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# ORIGINAL

RELATED CORRESPONDENCE  
RELATED CORRESPONDENCE

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

DOCKETED  
USNRC

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In the matter of:

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

LONG ISLAND LIGHTING COMPANY

(Shoreham Nuclear Power Station,  
Unit 1)

Docket No. 50-322-OL-3

Deposition of: Gregory Minor

Location: Hauppauge, New York

Pages: 1 - 37

Date: Friday, August 24, 1984

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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:  
In the Matter of: :  
LONG ISLAND LIGHTING COMPANY : Docket No. 50-322-OL-3  
: (Emergency Planning  
: Procedures)  
(Shoreham Nuclear Power Station, :  
Unit 1) :  
-----X  
H. Lee Dennison Building  
Ninth Floor  
Veterans Memorial Highway  
Hauppauge, New York 11787  
Friday, August 24, 1984

The Deposition of GREGORY MINOR, called for  
examination by counsel for LILCO, commenced at 9:01 a.m.,  
the witness having been duly sworn by Myrtle H. Traylor,  
a Notary Public in and for the State of Virginia.

## 1 APPEARANCES:

2 On behalf of LILCO (Deponent):

3 LEE ZEUGIN, ESQ.  
4 Hunton & Williams  
5 707 East Main Street  
6 Richmond, Virginia

7 On behalf of Suffolk County (Respondent):

8 CHRISTOPHER M. MC MURRAY, ESQ.  
9 MICHAEL S. MILLER, ESQ.  
10 Kirkpatrick, Lockhart, Hill, Christopher & Phillips  
11 1900 M Street, N. W.  
12 Washington, D. C. 20036

13 On behalf of the State of New York:

14 RICHARD J. ZAHNLEUTER, ESQ.  
15 Special Counsel to the Governor  
16 Executive Chamber  
17 Room 299  
18 State Capitol  
19 Albany, New York 12224

20 On behalf of the Nuclear Regulatory Commission:

21 BERNARD BORDENICK, ESQ.  
22 Office of the Executive Legal Director  
U. S. Nuclear Regulatory Commission  
Washington, D. C., 20555

C O N T E N T S

WITNESS	DIRECT	CROSS
Gregory Minor	4	30

\* \* \* \* \*

E X H I B I T S

Minor:	For Identification
No. 1	7
No. 2	10
No. 3	12
No. 4	21



## GREGORY MINOR

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

## 1                   DIRECT EXAMINATION

2                   BY MR. ZEUGIN:

3                   Q       Please state your full name and business address  
4                   for the record?5                   A       Gregory Minor, my business address is MHB  
6                   Technical Associates, 1723 Hamilton Avenue, San Jose,  
7                   California.8                   Q       I would like to start by asking you, I think,  
9                   some very brief background questions. I have looked at  
10                  your resume, and I was wondering if you have currently  
11                  or have ever had an operating license to operate a nuclear  
12                  power plant?

13                  A       No, I have not.

14                  Q       Have you taken any courses in reactor operations?

15                  A       It is hard to say. You can almost call the  
16                  Shoreham hearing a course in reactor operations, but no  
17                  formal courses.18                  Q       What documents have you reviewed in preparation  
19                  for testifying on the strike issues?20                  A       In preparation for the strike issue, I have,  
21                  of course, looked at the affidavits originally submitted  
22                  on this issue by LILCO. I have looked at the Board order

1 which sets out the issues that are concerned, and I have  
2 looked at some of the Chapter 15 analyses in other reviews  
3 that have been done. For instance, low power, and then  
4 the FSAR to see what the content would be, and how that  
5 would compare to Mr. Rigert's and Mr. Stergakos' analysis.

6 In addition, I have looked at the few discovery  
7 documents that have been supplied, including the portions  
8 of the tech spec which I am not sure of their status or  
9 revision or finality, but at least the portions that  
10 were provided, and the other discovery documents which were  
11 related to the analysis done on the refueling accidents to  
12 determine the length of time fuel must be held before they  
13 would release PAG limits levels of radiation to the boundary.

14 Q Okay. Let me try and distill for you the  
15 question I still think that is in front of us, now that the  
16 Board has taken out its first question, and ask your opinion  
17 on that question. And that is whether placing a plant in  
18 cold shutdown during a strike by the LILCO unions is an  
19 adequate measure -- and let me read you the Board's language,  
20 to give reasonable assurance that adequate protective measures  
21 can and will be taken in the event of a radiological emergency.

22 A And your question is what is my opinion about  
that?

1 Q Yes, sir. How would you answer that question.

2 A In general, I would say that I am not satisfied  
3 that the proposed LILCO solution will meet the question posed  
4 in Question 3.

5 Q Could you detail for me why you are not satisfied  
6 where the, in your view, the LILCO proposal may fall short?

7 A Well, an area of concern for me is the question  
8 of whether the staffing is really adequate, and this is based  
9 on my preliminary review of some of the numbers of people  
10 involved, and some of the numbers of people required.

11 Q Is that staffing that you are referring to the  
12 onsite staffing that would be required to keep the plant  
13 in cold shutdown, or are you talking about staffing of  
14 perhaps an offsite response organization?

15 A I think the staffing of an offsite organization  
16 is certainly inadequate in terms of a strike being carried  
17 on by the union. So, I am speaking more of the onsite  
18 staffing.

19 Q What particular questions do you have about  
20 that staffing?

21 A Well, based on my preliminary review and the  
22 documents that have been provided in discovery, it looks

1       like there is a fairly minimal skeleton group available  
2       to cover the requirements of operations and other functions  
3       which would have to be performed during the transition to  
4       cold shutdown, and maintaining the cold shutdown.

5               Q       Are there any particular job functions you are  
6       concerned about as being particularly thin?

7               A       You have to divide workers into two categories.  
8       The operators, and the others. And the operating level  
9       they identify in this discovery document of a few operating  
10      personnel who are non-union, not a large number, but there  
11      are some, and they identify very few people in the non-  
12      union functions. By this, I mean some of the maintenance  
13      and instrument techs and things like this, who would  
14      normally be around but wouldn't necessarily be around during  
15      a strike.

16              Q       Let me make sure I know which discovery document  
17      you are referring to. Let me show you a document that I  
18      will have marked Minor Exhibit No. 1, and ask you if that  
19      is the document you are referring to regarding the manning  
20      levels and drawing some of the conclusions we have just  
21      discussed?

22              A       Yes. I believe this is the same document I

1 was referring to.

2 Q Now, as I recall that document identifies the  
3 fact that during a strike there would be twenty licensed  
4 operators available to operate the plant, is that correct?

5 A It identifies twenty people with different  
6 job titles, and says that these are non-union LILCO  
7 employees who are licensed Senior Reactor Operators, yes.

8 Q And I believe it also says that as many as  
9 five could be available to man each shift that would occur  
10 during a strike, does it not?

11 A It says five licensed operators will be available  
12 on each shift during any perceived work stoppage, yes.

13 Q Now, is your concern that the five operators  
14 that would be available on each shift are not a sufficient  
15 number to maintain the plant in cold shutdown or, I guess  
16 to use your term, a skeletal crew?

17 A If I look at a strike condition, I would wonder  
18 if five people would always be available, for various  
19 reasons. I can't list them right now, but you just have  
20 to think that a strike can occur at any time. Various  
21 seasons of the year, or what have you, and it may not be  
22 that all those people would be available.

