chairman,
Atomic Safety and Licensing Board.

JUDGE PETER A. MORRIS, Member,
Atomic Safety and Licensing Board.

JUDGE GEORGE A. FERGUSON, Member,
Atomic Safety and Licensing Board.

(Not present.)

APPEARANCES:

On behalf of the Applicant:

TIM ELLIS, Esq.

ANTHONY EARLY, Esq.

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On behalf of the Nuclear Regulatory Commission Staff:

ROBERT G. PERLIS, Esq.

Office of the Executive Legal Director

RICHARD GODDARD

On behalf of Intervenor Suffolk County:

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DOUGLAS SCHEIDT, Esq.

Kirkpatrick, Lockhart, Hill, Christopher

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On behalf of the State of New York:

Special Counsel to the Governor

ADRIAN JOHNSON, Esq.

State of New York

Room 229, State Capitol

Albany, New York 12224

C O N T E N T S

WITNESSES	DIRECT	CROSS	REDIRECT	RECROSS
George F. Dawe (Resumed)				
Edward J. Youngling (Resumed)				
Jack A. Notaro				
by Mr. Ellis	27151			
by Mr. Dynner		27154		

RECESSES:

A.M. - None

NOON - 27146

P.M. - 27206

LAY-IN - DIESEL GENERATOR LOAD TESTIMONY OF GEORGE F. DAWE, JACK A. NOTARO AND EDWARD J. YOUNGLING ON BEHALF OF LONG ISLAND LIGHTING COMPANY, ATTACHMENT A, AND LETTER INDICATING ERRATA, Follows Page 27153.

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PROCEEDINGS

JUDGE BRENNER: Good morning.

We are gathered here for the reopening of the reopened emergency diesel generator hearing, if I have that straight in my mind.

I want to get the appearances for the parties, starting on the Board's left, for the Staff.

MR. PERLIS: Thank you.

My name is Robert Perlis. I represent the NRC Staff in this proceeding.

To my left is Richard Goddard. We are both with the Office of the Executive Legal Director.

To my right is Carl Berlinger from the NRC Staff.

MR. ELLIS: Good morning, Judge Brenner and Judge Morris. My name is Jim Ellis. I am here on behalf of the Long Island Lighting Company.

To my left is Tony Early who is also here on behalf of Long Island Lighting Company.

MR. JOHNSON: My name is Adrian Johnson. I am here as co-counsel with Fabian Palomino for the State of New York.

MR. DYNNER: Good morning. I am Alan Dynner of Kirkpatrick and Lockhart, representing Suffolk County.

On my right is my colleague, Douglas Scheidt.

JUDGE BRENNER: All right. Good morning again to

each of you.

As the Board had announced previously in our written order, we are sitting as a quorum today. We expect Judge Ferguson will be joining us tomorrow.

We have some preliminary matters.

We have ruled on the motions to strike filed with respect to the LILCO testimony and also the Suffolk County testimony, and you have that written ruling.

We of course have not ruled with respect to the motions to strike portions of the Staff's testimony because such motions were not due until this morning. We would like to get-- And we have received several such motions, three to be exact, two from the County -- both were timely -- and one from LILCO, which also was timely.

We would like to receive answers to those motions very early next Tuesday morning at our offices, certainly no later than 9:00 a.m., and even a little earlier if that can be arranged.

We have reviewed the Joint Report of the parties that we had asked by filed, and we received that on February 8th. I would inquire first of any counsel that wishes to address the matter whether there is any update to that written Joint Report. The report indicated that further discussions might proceed.

MR. ELLIS: There haven't been any further

discussions. I will let Mr. Dynner speak for himself, but I assume we will hear from them with respect to the monitoring issue on the blocks within the near future, at least before the block testimony goes on.

I think there was also some mention in the report about general agreement on figures, but we do not have a precise statement on those figures.

Am I correct about that?

Numbers. I thought there was something in the Joint Report relating to numbers.

I beg your pardon.

JUDGE BRENNER: I'm sorry, I don't know what you mean.

MR. ELLIS: I was referring to an earlier draft, just a fit of unwarranted optimism I guess.

JUDGE BRENNER: All right.

I take it none of the other counsel have anything to add since I've heard nothing.

We have some questions in our mind, and of course we are thinking ahead to the potential areas of proposed findings from the parties and, in turn, areas that we might or might not cover in our decision. I guess I would like to direct this to LILCO.

Can you tell me succinctly exactly why LILCO chose 3300 kw as the load to use in their recent endurance

run of EDG 103?

MR. ELLIS: Yes, sir. LILCO chose 3300 because on an analysis of the loads that would be automatically actuated in the event of a loop LOCA signal, those loads, as our testimony reflects, all add up to less than 3300. The August SER invited LILCO, on an interim licensing basis, to established a qualified load that would bound the maximum emergency loads that would be seen by the diesel generators in the event of a loop LOCA.

The other reason LILCO selected 3300 with confidence is that after the performance of the integrated electrical test which simulates the conditions of the testimony about the extent to which it simulates the conditions of a loop LOCA, -- all of the testimony will be and is in our prefiled testimony -- but all of the diesel generators saw loads below 3000, indeed at 2900.

The one that was over 3000 was at the time that there were still two service water pumps attached to diesel generator 103. So this gave LILCO more than adequate confidence that 3300 would actually bound the loads that the diesel generators would see in the event of a loop LOCA signal.

Therefore, in response to the SER in August it established this load and, as the December SER indicates, the Staff generally found approval of the 3300 figure, as

I can recall, with the exclusion of intermittent cyclic loads.

JUDGE BRENNER: You didn't add that until the last moment, I mean in your last statement.

MR. ELLIS: Yes. Do you want me to explain the exclusion of the intermittent or cyclic loads?

JUDGE BRENNER: No, we read the testimony, and my question is notwithstanding the testimony, why did LILCO choose 3300 as the load to use for the endurance run, notwithstanding the positions you have just expressed?

MR. ELLIS: Because that was the load at which LILCO was going to operate the engines on the interim licensing basis until the Staff completes its review of the DR/QR, at which time of course LILCO hopes that the Staff will approve the 3500.

(Counsel conferring.)

But yes, the August SER, the Staff urged I think all of the members of the Owners' Group to get as close to 185 BMEP as possible, so LILCO chose the 3300 as a load which comfortably bounds the loads that would be seen and yet would be as close to the 185 BMEP as it could get and still bound the loads that would be seen on a loop LOCA.

JUDGE BRENNER: You have referred to this interim licensing position once or twice here, and we've seen it in some of the documents that you have also referred to this

morning, and I'm confused at what you mean by that because, in terms of what is before this Board, you are asking us to make findings -- as I understand some dialogue I had with you or other counsel for LILCO earlier in this proceeding, you are asking us to make a finding that the TDI emergency diesel generators are acceptable for the life of the facility.

MR. ELLIS: That's correct, Judge Brenner. Our position has been that we asked the Board to make findings at the previous loads as well. The interim licensing basis was established by the Staff pending its review of the DR/QR which it did not expect to complete for some considerable period of time. I've forgotten how many months. So the interim licensing basis applies only to the 3300. The findings that this Board makes at 3300 would be the findings applicable to the interim licensing basis.

We are asking the Board for findings for the full 40 years, but if the Board makes findings at 33 and not at the other loads then, unless LILCO comes back to the Board or obtains Staff approval in some other fashion, 3300 is the load that the diesels would be limited to for the life of the plant.

JUDGE BRENNER: I am going to ask the same question I asked you at the beginning again, but I am going to add a predicate:

Since it is LILCO's position that the diesels, the TDI diesels are acceptable for a continuous rating of 3500 kw, why did you choose not to test them at that level?

MR. ELLIS: LILCO chose to test it at the 33 rather than the 35 because of the desire to get as close to 185 BMEP as possible. It could have chosen to test it at 35. And if you ask me six months from now whether that might have been a useful thing to do, or even two weeks from now, I might conclude that it might have been a useful thing to do.

At the time, the engineering decisions made were to get as close to the 185 BMEP as possible and to get as close to the August SER as possible. The purpose was to prove the engines using the endurance run at 33.

JUDGE BRENNER: I'm sure that, because I don't have a technical background, I'm missing something but simplistically to me it seems that the goal of testing them as close to 185 BMEP as possible would certainly be enveloped conservatively if you tested them at a higher BMEP.

MR. ELLIS: That's correct. And it would have been even more conservative to have tested them at 39 or 4 or 45 of whatever, but that wouldn't have been appropriate as LILCO viewed things at the time to do that. It was appropriate in their view to test it as 3300 for the reasons

I have stated.

Now I think that if what you're getting at, Judge Brenner, is a lot of controversy could have been avoided if we had done them at 35, I certainly concede that some controversy could have been avoided, and perhaps that should have been done. It was not done, it was not done for the reasons I indicated, namely, the desire to get as close to the 185 BMEP as we could get. And that's the reason it was done.

But I understand the Board's point. We could have eliminated some controversy by doing it at 35.

JUDGE BRENNER: I don't think it is hindsight. I think we had similar discussions before the testing even began. I will have to take a look at the transcript, but I remember somewhat when we talked about the qualified load, we never focused on 3300, and you don't see that number anywhere in our order granting the reopening.

And in fact, we had some discussion certainly at the time we granted the reopening that we didn't know what load would end up as the appropriate load. Whether you label that "qualified" or by some other term, we expected to see testimony covering the potential range of loads that might be focused on the hearing.

MR. ELLIS: Everyone of course was on notice that the test would be run at 33 by virtue of the SNRC letter

that was sent back in I believe it was late October of 1984. And I believe in that LILCO attached the SNRC letter, a protocol indicating the load at which the test would be run and in addition, the instrumentation which was to be used, and the kinds of inspections that would be performed. These were the result of negotiations and consultations with the Staff.

JUDGE BRENNER: Fine. I mean LILCO sent a letter stating what it unilaterally -- as far as this Board is concerned, what it unilaterally chose to test them at. I still have the question that I asked you, and I guess you have now answered it to the fullest extent you can.

MR. ELLIS: I think I have, Judge Brenner.

JUDGE BRENNER: Let me add that I have a distinction in my mind between a goal expressed by the Staff that the diesels be qualified at a load level as close to 185 BMEP as possible as distinct from what one would choose to test the diesels at on an endurance basis in order to prove the qualified load level. I will leave it at that.

In your explanation, Mr. Ellis, you have pointed out, and of course we know it even in more detail from the testimony, that not all the loads that might exist, such as the cyclic loads, are included expressly in the qualified load, which leads to my next question:

Does LILCO believe it needs a short time or

overload rating in addition to the qualified load rating?

MR. ELLIS: No, sir. And I'm glad you asked that question. It does give me an opportunity to clarify that.

LILCO included all the loads in the maximum emergency surface loads, the MESLs, that would be triggered or turned on automatically on a loop LOCA signal with the exception of the three classes that are mentioned in our testimony, the cyclic and intermittent loads. Everything else is included.

Even if you add the cyclic or intermittent loads, two of the three diesels are still below 3300 of their MESLs.

The qualified load, the 3300, was selected to bound the three MESLs. If you add the intermittent or cyclic loads to the third diesel, you arrive at the figure of 3331.4 and this-- As our testimony reflects and as the Staff SER confirms, these loads are conservative because they assume that the valves all stroke at the same time. If the valves are not in the right position when the signal comes, -- and as testimony can develop, there is substantial reason to believe the valves will be in the right position -- then they won't stroke at the same time. But even assuming that, it only takes you to 3331.4.

LILCO does not believe that it needs a qualified overload rating because it believes the qualified load

serves the functional equivalent. The reason for that is the overload or short-term rating from IEEE 387 is for the purpose of meeting short-term loads.

The loads in an integrated -- or in a loop LOCA begin, as we have analyzed, not as they actually are -- we believe they're much lower, for reasons that our testimony states -- but they would begin at a range of 3250, the MESLs.

Even if all of the intermittent or cyclic loads operated, only one diesel would be slightly over. And we believe that the 3300 serves the functional equivalent -- is the functional equivalent of an overload because all of these loads drop off within 10 to 20 minutes down to 2600.

So what one might analogize it to is a qualified load of 2600 and a qualified overload of 3300. And therefore, LILCO does not believe that it is required by regulation or otherwise to have a qualified load above 3300.

The Staff SER and the LILCO testimony point out that the intermittent loads that would take it to 3331 I believe are all of three minutes.

JUDGE BRENNER: We are familiar with the testimony.

MR. ELLIS: Have I answered that adquately, Judge Brenner?

JUDGE BRENNER: I understand your answer.

MR. ELLIS: My answer, again, is that the qualified load is the functional equivalent of the short-term load under IEEE which establishes that, not a requirement but that provision, that guideline. And we believe that the 3300 meets the intent and purpose of that.

JUDGE BRENNER: I understand why that, from LILCO's point of view, is a perfectly respectable litigative position and why LILCO believes there is going to be testimony in the record that will support that position.

Having said that--

MR. ELLIS: May I add one other thing?

JUDGE BRENNER: Yes.

MR. ELLIS: Also I think the August and December SERs do not require, or indicate that there's a necessity for any overload or short-term rating. And so we think that that, too, is confirmatory.

JUDGE BRENNER: We'll learn more when some of the staff witnesses take the stand.

MR. ELLIS: That's right.

JUDGE BRENNER: I started to say that I understand your position and why you believe there is support for the position in terms of the litigation and why, in the end, your position may well be supported in the litigation.

My context for starting this was -- and maybe I

didn't make that clear -- was the joint report from the parties that we've received, and the predecessor to that is to explore what really needs to be an issue, as opposed to what could be settled and narrowed in the real world which might be better than litigation.

MR. ELLIS: Yes, sir. I think that in our view would be a focussed issue.

There is another aspect--

JUDGE BRENNER: Well, let me add: How many hours does it take to run a diesel at 3500 Kw to get to 10 to the 7 cycles; do you remember?

MR. ELLIS: It takes 746 hours. Well, if you count hours that we've already had--

JUDGE BRENNER: Count hours that you've already had.

MR. ELLIS: Then you would have to have an addition 525 hours.

JUDGE BRENNER: All right; in that neighborhood, depending on which diesels you're going to test.

MR. ELLIS: Yes, sir. If you were going to test-- That's right.

JUDGE BRENNER: And if, hypothetically, you were to test EDG-101 or EDG-102 up to 10 to the 7 cycles at 3500 Kw perceived load -- that is, based on the normal instrumentation that you use in such a run -- that might be

done in -- whatever the exact number of hundreds of hours -- it might be done in some lesser number of hours than a hearing and proposed findings and a decision.

MR. ELLIS: Well, I don't-- I think that's comparing apples and oranges, but--

JUDGE BRENNER: Let me add one other point that I have in my mind; that is the point that you earlier said, and properly so, that if you extend the argument that diesels could be tested conservatively you could pick 4000 or 4500 or keep going higher.

MR. ELLIS: I may be sorry I said that.

(Laughter.)

JUDGE BRENNER: No. The reason I don't feel embarrassed as to discussing 3500 is because, as I understand it, LILCO firmly believes that these diesels would be acceptable at 3500.

MR. ELLIS: Yes, sir. We have spent a considerable amount of hearing time demonstrating that with analysis--

JUDGE BRENNER: If you believe that, why don't you, so to speak, put your money where your mouth is and run it at that load?

MR. ELLIS: A considerable amount of the 746 hours, some 200-some hours, is at loads in that general area. I've given you the reasons why LILCO decided to do

it. LILCO still believes 3500 is suitable for these engines and, indeed, it has done this exhaustive DRQR, which the Staff is still reviewing, that we believe demonstrate that.

I think what you're saying, Judge, is, wouldn't it have made more sense from a litigation point of view to have run it at 35?

JUDGE BRENNER: Not just a litigation point of view, but that's part of my framework because of the limitations of my training and education. But I suppose an engineer might think that if LILCO in the end wanted to convince somebody that 3500 was an acceptable load that that would be another reason to test it at 3500.

MR. ELLIS: Yes, it would be.

But we also thought, I think, that by testing it as close to 185 BMEP as possible, putting it down to 33, that we would, on an interim basis, certainly provoke less controversy because the loads were lower; nobody could deny that the load would be lower on a crankshaft and the block.

And, indeed, I think, as we have seen, much of the controversy that we're about to litigate does not hinge on the crankshaft or on the block but, rather, hinges on the qualified load.

So another purpose of doing the qualified load at 33 and not doing it higher is the fact that we made a judgment, LILCO made a judgment-- Now, perhaps it wasn't a

valid judgment, and you're calling it into question, and I think it's perfectly legitimate and appropriate -- that it would have reduced the scope of dispute.

If the county was concerned about higher load, then if on an interim basis we went for an overload one might reasonably assume that the scope of the dispute would have been narrowed.

JUDGE BRENNER: What I'm saying is that if you tested at 3500 you might have easier, from your point of view, from LILCO's point of view, bases for saying that the diesels would be acceptable for a planned run at 3300 as you now propose it, plus some existing margin based on the test for the cyclic loads and for the difference between what load meter might tell you and what the actual load might be, and to account for open fuel racks in the beginning, et cetera, et cetera.

MR. ELLIS: Yes, sir, I agree with that; it would have eliminated a lot of those disputes.

JUDGE BRENNER: One other point -- again, none of this is meant to express a Board view, preliminary or otherwise, or even my view on litigative positions. But putting that aside, and viewing this as kind of preliminary settlement stimulation remarks from the Board, and nothing else; I'm not commenting on what the evidence and the litigation might in the end show, and I hope all the parties

have recognized that: As I understand page 2 of the joint report -- and I'll direct this to the county -- the county is saying that if the crankshafts have been tested at the true value of whatever load LILCO wishes to qualify it at for 10 to the 7 cycles, and subsequent examinations show no problem, that that would be a basis for settlement.

MR. DYNNER: That's correct, Judge. And just so the Board understands it, it's also correct with respect to the blocks. And, in fact, during some settlement discussions in which Dr. Berlinger was acting as an intermediary, if I can call him that, or at least as an interested party, and we were communicating our views to him --

JUDGE BRENNER: Let me stop you just for a second. The other parties may have some sensitivity about your telling the Board certain things that went on in settlement discussions.

MR. DYNNER: All I'm going to do is convey to you the fact that, as is conveyed in the joint report of the parties, where it says the county, as stated here, it's their position in both cases that if the testing had been done at 10 to the 7 cycles, and we hoped it would been done on 101 or 102 so that it could address the issue of the cracked blocks, that we wouldn't be here today because it would have been settled.

MR. ELLIS: One of the reasons that it was done on the 103 block, I think we've already heard in testimony, was the existence of weld repairs on the 101 and the 102 and the ability with which one could measure strains and other things on the 103 block.

Another reason for testing the 103 block is the County contention that it was the block that wasn't adequately tested.

But I do want-- And I'm sure the Board will put this question directly to the witnesses: it is LILCO's position and belief that the engines will function satisfactorily at 35--

JUDGE BRENNER: I understand that.

MR. ELLIS: And I also understand the Board's observations. And all I can say is that those things were balanced, and it may appear in retrospect that it might have been better to go one way than the other.

JUDGE BRENNER: I don't understand why it's retrospect, Mr. Ellis, I really don't. But I won't repeat that remark.

MR. ELLIS: Yes, sir.

JUDGE BRENNER: It's retrospective because you haven't been before us since that time, but it certainly shouldn't have been retrospective from LILCO's point of view.

MR. ELLIS: Oh, no; I'm not suggesting that these considerations are new to us, what I'm suggesting is that there are considerations on both sides of the issues, a judgment was made. We, I think, reasonably believed that much of the controversy over the block and the cranks and other things would go away if we did everything at 33.

Now, your point is, Well if you had done it at 35 you would have covered 33. That might have been something that-- I accept that criticism.

JUDGE BRENNER: It's not a criticism; I'm just exploring things. I'm sure there might be a lot involved that I don't appreciate, and presumably I'll learn more from the testimony.

I want to add another piece of information to the discussion. Some of you had the good fortune to be in this room yesterday, and I have a portion of yesterday's transcript hot off the press discussing the schedule of this proceeding, where you were the prime speaker, Mr. Early.

I'm not familiar with the rest of this transcript. All I have are pages 72 to 77. Of course, you don't know what information that covers. That covers, Mr. Early, your responding to Judge Eddle's reminding you that he would like some sort of status report on where the proceeding before this licensing board is.

There are some things you stated, Mr. Early, that

in my mind have changed considerably, and, while your report reflects the things that were once accurate, that is no longer the case.

For one thing, I just don't see how we could have a decision anywhere near the time frame you're talking about in that transcript. As I recall -- and I only read it quickly -- you suggested the optimistic possibility of late April for a decision.

MR. EARLY: Judge, I think I had estimated late April or early May. Those dates were based on, I think the NRC's schedule is normally published, and it also was based on the assumtion from discussions among the parties that cross-examination here would not take more than a week or so to get done, and that previously indicated block findings would be due very shortly after the close of the record, and I told the Appeal Board that it was also based on the assumption that we would have a prompt schedule for supplementary findings on the crankshaft and whatever other issues.

Based on the information I had I believed that was accurate. If this Board doesn't think it's accurate I certainly would correct that with the Appeal Board.

JUDGE BRENNER: Well, that's one reason I brought it up. I think no one knows. But I think it's fair to say that those dates would not be met. How far beyond those

dates I wouldn't hazard a guess; I don't know how long this hearing is going to last.

But let me point out one or two things.

When we talked about an accelerated schedule for the block findings, and all the parties were on notice on that with the object that they would prepare all their findings on the blocks based on the testimony we had so far, even if they would choose not to file it, thereby putting themselves in a position to file prompt findings when we finished this block testimony, we also said we would take up the block testimony and the crankshaft testimony first. We then received an unopposed motion from the Staff to change that schedule, and I assumed that people realized fully and well what the impact of that Staff motion and not opposing that Staff motion would be.

So that while I would still anticipate being able to have an accelerated schedule for the proposed findings based on the blocks and the crankshafts -- that is the non-load portions of this litigation -- that those portions of the litigation are going to come later.

Now, if you're correct, Mr. Early, that we're going to finish the entire litigation this week and next week, then it won't matter much. But if you're incorrect and we do not get to those other matters until later, that would have an obvious effect.

MR. EARLY: Judge, as I said, it was based on discussion--

JUDGE BRENNER: I'm not criticizing you, I just wanted to--

MR. EARLY: The estimates for cross-examination for our panel range on the order of no more than a couple of days, a day and a half or so. And with that information I don't think it's overoptimistic to think we can finish the other issues, which don't seem to be in quite as much controversy as the load testimony -- be able to finish it in the next two weeks.

But if the Board thinks that's unrealistic and overoptimistic I'm certainly willing to inform the Appeal Board of a better date, if this Board thinks a better date might be more appropriate.

I'm not sure that whether the date is May or June really affects the Appeal Board deliberations, but that's....

JUDGE BRENNER: I don't know why they asked you the question either; I certainly haven't discussed that. The only conversation I had with the Appeal Board consists of the fact that I was informed that our hearing schedule came up as a factual status report inquiry yesterday, and as a courtesy they gave me this excerpt; that's all I know.

I think it is optimistic, but we'll know more by

the end of this week or next week in terms of the length of this hearing. But even if findings come in early I don't think you've left enough time in your assumption for Board deliberations.

MR. EARLY: Judge Brenner, if it's acceptable to the Board maybe we could wait until the end of this week to see where the hearings are going, and then we will apprise the Appeal Board what we think a better estimate would be.

JUDGE BRENNER: I have no objection. I would be willing to give the Appeal Board my present opinion that those dates appear optimistic at this time. And as the situation unfolds and the parties learn more, LILCO -- I assume it was you, Mr. Early, who made the remarks -- would report to the Board. I don't know how important it is to them....

While you were giving the report on the schedule of this hearing you also answered their questions as to the schedule for the, what has been referred to as the Colt diesels. I guess I think of them as the Fairbanks-Morse diesels: Colt is the company. I didn't quite understand your schedule report. I'm sure it's my problem.

Could you tell me when those diesels would be--

MR. EARLY: Let me elaborate on that schedule.

I think what I indicated to the Appeal Board was that the Colts -- the first Colt, I believe, will be run

within the next week or so, from my understanding of the schedule, and that by the time we get to May all of the machines will have been run.

In order to actually use the Colt machines they have to be hooked into the plant, and that process is more than just installing a breaker; all of these automatic controls and interlocks all have to be designed into the plant so you don't violate the single-failure criteria, and you meet all the quality assurance requirements and the like. That process is a fairly lengthy process.

The company about a month or so ago had to make a decision whether they wanted to go with the TDI diesel generators or the Colt diesel generators, because the easiest way to make the hook-up is to rip out the TDIs and rip out all the circuitry associated with them TDIs and install the Colts.

Given that the endurance run had been successfully completed and we had the Staff SERs that had approved the endurance run, the given -- and our consultants who had told us that the TDIs were acceptable for 35 and 39, and we had further assurance from the endurance runs and the integrated electrical tests, the company decided that the TDIs -- that it was appropriate to go with the TDIs.

