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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of:

LONG ISLAND LIGHTING COMPANY

(Shoreham Nuclear Power Station, Unit 1)

Docket No50-322-OL-3

Location: Hauppauge, New York **Pages:** 15,425-15,594

Date: Tuesday, August 28, 1984

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

Court of Claims
State of New York
State Office Building
Room 3B46
Veterans Memorial Highway
Hauppauge, New York 11787

Tuesday, August 28, 1984

The hearing in the above-entitled matter resumed, pursuant to notice, at 10:10 a.m.

BEFORE:

JAMES A. LAURENSON, ESQ., Chairman
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

DR. JERRY KLINE, Member
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

DR. FREDERICK SHON. Member
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SueT

APPEARANCES:

On Behalf of LILCO:

JAMES N. CHRISTMAN, ESQUIRE
LEE ZEUGIN, ESQUIRE
Hunton & Williams
Main Street
Richmond, Virginia

On Behalf of Suffolk County:

CHRISTOPHER M. MC MURRAY, ESQUIRE
MICHAEL S. MILLER, ESQUIRE
Kirkpatrick, Lockhart, Hill, Christopher & Phillips
1900 M Street, N. W.
Washington, D. C. 20036

On Behalf of New York State:

RICHARD J. ZAHNLEUTER, ESQUIRE
Special Counsel to the Governor
Executive Chamber
Room 299
State Capitol
Albany, New York 12224

On Behalf of the NRC:

DONALD HASSELL, ESQUIRE
ORESTE RUSS PIRFO, ESQUIRE
BERNARD BORDENICK, ESQUIRE
Office of the Executive Legal Director
Nuclear Regulatory Commission
Washington, D. C. 20555

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C O N T E N T S

WITNESSES	DIRECT	CROSS	RECROSS	REDIRECT	BOARD
MATTHEW CORDARO) JOHN SCALICE) ELIAS STERGAKOS) - and -) JOHN RIGERT)	15,435	15,449	15,564	15,565	15,537

E X H I B I T S

EXHIBIT NO.	IDENTIFIED	ADMITTED
LILCO EP-71	15,431	15,439
LILCO EP-72	"	"
" EP-73	15,432	"
" EP-74	"	"
" EP-75	"	"
" EP-76	"	"
" EP-77	"	15,446
" EP-78	15,433	"
" EP-79	15,590	15,590
" EP-80	15,590	15,590
Suffolk County EP-94	15,500	15,503

T1 mm1

PROCEEDINGS

JUDGE LAURENSON: Good morning. The hearing is now open. Before we begin with today's proceedings, I just want to review the telephone conference call that was held yesterday.

The Board was informed that there was a disagreement among counsel concerning the scheduling of the witnesses for the NRC Staff, and that the conference by telephone was requested. So, we did conduct such a telephone conference at about 11:30 yesterday morning with the result that we ordered that the order of testimony concerning the strike issues that we are hearing this week will be that the LILCO witnesses will go first, the County's witness will go next, and then the Staff witnesses will be last.

Is there anything else that anyone wants to place on the record before we begin hearing the testimony this week concerning the sua sponte questions raised by the Board?

MR. ZAHNLEUTER: Yes, Judge Laurenson.

The telephone conference call yesterday is precisely the point that I wish to discuss.

I have heard that the conference called occurred from counsel from Suffolk County. I heard that late yesterday and I hear it again this morning. But, I am amazed that the State of New York was not included in this conference call at all.

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The State of New York does have a position on this issue and I think that the State of New York deserves the opportunity to make a statement and in that sense, this would be a Motion for Reconsideration of your prior ruling.

I would note by letter of January 13th of this year, the Governor informed this Board that the State did intend to participate in all aspects of the Shoreham Licensing Proceeding, including this Emergency Planning Hearing. And the Governor also notified this Board that Fabian Palomino, the Governor's special counsel, would be attending. And I am here representing both the Governor and Mr.Palomino.

I have attended these hearings since January and I have participated as fully as possible. I have been in every conference call up to this point. I really wished that the State had been given an opportunity to participate in that conference call.

I would suggest that the Board reconsider its ruling because it appears that the NRC Staff witnesses have aligned themselves with the LILCO witnesses,and because of that alignment they should be heard before the County's witness, Mr.Miner.

The main point of my argument revolves around the deposition of Mr.Stergakos, where he revealed that the

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NRC Staff witnesses had indeed contacted Mr. Stargakos and discussed in detail the matters contained in the affidavits, specifically the Chapter 15 discussions. And the specific witness from the NRC Staff was Mr.Hodges. This is all according to the deposition on pages 21 through 26.

And Mr. Hodges inquired about the possibility of Class 9 accidents occurring and the feasibility. These matters are directly relevant to the testimony of each one of these witnesses.

I think that shows a clear alignment of those parties and they should be required to precede Mr.Miner in this case.

That would conclude my argument.

JUDGE LAURENSON: As far as the omission of New York from this conference call yesterday, I will take responsibility for that. Apparently -- well, it just was not raised by any of the parties to the conference call, but the responsibility is ours. It was inadvertent, and there was no intention of any kind not to include New York. So, I apologize for that.

Insofar as the Motion that you have made for reconsideration, we will just hold that in abeyance right now until we get to the point where a ruling will be necessary on that.

Is there anything further before we begin this

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part of the oral testimony today?

(No response)

Are there any preliminary statements or opening statements on this issue, or do you wish to begin with the testimony of the LILCO panel of witnesses?

(No response)

Since no one has any suggestion to the contrary, I guess we will call on Mr. Zeugin to present his witnesses.

We will go off the record for a moment.

(Discussion off the record.)

JUDGE LAURENSON: Back on the record.

Before we start the testimony of this panel, in order to expedite the questioning of the witnesses, LILCO has submitted several documents in advance, copies to all counsel and the Board, and these have been marked as follows:

The Affidavit of Matthew C. Cordaro is LILCO EP-71.

(The document referred to was marked LILCO EP-71 for identification.)

JUDGE LAURENSON: The Affidavit of Elias P. Stergakos and John A. Rigert is LILCO EP-72.

(The document referred to was marked LILCO EP-72 for identification.)

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JUDGE LAURENSON: The Affidavit of John A. Scalice is LILCO Exhibit EP-73.

(The document referred to was marked LILCO EP-73 for identification.)

JUDGE LAURENSON: The Curriculum Vitae marked John A. Scalice is LILCO EP-74.

(The document referred to was marked LILCO EP-74 for identification.)

JUDGE LAURENSON: Curriculum Vitae for Dr. Elias P. Stergakos is LILCO EP-75.

(The document referred to was marked LILCO EP-75 for identification.)

JUDGE LAURENSON: Curriculum Vitae for John A. Rigert is LILCO EP-76.

(The document referred to was marked LILCO EP-76 for identification.)

JUDGE LAURENSON: A document marked 3/4.0 Applicability, Limiting Condition for Operation is marked LILCO EP-77.

(The document referred to was marked LILCO EP-77 for identification.)

mm6

JUDGE LAURENSON: And finally, a document captioned Non-Union Manpower Available to Bring Plant to Cold Shutdown and Maintain it in that Condition is LILCO EP-78.

(The document referred to was marked LILCO EP-78 for identification.)

end T1

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JUDGE LAURENSON: Mr. Zeugin.

MR. ZEUGIN: Judge Laurenson, I would like to introduce the Board to the members of LILCO's panel on the strike issues. They are respectively, starting furtherest away from you, Dr. Cordaro, Dr. Stergakos, Mr. Rigert and Mr. Scalice.

Of these four witnesses, only Dr. Cordaro has been previously sworn, and I would ask, Judge Laurenson, at this time that you swear Messrs. Stergakos, Rigert and Scalice.

JUDGE LAURENSON: I will just remind Dr. Cordado that he has been previously sworn and is still under oath. I will ask the other three witnesses to stand and raise their right hands and be sworn.

Whereupon,

MATTHEW C. CORDARO

JOHN A. SCALICE

ELIAS P. STERGAKOS

- and -

JOHN A. RIGERT

were called as a panel of witnesses on behalf of LILCO and, Mr. Cordaro, having been previously duly sworn and Messrs. Stergakos, Rigert and Scalice, having been first duly sworn by Judge Laurenson, were examined and testified as follows:

XXXXXXXXXX

Sim 2-2

INDEX XXXXX

JUDGE LAURENSON: Please be seated.

DIRECT EXAMINATION

BY MR. ZEUGIN:

Q Gentlemen, could I ask you each of you in turn to identify yourselves and state your business address.

A (Witness Scalice) My name is John A. Scalice. I work at the Shoreham Nuclear Power Station, P. O. Box 628, Wading River, New York, 11792.

A (Witness Rigert) My name is John Rigert. I work at the Shoreham Nuclear Power Station, the same address.

A (Witness Stergakos) My name is Dr. Elias P. Stergakos. The address is Long Island Lighting Company, Shoreham Nuclear Power Station, North Country Road, Wading River, New York, 11792.

A (Witness Cordaro) My name is Matthew C. Cordaro, and by business address is the Central Operating Headquarters of the Long Island Lighting Company, 175 East Old Country Road, Hicksville, New York, 11801.

Q Dr. Cordaro, do you have before you a document that has been numbered LILCO Exhibit EP-71 that is entitled Affidavit of Matthew C. Cordaro and is dated August 3, 1984?

A (Witness Cordaro) Yes, I do.

Q Dr. Stergakos and Mr. Rigert, do you have a document before you that has been marked LILCO Exhibit 72

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Affidavit of Elias P. Stergakos and John A. Rigert dated August 3, 1984?

A (Witness Stergakos) Yes, I do.

A (Witness Rigert) Yes, I do.

Q Mr. Scalice, do you have before you a document that has been numbered LILCO Exxhibit EP-73 entitled Affidavit of John A. Scalice dated August 3, 1984?

A (Witness Scalice) Yes, I do.

Q Gentlemen, as to each of you, were these respective documents prepared by you or under your supervision and direction?

A (Witness Scalice) Yes.

A (Witness Rigert) Yes.

A (Witness Stergakos) Yes.

A (Witness Cordaro) Yes.

Q Are there any corrections any of you would like to make to your affidavit?

A (Witness Rigert) I have a correction to my affidavit. I would like to make a change on page 2 of Attachment 1. Item 15, I would like to change that from a double asterisk to single asterisk item, and as a result of that change there are some changes on page 3 of the body of the affidavit.

In paragraph 6, the second line, 21 would be changed to 22. On the fourth line, 14 would be changed to

Sim 2-4

13, and on the eighth line, 21 would be changed to 22. That is the only changes.

Q With the correction identified by Mr. Rigert, are these documents true and correct to the best of your knowledge and belief?

A (Witness Scalice) Yes.

A (Witness Stergakos) Yes.

A (Witness Rigert) Yes.

A (Witness Cordaro) Yes.

Q Mr. Scalice, let me ask you if you have a document in front of you that has been numbered LILCO Exhibit EP-74 that is headed John A. Scalice, Operations Manager, Long Island Lighting Company?

A (Witness Scalice) Yes, I do.

Q Could you please identify what this document is?

A This is an outline of my resume and professional qualifications.

Q Is this document true and correct to the best of your knowledge and belief?

A There is one minor change on the last page. I am no longer a member of the American Society of Mechanical Engineers.

Q I take it that other than that change the document is true and correct to the best of your knowledge and belief?

A It is.

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Q Dr. Stergakos, do you have a copy of a document that has been numbered LILCO Exhibit EP-75 headed Dr. Elias P. Stergakos, Radiation Protection Engineer, Long Island Lighting Company?

A (Witness Stergakos) Yes, I do.

Q Could you identify what this document is?

A This is my resume.

Q Is this document true and correct to the best of your knowledge and belief?

A Yes, it is.

Q Mr. Rigert, do you have before you a document that has been numbered LILCO Exhibit EP-76 and is headed John A. Rigert, Section Head, Nuclear Systems Engineering Section, Long Island Lighting Company?

A (Witness Rigert) Yes.

Q Could you identify what this document is?

A This is my resume.

Q Is this document true and correct to the best of our knowledge and belief?

A Well, I would like to make one change to it, and that is the title, to reflect the recent change in my position. It should not read Manager, Nuclear Systems Engineering Division. The body of the resume is correct.

Q Judge Laurenson, at this time I would move for admission into evidence LILCO Exhibits EP-71, 72, 73, 74, 75

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and 76 and ask that they be bourd into the transcript as if read by these witnesses.

JUDGE LAURENSON: Is there any objection?

MR. MILLER: No objection.

MR. HASSELL: No objection.

MR. ZAHNLEUTER: No objection.

JUDGE LAURENSON: LILCO Exhibits EP-71 through 76 will be received in evidence and bound into the trascript as indicated.

(LILCO Exhibits EP-71 through 76, inclusive, previously marked for identification were admitted into evidence.)

(LILCO Exhibits EP-71 through 76, inclusive follow:)

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 LEPO 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 6th 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, 19 86

My Commission Expires on 3/30/86.

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. 52-4615810
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

	Chapter 15 Event	Event Category
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 inconsequentiaql or non-existent.

*** Event possible but consequence below PAG limits.

15.	Off-Design Operational Transients Due to Inadvertent Loading of a Fuel Assembly into an Improper Location	**
16.	Inadvertent Loading and Operation of a Fuel Assembly in Improper Location	*
17.	Inadvertent Opening of a 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 - With Decreasing Flow	**
24.	Recirculation Flow Control Failure - With Increasing Flow	**
25.	Abnormal Startup of Idle Recirculation Pump	**
26.	Core Coolant Temperature Increase	**
27.	Anticipated Transients Without SCRAM (ATWS)	*
28.	Cask Drop Accident	*
29.	Miscellaneous Small Releases Outside Primary Containment	***
30.	Off-Design Operational Transient as a Consequence of Instrument Line Failure	**
31.	Main Condenser Gas Treatment System Failure	***
32.	Liquid Radwaste Tank Rupture	***

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	* 1/
37.	Feedwater System Piping Break	**
38.	Failure of Air Ejector Lines	*

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.

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
JOHN A. SCALICE

COUNTY OF SUFFOLK)
STATE OF NEW YORK)

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

Connie-Maria Pardo
NOTARY PUBLIC

My Commission Expires on March 30, 1985.

CONNIE-MARIA PARDO
NOTARY PUBLIC, State of New York
No. 52-4615810
Qualified in Suffolk County
Commission Expires March 30, 1985

Submitted: W. Hunter

Reviewed/OQA Engr.: J. Thomas Rose

Approved/Plant Mgr.: W. Cheng

MC.1

SP Number 22.004.01
Revision 5
Date Eff. 4/20/84
TPC
TPC
TPC

OPERATION BETWEEN 20 PCT. AND 100 PCT. POWER

1.0 PURPOSE

To provide instructions to the Station Operating Personnel for safe integrated plant operation between 20% and 100% power.

2.0 RESPONSIBILITY

The Operating Engineer shall be responsible for ensuring the proper implementation of this procedure.

3.0 DISCUSSION

3.1 This procedure will outline the steps necessary to provide for safe, efficient operation of the plant between 20% and 100% power.

3.2 The steps in this procedure are sequenced to provide a logical order of occurrence during power ascension and descension. The order may be altered at the discretion of the Watch Engineer based on plant conditions and equipment availability.

3.3 The following procedures are provided:

3.4 All control switches and controllers for remotely operated valves, pumps and equipment are located in the Main Control Room, unless otherwise specified.

3.5 Since numerous systems are covered in this procedure, system designators will be provided, as needed, for clarity.

4.0 PRECAUTIONS

4.1 Rod movements shall be in accordance with the Control Movement Sheets provided by Reactor Engineering.

4.2 Maintain generator operation within the Reactivity Capability Curve of SPF 22.004.01-1.

4.3 Maintain reactor operation within the Power/Flow Map limitations of SPF 22.004.01-2.

4.4 All precautions associated with the operation of individual systems and components as presented in the individual system operating procedures shall be adhered to.