1           Q     Do you have any opinion as to what number of  
2 operators would be required on each shift to maintain the  
3 plant safely in a cold shutdown condition?

4           A     A portion of the tech spec has been provided  
5 to us, which sets out some minimum requirements and I  
6 would rely on that as sort of an agreed upon minimum  
7 of the staff, but that is for licensed operators.

8           Q     Let's talk briefly about the other jobs in the  
9 plant that are non-licensed jobs. Is there any particular  
10 document that you would use to determine whether or not  
11 people available at the plant, or a skeletal force, are  
12 more than sufficient to carry out those jobs?

13          A     I would have to ask you to repeat that.

14          Q     Let me draw an analogy, and I think that may  
15 make the question a little clearer. You just told me that  
16 the tech specs are a way of determining a minimum amount  
17 of people -- of operators needed to operate the plant and  
18 keep it in a cold shutdown condition.

19                What I guess I am getting at, is there some  
20 type of parallel document -- is there some type of parallel  
21 document that you would look to to determine whether the  
22 amount of other workers in the plant are sufficient?



1           A       There are other documents that would define  
2 normal shifts, I think, in the LILCO documentation, but  
3 I am not sure where I would look to find the minimum  
4 required non-licensed operators in the plant.

5           Q       Are there any particular job categories that  
6 are of more concern to you in that group than in others?

7           A       Just the ones I mentioned.

8           Q       In your deposition you stated that you had  
9 reviewed the affidavits that have been provided to you.  
10 Let me show you a document that I will have marked as  
11 Minor Exhibit No. 2, which is the affidavit of John  
12 Scalice, and ask you if that is one of the affidavits  
13 you are referring to in your review?

14          A       Yes.

15          Q       Let me ask you to turn to pages 2 through 4  
16 of that document, which describes the procedure that  
17 would be followed in bringing the plant to full shutdown.

18          A       All right.

19          Q       In reviewing this affidavit, did you find any  
20 reason to disagree with the steps that are described there?

21          A       Are you saying would I have written a different  
22 procedure to bring the plant to cold shutdown?



1           Q     I think what I am asking you is chat a reasonable  
2 way of bringing the plant to cold shutdown.safely?

3           A     When you add the word, 'safely,' you change  
4 the predicament. I would say that these are steps which  
5 will probably bring the plant to cold shutdown in an orderly  
6 fashion.

7           Q     On page 4 of that affidavit, there is an  
8 estimation of the time required to complete those steps.  
9 Do you have any view on the reasonableness of that time  
10 estimate?

11          A     I think if you were trying to maintain the  
12 cool down rate at a steady value within the normal tolerances  
13 of what you would like for your vessel temperature change  
14 and so forth, these are probably in the ball park.

15          Q     Let me go back a minute to an earlier statement  
16 you made, which is basically the fact that you weren't  
17 satisfied that the LILCO proposal necessarily answered the  
18 Board's question, and you stated that one of the reasons  
19 for that is you have some questions about the staffing,  
20 and we have explored that.

21                Were there any other reasons why you feel that  
22 the LILCO proposal may not be satisfactory?

1           A       Well, based on my preliminary look at this, I  
2 have some concern about the wording of the licensing --  
3 licensed condition, rather.

4           Q       Let me show you a document that I will have  
5 marked Minor Exhibit No. 3, which is the affidavit of  
6 Matthew C. Cordaro. I take it this was another of the  
7 affidavits that you reviewed, is that correct?

8           A       That is correct.

9           Q       I believe you will find the language of LILCO  
10 proposed licensed condition on pages 3 and 4 of that  
11 affidavit.

12          A       That is right.

13          Q       Could you point out for me the portions of  
14 that proposed licensing condition that you have concerns  
15 about?

16          A       Well, in general. If I were writing this  
17 licensed condition, I would certainly start out to make  
18 it a conditional operation\* instead of a legal agreement,  
19 as it reads to me.

20          Q       I am sorry. Maybe you can expand on that a  
21 little bit to me. How are the two different.

22          A       Well, it starts out with a very conditional

1 statement: So long as LILCO shall rely on an offsite  
2 emergency response organization consisting entirely or  
3 primarily of LILCO employees -- blah, blah, blah, -- and  
4 then it goes on, and then at the end it has all these  
5 other conditions. If they agree to do other things,  
6 they will agree to do other things and do them.

7 So, it has conditions and caveats that I think  
8 are unnecessary for actual licensing condition.

9 The tech spec, for instance, does not have  
10 caveats like that.

11 Q Okay. Let me explore then some of the specifics  
12 of this licensing condition. Do you have concerns with the  
13 fact that the licensing condition proposes to commence  
14 bringing the plant to cold shutdown twenty-four hours prior  
15 to the commencement of a strike?

16 A It proposes to do that, but it doesn't say  
17 they will. It says if they can't, they won't. I have  
18 some concern about that.

19 Q Could you explain that to me?

20 A It says upon receipt of less than twenty-four  
21 hours notice, which could mean the instant a strike is  
22 declared. If they say somehow they didn't get their notice

1       early enough, or the strike occurred, what have you, it  
2       could be instantaneous. There is no guarantee of twenty-  
3       four hours before a strike shutdown.

4               Q       Okay. Let me ask you to hypothesize with me  
5       for a minute. There is a future strike. A strike vote  
6       is taken on Sunday night, and there is an announcement  
7       that at eight o'clock on Tuesday morning the workers will  
8       go out on strike.

9               Under that condition, the way the proposed  
10       licensing condition would operate is that LILCO would begin  
11       to bring the plant to cold shutdown by at least eight  
12       o'clock on Monday morning.

13              Do you follow me so far on this hypothetical?

14              A       I think I do.

15              Q       Okay. Now, in that hypothetical situation, do  
16       you have a concern about LILCO's licensing condition, or  
17       the operation of this licensing condition?

18              MR. McMURRAY: I am going to ask for a  
19       clarification. Are you talking about the entire licensing  
20       condition, or just about the twenty-four hour time period?

21              MR. ZEUGIN: The twenty-four hour time period  
22       in getting the plant to cold shutdown, and having it .t

1 cold shutdown at the time the strike occurs.

2 WITNESS MINOR: You are talking about a  
3 restraining condition here, and a hypothetical. Let's  
4 assume under this idealized condition they had clear  
5 and adequate notice, it started immediately, brought the  
6 plant to shutdown, and there were no abnormalities or  
7 no oddities of the shutdown process, and within the  
8 time estimated in Exhibit 2, they did achieve cold  
9 shutdown.

10 Under those idealized conditions, then this  
11 condition would be a nice thing to have written into the  
12 license.

13 BY MR. ZEUGIN: (Continuing)

14 Q Okay. And under those conditions -- those  
15 hypothetical conditions, to you, this would be an acceptable  
16 condition?

17 A Now you are getting into a degree of acceptance  
18 here that I am not willing to state right now. I just don't  
19 know at this point whether I could accept that.

20 Q What would you need to consider to determine  
21 whether you could accept it or not?

22 A As I said, all of these views I am getting are

1 preliminary. I have to do some more looking myself to  
2 figure out what my final position is going to be on this,  
3 and I am just not ready to make that statement yet.

4 Q What would you look at to determine whether  
5 twenty-four hours is sufficient advance time to begin  
6 to bring the plant to cold shutdown before a strike  
7 occurred?