Now, what that meant was that the company had to look at alternate ways to use the Colts. And I think we've

indicated that the company intends now at the first refueling outage to have the Colts hooked up in tandem with the TDI diesel generators, so that after the first refueling outage the plant will have six sources of emergency power, six diesel sources of emergency power that will greatly enhance the safety of the plant.

But in order to do that-- That is a complicated engineering process that is on-going right now, and the construction work associated with integrating the Colt controls and the TDI controls is fairly complex, it's on the order of I believe six to eight months it would take to do that.

So the company's plan is to run the Colts through the process as far as we can, running the Colts, making sure that they operate, and then at the first refueling outage,after this engineering work is done, integrating them into the plant.

But in May you can't just hook them to a breaker and turn them on, it's a complex control system that needs to be integrated.

(The Board conferring.)

JUDGE BRENNER: All right. Thank you.

I want to ask the Staff whether it believes that there was a need for a short time or overload rating for these TDI diesels above the 3300 Kw so-called qualified

load?

MR. PERLIS: It is the Staff's position that there is not a need for an overload rating for these diesels.

JUDGE BRENNER: Is that consistent with the prefiled direct written testimony of all the Staff's witnesses?

MR. PERLIS: There are two things on that: it is consistent with the large portion of our testimony; we are also planning on filing, or attempting to file some amendments to our testimony some time within the next day or two.

JUDGE BRENNER: That's nice of you to tell us that.

MR. PERLIS: This was a matter that came up yesterday.

JUDGE BRENNER: Were you going to tell us at some time today?

MR. PERLIS: Yes, I was planning on telling you that today. I have already told both parties that fact.

I would also like to make one other comment about the Colts, if I may, something that I was not aware of during the Appeal Board argument yesterday, but we will be letting the Appeal Board know by letter some time this week. We've also notified both parties of this.

The Staff has not yet begun its review of the Colt diesels, and in fact won't begin its review until the formal FSAR amendment comes in. That review is also likely to take a good deal of time: I'm told an estimate is somewhere along the line of six months.

In assessing when the diesels could be used, it's our position that until the Staff review is complete that they would not be proper for use at Shoreham.

JUDGE BRENNER: All right.

As I've stated in this proceeding from time to time, just because we're in litigation and we're about to renew that litigation here today does not mean that settlement discussions should not be continuing.

Speaking for myself, Mr. Ellis, I think that you should have some discussions quickly with the highest levels of your client as to what flexibility there might be, putting aside whether or not you might or might not be successful in the end in the litigation, as to what steps might be taken as a practical matter, given as a predicate LILCO's expressed position that the diesels would certainly be acceptable at 3500 Kw in LILCO's view.

MR. ELLIS: I understand, Judge Brenner.

I might point out, though, so that the Board -- I'm sure the Board has this in mind, but let me make it explicit:

There is some considerable basis for believing that, no matter what additional tests were run, it would do less to eliminate controversy than to add new controversy as a result of the nature of this proceeding, which I will simply call prone to creating disputes rather than eliminating them.

In addition to which, each one of these things that are run are on the order of 2 to 3 to 5 million dollars depending on what's done with it.

These are all factors which must be taken into account. I can assure you, Judge Brenner, that they will be taken into account, and I will personally discuss it, as you indicated, with higher levels.

But I don't want you to think that they haven't already been carefully discussed. And it is the view, as I've indicated, that rather more dispute rather than less would be prompted by that, in addition to the enormous expense.

I simply wanted to add that dimension. But I will do as you have directed.

JUDGE BRENNER: All right.

Of course, I don't understand what you're alluding to, but I'll take it on faith that you have something firmly in your mind in terms of more controversy.

But, nevertheless, things can be done both in a

technical context and in a legal context, to minimize that type of thing, such as agreements in advance predicated upon certain assumed results, et cetera, et cetera. Especially given the position expressed by the county on page 2 of the joint report and what Mr. Dynner said this morning.

I understand you're saying it's expensive to run these tests. I don't know if it would have been incrementally expensive to run the darn test at 3500 in the first place: we've discussed that already.

MR. DYNNER: Judge, if I may, to clarify something:

I'm really not sure what Mr. Ellis was referring to about controversies. I'm sure the Board, and the record is clear, and the Board has well in mind that the County in this procedure has in fact settled a number of issues, including, for example, the pistons, which were settled on the basis of future testing.

And just so that there is no doubt at all, the position that is expressed on page 2 of the report to the Board with respect to the crankshafts, and on page 3 with respect to the blocks, is the position that the county has adhered to, has made known to the parties, and continues to adhere to. And it represents, if you will, an open offer that's on the table.

MR. ELLIS: Judge Brenner, I don't think it would

be approriate for me to explain.

JUDGE BRENNER: Don't.

MR. ELLIS: I think it's fairly clear. And I understand what Mr. Dynner has said, but I have been in this proceeding four years and I have four years' experience which I will be glad to divulge to the Board.

JUDGE BRENNER: Well, you know, we're cognizant of a lot of the experience as we see it, also. And I don't think Mr. Dynner's comment were inaccurate in terms of the ultimate bottom line. The fact that people may have gone to a lot of pain in getting there I also understand.

MR. ELLIS: Yes, sir. Well, I will mention it again: I do want the Board to know that it has been carefully considered.

Perhaps there are steps short of that that can be taken. The County has indicated that that's its position and it won't move from that position. Perhaps if we could move from that position to some other means of granting assurance--

I think it's important to keep in mind that the interim licensing basis, if it goes at 33, is only until the first refueling outage. The engines will only be run for an hour a month, that's roughly eighteen hours between now and then. At the end there will be a 24-hour run. So roughly we're talking about no more than 50 hours. And if

there is a loop LOCA in the interim, the engines would be run -- if no power were restored to the site for the whole scenario, they'd be run for 177 hours.

It is already on the record, found as a fact by another Board, that LILCO can restore, and has restored power to the site in a matter of less than an hour.

So it wouldn't have to run--

JUDGE BRENNER: Yes, but you were at 5 percent or less power in that analysis.

MR. ELLIS: But the loads that you see at 5 percent or less power are no different. Just because you're running at 5 percent--

JUDGE BRENNER: No, no; the time to restoration margin is much greater, arguably, when you're at 5 percent or less.

Well, let's put that aside.

MR. ELLIS: Yes.

But that's just to say how long the diesels would run.

JUDGE BRENNER: I understand.

MR. ELLIS: That is, how long it would take to restore power, which is independent of what power you are running the plant at, how soon you can restore power from offsite sources to the plant.

MR. DYNNER: This may be getting us nowhere, but

it should be made clear that those findings were in the context of an exemption from GDC-17. GDC-17 itself requires that you assume that there is no offsite power source at all. Therefore it's an entirely different context with different standards.

JUDGE BRENNER: I'm not going to get into it.

But some of what you said, Mr. Ellis, in terms of the TDI EDGs being used only up until the first refueling, I had a dialogue with you earlier in this hearing in which I said: Well, what do you want to do after you get the Colts hooked in your first refueling? And you said you still wanted to be able to depend on the TDIs as a regulatory basis.

MR. ELLIS: That's right.

JUDGE BRENNER: Well, then, you're going to have-- As long as that's true, that affects what kind of interim agreements you might have.

MR. ELLIS: That's right. At the first refueling outage if matters are not resolved in other ways we may have to litigate again.

But from now until the first refueling outage, if the Board found that the diesels were okay at 33, we would be permitted to operate at 33. The whole picture may be different at the first refueling outage.

Your recollection is correct, the company does

intend to keep the TDI diesels for the--

JUDGE BRENNER: Let me stop you there.

As long as that's your intent, and as long as you someday hope to have them qualified at 3500 Kw -- and I'm not fully sure why, if your analysis is correct as to what loads you actually need for all safety purposes. But putting that aside, you may someday have to prove to somebody that the diesels are acceptable at 3500, and that somebody before which you have to prove that might want to have some sort of endurance test at 3500 at that time. You might factor that into whether or not it makes sense to run tests in some other time frame.

MR. ELLIS: Yes, sir, we will factor that in. We have, and we will do it again as you suggest.

JUDGE BRENNER: Again, the predicate is LILCO's belief that the diesels are acceptable at 3500. Now, if LILCO believed that something bad, or adverse, would happen to the diesels at 3500, that would be a reason not to test them at that level. I understand that.

MR. ELLIS: That's right. But I think part of what you're saying, Judge Brenner, makes us throw out all of the analyses that we have done.

Now, certainly that is a basis for concluding that they're adequate at 35, otherwise we might as well not hire any consultants and never do any analysis, and always

just run the diesels. And I don't think that was the basis on which we first started. That's certainly not the basis of the DRQR. And I do think that substantial weight is accorded to that. After all, the Board makes findings on the basis of analysis rather than actual tests on a host of other matters.

JUDGE BRENNER: That's right. And you have the burden of proof. And we have analyses before us that are somewhat divergent in their approach and conclusions.

MR. ELLIS: I think you have criticisms of ours. Whether you have analysis or not I think we will argue in findings.

JUDGE BRENNER: You have already argued in findings to some extent.

MR. ELLIS: But, Judge Brenner, let me reaffirm that I certainly will-- I have carefully noted what you've said, and that I will do as the Board has suggested and directed.

JUDGE BRENNER: Somebody in LILCO is in charge and somebody at LILCO can make that decision, one way or the other. I think that that person or those persons are the people you need to talk to.

MR. ELLIS: Yes, sir, there are people that I have talked to and will talk to.

JUDGE BRENNER: I know what I would do if I was making the decision, and I will leave it at that.

MR. ELLIS: Judge Brenner, may I address another point?

JUDGE BRENNER: Yes.

MR. ELLIS: Again, all that is aside from the litigation, and the fact that in the litigation I believe

that might prevail anyway is a consideration, but one of many considerations.

MR. ELLIS: Yes, sir. I understand. ons.

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JUDGE BRENNER: Yes. Again, all that is aside from the litigation, and the fact that in the litigation I believe that I might prevail anyway. It is a consideration,

but one of many considerations.

MR. ELLIS: Yes, sir, I understand.

If the Board will indulge me for a moment, I would like to just take a couple of minutes, and I mean it almost literally, to address a point that I think needs some clarification, and I think if I clarify it, it may assist the Board in some decision that it may have to make on the point. And I'm referring specifically to the scope and concept of the single failure analysis.

The single failure analysis of course is a regulatory standard for design which must be met. In essence it is done in this way:

First you postulate an accident, a loop LOCA. Then you look around at the universe of additional failures that might occur; you pick the worst one of those and you postulate that it happens in addition to the loop LOCA, and you design the plant so that it meets that combination.

The Staff and LILCO appear to be inconsistent but I think in fact they are consistent on whether operator error is considered. The Staff takes the position that operator error is not regulatorily required to be taken into account in a single failure analysis. LILCO does not dispute that.

What LILCO had out there was the industry standards where industry individuals do take, when they

consider the universe of additional single failures, they do consider active operator errors. But that is not the central point before the Board.

The central point before the Board is Contention A-4(iv). (iv) states--

JUDGE BRENNER: "Operators may erroneously start additional equipment."

MR. ELLIS: Yes.

Now all this flurry of paper which you've seen on single failure, I think I can boil down LILCO's position simply to this, and the reason I am restating it is because my prose may not have been as lucid as it should be. It boils down to this:

LILCO says that it is okay to litigate whether the procedures and training provide reasonable assurance that an operator error will not occur so as to create substantial overloads, or additional loads that are listed in the testimony. Indeed, this was true in 35 and 39. It was possible to go above 39 with an operator error.

However, LILCO does not think that it is permitted, under the regulations, to litigate that LILCO is required to design the plant to have the capacity to handle an operator error beyond the additional single failure.

And I should point out -- I did not mention it -- that the additional single worst failure after you postulate

a loop LOCA is a diesel generator failure, for whatever reason. So what we didn't want A-4 construed as, because we thought it would be contrary to the regulations, is to say okay, you have a loop LOCA, you fail another diesel generator as an additional single failure, for whatever reason, and then you must design the plant so that it can handle an operator error which overloads another diesel generator.

We say that the procedures and training-- And we have the burden to show that they are adequate to provide reasonable assurance, and I am conscious of the fact that the Staff has not yet found that. And we are working on accommodating Staff comments and we are working on providing that reasonable assurance. And if the County wishes to litigate that, we concede that that is a legitimate issue for litigation.

But it is not we think a legitimate issue for litigation to litigate that LILCO should provide, by design, the capacity to handle operator errors on the diesels.

Is that a little clearer, Judge Brenner? I hope I have summarized it succinctly and more lucidly than I was able to write it.

JUDGE BRENNER: I understand what you've said, and you have our written order on it at the time we ruled on the admission of the contention. You have some further

insight in our rulings on the motion to strike.

And I will also tell you that we are not prepared at this time to reconsider that preliminary Board decision and, as we also had indicated previously, may not be prepared to reconsider it until after the hearing. And so far, in the context of the motions to strike, we have not yet struck that testimony.

So I understand what you've said, and we'll leave it at that.

MR. DYNNER: Judge, may I respond, in as brief a time as Mr. Ellis has taken, to his points on the issue?

Our position on the single failure criterion is I believe clearly and properly stated in our pleadings. However, I must, on listening to Mr. Ellis, just comment on a few things he said because I think they go specifically to some of the issues.

Mr. Ellis talked about looking at industry standards and feeling that there is no issue before the Board that there would have to be a plant design that would take into consideration the possibility of operator error. We of course feel quite differently.

And in fact in our statement of the contention as opposed to LILCO's restatement of the contention, we specifically dealt with that issue, and did raise it as an issue which was thought, I think, by the Board to have been

embodied in LILCO's restatement of our contention.

More significantly, what LILCO seems to be saying is directly an issue of how GDC-17 is and ought to be and has been interpreted by the Commission and by other Boards. One of the reasons that we introduced or sought to introduce evidence as to the margins at other plants was this very issue; that is to say that where you have a margin between the maximum emergency service load and the rated overload which is large enough to encompass the possibility of an operator error, then you don't need to address that issue and in fact, it hasn't been addressed, so far as we have been able to tell in our research to date, but that here, where you have a very, very small margin between the maximum emergency service load and the rated load, you specifically do have to address the issue of whether or not the design of the plant should be such, as it is in the other plants, to umbrella the possibility of operator error.

So it is our contention that the design of the plant in this case does not fulfill the requirements of GDC-17 because you don't have the potential operator error enveloped by the rating.

And our secondary position is that in any case -- as stated in our original contention, that in any case the procedures and training can't eliminate the possibility of the operator error.

So I did want to say that and I will ask the Board in that context to reconsider its order, as I understand it, striking our testimony on the margin in diesels and other operating BWR plants because I am not sure the Board considered it in dealing with its relevancy in the context of this issue.

JUDGE BRENNER: We are not going to reconsider that ruling. We stated the reasons for that ruling and they apply even as to this argument. It is just much too collateral a path and an approach. Even if, arguably, there is a connection as you just indicated, that would be sufficient for the reasons.

I also don't think the connection as you've stated it is fully correct.

Beyond that, you should look when you have a chance -- and it certainly isn't necessary for you to do so now -- at the first full paragraph of page 5 of our January 18th order ruling on the contentions. And I believe -- it appears to me anyway -- that what you have said is not fully consistent with what we have said.

All right.

MR. ELLIS: Judge Brenner, the only other thing I have is a preliminary matter of when the panel is up there about how you want testimony dealt with.

JUDGE BRENNER: We haven't even gotten to who the

panel will be, which is another preliminary matter. But before we get there, I was going to bring this up in any event, and it's related to some of the discussion we just had. I will mention it for the Staff's consideration, and you don't have to get back to us right away on it.

We have reviewed the proposed direct testimony of Staff Witness Hodges. Preliminarily as we view that testimony, it is interesting but not particularly directed to factual issues before us in the case, and it would be perhaps appropriate as an affidavit in support of the Staff's brief on the single failure criterion. But it does not enlighten us, again as we see it preliminarily, on any detail of findings we have to make for the TDI diesels.

And arguably, the last question and answer in that testimony mentions the diesels but it doesn't say anything in terms of detailed factual bases that we presumbly would not get in testimony, one way or the other anyway, from other witnesses.

So take a look at that. I think it would be digressive to have that testimony for the reasons I just indicated. But I may be missing something and you can tell us that. But we need to hear back from you way in advance of the possible date of getting to that testimony. So if we can hear from you very quickly, perhaps as soon as tomorrow and certainly by Thursday, it would be helpful.

MR. PERLIS: I'll have something for the Board tomorrow on that.

JUDGE BRENNER: All right. You might want to discuss it with the other parties before coming back to us on it. All right.

In addition, also for the Staff, we have reviewed the Joint Testimony of Staff Witnesses Clifford, Posey, -- I hope I'm pronouncing that correctly -- and Eckengrove, and I would like to inquire whether through that testimony the Staff is proposing that we leave the resolution of the matters addressed in that testimony to the Staff as opposed to hearing the matter. That I would like to know now.

My framework, Mr. Perlis, is I guess summarized on the last page of that testimony which I will read for you.

> "We are requiring that the specific concerns identified during our review be acceptably addressed by the licensee before we complete our evaluation."

And then there is a reference to the letter from Mr. Swenser to Mr. Leonard.

MR. PERLIS: I will be frank with the Board. I haven't considered this previously. It is certainly something the Staff is going to want to look at, regardless of what the Board decides.

I think this question really should be directed at Suffolk County, though. We believe they have a contention which calls the adequacy of the procedures into question--

JUDGE BRENNER: The question is properly directed to you.

I'm asking what the Staff is proposing.

MR. PERLIS: What the Staff is stating in its testimony is, today we don't find the procedures adequate.

I think, in light of the contention, that I'm not prepared at this point to say that the Board should leave this matter to the Staff, but I would also like to discuss that one further with our reviewers and get back to the Board.

JUDGE BRENNER: As I understood the function of this Board in a hearing, the parties were going to present evidence as to the facts as they saw them, not just a status report of where they are in their analyses, and the facts would be presented to us and we would make a decision in favor of one party and against another party.

I'm applying that to the subject of the testimony of the Staff's witnesses, and that piece of testimony was sponsored by the three witnesses I have mentioned. I would have expected that as that testimony was prepared with the assistance of counsel and the input of the technical witnesses that what we would get would be the

analyses of what shortcoming -- the factual presentation in the testimony of what shortcomings those witnesses saw. And we would consider that through the testimony and oral examination of the witnesses, and match that with the testimony of the other parties, and then reach a decision.

And as I view that testimony preliminarily, we don't have that. It's just a summary of the status of the review, and it says there are things that may concern the witnesses and may not be acceptable and they are going to pursue the concerns, and so on and so forth. But it doesn't give us any facts as to what the specific problems are.

It has some conclusions that the procedures may be complex and they may not be complete, but no factual information.

MR. PERLIS: Judge Brenner, I'm not sure that we can spell out in our testimony the prescriptive corrections necessary for the procedures such that it wouldn't deprive Suffolk County of the right to a fair hearing if the Board were to postpone this and delay it, or were to leave this matter to the Staff. That's my only problem. I'm not sure that we can or cannot do that. I would need to talk to the reviewers.

At this stage my understanding is that the procedures and training aren't very close at all, and that's what the testimony indicates.

JUDGE BRENNER: You have kind of addressed my first question in your answer, but I've changed questions, and I guess to state it another way, shouldn't the Staff in that testimony have set forth the factual defects that it saw at this point in time, rather than just the testimony it did present?

I don't see any facts to grab ahold of, to put it in the vernacular.

MR. PERLIS: I think if the procedures and training had been further developed we could have done that. I think the gist of our testimony is that they are not close enough for us to really get into the specific shortcomings.

JUDGE BRENNER: I'll tell you what. We've got a litigation before us now, the timeframe for which was well understood by all the parties. We are going to proceed. And if the Staff disagrees with the testimony, for example, presented by LILCO as to why they think their procedures are acceptable or, given certain guidelines, can be made acceptable, it is going to be your obligation to support you, meaning the Staff, to support the conclusion expressed in the Staff testimony by cross-examination of LILCO's witnesses, as well as by the testimony that we will get under oral examination from the Staff witnesses.

MR. PERLIS: I understand that.

JUDGE BRENNER: Okay.

MR. DYNNER: I have a question that is related to the exact subject matter that you raised, and it goes to the old issue that we have faced several times in the previous meeting of a moving target.

We know from a meeting we attended on February 8th, which is referred to in the report to the Board, that LILCO is apparently in the midst of some very active revisions to their procedures and, as far as we know, adoption of new procedures.

And as far as we're concerned, this new litigation deals with the procedures and training which were in existence at the time the testimony was filed and the hearing commenced.

And if that is not the case then the County is faced with what we believe to be an extraordinarily unfair situation in which we are going to be attempting or expected to keep pace with the development of procedures between LILCO and the Staff, and to have people reviewing these things.

We don't know how long that is going to take, but the procedures are complex and the review takes time.

And I say that because of the problems that have arisen in the past. And it seems to me the situation would be even a greater difficulty.

MR. ELLIS: Judge Brenner, may I correct? Mr. Dynner wasn't there Friday, and I was, and I think it's important to get those particular facts straight.

The Staff came to LILCO about January 16th or 17th. As a result of that meeting they made several comments, suggestions and criticisms. LILCO revised its procedures and submitted them to the Staff. The County also has it. It is not now, I don't believe, in the process of revising any further procedures.

The procedures are now that way, and they were that way three or four or more working days prior to the submission of the Staff's testimony.

So there may be a moving target in the sense that if-- I had asked Mr. Dynner several times: You tell me what you think is wrong with the ones you've got, and we'll see what we can do to fix them.

It may be moving in the sense that people tell us what they think is wrong. In addition to what they've told us, we may do it.

Now, there are some disagreements between the Staff and LILCO that have yet to be ironed out.

Training is another matter. I was referring strictly to procedures.

So the only thing I want to amend to what Mr. Dynner is that the procedures were revised prior to the

February 8th meeting and, indeed, prior to the submission of the Staff's testimony.

So those procedures are not in the process of further revision.

The Staff has issued a request for additional information to LILCO, which LILCO will respond to in the near future. But the procedures, the ones I asked Mr. Dynner about, that were provided to Suffolk County -- and I've asked him on a number of occasions to give me what they think is wrong with them, and he indicated the last time I asked that they weren't yet prepared to do so, but that they might change then if they had a specific comment that we could accommodate.

The procedures are not in the process of current revision.

JUDGE BRENNER: What did you mean when you said "Training is another matter"? I don't know in which direction.

MR. ELLIS: Well, training-- I'm not sure. Training is already under way. I do not know whether the Staff has reviewed the specific training that is under way.

The Staff indicated that it had reviewed a job analysis, but I am less familiar with the details of that.

So I guess I didn't mean to say it was another matter; I was just saying that I am familiar with the

procedures thing, and I wanted to address that very specifically.

JUDGE MORRIS: Mr. Ellis, you mentioned a request for further information. Are you referring to the February 5th letter to Mr. Leonard from Mr. Swanscer?

MR. ELLIS: I am indeed, Judge Morris.

JUDGE MORRIS: Is it your position that you will not change procedures as a result of supplying that information?

MR. ELLIS: No, sir; it's my position that many of the things in the February 5th letter have already been done.

Many of the things in the February 5th letter were comments that were made to LILCO on January 16th and 17th, at which time LILCO made many of those changes.

So that I'm fairly certain that many of those have been done. So it is not LILCO's position that we won't do what is in there.

Now, there may be some disputes in there. I can think of one format that I happen to know about that may or may not be a matter of some dispute.

Excuse me a minute, Judge.

(Counsel conferring.)

MR. ELLIS: Mr. Notaro tells me that there are some of these formats, whether or not you put cautions in

boxes or not is something that is still being considered by LILCO whether it's going to address that.

To that extent, things of that nature, there may be, I think in fairness to Mr. Dynner that could be called a moving target.

But the procedures, in substance, are as they were revised to respond to the Staff comments on January 16th and 17th.

JUDGE BRENNER: Mr. Dynner, of course, as you know, Mr. Ellis, is a veteran of the operating QA procedures matter some time ago: I forget how long ago it was. It seems like a long time.

I guess our present approach to life is protected by not remembering well the things that were less pleasant. But, in any event, there are several lessons to be gleaned from that experience: Mr. Dynner, you referred to one of them. We're cognizant of that letter. And there is some unfairness of a moving target, if that proves to be the case, in more than just very minor ways.

Another lesson, however, to be gleaned from that experience, Mr. Dynner, is how the subject of procedures is uniquely suitable for intense discussions among the parties outside the hearing process. And those discussions should be taking place. It is quite ineffecient to have to go through Box 1, Line 3, Subparagraph 5 of a procedure in a

litigation.

The other problem is, you don't end up with as fine-tuned a result as you might where the parties are actually sitting down and rewriting words and formats and so on. And given the apparent situation, that process really should be taking place now on a continuous basis to the extent feasible while the hearing is going on.