4.5 Primary containment O_2 concentration shall be less than 4% within 24 hours after achieving >15% rated thermal power and shall be verified <4% once per 7 days thereafter, unless within 24 hours prior to reducing thermal power to <15% rated thermal power preliminary to a scheduled reactor shutdown. (except during the performance of the Startup Test Program until either the required 100% of Rated Thermal Power trip tests have been completed or the Reactor has operated for 120 effective full power days).

4.6 Prior to all power ascensions, reactor engineering shall be notified so that they may monitor thermal limits and direct flux shaping and PCIOMR manuevers as appropriate.

4.7 Do not exceed the 80% rod line on the Power/Flow map unless total core flow is greater than 35 Mlbm/hr; otherwise, excessive neutron flux noise levels may occur.

5.0 PREREQUISITES

5.1 SP 22.001.01, Startup, Cold Shutdown to 20% Power Procedure completed.

6.0 LIMITATIONS AND ACTIONS

6.1 If any safety related equipment is or becomes inoperable follow the applicable Technical Specification requirements.

6.2 Notify Reactor Engineering upon completion of a thermal power increase of at least 15% of rated thermal power so that necessary Technical Specification Surveillances amy be performed.

6.3 The pressure drop across any one Condensate Demineralize Unit should not exceed 40 psid clean and 50 psid dirty when passing minimum flow (3430 gpm). Maintain flow rate through each demineralizer between 1600 and 3100 gpm during power ascension and descension.

6.4 Do not exceed 2436 MW_t power level.

6.5 The reheaters should be operated to maintain a reheat steam temperature differential of <50°F and a ramp rate of <125°F/hr.

6.6 Follow PCIOMR as directed by Reactor Engineering.

6.7 Radiochemistry Section shall be notified to perform an Isotopic Analysis for Iodine (SP 74.010.02) if:

6.7.1 Thermal power changes >15% of rated thermal power in 1 hour or

6.7.2 Off-gas level at SJAE increased by more than 10,000 uci/sec or

6.7.3 Off-gas level at SJAE increased by more than 15% in one hour at release rates greater than 75,000 uci/sec.

7.0 MATERIAL OR TEST EQUIPMENT

N/A

8.0 PROCEDURE

8.1 Power Ascension

8.1.1 Ensure SP 22.001.01, Startup, Cold Shutdown to 20% power procedure completed.

8.1.2 Perform SP 24.12Ø.Ø1, Reactor Recirc and Jet Pump Operability Test.

8.1.3 Withdraw control rods in accordance with the Control Rod Movement Sheets provided by Reactor Engineering.

NOTE: Place additional Condensate Demineralizers in service as required by increased condensate flow, during the performance of this procedure.

8.1.4 Above 2Ø% power verify the following:

8.1.4.1 The RWM System is providing monitoring functions only and no rod blocks.

8.1.4.2 The RSCS is bypassed by verifying its above LPSP light is energized.

8.1.5 When power is ≥3Ø% perform the following:

8.1.5.1 Verify that the RWM System and RSCS monitoring functions is bypassed.

8.1.5.2 As power increases above 3Ø% determine the RBM setpoint by pushing each RBM pushbutton to record and read the setpoint from the associated RBM recorder.

1. If during power escalation, the green PUSH TO SET UP pushbutton illuminates, press the pushbutton to upscale the RBM setpoint.

NOTE: The RBM setpoint may be upscaled only twice before a rod block occurs.

8.1.5.3 Close the fifth point heaters extraction steam drain isolation valves, 1N23-AOV-Ø35A, B, C & D.

8.1.5.4 Ensure the steam lead drain valves 1N23-AOV-Ø55 A and B; close when their associated control valve opens.

8.1.5.5 Monitor the turbine supervisory instruments for abnormal trends.

8.1.6 At ≥4Ø% power perform the following:

8.1.6.1 Place the Steam Seal Evaporator on extraction steam.

1. Open the Extraction Steam to Steam Seal Evaporator Valve 1N11-MOV-Ø52 by momentarily depressing the OPEN pushbutton on panel *MCB-Ø1.

2. When Steam Seal Evaporator Shell Side pressure increases to >1Ø psig as indicated on PI-Ø11, and Steam Seal Evaporator Tube Side pressure increases to >4Ø psig as indicated on PI-Ø23, CLOSE the Main Steam to Steam Seal Evaporator Valve 1N11-MOV-Ø46 by placing its control switch to CLOSE on panel *MCB-Ø1.

3. When the Steam Seal Evaporator Shell Side pressure is stable at >1Ø psig, as indicated on PI-Ø11, place 1N11-MOV-Ø46 control switch to AUTO.

8.1.7.2 Place the second Reactor Feed Pump in AUTO control as follows:

1. Place the differential pressure selector switch for 1N21-PDI-Ø18 to the discharge valve (1N21-MOV-Ø35A or B) for the pump being placed in service.

2. Slowly increase the Feedwater Pump speed with its manual flow controller until the dP on PDI-Ø18 is slightly higher than the inservice pump differential pressure.

3. Slowly jog open the Feedwater Pump Discharge valve and observe the differential pressure and valve position indication to insure the valve is moving open.

   NOTE: As the speed of the second Feedwater Pump is increased, observe that the speed of the pump in Auto decreases proportionally and reactor vessel level remains constant.

4. Slowly increase the speed of the second Feedwater Pump with its manual flow controller until there is zero deviation on the manual flow controller.

5. Place the second Feedwater Pump control in automatic by depressing its AUTO pushbutton and observing that the AUTO indicating light is illuminated.

6. Observe Reactor Vessel Level and Feedwater Pump operation and insure feedwater control stability.

NOTE: With both Reactor Feedwater Pumps in automatic, the pump flows should be approximately equal. If flows are not equal impose a bias signal on Reactor Feedwater Pump A with its bias adjust thumbwheel until flows are equal.

8.1.8 Continue withdrawing control rods until the 80% power rod line is established in accordance with the Control Rod Movement sheets provided by Reactor Engineering.

CAUTION: During power ascension to the 80% rod pattern line perform core thermal power calculations as necessary to ensure Reactor thermal limits are maintained.

8.1.9 Place the Recirculation Pumps on Master Manual Control as follows:

NOTE: Feedwater Flow must be >3x106 lbs/hr and the low flow control interlock must be cleared.

CAUTION: When controlling recirc. flow with the individual M/A Transfer Stations, maintain Recirc Pump A & B speeds within 5% of each other.

8.1.9.1 Increase recirc flow in each recirc loop to 45% core flow by increasing each recirc pump speed with its associated speed controller on M/A Transfer Stations FIC-088A & B.

1. Observe that neutron flux and reactor power increase as recirc flow increases.

2. Prior to power ascension on recirc flow, notify reactor engineering so that they may monitor thermal limits and direct PCIOMR manuevers as appropriate.

8.1.9.2 Transfer control of Recirculation Pump A to the Master Controller as follows:

1. Ensure the Master Controller FIC-Ø83 is in Manual by observing its MANUAL light is illuminated and its AUTO light is extinguished.

2. Adjust Master Controller FIC-Ø83 with its Increase/Decrease pushbuttons until M/A Transfer Station FIC-Ø88A input meter and output meter are matched.

CAUTION: While performing the next step observe Recirculation Flow on Flow Recorder FR-Ø11. If flow increases or decreases rapidly, place the M/A Transfer Station back to MANUAL by depressing the MANUAL pushbutton and re-establish flow to its original value.

3. Place M/A Transfer Station FIC-Ø88A in AUTO by depressing the AUTO pushbutton and observing the AUTO light illuminates and the MANUAL light extinguishes.

8.1.9.3 Transfer control of Recirculation Pump B to the Master Controller as follows:

1. On the M/A Transfer Station for Recirculation Pump B, FIC-Ø88B, adjust the pump speed with the Increase/Decrease pushbuttons until the M/A Transfer Station FIC-Ø88B input meter and output meter are matched.

   CAUTION: While performing the next step observe Recirculation Flow on Flow Recorder FR-Ø11. If flow increases or decreases rapidly place the M/A Transfer Station back to MANUAL by depressing the MANUAL pushbutton and re-establish flow to its original value.

2. Place M/A Transfer Station FIC-Ø88B in AUTO by depressing the AUTO pushbutton and observing the AUTO light illuminated and the MANUAL light extinguishes.

3. Verify that both M/A Transfer Stations, FIC-Ø88A & B, input and output meters read the same.

NOTE: Maximum Recirculation Pump speed is 88%. See Precautions.

8.1.10 Continue withdrawing control rods until the 100% power rod line is established in accordance with the Control Rod Movement Sheets provided by Reactor Engineering.

CAUTION: During power ascension to the 100% rod line perform core thermal power calculations as necessary to ensure reactor thermal limits are maintained.

8.1.11 Continue increasing reactor power by increasing Reactor Recirculation Flow with the Master Controller, FIC-088 as directed by Reactor Engineering.

8.1.12 At ≥90% power ensure Extraction Steam is aligned to supply the Radwaste Steam Generator as follows:

8.1.12.1 Open or verify Open Extraction Steam to Radwaste Steam Generator valve 1N11-MOV-053.

8.1.12.2 When the Main Steam to Radwaste Steam Generator pressure control valve, 1N11-PCV-026, is fully closed, close the Main Steam to Radwaste Steam Generator valve 1N11-MOV-047.

8.1.13 Continue increasing reactor power to 100%. Perform a thermal calibration and adjust APRM indication to match the thermal calibration as required.

8.1.14 Ensure Primary Containment inerting is completed and O2 concentration is verified less than 4% within 24 hours of the time that reactor power first reached 15%.

8.1.15 Notify Reactor Engineering to perform SP 54.002.01, Reactivity Anomalies Check, if the current startup is the first startup following Core Alterations.

8.2 Power Descension

8.2.1 Begin decreasing reactor power by decreasing Reactor Recirculation Flow with the Master Controller, FIC-088 as directed by Reactor Engineering.

CAUTION: During power descension to the 100% rod pattern line perform core thermal power calculations as necessary to ensure Reactor thermal limits are maintained.

8.2.2 Below 90% power, align Main Steam to the Radwaste Steam Generator by opening Main Steam to Radwaste Steam Generator valve 1N11-MOV-047.

8.2.2.1 Verify that Main Steam to Radwaste Steam Generator pressure control valve, 1N11-PCV-Ø26, opens to maintain 85 psig supply to the Radwaste Steam Generator.

8.2.3 Continue reducing reactor power by reducing Recirculation Flow until the flow biased rod blocks are reached.

CAUTION: Do not reduce total core flow below 35 Mlbm/hr while above the 8Ø% power rod line on the Power/Flow map.

8.2.4 Obtain from Reactor Engineering the Control Rod Movement sheets necessary to establish the desired rod line.

8.2.4.1 Establish the desired rod line as directed by Reactor Engineering.

8.2.5 Begin insertion of control rods in the order specified by Reactor Engineering.

8.2.6 When Recirc. flow is equal to 45% in each loop remove Recirculation Pump A from Master Manual Control as follows:

8.2.6.1 Verify that M/A Transfer Station FIC-Ø88A input meter and output meter indication are matched.

8.2.6.2 Place M/A Transfer Station FIC-Ø88A in MANUAL by depressing the MANUAL pushbutton and observing the MANUAL light illuminates and the AUTO light extinguishes.

8.2.7 Remove Recirculation Pump B from Master Manual Control as follows:

8.2.7.1 Verify that M/A Transfer Station FIC-Ø88B input meter and output meter are matched.

8.2.7.2 Place M/A Transfer Station FIC-Ø88B in Manual by depressing the MANUAL pushbutton and observing the MANUAL light illuminates and the AUTO light extinguishes.

CAUTION: When controlling recirc. flow with the individual M/A Transfer Stations, maintain Recirculation Pumps A & B speeds within 5% of each other.

8.2.8 Continue reducing reactor power by reducing Recirculation Flow with M/A Transfer Stations A & B until both Recirculation Pumps are at minimum speed.

8.2.9 At approximately 45% power perform the following:

8.2.9.1 Establish Main Steam to the Steam Seal Evaporator as follows:

1. Open the Main Steam to Steam Seal Evaporator valve 1N11-MOV-Ø46.

2. Verify that Steam Seal Evaporator Tube Side Pressure Controller 1N11-PC-Ø22A opens to maintain tube side pressure at 4Ø psig as extraction steam flow decreases.

3. Close the Extraction Steam to Steam Seal Evaporator valve 1N11-MOV-Ø52 after 1N11-PC-Ø22A is controlling.

8.2.9.2 Place Reactor Feed Pump B in Manual Control and reduce the pump flow to minimum as follows:

1. Place the Feedwater Turbine Flow Controller HC-Ø12B to the Manual mode by depressing the MANUAL pushbutton. Observe that the MANUAL indicating light is illuminated.

2. Slowly decrease Feedwater Pump B speed to minimum with the Feedwater Turbine Flow Controller and observe that Feedwater Pump A speed increases to maintain reactor water level.

8.2.10 As power decreases toward 3Ø% perform the following:

8.2.10.1 Ensure the Steam Lead Drain valves 1N23-AOV-Ø55A & B open when their associated control valves go closed.

8.2.10.2 Open the fifth point heaters Extraction Steam Drain Isolation valves 1N23-AOV-Ø35A, B, C & D.

8.2.11 At $\leq$3Ø% power perform the following:

8.2.11.1 At the RBM recorders press the Push to Record switch.

8.2.11.2 Verify that RWM System monitoring function is automatically initiated.

1. At ≤30% power but ≥20% power, the RWM System will provide insert error alarms only. Ensure the rod pattern is correct as per Reactor Engineering in this transition zone and attempt to clear any insertion errors prior to reaching 20% power.

2. Verify the RSCS is in service.

8.2.12 Remove from service any condensate demineralizers not required as determined by condensate flow if not previously done.

8.2.13 Continue reducing power to 20% by rod insertion.

8.2.14 At 20% power perform the following:

8.2.14.1 Verify that the RSCS is automatically placed in service.

8.2.14.2 Verify that RWM System is active.

8.2.15 Stop Reactor Feed Pump B as follows:

8.2.15.1 At the Reactor Feed Pump Control panel, lower turbine B speed reference from the high speed stop by pressing the lower FAST pushbutton until the AUTO control light extinguishes.