8 A I would want to look at three areas that  
9 are involved here. The type of accidents that can  
10 occur, the staffing that is available, and what this  
11 licensing condition really means to operation.

12 Q Other than your concern with what you have  
13 described as the caveat to this licensing condition, do  
14 you have other factual -- what I would consider factual  
15 or actual concerns about the way this licensing condition  
16 would operate?

17 MR. McMURRAY: I am going to have to ask for  
18 a clarification of, 'factual,' or 'actual,' concerns.

19 BY MR. ZEUGIN: (Continuing)

20 Q I guess what I am trying to do is divorce  
21 concerns about the actual language of the condition and  
22 the caveat on how it may or may not apply, as compared to



1       whether bringing the plant to cold shutdown, keeping it  
2       there until proof is made of doing something else to the  
3       NRC Staff. That abstract idea of how the plant will  
4       operate -- how the condition will operate creates a  
5       problem in Mr. Minor's mind.

6               A       I am sorry. Can you make that a little  
7       narrower question?

8               Q       Okay.

9               A       I may understand what you mean, but I am not  
10      certain.

11              Q       Okay. I thought you told me earlier today  
12      that one of your concerns for the licensing condition is  
13      it is written in legalese instead of as a true operating  
14      condition.

15                   What I am asking you to do is cut away the  
16      legalese from this, and just focus on the way this  
17      condition would operate.

18              A       Can you tell me what part of the condition is  
19      still in force if I cut that away, and I will try and answer  
20      that.

21              Q       Let me ask you to assume that LERO, as it  
22      currently exists, will be in existence at the time of a



1 strike.

2 I think that cuts away the first part of this,  
3 which is the, 'so long as' clause. I think you then begin  
4 in anticipation of a strike, and that commitment then  
5 proceeds and runs through the end of Point 2, and I think the  
6 last paragraph where the condition being terminated because  
7 Federal, State or local government has decided to cooperate  
8 -- let's ignore that, let's assume they have not --

9 A You think that now would cut out the legalese.  
10 Are you saying all the way through Point 2?

11 Q Yes.

12 A I would not find that acceptable.

13 Q Okay. Why not?

14 A For the same reason I stated earlier, too many  
15 uncertainties in it. For instance, until the end of the  
16 strike. What do you define as the end of the strike? Is  
17 that when somebody says we are going to go back to work  
18 soon?

19 Does that mean when all the workers get back  
20 to work? Is that when ninety-nine percent of the people that  
21 went on strike are now back to work? What defines the end  
22 of the strike. How do you determine that.

1                   Conditions 1 and 2, I don't think I would find  
2 acceptable.

3           Q       Why don't you find those two acceptable?

4           A       Basically, the condition talks about the safety  
5 of the plant in a cold shutdown condition, and Conditions 1  
6 and 2 talk about it in some other mode of operation.

7                   And, so, it is not the same condition.

8           Q       Is part of your concern a concern that you would  
9 not want to place in the Staff's hand an ultimate decision  
10 of whether or not other conditions than cold shutdown can  
11 be gone into during a strike? Those conditions, I think,  
12 are premised on first, proving the ability to go to some  
13 other State, to the Staff, and getting their approval.

14          A       I am not trying to implicate the staff's decision  
15 here at all. I am just saying those two conditions are beyond  
16 what is needed, in my mind, for licensed condition to protect  
17 against the strike.

18          Q       Okay. You would merely suggest that it would make  
19 more sense to keep the plant in cold shutdown?

20          A       It would make more sense, yes.

21          Q       You stated earlier, Mr. Minor, that you have looked  
22 at the Chapter 15 analyses of other settings. I take it --

1           A       Excuse me?

2           Q       You have looked at Chapter 15 analyses that  
3 have been done at other points in this proceeding. I think  
4 you mentioned the Low Power proceeding, and also the FSAR,  
5 is that correct?

6           A       Yes, sir.

7           Q       I take it the reason you looked at those analyses  
8 was to compare them to the analyses that are presented in  
9 the affidavit of Messrs. Stergakos and Rigert?

10          A       That is correct.

11          Q       Did you draw any conclusions from your comparison  
12 of those analyses?

13          A       Well, my preliminary conclusion is that the  
14 categorization that has been used by the LILCO analysis  
15 into three categories. Three star categories. A one  
16 star accident doesn't do much; and a two star accident  
17 does something, but not too much; and a three star accident  
18 can do more, but they still don't think it is a problem.

19                 That seems to be a very broad categorization,  
20 without much specificity as far as what the actual consequences  
21 would be, or what they could be, with other complications.  
22 That is my preliminary conclusion.

1           Q       Let me show you a document that I will have  
2 marked Minor Exhibit No. 4. That is the affidavit of  
3 Messrs. Stergakos and Rigert, and ask you if that is the  
4 document that has just been discussed?

5           A       That is correct.

6           Q       Let me have you turn to the Attachment to  
7 that particular affidavit, which lists 38 accidents that  
8 are presented in the FSAR, and categorizes them into one  
9 of three categories. Are there any particular accidents  
10 in that list that cause you more concern in terms of the  
11 categories being too general, or the consequences not  
12 being clearly explained, than others?

13           MR. McMURRAY: I am going to have to object  
14 to the form of the question. I think it is overly broad  
15 and vague.

16           WITNESS MINOR: I think you are asking if  
17 some caused more concern than others?

18           BY MR. ZEUGIN: (Continuing)

19           Q       Yes. You just told me you had a broad concern  
20 about the fact that the categories may be too general, and  
21 not tell you enough. And I was wondering if there were  
22 certain accidents in that listing that created that concern

1 more than others.

2 MR. McMURRAY: I will repeat my objection.

3 WITNESS MINOR: I can't point out specifics  
4 at this time that would cause me to identify them immediately  
5 as an item of more concern than the one below it.

6 But what I would look for in these is the  
7 involvement of human interaction, operator involvement in  
8 these different accidents. Potential consequences, for  
9 instance, in there were more errors caused by human  
10 involvement. Uncertainties such as the fuel handling  
11 accident, which is rated one star with a footnote that  
12 says this could be elevated to a higher category. In  
13 essence it said that.

14 I guess that is my preliminary look at that  
15 right now.

16 BY MR. ZEUGIN: (Continuing)

17 Q The first part of your answer, you said you  
18 would look at the involvement of human interaction. Is  
19 what you mean by that you would look at these accidents  
20 each in turn, and determine the parts of the accident that  
21 were attributable to human interactions and use that as a  
22 means of identifying ones that could potentially have a

1 broader range of potential outcomes than others?

2 A Yeah.

3 Q You didn't mean you would look at these accidents  
4 and -- assume it is a mechanical accident. Let's just take  
5 an example. Number 4, MSIV closure, and let's assume it  
6 happened not because of human interaction, but because of  
7 a failure in a piece of equipment somewhere.

8 The human interaction you are talking about  
9 is not some additional event after the MSIV closure that  
10 would define the event that is in FSAR 15?

11 A That is also part of it.

12 Q Okay. Which of those two types of human  
13 interaction is of more concern to you?

14 A It is hard to rank those in priority. You are  
15 dealing with a situation where either could be important.  
16 You are dealing with a situation where there is an abnormal  
17 situation about to occur with this plant. A lot of the  
18 workers are going to be going on strike. Supposedly "X"  
19 hours, up to twenty-four, let's say.