As we hear about procedures on the record we will be cognizant, however, of Mr. Dynner's other point that if there are real substantive changes that have not been previously discussed, that too might present problems. And we might just get to the point in the record where we will have to make some adjustment, either getting to the point where we'll just make a finding on the record as it is, knowing that there are other things being done, or some other adjustment

But the primary lesson is the one I just alluded to, and that is that the parties should sit down and go through these detailed procedures.

MR. DYNNER: Judge, we agree.

MR. ELLIS: We were prepared to do that in advance, and, as I indicated, we offered to make specific changes if we were advised of any, and Mr. Dynner indicated he didn't intend to do so.

We are still prepared to sit down and discuss

specific changes.

MR. DYNNER: Judge, my comment did not go -- and I agree with you as far as trying to settle differences of language in existing procedures, and my comment didn't go to that issue, which the parties, I agree with you, ought to be discussing. And, in fact, we do address some of the procedures in our testimony.

My statement went to the issue, and Mr. Scheidt was at the meeting and informed me that his understanding of what was said there-- Maybe we can get something from the Staff on this. --was that LILCO was going to supplement its procedures and develop a training program. And our contention obviously goes to both the procedures and the training. They are issues that are hand-in-glove. And the background to the LILCO restatement as far as operators erroneously starting additional equipment, our affidavit at the time clearly referred to both procedures and training.

We do have the concern which I've expressed as to a training program and as to procedures which, if they're not going to be revised, may be supplemented.

The Staff was at that meeting, and maybe they have some more light to shed on it.

JUDGE BRENNER: I think more light could be shed on it outside the hearing room at this point. And very quickly.

JUDGE MORRIS: One further question, Mr. Ellis.

Do you have a schedule for your submittal to the Staff in response to the February 5th request?

MR. ELLIS: I'm not familiar with the exact date, but I think it was an as-soon-as-possible sort of thing that we'd would try and get out either this week or early next.

And let me say in conjunction with that that the training has already commenced. Lesson plans and the training plan has been developed. Training has commenced. It's going on now. And simulator training is scheduled for March.

So that point should be made.

JUDGE MORRIS: I still have the desire to try to understand when Mr. Dynner can say the target has stopped moving.

MR. ELLIS: Well, I think, as I indicated, with respect to the procedures, we have not seen any concern in particular about training from the County. I don't recall any specifics in the County testimony concerning training.

With respect to procedures, as I indicated to you, Judge Morris, the procedures were revised shortly after the Staff left. They were submitted to the Staff. The County has those. And I am advised that apart from matters of form, such as the format, the comments -- I mean, the cautions being in blocks or not being in blocks, that kind

of thing, there is no -- there has been, and is currently planned, no substantive changes to the procedures. Those procedures have been out there for folks to look at and pick apart if they wanted to and call us and tell us to change certain things for some time now.

JUDGE MORRIS: You told me that several times, but I'm still interested in knowing when your submittal in response to the February 5th letter will be transmitted.

MR. ELLIS: Later this week or early next, is what I'm advised. I do not know the specific date.

JUDGE MORRIS: Thank you.

JUDGE BRENNER: All right. I'd like to turn to the subject of whether or not we should put witness panels on the stand for different parties at the same time on the load contention, which is all we're discussing now. LILCO has suggested that be done, the County opposed it.

We agree with some of the County's reasons as applied to all the parties: if you added up all the witnesses it would be too large a number to be readily manageable in our view. So we don't think the Staff witnesses should be up there with witnesses for the other parties.

If the Staff disagrees with that I'll let them... This is just on the load contention.

MR. PERLIS: The Staff does not disagree with

that.

JUDGE BRENNER: All right.

That does not preclude putting Staff witnesses up there with witnesses for other parties at the end, similar to what we did with some of the metallurgical testimony on the blocks.

Having said that, we also believe that there might be benefits of a substantive nature and efficiency of putting the County's load witnesses on the stand with LILCO's witnesses. And I wanted to ask the County what it's position on that would be. As we read the County's written filing, it seemed to be addressed to the idea of having a very large number of witnesses. But we would cut down on that number by quite a bit if we just had the County and LILCO witnesses on the load contention up there together.

MR. DYNNER: Yes, Judge. We would have five people, and that's not too large a number panel. However, it's our feeling that it would be awkward to attempt to do cross-examination at this stage on a mixed panel, that it would be better to hear what each panel has to say under efficient and hopefully short time frame cross-examination. And then to the extent that issues are framed as having clear divergences, then if the Board wanted to we'd have a joint panel.

It seems to us at this stage that it wouldn't be

very productive, it would be awkward, and we certainly haven't prepared our cross-examination with that expectation.

That's not saying I can't do it, but it's another factor that I think weighs against it.

(The Board conferring.)

JUDGE BRENNER: Somewhere in there, Mr. Dynner, did you say, or mean to imply that you thought the County's cross-examination of LILCO's load panel would be relatively short?

MR. DYNNER: Yes; I have given an estimate, with all the hedges that I usually give when I give estimates, that I thought it could be completed in about a day or a day-and-a-half.

JUDGE BRENNER: All right.

We won't put the witnesses for the County and LILCO together over the County's objection. First, I believe it might have led to some efficiencies, but if the cross-examination is going to be in approximately the time frame you just estimated, Mr. Dynner, I don't think the differences would be very much in the end.

So after the lunch break we'll proceed with LILCO's panel on this and begin the cross-examination of that panel by the County. And then we would follow that in turn with the County's panel, and then the Staff witnesses.

Now, did the Staff intend on combining some of its witnesses, Mr. Perlis?

MR. PERLIS: Yes; the Staff intended on dividing its witnesses along the same lines that LILCO divided its witnesses. So that Messrs. Bush, Henriksen, Sarsten and Berlinger would go up as a panel later, and all the other gentlemen would go up as a panel on load.

JUDGE BRENNER: Yes; and you're going to consider our request that you think about the status of Mr. Hodges' proposed testimony.

MR. PERLIS: That's correct.

JUDGE BRENNER: We have nothing further as preliminary to getting to the witnesses' testimony, which we will do after our lunch break.

MR. ELLIS: Judge Brenner, a minor matter, if I may.

We submitted errata by letter dated February 7th, 1985, and as the Board has indicated in the past we intend to have I believe it's four copies of the testimony with the errata made in the testimony in ink. One of those changes, as a result of a job title change of Mr. Dawes, was a bit long, and I would like to have your views again on how you want us to do that.

Do you want us to write all that in there? It's kind of hard to write it in the margin. We could write it

on the back of a page.

JUDGE BRENNER: Why don't you just put it in the errata along with the testimony, and we will understand that you have made the handwritten changes for all the other errata, and we'll find it in with the testimony.

We actually need three copies, not four copies, of material that will be bound into the transcript.

MR. ELLIS: Yes, sir. What we then will do, with your approval, would be to make in pen and ink in each of the copies a notation at the point where this lengthy errata is, to see Errata dated so-and-so.

JUDGE BRENNER: Fine. And we'll bind the errata in also.

I would also ask the County to annotate its testimony consistent both with its errata which we have received and also with our ruling on the motions to strike, much the same as was done previously.

When we get to the County testimony we may have to renumber the exhibits in a certain fashion; in fact, why doesn't the County see if it could do that in the first instance, given the previous numbering of County exhibits in the reopened diesel hearing. If you need the last number we can give it to you during a break.

MR. DYNNER: I assume, Judge, that you want us to do it in the same fashion as last time, where we'd strike

through in a legible manner insofar as the written testimony, including the exhibit that the Board struck, will continue as our offer of proof.

JUDGE BRENNER: Correct.

All right. We'll take a recess until one-thirty this afternoon. In case the parties are wondering, it's our proposal to run until five o'clock for each of the hearing days scheduled for this week and next week. And we would also start at ten-thirty next Tuesday, if that's what the parties desire; that is, we're extending to the out-of-town parties the same courtesy that we take for ourselves in being able to travel on the morning, if that makes a difference.

If, for some reason, it makes no difference, you can discuss that among yourselves and let us know, and we could start earlier next Tuesday.

MR. ELLIS: I think we're the only country folks. But we'll start earlier, if that's the Board's pleasure.

JUDGE BRENNER: You can think about it. If you have some witnesses from New York who can take their wonderful flight out of beautiful downtown Islip, then why don't you talk about it with them before you get into some trouble?

All right, we'll be back at one-thirty this

afternoon.

(Whereupon, at 12:00 o'clock noon, the hearing in the above-entitled matter was recessed, to reconvene at 1:30 p.m. the same day.)

AFTERNOON SESSION

(1:30 p.m.)

JUDGE BRENNER: We can put LILCO's witnesses on at this time.

MR. ELLIS: Judge Brenner, one preliminary matter, if you will indulge me.

As we indicated, Judge, we will take up with the company, as you've indicated, the possibility of additional testing. There is one factor, additional technical information, that I think the Board should know concerning 10 to the 7th testing at 3500 kw.

As I indicated this morning, 10 to the 7th testing was the interim basis. The option in the SER is either 10 to the 7th testing for the interim basis or wait until the review of the DR/QRs is completed for the long-term testing.

JUDGE BRENNER: That is just the Staff's view. Let's never forget that.

MR. ELLIS: Yes, that's right.

Nonetheless, LILCO is guided frequently by that.

JUDGE BRENNER: You know, fine, but I don't feel the least bit estopped from disagreeing strongly at any time with the Staff's view, based on whatever record is adduced before us.

MR. ELLIS: I understand that, Judge.

Secondly, as I indicated on other occasions, and I think we've had testimony, the 10 to the 7th was chiefly focused on the crankshaft. Its basic objective, of course, is to show no crack initiation. The 101 and 102 of course already have ligament cracks in the block, and as LILCO and FaAA witnesses have already testified, the analysis that LILCO and FaAA have done demonstrates that the blocks are adequate for normal surveillance testing and for operation during a LOOP/LOCA with a substantial margin.

To perform further testimony on the 101 and 102 engines may unnecessarily, since they already have a substantial number of hours, unnecessarily reduce the ultimate life and therefore, not be a prudent thing to do. Testing the 103 at 3500 would of course have not satisfied the County on 101 and 102, so that was an additional factor which I should have mentioned this morning, which I think is pertinent.

JUDGE BRENNER: Yes, and we have the record before us, and we have to reach a decision on the adequacy of the 101 and 102 block, based on the analyses and the testing that has been performed and the testing that has not been performed.

MR. ELLIS: That's correct. And the analysis has been performed with respect to the 101 and the 102 blocks that resulted in our testimony that they were adequate for

normal surveillance testing and operation during a LOOP/LOCA with a substantial margin for the 101 and the 102. And that is the testimony that we think justifies the conclusion that they are suitable, and to perform further testing may not be prudent under all the circumstances. And that's the point that I omitted to mention.

The objective, as I said, of 10 to the 7th testing, furthermore, is to show no crack initiation, and we do have cracks in the ligaments of the 101 and 102. The DR/QR, after it is reviewed and put in place, of course over the life of the plant requires inspections at various times. And if at any time the blocks do not pass a particular inspection, appropriate action may have to be taken.

JUDGE BRENNER: All right. Let's get LILCO's witnesses up.

Why don't you introduce them, Mr. Ellis, and then we can swear them in?

MR. ELLIS: Gentlemen, beginning with Mr. Dawe, would you state, please, for the record your name, business address, and business affiliation?

MR. DAWE: My name is George Dawe. I am associated with Stone and Webster Engineering Corporation in Boston. My business address is 245 Summer Street, Boston, Massachusetts.

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MR. YOUNGLING: My name is Edward J. Youngling. I am the Manager of Nuclear Engineering with the Long Island Lighting Company. My business address is Shoreham Nuclear Power Station, Wading River, New York.

MR. NOTARO: My name is Jack Notaro. I am the Outage and Modifications Manager for the Long Island Lighting Company. My business address is Shoreham Nuclear Power Station, Wading River, New York.

MR. ELLIS: Judge Brenner, I think Mr. Dawe and Mr. Youngling have been sworn previously in this proceeding. I am not sure about Mr. Notaro. No, he has not.

JUDGE BRENNER: No, he is not. I was going to say welcome to Mr. Notaro, and welcome back to Mr. Dawe and Mr. Youngling.

All right. That's correct. We will remind Mr. Dawe and Mr. Youngling that they have been previously sworn.

Whereupon,

GEORGE F. DAWE

and

EDWARD J. YOUNGLING

resumed that stand and, having been previously duly sworn, were examined and testified further as follows:

JUDGE BRENNER: Mr. Notaro, would you stand at

this time and raise your right hand, please?

Whereupon,

JACK A. NOTARO

was called as a witness and, having been first duly sworn, was examined and testified as follows:

JUDGE BRENNER: Please be seated.

Mr. Ellis.

DIRECT EXAMINATION

BY MR. ELLIS:

Q Gentlemen, do you have before you a document entitled "Diesel Generator Qualified Load Testimony of George F. Dawe, Jack A. Notaro, and Edward J. Youngling on behalf of the Long Island Lighting Company"? Do each of you have that before you?

A (Witness Youngling) Yes, we do.

Q All right. I will refer to that as the LILCO Generator Load testimony.

Do you also have before you the letter dated February 7, 1985, to Messrs. Dynner and Perlis from me regarding errata concerning the LILCO Diesel Generator Load testimony?

A (Witness Youngling) We do not have the final letter in front of us.

(Document handed to the witness panel.)

(Witness Youngling) Yes, we have it.

Q Now is the LILCO Diesel Generator Load testimony as corrected by the errata dated February 7, 1985, true and correct to the best of your knowledge and belief?

A (Witness Dawe) Yes, it is.

A (Witness Youngling) Yes, it is.

A (Witness Notaro) Yes, it is.

Q And do you adopt it, each of you, as your testimony in this proceeding?

A (Witness Dawe) I do.

A (Witness Youngling) I do.

A (Witness Notaro) I do.

MR. ELLIS: Judge Brenner, we would now offer into evidence the LILCO Diesel Generator Load testimony, together with the errata dated February 7, 1985.

And we would note for the record that the copies that we are furnishing to the Court Reporter have the changes pencilled in or inked in, with the exception of the errata pertaining to Mr. Dawe's title and job and that for that we have indicated that the reader of the record should refer to the errata sheet which I believe the Board has indicated it will bind in.

JUDGE BRENNER: All right.

In the absence of objection not previously ruled upon and denied by the Board, we will admit the testimony just identified into evidence. It consists of the testimony

which includes Attachment A, Mr. Notaro's personal qualifications, and we will bind the testimony in at this point of the transcript, to be followed immediately by the letter which indicates the errata.

(The documents follow:)

LILCO, January 15, 1985

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)	)	

DIESEL GENERATOR QUALIFIED LOAD TESTIMONY OF GEORGE F. DAWE, JACK A. NOTARO AND EDWARD J. YOUNGLING ON BEHALF OF LONG ISLAND LIGHTING COMPANY

Testimony and Attachment

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)	)	
	)	

DIESEL GENERATOR QUALIFIED LOAD
TESTIMONY OF GEORGE F. DAWE,
JACK A. NOTARO AND EDWARD J. YOUNGLING
ON BEHALF OF LONG ISLAND LIGHTING COMPANY

1. Please state your names and business addresses.

A. (Dawe) My name is George F. Dawe. My business address is Stone & Webster Engineering Corp., 245 Summer Street, Boston, Massachusetts 02107.

(Notaro) My name is Jack A. Notaro. My business address is Long Island Lighting Company, Shoreham Nuclear Power Station, North Country Road, Wading River, New York 11792.

(Youngling) My name is Edward J. Youngling. My business address is Long Island Lighting Company, Shoreham Nuclear Power Station, North Country Road, Wading River, New York 11792.

2. Please identify your current position and describe your professional qualifications.

A. (Dawe) My current position, to which I was

appointed in January 1980,* is Supervisor of Project Licensing within the Licensing Division of Stone & Webster (SWEC). I am responsible for technical and administrative supervision of all project licensing personnel assigned to SWEC headquarters projects, including field assignments. My duties include assuring project awareness of regulatory requirements and developments, assuring proper and consistent application of SWEC licensing policies, and consulting with projects and clients on licensing issues.

I joined Stone & Webster in 1973 as an Engineer in the Licensing Group. In January 1974, I was assigned as Licensing Engineer for the Shoreham Nuclear Power Station (SNPS) under construction, and was Lead Licensing Engineer from 1976 to 1980. In this capacity, I was responsible for all licensing related activities for SNPS including preparation of the Final Safety Analysis Report. I have had additional assignments at Stone & Webster including development of company positions for NRC Regulatory Guides and Lead Licensing Engineer for the Special Projects Group of the Operations Services Division. I am also the Stone & Webster representative to, and participating member of, two subcommittees of the AIF Committee on Reactor Licensing and Safety.

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* See errata dated February 7, 1985

Prior to joining Stone & Webster, I served seven years as a commissioned officer in the U.S. Navy Nuclear Power Program. My duties included direct supervision of operation and maintenance of a submarine nuclear propulsion plant. I also served on the staff of the U.S. Navy Nuclear Power School as Director, Core Characteristics and Reactor Physics Division. While on active duty, I was qualified for assignment as Chief Engineer on nuclear powered vessels.

I received a Bachelor of Science degree from the United States Naval Academy in 1966. I have 18 years experience in the nuclear power field and hold a certificate as Engineer-in-Training in Massachusetts by 8 hour examination. A copy of my resume setting forth my professional qualifications has previously been submitted on the record in this case.

(Notaro) My current position, to which I was appointed in May 1984, is Outage and Modification Manager for the Shoreham Nuclear Power Station. As such, I am responsible for the implementation of design changes to the plant systems or equipment as required by the regulatory agencies or for plant operational considerations. I supervise the Planning and Scheduling, Modification Engineering and Outage Planning Sections of the plant staff. In my current position, I have been involved with LILCO's diesel generator recovery efforts,

including the endurance test run of EDG 103 at the qualified load of 3300 KW. I hold NRC Senior Reactor Operator License SOP-4419 for Shoreham, which I obtained November 1982.

I have been employed by LILCO since 1970 and assigned to the Shoreham Nuclear Power Station since 1973. I have held a number of plant staff positions prior to my current position, including Operating Quality Assurance Engineer, Operating Engineer and Chief Operating Engineer. In addition, I have been assigned for periods of time to the Vermont Yankee Nuclear Power Station, the Millstone Nuclear Power Station and the Dresden Nuclear Power Station for power operation training.

I have successfully completed numerous LILCO, General Electric Company and industry training programs. I received a Bachelors Degree in Mechanical Engineering from City College of New York, and a Master of Business Administration Degree from Adelphi University. A copy of my resume, setting forth my professional qualifications more fully, is attached to this testimony as Attachment A.

(Youngling) I am the Manager of the Nuclear Engineering Department at LILCO. In this capacity, I am responsible for engineering support at Shoreham, including the three TDI diesel generators. From 1981 until 1984, I was the Start-up Manager for the Shoreham plant. In this position, I was

responsible for implementing the preoperational test program for Shoreham, including checkout, initial operation and subsequent preoperational testing of the TDI diesel generators. After the failure of the EDG 102 crankshaft, I was designated as the Recovery Manager for the repair and requalification of the diesel engines. In my various capacities, I have supervised more than 3,350 hours of operation of Shoreham's TDI diesel generators, the development of the program to define the qualified load for the Shoreham TDI diesel generators, and the development of the confirmatory test and inspection program to assess the adequacy of the diesel generators at this qualified load. A copy of my resume setting forth my professional qualifications has previously been submitted on the record in this case.

3. What is the purpose of your testimony?

A. (All) The purpose of this testimony is to respond to the contention of Suffolk County and the State of New York concerning qualified load for the Shoreham TDI emergency diesel ~~operators~~ generators. That contention, as admitted by the Board, states as follows:

> 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;

(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) [subsection not admitted]

(vi) [subsection not admitted]

(b) [subsection not admitted]

(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) [subject matter to be covered in block testimony]

(ii) [subject matter to be covered in block testimony]

(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) [subsection not admitted].

4. Please summarize your testimony.

A. (All) (1) The qualified load of 3300 KW is adequate and appropriate. Three intermittent load groups (motor operated valves, diesel generator fuel oil transfer pumps and diesel generator air compressors) were excluded in establishing the maximum emergency service load for each EDG and thus the qualified load. This exclusion, concurred in by the NRC Staff, was appropriate and justified because these are short term, small magnitude loads.

(2) The accuracy of the diesel generator load instruments to be used during operation does not affect the adequacy of the qualified load. These instruments do not introduce errors of sufficient magnitude to impair the ability of the diesel generators to perform their intended function.

(3) A control band of $\pm$ 100 KW about the 3300 KW qualified load is permitted only during required surveillance testing at the qualified load. This is necessary, as a practical matter, to conduct such tests. This testing is not performed for extended periods of time and therefore any variation of the load about 3300 KW will not affect the ability of the diesel generators to perform their intended function.

(4) As required by regulation, operator error has been considered in the design of the plant. The use of a

qualified load for interim licensing does not alter the plant's ability to meet this design basis. Operator error remains an unlikely cause of a diesel generator failure, and failure of a diesel generator is within the design basis of the plant.

(5) The 10^7 loading cycle confirmatory test was adequate to establish the qualified load of 3300 KW. The operators were directed to conduct the endurance run portion of the test on EDG-103 at 3300 KW $\pm$ 100 KW. The load data obtained at 30 minute intervals throughout the endurance run demonstrate the adequacy of the test. The accuracy of the EDG-103 load meter was verified before and after the endurance run to be well within the specified calibration limits for the instrument. Any operation during the confirmatory test that may have been above or below 3300 KW due to instrument error was not substantial, did not affect the validity of the test and is representative of future operation utilizing the installed load meters.

5. Please define "maximum emergency service load" (MESL).

A. (All) The maximum emergency service load, as defined in Amendment 52 to the Shoreham License Application (Revision 34 to the FSAR) is the maximum load which would exist on an EDG during a loss of coolant accident in conjunction with a loss of offsite power (LOOP/LOCA).

6. How is the MESL determined?

A. (All) The MESL is determined for each EDG by summing the individual loads which will be simultaneously connected to that EDG for more than short periods of time following initiation of a LOOP/LOCA event. These loads are generally engineered safety features (ESF) or ESF support equipment, and are powered automatically following diesel generator start in response to a LOOP/LOCA initiation signal. Component nameplate load values are used in the summation except where values measured in the plant are available.

7. What is the MESL for each EDG?

A. (All) The MESL for each EDG is set forth in the Shoreham FSAR, Revision 34, Table 8.3.1-1A. The MESL is 3253.3 KW for EDG-101, 3208.7 KW for EDG-102 and 3225.5 KW for EDG-103.

8. Please define "qualified load."

A. (All) The concept of a "qualified load" was introduced in the NRC Staff's Safety Evaluation Report on the Transamerica Delaval, Inc.-Diesel Generator Owners Group Program Plan. The SER states that the Staff and its consultants have not completed their review of the Owners Group efforts. However, the SER reflects that the Staff has established an

interim licensing basis for TDI diesel engines. The NRC Staff has concluded that engines operating below a BMEP of 185 psig could be licensed in the interim. In considering whether an engine meets the 185 psig BMEP criteria, the NRC Staff has stated they would consider excepting engines from the requirement where the load exceeds the 185 psig BMEP criterion for brief periods of time. See Safety Evaluation Report, Transamerica Delaval, Inc. Diesel Generator Owners Group Program Plan, pp. 13-14.

For engines where emergency service load requirements involve a BMEP greater than 185 psig, the NRC Staff has required utilities to demonstrate that certain key components of the engines had been operated successfully for at least 10^7 loading cycles at or above the maximum emergency service load for those engines. This load level at which 10^7 loading cycles could be demonstrated was called the "qualified load." For Shoreham's TDI diesel generators, the confirmatory testing was chiefly for the purpose of demonstrating the adequacy of the replacement crankshafts. See Tr. 26292-93 (Berlinger).

9. What is the qualified load for the Shoreham TDI emergency diesel generators?

A. (All) For Shoreham, the qualified load is 3300 KW. This is an upper bound of the maximum emergency service loads for all three TDI diesel generators.

10. Were intermittent or cyclic loads included in LILCO's determination of the 3300 KW qualified load?

A. (All) No. Intermittent or cyclic loads are small loads that will operate only once or occasionally following a LOOP/LOCA event. In either case, operation is for a short period of time. Because this equipment does not impose a continuous load on the diesel engines but only small load increases for short periods of time, it was not included in LILCO's determination of the qualified load.

11. How did LILCO arrive at the conclusion that intermittent or cyclic loads should not be included in the determination of the qualified load?

A. (Youngling) LILCO concluded that intermittent or cyclic loads should not be included in determining the qualified load from review of the Staff SER for the TDI Diesel Generator Owners Group Program Plan, as well as subsequent discussions with the Staff. That SER establishes the concept of a qualified load for diesels which operate at a BMEP greater than 185 psig. Since this SER in addressing qualified loads discussed long term (10^7 cycles) loading conditions, and also provided for exceeding 185 psig BMEP for brief periods of time when applying the BMEP criterion, LILCO concluded that brief, intermittent loads need not be included in establishing the

maximum emergency service loads, and thus the qualified load. Prior to establishing the qualified load and performing the required testing, LILCO discussed this interpretation with the NRC Staff. The NRC Staff concurred with LILCO's conclusion that intermittent or cyclic loads should be excluded from the MESL and qualified load. Dr. Berlinger restated this position in his December 13, 1984 deposition at pp. 17-19.