8.2.15.2 Close the Feed Pump discharge valve 1N21-MOV-035B.

8.2.15.3 Trip Reactor Feed Pump B with its Manual Trip pushbutton.

8.2.15.4 Ensure that Reactor Feed Pump B goes on turning gear at approximately 2 rpm.

8.2.16 If shutdown is to continue, proceed to procedure SP 22.005.01 Shutdown - from 20% Power.

9.0 ACCEPTANCE CRITERIA

N/A

10.0 FINAL CONDITIONS

N/A

11.0 REFERENCES

11.1 Technical Specifications

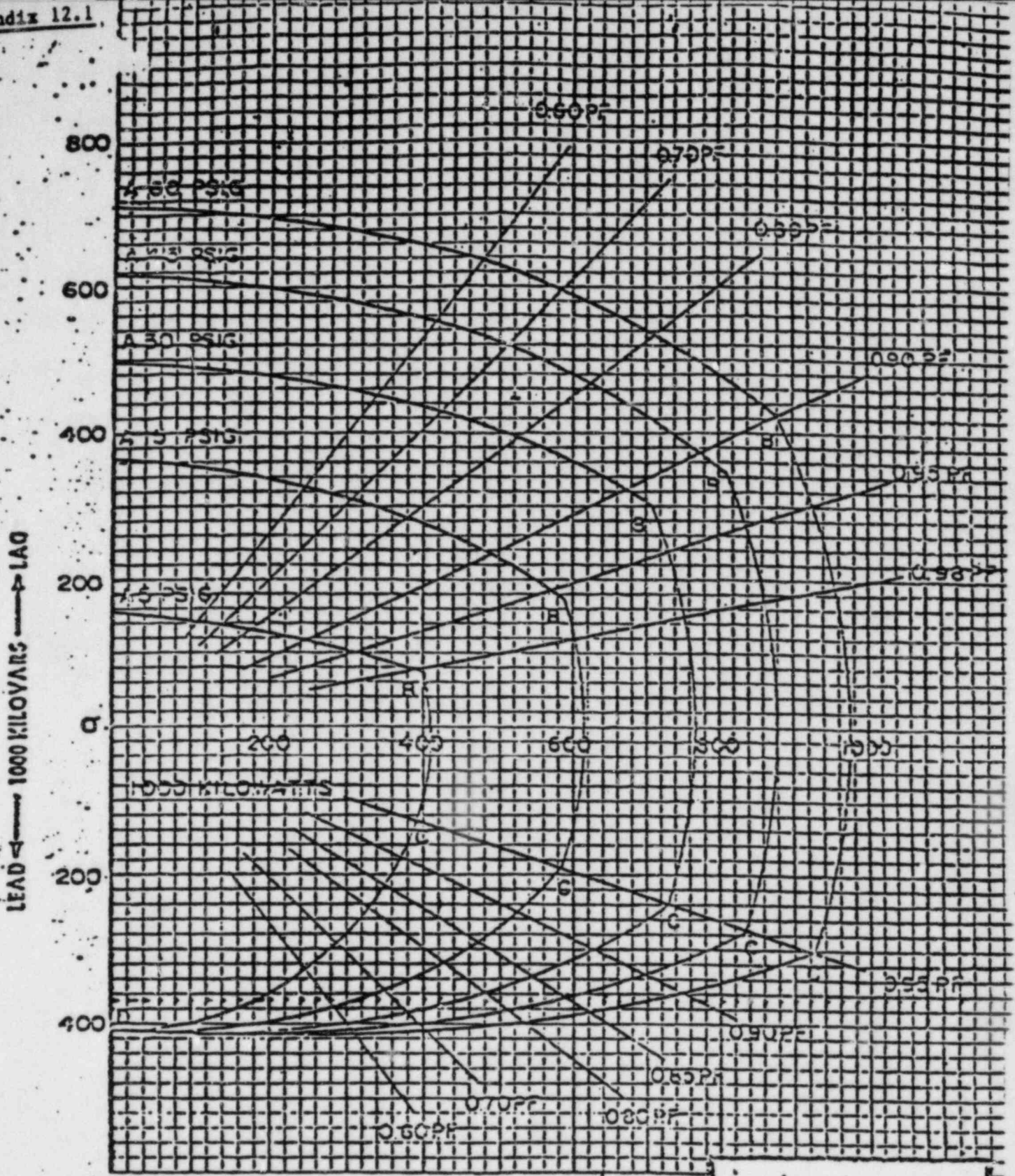
11.2 SP 22.001.01 Startup, Cold Shutdown to 20% Power

11.3 SP 22.005.01 Shutdown - From 20% Power

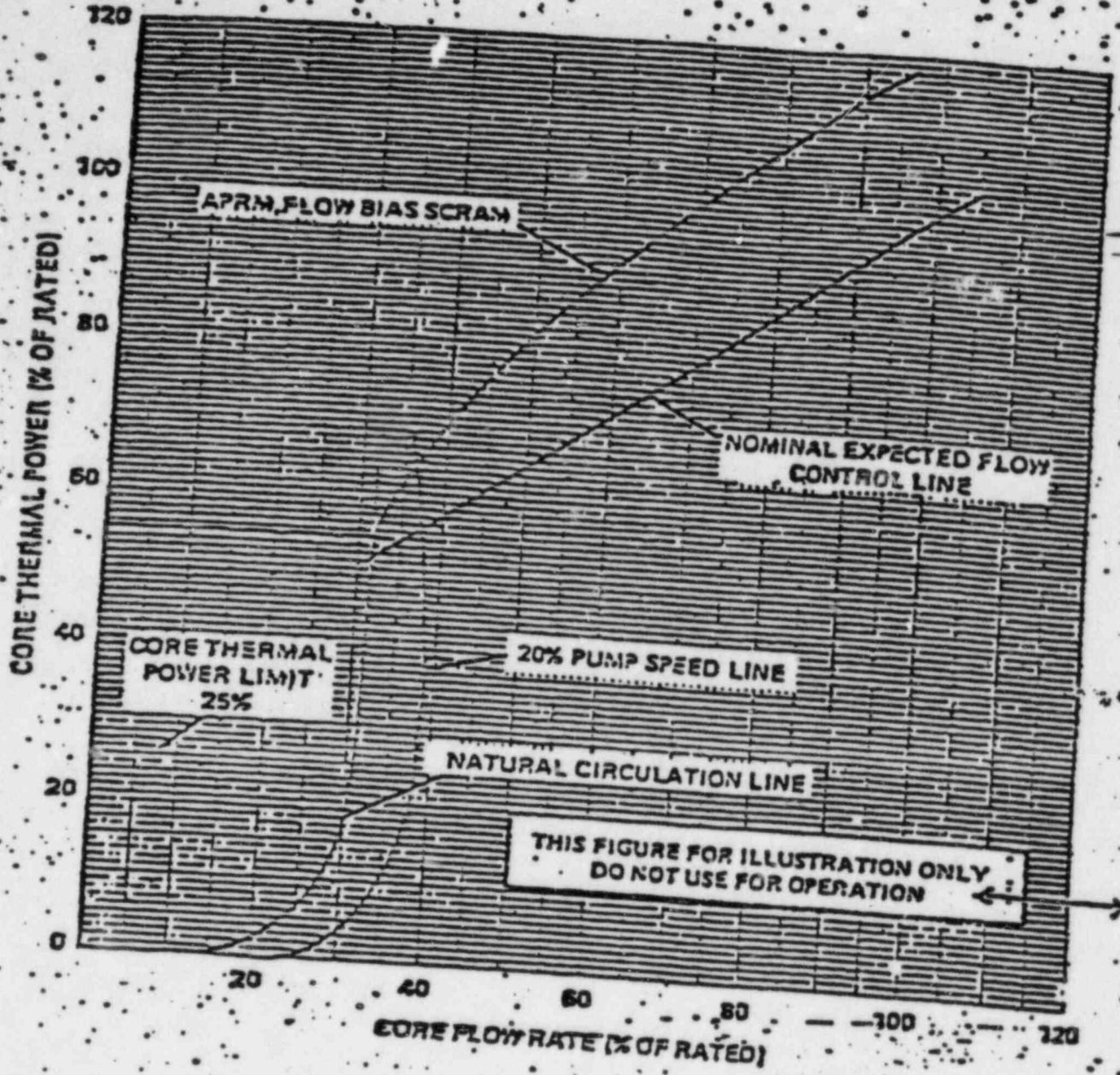
12.0 APPENDICES

12.1 SPF 22.004.01-1, Generator Capability Curve

12.2 SPF 22.004.01-2, Power to Flow Map



CURVE AB LIMITED BY FIELD HEATING
CURVE BC LIMITED BY ARMATURE HEATING
CURVE CD LIMITED BY ARMATURE CORE END HEATING


120
100
80
60
40
20
0
CORE THERMAL POWER (% OF RATED)
APRM FLOW BIAS SCRAM
NOMINAL EXPECTED FLOW CONTROL LINE
CORE THERMAL POWER LIMIT 25%
20% PUMP SPEED LINE
NATURAL CIRCULATION LINE
THIS FIGURE FOR ILLUSTRATION ONLY DO NOT USE FOR OPERATION
To be Provided
20
40
60
80
100
120
CORE FLOW RATE (% OF RATED)

Submitted: W E [signature]

Reviewed/OQA Engr.: [signature]

Approved/Plant Mgr.: W [signature]

MC-1

SP Number 22.005.01
Revision: 4
Date Eff.: 1/16/83
TPC
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TPC

SHUTDOWN - FROM 20% POWER

1.0 PURPOSE

To provide instructions to the station operating personnel for the shutdown of the Shoreham Nuclear Plant from 20% power generation to Hot Standby, Hot Shutdown or Cold Shutdown conditions.

2.0 RESPONSIBILITY

The Operating Engineer shall be responsible for ensuring the proper implementation of this procedure.

3.0 DISCUSSION

3.1 It is the intent of this procedure to outline the many steps required to achieve a safe Reactor shutdown.

3.2 This procedure addresses bringing the plant from 20% Reactor power with the generator on the line to a Cold Shutdown condition. If desired pressure reduction and cooldown using this procedure may be stopped and maintained at any pressure and temperature desired.

3.3 The following procedures are provided for Shutdown of the Reactor.

4.0 PRECAUTIONS

4.1 Reactor SCRAM will result if MSIV's are closed with the Mode Switch in RUN.

4.2 Reactor SCRAM will occur if the Mode Switch is placed in Startup above 15% Reactor power.

4.3 The decay of reactor power during the full insertion of control rods, which will performed concurrently with reactor cooldown, must be monitored continuously to avoid an inadvertant criticality.

4.4 Initiation of Shutdown Cooling must be done slowly to minimize the possibility of thermal shock on system components.

4.5 When operating the Shutdown Cooling System in conjunction with the Reactor Head Cooling System, adjust head cooling flow as required to avoid causing a pressure increase in the Reactor vessel.

4.6 Isolation of Shutdown Cooling will occur if reactor pressure rises above 109 psi.

4.7 Do not secure one method of decay heat removal prior to establishing another.

4.8 The use of auxiliary steam to support main turbine sealing system, radwaste off-gas and radwaste evaporators should be kept to the minimum consistent with good operations. The condensed Aux. boiler steam adds to the radioactively contaminated water inventory of the station.

5.0 PREREQUISITES

5.1 Section 8.2 of SP22.004.01 completed.

5.2 Aux boilers available to supply loads as needed.

5.3 System Operations has been notified of the impending shutdown and permission has been obtained from the Plant Manager or Chief Operating Engineer to perform a normal plant shutdown.

6.0 LIMITATIONS AND ACTIONS

6.1 Technical specifications; all sections of the Tech Specs listed in Section 11.0 are applicable.

6.2 Cooldown rate $\leq$ 100°F/hr.

6.3 Monitor Reactor vessel shell Temperature and Reactor vessel pressure once per 30 minutes during cooldown to ensure cooldown rate is within limits.

6.4 During Reactor Vessel heatup and cooldown the reactor coolant system temperature at the following locations shall be recorded until 3 successive readings at each location are within 5°F:

1. Reactor vessel bottom drain,

2. Recirculation Loops A and B, and

3. Reactor vessel bottom head.

6.5 Do not allow vessel temperature to decrease to <70°F while head studs are tensioned.

6.6 Radiochemistry Section shall be notified to perform an Isotopic Analysis for iodine (SP 74.010.02) if thermal power changes >15% of rated thermal power in 1 hr.

6.7 Do not place RHR system in the Shutdown Cooling mode until Reactor pressure is <109 psig.

6.8 The sequence listed in any one section of this procedure may be altered with the approval of the Watch Engineer to suit existing plant conditions and time requirements, however, all steps within a given section shall be completed before starting the next section. Each step shall be initialed by the Watch Engineer or Nuclear Station Operator. If steps are repeated, due to problems encountered during the cooldown, the repeated steps should be indicated and initialed.

7.0 MATERIALS OR TEST EQUIPMENT

N/A

8.0 PROCEDURE

Initials

8.1 Normal Shutdown

8.1.1 Prior to reducing power below 20% perform the following:

8.1.1.1 Ensure the prerequisites of Section 5.0 are complete. _____

8.1.1.2 If required, perform Rod Worth Minimizer Functional Test, SP24.607.01. _____

8.1.1.3 If required perform Rod Sequence Control System Functional Test, SP24.609.01. _____

8.1.2 Continue inserting control rods as directed by Reactor Engineering. _____

8.1.3 Between 20% and 15% power perform the following:

8.1.3.1 Stop one condensate booster pump. (SP23.109.01) _____

8.1.3.2 Stop one condensate pump. (SP23.103.01) _____

8.1.3.3 Place the Reactor Vessel Level Control System to the single element mode of operation. (SP23.656.01) _____

8.1.3.4 As necessary, remove condensate demineralizers from service as Condensate Flow decreases. (SP23.104.01) _____

8.1.3.5 Place all 8 IRM range selector switches to Range 10 (SP23.602.01). _____

8.1.3.6 Fully insert all operable IRM detectors. (SP23.602.01) _____

8.1.4 At 15% power perform the following:

8.1.4.1 IRM/APRM overlap calibration in accordance with SP24.602.02. _____

8.1.4.2 OPEN the following main Turbine drain valves (SP23.127.Ø1):

a. Crossunder Pipe (1N23-MOV-38A, B, C, & D) _____

b. Crossover Pipe (1N23-MOV-74A, B) _____

c. MSR 1st Stage Reheat Steam Supply Pipe (1N23-MOV-44A, B) _____

d. MSR Shell Pocket (1N23-MOV-61A, B, C & D) _____

e. Extraction Line Drains on 1st thru 4th Point Heaters (1N23-AOV-31A, B; 32A, B; 33A, B; 34A, B). _____

8.1.5 Continue inserting control rods as directed by Reactor Engineering. _____

8.1.6 When Reactor power is between 5 - 1Ø%, transfer the Reactor Mode Switch to START/HOT STANDBY as follows:

CAUTION: (1) If Reactor power >15% and the mode switch is place in START/HOT STANDBY a scram will result.

(2) An APRM downscale combined with a companion IRM Hi Hi will cause a scram if the Mode switch is in RUN.

8.1.6.1 Momentarily switch each IRM/APRM and IRM/RBM recorder to IRM and verify all eight IRM indications are on range. _____

8.1.6.2 Turn the IRM/APRM recorders back to indicate APRM output, but leave the IRM/RBM recorders switched to IRM. _____

8.1.6.3 When the first APRM DNSC alarm light illuminates, switch the IRM/APRM recorders to IRM. _____

8.1.6.4 Select the IRM ranges for each of the eight channels so that the indication is between 25/125 and 75/125 on the black (125) scale or between 8/4Ø and 25/4Ø on the red scale. _____

8.1.6.5 Place the Reactor Mode Switch in START/HOT STANDBY and record the time in the operator's log. _____

8.1.7 When the Reactor Feed Pump Turbine speed decreases to 2000 rpm, transfer the feedwater flow path to the Startup Level Control Valves, 1N21-LCV-007X/Y. (SP23.656.01) _____

8.1.8 Continue decreasing load until Main Generator output is at 50 MWe, then perform the following:

8.1.8.1 Test the AUTO start of the Emergency Bearing Oil Pump then, return to AUTO. _____

8.1.8.2 START the Main Turbine High Pressure Lift Pumps, Motor Suction Pump, and the Turning Gear Oil Pump. _____

8.1.8.3 Request permission from the System Operator to separate the Generator from the Grid. _____

8.1.8.4 Place the Main Turbine Generator Bearing Vibration and Temperature Recorders in HI speed. _____

8.1.9 Decrease the Main Generator output to 20 MWe with the Load Selector and then perform the following:

8.1.9.1 Adjust the Generator MVAR's to 0 with the AC Auto Adjust regulator. _____

8.1.9.2 Verify that the Turbine Bypass Valves are open maintaining Reactor pressure at approximately 920 psig. _____

8.1.9.3 Adjust the Main Generator DC Manual Adjust for Zero indication on the Main Transfer Voltage Indicator and then place the Main Generator Auto Voltage Reg. Transfer switch to MANUAL. _____

8.1.9.4 OPEN both GENERATOR OUTPUT BREAKERS 91310 and 13300). Record the time in the operator's log. _____

8.1.9.5 Run the Main Generator DC Manual Adjust down to its low limit stop, GREEN light illuminated. _____

8.1.9.6 OPEN the Exciter Field Breaker and verify that generator voltage decreases to zero. _____

8.1.9.7 Inform the System Operator that the unit is off the line. _____

CAUTION: The Vacuum Breakers should be used only when an emergency condition requires that the unit be decelerated as fast as possible.