20 You are dealing with a staff shift, where you  
21 are going to be dealing now with a group of people who  
22 meet the license operator requirements, perhaps, but haven't



1        been shift operators for a while, or what have you, and they  
2        are going to be doing functions that they don't normally  
3        do, so you have both opportunities available. That is,  
4        for human interactions.

5                Q        I guess what I was getting at is whether you  
6        felt the categorization here was not sufficient because  
7        you would postulate events beyond the simple defining  
8        events that are presented in the FSAR as the accident  
9        sequence.

10               In other words, some additional actions would  
11        be taken beyond the accident that is described in the  
12        FSAR to conceivably make the accident more severe.

13               MR. McMURRAY: I am going to object to the  
14        question as vague and confusing, at least to me. Maybe  
15        the witness can answer it.

16               WITNESS MINOR: I was stumbling over the same  
17        problem.

18               BY MR. ZEUGIN: (Continuing)

19               Q        Bear with me. I am doing the best I can in this  
20        area. As I understand the FSAR, each of these 38 accidents  
21        has a fairly clearly defined sequence of events that  
22        causes it, or that define it. Is that correct?



1           A       They are assumed failures to start these  
2 accidents, correct.

3           Q       Okay. Now, I take it there are also limits  
4 on the amount of assumptions that are made about subsequent  
5 events that have occurred.

6           A       Yes. They are assumed operable systems, for  
7 instance.

8           Q       Now, I guess what I am asking is, do your  
9 concerns go beyond simply doing a Chapter 15 analysis, to  
10 considering whether or not these other operable systems  
11 may not operate, and what the effect of those would  
12 be, or is your concern really limited to the parameters,  
13 I guess, of Chapter 15?

14          A       Well, what we have been discussing so far  
15 are the parameters of Chapter 15 analysis. What we have  
16 been discussing so far is up to that limit. Now, I don't  
17 understand the other part of your question.

18          Q       I was just trying to clarify in my own mind  
19 what we were talking about. What the human interactions  
20 were. I think I was a little confused. I think you just  
21 clarified it for me in your answer.

22                   Part of your answer earlier about your concerns

1 with these three categories was that in some cases the  
2 consequences -- it wasn't clear about the uncertainties  
3 regarding some of the consequences.

4 Let me have you turn to page 4 of Exhibit 4,  
5 Item No. 7.

6 A Yes.

7 Q That item provides some description of the  
8 consequences of the four events that may produce offsite  
9 radiological effects. Do you have any disagreement with  
10 the facts that are presented in that particular item?

11 A I haven't tried to create any alternate  
12 quantification of these events, nor to determine their  
13 sensitivity to other failures or anything like that, so  
14 I, at this point, don't have an opinion on that.

15 Q Okay. Let me have you look at Item No. 9, which  
16 deals with a fuel handling accident. I believe earlier  
17 you also stated to me that you had reviewed the calculation  
18 that was provided in response to discovery that presumably  
19 forms the basis for this conclusion, is that correct?

20 A I have reviewed it to the best of my ability.  
21 My copy is not exactly readable in all circumstances, but  
22 yes, I have.

Q Okay. Did your review of that calculation raise

1 any concerns in your mind?

2 A My preliminary review of that said that it is  
3 an analysis which shows the uncertainty of the safety of a  
4 refueling operation, after operation at full power, during  
5 a strike condition.

6 I don't, at this time, have any opinion on  
7 the exact quantification. Number of days.

8 Q I take it you have no problem with the theoretical  
9 concept that as time passes following the attainment of  
10 cold shutdown, the offsite consequences from a refueling  
11 accident -- assuming one would occur -- decreases as the  
12 time following the initiation of cold shutdown increases?

13 A Certainly there are laws of physics which  
14 govern the decay of radio active material which would apply  
15 here.

16 Q Mr. Minor, have you performed any analyses on  
17 your own to study the likelihood or consequences of accidents  
18 that could occur at cold shutdown?

19 A At this time, I have not performed any analysis  
20 of that type.

21 Q Are you aware in scientific literature if any  
22 such analyses have ever been conducted that you are aware of?

1           A       None come to mind.

2           Q       Let me ask -- there are probably just one or two  
3 more questions. In your review of the materials that have  
4 been provided you, and in your thoughts to present on  
5 testifying in the strike issue, have you identified any  
6 conditions under which there would be a need for an offsite  
7 response organization, assuming the plant is in cold shutdown  
8 at the start of the strike?

9           MR. McMURRAY: I am going to object to the  
10 question. I don't understand what you mean by, 'any  
11 conditions.'

12           BY MR. ZEUGIN: (Continuing)

13           Q       By any condition, meaning any accidents.

14           A       That would do what?

15           Q       Require the presence of an offsite response  
16 organization.

17           A       That is a difficult question to answer with  
18 certainty. In my opinion, there are events that are described  
19 -- for instance Mr. Stergakos and Rigert affidavit, which  
20 would require the activation of certain levels of the  
21 emergency response plan.

22                   I am not saying that I could identify an accident

1       that is going to require evacuation, or something like that,  
2       at this point. But it appears to me that some of these  
3       events would probably require activation of some of the  
4       facilities connected with emergency response plan, and  
5       to that extent there would be a requirement for some LERO  
6       workers to report to their stations for possible action.

7               Q       Let me try and restate your answer in slightly  
8       different terms and see if you agree with my statement.

9               Is what you are saying that there are some  
10       accidents that are -- that would be one of the 38 that  
11       are presented in the Stergakos-Rigert affidavit, that  
12       would result in an alert classification at the plant, and  
13       thus, in turn, require some actions by LERO under the LILCO  
14       Emergency Plan, or even say some could result from site  
15       area condition?

16               Is that basically what you are saying?

17              A       That is basically what I am saying.

18              Q       But you have also not identified any accidents  
19       which would conceivably lead to the need for an evacuation?

20              MR. McMURRAY: I am going to object to the  
21       question as broad. I am not sure what you mean by, 'need for  
22       evacuation.'

1                   WITNESS MINOR: I am not sure at this time that  
2 I can identify any one that requires that. You said, 'lead  
3 to,' and I don't know what that exactly means, because there  
4 are other eventualities that could eventually lead to the  
5 requirement for an evacuation.

6                   But as far as identifying one that requires it,  
7 right now, that I can lay my hands on, I can't identify  
8 any at this point.

9                   MR. ZEUGIN: We have no further questions.  
10 Thank you, Mr. Minor.

11                   MR. McMURRAY: I think we are going to take  
12 a break and --

13                   MR. BORDENICK: I have a few.

14                   MR. McMURRAY: Oh.

15                   CROSS EXAMINATION

16                   BY MR. BORDENICK:

17                   Q       I wonder if you are aware of any U. S. reactors  
18 that have continued to operate at full power after a strike,  
19 a labor strike, against the utility that held the operating  
20 license?

21                   MR. McMURRAY: I am going to object to the  
22 question as being really broad and vague.



1 MR. BORDENICK: Your objection is noted. If the  
2 witness can answer it, I would like an answer.

3 WITNESS MINOR: I haven't particularly looked  
4 for that type of data. But I don't recall any either.

5 BY MR. BORDENICK: (Continuing)

6 Q Would you be surprised if that data existed?

7 A I don't know what you mean. Would I be surprised  
8 if some data existed on that subject? No, I wouldn't be  
9 surprised if some data existed on it.