12. Which loads were not included in the determination of the qualified load as being intermittent or cyclic loads?

A. (Youngling, Dawe) Only three load groups are excluded as intermittent or cyclic loads. These are (i) automatically actuated motor operated valves (MOV), (ii) diesel generator fuel oil transfer pumps and (iii) diesel generator air compressors. As explained more fully below, each group represents a small number of components, a small KW load or both.

13. Please explain why automatically actuated motor operated valves have been categorized as excludable intermittent or cyclic loads.

A. (Youngling, Dawe) The automatically actuated motor operated valves are all of those valves which both receive power from an EDG and have the ability to operate automatically in the event of a LOOP/LOCA. The connectable load associated

with these valves is included in FSAR Table 8.3.1-1 by the line item "Motor Operated Valves" and a portion of the line item "480 V M-G Set."

These valves are valves which may be called upon to reposition automatically following a LOOP/LOCA initiation signal. They include such valves as containment isolation valves, emergency core cooling system injection valves, and various system valves used to isolate redundant trains, unnecessary system loads or unwanted flow paths. A number of factors justify the exclusion of these valves as intermittent loads. Not all of these valves would be expected to reposition following an accident and thus would not actually represent a load on an EDG. Although they all receive automatic actuation signals to ensure proper positioning, many will be in their desired post-accident position during normal operation, and thus will not operate even upon receipt of a signal. Those that do operate can generally be expected to operate only once. If subsequent operation is necessary or desirable, it will generally result only from operator action. The automatic operation will occur during the first several minutes after the diesel generators start.

The stroke times of the MOV's are short. Most will complete their stroke, open or close, in less than one minute.

The longest stroke times do not exceed three minutes. Further, not all valves which will automatically reposition do so simultaneously. Inherent time delays in reaching various actuation and permissive set points, bus programming and actuation signal generation will result in sequencing of valve operations.

For all of these reasons, the automatically actuated motor operated valves represent short time, intermittent loads on the EDG's. Because they represent small load increases for short periods of time, they are properly excluded in establishing the qualified load.

14. What load could the automatically actuated motor operated valves impose on the diesels?

A. (Youngling, Dawe) For the reasons we have just stated, it is incorrect to take a simple summation of the loads attributable to each individual valve to represent the load a given EDG will supply. Such a summation yields a load which exceeds any that could reasonably be expected. Even this summation of loads, however, would not result in exceeding the qualified load except in the case of one of the diesel generators and then by only 19 KW.

As can be seen from FSAR Table 8.3.1-1, the category "Motor Operated Valves" provides a summation of nameplate valve loads of 19.7 KW for EDG-101, 18.3 KW for EDG-102 and 0.7 KW

for EDG-103. These totals include all automatically actuated motor operated valves except two sets of 4 valves associated with operation of each train of the Low Pressure Coolant Injection (LPCI) System. These LPCI related valves are powered by 480 V motor generator (M-G) sets which are, in turn, powered by the EDG's. By design, no diesel generator will be called on to power more than one of these sets of 4 LPCI related valves.

The 480 V M-G sets are maintained operating, but unloaded, to be ready to power the associated valves. This places a load of 19 KW per M-G set on the associated diesel generators. This 19 KW load per MG set is not an intermittent load and was included in determining the qualified load as demonstrated by FSAR Table 8.3.1-1A. Based on the nameplate ratings for each of the 4 valves powered by a given 480 V M-G set, the maximum coincident demand for each set of valves is less than 46 KW. Since this intermittent 46 KW load could be assigned to any of the three diesels, it can be summed with the previously listed valve loads to establish an upper bound on the valve load for each diesel. This yields a total connected valve load of 65.7 KW for EDG-101, 64.3 KW for EDG-102 and 46.7 KW for EDG-103. As previously stated, though, such coincident loading is unlikely to occur, nor could it occur for more than a very short period of time, particularly in the context of the

10^7 loading cycles for which the qualified load is demonstrated. Moreover, even if these coincident valve loads are added to the MESL of each EDG, the loads would be 3319.0 KW for EDG-101, 3273.0 KW for EDG-102 and 3272.2 KW for EDG-103. Thus, there is no significant period of operation above the qualified load level, even assuming the coincident operation of all automatically actuated valves.

15. Please explain why the diesel generator fuel oil transfer pumps have been categorized as excludable intermittent or cyclic loads.

A. (All) The diesel generator fuel oil transfer pumps transfer fuel oil for the diesel generators from the storage tanks to the day tanks in the diesel generator rooms. Each diesel generator has two associated fuel oil transfer pumps, only one of which is called on to operate. The preferred pump only operates after the fuel oil level in the day tank has been lowered to a predetermined value by operation of the diesel. Thereafter, the pump operates to refill the tank and then stops. The second pump will operate only if the first fails. The pump will operate for approximately ~~11~~ 22 minutes every ~~hour~~ 48 minutes during the operation of the diesel (at 3300 KW) to maintain level in the day tank. The diesel generator fuel oil transfer pump load is only 0.2 KW per pump. Because this load does not operate

immediately after the start of an accident when the peak load on the diesel generators would be experienced and because the load is both small and intermittently imposed, it was not included in the determination of the qualified load.

16. Please explain why the diesel generator air compressors have been categorized as excludable intermittent or cyclic loads.

A. (All) The diesel generator air compressors are used to recharge the air start receivers following the start of the diesel generators. Each diesel generator has two independent, redundant air starting systems with each, in turn, having one air compressor. Each air compressor will automatically operate one time following energizing of the emergency bus by its associated diesel generator. Following one successful start attempt, each compressor will operate for approximately 15 minutes. Each compressor can recharge its associated air system in 30 minutes following the design capability of five start attempts. The air compressor load is 12 KW per diesel generator. Since this is a one time load of short duration, it was not included in determining the qualified load. This load, if summed with the MESL for each EDG shown on FSAR Table 8.3.1-1A, does not raise the load on any EDG to the qualified load.

17. What load would be predicted if all the intermittent or cyclic loads on one EDG operated simultaneously?

A. (Youngling, Dawe) As explained for motor operated valves, it is incorrect to postulate all intermittent or cyclic loads operating simultaneously. In addition to the position and timing questions for valves, the fuel oil transfer pumps will not operate until the day tank level has been lowered by diesel operation. The air compressors will operate only once after a diesel starts; the length of operation depends on the number of start attempts required. As with the valve loads alone, only an upper bound on intermittent loads can be easily predicted and, as before, if it were to occur it would be for a very short period of time. If all the intermittent or cyclic loads above are simply summed and added to the MESL for each EDG, the predicted load would be 3331.4 KW, 3285.4 KW and 3284.6 KW for EDG 101, 102 and 103, respectively. Thus, it is possible to calculate a load greater than the qualified load for only one EDG, and even then by only a small amount (less than 1%) and for no more than a few minutes even assuming coincident operation of all intermittent or cyclic loads.

18. Given that answer, shouldn't the qualified load have been established above 3300 KW?

A. (All) No. As previously explained, intermittent loads need not be considered in determining the qualified load. Moreover, the summation of loads to establish the MESL does not take into consideration the actual sequence of operation of, or operating conditions seen by, plant equipment. In summing the loads on FSAR Table 8.3.1-1A to obtain the MESL it is simply assumed that all equipment operates simultaneously at the name-plate or measured value shown. This is conservative.

The extent of this conservatism is indicated by the results of the integrated electrical test (IET). The IET is performed to ensure that each redundant onsite power source and its associated load group can function without dependence upon any other redundant load group or portion thereof. Each portion of the test is of sufficient duration to achieve stable operating conditions and thus permit the onset and detection of adverse conditions which could result from improper assignment of loads, such as lack of forced cooling to a vital piece of equipment. The tests include introduction of an accident signal (LOCA), and isolation from offsite power (LOOP).

Although the IET cannot simulate exactly the conditions that will exist following a LOCA, it does result in the full sequencing of loads, particularly in the short term before an operator would be expected to start responding to particular

symptoms from a particular accident sequence. This is significant because it is during the initial stage of the LOOP/LOCA that predicted loads would be at their highest due to initial starting of equipment before operators secure unneeded equipment. Following a LOOP/LOCA, the major loads on the diesel generators are attributable to the emergency core cooling system (ECCS) pumps, air-conditioning equipment and the service water pumps. During the IET, expected post-LOCA flows are achieved for both the ECCS and service water pumps and the chilled water systems are preheated to simulate design loads on the water chillers. Thus, there is substantial assurance that the IET results are a reasonable approximation of post-LOCA loads.

The IET has been performed at Shoreham with the TDI diesel generators. The peak loads measured for each EDG were 2833.6 KW, 2806.9 KW and 3072.0 KW for EDG-101, 102 and 103, respectively. These loads are significantly lower than the predicted MESL, and the qualified load for each diesel generator. Additionally, during the IET, both reactor building service water pumps powered from EDG-103 were started automatically. Had they been operated then as they now will be during plant operation, only one of these pumps would have started automatically, and the peak load on EDG-103 would have been up to

358 KW less than the recorded 3072.0 KW. Thus, the IET provides confidence that the predicted MESL for each EDG is conservative.

19. What assurance is there that the qualified load of 3300 KW will not be exceeded during plant operation?

A. (All) Diesel generator operation itself can occur in response to plant conditions or as a result of operator action for surveillance testing in accordance with technical specification requirements. Loads can be placed on the diesel generators in one of two ways: (i) automatically in response to signals generated during events which require operation of the diesels, e.g., LOOP/LOCA, or (ii) manually by the operator when the diesel generators are operating.

Automatic loading of the diesel generators will not result in exceeding the qualified load. As previously explained, all automatically connected loads, except the identified short time, intermittent loads, are included in the MESL for each EDG. These loads are bounded by the qualified load.

Operator action will also not result in loads greater than the qualified load. There is no condition under which all of the loads shown in FSAR Table 8.3.1-1 are needed or expected to be operated simultaneously. The ability to connect manually various loads is provided to ensure the operator

has sufficient procedural flexibility to utilize various plant capabilities in the event of a LOOP or LOOP/LOCA. Some are provided to protect the non-nuclear portions of the plant.

The plant is designed so that operators do not have to take manual action during the first ten minutes of the event. Since this is approximately the time when peak loads are likely to be experienced on the diesel generators, it is unlikely that operator action will result in loads exceeding the qualified load. Due to the redundancy and diversity of accident mitigation equipment, there is initially more equipment in operation than is needed. Thus, the initial actions taken by the operator in stabilizing the plant are directed towards securing unneeded equipment, redirecting flows, or otherwise reducing flows in such ways as throttling of ECCS once reactor vessel water level is restored.

Those loads which can only be connected manually are not needed or used during the initial response to a LOOP/LOCA. They are available for later use by the operator. In some cases, this is equipment which may be used in the long term to mitigate LOOP/LOCA consequences, such as the post-LOCA hydrogen recombiners for control of combustible gases in the primary containment atmosphere, or the main steam isolation valve leakage control system. In other cases, it is equipment not used

for LOOP/LOCA mitigation such as, for example, turning gears and lube oil pumps for the main and reactor feed pump turbines. In either case, at the time such equipment is considered for use, the loads on the EDGs will have been reduced substantially from the MESL. When manually loading the diesel generators, the operators are directed by procedures and training not to exceed 3300 KW.

The situation is the same for response to events other than a LOOP/LOCA. The automatic LOOP/LOCA loads bound the automatic loads for other events such as a LOOP. Subsequent operator decisions are limited by the 3300 KW load restriction, but in no case are cumulative loads in excess of 3300 KW required.

For surveillance tests which confirm the automatic load sequencing of the diesel generators, the load experienced during the test is bounded by the MESL, and thus the qualified load is not exceeded. For surveillance testing of load carrying capability at the qualified load, the operators are directed to conduct the test at 3300 $\pm$ 100 KW.

Therefore, there is reasonable assurance that the qualified load will not be exceeded following events which necessitate reliance on the diesel generators. To the extent it may be exceeded during surveillance testing, as is discussed

more fully below, this would not affect the ability of the diesel generators to perform their intended function.

20. What assurance is there that the operators will not operate the diesel generators at loads in excess of 3300 KW?

A. (Notaro, Youngling) Procedures and training give ample assurance that the operators will not load the diesel generators above the qualified load of 3300 KW. In addition, the NRC Staff has included in the Supplemental Safety Evaluation Report for the Shoreham TDI diesel generators, dated December 18, 1984, a requirement for a 3300 KW limit in the technical specifications. Plant operators are required to be familiar with the technical specifications, and they are trained to maintain the plant so as not to violate those specifications. Thus, it is highly unlikely that an operator would manually operate a piece of equipment that would cause the load on a diesel generator to exceed 3300 KW.

21. Please describe the procedural guidance provided for the operator to ensure that the qualified load of 3300 KW is not exceeded on any EDG.

A. (Notaro, Youngling) A number of procedures have been developed or revised to provide the proper procedural guidance to the operator. Included among these are (i) SP

23.307.01, Revision 12, "Emergency Diesel Generators," (ii) SP 29.015.01, Revision ~~7~~ 9, "Loss of Off-Site Power Emergency Procedure," (iii) ~~SP 29.015.04, Revision 0, "Loss of Coolant Accident Coincident With a Loss of Off-Site Power," and (iv)~~ SP 29.023.01, Revision ~~4~~ 5, "Level Control Emergency Procedure."

The emergency diesel generator procedure, SP 023.307.01, provides instructions for proper operation of the EDG's and their associated auxiliaries. This procedure, in Paragraph 6.2.1, establishes as an operating limit that the continuous loading of any EDG should not exceed 3300 KW. During surveillance testing of the diesel generators' ability to carry a load of 3300 KW, operation will be permitted at 3300 ± 100 KW.

The level control procedure, SP 29.023.01, and the LOOP/~~LOCA~~ procedure, SP 29.015.0~~4~~ 1, are interrelated procedures. Individually and together, they provide guidance for the operator during the initial stages following a LOOP/LOCA. They require the operator to verify proper actuation of automatic loads and, if necessary, to initiate manually actions which should have occurred automatically. They also require the operator to verify that diesel generator loads do not exceed 3300 KW. The loss of off-site power procedure, SP 29.015.01, is then used to provide the load management guidelines for the

diesel generators. This procedure establishes an upper limit for loading on each diesel generator at 3300 KW, directs that non-safety related loads be controlled so as not to exceed this limit, and provides load values for the connectable loads for the operators' use in maintaining the load below this limit. Since all of the automatic loads are considered in the MESL for each EDG, manual actuation of loads which could result in exceeding the qualified load is unlikely. For subsequent actions, sufficient direction, warnings and guidance are provided by the procedures to allow the operator to manage load without exceeding the qualified load.

In addition to these procedures, a number of other procedures have been, or will be, modified. SP 24.307.01 (Emergency Diesel Generators Start and Load Test), SP 24.307.02 (DG-Emergency AC Power Load Sequencing Test), and SP 24.307.03 (Emergency Diesel Generators Load Rejection Test) provide procedural control for surveillance testing. These procedures will implement the technical specification testing requirements at 3300 KW, and provide for a control band during testing of 3300 $\pm$ 100 KW. Minor revisions have been, or will be, made to operating procedures ~~for~~ such as the service water, core spray and residual heat removal/low pressure coolant injection systems. These revisions provide caution and action statements for these systems to ensure that the qualified load is not exceeded.

Thus, during all phases of operation except surveillance testing at the qualified load, operation of the diesel generators is limited to 3300 KW. Only during surveillance testing will operation be conducted at 3300 ± 100 KW. This ± 100 KW operating band is necessary because it is not practical to maintain a perfectly constant load throughout a test. This will not adversely affect the diesel generators given the length of the testing and the width of the control band.

22. What training will be provided to the operators to ensure that the qualified load of 3300 KW is not exceeded?

A. (Notaro) The procedures just discussed will be placed on the required reading list for senior reactor operators and reactor operators. Beginning February ~~14~~ 1985, training on these procedures will be formally implemented through lesson plans. All licensed operators will receive this training.

23. How does the operator monitor load on the diesel generators to ensure it does not exceed 3300 KW?

A. (Notaro, Youngling) A diesel generator load meter, reading 0 to 5600 KW, is provided for each EDG on the main control board in the control room. These meters are easily accessible to the operators.

24. What is the accuracy of the diesel generator load meters?

A. (Youngling) Each diesel generator load meter is a Weston wattmeter which has a specified measurement accuracy of 2% of full scale. Each meter is used in an instrument loop with other components such that the entire loop has an accuracy of 2½% of full scale. Therefore, each load meter can measure the kilowatt load on the diesel generator to an accuracy of ± 140 KW. This would be the maximum error that could be introduced by an in-calibration instrument. In fact, the instruments currently installed have been measured to perform with a higher degree of accuracy. For example, the wattmeter for EDG-103 has been checked for calibration four times since October 1982. In all four calibration checks, only one data point, the maximum scale reading of 5600 KW during the October 1982 check, was found to be out of calibration, and then by only a very slight amount. In the range of operation corresponding to the 3300 KW qualified load, these last four calibration checks have shown the instrument to be well within tolerance. The largest deviations observed at 3000 KW or 4000 KW indicated have been approximately ± 100 KW. Significantly, however, in the calibrations performed just prior to and following the endurance run, the instrument was found to be within

60-70 KW (1-1.25% of full scale) at 3000 KW and 4000 KW indicated.

25. What steps does LILCO take to ensure that the accuracy of the load meters is maintained?

A. (Youngling, Notaro) As part of the Shoreham instrument calibration program, the diesel generator load meters and their associated instrument loops are required to be calibrated annually. This calibration is performed in accordance with approved station calibration procedures.

26. What assurance is there that the loads on the diesel generators will not exceed the qualified load as a result of diesel generator load meter instrument error?

A. (All) A LOOP/LOCA event results in the maximum automatic demand on the diesel generators and is therefore the event considered in establishing the MESL for each diesel generator. Upon receipt of a LOOP/LOCA signal, the plant response is automatic. There is no initial operator action based on readings from these instruments other than verification that loads do not exceed 3300 KW on any EDG. Analysis of the loads to be accommodated during a LOOP/LOCA confirms that this automatic loading will not result in exceeding the qualified load. The results of the IET provide further confidence that the

predicted loads included in the MESL for each EDG are conservative. Thus, the accuracy of these instruments at the outset of the LOOP/LOCA, or the LOOP alone, has no effect on individual EDG loading.

Because the subsequent operator actions after a LOOP/LOCA event initially result in reduction of load on a diesel generator, loads will be significantly reduced by the time the operator considers placing discretionary loads, in a procedurally controlled manner, on the diesel generator. Although the technical specifications and plant procedures will allow loading an EDG to 3300 KW indicated, it is nevertheless unlikely that the operator will approach this level to within the accuracy of his instrumentation, and extremely unlikely that it would persist for any appreciable length of time. The load profile following a LOOP/LOCA is bounded by 3200 KW after 12 minutes into the event and by 2617 KW after one hour into the event. This profile includes expected manual loading of the diesel generator. Even if the diesel generator is loaded to 3300 KW indicated, as the testimony of Drs. Pischinger and Rau reflects, the possible additional load due to instrument accuracy would have no adverse impact on the ability of the diesel to perform its intended function.

Similarly, during surveillance testing of the diesel generators at 3300 KW indicated, the actual load on a diesel generator could differ from that indicated by the amount of instrument error. This does not invalidate the surveillance testing since the testing is representative of actual operation. To the extent the test load may be slightly below 3300 KW due to instrument error, the necessary load carrying capability of the EDG is adequately demonstrated because the long-term demands on the diesel are not expected to approach 3300 KW. To the extent the qualified load could be slightly exceeded during testing as a result of instrument error, the time duration of such loading is not long. The technical specifications will require that the diesel generators be tested at this maximum load for only one hour per month. Once per 18 months, the diesel generators will be tested at this load for 24 hours. As reflected in the testimony of Drs. Pischinger and Rau, this will have no adverse effect on the ability of the diesel generators to perform their intended function. In either an operational or testing situation, the relationship of load limits to instrument accuracy is no different in the context of qualified load than in the context of rated load. For example, it is common practice, in performing EDG surveillance tests at design rated loads, to utilize control room instrumentation for conduct of the tests.

27. Is it possible for an operator to start additional equipment erroneously, resulting in a total load exceeding the qualified load?

A. Although it is possible, it is unlikely.

28. For each EDG, what is the single worst case load that could be started erroneously as a result of an operator error following a LOOP/LOCA?

A. (All) For EDG-101 and EDG-102, the largest load which could be manually started is a control rod drive (CRD) pump with a load of 206.1 KW. This would result in loads of 3459.4 KW and 3414.8 KW on EDG-101 and EDG-102 respectively, if superimposed on each diesel generator's MESL. Significantly, the MESL itself is conservative. A more realistic assessment of the effect of these operator errors would be found by considering the erroneously started load concurrent with the measured IET loads. This would yield loads of 3039.7 KW and 3013.0 KW for EDG-101 and EDG-102 respectively. Thus, even with the operator error, it is unlikely that the qualified load would be exceeded. Moreover, the error itself is unlikely. The CRD pumps are tripped automatically on a LOCA signal. They are not needed for the reactor scram. ~~The CRD pumps cannot be restarted as long as a LOCA signal is present.~~

For EDG-103, the largest available load would be the service water pump which does not start automatically. This load of 358 KW, if superimposed on the MESL for EDG-103, would result in a total load of 3583.5 KW. In fact, however, the IET was run with the second service water pump starting automatically and the measured load was only 3072.0 KW, well below the qualified load. Starting of this pump is unlikely because only two service water pumps are needed to mitigate the LOOP/LOCA event. Given the procedural controls, the available indication of diesel generator load in the control room, and the fact that more than one operator is cognizant of plant conditions, there is reasonable assurance that operator action to correct such errors would occur in a matter of minutes.

29. For each EDG, what is the single worst case load that could be started erroneously as a result of an operator error following a LOOP?

A. (All) For EDG-101 and EDG-102, the largest available load would be a core spray pump at 998 KW. When added to the predicted automatic load for these diesels following a LOOP, the total load would be 3839.2 KW and 3627.6 KW for EDG-101 and EDG-102, respectively. This is an unlikely error since core spray is only required following a LOCA. Following a LOOP, reactor water level is maintained by the HPCI and/or

RCIC systems. Moreover, the 998 KW load we have assumed for starting a core spray pump is the nameplate load at design flow. To achieve this load, in addition to the action required to start the pump, the operator would have to continue to take action to establish a flow path capable of design flow. Since the reactor remains pressurized following a LOOP, absent other equipment failures or operator actions, the only flow path available to the operator would be the test mode from the suppression pool returning to the suppression pool. There would be no purpose for establishing this flow path. If this flow path is not established, the core spray pump would operate in the minimum flow return mode which provides for a small amount of flow to protect the pump. With minimum flow, the core spray pump load would be significantly less than 998 KW. Thus, it is very unlikely that total loads comparable to those stated above would be seen since multiple operator errors would be required to establish this plant configuration for which there is no need.

For EDG-103, the largest available load is the 1022 KW residual heat removal (RHR) pump which would result in a total load of 3867.3 KW. (This value is conservative because the pump load assumes runout flow which would not exist without a break in the injection path.) This error is also unlikely.

Following a LOOP, only two out of four RHR pumps are required. EDG-103 can supply power to two of the four RHR pumps. Each of the other EDGs can provide power to one of the other two RHR pumps. The RHR pump assumed as the worst erroneous load for EDG-103 is the second RHR pump on that diesel generator's emergency bus. It would not be considered for operation unless both RHR pumps powered from sources other than EDG-103 were unavailable. This condition would only exist following multiple independent equipment failures beyond the design basis of the plant.

As is the case for an operator error following a LOOP/LOCA, and for the same reasons, there is reasonable assurance that operator action to correct these errors would occur in a matter of minutes.

30. Is the qualified load of 3300 KW adequate when operator error is considered?

A. (All) Yes. In addition to technical specificiation limits, procedural controls and operator training are used to minimize the potential for operator error. Further, the design of the plant and its automatic response to events requiring diesel generator operation greatly minimize the need for operator action during the time frame in which the diesel generators will be carrying their maximum loads. When operator action is

initially directed, other than to verify proper operation of automatic equipment, it is to secure or reduce operating loads. Consideration of additional loads occurs only after loads have been substantially reduced as a result of implementing the emergency response procedures.

In the unlikely event an operator erroneously added a worst case load to an EDG coincident with maximum intended demand, the design ratings of the EDG would not be exceeded. Testing and analysis of the diesel generators have demonstrated the ability of these units to carry these loads without tripping or, as shown by the testimony of Dr. Pischinger and Dr. Rau, without adversely affecting the ability of the engines to reliably perform their function. Such an error would be of short duration. Diesel generator load is clearly indicated in the main control room. By procedure, the operator is trained and required to verify diesel generator loading does not ~~to~~ exceed 3300 KW. Such an error would therefore be easily recognizable and promptly corrected.