Opening Vacuum Breakers imposes excessive loads on the Turbine last stage buckets. Vacuum shall not be broken until the unit shaft rotation has decreased to <1200 RPM.

8.1.10 TRIP the turbine in accordance with SP 23.127.01. _____

8.1.11 Open the drain valves associated with the turbine, reheater and Main Steam lines as required. (SP 23.127.01) _____

8.1.12 As the Turbine slows down, observe bearing metal temperatures for a sudden spike which may be indicative of a wiped bearing. _____

8.1.13 Secure cooling water to the Generator Bus Duct cooler if, TBCLCW drops below ambient temperature. _____

8.1.14 Reduce Main Turbine Generator bearing oil inlet temperature as the Turbine slows down so that it is 95°F when ready for Turning Gear operation. _____

8.1.15 Start the Turning Gear oil pump. As soon as the Turbine Shaft is $\leq$ 1/2 rpm, verify that the Turning Gear Motor starts and the Turning Gear engages. Verify locally that the turbine shaft is turning. _____

8.1.15.1 If the Turning Gear does not engage automatically, engage it manually. _____

8.1.16 After the Main Turbine is on turning gear Stop the Motor Suction Pump and place its control switch in Pull-To-Lock. _____

8.1.17 CLOSE the Main Steam to the 2nd Stage Reheaters (1N11-MOV-031A & B) and open the steam line drains (1N23-MOV-043A & B). _____

8.1.18 CLOSE the 2nd Stage Extraction steam to the 1st Stage Reheaters (1N23-MOV-033A & B) and open the Extraction Steam Line Drains (1N23-MOV-044A & B) and apply blanket steam to the Reheaters (SP 23.110.01). _____

8.1.19 Press the Vent Pushbutton on the Main Generator Hydrogen panel to vent the hydrogen sample system to atmosphere. OPEN Analyzer vent to atmosphere (1N45-02V-0012) & CLOSE Analyzer return to generator (1N45-01V-0016). _____

8.1.20 Insert the SRM detectors, prior to reaching range 4 on the IRM's, and move them in as necessary to maintain the SRM count rate between 10^2 & 10^5 counts per second. _____

NOTE: If the Reactor is to be maintained in the Hot Standby condition go to Section 8.2 of this procedure at this time.

8.1.21 Open the Main Steam Line drains 1B21*MOV-Ø33 & 38 to the condenser. _____

8.1.22 Monitor Reactor cooldown, record temperatures on SPF22.ØØ5.Ø1-2 every 5 minutes and plot the cooldown on SPF22.ØØ5.Ø1-1 every 3Ø minutes. _____

8.1.23 Continue inserting control rods in the selected rod sequence until all rods are fully inserted. _____

8.1.24 Change the range switches on the IRM recorders as necessary to keep all recorders operating in the desired range. _____

8.1.25 Place the Reactor Mode Switch to SHUTDOWN. _____

NOTE (1) The Reactor Mode Switch may be placed in REFUEL to allow trouble shooting or surveillance testing.

(2) If the Reactor is to remain in Hot Shutdown perform Step 8.1.26.

(3) If the reactor is to be cooled down to Cold Shutdown proceed to Step 8.1.27.

8.1.26 If the Reactor is to remain in Hot Shutdown, transfer the following loads to the Aux Boiler as required to minimize plant cooldown:

8.1.26.1 Main Turbine Steam Seal System (SP23.124.Ø1). _____

8.1.26.2 Steam Jet Air Ejector and Radwaste Off Gas (SP23.7Ø1.Ø1). _____

8.1.26.3 Radwaste Regen and Waste Evaps (SP23.124.Ø2). _____

8.1.26.4 Station heating system (SP23.422.Ø1). _____

NOTE: Maintain Hot Shutdown by dumping steam to the condenser as required to maintain Reactor pressure and temperature.

CAUTION: Reactor cooldown is limited to $\leq$ 1ØØ°F per hour.

8.1.27 Start Reactor pressure reduction and cooldown by adjusting the BYPASS JACK as necessary to maintain a cooldown rate less than the Technical Specification rate.

8.1.28 As feedwater flow to the Reactor decreases, verify the condensate pump pressure control valve opens to maintain dP across the pump at approximately 205 psid.

8.1.29 Decrease Pressure Set 50 - 75 psig above reactor pressure until 150 psig is reached.

8.1.30 When Reactor pressure decreases to 350 psig perform the following:

8.1.30.1 Place the Low Flow Feedwater Level Control Valves 1C32-LCV-007X/Y in Manual and maintain Reactor water level at 35" ± 2".

8.1.30.2 Remove the remaining Reactor Feed Pump from service (SP23.656.01).

8.1.31 When Reactor pressure decreases to 150 psig place the following loads on Aux Boiler Steam:

8.1.31.1 Main Turbine Steam Seal System (SP23.124.01).

8.1.31.2 Radwaste Regen and Waste Evaps. (SP23.124.02).

8.1.31.3 Station Heating System if required (SP23.422.01).

8.1.32 When Reactor pressure decreases to 120 psig place the SJAE and Radwaste Off-Gas on Aux Boiler Steam. (SP23.701Ø1).

8.1.33 When Reactor pressure decreases to <109 psig perform the following:

NOTE: When aligning the RHR System for shutdown cooling it is preferred to use the "B" RHR System for Reactor cooling.

8.1.33.1 Stop Reactor Recirculation Pump B (SP23.120.01).

8.1.33.2 Place the "B" loop of RHR in service in the Shutdown Cooling Mode of operation as per SP23.121.01.

8.1.34 Continue cooldown using RHR Shutdown cooling and steam dump to the condenser.

8.1.35 When Reactor coolant temperature is <212°F and Reactor

pressure is atmospheric perform the following:

8.1.35.1 Open the Reactor head vent valves to the drywell equipment drain tank, 1B21*MOV-Ø83 & Ø84. _____

8.1.35.2 Close the Reactor head vent valve to "A" Main Steam line, 1B21*MOV-Ø85. _____

8.1.35.3 Secure the Feedwater alignment to the Reactor vessel. _____

8.1.35.4 Stop the running condensate booster pump. _____

8.1.36 Continue cooldown to ≤ 2ØØ°F. _____

NOTE: The Reactor is now in COLD SHUTDOWN with the Reactor mode switch in SHUTDOWN, moderator temperature is ≤ 2ØØ°F and all rods are inserted.

8.1.37 If desired, break condenser vacuum as follows:

8.1.37.1 Announce TWICE over the plant PA System.

"CAUTION, all personnel stand clear of the Main Condenser vacuum breakers." _____

8.1.37.2 Secure the SJAE and the Condenser Off-Gas Removal System (SP23.7Ø1.Ø1). _____

8.1.37.3 Fully open the Main Condenser vacuum breaker valves. _____

8.1.37.4 When the Main Condenser vacuum reaches Ø psig, secure the steam seals on the Main Turbine and Reactor Feed Pump Turbines and remove the Gland Steam packing exhauster from service SP23.124.Ø1. _____

8.1.37.5 Stop the running condensate pump if desired. _____

8.1.38 Continue cooldown using shutdown cooling until the final desired shutdown temperature is achieved. _____

8.1.39 Remove the running Reactor Recirculation Pump from service and any remaining equipment from service as desired using the applicable operating procedures. _____

8.1.40 The final conditions of this section are as follows:

8.1.40.1 Reactor temperature <2ØØ°F. _____

8.1.40.2 Reactor Mode Switch in SHUTDOWN or REFUEL. _____

8.2 Shutdown, Hot Standby

NOTE: (1) This section is to be used when it is necessary to isolate the Reactor from the condenser while maintaining the Reactor critical. It is designed to eliminate the time consuming plant cooldown and shutdown with subsequent approach to criticality and heatup.

(2) When lowering RHR heat exchanger level, in Steam Condensing Mode, it must be done slowly to minimize thermal shock to the heat exchanger.

(3) While regulating Reactor pressure with the Bypass Valves, and if inadvertently a Group I isolation occurs, actuate RCIC/HPCI in the Heat Sink Mode, to control Reactor pressure.

(4) If, while regulating reactor pressure with the RHR in the Steam Condensing Mode, and RHR inadvertently isolates, actuate RCIC/HPCI or Safety Relief Valves to control reactor pressure.

8.2.1 Place the RCIC System in operation in the Full Flow Test Mode (SP23.119.Ø1). _____

8.2.2 Place 1 RHR heat exchanger (B" loop is preferred) in the Steam Condensing Mode of operation with its condensate returning to the suppression pool (SP23.121.Ø1). _____

8.2.3 If Suppression Pool heatup is anticipated, place 1 RHR loop (A" loop is preferred) in the Suppression Pool Cooling mode of operation. _____

8.2.4 Transfer the following loads to the Aux Boiler:

8.2.4.1 SJAE and Condenser Off-Gas System (SP23.7Ø1.Ø1). _____

8.2.4.2 Steam Seal System (SP23.124.Ø1). _____

8.2.4.3 The Waste Evaporator (SP23.711.Ø1). _____

8.2.4.4 The Regen Evaporator (SP23.712.Ø1). _____

NOTE: Excessive rod insertion, will result in an undesirably large shutdown margin and increased rod motion.

8.2.5 Insert control rods to achieve a slightly negative period.

8.2.6 Insert SRM detectors as necessary to maintain the count level between 1,000 and 100 CPS.

8.2.7 When a desired power level is achieved for "HOT STANDBY", adjust rods in accordance with the rod sequence checklist to obtain the target power level desired by Reactor Engineering.

NOTE: (1) It is recommended that the "HOT STANDBY" power level should be in the IRM range 4-6.

(2) It is desirable to maintain reactor pressure as close to 920 psig as is practicable during the hot standby condition. This will minimize the thermal cyclic stresses on the primary boundary and expedite the subsequent recovery.

CAUTION: 1) The operator should not attempt to control reactor pressure with control rod movement.

2) If inadvertant safety relief actuation should occur while in Hot Standby manually scram the Reactor.

3) Reactor Cooldown limit is $\leq$ 100°F/hr.

8.2.8 Ensure the PRESSURE SET setpoint is 920 psig and the bypass valves are modulating to maintain this pressure.

CAUTION: The injection of RCIC water to the reactor must be introduced slowly as not to add a significant amount of positive reactivity due to cold water. Control rods may have to be inserted to control power within the desired range.

8.2.9 When the conductivity of the condensate being rejected from the RHR heat exchanger to the suppression pool is suitable for reactor makeup, commence feeding the reactor with the RCIC pump as follows:

8.2.9.1 Adjust the speed of the RCIC turbine and the position of full flow test valve 1E51-MOV-037 to match its discharge pressure with reactor pressure.

NOTE: At this point, it may be necessary to divert some flow to the CST in order to maintain RCIC speed above 2000 RPM.

8.2.9.2 With RCIC pump discharge pressure equal to or greater than reactor pressure, open the RCIC pump discharge valve 1E51-MOV-035. _____

8.2.9.3 Slowly increase RCIC pump speed. Observe that the Low flow feed control valves 1N21-LCV-007X/Y move in the close direcion as the RCIC pump provides reactor makeup water. _____

8.2.9.4 Divert RHR heat exchanger condensate flow to the RCIC pump suction by opening RHR HX to RCIC 1E11-MOV-043A(B) and closing RHR supp pool drain 1E11-MOV-044A(B). _____

NOTE: Do not exceed 140°F or 75 psig at the suction of the RCIC pump or let turbine speed fall below 2,000 rpm.

8.2.10 Adjust the RHR heat exchanger level and RCIC pump speed such that they are removing all of the reactor heat as indicated by the turbine bypass valve(s) automatically closing. _____

NOTE: RCIC pump speed is being maintained manually or automatically with its controller and being supplied condensate from the RHR heat exchanger supplying all of the reactor makeup water (excluding CRD hydraulic flow). RHR heat exchanger level is being adjusted manually to remove all the excess heat from the reactor.

8.2.11 Ensure that the following conditions have been met:

8.2.11.1 Vessel level is stable. _____

8.2.11.2 RHR heat exchanger level is stable. _____

8.2.11.3 Reactor makeup is being provided entirely by RCIC and CRD flow. _____

8.2.11.4 Reactor pressure is stable. _____

8.2.12 Isolate the reactor vessel as follows:

8.2.12.1 If a reactor feedpump is operating, remove it from service (SP23.109.01). _____

8.2.12.2 Shut main steam isolation valves 1B21-AOV-081A, AOV-081B, and AOV-081C. _____

8.2.12.3 Note that the above listed conditions of 8.2.11 are still stable, then shut main steam isolation valves 1B21-AOV-081D, AOV-082A, AOV-082B, AOV-082C, AOV-082D. _____

8.2.12.4 CLOSE Main Steam Line Drain Valves, 1B21-MOV-033 and 1B21-AOV-089. _____

8.2.13 Continue to make the proper adjustments to maintain Hot Standby condition:

8.2.13.1 Maintain reactor power with control rod movement. _____

8.2.13.2 Maintain reactor pressure by varying RHR heat exchanger level. _____

8.2.13.3 Reactor level is maintained by the RCIC system injecting a constant flow. Reactor Water Cleanup will have to be lined up to reject the extra water inventory added by CRD flow. _____

8.2.13.4 If reactor decay heat is decreased to a small amount, RHR steam condensing may be secured. The RCIC turbine can be run periodically in the full flow test mode to control temperature and pressure. _____

CAUTION: If RHRS inadvertently isolates, use Safety Relief Valves as necessary to maintain Reactor pressure.