10 Q Maybe data, I think, which I think was your word,  
11 is a little ambiguous. Would you be surprised to learn that  
12 nuclear power plants in the United States have continued to  
13 operate at full power after a labor strike called by the  
14 unions against the utility that held the operating license?

15 A I am not sure we are comparing apples and  
16 oranges. I don't think I would be overly surprised by that  
17 if they have the adequate staffing of licensed operators and  
18 support personnel on the site to run the plant.

19 However, the question here is not whether the  
20 -- it would be technically possible to run a plant with the  
21 strike. The question is whether if you had an accident during  
22 a strike whether it would be protected. If it was a plant  
23 which required a lot of union employees to implement.

24 Q Well, assuming that there has been one or more  
25 nuclear reactors in the United States that have continued



1 to operate at full power, or some power less than full power,  
2 after a strike, do you have any -- can you tell me any  
3 reasons why an accident at Shoreham would be more likely  
4 than an accident at any of those other plants?

5 MR. McMURRAY: I am going to object to  
6 relevance of the question.

7 MR. BORDENICK: Your objection is noted. If  
8 the witness can answer, I would like an answer.

9 WITNESS MINOR: That is a very difficult  
10 comparison to make, because there are so many uncertainties  
11 in the question.

12 First of all, you are talking about the type  
13 of plant. Is it a new plant, and new plants tend to have  
14 more accidents than older plants. Than middle aged plants,  
15 let's say. Older plants might, again, have more problems.

16 Is it a utility that has a lot of operating  
17 experience? Do they have a lot of other reactors? Do  
18 they have a lot of reactors that they can call on, similar  
19 type, to have support people come in from those other  
20 reactors and help them out.

21 Is it in an area that is not vulnerable to  
22 natural phenomena; lightening storms, things like that,

1 that might cause upsets of the grid or the transients, that  
2 would cause problems.

3 And is it a facility that has a firm commitment  
4 from support organizations for an emergency response plan  
5 if they did have an accident?

6 All of these are variables that are hard to  
7 put into the equation you are asking me to make. But I  
8 think, in general, a reactor is safer when it is shut down  
9 than when it is operating. It is probably also relatively  
10 unsafe during the period of transition between those two  
11 states.

12 BY MR. BORDENICK: (Continuing)

13 Q So your testimony is essentially that you  
14 have to make a case-by-case analysis. You couldn't really  
15 give abstract answers.

16 A Absolutely.

17 Q Assuming -- I posed a series of questions to  
18 you based on full power operation, or some amount close  
19 to full power. Suppose I had stated the question in terms  
20 of reactors in cold shutdown as opposed to continued operation.  
21 Would your answers essentially be the same, or would they  
22 change at all?

23

24

25

1           A       State your hypothesis again? Cold shutdown  
2 being the change --

3           Q       I am sorry. I didn't hear.

4           A       I didn't understand the transition you made  
5 from your previous hypothesis to this one. State it for  
6 me, please.

7           Q       Well, I just asked you a series of questions  
8 which you have answered, and the predicate for my questions  
9 was a U. S. operating reactor, operating at full power or  
10 some amount less than full power, but close to full power,  
11 would your answers have changed if I had said-- used the  
12 phrase, 'reactor in cold shutdown,' as opposed to operating  
13 reactor?

14           MR. McMURRAY: I am just going to still have  
15 to object to the question. Is there a simpler way to  
16 put it, Mr. Bordenick?

17           BY MR. BORDENICK: (Continuing)

18           Q       All right. I will run through the list.

19           A       Would you do that please, so I understand  
20 the premise.

21           Q       Are you aware of any U. S. reactors that have  
22 been put -- placed into cold shutdown, after a labor

1 strike by a union, or unions, against the utility which  
2 held the operating license for that reactor, which is now  
3 in cold shutdown?

4 A You are testing my recollection of some  
5 past events that -- I have this vague recollection of  
6 reading articles about utilities that have shut down their  
7 plant because of a strike. Now, I don't remember where  
8 that was or when, but I have this vague recollection.

9 Q You would then not be surprised, and again  
10 to use your word or phrase, you would not be surprised  
11 if data existed, or there was a history of one or more  
12 U. S. reactors being put in cold shutdown during a strike.  
13 Would you be surprised if I pulled out a list and said  
14 here is a list of reactors, one or more reactors?

15 A No, I don't think I would be surprised.

16 Q Specifically, if I in an attempt to try to  
17 refresh your recollection, and I realize you are not a  
18 walking fount of historical events such as strikes against  
19 nuclear reactors, but if I were to mention, for example,  
20 Indian Point, would that refresh your recollection?

21 A Yes, it does trigger two thoughts together that  
22 could go together. Indian Point and some sort of a shutdown

for a strike, but I can't recall whether that was the incident I am thinking of or not.

Q Okay, are you saying that you remember looking at that sort of a situation, but you just don't remember the details?

A I remember reading about an event of that type,  
but I don't remember when or where.

Q Reading where? Newspapers?

A      Could have been anywhere. Newspapers, --

Q Trade publications.

A Yes.

Q Engineering journals, that sort of thing.

A Yes.

MR. BORDENICK: Okay. I have no further questions.

MR. McMURRAY: I think what we ought to do is take a break. I don't think we have any redirect, but if we do it is not going to be much.

So, why don't we take a break.

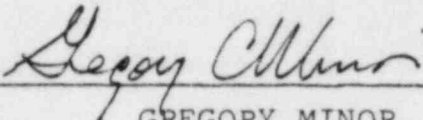
(Short recess taken at 10:00 a.m.)

(10:10 a.m.)

MR. McMURRAY: We have no redirect

1 examination.

2 . (Whereupon, at 10:10 a.m., the taking of the  
3 deposition was concluded.)

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7 GREGORY MINOR  
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1 COMMONWEALTH OF VIRGINIA:  
2 STATE AT LARGE :

3 I, MYRTLE H. TRAYLOR, a Notary Public in and  
4 for the State of Virginia at Large, do hereby certify that  
5 the witness whose testimony appears herein was duly sworn  
6 by me.

7 Myrtle H. Traylor  
8

9 My Commission Expires:

10 June 1, 1985  
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NON-UNION MANPOWER AVAILABLE TO  
BRING PLANT TO COLD SHUTDOWN AND  
MAINTAIN IT IN THAT CONDITION

In the event of a threatened or actual strike of union operators at the Shoreham Nuclear Power Station, actions will be immediately commenced to bring the plant to a cold shutdown condition. Three management staff members, the Watch Engineer, the Watch Supervisor -- each of which hold an SRO License -- and the Shift Technical Advisor, are stationed in the Control Room or onsite at all times during "Power Operation." These individuals alone could commence and accomplish bringing the plant to a shutdown condition. The emergency card dialer telephone could be used to notify and mobilize additional licensed reactor operators. Within one hour from the time of a work stoppage, sufficient licensed Senior Reactor Operators can arrive onsite to assist the above individuals and man indefinitely, if necessary, four rotating shifts with five licensed Senior Reactor Operators on each shift.