Operator error affecting a diesel generator is not made more likely by the potential duration of a post-LOCA recovery period. The necessary electrical loads in the plant decrease substantially a short time following a LOCA. Thus, there is more capacity available on the EDGs to accept

additional loads. Moreover, the diesel generators are only used so long as off-site power is unavailable. In the low power licensing proceeding, offsite power has been shown to be reliable, and restoration time following its loss is short. Long Island Lighting Co. (Shoreham Nuclear Generating Plant, Unit 1), LBP-84-45, slip. op. at 40-46 and 82-83 (October 29, 1984). Thus, the diesel generators would be in use, if at all, for only a small portion of the potentially longer post-LOCA recovery time.

Even if an operator error resulting in loading greater than 3300 KW on an EDG were assumed to cause failure of that EDG, that failure would be within the design basis of the plant. There is no single operator error which can simultaneously increase the load on two or more diesel generators. The IET has demonstrated the independence between the various power sources and their associated load groups. Shoreham has three independent diesel generators, any two of which provide sufficient capacity to ensure safety for any design basis event. The loss of more than one EDG due to operator error, or other failure mechanism, can be postulated only if multiple, independent failures are assumed. No such assumption is required by NRC regulations. In implementing the single failure criterion embodied in 10 CFR Part 50, Appendix A, an operator error constitutes a single failure.

For all of these reasons, the potential for operator error does not call into question the adequacy of the 3300 KW qualified load.

31. What assurance is there that the allowed operating band of 3300 ± 100 KW did not result in an inadequate confirmatory test run?

A. (All) The confirmatory test to accumulate 10^7 loading cycles at or above 3300 KW on EDG 103 was comprised of two parts. First, the number of hours of operation accumulated at or above 3300 KW on EDG-103 (221 hours) prior to the decision to establish a qualified load was determined. Then, the remaining required hours were accumulated during an endurance run conducted solely for this purpose. This endurance run was conducted for 525 hours, and it was during this test that an operating band of 3300 ± 100 KW was established.

The 525 hour endurance run was conducted under operator control to maintain a load of 3300 KW ± 100 KW on EDG-103. Readings were taken of the EDG-103 KW output every 30 minutes. Of the 525 hours, only 20 hours were recorded at loads below 3300 KW. No load was recorded below 3250 KW. 81 hours were recorded at loads above 3300 KW, with no load above 3400 KW. This shows that only a short amount of time during the endurance run was at loads below 3300 KW. More operation occurred at

loads greater than 3300 KW than below it. As the testimony of Drs. Pischinger and Rau shows, this test, when combined with previous testing at or above 3300 KW, adequately demonstrates 10^7 loading cycles at the qualified load. Thus, the allowed EDG load control band did not affect the adequacy of the confirmatory test to demonstrate reliable operation at 3300 KW.

32. What assurance is there that the diesel generator load meter accuracy was adequate for purposes of the endurance run?

A. (All) We have previously testified to the accuracy of the EDG-103 load meter. The EDG-103 load meter was calibrated on October 1, 1984, one week prior to the commencement of the EDG-103 endurance run, and calibration was rechecked January 4, 1985. It was found, in the range of 3300 KW indicated, to be accurate to $\pm$ 60 to 70 KW during each of these calibration checks.

With respect to the instrumentation, the diesel generator generator was operated during testing, just as it will be operated in the future. Thus, the test was representative of operating conditions and demonstrates that when run at an indicated load of 3300 KW, the diesel will operate reliably. The qualified load of 3300 KW, as indicated during the test, is the same indicated load to which the diesel will be limited in

operation by technical specifications and procedures. Even if the actual load represented by that indicated load is slightly different, it is of no significance because the addition of manual loads will be procedurally restricted by the total load as indicated on the load meter, while the automatically connected loads, as demonstrated by the IET, will be well below the qualified load indicated during testing.

ATTACHMENT A

JACK A. NOTARO
Outage and Modifications Manager
Long Island Lighting Company

Assigned as Outage and Modifications Manager in May 1984. Responsible for the implementation of design changes to plant systems or equipment as required by the regulatory agencies or for plant operational/reliability considerations. Specific duties include supervision of the Planning and Scheduling, Modification Engineering and Outage Planning sections to maximize station availability and to optimize the size of the modification related work forces.

Graduated from City College of New York in 1970 with a Bachelors Degree in Mechanical Engineering. Received a Masters of Business Administration Degree in 1974 from Adelphi University.

Completed the General Electric Co. Boiling Water Reactor Simulator Program in July 1976, and obtained certification as a Senior Reactor Operator.

Obtained NRC Senior Reactor Operator License #SOP-4419 for Shoreham November 1982.

Completed the following industry seminars and training programs:

(a) BWR Design Orientation - General Electric Co.

(b) BWR Technology - General Electric Co.

(c) Nuclear Power Plant Technology - General Physics Corp.

(d) BWR Observation Training - General Electric Co.

(e) Degraded Core Conditions - General Electric Co.

(f) Refueling Activities - General Electric Co.

(g) Radiation Protection - LILCO Evening Institute

(h) Basic Applied Health Physics - Brookhaven National Laboratory

(i) Vibration Analysis - IRD Mechanalysis, Inc.

(j) Statics, Strength of Materials & Dynamics - LILCO Evening Institute

(k) Management of Maintenance Storekeeping & Inventories - Management Dynamics Institute

(l) QA for the Nuclear Industry - Stat-A-Matrix and General Physics Corp.

(m) Inservice Inspection and QA During Operations - Southwest Research Institute

(b) Basic Radiography - Corvair Division of General Dynamics

(o) Magnetic Particle & Liquid Penetrant Testing - Magnaflux Corp.

(p) Basic Ultrasonics - Automation Industries

(q) Nuclear Power QA - Long Island Section of AQSC

(r) Inservice Inspection Symposium - Mirror Insulation

(s) Operations Quality Assurance - Stat-A-Matrix

(t) Reactor Research Training - Brookhaven National Laboratory

1983 - 1984

Assigned as the Shoreham Chief Operating Engineer in April 1983. Responsibilities include the formulation and implementation of the training programs for all Station personnel; development and review of the Operations, Training and Security Sections of the Station Operating Manual; and the overall management of the Operations, Training and Security Sections of the Station.

1978 - 1983

Assigned as Operating Engineer of the Shoreham Nuclear Power Station in July 1978. Responsible for the development and implementation of the Station's operational activities including the direction of day-to-day operation of the unit; startup, operation and shutdown of all station equipment; implementation of initial, requalification and replacement training programs for licensed and unlicensed operators; the development, review and implementation of the Operations Section of the Station Operating Manual.

June 1981 - August 1981

Assigned to the Operations Section of the Millstone Nuclear Power Station. The scope of this assignment included power operation training at greater than 20% power. The assignment encompassed three months of actual hands-on experience in a two-month calendar period.

Participated in weekly and monthly routine BOP and NSSS system surveillance testing. Participated in high risk I&C Operations equipment and system surveillance testing. Witnessed TIP traces and conducted heat balances, core flow calculations were conducted with and without main computer available. Participated in power downs from 100% power to complete control rod repositioning and repairs to main condenser cross-over valving. Assisted in maintaining power at less than 25%, as required by Tech Specs, as a result of main computer problems. Witnessed implementation of emergency notification procedures.

Manipulated controls for power downs, return to power, Tech Spec LCO's, control rod repositioning, and stuck control rod surveillance testing. Witnessed and participated in half scram and full scram recoveries, subsequent investigations, evaluations and notifications.

In addition to the above, attended daily Plant Manager's Unit and Unit Superintendent's meetings, Operations Department meetings, Plant Operations Review Committee meetings, shift staffing, planning and scheduling evaluations.

March 1981 - May 1981

Assigned to the Operations Section of the Millstone Nuclear Power Station for the completion of the Unit 1 refueling outage. The scope of this assignment included refueling, cold shutdown to greater than 20% power, and greater than 20% power to cold shutdown. The assignment encompassed three months of actual hands-on experience in a two-month calendar period.

Participated in all significant pre and post refueling outage surveillance testing and inspections. Actively took part in refuel bridge operations including control rod removal and replacement, channeled and dechanneled fuel movements, core inspections and verifications, dropped fuel bundle evaluations and recovery. Assisted in the evaluations and calibrations resulting from abnormal nuclear instrumentation indications. Participated in integrated leak rate testing, primary system

hydrostatic pressure testing and drywell inspections, assessed system status and return to normal. Conducted portions of pre-criticality testing including control rod functional, subcritical checks and friction testing. Actively took part in returning the unit to survive from cold shutdown to greater than 20% power including manipulation of controls during plant heat-up.

In addition to the above, participated in daily outage coordination meetings, Operation Department staff meetings, Plant Operations Review Committee meetings, shift staffing and scheduling evaluations.

April 1979 - May 1979

Completed the 160 hour General Electric Company Observation Training Program at Commonwealth Edison Company's Dresden Nuclear Power Station. Modification of the standard observation training program was effected in this instance including direct assignment to Dresden Operations and Clearance for unescorted access.

Dresden Unit 2 was returning from a refueling outage and Unit 3 was returning from a forced outage to replace the main transformer during this training assignment.

On Unit 2, observed significant pre and post refueling outage surveillance testing. Witnessed integrated leak rate testing. Participated in the primary system hydrostatic pressure test and drywell inspections. Observed preparations for an accomplishment of approach to criticality, plant heat-up, transfer to run, placing the main turbine in service and power operation. Witnessed half and full scram recoveries. Manipulated controls to reduce power from 700 MW to 200 MW in preparation for stator cooling system filter replacement.

August 1978

Assigned to the Vermont Yankee Nuclear Power Station to observe startup of the unit following a refueling outage. Witnessed the completion of the integrated leak rate test. Witnessed the primary system hydrostatic pressure test and took part in the drywell inspection. Observed preparations for and accomplishment of approach to criticality, plant heat-up and transfer to run. Witnessed half scram recovery during plant heat-up.

March 1973 - July 1978

Assigned to the Shoreham Nuclear Power Station in the Quality Assurance Section and subsequently promoted to Station Operating Quality Assurance Engineer responsible for the Section in July 1974.

Responsibility included initial development of the operational quality assurance program. Responsible for all aspects associated with its implementation at the station including reviews, audits, surveillance, inspections, selection and training of personnel, development of procedures and instructions, and the utilization of consultants and contractors. Additional responsibilities included licensing and inspection activities associated with the U.S. Nuclear Regulatory Commission and interfacing with external and internal organizations required to implement the operational quality assurance program.

1970 - 1972

Assigned to the Maintenance Section in the Northpower Power Station. Assigned duties included assisting in outages of both a scheduled and forced nature as well as maintaining plant equipment and systems, and completing special projects.

Member of the American Society for Quality Control. Member, Edison Electric Institute - Quality Assurance Task Force (EEI-QATF) and the EEI-QATF Operations Subcommittee.

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February 7, 1985

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Robert G. Perlis, Esq.
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Dear Alan and Bob:

This letter lists errata for LILCO's qualified load, additional block and crankshaft testimony.

I. Errata Regarding Additional Crankshaft Testimony

A. Page 2, line 22, the words "crankshafts were" should read "crankshaft was."

B. Page 6, line 1, the words "Were the crankshafts" should read "Was the crankshaft."

C. Page 8, line 15, the word "crankshafts" should read "crankshaft."

D. Page 8, line 17, the words "crankshafts have" should read "crankshaft has."

II. Errata Regarding Additional Block Testimony

A. Page 4, answer 3, paragraph 3c, first sentence, delete the word "replacement" which appears at the end of the first and beginning of the second lines.

B. Page 6, last line of answer 6, insert the word "during" in lieu of "before."

C. Page 9, delete the term "replacement" the first time it appears in the first sentence of the second paragraph.

III. Errata Regarding Diesel Generator Qualified Load Testimony

A. The portion of answer 2 on pages 1 and 2 is set forth fully below with the revisions underscored.

(Dawe) My current position, to which I was appointed in February, 1985, is Supervisor of Projects within the Nuclear Technologies and Licensing Division of Stone & Webster (SWEC). I am responsible for technical and administrative supervision of personnel assigned to SWEC headquarters projects, including field assignments.

I joined Stone & Webster in 1973 as an Engineer in the Licensing Group. In January 1974, I was assigned as Licensing Engineer for the Shoreham Nuclear Power Station (SNPS) under construction, and was Lead Licensing Engineer from 1976 to 1980. In this capacity, I was responsible for all licensing related activities for SNPS, including preparation of the Final Safety Analysis Report. From 1980 through 1984, I held the position of Supervisor of Project Licensing within the Licensing Division. My duties included assuring project awareness of regulatory requirements and developments, assuring proper and consistent application of SWEC licensing policies, and consulting with projects and clients on licensing issues. I have had additional assignments at Stone & Webster including development of company positions for NRC Regulatory Guides and Lead Licensing Engineer for the Special Projects Group of the Operations Services

Division. I am also the Stone & Webster representative to, and participating member of, two subcommittees of the AIF Committee on Reactor Licensing and Safety.

B. Page 5, eighth line from the bottom, insert "generators" in lieu of "operators."

C. Page 16, third and fourth lines from the bottom, should be changed to read as follows: "approximately 22 minutes every 48 minutes during the operation of the diesel (at 3300 KW) . . . ."

D. Page 25, line 2, change "Revision 7" to "Revision 9."

E. Page 25, lines 3-4, delete "(iii) SP 29.015.04, Revision 0, 'Loss of Coolant Accident Coincident With a Loss of Off-Site Power,'" and change "(iv)" to "(iii)."

F. Page 25, line 5, change "Revision 4" to "Revision 5."

G. Page 25, second line of second full paragraph, change "LOOP/LOCA" to "LOOP" and change "SP 29.015.04" to "SP 29.015.01."

H. Page 26, fourth line from bottom, insert "such as" for "for."

I. Page 27, answer 22, third line, change "February 1, 1985" to "February 1985."

J. Page 32, delete the last sentence on the page which reads "The CRD pumps cannot be restarted as long as a LOCA signal is present."

K. Page 33, line 3 of answer 29, delete term "automatic."

L. Page 33, answer 29, fourth line, insert "3741.8 KW" in lieu of "3839.2 KW" and "3575.2 KW" in lieu of "3627.6 KW."

M. Page 34, second and fifth lines, substitute "runout" for "design."

N. Page 34, first line of last paragraph, insert the figure "999 KW" in lieu of "1022 KW."

O. Page 34, last paragraph, line 3, insert "3707.9 KW" in lieu of "3867.3 KW" and delete the parenthetical sentence which follows.

P. Page 36, third line from bottom of first full paragraph, delete "to."

If the County and Staff plan to submit testimony errata at the time of the hearing, it would be helpful if you would send it to us in advance of the hearing.

Best wishes.

Sincerely,

T. S. Ellis, III

75/403

cc: Service List

MR. ELLIS: With that, Judge Brenner, the LILCO panel is ready for cross-examination.

JUDGE BRENNER: All right.

The County.

CROSS-EXAMINATION

BY MR. DYNNER:

Q Good morning, gentlemen. I think I have met all of you. As you know, I am Alan Dynner, representing Suffolk County in this proceeding.

Mr. Youngling has heard my little speech before, and in case, Mr. Notaro or Mr. Dawe, you haven't heard it, let me briefly remind you as to the way I will be asking questions.

If I ask a question which is not directed to any individual, then any of the three of you that feels most qualified should answer the question. Those who agree remain silent. If you disagree with the speaker, please speak up.

If I address a question to any one of you specifically, I would like that individual to please respond first, and then if any of you want to add something that is responsive to the question, you will have an opportunity to do so.

If you don't understand one of my quetions, and your counsel doesn't jump in first, please tell me you don't

understand and I will try to clarify it. And if you can't hear me, say so.

JUDGE BRENNER: If I could lengthen Mr. Dynner's little speech slightly, if he is directing a question to the panel, your choices aren't limited to agreeing or disagreeing with the witness who answers first. If you have something you want to add, whether it be in agreement or disagreement, as long as it is still responsive you can answer.

Go ahead, Mr. Dynner.

MR. DYNNER: Thank you.

Judges Brenner and Morris, I am going to start with a few questions at pages 8 and 9 for the cross-examination.

BY MR. DYNNER:

Q Am I correct that your testimony is that procedural controls are in effect which would minimize the likelihood that an error by the operator would result in the EDGs running at greater than 3300 kw?

A (Witness Youngling) Yes, Mr. Dynner, our testimony is that the procedural controls will minimize the potential for an error to overload the diesel generators.

Q Would you please state for the record and for me each of the procedural controls that you are relying upon for that purpose, naming, if you will, the revision as well

as the procedure number that you are referring to?

A (Witness Notaro) Mr. Dynner, on page 25 of our testimony we have listed the procedures we feel will provide the guidance to the operator in maintaining less than 3300 on the diesels.

A (Witness Youngling) Mr. Dynner, I also would like to add that that description goes on to page 26 also.

Q If I may add, on page 26 it says:

"In addition to these procedures, a number of other procedures have been or will be modified...."

and it proceeds to list three additional surveillance procedures. Those procedures have in fact been modified.

A (Witness Notaro) At the bottom of the page there is also an indication that minor revisions will be incorporated into specific system procedures. That would also address the 3300 loading.

Q All right.

So as I understand it, you are relying for your testimony on the procedures beginning at the top of page 25, which is SP23.307.01, Revision 12, emergency diesel generators, SP29.015.01, Revision 9, loss of offsite power emergency procedure, SP29.023.01, Revision 5, level control emergency procedure, and then, over on page 26 you refer to SP24.307.01, emergency diesel generators start and load

test.

What revision of that procedure are you relying upon?

A (Witness Notaro) 24.307.01, Rev. 9., 24.307.02, Revision 8, and 24.307.03, also Revision 8.

Q Now you also refer on page 26 to operating procedures such as.... and then you state a number of the procedures.

Would you please identify for me which specifically are all of the other procedures that you are relying upon in your testimony, and the revision number?

A (Witness Notaro) The core spray procedure would be 23.203.01. I believe that revision number is 14.

Q Sir, could you give that to me one more time with the number?

A (Witness Notaro) The core spray would be 23.203.01, and I believe the revision number is 14.

Q Thank you.

A (Witness Notaro) Service water is 23.122.01. I believe the revision number to that will be Revision 11.

Q You say will be Revision 11?

A (Witness Notaro) Yes. What I have as a reference is an information copy. I believe the Revision Numbers will be 14 and 11, but I'm not sure.

Q But you're giving me revision numbers of

procedures which are currently approved by LILCO?

A (Witness Notaro) Currently approved; that's correct.

The low pressure coolant injection procedure would be 23.204.01, and I believe that revision is 2.

Mr. Dynner, the last procedure, low pressure coolant injection, that revision should be 3.

Q The next-to-the-last sentence on page 26 was revised in your testimony. It used to say that:

"Minor revisions have been or will be made to operating procedures for...."

and now it says:

"....operating procedures such as...."

Now I want to be sure that you're giving me all the procedures you are relying on, not just examples. Can you confirm that you have given me all of the procedures that you're relying upon?

A (Witness Notaro) Mr. Dynner, the procedures that we identify in the testimony were given as examples because we are still reviewing all of the system operating procedures.

As an example, we have modified the suppression pool leakage return system procedure, which is 23.702.04, Rev. 4.

We will be going back and reviewing those system procedures that are identified on the load table in 29.015.01, and we will be reviewing those individual system procedures for incorporation of appropriate caution statements, if necessary.

Q Do I understand your testimony is that you cannot now give me today an exhaustive complete list of all of the procedures that you are relying upon, that LILCO is relying upon, to ensure that the EDG's won't operate at above 3300 KW?

A (Witness Notaro) No, what I am saying is that the listing that we provided plus the system procedures on the load table in the back of 29.015.01 constitute that group of procedures that LILCO will utilize for controlling the 3300 load limit.

Q How many systems procedures are listed on the load table that you are referring to?

A (Witness Notaro) If I may, we can go through

the listing on that load table in back of that procedure to give you the indication of those system procedures that would be utilized or are going to be included in this review.

Is that what you would like me to do?

Q Yes. How many are you relying upon means -- your answer is that you are not going to rely on all of the system procedures on the load table and you want to tell me which ones you are going to be relying on, is that correct?

A (Witness Notaro) No. My answer was that we will be looking at all of the system procedures for loads on that load table for inclusion of the caution statements.

It is significant, I think, to note that these loads now that are listed on this load table are the loads which would not come on during a LOOP/LOCA. These are the loads that are automatically shed, but we have decided that we will evaluate each of the system procedures and decide whether or not a caution statement is appropriate anyway. In each of these system procedures, they will not affect -- adversely affect the 3300 load.

Q And I understand that as of today you have not completed that evaluation of the system procedures, is that right?

A (Witness Notaro) We have not changed the system procedures to add that caution.

Q Is the only reason that you are reviewing these system procedures to determine whether or not to add a caution?

Is the only reason that you are going to review these system procedures on Table 1 for the purpose of deciding whether or not to add a caution to the operator?

A (Witness Notaro) That is correct.

Q And when do you expect to complete your review of these procedures, if you have a timetable?

A (Witness Notaro) These would all be determined before we declare the three engines operable to tech specs.

Q Can you be a little more precise than that? Do you have a timetable? Did you decide you are going to do this within the next week or the next 10 days or the next month?

A (Witness Notaro) Within the next six to eight weeks.

Q Six to eight weeks?

A (Witness Notaro) That is correct.

Q And looking at Table 1, can you now tell me how many of these procedures that you have already reviewed, if any, for the purpose that we are talking about?

A (Witness Notaro) The diesel generator procedure which would encompass the loads on the back of page 2 of 2.

Q The question is: how many of the procedures

that are listed there have you completed reviewing?

A (Witness Notaro) That would be one procedure.

Q You completed reviewing one procedure.

And what is the title of that procedure, please, and the number?

A (Witness Notaro) 23.307.

Q 23.307.01, and which revision?

A (Witness Notaro) 12.

Q And how many procedures still have to be reviewed from this list on Table 1?

A (Witness Notaro) 13 or 14.

Q You don't know whether it is 13 or 14?

A (Witness Youngling) Mr. Dynner, Mr. Dawe and I went through the listing. He came up with one number; I came up with another. So it is either 13 or 14.

Q If you haven't reviewed those procedures recommended in order to determine how they will affect controlling the load to 3300 or below, how do you know that all that will be necessary to do will be to add a caution or not?

A (Witness Notaro) It is not that they are necessary to control the load. I think if you reviewed the table, at the top of the table, page 1 of 2, it says that the following loads control for the main control room trip, loss of offsite power with a LOCA signal.

I think the significant point here is that before the operator ever gets to making a decision based on these loads he has gone through the immediate actions. He has also gone through the emergency shutdown procedure and thereby would be looking at level control, containment control in the reactor itself.

By the time the operator has to make a decision as to whether or not one of these loads should be placed on, he will not be anywhere near the 3300 load.

Q Yes, but that is not my question, Mr. Notaro.

My question was: how do you know if you haven't reviewed these procedures yet that the only change you might have to make is to add a caution? How do you know you might not have to do something else?

A (Witness Notaro) Because the only indication that we would have to put in this procedure would be an indication to the operator that he verify that the diesel generator load was not in excess of 3300 as these loads relate to a LOCA or a loss of offsite power. And if he has gone through the immediate actions, which he will have, of this loss of offsite power and the emergency shutdown procedure, by the time he gets to having to make a decision as to whether or not he wanted to add a discretionary load as listed on this table he would not be anywhere near the 3300 KW load.

Therefore, the only thing that the indication of a caution would be -- in the procedure would be a simple reminder. The reality of his need for taking some action predicated on this particular load or any of these loads on the table would not in reality pose any problem to the 3300 load whatever.

Q But the reality is, isn't it, Mr. Notaro, that if you haven't reviewed the procedure you really don't know whether you might have to add another phrase or another clause to it?

A (Witness Notaro) No, I think I do know. I think, predicated on the fact that we haven't run the IET and that the LOOP/LOCA loads were nowhere near 3300, or in fact 3100, that when the operator goes through the immediate actions of this procedure or emergency shutdown procedure or the level control procedure he will have stabilized conditions within the reactor, have control of containment, and the loading on the diesel generators will be nowhere near 3300, such that if he had to make a decision based on subsequent actions in this procedure and they had a discretionary load he would not have to be concerned about the 3300 number, and I feel very confident of that number.

MR. DYNNER: If the record could show that I am withholding my next question while the witnesses are talking to each other.

BY MR. DYNNER:

Q Would you like to add something?

A (Witness Notaro) The significance of the individual system procedure is more a "how to." The system procedure would be identifying to the operator that this is the manner in which you were to put a load on, what switch to turn, what indicating might be looked at, as opposed to the emergency procedure, which would be telling him when to put that load on.

So, again, the significance of adding the caution statement to the system procedure is not going to be relevant in terms of what the operator has experienced, and it will make this emergency procedure.

Q Do I understand then that you are not relying on these procedures in order to control the possibility of the operator adding more load than the 3300 maximum?