8.2.14 If it is desired to break Condenser vacuum, perform the following steps:

CAUTION: Announce twice on the PA system "CAUTION all personnel stand clear of the turbine condenser vacuum breakers." _____

8.2.14.1 Insure all MSL drains are SHUT to prevent blowing steam to Condenser. _____

8.2.14.2 Remove SJAE and Radwaste Off-Gas system from service (SP23.701.01). _____

8.2.14.3 OPEN the Vacuum Breaker by placing its Control Switch to OPEN. _____

8.2.14.4 When Condenser vacuum reaches zero, SHUTDOWN the Steam Seal system (SP23.124.01). _____

8.2.15 The final conditions of this Section are as follows:

8.2.15.1 Reactor is critical with Mode Switch in Startup.

8.2.15.2 Reactor temperature $\geq$ 212°F.

8.2.15.3 MSIV's are closed.

8.2.15.4 The Main Condenser may or may not be available.

9.0 ACCEPTANCE CRITERIA

N/A

10.0 FINAL CONDITIONS

10.1 The final conditions are listed at the end of Sections 8.1 and 8.2.

11.0 REFERENCES

11.1 Technical Specifications, Section 3.1.4.1 RWM OPERABLE <20% Power.

11.2 Technical Specifications, Section 3.1.4.2 RSCS OPERABLE <20% Power.

11.3 Technical Specifications, Section 3.4.4 Reactor Coolant Conductivity and Chloride Limits.

11.4 Technical Specifications, Section 3.4.6.1 Reactor Coolant Heatup and Cooldown Limits.

11.5 Technical Specifications, Section 3.6.2.2 Suppression Pool Water Temperature and Level Limits.

11.6 Technical Specification, Section 3.5.1 HPCI OPERABLE >150 psig.

11.7 Technical Specification, Section 3.7.4 RCIC OPERABLE >130 psig.

11.8 SP22.002.01 Hot Standby

11.9 SP22.004.01 Operation Between 20 PCT and 100 PCT Power

11.10 SP23.101.01 Aux Blr & Aux Blr Stm & Fuel Oil Supply

11.11 SP23.103.01 Condensate

11.12 SP23.104.01 Condensate Filter Demineralizer

11.13 SP23.109.01 Feedwater System

11.14 SP23.110.01 Feedwater Heaters, Extract Stm, Htr Drains and Moisture Separator Reheaters

11.15 SP23.111.01 Generator Hydrogen and Carbon Dioxide Gas

11.16 SP23.115.01 Generator Exciter

11.17 SP23.116.01 Main and Auxiliary Steam

11.18 SP23.119.01 Reactor Core Isolation Cooling (RCIC) System

11.19 SP23.121.01 Residual Heat Removal (RHR) System

11.20 SP23.124.01 Steam Sealing

11.21 SP23.127.01 Turbine Generator

11.22 SP23.130.01 Turbine Lube Oil and Turning Gear

11.23 SP23.202.01 High Pressure Coolant Injection (HPCI)

11.24 SP23.601.01 Source Range Monitoring System (SRM)

11.25 SP23.602.01 Intermediate Range Monitoring System (IRM)

11.26 SP23.604.01 Average Power Range Monitoring System (APRM)

11.27 SP23.607.01 Rod Worth Minimizer (RWM)

11.28 SP23.609.01 Rod Sequence Control System (RSCS)

11.29 SP23.621.01 Reactor Vessel Water Level

11.30 SP23.623.01 Reactor Vessel Temperature System

11.31 SP23.656.01 Feedwater Control

11.32 SP23.701.01 Condenser Off-Gas Removal

11.33 SP23.709.01 Reactor Water Cleanup

11.34 SP23.714.01 Gaseous Radwaste (Holdup)

12.0 APPENDICES

12.1 SPF 22.005.01-1, Reactor Cooldown Rate Data Sheet.

12.2 SPF 22.005.01-2, Reactor Vessel Temperature Data Sheet.

REACTOR COOLDOWN RATE DATA SHEET (Limit < 100°F/Hr)

Date_____ Start Time_____

LATER

REACTOR VESSEL TEMPERATURE DATA SHEET
NORMAL SHUTDOWN

Date _____ Start Time _____

START TIME PLUS HOURS	MINUTES	ACTUAL TIME	REACTOR VESSEL WALL TEMPERATURE	B21-R007 REACTOR VESSEL FLANGE TEMPERATURE	REACTOR VESSEL BOTTOM HEAD TEMPERATURE	G33-R607 REACTOR VESSEL BOTTOM DRAIN TEMPERATURE	B31-R650 RECIRCULATION PUMP SUCTION TEMPERATURE A	B	1C32-P1-R003 REACTOR VESSEL PRESSURE
	00								
	05								
	10								
	15								
	20								
	25								
0	30								
	35								
	40								
	45								
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2	30								
	35								
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	45								
	50								
	55								
	60								

 Completed by _____

JOHN A. SCALICE

Operations Manager

LONG ISLAND LIGHTING COMPANY

Assigned to the position of Operations Manager at the Shoreham Nuclear Power Station on April 15, 1984. Responsible for all phases of plant operation, including management of Operations, Reactor Engineering and System Engineering/Operability Sections.

Educational Background:

Graduated from Polytechnic Institute of Brooklyn in 1970 with a Bachelor of Science degree in Mechanical Engineering. Received a Master of Science (Nuclear Engineering) degree at Polytechnic Institute of New York, 1979.

Completed the General Electric Boiling Water Reactor (BWR) Simulator Program in December 1979 and obtained a Senior Reactor Operator Certification. Completed Simulator refresher training September 1981.

Obtained NRC Senior Reactor Operator License (SOP-4424) November 12, 1982.

Completed the following additional training and qualification programs:

a) A two-week General Electric Company BWR Design Orientation course in Morris, Illinois.

b) A five-week General Electric Company BWR Technology course.

c) American Society of Industrial Security Comprehensive Assets Security course.

d) Research Reactor Training (RRT) at Brookhaven National Laboratory's Medical Research Reactor including ten training criticals.

e) A five-week General Electric Station Nuclear Engineering course (March 1980).

f) Two-week Honeywell Concepts and Practices Computer course (April 1980).

g) Four-week Honeywell Process Assembly Language (PAL) Programming course for the HS4000 series computer (May 1980).

h) A sixteen (16) week field assignment ending September 1980 to CP&L's Brunswick Steam Electric Plant in the Nuclear Engineering Group. Actively participated in Units 1 & 2 refueling outage and post refueling Startup Test Program. Successfully completed BSEP's qualification program for an on-shift Nuclear Engineer. Participated in reactor power maneuvers and issued reactivity change request to operators including rod movements and flow changes.

i) A four (4) week field assignment ending in April 1984 at CP&L's Brunswick Steam Electric Plant in the Operations group. Witnessed plant evolutions at high power levels and participated in daily management and planning activities.

General Industrial Record:

1974 - 1979

Joined the Shoreham Nuclear Power Station Plant Organization in January 1974, and assigned to the Shoreham Project as Assistant Project Engineer - Nuclear. Responsible for coordinating and monitoring the design, scheduling, procurement and construction activities related to all nuclear plant systems, including liquid and solid Radwaste, Reactor Building Standby Ventilation System, Primary Containment Atmospheric Control, Fuel Pool Cooling and Fuel Pool Cleanup.

Was assigned to the LILCO Startup team in May 1975 as Nuclear Startup Engineer. Responsible for definition of System Turnover packages, initial phases of startup scheduling, preparation of system checkout and initial operation test procedures for all nuclear plant systems, and coordination of spare parts ordering program.

Assigned as Performance and Compliance Section Head at the Shoreham Nuclear Power Station in October 1975. Responsible for supervising the section activities which include: coordinating technical consultant activities for station software, reviewing preoperational test and test results for compliance to design parameters and regulatory requirements, and assisting the plant organization in technical related activities. Additional direct responsibilities include overviewing and coordinating the schedule of procedure writing by maintaining the computerized procedure index status report, witnessing preoperational tests, and writing of general plant administrative procedures.

Assigned as Site Security Supervisor at the Shoreham Nuclear Power Station in April 1977. Responsible for the planning, development and administration of the Station's Security Program. Detailed program activities include: administration and direction of the plant security force, maintaining electronic security devices,

administration of the security force training program, formulation of security procedures and a continuing evaluation of their effectiveness and adequacy to satisfy company and NRC regulatory requirements, maintaining current working knowledge of industry and regulatory security practices and policies.

Assigned to the position of Reactor Engineer on July 1, 1979. Responsible for the nuclear and thermal performance of the core. Assisted in maintaining overall unit performance, and maintaining fuel inventory, refueling schedules and refueling patterns. Developed power ascension test program, including preparation of startup test procedures, initial schedule up to the time plant was ready to load fuel.

1970 - 1974

Employed by the Long Island Lighting Company as an assistant, associate and Plant Engineer in the Electric Production and Nuclear Projects Department. Held supervisory positions in Maintenance, Operations, and Instrument and Controls Section in a 350 MWE fossil fueled multi-unit power station. Particular responsibilities included planning and supervising maintenance of major overhauls of all plant equipment including four (4) General Electric Company Turbo-Generators and their associated oil, gas fired boilers. Was also given full responsibility for engineering design and startup of several plant sub-systems such as automatic minimum flow recirculation for four (4) boiler feed pumps, and complete automation of the magnesium-oxide injection system.

While in the Instrument and Controls Section, was responsible for maintaining and testing all plant electric and pneumatic controls systems, Turbine Boiler performance tests and calculation and improvement of the station heat rate.

As Operations Supervisor, was responsible for the reliable, safe, and efficient operation of all plant equipment, personnel scheduling and training, coordination of equipment outages, and preparation of operating reports. Subsequently transferred to the Shoreham Plant Staff in January 1974.

Member, American Society of Mechanical Engineers
Member, American Nuclear Society

DR. ELIAS P. STERGAKOS

Radiation Protection Engineer

LONG ISLAND LIGHTING COMPANY

ACADEMIC DEGREE	YEAR AWARDED	NAME OF INSTITUTION
Bachelor of Arts--Physics	1966	Adelphi University
Master of Science--High Energy Physics	1968	Virginia Polytechnic Institute
Doctor of Philosophy--Nuclear Science & Engineering	1970	Virginia Polytechnic Institute
A review course in Engineering Sciences and Economics	1982-1983	Hofstra University

SPECIAL TRAINING:	YEAR TAKEN	ADMINISTERED BY
Reactor Operator Course	1967-1968	Virginia Polytechnic Institute. Passed U.S. AEC Test and obtained License No. OP-2414 to operate VPI's UTR-10 nuclear reactor.
Nuclear Fuel Management Course	1970-1972	Stoller Corporation
Practical Fossil Power Plant Technology	1977-1978	Burns & Roe
Managing for Motivation	1977-1978	Burns & Roe
Environmental Engineering	1979-1980	Burns & Roe

EXPERIENCE SUMMARY:

Organization	Time Span In Years	Position Title
Virginia Polytechnic Institute	4	Graduate Teaching & Research Assistant
Duke Power Company	2.2	Lead Engineer
Burns & Roe	11	Nuclear Analysis Supervisor
Long Island Lighting Company	1	Radiation Protection

PROFESSIONAL SOCIETIES:

a) Member of ANS (Treasurer of VPI Chapter 1967-1970)

b) Sigma Pi Sigma - Physics Honor Society 1963-1966
(President of the Adelphi Chapter 1965-1966)

AWARDS & PUBLICATIONS

1) Certificate of Merit from Burns & Roe in recognition of excellence of technical articles entitled "Energy - The Problem That Won't Go Away" by E.P. Stergakos, Greek Accent, September and October 1981.

2) Second place award for paper, "Studies of Resonances in 26Mg, 55Mn, 41K, 59Co, and 23Na" by E.P. Stergakos, Virginia Chapter of ANS, University of Virginia, 1969.

3) "A Synopsis of the World Energy Problem and its Solution" by E.P. Stergakos, Annals of KRIKOS Conference Volume II, October 1980.

LICENSE

License No. OP-2414 to operate VPI's UTR-10 Nuclear Reactor 1968-1970.

EXPERIENCE DESCRIPTION

Graduate Teaching and Research Assistant, Virginia Polytechnic Institute (1966 - 1970):

As a Teaching and Research Assistant, I taught undergraduate courses and their associated laboratories in the field of Nuclear Science and Engineering, i.e., Reactor Physics, Reactor Thermodynamics, Materials Damage, Shielding & Health Physics, etc. I also took the required AEC test and in April of 1968 obtained License No. OP-2414 to operate the school's research reactor, and operated the reactor for student research and for research and tests that the school performed for state and government agencies.

Duke Power Company (1970 - 1972):

I was employed in the Nuclear/Fuel Management Department and was stationed at the Oconee Nuclear Power Station. I was responsible for fuel management and accountability at the station, participated in hot functional testing and was responsible for all physics and nuclear start-up testing. My duties included the review of tests for completeness of data and acceptance criteria, and the analysis of core performance, both nuclear and thermo-hydraulic.

To help ensure conformance with the AEC requirements on fuel accountability, I wrote procedures and computer codes which were used by the station staff. For fuel management, I used the fuel management codes that Duke had acquired from the Stoller Corporation and made studies on reactivity changes due to rod drops and ejected rods, power peaks, shut-down margins, critical ppm boron, temperature coefficients, DNBR and fuel shuffling up to five refueling periods. In addition, I wrote a four-energy group computer code that determined Xe and Sm negative reactivity contributions to the reactor core for any number of time and power perturbations. My fuel management duties were combined with other efforts, including working in conjunction with Babcock and Wilcox personnel in writing the following test and/or operating procedures:

1) Induced Power Oscillation Test;
2) Power Imbalance Detector Correlation Test;
3) Xenon Reactivity Worth and Rapid Depletion Test;
4) Reactivity Depletion vs. Burnup;
5) Initial Fuel Loading.

I also authored the following procedures:

1) Reactivity Balance Calculation;
2) Core Energy Calculation (Computer Inoperative);
3) Control and Accountability Procedure for Nuclear Fuel Material.

My other activities at the Oconee Station included teaching the station staff the section of the reactor operation course that pertained to the fundamentals of nuclear engineering and reactor operation, and advising the plant health physicist on matters pertaining to radiation protection.

Burns and Roe, Inc. (1972 - August 13, 1983):

As Nuclear Analysis Group Supervisor, I was responsible for:

1) Writing projects' criteria documents;
2) Reviewing, evaluating and determining projects' conformance with the pertinent regulatory guides, standard review plans, code of Federal Regulations and NUREGs.

I also supervised the activities of the nuclear analysis group, giving them guidance on the criteria for solving problems and approving all calculations.

Among the problems I addressed in this position were:

1) Analyses of control rooms and technical support centers habitabilities after DBAs as a function of containment leak rates, filter bypasses, habitable volumes, fresh air intake rates, recirculated and non-recirculated atmospheres, pressurized and non-pressurized atmospheres, with and without containment sprays, SGTS bypass, single, dual near and remote intakes, and intake malfunctions;
2) Analyses of off-site doses;
3) Establishment of personnel traffic flow during normal plant operation and after DBAs;
4) Determination of integrated dose to plant and contractor personnel during normal plant operations and after DBAs;
5) Determination of X/Qs;
6) Establishment of radiation zones for normal operation and shutdown conditions;
7) Establishment of annual man-rem goals;
8) Performance of ALARA cost benefit analyses;
9) Establishment of the location and setpoints of area, process and atmospheric radiation monitors;
10) Determination of response times of radiation detectors as a function of systems' leak rates;
11) Designation of decontamination facilities for personnel and equipment;
12) Determination of radiation source terms and activation rates;
13) Evaluation of bulk shielding;
14) Performance of scatter radiation and penetration analyses;

15) Evaluation of post LOCA oxygen/hydrogen generation and control;
16) Sizing of post LOCA hydrogen recombiners;
17) Analyses of concrete aging due to heat and radiation;
18) Evaluation of flooding of safety equipment due to pipe rupture;
19) Determination of integrated dose to safety equipment from 40 years of normal operation and from postulated accidents for radiation qualification purposes; and
20) Participation in bid proposals.

In addition, I performed a field evaluation, and drafted a report, on the ALARA and radiological aspects of TII's gas mixing and diffusion facilities in Puerto Rico. I also analyzed a DOE decontamination and dilution facility at Hanford, Washington, and made recommendations on ALARA and radiation protection matters. Thereafter, I participated in the design of the shielding and of the remote master slave manipulator changes. Within a week of the May 29, 1979 TMI No. 2 accident, I arrived at that site and assisted in the radiation protection, health physics and the design of recovery systems efforts for 2 1/2 months.

My major project assignments included:

Nuclear Analysis Group Supervisor:
1150-MW BWR, WPPSS Nuclear Project No. 2, Richland Washington;

680-MW PWR, Philippine Nuclear Power Plant Unit No. 1, Philippines;

Additional Facilities 965-MW PWR Unit 3, Indian Point Nuclear Power Station, Buchanan, New York;

2x675-MW BWR Units 1 and 2, Laguna Verde Nuclear Power Stations, Veracruz, Mexico.

As a Nuclear Engineer, I was responsible for the design and shielding of radwaste systems (liquids, gaseous, solids and miscellaneous), chemical addition systems, nitrogen supply systems and residual heat removing systems. I authored the system descriptions, operating procedures and the sections of the SARs that pertained to these systems. I performed economic studies, wrote and evaluated bid specifications. I also sized components of systems and updated their respective flow diagrams and general arrangement drawings. I investigated compatibility of materials and heat tracing requirements. Finally, I contributed to the writeup of the computer codes FSPROD-DBAA and AID and hand checked completely the former. (Both of these codes analyze DBAs source terms and doses.)