There are presently twenty non-union LILCO employees who are licensed Senior Reactor Operators. The job titles of these non-union licensed operators are:

<u>TITLE</u>	<u>NUMBER</u>
Watch Engineer	6
Watch Supervisor	6
Operating Engineer	1
Operations Division Manager	1
Plant Manager	1
Outage/Modification Manager	1
Training Manager	1
Training Supervisor	1
Training Specialist	1
Compliance Engineer	<u>1</u>
TOTAL	20

In accordance with Shoreham Technical Specifications (Table 6.2.2-1), only two licensed reactor operators are required during a "Cold Shutdown" condition, while five licensed operators will be available on each shift during any perceived work stoppage. Sufficient non-union licensed operators therefore exist to bring and maintain the plant in a "Cold Shutdown" condition indefinitely.

In addition to these licensed non-union personnel, six Shift Technical Advisors and over 75 non-licensed Shoreham management employees are available to conduct the necessary, day-to-day plant activities should a strike occur.

LILCO, August 3, 1984

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
LONG ISLAND LIGHTING COMPANY	)	Docket No. 50-322-OL-3
	)	(Emergency Planning Proceeding)
(Shoreham Nuclear Power Station,	)	
Unit 1)	)	

AFFIDAVIT OF JOHN A. SCALICE

JOHN A. SCALICE, being duly sworn, deposes and says as follows:

1. My name is John A. Scalice. I am Operations Manager at the Long Island Lighting Company Shoreham Nuclear Power Station. My business address is North Country Road, Wading River, New York, 11792.

2. I make this affidavit in response to the July 24, 1984 "Memorandum and Order Determining that a Serious Safety Matter Exists" of the NRC Licensing Board in the Shoreham emergency planning hearings. This affidavit has two primary purposes. The first is to describe the actions that the Operations Division would typically take to bring the Shoreham plant to cold shutdown using normal station operating procedures, and the time required to complete those actions. The second is to discuss briefly the obligations of licensed reactor operators regarding operator relief and the turnover of reactor operations.

3. The initiation of a controlled plant shutdown is controlled by procedures SP22.004.01, "Operation Between 20 Percent and 100 Percent Power," and SP22.005.01, "Shutdown From 20 Percent Power." (Attachments 1 and 2). These procedures detail the steps and supplementary activities needed to bring the plant from "Power Operation" through "Hot Shutdown" to a "Cold Shutdown" condition.

4. The Shoreham Technical Specifications (§ 1, Table 1.2: Definitions) define the pertinent operational conditions as follows:

Power Operation - Reactor Mode Switch in "Run" position with the average reactor coolant at any temperature.

Hot Shutdown - Reactor Mode Switch in "Shutdown" position with the average reactor coolant temperature greater than 200°F.

Cold Shutdown - Reactor Mode Switch in "Shutdown" position with the average reactor coolant temperature at less than or equal to 200°F.

Refueling - Reactor Mode Switch in "Shutdown" or "Refuel" position, fuel in reactor vessel with the reactor head closure bolts less than fully tensioned or with the head removed; average reactor coolant temperature less than or equal to 140°F.

5. Briefly, the operator actions required by procedures SP22.004.01 and SP22.005.01 to bring the plant to cold shutdown are as follows:

- a. Reactor power is reduced by lowering recirculation flow utilizing Reactor Recirculation pumps.
- b. The main steam is aligned to the Radwaste Steam Generator below 90% power.



- c. Power is further reduced using the Reactor Recirculation pumps until the flow-biased rod blocks are reached.
- d. Existing control rod movement sheets are then utilized to insert the control rods until both recirculations pumps can be removed from Master Manual Control.
- e. Power reduction continues by the insertion of control rods and by the reduction of recirculation flow until both recirculation pumps reach minimum flow.
- f. Plant auxiliaries are aligned in preparation for Turbine-Generator de-energization.
- g. At approximately 15% to 20% power, the neutron level instrumentation is activated, tested and then utilized to monitor reactor power.
- h. The control rods continue to be inserted and at approximately 5-10% power the reactor mode switch is placed in the next condition of operation: "Start/Hot Standby".
- i. Generator load is reduced and the Turbine-Generator is removed from service by opening the main generator output breakers.
- j. Control rod insertion continues until the reactor is subcritical and then an "all-rods-in" configuration is achieved.
- k. The Reactor Mode Switch is then placed in the "Shutdown" position.
- l. Reactor pressure is reduced by using the turbine bypass valves to maintain a cooldown rate below the allowable Technical Specification rate.
- m. Reactor water level is maintained using the low flow feedwater controller, and the auxiliary boiler is used to transfer auxiliary loads to auxiliary steam.
- n. When reactor pressure has moved below 109 psig, the Residual Heat Removal System is

aligned in the "Shutdown Cooling Mode" of operation and one recirculation pump is removed from service.

- o. This mode of cooling is continued until the reactor coolant temperature is below 200°F at which time the remaining recirculation pump is removed from service.

At this point, the reactor is in a "Cold Shutdown" condition.

6. The time needed to perform the entire sequence of activities described in Paragraph 5 is approximately 12 to 16 hours.

7. While not desirable, power reduction can be achieved more quickly by first reducing recirculation flow and then manually scramming the reactor. The scramming action inserts the control rods and takes the reactor to a subcritical condition in approximately 5 seconds. The time from full power to "all-rods-in" is therefore on the order of minutes. Subsequent pressure reduction and cooldown would follow the path described in items k to o of Paragraph 5. Using this method of power reduction, the total time to Cold Shutdown is approximately 8 hours, or one operations shift.

8. Based on the preceding discussions, if a postulated work stoppage provided twenty-four hours of advance notification, then ample time would exist for the planned operations complement to place the reactor in a Cold Shutdown condition.

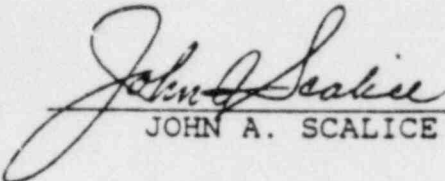
9. My observations of those Shoreham licensed operators who are union members uniformly confirm a mature and dedicated

attitude on the part of these operators toward the performance of their duties, obligations and requirements of their licenses. They are fully trained in the proper procedures for operator relief and turnover, and are aware of the provisions of 10 CFR Part 55 which govern their licenses and outline possible causes for revocation including "any conduct determined by the Commission to be a hazard to safe operation of the facility."

10. This responsible attitude was abundantly apparent at the onset of the current work stoppage. The operating crew on shift provided an excellent shift turnover, which included the placement of new chart paper in all recorders, the preparation of operator log sheets, and even the cleaning of the control room facilities. Even though I am confident of the participation of licensed union-member reactor operators in bringing the plant to cold shutdown, their participation is not necessary to effectuate shutdown, following the procedures outlined in Paragraphs 5 through 7 of this Affidavit, in the times stated. Management-level plant staff employees alone can also perform these operations without further assistance, if necessary.

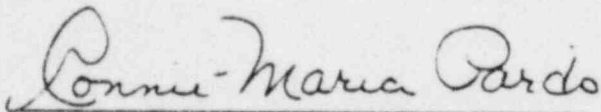
11. Once the reactor has been brought to cold shutdown, it can be maintained in that condition indefinitely, by management-level plant staff employees alone if necessary.

12. To conduct fuel handling activities the reactor must be brought to an operational level below cold shutdown: "Refueling Mode." Management-level plant staff employees alone could also take the reactor to this mode of operation and maintain it in that state.