A (Witness Notaro) We will be evaluating the system procedures to determine whether or not it is appropriate to add an additional caution statement to the system procedures, but in fact we do not believe that when any operator gets to the point of having to decide whether or not he wants these discretionary loads should be placed on, that he could be anywhere near the 3300 number.

Q My question is a simple one: are you relying on these procedures, or are you not, or don't you know? Which

of the three?

A (Witness Notaro) I am sorry?

Q Are you relying on these procedures on Table 1 as the basis for your testimony, or are you not relying on them, or don't you know at this time? Which of those three is your answer?

(Witness panel conferring.)

MR. DYNNER: I have to revise my estimate of how long this is going to take, Judge, because there has been a big long pause.

JUDGE BRENNER: We may revise your revision, but I heard you anyway.

Incidentally, I take it, to make sure I am still following this, Mr. Dynner, your reference to Table 1 is Table 1 of the loss of offsite power emergency procedures referred to at the top of page 25 of LILCO's testimony?

MR. DYNNER: Yes, sir. It is my understanding that is the systems procedures on the load table that the witnesses were referring to.

BY MR. DYNNER:

Q Is that right, gentlemen?

A (Witness Notaro) Yes, that is correct.

Could you please repeat the question?

Q Yes. It is a simple question. Of all these procedures, the 13 or 14 that you have referred to that

you still have to review, which ones, if any, are you relying upon for your testimony, or are you not relying on them, or don't you know?

A (Witness Notaro) We will rely on all procedures to operate the plant, including the 13 that are on that list.

Q My question, Mr. Notaro, had nothing to do with how many procedures you are relying on to operate the plant.

MR. ELLIS: Would you like the witness --

MR. DYNNER: I want to make sure he is not answering the long question.

JUDGE BRENNER: Let him refocus the question.

Go ahead, Mr. Dynner.

BY MR. DYNNER:

Q What we are talking about is in order to, as you testify here, your testimony, that you have procedures to control and minimize the possibility that an operator error may result in operating the EDG's at more than 3300, and I am asking you and have been trying to ask you specifically which procedures that you are relying on for that testimony, not which procedures you are relying upon for the overall operation of the plant for that testimony.

And you have now told me that there are 13 or 14 procedures that still have to be reviewed.

Are you relying on those 13 or 14 procedures for your testimony, are you not relying upon them, or don't you know at this time?

A (Witness Notaro) We would be relying on a review of those 13 or 14 procedures to add a caution if we deem it necessary, all 13 or 14 precedures.

Q Let me try it one more time.

JUDGE BRENNER: Mr. Dynner, let me try something.

Mr. Notaro, or anyone on the panel for that matter, if I understand it so far, you have put all those procedures in that Table 1 to which you have referred in that same category; that is, the category of loads that are automatically shed or otherwise are not connected to the diesels after the initial emergency procedures, yet may represent procedures for manually connecting equipment to the diesels later on.

I think the question that Mr. Dynner might have, given the fact that so far you have put them all in that same general category, yet nevertheless have also said you are going to review them to determine whether or not this cautionary type statement that you have talked about might or might not have to be added leads to the question of what type of criteria do you have in mind for those procedures as to whether you might have to add such a statement to some

of them but not others.

It sounds like either they all need such a statement or they all don't, from what I have heard so far. So you must have some further distinction in mind.

WITNESS NOTARO: The only caution that we would add, Judge Brenner, would be the same type caution that we have already got throughout the emergency procedures and the system-oriented procedures of not exceeding the 3300 number. That would be the extent of the caution to be added.

JUDGE BRENNER: But you said you are going to have to review those 13 or 14 procedures to determine whether to add such a caution, and my question then is what criteria would you apply to determine whether such a cautionary statement or statements would be necessary in a procedure?

WITNESS NOTARO: More in terms of the timing to get through the cycle of actually revising the group of procedures as opposed to the technicality of the number that would be included in the caution.

There is more of an administrative concern than there is a technical concern, which is why we took so long on agreeing on a schedule for accomplishing it.

Does that --

JUDGE BRENNER: I am afraid I don't understand

now.

WITNESS DAWE: Judge Brenner, I think what we are trying to say, not very artfully, is that you can't look at any one procedure in a vacuum because an operator is directed to different type of procedures given different initiating events, symptoms he recognizes, and so on.

That is why the answer is that we rely on all the procedures. The 13 or 14 individual system procedures are the procedures which tell the operator how to operate the system, to either get it lined up for Mode A or to line it up for Mode B and how to test the system versus how to operate during normal operations.

We did not originally believe that those procedures needed that caution. Part of the Staff's concern in the review is whether they did or not.

The answer to your specific question is we will decide whether all of the procedures or none of the procedures need that caution.

JUDGE BRENNER: I see. So don't expect to end up with the result that you would add to some of those procedures but not others?

WITNESS DAWE: That is correct. That does not mean that the procedures one way or the other are not relied upon for proper operation of that system.

JUDGE BRENNER: Mr. Dynner.

BY MR. DYNNER:

Q So since you haven't reviewed these 13 or 14 procedures, it is fair to say, isn't it, that at the present time you don't know whether you are going to rely on those procedures or not rely on those procedures to limit operation to 3300 KW? Isn't that right?

A (Witness Notaro) It is, as I stated before, not a concern for controlling the 3300 number. It was not a concern before; it won't be a concern in the future; it won't be a concern of whether the decision is to add the caution statement or not.

The operator would have already completed all the immediate actions of the procedure. He would be nowhere near the 3300-kilowatt load when he made a decision as to whether or not to apply one of these discretionary loads further on in the subsequent action of the procedure.

So it is not going to be a problem or a concern.

Q So you are not relying on them to control or limit operation to 3300, is that right?

A (Witness Dawe) Mr. Dynner, I don't think we are communicating on the same definition of the word "reliance." The emergency operating procedures, the higher level procedures, are the ones which are of primary importance in identifying to the operator those cautions that he needs to take given the conditions the plant is in.

To execute the loss of offsite power procedure, where in a subsequent action it directs him to initiate an action such as starting one pump in each loop of the reactor building closed loop cooling water system, there is behind that statement a procedure which tells him how to align that system and start that pump.

The caution in the configuration of being in a loss of offsite power is contained in the loss of offsite power procedure.

For absolute consistency, if somebody wanted to postulate that somebody without any training were going to use these procedures at the same time and take out the reactor building closed loop cooling water system procedure and say this procedure doesn't caution me not to start that pump on a diesel generator if the diesel generator is currently exceeding 3200 KW, then I would be willing to put the caution statement in to satisfy somebody's concern. But I don't believe it needs to be there because in the operation of this procedure he has the caution statement.

We may or may not put the caution statement in the lower order procedure to satisfy somebody else's concerns. We didn't think that was necessary when we did our first procedural revision.

If ultimately, and primarily because of Staff questions asked during their past or future reviews, they

indicate they would like that type of caution statement for consistency between the procedures, we don't have any problem putting it in. We don't necessarily believe it needs to be in there.

Do we rely on all these procedures for the proper operation of the closed loop cooling water system, not only during the loss of offsite power but any other time? Yes.

Q Mr. Dawe, this Board has to make a decision on whether or not the procedures are adequate, as you say, in Question 21 that you are responding to on pages 24 through 27, whether or not the procedural guidance provided the operator will ensure that the qualified load of 3300 KW is not exceeded on any EDG.

Now, in order for the Board to make that decision and in order for the County or the State of New York to understand what you are going to -- what might need to be settled or discussed or to address ourselves to the issue, we have to know what procedures you rely on in answer to Question 21.

Question 21 is clear. It says: "Please describe the procedural guidance provided for the operator to ensure that the qualified load of 3300 KW is not exceeded on any EDG."

And what I have simply been trying to get at for the last half hour is for you to give me a list of the

procedural guidance that you responded to that question with so we know what to address and we know what you are relying upon.

And, frankly, I would like to ask you again now, with that clarification, to please answer the question as of today, right now, are you relying on the 13 or 14 procedures, are you not relying on them, or don't you know until you finish reviewing them?

MR. ELLIS: Objection. Asked and answered. Mr. Dawe just answered it.

JUDGE BRENNER: I am going to sustain the objection. We understand the testimony and will match it up with your question.

As a minor point, when you asked the question the last time, Mr. Dynner, I don't think you asked the question you wanted to ask because you are going to get the answer that they rely on all procedures.

But nevertheless let's move on.

BY MR. DYNNER:

Q Now, forgetting for a minute -- and you have now given me all the procedures that you are relying upon for the answer to the Question 21, is that correct?

MR. ELLIS: I think I just objected to that very same question.

JUDGE BRENNER: I am going to sustain it again.

Move on to another question, Mr. Dynner.

BY MR. DYNNER:

Q Has any of the procedures that you referred to in answer to these questions I have been posing been approved by the Staff as adequate for the purpose of ensuring that the qualified load doesn't exceed 3300 or that the operation of the EDG will not exceed 3300 KW?

A (Witness Youngling) Mr. Dynner, I think you are going to have to ask the Staff that question.

Q I am asking you. Has the Staff communicated to you any approval of any of those procedures?

A (Witness Youngling) They have not communicated either approval or disapproval.

Q Have they suggested any revisions to any of those procedures?

A (Witness Youngling) Prior to the revisions that we listed in our earlier testimony, yes, they did suggest some changes.

Q I am talking now about the revisions that you have given me to the particular procedures that you have listed.

Are you in the process now of doing any more revisions to any of those procedures with the revision numbers you have given me which would in any way change the substance of those procedural guidelines?

(Witness panel conferring.)

A (Witness Notaro) There is one procedure that we are contemplating a change to now, and that is the surface water procedures. That number is 23.122.01, and the revision is to include both surface water pumps on the 103 diesel, Pump C and Pump D, but there is a flexibility of which pump the operator takes to pull the lock. He will have a choice, as opposed to being locked into one pump. So we are just adding both pumps in lieu of what the procedures said originally as one pump.

Q Are there any procedures which are currently under preparation which would supplement these procedures for the purpose of controlling operation of the EDG's to not exceed 3300 KW?

A (Witness Notaro) No, there are none.

Q Are there any procedures that deal with the training plan or training program in order to train operators not to exceed 3300 KW?

A (Witness Notaro) I am sorry, could you please repeat that?

Q Are there any procedures that deal with any training program or training plan in order to train operators not to exceed 3300 KW?

A (Witness Notaro) Are you asking me if one exists or if one is being developed?

Q If one exists.

A (Witness Notaro) One does exist.

Q And you relying on that procedure for the purpose of controlling operation of the diesels not to exceed 3300 KW?

(Witness panel conferring.)

A (Witness Notaro) The procedure that exists for training of operators will not be changed.

Q My question is: and is that the procedure that you are relying upon to train the operator not to exceed 3300 KW?

A (Witness Dawe) Mr. Dynner, if you are asking for a procedure, the procedure requiring training and the frequency of training is not going to change. If you are asking about lesson plans or the content of training for any one item, then we may have different answers.

The lesson plans have been changed.

Q What is the procedure number that establishes the training requirements that you are referring to?

A (Witness Notaro) I don't remember the number of that procedure offhand. It was an administrative procedure within the station operating procedure manual, and it addresses the requalification training program.

Q As I understand it, the substance of the training to be given would be set forth in a lesson plan, is that

correct?

A (Witness Notaro) That is correct.

Q And have those lesson plans been completed?

A (Witness Notaro) A lesson plan has been developed for the 3300 load.

Q Has it been approved?

A (Witness Notaro) Approved by whom?

Q By LILCO.

A (Witness Notaro) Yes, it has.

Q Has it been published?

A (Witness Notaro) The Staff has been given a copy of that lesson plan.

Q When?

A (Witness Notaro) Approximately two weeks ago.

Q Was that lesson plan going to be revised, changed, or modified in any way?

A (Witness Notaro) Not to my knowledge.

Q Is the lesson plan which you refer to the only document that would provide substance as to the necessary training in order to control operation of EDGs not to exceed 3300 Kw?

A (Witness Notaro) There was also required reading as a mechanism or training, whereby operators were issued material to review and to sign off on that addressed the 3300 load limit. And that's already in progress.

Q Anything else you would like to add before I go to another line of questions?

A (Witness Youngling) No, we have nothing.

Q Am I correct that 3300 Kw is the rated load for the EDGs for all purposes?

JUDGE MORRIS: Mr. Dynner, excuse me; I foresee a semantics problem if we don't get started off on the right foot with our terms -- qualified load, rated load, short-term load, continuous load, and so on.

MR. DYNNER: I'll try and clarify that question; that you, Judge Morris.

BY MR. DYNNER:

Q Is it correct that the qualified load for the diesels is 3300 Kw, as set forth in Revision 34, which is the FSAR amendment?

A (Witness Youngling) Yes, it is.

Q And am I also correct that the qualified load

will be used for all purposes, as set forth in Section 8.1.4. of the FSAR? I'll read that for you in order to make the record clear.

A (Witness Dawe) Mr. Dynner, we have that.

Q Yes; I'll read it into the record in the event that the Board doesn't have it in front of them. The relevant part of Section 8.11.4, entitled "On-site AC Power System," says -- and I quote:

"Each diesel generator has a qualified load of 3300 Kw. The nameplate ratings are retained in the FSAR as these ratings were used in the design and initial testing phases. In the future, however, the new qualified load will be used for all purposes."

BY MR. DYNNER:

Q Do you agree that the qualified load of 3300 Kw will be used for all purposes?

A (Witness Dawe) Yes, until such lifetime as the licensing basis of the plant changes.

Q Am I correct, then, that there is no two-hour or other short-term overload rating which is now applicable; that is to say, Section 8.3.1.1.5 of the FSAR does set forth some ratings including a two-hour rating for a 24-hour period and a 30-minute rating of 3900 Kw, and that those short-term ratings are in the FSAR because they were the ratings that were originally used in the original, or

initial testing; is that right?

A (Witness Dawe) I don't believe that's correct the way you've characterized it. Those ratings of the machine are still the ratings of the machine. The licensing basis that we have asked for in the FSAR is licensing any qualified load of 3300, which means that we will not take advantage of the ratings on the machine.

We believe we have demonstrated in this FSAR submittal that with a qualified load of 3300 kilowatts, and looking at the load profiles for the worst case situation, that we have a single qualified load.

If you want to look at what that does relative to other types of terminology, we believe that is essentially an overload and a continuous and any other kind of load level of rating you want to call it, because we found the expected loads on a diesel with a qualified load.

But the machine still has its ratings, continuous rating and two-hour rating. We just are not using that as the licensing basis of the plant at this time absent a decision from the NRC on the DRQR, or this Board, on those ratings.

For the purpose of qualified load it is a single load that we state for which the diesel is qualified.

Q So that when you say the qualified load of 3300 Kw will be used for all purposes, you mean that that is, in

effect, the continuous load and the short-term load rating for the diesels in the future until there is another possible amendment to this FSAR; is that right?

A (Witness Dawe) Yes, that is true.

Q And that means, as I understand it, that you won't operate those diesels at above 3300 Kw, and you're going to put that into the form of a technical specification as well; is that right?

A (Witness Dawe) We do not intend or anticipate to operate those diesels above 3300 Kw except, as we have identified in our testimony, for surveillance testing, when the operator would be allowed plus or minus 100 Kw for practicality of testing purposes at 3300 Kw. But we would still be testing for a mean 3300 Kw. That would not be saying to test it at 34 or to test it at 32. We test at a mean value of 3300.

But to conduct a test we must give the operator a band, otherwise we will most likely violate our test procedure and never complete it; because you can't maintain a continuous load exactly in a test for that length of time.

Q Do you agree with your counsel's statement this morning, as I understood it, to the effect that the real continuous load on these diesels is about 2600 Kw?

A (Witness Youngling) Yes, I do agree with that statement.

Q Why didn't you provide in your FSAR amendment that there was a continuous load of 2600 and an overload of 3300, if that's what you say you now meant?

A (Witness Dawe) We didn't say we meant that, we say we agree that the real load profile is at the range that counsel stated earlier.

The qualified load concept comes from the Staff SER and discussions with the Staff, and it is a single number. We, in fact, early on proposed testing at a continuous load below peak load with a lower overload qualified load, if you will, and there's just no provision for doing that within the SER.

Q So it's true, isn't it, that there really is no basis for licensing this plant on the basis of the diesels having a continuous load of 2600?

Right now you have a continuous load and an overload, which is the same as a qualified load of 3300; isn't that right?

A (Witness Dawe) I won't agree to that, Mr. Dynner, because I just don't understand.

There is a licensing basis to license this plant at a qualified load per the Staff SER of August of 1984. That qualified load for these diesels is 3300 Kw. And that's what's reflected in this FSAR.

It was also concurred in by the subsequent SERs

of December 3rd and December 18th specifically for Shoreham by the Staff with a qualified load for these machines.

Q My point is that there is no basis for saying that, if you will, the real continuous load is 2600 Kw, because you have already said in here that for all purposes you are using the qualified load of 3300 and, therefore, the continuous load is the same as the qualified load, and it would be 3300; isn't that right?.

A (Witness Dawe) For the diesel, yes, but not for the plant in reality following a given event. We can project what the plant will do, what components will be operating for how long and at what loads, and we can project a load profile.

If you are using a continuous load to express what the machine can operate at continuously, that right now in the FSAR is the qualified load. If you are asking me what continuous load will the machine will really see or be expected to operate at following a particular event, that will be less than 3300.

In the case of a loss of coolant accident or the loss of offsite power we project after one hour that number will not exceed 2617 Kw expected operating equipment, including failures of equipment, including other means. That's part of an analysis of what the plant will do in the long term following a LOCA.

Q And that 2617 is not an adequate basis to meet the requirements of GDC-17 and get a license, is it?

A (Witness Dawe) It certainly is. That is the load that I need to carry for safety in this plant. That's what my analysis shows. That's what my SAR will show if you look at all the constituent parts of that SAR and my accident analyses. As long as my machine will carry more than that on the long term on a continuous basis, then I have met the requirements for that plant in that accident analysis.

I think the difficulty we're having is, you are applying names to apples and names to oranges, and the applies don't look like the oranges, and therefore the names don't look the same, so you can't make the match.

Q Well, in fact, Mr. Dawe, it's true, isn't it, that the original diesels were ones which you sought to qualify under the GDC-17 on the basis of continuous load of 3500 Kw; isn't that right?

A (Witness Dawe) The diesels in the FSAR have, and have had, a continuous rating of 3500 Kw; that's correct.

Q And that's what you thought was necessary in order to qualify the diesels, and that's why we had a 3-month litigation, isn't that right?

A (Witness Dawe) That's what the diesel have a continuous rating of. They don't need to be that high.

They never did need to be that high.

Q But that's what you went to the NRC and to the Board on as necessary to meet GDC-17, and that was a continuous load of 3500; isn't that right?

A (Witness Dawe) I would characterize it as I went to the Board -- and I personally didn't go to the Board, I presented the NRC with a diesel generator with a continuous load of 3500, and it was my position, and still is my position, that that machine with a continuous load of 3500 would satisfy GDC-17.

I am now looking for an interim licensing basis which is stated in the FSAR that the machine has a qualified load demonstrated by testing at 3300. And I still say that meets GDC-17.

Q And with the original diesels you never suggested to the Staff or the Board or anybody else that the diesels should be licensed if they could only do 2600 Kw continuosly, did you?

A (Witness Dawe) I would like you to repeat that question.

Q Yes.

You never suggested to the Board or the Staff or anybody else when you went to get the license on the original -- on the plant with the original EDGs, that the plant should be licensed if the EDGs could only do 2600 Kw

continuously, did you?

MR. ELLIS: Objection. I don't see that that's relevant at all.

JUDGE BRENNER: Mr. Dynner, I don't see the relevance immediately, either.

MR. DYNNER: I think it is relevant, if you will let me get an answer to the question.

JUDGE BRENNER: Why don't you first tell me why you think it's relevant.

MR. DYNNER: It's relevant because we have had statement here made which would indicate that there's some change that occurred in terms of what LILCO thought was necessary as the continuous load between the original diesels and the current diesel engines. And, in fact, there's no basis for that at all.

JUDGE BRENNER: I'm sorry; I'm having the same trouble the witnesses have; I lost what you were saying. No basis for what?

MR. DYNNER: No basis for the assumption, or the statement which has been made on the record that in fact all that's needed because of the new configuration is a continuous load of 2600, and that in fact the greatest load, or the overload, if you will, is 3300.

There was an attempt to characterize that there has been some change in facts. What I'm trying to show, and

it is a fact, and could show if I could pursue this with the witness, is that even with the load configuration of the original diesel engines there was no change to the current ones.

In other words, you had one hour in the original diesels at most where the peak load was up to 3881, and then it dropped down to 2600. And yet LILCO there thought, and proceeded on the basis that it was necessary in order to meet GDC-17 to qualify the diesels at the continuous load of 3500 Kw. They're now using the argument that because the diesels are only going to run for an hour at 3300 and then drop down to 2600, that in reality the continuous load is 2600. That's what counsel said this morning.

What I'm pointing out is that it has always been the case that after an hour or so the diesels would run without operator error at 2617. That hasn't changed. Therefore it is a spurious argument to sat that you're really looking now within the umbrella of the qualified load at 2600 continuous and 3300 short-term.

JUDGE BRENNER: I was looking at the contention while you were giving me that argument, and I have trouble fitting your argument within the contention.

I'm going to grant the objection. You can take a look at some parts of the contention and ask them about why they think their proposed 3300 Kw bounds either parts of the

contention -- cyclic loads, the diesel load, meter instrument error, the operator potential error, the permission for the operator as alleged in subpart A(iii) to maintain the diesel load at 3300 Kw plus or minus 100, and so on.

But it's not pertinent to the contention or to our present consideration as to why they didn't ask for 3300 or 2600 or 4000 or any other number back then. What we do have to do is take a close look at what loads are required and what licensing basis LILCO is trying to establish, given those loads.

So we'll grant the objection.

MR. DYNNER: I perhaps didn't have an opportunity to show you where I thought it was relative to the contention as such.

JUDGE BRENNER: I'm not going to revisit the argument. Move on to another question.

JUDGE MORRIS: Mr. Dynner, if you're going to another area I would like to interject a question.

MR. DYNNER: I can't promise I'm going to another area but please go ahead, Judge Morris.

JUDGE MORRIS: I just want to be clear, Mr. Dawe, that I understood what you said about exceeding the 3300. Did you have in mind transients and cyclical loads when you made that statement?

A (Witness Dawe) Yes, Judge Morris, I did, as explained in our testimony. If you take a very unreal approach to the transient and cyclic loads and simply add them all up and then assume that the maximum emergency service load, that is also a summation of simultaneous operation of loads and design conditions, are real and that there is no margin in the MESL or no margin in reality in the cyclic loads and add them then as our testimony states you could project one diesel for certainly less than three minutes exceeding 3300 by 31 kilowatts which -- other parts of LILCO's testimony address whether that is acceptable for the diesel.

We don't believe that even with the cyclic loads even that one diesel would exceed 3300 because there is margin elsewhere in the calculations to arrive at that number of 3331 for kilowatts for diesel 101 even including all the cyclic loads simultaneously.

JUDGE MORRIS: Thank you.

JUDGE BRENNER: As long as we interrupted you, Mr. Dynner, I would like to ask a question and instead of visiting the past I would like to ask a question about the future. One of your answers -- I believe it was you, Mr. Dawe -- you were careful to add the phrase that this was the proposal for now unless LILCO in the future might seek to change the licensing basis before some forum.

My question is if the loads as presented in the analyses before us now are all that is needed in LILCO's view for an emergency situation, the safety equipment what possible change in the licensing basis are you contemplating or might be be contemplated in the future?

WITNESS DAWE: I'm not contemplating any specific one right now, Judge Brenner, but I've watched this plant grow for 15 years and a lot of things have been added to this plant as a result of regulatory requirements and I can't say that in five years from a new system or a new component or something else won't be required by some regulatory mandate that is not now in the plant, and in lieu

of looking somewhere else to power that component if the diesels are licensable at higher than the 3300 there is no reason why they shouldn't be.

JUDGE BRENNER: All right.

That's all you have in mind then by that phrase?

WITNESS DAWE: That's all I have in mind.

JUDGE BRENNER: So as far as LILCO is concerned now with the present equipment in the plant -- or presently proposed in the plant in case there's something still being put in this week that I don't know about -- the loads that you have presented in your testimony are the only loads that would be -- in which the diesel would be called upon?

WITNESS YOUNGLING: Judge Brenner, we do not anticipate any additions to the diesels with one exception. At the end of the first refueling outage we will have to put the spent fuel pool cooling pumps back on the 101 and 102 engines. They are administratively held in lockout.

JUDGE BRENNER: That's in your testimony. Thank you for reminding me of that, I'd forgotten. Do you present the loads for that in your testimony? I don't remember.

WITNESS YOUNGLING: I don't believe we present the load but they each carry 24 Kw nameplate.

JUDGE BRENNER: Mr. Dynner, back to you.

BY MR. DYNNER:

Q You agree, don't you, that normally the short

term load for an EDG or for a diesel engine in the nuclear power plant is required to bond the cyclic and intermittent loads; isn't that right?