My assignments included:

Nuclear Engineer:
380-MW LMFBR Clinch River Breeder Reactor Plant, Oak Ridge, Tennessee

960-MW PWR Unit No. 2, Three Mile Island Nuclear Power Station, Dauphin County, Pennsylvania.

Long Island Lighting Company (August 15, 1983 - Present):

As Radiation Protection Division Manager, I have overall responsibility for the corporate overview and technical direction of all aspects of radiological protection as well as the design of the radwaste systems. The programs under the manager's auspices include the radiological safeguarding of members of the public, the environment, and LILCO personnel. My duties also include the development of company radiation protection and ALARA policies, program manual and procedures; the direction and/or performance of shielding and other radiological engineering calculations and analyses; the performance of design reviews of facilities and systems changes and/or additions; the verification of the radiological qualification of safety equipment; the review and updating of accident analyses including Probabilistic Risk Assessment (PRA); the development of the Offsite Dose Calculation Manual (ODCM); the determination of instrument setpoints and response times; and the assignment as Environmental Radiation Coordinator in the event of a plant accident.

JOHN A. RIGERT

Section Head, Nuclear Systems Engineering Section

LONG ISLAND LIGHTING COMPANY

My name is John A. Rigert. My business address is Long Island Lighting Company, North Country Road, Wading River, New York, 11792. I am the Manager, Nuclear Systems Engineering Division of the Nuclear Engineering Department. I was appointed to this position in May 1984. My responsibilities are detailed in Attachment 1.

I received my Bachelor of Mechanical Engineering degree from Pratt Institute in 1970 and my Master of Science degree in Nuclear Engineering from Polytechnic Institute of Brooklyn in June 1976. I have completed courses in GE BWR systems and simulator training, Westinghouse PWR systems training and other subjects related to nuclear power.

I am a member of the American Society of Mechanical Engineers and am a registered Professional Engineer in the State of New York.

I have been employed by LILCO since June 1970. In the period from June 1970 to February 1972, I held the position of assistant engineer in the Gas Production and Operations Department. Then, from February 1972 to August 1976, I held the positions of associate engineer and engineer in the Power Engineering Department. I was responsible for various assignments related to Shoreham, Jamesport, Northport 3 & 4 and other projects with emphasis on mechanical and electronic instrumentation and controls, demineralizers and water treatment.

In the period for August 1976 to October 1978, I held the position of Nuclear Systems Test Engineer in the Shoreham Startup organization. I was responsible for procedure preparation, flushing, testing and other activities on the following systems: control rod drive, reactor core isolation cooling, standby liquid control, refueling and reactor vessel servicing, fuel pool cooling and cleanup and other miscellaneous systems.

From October 1978 until May 1984 when I assumed my present duties, I was the Section Head of the Systems Engineering Section of the Nuclear Engineering Department. My responsibilities included the review and approval of the technical aspects of nuclear and radwaste systems engineering and the performance of special studies relating to nuclear and radwaste system design and performance. In addition, I provided technical support for modifications and improvements during nuclear plant operations.

APPENDIX 6

Nuclear Systems Engineering Division Responsibilities

1. Support an operating nuclear power station with nuclear engineering expertise. The division will have expertise in the areas of: thermal-hydraulics, heat transfer, stress analysis, systems engineering, instrumentation and controls, materials engineering and safety and reliability analysis.

2. Direct nuclear engineering activities associated with operating plant modifications. Coordinate nuclear activities with related support from other Company engineering departments.

3. Perform review and approval of all changes made to safety related systems or technical specifications, to insure compliance with FSAR and NRC regulations. Perform safety analysis in accordance with 10 CFR 50.59.

4. Provide engineering resources for proper material selection, welding and metallurgical procedures and nondestructive examination of systems, components, and equipment with safety significance or with important reliability considerations.

5. Provide support for analysis of modifications as they effect transient and accident analyses. Develop a reliability and risk assessment capability aimed at improving plant safety and availability.

6. Develop a working knowledge of applicable industry codes and standards, including Title 10 Code of Federal Regulations.

7. Perform review and approval of applicable FSAR and ER Changes.

8. Responsible for technical supervision of the services of outside consultants and/or vendors whose services are required to support the division covered by the general services agreement contracts.

9. Responsible for administration of the services of outside consultants and/or vendors whose services are required to support the Division and are not covered by the general services agreement contracts.

10. Develop policies and procedures for the proper control and updating of drawings and documentation asociated with an operating nuclear station.

11. Maintain awareness of industry operating problems, emerging regulatory concerns and maintain a familiarity with EPRI and other industry group studies that relate to the Company's nuclear program.

Sim 2-7

BY MR. ZEUGIN:

Q Dr. Cordaro, could I ask you to look at LILCO Exhibit EP-71, particularly pages 3 and 4 of that document, which contain a proposed licensed condition which you state that LILCO is willing to accept as a condition on an operating license at Shoreham.

Could you please explain why this condition is viewed as acceptable to LILCO?

A (Witness Cordaro) The concern has been expressed in these proceedings that due to the unique nature of the offsite emergency plan which supports the Shoreham facility, that is that this offsite organization is staffed primarily by LILCO people and that a good portion of the organization, roughly two-thirds, consists of union personnel, that in the event of a strike serious safety concerns would develop as far as the potential for an accident and our ability to react and deal with that accident.

Although we don't believe the situation is as grave as some people suggest, namely, that for most of the types of accidents or incidents that we might face at Shoreham, a LERO organization staffed merely by the management people, the roughly one-third of the total organization which consists of management people, could handle on an ad hoc basis most of those incidents.

We do concede, however, that there are serious

Sim 2-8

accidents which have some potential for occurrence. Fortunately, they are extremely improbable and the least likely type of events. But in the event of such an accident, such as a general emergency with a full-scale evacuation, the fact that a strike exists would hamper, theoretically hamber LERO's ability to handle that accident principally because the union people would not be available to staff the organization.

For that reason we have agreed or are willing to agree to include as a condition of our license a licensing condition which addresses this factor. Essentially the licensing condition states that in the event that a strike does commence, that we will agree to bring down the Shoreham Nuclear Power Station to a cold shutdown condition 24 hours prior to the commencement of such a strike.

We would maintain the plant in such a cold shutdown condition until the end of the strike, except that with approval, prior approval of the NRC staff and upon written application by the company, we would be permitted to, first of all, take the reactor to a refueling mode to conduct certain refueling oprations that require access to the reactor core provided that we can show that such operations won't result in the occurrence of any event requiring offsite emergency response capability.

Secondly, as an exception, we would, again

Sim 2-9

subject to the proviso that this would be approved by the NRC staff, we would want the capability to conduct other operations such as maintenance type work if it is shown that the strike does not in fact impair our ability to implement the offsite emergency preparedness plan.

end Sim
Joe fols

And this proviso was mainly included in this condition to address future developments in the emergency planning area, such as realization of the fact that the source terms that we are using to evaluate accidents today may be reduced significantly in the future, such that the measures needed to be taken in the event of an emergency may not be as extensive as they are today.

Finally, we, in this condition, assume that -- or making the assumption that if at any time in the future our situation should change, such that the State, the County, or Federal government agreed to assume legal responsibility for the effectuation of an offsite emergency plan, such as the normal arrangements which exist at most operating reactors in the country, that this condition would be removed from our license.

Q Thank you, Dr. Cordaro. Mr. Scalice, if I could have you look at your affidavit which has been marked LILCO Exhibit EP-73. In paragraph 10 of your affidavit, you state that Management-level plant staff employees could bring the Shoreham plant to cold shutdown.

Similarly, in paragraphs 11 and 12, you state that Management personnel could indefinitely maintain the plant in a cold shutdown condition, or could maintain the plant in a refueling mode.

Could you please explain how you reached

these conclusions?

A (Witness Scalice) Yes. In reviewing the number of manpower that exists at the plant, and comparing that manpower of licensed operators to the technical specification requirements for licensed operators, I determined that the number of personnel available at the site was sufficient to be able to bring the plant to a cold shutdown condition, and maintain it in that condition, and also to bring it to a lower condition of operation, such as the refueling mode.

Q Mr. Scalice, do you have in front of you a document that has been marked LILCO Exhibit EP-77, that is headed 3/4.0 Applicability, Limiting Condition for Operation?

A Yes, I do.

Q Could you please identify what that document is, or do you recognize what that document is?

A I recognize the document. It is the Shoreham Technical Specifications, and this set of technical specifications, along with the table that references the number of personnel within the technical specifications required to operate under various conditions was utilized to come to the conclusion that the plant could be brought to a cold shutdown condition with the existing management personnel.

Additionally, the section of 3/4, Applicability, under Section 3.0.3, that states basically that in the event that you cannot maintain the requirements of the table that

is referenced, that table being Table 6.2.2-1, of the number of licensed operators required, then this requirement becomes in place, and this requirement states that should I not be able to meet the manpower requirements of any of those conditions, I shall take the actions set forth, and those actions indicate that I should bring the plant to a cold shutdown condition.

In fact, it states that I should bring it to a cold shutdown condition within 36 hours.

Q Mr. Scalice, let me ask you if you have a document in front of you that has been marked LILCO Exhibit EP-78, that has been headed non-union manpower available to bring plant to cold shutdown and maintain it in that condition.

A Yes, I do.

Q Do you recognize this document?

A Yes, I do. I prepared it in response to a discovery request and this document includes the comparison of affidavit and the technical specifications and outlines the number of personnel available, management licensed operator personnel that are available to bring the plant to a cold shutdown and maintain it there.

Additionally, it identifies a number of other personnel that are available to perform functions in the plant. This document was prepared in conjunction with the technical specifications.

Q Did you rely on this document in drawing the conclusions that are presented in your affidavit?

A I did, sir.

MR. ZEUGIN: Judge Laurenson, at this time I would move the admission into evidence of LILCO Exhibits EP-77 and EP-78.

JUDGE LAURENSON: Is there any objection to those exhibits?

MR. MILLER: No objection.

MR. ZAHNLEUTER: No objection.

MR. HASSELL: No objection.

JUDGE LAURENSON: LILCO Exhibits EP-77 and 78 will be received in evidence, and bound into the transcript following this page.

XXXXXINDEX

(LILCO Exhibits EP-77 and EP-78 are received in evidence.)

(Exhibits follows)

3/4.0 APPLICABILITY

LIMITING CONDITION FOR OPERATION

3.0.1 Compliance with the Limiting Conditions for Operation contained in the succeeding Specifications is required during the OPERATIONAL CONDITIONS or other conditions specified therein; except that upon failure to meet the Limiting Conditions for Operation, the associated ACTION requirements shall be met.

3.0.2 Noncompliance with a Specification shall exist when the requirements of the Limiting Condition for Operation and associated ACTION requirements are not met within the specified time intervals. If the Limiting Condition for Operation is restored prior to expiration of the specified time intervals, completion of the Action requirements is not required.

3.0.3 When a Limiting Condition for Operation is not met, except as provided in the associated ACTION requirements, within one hour action shall be initiated to place the unit in an OPERATIONAL CONDITION in which the Specification does not apply by placing it, as applicable, in:

1. At least STARTUP within the next 6 hours,
2. At least HOT SHUTDOWN within the following 6 hours, and
3. At least COLD SHUTDOWN within the subsequent 24 hours.

Where corrective measures are completed that permit operation under the ACTION requirements, the ACTION may be taken in accordance with the specified time limits as measured from the time of failure to meet the Limiting Condition for Operation. Exceptions to these requirements are stated in the individual Specifications.

This Specification is not applicable in OPERATIONAL CONDITIONS 4 or 5.

3.0.4 Entry into an OPERATIONAL CONDITION or other specified condition shall not be made unless the conditions for the Limiting Condition for Operation are met without reliance on provisions contained in the ACTION requirements. This provision shall not prevent passage through or to OPERATIONAL CONDITIONS as required to comply with ACTION requirements. Exceptions to these requirements are stated in the individual Specifications.

6.1 RESPONSIBILITY

6.1.1 The Plant Manager shall be responsible for overall unit operation and shall delegate in writing the succession to this responsibility during his absence.

6.1.2 The Watch Engineer (or during his absence from the control room, a designated individual) shall be responsible for the Control Room command function. A management directive to this effect, signed by the Vice President-Nuclear shall be reissued to all station personnel on an annual basis.

6.2 ORGANIZATION

OFFSITE

6.2.1 The offsite organization for station management and technical support shall be as shown on Figure 6.2.1-1.

UNIT STAFF

6.2.2 The station organization shall be as shown on Figure 6.2.2-1 and:

a. Each on duty shift shall be composed of at least the minimum shift crew composition shown in Table 6.2.2-1;

b. At least one licensed Reactor Operator shall be in the control room when fuel is in the reactor. In addition, while the unit is in OPERATIONAL CONDITION 1, 2 or 3, at least one licensed Senior Reactor Operator shall be in the control room;

c. A Health Physics Technician* shall be on site when fuel is in the reactor;

d. All CORE ALTERATIONS shall be observed and directly supervised by either a licensed Senior Reactor Operator or licensed Senior Reactor Operator Limited to Fuel Handling who has no other concurrent responsibilities during this operation;

e. A site fire brigade of at least five members shall be maintained on site at all times*. The fire brigade shall not include the Watch Engineer, the Shift Technical Advisor, nor the two other members of the minimum shift crew necessary for safe shutdown of the unit and any personnel required for other essential functions during a fire emergency; and

*The Health Physics Technician and fire brigade composition may be less than the minimum requirements for a period of time not to exceed 2 hours, in order to accommodate unexpected absence, provided immediate action is taken to fill the required positions.

UNIT STAFF (Continued)

f. Administrative procedures shall be developed and implemented to limit the working hours of unit staff who perform safety-related functions (e.g., licensed Senior Reactor Operators, licensed Reactor Operators, health physicists, auxiliary operators, and key maintenance personnel).