  
JOHN A. SCALICE

COUNTY OF SUFFOLK)  
STATE OF NEW YORK)

Subscribed and sworn to before  
me this 7 day of August, 1984.

  
NOTARY PUBLIC

My Commission Expires on March 30, 1985.

CONNIE-MARIA PARDO  
NOTARY PUBLIC, State of New York  
No. 52-46158-10  
Qualified in Suffolk County  
Commission Expires March 30, 1985

LILCO, August 3, 1984

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
LONG ISLAND LIGHTING COMPANY	)	Docket No. 50-322-OL-3
	)	(Emergency Planning Proceeding)
(Shoreham Nuclear Power Station,	)	
Unit 1)	)	

AFFIDAVIT OF MATTHEW C. CORDARO

Matthew C. Cordaro, being duly sworn, deposes and says as follows:

1. My name is Matthew C. Cordaro. I am Vice President, Engineering, for LILCO. My business address is Long Island Lighting Company, 175 East Old Country Road, Hicksville, New York 11801. I make this affidavit in support of LILCO's motion for summary resolution of issues involving the effect of a strike against LILCO under circumstances where, as now, a substantial proportion of LERO members are also unionized LILCO employees.

2. The Local Emergency Response Organization (LERO) for Shoreham Nuclear Power Station is composed largely though not entirely of LILCO employees. Approximately two-thirds of the LILCO employees in LERO belong to one or another of two unions. Absent the occurrence of events not being relied on as a basis for this license application, the composition of LERO will remain roughly in its present form for the foreseeable future.

3. In the current configuration of LERO it cannot be demonstrated that a strike against LILCO involving all of the union



members of LERO would not, under any circumstances, impair the functioning of LERO in the event of a radiological event requiring offsite response.

4. The recently expired contracts with LILCO's unions contain no-strike clauses prohibiting strikes during their term. Such clauses, or other clauses prohibiting strikes without notice, are typical of union contracts and are expected to be included in future contracts between LILCO and unions.

5. Strikes of any significant proportion generally do not begin without at least several days' notice established by either the contract expiration date, the subsequent failure of negotiations, or reports of unrest among union members. Further, the mechanics of strike commencement, including membership meetings and votes, build significant time, generally several days, into the process. The strike which began in July 1984 did not begin before the expiration date of the contract. Union leadership worked with LILCO management to provide ample notice of the actual start of the strike and to assure a smooth transition. I would expect, should a strike against LILCO ever occur in the future, that for the reasons outlined in this paragraph, LILCO management would have at least several days' advance notice of its imminence.

6. LILCO management understands, on the basis outlined in the accompanying affidavits of Dr. Stergakos and Messrs. Rigert and Scalice, that the Shoreham plant can be brought to cold shutdown in 24 hours or less, by management employees alone, and maintained in that status indefinitely thereafter by management



employees alone; and that from attainment of cold shutdown on, as long as the reactor is maintained in cold shutdown, no credible accident sequences can lead to offsite doses requiring the availability of an offsite emergency response capability, i.e., 1 rem or more to the whole body or 5 rems or more to the thyroid. LILCO management also understands, on the basis of these affidavits, that fuel handling and other operations requiring access to the reactor core would not result in accidents having offsite consequences requiring the availability of an offsite emergency response capability provided sufficient time has passed following the attainment of cold shutdown.

7. On the basis of the facts outlined in this affidavit and those set forth in the affidavits of Dr. Stergakos and Messrs. Rigert and Scalice, LILCO would be willing to accept the following condition on an operating license at Shoreham:

PROPOSED LICENSE CONDITION

So long as LILCO shall rely on an offsite emergency response organization consisting entirely or primarily of LILCO employees, then in anticipation of the commencement of a strike by a union representing LILCO employees, LILCO shall bring the Shoreham Nuclear Power Station (SNPS) to cold shutdown condition using normal operating procedures. LILCO shall commence bringing SNPS to cold shutdown condition 24 hours prior to the commencement of such strike, or immediately upon receipt of less than 24 hours' notice of the impending commencement of a strike, with the goal of having the plant in cold shutdown condition by the time the strike commences. LILCO shall maintain SNPS in cold shutdown condition until the end of the strike except that, with the prior approval of the NRC Staff upon review of written application by LILCO, LILCO shall be permitted:

- (1) to take the reactor to a refueling mode to conduct refueling or other operations requiring access to the reactor core if it is shown that such operations cannot result in the occurrence of any events requiring offsite emergency response capability; and
- (2) to conduct such other operations as the Staff shall approve if it is shown that the strike does not, in fact, impair LILCO's ability to implement its offsite emergency preparedness plan.

This condition shall terminate at such time as any or any combination of agencies of the Federal, New York State, or Suffolk County governments shall provide to the NRC written notice of its or their agreement, under terms and conditions approved by FEMA, to assume legal responsibility for effectuation of offsite emergency response for Shoreham Nuclear Power Station.

Matthew C. Cordaro  
Matthew C. Cordaro

COUNTY OF NASSAU )  
STATE OF NEW YORK)

Subscribed and sworn to before  
me this 6<sup>th</sup> day of August, 1984

Graceann Powers  
NOTARY PUBLIC

GRACEANN POWERS  
Notary Public, State of New York  
No. 30-4721199  
Qualified in Nassau County  
Commission expires Mar. 30, 1986

My Commission Expires on 3/30/86

LILCO, August 3, 1984

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
LONG ISLAND LIGHTING COMPANY	)	Docket No. 50-322-OL-3
	)	(Emergency Planning Proceeding)
(Shoreham Nuclear Power Station,	)	
Unit 1)	)	

AFFIDAVIT OF ELIAS P. STERGAKOS AND JOHN A. RIGERT

ELIAS P. STERGAKOS and JOHN A. RIGERT, being duly sworn,  
depose and say as follows:

1. [Stergakos only] My name is Elias P. Stergakos. I am employed by the Long Island Lighting Company as Manager of the Radiation Protection Division; I report directly to the Manager of Nuclear Engineering Department. I have the overall responsibility for the Corporate overview and technical direction of all aspects of radiological protection and the design of radwaste systems. My business address is Long Island Lighting Company, Shoreham Nuclear Power Station, North Country Road, Wading River, New York, 11792.

2. [Rigert only] My name is John A. Rigert. I am employed by Long Island Lighting Company as Manager, Nuclear Systems Engineering Division of the Nuclear Engineering Department. My business address is Long Island Lighting Company, Shoreham Nuclear Power Station, North Country Road, Wading River, New York, 11792.

[Both affiants declare Paragraphs 3 through 9, as follows:]

3. We make this affidavit in response to the July 24, 1984 "Memorandum and Order Determining that a Serious Safety Matter Exists" of the NRC Licensing Board in the Shoreham emergency planning hearings. The purpose of this Affidavit is to provide support for the proposition that 24 or more hours after initiation of the descent to cold shutdown from full power following normal operating procedures -- a process which takes less than 24 hours -- there is no postulated abnormal event that could result in radiological consequences in excess of EPA's Protective Action Guidelines of 1 rem to the whole body and 5 rem to the thyroid. This conclusion is based upon a review of the events described in Chapter 15 of the Shoreham FSAR. The EPA PAGs have been utilized in NRC licensing proceedings to help determine the need for off-site radiological emergency response capability.