A (Witness Youngling) Mr. Dynner, the IEEE standard of 387-1977 does talk about the short-term load or short-term rating of the engine as bonding the loads during the operating phase. However, the licensing basis for this plant is now the August 1984 SER which defines the qualified load and in that SER there is an allowance for short-term increases above the qualifying load.

Q Yes. I'm not talking about the Staff's position. I'm talking about the fact that you don't, in fact, meet the requirements of the IEEE 387-1977 then, do you?

A (Witness Dawe) I believe we do meet IEEE 387 in that we have a continuous rating and an overload rating for this machine. All we are awaiting at this point in time is completion of the DRQR and I suppose the deliberations of this licensing board to approve the design under that standard. The concept of qualified load -- if you want to say the concept of qualified load has to fit in one way or another into IEEE 387 terminology, I don't believe that that's true. The qualified load is an interim concept presented by the Staff to its SER and that is the concept we are discussing. It's very difficult to say that that meets

all the terminology for -- the terminology of the IEEE standards -- even applies when you're talking about qualified load is the concept of the TDI owner's group SER of August 1984.

I previously said on this record and our testimony says it that we believe if you want to make that type of comparison that the qualified load we have stated is in reality a continuous overload rating because our LOOP/LOCA profiles do not exceed the qualified load.

If we do an unrealistic calculation as we have done in our testimony for one machine for three minutes for 31 Kw, analytically you get to check that number. But we don't believe that number will be seen but there is significant kilowatt margin below that in the actual operation of this plant.

There is conservatism in the MESL's. There is conservatism in the nameplate ratings and the cyclic loads and there's more conservatism when you add these together.

That's the closest I can answer your question, Mr. Dynner, because other than that it doesn't have any basis in the answer.

Q The cyclic and intermittent loads are part of the output capability of the diesel, aren't they?

A (Witness Dawe) Anything that is connected to that diesel is part of the output capability of the diesel

at the time the diesel is providing load to it. The cyclic loads that we have identified in three categories are loads that may operate automatically. Generally, they will automatically operate. The question is in what sequences they will do that but if they are connected they're part of the output of the machine.

Q And it's true, isn't it, that the IEEE standard 387-1977 requires and I quote: "The diesel generator unit shall have a continuous and short-term rating which shall reflect the output capabilities of the diesel." So you don't meet that IEEE standard in that regard, do you?

A (Witness Dawe) I believe we do as I've just explained, we just call it something different under the concept of qualified load.

Q Do you maintain that you meet all the requirements of Reg. Guide 1.9 with respect to these diesels?

A (Witness Dawe) I think it's the same answer. I believe we do. I believe that the concept of qualified load introduces a new concept with new terminology that makes it difficult to make that comparison. But we have stated in the FSAR that we complied in Reg. Guide 1.9 and I believe we still do.

Q Just so I'm clear as to what you're saying -- because you keep introducing the concept of the SER -- I

would like you to assume with me for a minute that there isn't any SER, it's not valid, it's based upon a -- let's just say -- it's based upon a radical departure from past practice of the Staff and it has no basis and therefore I'm asking you that in the absence of the SER the whole qualified load concept it's true, isn't it, that you don't meet Reg. Guide 1.9 and you don't meet IEEE 387 with respect to the diesels, isn't that right, in the absence of the SER, the qualified load concept that you're talking about?

A (Witness Dawe) I see no basis to assume the SER doesn't exist, which it does, which motivated all the activities of the council for months. I still believe we meet IEEE and the Reg. Guide 1.9.

Now, if you want to talk about a specific part of that and you want to look at it I'll explain to you why I believe that but you're asking me to assume something doesn't exist that does, that motivated us to be here. You're asking me if I meet Reg. Guide 1.9. I believe I do. And if you want to look at Reg Guide 1.9, then we can look at them.

(Counsel conferring.)

Q I've got one more question, Mr. Dawe. I just want to make sure I understand what you're saying because I don't understand all of it. Is what you're saying that the cyclic and intermittent loads need not be counted in terms

of the requirements of the IEEE Standard 387 or Reg. Guide 1.9 because the SER says that they need not be counted or is there some other reason that they need not be counted?

A (Witness Dawe) I don't believe I said that.

Q Well, help me out. Why don't they have to be counted as part of the short-term -- within the short-term rating requirement, in your view?

A (Witness Dawe) The qualified load to which we have tested as described in the Staff SER in August was to demonstrate ten to the seventh loading cycle capability at that load. That SER also stated in lieu of testing for ten to the seventh cycles at some qualified load if the machine did not operate in excess of 185 BMEP equivalent that was an interim licensing basis. It also stated in that SER that if a machine generally did not operate in excess of 185 BMEP but it exceeded that for periods of time that machine may still be qualified on an interim basis with evaluation.

That all led to the question if you're going to operate for ten to the seventh cycles at a continuous load, a qualified load, should that qualified load be the equivalent of some overload rating or should it be a continuous rating? It's really looking at an overload rating and the overload rating or qualified rating of 3300 that we have, we believe, bounds the peak load on those easily. It certainly bounds the maximum emergency service

load that we have conservatively calculated and presented in the FSAR in revision 34. When we were calculating the maximum emergency service load -- as our testimony also said and Mr. Youngling can explain more fully -- we discussed that with the Staff to see whether the cyclic loads should or should not be included in the MESL. The results of those discussions, as we understood them, was that they should not be. We identified three categories, relatively small loads, certainly cyclic loads, in some cases one-time loads, that should not be in the MESL and tested for ten to the seven cycles.

Even having done all that if you then, in a most conservative way you can think, add them back in and say -- add them on to the MESL -- we still stayed below the qualified load with the one exception being in our testimony. But even then in reality there's enough margin in that MESL -- as demonstrated by the IET -- tnat the machine will not exceed the qualified load with or without the cycle. And on that basis I believe the qualified is the equivalent of an overload and it's even better than an overload because rather than test it for two hours, we've tested it for 746 at that level.

But beyond that I can't put apples and oranges and say qualified loads describe an IEEE or Reg. Guide 1.9 because it's not. Qualified loads is described in the SER

and in our FSAR. I can make some relationships between them and show you why I think one looks like something else and another one but I can't plug things into slots like you're trying to do because I just don't think it is very meaningful beyond what I just answered.

Q You have given a very complete history. The only thing is I am still not clear. You say you've got the single exception where you have a cyclic load, which you agree in your testimony, would be 33-something. It would exceed 3300 in that single case if you added these coincident cyclic -- if you added all these cyclic and intermittent loads and what I'm trying to find out is why doesn't that exception -- that case in which you exceed 3300 -- why doesn't that mean that you haven't met the requirements of the IEEE standard that you not operate -- that you have a short-term rating that encompasses all the output including the cyclic and intermittent loads.

A (Witness Dawe) I think I've answered that several times. Perhas I should try it a different way. Do I have to meet IEEE 387 to satisfy GDC 17? That's one way to do it.

Q That's not my question.

A (Witness Dawe) I understand that, Mr. Dynner, but your question can't be answered the way you're asking it. I honestly believe that the loading conditions on that

machine will not exceed 3300 even with the cyclic and intermittent loads because of the margins and the calculations that define the MESL and the margin and the assumption of adding the cyclic loads to the MESL to say what a peak load would be.

I do concede in the testimony -- as to the other witnesses here -- that if I do that I can project 3331.4 Kw on one machine for three minutes. I don't really believe that's going to happen and therefore trying to put names from different standards or different directives together, the closest I can come to answering your question is to say that the qualified load most closely relates to the overload rating as described in the IEEE standard.

MR. DYNNER: Page 1 of the cross plan.

BY MR. DYNNER:

Q You mentioned the IET, that's the Integrated Electrical Test, is that right, Mr. Dawe?

A (Witness Dawe) That's correct.

Q And it's true, isn't it, that the IET did not measure individual equipment loads, isn't that right?

A (Witness Youngling) That is correct. The IET did not measure individual loads, however, it did measure the cumulative load on the engines. It also verified that equipment which needed to be running in response to a LOOP/LOCA when it was operating.

Q Well, did the IET cumulative load come in lower than the aggregation of your individual load measurements because there were fewer systems being run during the IET, or was there some other reason?

A (Witness Dawe) I don't think your question quite expressed it correctly in that you asked if it came in below the aggregate measurements of all the individual systems. It came in below the MESL, which is calculated by adding together the nameplate ratings of the components in operation in most cases, with some actually being measured. There are not measured values for every component in the plant.

The reason why it comes in below the MESL is not that equipment was not running, it's that the MESL is conservative. It assumes everything operates at design conditions simultaneously, which really doesn't happen.

Also the MESL takes the nameplate ratings in many cases, and the nameplate ratings are generally conservative because they're based on the sizing of the components when they were procured. And in fact in many cases the components are, I guess for lack of a better term, oversized.

For example, when I bought a major pump I may have bought a 1500 horsepower pump to insure I would get the desired flows. But when I actually piped the systems in the

plant and can look at the actual elevations of the pump houses versus projection points, the diameters of the pipes and the numbers of elbows, and the numbers of intervening flow restrictions such as valve bodies, I don't need the 1500 horsepower that I bought. I may only need 1300 horsepower, or 1250 horsepower, and so on.

So to run that component at its designed ratings in terms of plant parameters, flows for example, I won't need the number of kilowatts that its nameplate rating shows because I am not generating the number of horsepower that I need to generate.

JUDGE BRENNER: Mr. Dynner, we can take our break whenever it's convenient for you.

MR. DYNNER: Let me get maybe a couple of more follow-ups.

BY MR. DYNNER:

Q In some cases it is true, isn't it, that in some cases the nameplate was not conservative and in fact, that the equipment operated at or above the nameplate. Isn't that right?

A (Witness Youngling) Mr. Dynner, in our work on the MESL we made measurements of many pieces of equipment, and only in one instance did a piece of gear come in at higher than the nameplate rating.

In a second instance, a pump came in at higher

than nameplate at a run-out condition. However, at rated flow it was within bounds. So only one piece of gear came in at higher than nameplate.

Q Which one was that?

A (Witness Youngling) That was the emergency switch gear room, relay room and control room air-conditioning units which is actually a fan blowing, moving air through an air-conditioning unit. And in actuality it came out 2.5 kilowatts above its nameplate value, and the nameplate value was 33.9 kw. It came out at 36.4 kw.

Now on the other side of the coin--

Q I didn't ask you about the other side.

A (Witness Youngling) I would like to get to the other side.

Q I'm asking the questions. All right?

JUDGE BRENNER: I am going to let him add it because your question is really going to how do you know the nameplate ratings are conservative, and I'm not interested in each little piece of the plant, piece by piece. In the end it is an aggregate that is of concern here.

Go ahead, Mr. Youngling.

WITNESS YOUNGLING: On the other side of the coin, we had pieces of gear come in as low as 141 kw below the nameplate rating, based on 160 nameplate, which is about

80 percent lower. And in another instance we had a piece of gear come in as low as almost 45 percent below nameplate.

I think what that is showing is exactly what Mr. Dawe is testifying to, that there is a great deal of conservatism put in place during the sizing and designing of equipment.

BY MR. DYNNER:

Q You took credit for the cases that your measurements showed were lower than the nameplate, didn't you?

A (Witness Youngling) Yes, we did.

A (Witness Dawe) Mr. Dynner, that's not true in all cases.

Q All right.

Do you want to tell me which one it's not true in?

A (Witness Dawe) We had more components measured, actual measurements, than we took credit for in the MESL. The one that came out higher than nameplate, we used the higher value than the MESL.

Four or five loads -- I can't remember which it was -- that came out substantially below nameplate, those we used the actual in calculating the MESL.

There were numerous others which may have been 2, 5, 8, 10 kw lower than nameplate. We left the nameplate in

there as conservative. We did not use the measured value.

Q What percentage of the total loads on each diesel did you use the measured value on, do you know, approximately? Or did you try to measure any?

A (Witness Dawe) I don't know the answer in percentages at this time.

Q Could you measure more than eight loads?

A (Witness Youngling) In the determination of the MESL, we measured 27 loads.

Q And how many loads are there in total, approximately?

MR. ELLIS: Judge Brenner, is this a question on which we can take a break? Apparently they are going to have to count up.

JUDGE BRENNER: We could. I'm not sure whether the answer is going to help me at all. And we'll take the break with that thought.

MR. DYNNER: I can explain that, too.

JUDGE BRENNER: I think what you want to get at is approximately how many kw represents measured values. I don't know if he measured 27 items and they are all 5 kw, and left out three items that were 1500 kw, if that might matter.

Let's take a break until 3:35.

WITNESS YOUNGLING: Judge Brenner, maybe I can

clarify that.

JUDGE BRENNER: Let's take the break, because the question is still pending, except when we come back I will let Mr. Dynner rephrase it if he wants to. And I assure you we will get into this whole area.

(Recess.)

JUDGE BRENNER: All right. We're back on the record. I think it would be best if you could either rephrase your question or ask another one getting at the same subject, Mr. Dynner, given the break we've had.

BY MR. DYNNER:

Q What I was trying to get at is you say you measured 27 loads. Approximately what percentage is that of the total loads directed to the diesels?

A (Witness Youngling) Over the break I was able to calculate that in terms of the MESL we measured about 60 percent of those loads. I would also like to add that we actually used about 30 percent of the measured values in the MESL determination.

A (Witness Dawe) Mr. Dynner, I would just like to make sure that's clear. In terms of nameplate loads, of the loads connected to the diesel that are part of the MESL, measured loads were used for equipment which represents about 30 percent of the MESL. We actually measured loads which represent about 60 percent of the nameplate loads connected to the diesel where those loads are part of the MESL. I'm just going to make sure what the percentages are.

Q It's 30 percent stated in terms of total kilowatts, is that right, and it's 60 percent stated in terms of the number of specific loads, not in kilowatts?

A (Witness Dawe) No, about 30 to 40 percent of the stated MESL is measured load.

Q In kilowatts.

A (Witness Dawe) In kilowatts. If you look at the total number of loads in terms of line items, components that are part of the MESL, we measured about 60 percent of the kilowatts that that represents.

Q I'm really confused now. You talk about the MESL in terms of kilowatts --

JUDGE BRENNER: Let me try. They measured about 60 percent of the total demand loads, 60 percent of the Kw represented by those loads but they only used, in arriving at the MESL, 30 to 40 percent, again in kilowatts.

Is that right, gentlemen?

WITNESS YOUNGLING: Yes, it is, Judge.

MR. DYNNER: That's what I thought he said initially.

BY MR. DYNNER:

Q In terms of the number of separate loads put on the engine, not in terms of kilowatts, you said you measured about 27.

What percentage of that, of the total loads, not in kilowatts but in terms of the total possible measurements that you could have taken....

A (Witness Youngling) We did not count that.

Q Is there a reason that you only used 30 percent of the total kilowatts, rather than the 60 percent of the total kilowatts that were measured, because the other 70 percent were at or very close to the nameplate rating?

A (Witness Youngling) No, Mr. Dynner, I think you're confusing the numbers. Of the 60 percent that we measured, we only factored in about half of those measured values into the MESL.

JUDGE BRENNER: His real question, I believe, is what led to your decision not to include the measured loads which you did not include in the MESL?

WITNESS YOUNGLING: As Mr. Dawe talked about earlier in his testimony, there were several values that came in very close under their nameplate rating, and we made the engineering judgment that we would maintain the nameplate rating as opposed to the slightly lesser value.

BY MR. DYNNER:

Q Turn for a minute to page 20, would you, of the Suffolk County load contention testimony, if you have that a available to you.

Do you have that?

A (Witness Youngling) Yes, sir.

Q Looking at the top where there is a little chart that shows type of load, measured loads, nameplate loads and then the percentages for each of the EDG's, do you have any

reason to disagree with those figures?

A (Witness Youngling) Which figures exactly do you mean?

Yes --

Q Do you agree or disagree that on EDG 101 that you had, on the basis of the four loads actually measured and utilized by LILCO in the generation of Table 8.3.1-1A that those account for the percentages of loads on the EDG's that are shown on the top of page 20; do you agree or disagree with that?

A (Witness Youngling) Yes, Mr. Dynner, I have confirmed that on the top of page 20 you have 34 percent on 101 and 35 on 102 and 64 on 103. I believe I understand the basis for your calculation.

However, what you have done there is you have simply taken on the Table 8.3.1-1A the loads that we put an asterisk on which indicates an actual measured load and you converted those loads to kilowatts and then divided by, I believe it was, the MESL and therefore came up with the 34, 35 and 64 percent.

However you do not have any information on the additional loads that we measured that we just talked with you -- I'm sorry, yes, that's right, you did have the information on the loads, we had sent you the test results, right.

We chose not to use those.

Q And those loads were in fact not used by you in the MESL, is that right?

A (Witness Youngling) As I testified earlier, those measurements were not used by LILCO by we chose to use the higher nameplate loads.

Q So you agree with these percentages?

JUDGE BRENNER: You have to direct him to the bottom on page 19 also, so he can see --

MR. DYNNER: I did, I did, Judge, in fact I read it to him.

JUDGE BRENNER: I must have been asleep, I missed that.

Do you understand what the County is saying those figures represent, Mr. Youngling?

WITNESS YOUNGLING: Yes, I think I explained to Mr. Dynner and hopefully to the Judges my interpretation of those numbers and we shouldn't be mislead by them.

JUDGE BRENNER: The question is do you agree or disagree that those numbers are the ones actually measured and utilized by LILCO in arriving at the MESL?

WITNESS YOUNGLING: Yes, I agree with that.

BY MR. DYNNER:

Q So in fact it's true, for example, on EDG 101 that only 34 percent of the load which you checked -- of the

total job that you did in measuring loads, only 34 percent of the total kilowatts were less than the nameplate loads?

A (Witness Dawe) No, Mr. Dynner, that's not true. Your calculation there in your testimony, as I understand it, says that if I looked at EDG 101 with a stated MESL of 3253.3 kilowatts, of that 3253.3 kilowatts 34 percent of those kilowatts were measured and 66 percent of those kilowatts represent nameplate values. On EDG 101 within that 66 percent that are nameplate values, some of those kilowatts were also measured and were measured to be less than the nameplate values. However, we chose not to take credit for that in defining the MESL, we used the nameplate value.

Q What's the reason that you decided not to take credit for those?

MR. ELLIS: Objection, asked and answered, I thought.

JUDGE BRENNER: That's correct, however, I'm going to allow the question on the subjective basis that although I heard the answer before and could, right now, almost verbatim tell you what the answer was, I didn't understand the significance of it as a distinction based on the loads that were included and if I allow the question now maybe we'll get to it.

WITNESS YOUNGLING: As I testified earlier, we

just made the judgment that we would use the higher numbers and the higher numbers did not threaten the qualified load number.

BY MR. DYNNER:

Q In any case where you made that judgment was the measured load 5 percent or more less than the nameplate load or were they pretty close, that is, were they within 5 percent of the nameplate in each one of those cases where you didn't use the measured load?

(Witness panel conferring.)

A (Witness Youngling) Yes, Mr. Dynner, some of the numbers were higher than 5 percent and we still chose not to use them.

Q Well could you give me a general idea in kilowatts as to how generous you were in not using -- in other words, in the aggregate, if you used all the measured loads instead of using the nameplate loads in those cases, what are we talking about in kilowatts?

A (Witness Youngling) In making that evaluation, we chose not to use approximately 30 Kw on any diesel.

Q I'm sorry, do you mean that there is an additional 30 kilowatts on each diesel or do you mean 30 in the aggregate?

A (Witness Youngling) Yes, there is approximately 30 kilowatts on each diesel that we chose not to use

to reduce the MESL further.

Q In making these measurements, did you in any case give any allowance to the issue, or the possible issue of instrument error?

A (Witness Youngling) Mr. Dynner, we made these measurements with a very accurate state-of-the-art instrument much better than the 2.5 percent that you cite in your testimony at page 20 and, as I testified in my deposition, that device was a Dranetz power meter.

Q What instrument error did that have?

A (Witness Youngling) Approximately 1 percent.

Q Was it the Dranetz meter with the 1 percent error band that was used for all four of the loads that are referred to in your MESL chart that were reduced?

A (Witness Youngling) Yes.

Q And was the Dranetz meter also used for the loads -- approximately 30 kilowatts difference that you referred to in the load measurements that were not used by you?

A (Witness Youngling) Yes.

Q In coming up with the numbers that you gave in your table to the FSAR did you, in those numbers, account for a conservative minus-1-percent possible error or did you ignore the issue of that possible error?

A (Witness Youngling) We used the value which was recorded during the test procedure.

Q Do you have any reason to believe that the balance of the nameplate ratings for items that you didn't measure are necessarily more than the load would be had you measured them, or is that just a guess based upon the measurements that you did take?

MR. ELLIS: Objection as to form. He has given him a choice of X or Y, one of which is a guess, and I think he ought to ask the question how they did it if he's interested but I object to the form of the question.

JUDGE BRENNER: I'm sorry, I just missed the problem in the form, although I understand what you're saying. I'm going to allow the question and I don't think these witnesses are going to have any problem phrasing the answer the way they want to.

WITNESS YOUNGLING: Mr. Dynner, I'm going to have to ask you to repeat the question.

MR. DYNNER: Would you kindly reread the question?

(Whereupon, the Reporter read from the record as requested.)

(Witness panel conferring.)

WITNESS YOUNGLING: Mr. Dynner, the trend established by the measured values whereby 26 of the 27 measurements we made were actually lower than nameplate values was one positive observation which led us to believe

that the remaining nameplate values were reasonable numbers. In addition, knowing the design process, which tends to be conservative, that was a second observation. And in fact the first item supports that.

Finally, the data that we got back from the integrated electrical test even supports both observations to a third degree. So we do believe that the remaining nameplate values left on the tables are appropriate and are conservative.

JUDGE BRENNER: Mr. Youngling, were there any relatively large items in terms of Kw rating left unmeasured or did the residue fall into the category of a lot of items that were relatively small and of approximately the same small value?

WITNESS YOUNGLING: It was the latter, Judge.

JUDGE BRENNER: Is that another reason why you didn't measure them?

WITNESS YOUNGLING: Yes. When we made the engineering judgment as to which loads to go after, we wanted to go after the loads which would drive us in one direction or the other, and those are the loads we chose to measure. There was not much sense in measuring a very, very small contributor.

BY MR. DYNNER:

Q Do you agree or disagree with the County's

testimony that the nameplate loads are at best accurate to plus or minus 5 percent?

A (Witness Youngling) I have no basis as to whether that is a proper number. However, my feeling is that if a manufacturer were to test his components on a test end, using state-of-the-art testing techniques, I believe his accuracy would be a lot better than plus or minus 5 percent.

Perhaps Mr. Dawe can add to that.

A (Witness Dawe) I just wanted to add to what Mr. Youngling said that I really don't know where the County would -- or the basis for the plus or minus 5 percent. My experience is that when we buy components and get nameplate values which they've got on large motors they're measured values by the manufacturer or at least the type value, and I don't know what the basis of your plus or minus 5 percent would be, I think they tend to be more accurate than that. We know we can measure the plant values to plus or minus 1 percent with a Dranetz power meter. I don't know where your number came from.

Q By the way, you mentioned the IET a couple of times. Am I correct that you are not relying upon the IET for purposes of qualification under GDC-17?

A (Witness Dawe) The IET is a required test of on-site electric power systems and off-site electrical power

systems to show that you have caacity, capability, independence, testability, all of those things are in GDC-17; if I didn't do an IET, I doubt if I would be found to have met GDC-17.

Q Mr. Dawe, let me ask you to see whether I can help your recollection.

Do you remember in a meeting on February 8th with the Staff a colloquy in which the Staff indicated that they were not relying on the IET to show compliance with the regulations and that you agreed that was the case?

A (Witness Dawe) I think you would have to go back to that discussion. I remember something like that.

I don't think the IET is the only proof that the loads the diesel will see is less than the qualifying loads that we have established through testing, and to the extent we agreed that it wasn't the only proof, yes, but again the IET is required. It does show the loads that the diesel will see.

It also shows the independence between various trains of offsite power. It is a required test.

I think that is the answer to your question.

Q Is it your testimony that the IET precisely simulates the accident conditions?

A (Witness Dawe) It is not our testimony that an IET precisely simulates LOCA conditions in the plant to the extent that I don't pour water out of the vessel if I don't experience the break and I don't experience the dynamic forces of the break, and all that.

In terms of simulating the electrical load

demand during a LOCA, I think the IET gives you a very accurate picture of what that is because you simulate those parameters that the plant needs to generate, which translate then into electrical load.

And by that, I mean you simulate design loads on the ECCS injection systems. We preheat the chilled water system so that the chiller units will pick up on a full load. We simulate service water flows at design flows, proposed LOCA conditions.

What you don't simulate is what the actual temperatures of the buildings may be or the rate at which the flow drops in the vessels, but you can simulate the parameters of system responses in other ways, such that you can have assurance that the electrical loads that you see are, if not exactly those seen in a closed LOCA, they are very close.

So we don't simulate the LOCA condition in terms of the driving forces, but we do simulate the LOCA conditions in terms of the plant responses.