Adequate shift coverage shall be maintained without routine heavy use of overtime. The objective shall be to have operating personnel work a normal 8-hour day, 40-hour week while the unit is operating. However, in the event that unforeseen problems require substantial amounts of overtime to be used, or during extended periods of shutdown for refueling, major maintenance, or major unit modification, on a temporary basis the following guidelines shall be followed:

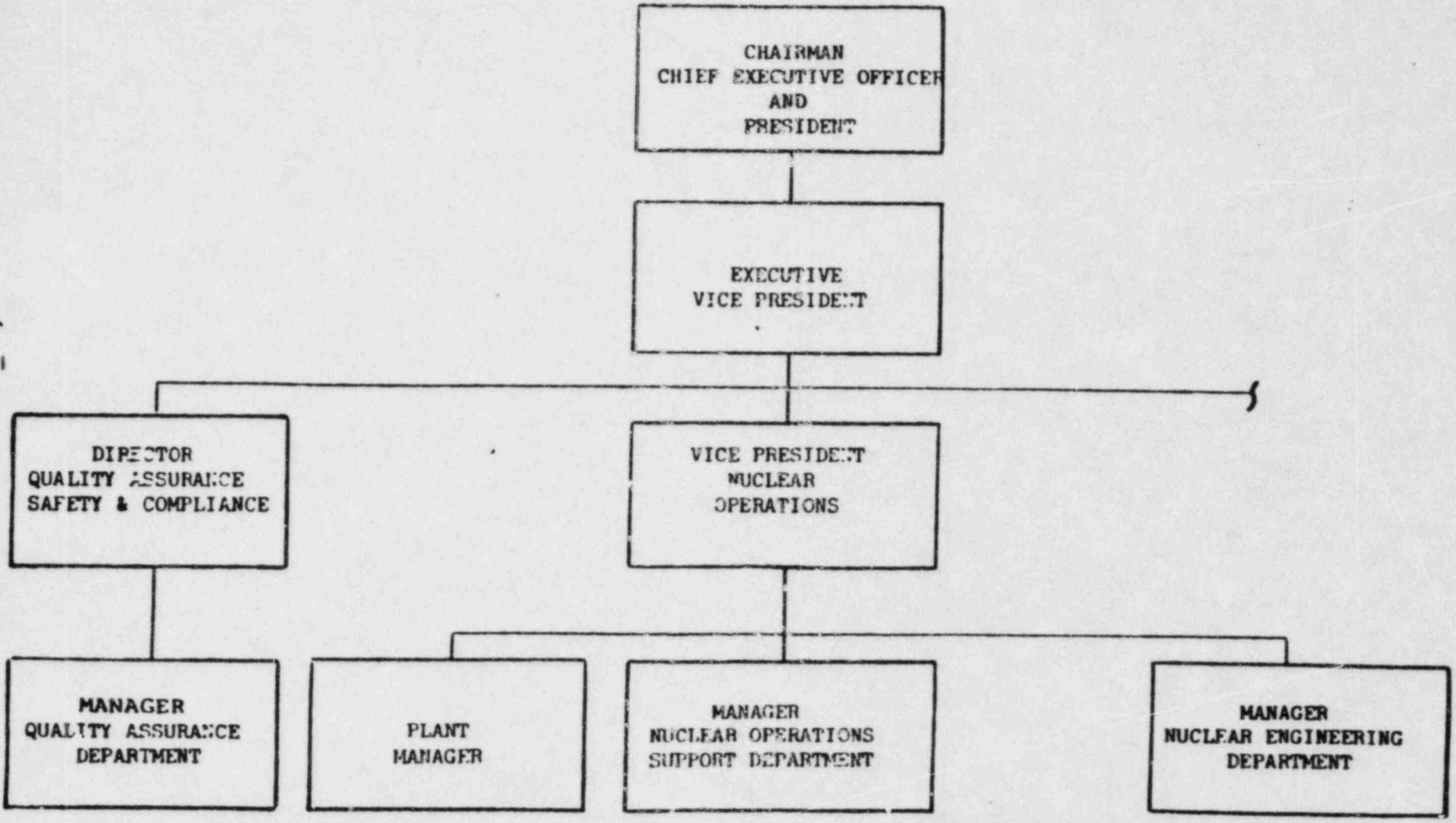
1. An individual should not be permitted to work more than 16 hours straight, excluding shift turnover time.

2. An individual should not be permitted to work more than 16 hours in any 24-hour period, nor more than 24 hours in any 48-hour period, nor more than 72 hours in any 7-day period, all excluding shift turnover time.

3. A break of at least 8 hours should be allowed between work periods, including shift turnover time.

4. Except during extended shutdown periods, the use of overtime should be considered on an individual basis and not for the entire staff on a shift.

Any deviation from the above guidelines shall be authorized by the Plant Manager or his deputy, or higher levels of management, in accordance with established procedures and with documentation of the basis for granting the deviation. Controls shall be included in the procedures such that individual overtime shall be reviewed monthly by the Plant Manager or his designee to assure that excessive hours have not been assigned. Routine deviation from the above guidelines is not authorized.


CHAIRMAN
CHIEF EXECUTIVE OFFICER
AND
PRESIDENT
EXECUTIVE
VICE PRESIDENT
DIRECTOR
QUALITY ASSURANCE
SAFETY & COMPLIANCE
VICE PRESIDENT
NUCLEAR
OPERATIONS
MANAGER
QUALITY ASSURANCE
DEPARTMENT
PLANT
MANAGER
MANAGER
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SUPPORT DEPARTMENT
MANAGER
NUCLEAR ENGINEERING
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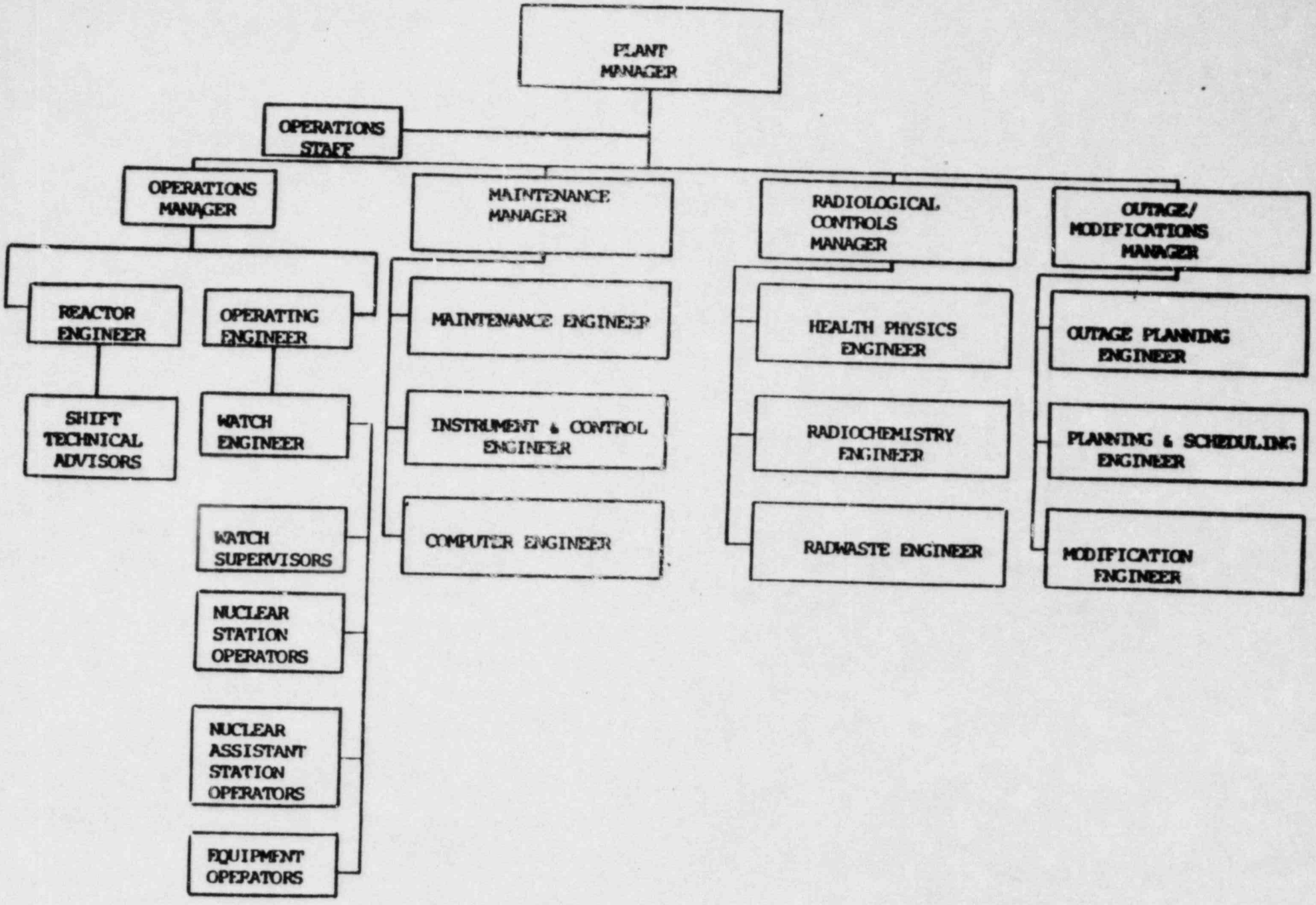
PLANT MANAGER
OPERATIONS STAFF
OPERATIONS MANAGER
MAINTENANCE MANAGER
RADIOLOGICAL CONTROLS MANAGER
OUTAGE/ MODIFICATIONS MANAGER
REACTOR ENGINEER
OPERATING ENGINEER
MAINTENANCE ENGINEER
HEALTH PHYSICS ENGINEER
OUTAGE PLANNING ENGINEER
SHIFT TECHNICAL ADVISORS
WATCH ENGINEER
INSTRUMENT & CONTROL ENGINEER
RADIOCHEMISTRY ENGINEER
PLANNING & SCHEDULING ENGINEER
WATCH SUPERVISORS
COMPUTER ENGINEER
RADWASTE ENGINEER
MODIFICATION ENGINEER
NUCLEAR STATION OPERATORS
NUCLEAR ASSISTANT STATION OPERATORS
EQUIPMENT OPERATORS

TABLE 6.2.2-1

MINIMUM SHIFT CREW COMPOSITION

SINGLE UNIT FACILITY

POSITION	NUMBER OF INDIVIDUALS REQUIRED TO FILL POSITION	
	CONDITION 1, 2, or 3	CONDITION 4 or 5
WE	1	1
SRO	1	None
RO	2	1
EO	2	1
STA	1	None

TABLE NOTATION

WE - Watch Engineer with a Senior Reactor Operators license on Unit 1.
SRO - Individual with a Senior Reactor Operators license on Unit 1.
RO - Individual with a Reactor Operators license on Unit 1.
EO - Equipment Operator
STA - Shift Technical Advisor

Except for the Watch Engineer, the shift crew composition may be one less than the minimum requirements of Table 6.2.2-1 for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements of Table 6.2.2-1. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crewman being late or absent.

During any absence of the Watch Engineer from the control room while the unit is in OPERATIONAL CONDITION 1, 2 or 3, an individual (other than the Shift Technical Advisor) with a valid Senior Reactor Operator license shall be designated to assume the control room command function. During any absence of the Watch Engineer from the control room while the unit is in OPERATIONAL CONDITION 4 or 5, an individual with a valid Senior Reactor Operator license or Reactor Operator license shall be designated to assume the control room command function.

LILCO Ex.
EP-78

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:

TITLE	NUMBER
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	1
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.

BY MR. ZEUGIN: (Continuing)

Q Mr. Rigert, if I could have you look at your affidavit, which has been marked LILCO Exhibit EP-72. In that affidavit, you discuss a variety of accidents that are presented in Chapter 15 of the FSAR. In preparing this affidavit, did you consider any accidents other than those presented in Chapter 15 of the FSAR?

A (Witness Rigert) Yes. In the course or reviewing the Chapter 15 events, we gave consideration to the possibility of any of these events propogating into so-called Class 9 accidents, or degraded core accidents.

Based upon the plant conditions, we concluded that there are no credible events that could lead to a degraded core. For this reason, we did not directly address degraded core accidents in this affidavit.

Q Mr. Rigert, could you explain in a little more detail how you reached the conclusion that no degraded core events were credible during cold shutdown?

A First, let me describe cold shutdown. During cold shutdown, the reactor is sub-critical. All control rods are inserted. The reactor is fully depressurized, and the reactor coolant is at less than, or equal to, 200 degrees Fahrenheit. Many of the systems which were operating during power operation are not in service during cold shutdown.

Main steam isolation valves are closed. Of the

Chapter 15 events, 22 of them are deemed to be not possible at all during cold shutdown because of this plant configuration.

Most of the other events are trivial in the sense that while they could occur, there would either be no consequence whatsoever, or the consequence does not in any way challenge the integrity of the core.

There are a few remaining events which do affect the core, but during cold shutdown their likelihood of occurence is extremely remote.

Also, during cold shutdown, due to the fact that the temperature and pressure are so low, and the heat production rate is so low at this stage, the time to mitigate any potential event like this is greatly increased, and the required capacity of any mitigation system is also greatly reduced.

As a result, it has been determined and concluded that there is no credible series of events which would be -- which would require multiple failures that could lead to a degraded core situation during cold shutdown.

MR. ZEUGIN: Thank you, Mr. Rigert. Judge Laurenson, that concludes LILCO's direct testimony on the strike issues at this time, and the LILCO panel is available for cross examination.

End 3. Sue fols.

#4-1-SueT

JUDGE LAURENSON: Mr. Miller.

MR. MILLER: Judge Laurenson, in light of the unusual nature of this proceeding, in terms of the direct case being presented orally, and I think in light of the fact that we are hearing some things for the first time, the County would request a short recess. I think fifteen minutes would be adequate before we begin our cross-examination.

JUDGE LAURENSON: All right. The request is granted. We will reconvene here at 11 o'clock.

(Whereupon, the hearing is recessed at 10:43 a.m., to reconvene at 11:00 a.m., this same day.)

JUDGE LAURENSON: Are you ready to resume?

MR. MILLER: Yes, sir.

JUDGE LAURENSON: Mr. Miller

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CROSS EXAMINATION

BY MR. MILLER:

Q Dr. Cordaro, let's start with you. If you would, look at your affidavit, which is LILCO Exhibit 71?

I just have some basic preliminary questions to ask to begin with. Could you tell me how many of the LILCO employees are unionized?

A (Witness Cordaro) Roughly three thousand eight hundred, something in that order.

Q And the total work force of LILCO is what?

#4-2-SueT

A Oh, about fifty-two to fifty-three hundred right now.

Q And how many unions represent LILCO workers?

A Two.

Q What unions are they?

A Local 1381 and Local 1049 of the International Brotherhood of Electrical Workers.

Q Is it fair to say that all LILCO workers are unionized except for management personnel?

A Yes.

Q Now, with respect to the Shoreham site, Dr. Cordaro, what is the approximate work force assigned to the Shoreham site?

A Probably Mr. Scalice could give you a more accurate answer. I haven't checked that in a long while.

(Witness Scalice) Within the plant staff, there are approximately three hundred and twenty people. Within the Nuclear Engineering Department, there are sixty-six. And within our Nuclear Operations Support Division, there are another approximately thirty of which a hundred and seventy-three of those personnel are unionized.

Q Now, Mr. Scalice, the numbers you just gave me, is it fair to say that the personnel who actually work at the site on a daily routine basis would be the three hundred twenty that you listed first?

#4-3-SueT1

A No. On a daily basis, on Monday through Friday, all of those individuals except for those people that would be on shift work and away from the site because they are either at home, on their day off, or are waiting their turn to come in on, we will say, a 4 to 12 or 12 to 8 shift, all of those personnel would be on the property.

(Witness Cordaro) The Offices of the Nuclear Engineering Support personnel are at the site itself.

Q And what about the Nuclear Support Division, is that at the site?

A Yes, they are at the site also. Yes.

Q The figures you have given me, Mr. Scalice, those include the clerical, secretarial, maintenance people, as well; is that correct?

A (Witness Scalice) That is correct.

Q And of the approximate, I think it was about four hundred and twenty persons you have listed, how many are unionized?

A Approximately a hundred and seventy, a hundred and seventy-three, last count.

Q Are those one hundred and seventy persons represented by the same two unions, Local 1381 and Local 1049?

A Yes, they are.

Q Are there any other unions that represent the

#4-4-SueT

personnel assigned to the site?

A Not Long Island Lighting Company employees.

Q Or personnel that work at the site?

A There are some personnel presently at site from the trade unions.

Q Are those construction personnel?

A That's correct.

Q Other than construction personnel, are there any other personnel assigned to the Shoreham site that are represented by any union other than the two that Dr. Cordaro mentioned?

A There are some temporary technicians that are represented by Local 25. Again, that's during the construction phase.

Q Anyone else?

A There are contractual security personnel. They are not in the number of -- that four hundred and, I believe you said four hundred and twenty, though. Those are additional personnel.

Q Okay. The number actually I think is four sixteen. That number would not include security personnel assigned to the site?

A That is correct. It would not include.

Q Dr. Cordaro, would you look at your affidavit on Page 2?

#4-5-SueT1

A (The witness is complying.)

Q Paragraph 4 discusses the recently expired contracts with LILCO's unions, talks about the fact that those contracts contain no strike clauses.