4. Chapter 15 of the Shoreham FSAR provides the results of analyses for the spectrum of accident and transient events that must be accommodated by the Shoreham plant to demonstrate compliance with the NRC's regulations. This portion of the safety analysis is performed to evaluate the ability of the plant to operate without undue risk to the health and safety of the public. The Shoreham FSAR was submitted to the NRC Staff for its review and was approved in the Staff's Safety Evaluation Report for Shoreham. (NUREG-0420).

5. A number of the Chapter 15 events need no longer be postulated because of the different plant configuration and system lineup under cold shutdown versus operating conditions. In particular, the MSIVs would be closed; the reactor would be fully depressurized; and only low level decay heat would be produced. As a result of these plant conditions, even events which are theoretically possible are of little concern since they are unlikely to occur. Should they nonetheless occur, the available time for automatic or manual mitigation of the event would be greatly increased; the capacity requirements of the mitigation systems would be greatly reduced; and the radioactive inventory of the core and plant systems would be reduced thus reducing the potential radiological consequences.

6. The review of the Chapter 15 analysis revealed that of the 38 accident or transient events addressed in Chapter 15, 21 of the events could not occur physically during cold shutdown because of the operating conditions of the plant. An additional 14 events could physically occur, but the offsite radiological consequences would be inconsequential or non-existent. The remaining 3 events are possible at cold shutdown but have offsite radiological consequences below the PAG limits. One of the 21 events which could not occur during cold shutdown could, however, occur during the refueling mode. This event is the fuel handling accident that is discussed separately in Paragraph 9 below. Attachment 1 identifies the category into which each Chapter 15 event falls.



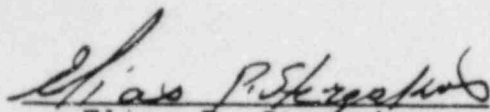
7. Of the four events which may produce an offsite radiological effect three produce doses which are at least an order of magnitude below the PAG limits even at full power operations. Event 29 represents occasional miscellaneous spills and leaks which may occur outside the primary containment. The offsite consequences are described in FSAR §§ 11.2 and 11.3 and are trivial (approximately 0.001 rem/year). Event 31 is postulated to occur due to the failure of one of the off-gas system charcoal absorber tanks during system operation. The offsite consequences are described in FSAR § 15.1.31 and the whole-body dose is approximately 0.02 rem. The consequences during cold shutdown would be significantly reduced since the off-gas system would be out of service. Event 32 entails the simultaneous failure of all liquid radwaste tanks as described in FSAR § 11.2.3.4.2 and results in a whole-body dose of less than 0.0004 rem and a thyroid dose of less than 0.5 rem.

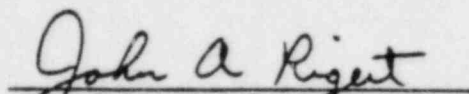
8. Our review of Chapter 15, described above, confirms that no accident could occur during a cold shutdown condition which would result in any undue risk to the public health and safety.

9. If fuel handling operations or other operations requiring access to the core are conducted following cold shutdown, a fuel handling accident (Event 36), not possible during cold shutdown, may occur. The offsite consequences of this type of accident vary depending on fuel burnup and on the time that has passed since the attainment of cold shutdown. As time passes following cold



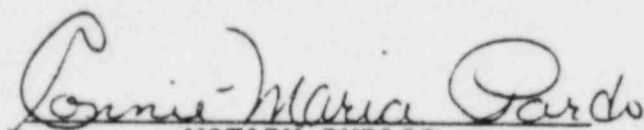
shutdown, all such consequences would diminish to levels below EPA  
PAG limits.

  
Elias P. Stergakos

  
John A. Rigert

COUNTY OF SUFFOLK)  
STATE OF NEW YORK)

Subscribed and sworn to before me  
this 7 day of August, 1984.

  
NOTARY PUBLIC

My Commission Expires on March 30, 1985.

CONNIE-MARIA PARDO  
NOTARY PUBLIC, State of New York  
No. 52-46158-10  
Qualified in Suffolk County  
Commission Expires March 30, 1985

FSAR CHAPTER 15 ACCIDENT CONSEQUENCES

REACTOR AT COLD SHUTDOWN, 24 HOURS  
OR MORE AFTER INITIATION OF DESCENT  
FROM OPERATION AT 100% POWER

<u>Chapter 15 Event</u>	<u>Event Category</u>
1. Generator Load Rejection	*
2. Turbine Trip	*
3. Turbine Trip with Failure of Generator Breakers to Open	*
4. MSIV Closure	*
5. Pressure Regulator Failure - Open	*
6. Pressure Regulator Failure - Closed	*
7. Feedwater Controller Failure - Maximum Demand	**
8. Loss of Feedwater Heating	*
9. Shutdown Cooling (RHR) Malfunction - Decreasing Temperature	**
10. Inadvertent HPCI Pump Start	*
11. Continuous Control Rod Withdrawal During Power Range Operation	*
12. Continuous Rod Withdrawal During Reactor Startup	*
13. Control Rod Removal Error During Refueling	*
14. Fuel Assembly Insertion Error During Refueling	*

\* Event not possible.

\*\* Event possible but offsite radiological consequences are  
inconsequential or non-existent.

\*\*\* Event possible but consequence below PAG limits.

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|-----|--|-----|
| 15. | Off-Design Operational Transients<br>Due to Inadvertent Loading of a<br>Fuel Assembly into an Improper<br>Location | **  |
| 16. | Inadvertent Loading and Operation<br>of a Fuel Assembly in Improper<br>Location                                    | *   |
| 17. | Inadvertent Opening of a<br>Safety/Relief Valve  | *   |
| 18. | Loss of Feedwater Flow   | **  |
| 19. | Loss of AC Power   | **  |
| 20. | Recirculation Pump Trip  | **  |
| 21. | Loss of Condenser Vacuum   | *   |
| 22. | Recirculation Pump Seizure   | **  |
| 23. | Recirculation Flow Control Failure -<br>With Decreasing Flow   | **  |
| 24. | Recirculation Flow Control Failure -<br>With Increasing Flow   | **  |
| 25. | Abnormal Startup of Idle<br>Recirculation Pump   | **  |
| 26. | Core Coolant Temperature Increase  | **  |
| 27. | Anticipated Transients Without<br>SCRAM (ATWS)   | *   |
| 28. | Cask Drop Accident   | *   |
| 29. | Miscellaneous Small Releases<br>Outside Primary Containment  | *** |
| 30. | Off-Design Operational Transient<br>as a Consequence of Instrument<br>Line Failure                                 | **  |
| 31. | Main Condenser Gas Treatment<br>System Failure   | *** |
| 32. | Liquid Radwaste Tank Rupture   | *** |

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|---|-------------|
| 33. Control Rod Drop Accident   | *           |
| 34. Pipe Breaks Inside the Primary Containment (Loss of Coolant Accident) | **          |
| 35. Pipe Breaks Outside Primary Containment (Steam Line Break Accident)   | *           |
| 36. Fuel Handling Accident  | * <u>1/</u> |
| 37. Feedwater System Piping Break   | **          |
| 38. Failure of Air Ejector Lines  | *           |

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1/ Event not possible during cold shutdown. If fuel handling operations were conducted following cold shutdown and an accident were to occur, the consequences at the Shoreham site boundary would be below PAG limits if sufficient time had passed following the attainment of cold shutdown.