JUDGE MORRIS: Mr. Dawe, what do you mean by "very close"?

WITNESS DAWE: The IET loads, when you look at them and look at the flows that were measured, the flows are at design flow. Part of the test was to bring the core spray and the RHR to design flow conditions.

The chiller units, we can't sustain the load without the LOCA. But we can preheat the chilled water to that temperature which triggers a chiller to pick up its load, and then we can sustain it for a long enough period of time to get the chillers operating at peak capacity.

We can't sustain it forever, but we can sustain it through that period when the rest of the peak loads are being seen, such as the ECCS injections, before we start throttling security, and that is what I mean by "close."

JUDGE MORRIS: Can you estimate in percent how close the IET loads will be to actual loads?

(Witness panel conferring.)

WITNESS DAWE: It is our impression, Judge Morris, that given all the factors of the instrumentation used to establish the flows, and so on, that in terms of those parameters of flow and heat load, and so on, we would be within a couple of percent, 2 or 3 percent.

JUDGE MORRIS: Thank you.

BY MR. DYNNER:

Q Gentlemen, there was discussion in the Stone & Webster memorandum dated June 7, 1984, which is Exhibit 5 to the County's testimony, that there was a need to lock certain valves in the RBSW system into throttle position.

Were the valves locked into the throttle position at the time that you measured the load of the RBSW

system?

A (Witness Dawe) Were the valves in the throttle position at the time the IET was done? Is that your question?

Q No, at the time when you measured the RBSW system as an individual load.

A (Witness Dawe) We did not measure the service water system as an individual load.

Q Are you sure that Engineering Test No. ETRR 43001 didn't make that measurement?

A (Witness Dawe) We had an engineering test procedure -- that may be the number. I can't tell you without looking at it -- to perform that test, along with other tests.

That portion of the test we did not perform with the rest of the test because the service water system was not available to us at that time.

Q Well, in connection with that memorandum, which is Exhibit 5, is it your intention to lock the valves into throttle positions, as stated in that memorandum, for future operation of the plant?

A (Witness Dawe) The answer to your question directly is that LILCO has not yet decided whether to do that or not. They probably will.

It is not necessary that they do.

Those valves in their throttle position are downstream of the pump. All that portion of the calculation was related to is once the pump has pumped the water, where does it go?

The calculation was done to assure that with the one pump operating the loop supply in three diesel generators, plus the balance of the loads on that one service water loop, we would get sufficient flow and head to the highest point of the system.

The results of our calculations were that we would have more margin in flow and head at the highest point of the system if those valves were throttled because it would put 250 gallons per minute less water through the strain backwash system if the strains were in automatic backwash.

However, without doing that, the calculation still shows the acceptability of the service water system.

We just thought it was a better way to operate the system because you don't need the full 500 GPM to backwash, and we preferred to direct some of that flow into the system.

In any event, it is not going to change the total pumping capacity of the pump nor the power to manage the pump in terms of kilowatts.

So it is not germane to the IET, it is not

germane to the loading system, and it is not necessary for the acceptable operation of service water system.

Q In connection with the measurement of the RHR pump load, there was a value originally given in your testimony, on page 34, of 1,022 kilowatts for the RHR pump on EDG 103, and in the revision to your testimony that number was changed to 999.

Can you explain why?

A (Witness Dawe) The reason is that the 1022-kilowatt load for the RHR pump represents a runout condition for that pump discharging into a broken recirculation loop.

999 is the kilowatt demand at design flow. You can't get the runout without the break in recirculation loop, and if you have that, you have got a loss of coolant accident, which is a different situation from a loss of offsite poweronly, which is what this answer addresses, the loss of offsite power only. To get the 1022 I would have to be in a LOCA condition with the LOCA being in my recirc line.

Q While we are at it maybe you can explain the other change on that page 34 for the total load from -- originally it read 3,867.3 kilowatts, in revisions at 3,707.9 kilowatts.

Why is that change in there?

A (Witness Youngling) Mr. Dynner, not only for that number on page 34, the 3867.3, but also on the previous page, page 33, in the response to Question 29 a. the bottom of the page, the loop loads for the 101 and the 102 engines, the 3839.2 and the 3627.6 would change, for the five following reasons:

When we did the original analysis of the loop loads we did not take credit in the analysis for the measured values that we have been talking about earlier this afternoon.

In addition, as we have already discussed, the RHR system in the original analysis was assumed to be at run-out, whereas it will actually be at rated flow. That resulted in a lower Kw value for the RHR system.

We had forgotten to delete the spent fuel pool cooling water pumps which are now administratively locked out.

We had also not deleted the intermittent and cyclic loads that we referred to in our testimony dealing with the diesel generator air compressors, the automatic MOVs and fuel oil transfer pumps associated with the diesel systems.

Finally, on Diesel Generator 103 only we deleted the reactor building closed loop cooling water pump due to the 10-minute lock-out associated with that pump.

For those reasons we were able to recalculate the LOOP/LOCA -- I'm sorry; the loop loads, and when we added the worst case error on top of that we came up with the changed values that we submitted as part of the change to our testimony.

I guess I should summarize: basically what we did was make the analysis done for the LOOP/LOCA MESL consistent now with the analysis for the loop only.

Q Just a clarification, Mr. Youngling.

When you referred to the deletion of the cyclic loads, was that because they wouldn't be there at all, or was that because they're just not shown?

A (Witness Dawe) It was to put it on a consistent basis with the numbers that are defined for the MESL for the LOOP/LOCA condition.

Q In other words, you don't count any of the cyclic or intermittent numbers in any of those numbers, is that right?

A (Witness Dawe) The cyclic loads are not in those numbers in our testimony now. Likewise, the cyclic loads, many of them cannot exist in a LOOP/LOCA because they are cyclic responding to a LOCA. The valve load particularly is what we're talking about.

JUDGE BRENNER: Mr. Dawe, either I didn't fully hear or didn't understand your very last point. Could you

elaborate on why the cyclic loads wouldn't be there in certain situations?

WITNESS DAWE: The cyclic loads related to the diesel generator, the one-time air compressor recharging the start system, and ultimately, when enough fuel has been used, a fuel oil transfer pump at .2 Kw would be operating. The air compressor wants the fuel oil pump periodically while you're operating the diesel. The valve loads, however, are predominantly post-LOCA valve loads. With a LOCA signal you will get the sequencing of the valves. With a LOOP signal most of those valves will not respond.

BY MR. DYNNER:

Q You were provided some numbers in terms of the time that the maximum emergency service load for each EDG would last. How do you know that those loads won't last longer than the times that you have given?

A (Witness Dawe) Could you be specific to which loads and which times you're referring to?

Q Yes. Take page 9 of your testimony. In Answer 7 you state that the MESL is, for example, for ED-101, and you say that's 3253.3 kilowatts. How long would that maximum load be on the EDG-101?

A (Witness Youngling) Mr. Dynner, we have made a conservative estimate that that load will be on that engine for 12 minutes.

Q And are the MESLs for--

A (Witness Dawe) I would just like to finish that up.

If you just summed the load, yes, it is extremely conservative to say that it will even be there for 12 minutes. For example, this assumes the chillers are operating at max load concurrent with the ECCS injection pumps. But, of course, the chillers to operate at max load, have to wait for the ECCS pumps and all the other running equipment to start heating up the spaces to make the chillers pick up the load. And that takes time.

So that number itself is conservative. But if you summed them all the 12 minutes would be a conservative length of time, because after that time you would start reducing load after reflood.

Q And can you give me the approximate number of minutes for other two diesels?

A (Witness Youngling) It would be the same, 12 minutes.

Q And is this for a LOOP/LOCA?

A (Witness Dawe) Yes.

Q And that's a higher requirement than for LOOP alone; is that correct?

A (Witness Dawe) That's true.

Q Now, what assurance do you have that 12 minutes

might not be exceeded?

(The Panel conferring.)

A (Witness Dawe) Well, the assurance comes from the analysis which states how much equipment running time we need to reach conditions at which the operator is then directed to begin changing the conditions of the plant.

For example, we're sure that the vessel will reflood during that period of time. And when that happens the operator is directed to start reducing the injection rates. But in the context of assurance, the load can't exceed that due to automatic loading. So if it went longer than 12 minutes it's not going to get higher.

Q But it takes operator action to reduce the load, is that correct?

(The panel conferring.)

A (Witness Dawe) To get significant reduction from that load, yes, the operator is going to be taking action. As we have already said, though, some things will happen in the plant without operator action, such as the chillers ultimately do come in and the operator has not reduced his pumping rates such that he gets closer to the 3253. Then the chillers are going to go back out again once it drops the heat loads.

It's like the air conditioner in your house, it doesn't operate continually, it goes on and off. When it

goes off the loads go back down again.

Q What did you mean by "significant"?

A (Witness Dawe) I should also-- Let me answer your question first.

By "significant" I'm talking about getting down to the 2600 range that we project in the load profile. That requires the operator having turned off some of the large ECCS pumps; which clearly he will. Or they weren't operating in the first place because they had failed to operate, but if they failed to operate then they didn't blow the diesel.

But for the big break the safeguards showed that you need two of these low pressure pumps to reflood the vessel and restart 6. He has to start turning some of them off sooner or later.

Q Wouldn't he also add a service water pump maybe around that same time frame?

A (Witness Dawe) He will not add a service water pump, or need not add a service water pump -- will not be directed to have the service water pump until he considers putting in the RHR heat exchanger into operation.

Q When would that be?

A (Witness Dawe) I need to modify my previous answer. He should not have to turn on another service water pump because he only needs two, and he will have three. So

with the three he has, or even with the single failure of one of the diesels or the automatic pumps he will have two and he will not have to do it. He has an option to do it, but he will not have to do it.

Q Mr. Notaro?

A (Witness Notaro) There is one more significant reduction in load that has to be addressed here, and that's the fact that after this reflood the operator is going to have the capability of removing two of the four chillers, one in each room. That's another significant load reduction. He will have the vessel reflooded, he will not need all those pumps, and once he removes the pumps he can remove the chillers.

A (Witness Dawe) To summarize, as we've stated in our testimony, the reason all of this equipment is running is because we have to design to single failure. And we've got twice as much as we need. So if it all starts, we have to start turning some of them off -- or we gradually start turning some of them off.

Q In the FSAR you have the statement -- and this is on page 8.3-6B of Revision 34:

"Even 3300 Kw is conservative because many loads were assumed to be at their maximum levels while in actuality this would is unlikely tobe the case. Moreover, within 20 minutes after the start of the accident loads lower than 3200 Kw for all three engines would likely be achieved by operator action to reduce core spray and RHR flow from runout to rated flow conditions."

I'm not a technical expert and maybe I'm missing something but could you explain the difference between the 20 minutes? You only get down to below 3200 Kw in the 12 minutes in the numbers that you've given in your testimony.

A (Witness Youngling) Mr. Dynner, I think what we have here is just a problem with the words. Basically, on page 8.3-6B of Revision 34 to the FSAR we are saying that within 20 minutes after the start of the accident we will be lower than 3200 Kw on all three engines and as we have justified now that within -- after 12 minutes the operator will have taken actions which will reduce the load to that level, which is within 20 minutes.

Q Is the load reduced from the MESL by any automatic means that does not require any operator action?

(Witness panel conferring.)

JUDGE BRENNER: Maybe I should ask the witness

for an estimate of how long it would take.

A (Witness Dawe) Not much longer, Judge.

A (Witness Youngling) Mr. Dynner, within the time that we've taken here, not looking at all the introductory diagrams and the logic to the systems, we've found several loads which will go off automatically: the RBSVS chillers and their condensing pumps; the RBSVS reheat coils; the loop level pumps; the heat tracing tranformer -- as I've said this is without a detailed analysis.

Q I'm not going to ask you to go back and do this. As you were looking at those did you get a ballpark number or a rough estimate as to what total load those represent -- and I don't want to make you take too long to do this but if it is something that you had in mind as you looked at that...

A (Witness Dawe) Between 250 and 300 Kw.

Q In order to be on the safe or conservative side why didn't you select a larger margin between the MESL and the qualified load; in other words, why didn't you pick a number higher than 3300 for the qualified load in order to give a greater margin?

A (Witness Youngling) First of all, Mr. Dynner, I would like to take issue with your characterization of not being safe and conservative. Our analysis is safe and is conservative. The MESL includes all loads that need to

operate to mitigate a LOOP/LOCA event within the Shoreham plant. That analysis has been confirmed by the integrated electrical test to show that there is even further margin and conservatism in that analysis and we feel that there is more than adequate margin in the qualified load.

(Witness panel conferring.)

Q What I'm getting at is, again going back to a statement that your Counsel made this morning, I believe, and that is since the qualified load -- in this case 3300 was the load that you were going to test the engine at -- did your selection of that 3300 number have anything to do with the intent to keep the total load to somewhere as close to the 185 BMEP level as was possible under the circumstances?

A (Witness Youngling) Absolutely.

Q It did?

A (Witness Youngling) Yes, sir.

Q Why did you want to keep it as close to 185 BMEP as possible?

A (Witness Youngling) As you are aware the Staff had issued an SER in August of 1984 which presented to us a picture that if your engine was not operating at 185 BMEP there would be a requirement for a revised interim operating basis. LILCO analyzed the loads on the engine; we found, of course, that we were above the 185 BMEP and one of the objectives that we had in performing the analysis

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objectives that we had in performing the analysis of the MESL and the qualified load was to come as close as we could to the 185 BMEP criteria.

Q Well, the SER really said that in the case where your BMEP was less than 185 that you wouldn't have to do a testing of 10 to the 7th; that in cases in which you had only a short time operation above the 185 BMEP the Staff would consider exempting you from the 10 to the 7th test but once you were going to be continuously above 185 BMEP you still had to do the 10 to the 7th cycle test, isn't that right?

(Pause.)

Do you have the SER there -- and the one I'm talking about is the Safety Evaluation Report, TransAmerican Delaval Diesel Generator Owners' Group Program Plan and it's dated August 13, 1984. I refer you to pages 13 and 14 for the statement that I have just paraphrased.

(Witness panel conferring.)

A (Witness Youngling) Mr. Dynner, it's our interpretation of the requirements of the SER that the NRC Staff was looking for us to get as close to the 185 BMEP as possible on the basis that they had not completed the entire review of the design review program for the TDI Owner's Group and therefore we tried to get as close as we could to 185.

Q Is it your testimony that the Staff told you that you should try to keep as close to 185 BMEP for this test as possible?

JUDGE BRENNER: Wait a minute, you switched predicates, ii not right now, in the previous question and I missed it. You were talking about the goal, the Staff's goal anyway, of ending up with a qualified load as close to 185 BMEP as possible, at least that was your question. Your last question talked about the load of the test came as close to 185 BMEP as possible and those are two different things in my mind.

MR. DYNNER: Perhaps I'd better direct everyone to -- I don't have copies of the SER; I have my copy and I can read into the record pertinent passages which make it clear that there is a direct connection in that SER between what the Staff's requirements are with respect to qualified load and with respect to the testing. Specifically the Staff said, and this is starting on page 13 under 4.6 of the SER, paragraph one, stating the interim bases for licensing,the Staff said:

"For engines where emergency service load requirements involve a BMEP greater than 185 PSIG the utilities shall provide information demonstrating that crank shafts, pistons and other key engine components as identified below

which are of the same design as those of the subject engines have operated successfully for at least 10 to the 7th loading cycles under loading conditions which neither exceed the severity of the maximum emergency service load requirements for the subject engines. For purposes of this SER this load level, i.e., the load level above the load level corresponding to 185 PSIG BMEP enveloped by successful operating experience, will be referred to as the qualified load for the subject engine. Where appropriate operating experience does not already exist relative to this qualified load a test of an engine with the same designs of these key components for 10 to the 7th cycles will be required to establish an adequate qualified load for the subject engine."

And, Judge Brenner, that is the nexus between the requirement for a 10 to the 7th cycle test for an engine with an BMEP that exeeded 185 in terms of establishing its qualifed load.

JUDGE BRENNER: My statement is still accurate in my mind. I recall quite well what that SER said.

I don't know where you're going with these witnesses, and the only reason I interrupted before was in my mind, I thought you changed the direction of the question.

MR. DYNNER: I'm exploring the question. The cross plan on page 4 is where I am at this point.

JUDGE BRENNER: There's a difference between enveloping a load and testing as close as possible to a load.

MR. DYNNER: Exactly my point.

BY MR. DYNNER:

Q And what I am now suggesting to you, Mr. Youngling, is that while the SER says you would have to test to 10 to the 7th cycles in order to establish your qualified load, there is nothing in the SER, unless you can point me to it, that says that you have any requirement for doing that 10 to the 7th cycle test for establishing a qualified load as close to 185 BMEP as possible.

And if you can point me to where it says that, fine. Otherwise my next question was:

Did the Staff tell you that is what you should do?

(Witness panel conferring.)

A (Witness Youngling) Mr. Dynner, we got the SER some time in September or late August of 1984. We sat down

to analyze the SER and we began a dialogue with the NRC. From that period until the start of the test in October of '84, we talked with the Staff about a qualified load which was lower than the 3300 number that was finally chosen and that particular approach to an interpretation of the qualified load was not supported by the Staff.

We continue the dialogue and when we finished that dialogue we agreed on establishing the qualified load at the 3300 level. The 3300 level was sufficient to support the LOOP/LOCA response of the plant and was sufficiently close to the 185 BMEP that the Staff was concerned about.

As to a particular individual, I can't remember a particular individual giving me a particular response as you have asked.

Q What is the BMEP of the diesels at 3300 kw? Do you know?

A (Witness Youngling) I believe it is 202.

Q And the 3500 kw is 225 BMEP. Isn't that right?

JUDGE BRENNER: Yes, that's right.

WITNESS YOUNGLING: Yes, that's right.

JUDGE BRENNER: At least that is what people on this record have told me.

BY MR. DYNNER:

Q It is true, isn't it, gentlemen, that the practice in the utility industry is to operate diesel

engines at only about 80 or 85 percent of their rated load. Isn't that right?

MR. ELLIS: Objection. I don't see the relevance of that question.

JUDGE BRENNER: I knew I wouldn't get away without pulling out a ruling on the motions to strike before the end of the day, although I was beginning to hope.

(Pause.)

You are right on the border, Mr. Dynner. If you look at our ruling on the motion to strike, we're not interested in exploring, in any sort of detail, what is the situation at other plants. We thought it would be pertinent and, in fact, left in, in agreement with LILCO's motion to strike, some portions of the County testimony to the effect, in the County witness' view, that the general industry practice is to bound intermittent and cyclic loads by a short-term overload rating for the EDGs, and we said that in our ruling.

I'm not interested in particular numbers very much because we have ruled that it is not pertinent in the context of the specifics of the contention.

Having said that, I can see how your question, if it didn't go too far, might be a foundation to pursue the particular portions of your contention as to how intermittent and cyclic loads are either excluded or

bounded, and I can say the same in terms of taking account of the load meter error, et cetera, but I have a feeling that is not the way you're going.

I will let you ask the question but I am going to be quick to cut you off if it is going to get into the details of the other plants as opposed to what the bases is, in the view of these witnesses, as to why they've taken account of the loads for which Suffolk County's and the State's contention alleges have not properly been taken account of.

Do you need the question again, having heard all that?

WITNESS YOUNGLING: Yes, Judge, I'm going to ask for the question again, but I would like to correct that number I gave earlier on the BMEP at 3300 being 202.

I have done a calculation. It would be about 212.

JUDGE BRENNER: Maybe I shouldn't have reserved your testimony at 3500 kw in case we were going to get a different number. And after I said that I realized that maybe that was wrong for me to do.

Is it 225 at 3500?

WITNESS YOUNGLING: Yes, sir.

JUDGE BRENNER: All right.

Could you give us the question again?

MR. DYNNER: I think I can read it again.

JUDGE BRENNER: All right.

MR. DYNNER: I'm at the bottom of page 2 of the cross plan.

BY MR. DYNNER:

Q It is true, isn't it, that the utility industry practice is to operate diesels at only 80 to 85 percent of the rated load? Isn't that right?

A (Witness Youngling) Mr. Dynner, I can't say that utility practice is to operate engines in that range, no. I can't say that would be rule of the industry, no.

However, I think Mr. Dawe can add some information from the IEEE standards.

JUDGE MORRIS: Before you do, Mr. Dawe, I want to be sure we understand what we're talking about.

The question as read said utility practice with respect to running diesels. Now there's a question in my mind whether these are continuously operating diesels for generating power or they are standby emergency diesels. Perhaps you can answer in terms of what you know.

JUDGE BRENNER: We're talking about emergency diesels. Right, Mr. Dynner?

MR. DYNNER: Yes, sir-- I was talking about diesels in general. I'm sorry, no, utility practice to operate diesels.

JUDGE BRENNER: All right. Judge Morris once again is more alert than I.

MR. ELLIS: I might have another relevancy objection then.

JUDGE BRENNER: Go ahead. Do you or don't you?

MR. ELLIS: I do.

JUDGE BRENNER: Why should we be interested in other diesels, Mr. Dynner? You are adding another collateral point on a point which I told you was on the border of being collateral in the first instance. So tell me why you are prejudiced if we restrict it to emergency diesel generators for standby emergency service?

MR. DYNNER: Yes, I can tell you why, because I thought I knew the answer based upon all diesels in general because of testimony Mr. Busler gave in a deposition which was to that effect, and I was going to establish that and then ask -- because I thought they knew that.

And then I was going to move to ask the same question with respect to emergency diesel generators at nuclear power plants because I thought they might not know the answer to that one.

Apparently they don't know the answer to this question --

JUDGE BRENNER: No, that's not a correct assumption, we have interrupted their thought process and their ability to answer, I don't know whether they know it or not. I'm not interested, I don't think, in knowing the answer though.

We're going to grant Mr. Ellis' second objection.

Why don't you ask about emergency diesel generators?

MR. DYNNER: That was going to be my next question, Judge.

JUDGE BRENNER: Let's make it this one.

BY MR. DYNNER:

Q It's true, isn't it, that it's standard practice in the industry, in the utility industry, to operate emergency diesel generators in nuclear power plants at only about 75 to 80 percent of their rated load?

A (Witness Dawe) I don't believe there is such a standard industry practice as that, no. The concensus standard says that the diesels can be operated to the limit of their capability. That is the concensus industry position.

And I guess I don't know how much more to answer relative to where I think you got those numbers from.

Q What's your basis for the statement that the concensus is that they can be operated at full load?

A (Witness Dawe) It says that, Mr. Dynner.

Q What's "it?"

A IEEE 387, 1982 and 1977.

A (Witness Nataro) I'd like to add to that, Mr. Dynner, that within the industry they would have to meet those numbers that were established in the tech specs for normal surveillance testing, which would bring them up to

full load.

Q You're not suggesting, are you, Mr. Dawe, that IEEE says that EDG's can be operated continuously at an overload rating, are you?

A (Witness Dawe) It says that they can be operated to the limit of their capability under the operation application rule which refers you to the definitions of the ratings, where the continuous ratings and the short-time ratings are defined and it says:

"The continuous and short-time ratings may be utilized to the limit of their power capabilities."

I can operate at my overload rating exactly for two hours, I can operate at my continuous rating exactly for the rest of the time.

Q Yes, I know that's what IEEE says and that's a much more accurate statement.

But can you tell me, based upon anything any of you gentlemen know, whether in fact, whether in fact the industry practice is to have a maximum emergency service load that is within a few percentage points of the overload rating?

A (Witness Dawe) I cannot speak exactly about every unit that's out there. It is my knowledge that there are units that operate very, very closely and there are

units out there who are looking for people to add diesels to the units because they are operating so closely, yes.

Q What's the margin -- just to see how LILCO has construed this standard, what's the margin between the maximum emergency service load and the full rated overload of the new Colt diesels that you ordered?

MR. ELLIS: Objection, irrelevant.

JUDGE BRENNER: I'm going to sustain that objection. You are getting into the collateral area, Mr. Dynner. We understand the County's point very well from the contention that there may be certain loads as specified in the contention that are not properly considered and that's what we'll focus on. And if you can show us where certain loads were not properly considered, then LILCO will be unsuccessful before us. But I don't want to again get into what other plants might be doing in other circumstances.

We're going to adjourn for the day at this point. The Appeal Board has asked me to distribute to the parties here a copy of an order that was issued today in the low power proceeding, of which I know little but some of you know a lot, and we will resume tomorrow at 9:00 a.m.

(Whereupon, at 5:00 p.m., the hearing in the above-entitled matter was recessed, to reconvene at 9:00 a.m., the following day.)

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceedings before the UNITED STATES NUCLEAR REGULATORY COMMISSION in the matter of:

NAME OF PROCEEDING: LONG ISLAND LIGHTING COMPANY

(Shoreham Nuclear Power Station, Unit No. 1)

DOCKET NO.: 50-322-OL

PLACE: BETHESDA, MARYLAND

DATE: TUESDAY, FEBRUARY 12, 1985

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission.

(sigt) Anne G Bloom/sg

(TYPED)
ANNE G. BLOOM

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