And my question is, do the new union contracts contain such no strike clauses?

A (Witness Cordaro) Yes.

Q Are the clauses the same clauses that were contained in the previous contracts?

A I don't know that. I haven't read the exact clause. I did verify, however, that there was a no strike clause in the current agreement.

I would expect that there would be a minor difference because the term of the contract is different. The old agreements were three year agreements, I believe; and, this is an eighteen month agreement. So, in that respect there might be a minor difference.

Q Do you know if the wording of the no strike clause is the same with respect to the contracts for both unions?

A I expect so. But I don't know that for a fact since I haven't read them.

end #4
MM flws

Q Can you give me a general synopsis of the clauses, Dr. Cordaro, and what they do provide for?

A My understanding in discussions with our Vice President of Employee Relations, who is the chief negotiator in the contracts, it essentially states that the union agrees throughout the term of the contract not to strike.

Q Do the clauses provide that the union will provide notification to LILCO prior to any strike?

A No, I don't think so, because there is agreement that no strike will occur, so there is no need for such a statement.

Q Well, for example, if the contracts would expire thereby under the term of such a no-strike clause permitting a strike, are the unions obligated under the contracts with LILCO to provide notification to LILCO that they will indeed go on strike?

A I don't know if they are obligated by any formal covenant. However, I do know in the strike we just had there was an agreement reached through the mediator that indeed the union would provide 24-hour notice to the company in the event they intended to strike.

But, I don't know of any formal covenant which require them to do so, and I doubt there are.

Q Dr. Cordaro, let's focus for a moment on the

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strike which did occur recently, the strike in July.

When did LILCO know that that strike was going to occur?

A Well, there was always a degree of expectation that the strike would occur, which increased in certainty as events unfolded. I think after the union vote on the Sunday of that week, we were pretty sure a strike was going to take place. And, in fact, we had planned for accommodating that strike with management personnel weeks before that particular date.

As far as official notice of the strike taking place, I believe that was given on Monday of that week through the mediator in a meeting before, after or during a meeting with the mediator. And a schedule was developed in consultation with the union for the union to go on strike and management to assume control of all operations.

Q Dr. Cordaro, the strike officially began on July 10th, is that correct?

A I believe it was the 11th. I'm not absolutely positive of that, but I believe it was the 11th.

Q That would have been Wednesday, July 11th?

A Okay,then I'm wrong. I thought the 11th was a Tuesday. No, it was a Tuesday, so it would be the 10th.

Q Can you tell me, Dr. Cordaro, when did the contracts then in existence between LILCO and the unions,

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expire?

A Well, they formally expired on July 1st. However, there was an agreement with the unions to extend the contract from day to day through an additional negotiating period to try to settle the differences.

Q And you say that LILCO was given official notice through the mediator on Monday, July 9th, that the strike would, in fact, happen?

A Yes.

Q Can you tell me, Dr. Cordaro, what was the absenteeism rate among LILCO employees on Monday,July 9th?

A I can't give you a specific number. But I don't believe it was abnormally high.

Q What about on Tuesday, July 10th?

A Well, on Tuesday we had dismissed shifts earlier in preparation for the strike. We actually didn't bring certain shifts on that we would have brought on and paid the union personnel for that time in the transition from a union operation to a total management operation.

Q When you say you dismissed shifts early, do you mean you told shifts not to report?

A Yes, yes.

And certain shifts that occurred during the day, some unique shifts that we have, those individuals were dismissed early.

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Q What was the reason for wanting to dismiss shifts early and ask shifts not to report for work?

A I think the primary reason was to control the transition more effectively, to avoid problems, to be able to pick our own spot and time to do certain things. And we were willing to incur the costs of paying the union people to do that, to enable us to effect a smooth transition.

Q I take it, Dr. Cordaro, that part of the concern and part of the reason for dismissing such shifts early and asking shifts not to report was a concern by LILCO for possible vandalism among union workers?

A That was a concern. Not necessarily vandalism, but nuisance type measures that they could take such as placing tools in the wrong location or not filling a certain tank or something like that. That is true, that was a concern.

Q During the strike itself, did LILCO experience any vandalism or worker sabotage, I guess I would call it?

A There were incidents of vandalism. I think in the legal sense, I don't think they have been fully explored or pursued through formal legal channels as of yet. But there appear to be instances of what I would call vandalism.

Q As a result of the strike, Dr. Cordaro, I gather that LILCO increased its security around its plant properties, is that correct?

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A Yes.

Q Did you use management personnel to do this?

A No, we used an outside security force which is under contract to the company, and we increased the number of people that we usually use from this outside security company -- or companies. I think there were two companies involved.

We also relied on the police departments to provide assistance.

Q And despite --

A Of course there are certain activities which took place which you might categorize as essentially security. for instance, we had certain management people babysit at some substations which are normally not manned. And you might construe that as a security measure, although I wouldn't classify it strictly as such.

Q Despite this increased security, Dr. Cordaro, you did experience some instance of vandalism and some damage to LILCO plant property, correct?

A Yes.

Q Dr. Cordaro, what happens -- let me back up.

I take it that in July both unions, Local 1381 and 1049 did strike, corrrect?

A Yes.

Q And what would happen if only one of the unions

mm6

went out on strike in the future, do you expect that the other union would go out in sympathy?

A It is hard to say because these two unions usually function almost identically. There are very close ties between them. So, it is hard to conceive of one union functioning totally -- in a total separate sence than the other. They usually do things in concert.

In fact, the negotiating sessions are held jointly with these two unions.

You can't dismiss the possibility that at some time in the future, the unions might function separately or negotiate separately. I think they have the right to do so if they would like. But, historically, that hasn't been the case.

Q Dr. Cordaro, I take it it is fair to say that you and LILCO place some -- rely to some extent on the no-strike clauses that you do have in the current contracts, is that a fair statement?

A Well, we rely on them in the sense that they have some degree of validity. And we believe the union stands behind them, yes, as was exhibited in the last strike.

Q And if the unions, for whatever reason, would fail to stand behind such clauses, what would be LILCO's response?

A I'm sure we would take the appropriate legal

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action.

Q There is no way that LILCO could prevent a walkout by workers if they chose to walk out, is there?

A Well, legally you could obtain injunctions and things of that general nature. But physically, it is a free country. If someone wanted to walk off the job, they could walk off the job and that would be the case anywhere.

Q Dr. Cordaro, in paragraph 6 of your affidavit, going over to page 3, you make a statement:

". . .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."

Do you see that at the top of the page?

A Yes.

Q How do you define credible in the context used here?

A Credible in the sense of trying to put together a sequence of events that has the remotest possibility of occurring, that could lead to a core melt situation, or a degraded core situation.

And I think you have a basis of comparison for developing and understanding this type of event by looking at the probabilistic risk assessment type studies and the kind of events that they look at as being credible, and the

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kinds of quantitative measures they give to those events.

Q Under that definition, Dr. Cordaro, do you consider any of the accident sequences which we have spent some period of time discussing in these hearings, which require the activation of an offsite emergency response force to be credible?

A Not in the sense as credible has been used in a historical sense.

If you go back and look at a nuclear plant licensing, before there was such a thing as a Class 9 accident, you had to address the maximum credible accident which was the standard loss of coolant accident. In that context, credible took on a certain meaning.

And then things went a little bit further, and we have gotten into the discussion of Class 9 accidents. And I don't think Class 9 accidents are usually classified in the same sense as the LOCA was, as the maximum credible accident.

So in that sense, you know, I wouldn't call them credible in quotes. Just to use the word as a word and not tie it to some historical significance, you could say they are credible and qualify that with a particular probabilistic number which establishes the degree of credibility that the accident has. And that is what has been done in PRAs.

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Q But Dr. Cordaro, even though you don't consider such accidents to be credible under your definition, LILCO still has to plan for such accidents,and that is what has led to the formation and the concept of LERO, correct?

A Well, yes, in a sense there has been a whole series of requirements developed for this so-called Class 9 type of accident. And we have had to respond to the legal requirements which have been developed as such.

Q Dr. Cordaro, looking at the end of that paragraph 6, you are talking about fuel handling and other operations which are mentioned in the proposed license condition. And you say that:

". . .they 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."

Do you see that statement?

A Yes, I do.

Q I'm just curious, what is sufficient time, in your opinion? How much time would have to pass following the attainment of cold shutdown to allow these activities?

A As far as the exact time, I would defer to someone else in the panel to give that assessment.

A (Witness Stergakos) Sufficient time depends very

mm9

much on the core history, and that would determine it.

Q So, Mr. Stergakos, you are unable to give me an absolute number in terms of the time that would have to elapse?

A At this time we can conjecture. If we assume equilibrium, we can give you approximate time. But, to give you a time that we have at that particular moment, no, because one has to follow the core history.

Q Is it fair to say, Mr.Stergakos, that LILCO would have to use engineering judgment --

A No.

Q I haven't finished my question.

-- at the time that it decides to pursue fuel handling or other operations following the attainment of cold shutdown?

A The answer is still no. We use mathematical and engineering practices to determine that.

Q And once LILCO has made its determination using mathematical practices, LILCO under the proposed license condition would go to the Staff and seek permission to do such things as fuel handling?

A I will let Dr. Cordaro answer it.

A (Witness Cordaro) Yes.

Q Mr. Stergakos and Mr. Rigert, if you would please look at your affidavit, or affidavits. On the second page of the affidavit -- the second sentence states that:

mm10

"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 could result in radiological consequences in excess of the EPA's PAG limits."

Do you see that?

A (Witness Stergakos) Yes.

A (Witness Rigert) Yes.

Q Is it fair to say, gentlemen that you are saying in that sentence, there could not be any radiological consequences in excess of the PAG limits so long as you waited any time more than 24 hours after the initiation to cold shutdown?

A (Witness Stergakos) Any more if we exceed the 24 hours, of course the consequences would become less and less.

Q So whether it would be 25 hours or 96 hours would really make no difference, is that correct?

A No, I didn't say that.

What I am saying, the source terms will be reducing because they will be decaying. So, as you go down in time the available radioactive isotopes to be released, will be

mm11

becoming sm aller and smaller.

Q Well, let me make sure I understand.

The way I read this sentence you are saying that 24 hours after initiation of the descent to cold shutdown, you could not have a postulated event that would result in consequences offsite that would exceed the PAG Limits, correct?

A Yes.

Q And that conclusion on your part does not change in any respect whether the time is more or less than the 24 hours?

A No, that's correct.

Q And when you say after initiation of the descent to cold shutdown from full power, are you saying from the time the process begins to shut down, or are you saying from the time the cold shutdown stage is actually attained?

A From the time you initiate, from the time the control rods are inserted.

end T5

Sim 6-1

Q Gentlemen, your analysis of possible accident scenarios which are discussed in your affidavit were limited to Chapter 15 events; is that correct?

A (Witness Rigert) We used the Chapter 15 events as the basis for the evaluation.

Q And when you looked at the Chapter 15 events, you accepted all the assumptions associated with Chapter 15, correct?

A (Witness Stergakos) Yes, radiologically, yes.

Q Did you make an assumptions of possible failures beyond those described in Chapter 15?

A (Witness Rigert) That was considered. As you go through the events you find that there are very few events that are really even relevant at cold shutdown, and in those events consideration was given to the possibility of those becoming degraded events. In that sense we did beyond the classic assumptions of Chapter 15.

Q Mr. Rigert, in the analysis that you performed, did you make any assumptions of possible failures beyond Chapter 15?

A We did in the sense of doing let's say a scoping estimate of the time that would be available in the event of a loss of reactor coolant and the heat up, although we feel that the event itself isn't really credible under the circumstances of cold shutdown.

Sim 6-2

We took the approach of saying that we wanted to scope out what that time would be. We found that as opposed to at full-power conditions where things are happening in a matter of seconds, that the core must be reflooded within a minute or less and that at cold shutdown there is something on the order of a hundred minutes available even in the worst cases which are really not credible cases. They require making assumptions that we feel in themselves are not credible, high-pressure piping breaking even though it is at cold depressurized conditions and things of that sort.

So we went to the effort of making these assessments or scoping calculations to get a handle on what it would look like.

Q Mr. Rigert, the scoping estimate that you have just referred to, do you consider that an analysis?

A I would call that an analysis. It is not a design calculation. It is a scoping analysis. It is a hand calculation. It has assumptions in it that I think are by and large quite conservative. Some of them are unreasonably conservative and we use that only to form a judgment. We didn't just use a gut feel.

Q The scoping estimate that you are talking about, Mr. Rigert, that was the estimate regarding the Class 9 accidents; is that correct?

Sim 6-3

A I would call that a Class 9 accident, yes.

Q You did not analyze Class 9 accidents, though, did you?

A I would say that is a Class 9 accident.

Q The scoping estimate that you have mentioned, is that the extent of any analysis you have performed of Class 9 accidents?

A That is the worst case Class 9 accident that we could reasonably think so.

Q Is that the extent of the Class 9 analysis that you performed?

A Yes, that is the extent of any mathematical analysis. The rest of our assessment was using the 38 Chapter 15 events and engineering judgments.

A (Witness Cordaro) That is under cold shutdown of course.

A (Witness Rigert) Yes, this is all in the context of cold shutdown.

Q Dr. Stergakos, in the Class 9 estimate that Mr. Rigert and you have referred to, did LILCO look at the SAI/PRA for Shoreham?

A (Witness Stergakos) The PRA for Shoreham? No, we did not look at the PRA to draw any conclusions.

A (Witness Rigert) I am familar with the PRA and used it only in a judgmental sense. I didn't go to it and

Sim 6-4

I didn't open it up and review it. But knowing the Shoreham PRA and other PRAs in the industry and the practices, we know what is considered credible and not credible.

We have also used as a basis in judgment things like the standard review plan, which doesn't require postulating piping ruptures in non-pressurized piping systems. By a combination of these supporting documents or general background documents, that is the type of material that went into these engineering judgments we are referring to.

Q Now you did not look at accidents which could occur during the transition from full-power operation to cold shutdown, correct?

A No, because we are not trying to claim that that is not possible.

Q Let me ask you, Mr. Rigert, could Chapter 15 events result in offsite consequences which would exceed the PAG limits even at full power?

A There are a few. I will let Dr. Stergakos explain.

A (Witness Stergakos) That is correct.

Q Which ones could exceed the PAG limits at full-power operation?

A Well, the ones that I can enumerate right now is the LOCA, the steamline break, fuel handling accident, control rod drop and then the tube failure for the instrument line. That is what I call the tube failure, the instrument

Sim 6-5

line failure.

Q Mr. Stergakos, let me make sure I got those. The LOCA, the fuel handling ---

A (Witness Stergakos) Control rod drop.

Q Control rod drop and the instrument line failure?

A Yes.

Q Those are the four events you can think of?

A No, I mentioned five I believe, the steamline break, LOCA, fuel handling and control rod drop.

Q Now if you were operating a full power, Mr. Stergakos, and ---

A Excuse me. Let me clarify something there. No, I am sorry. Go ahead.

Q If you were operating a full power, at the time that you decided to take the plant to cold shutdown because of, for example, a strike, I take it then that at various of the stages from full power to cold shutdown these same five events could result in offsite consequences which would exceed the PAG limits, correct?

A Yes, that is right. The fuel handling accident, for example, that will not be, because it is not during full power.

Q But the steamline break, the LOCA, the control rod drop and the instrument line failure, those sorts of events could lead to offsite consequences exceed the PAG

Sim 6-6

limits, correct?

A As far as the control rod drop, I will let Mr. Scalici or Mr. Rigert explain where the various possible consequences will occur at those stages, but the others, yes.

A (Witness Rigert) Well, I believe that theoretically the control rod drop would be possible. Normally it is assumed that that is occurring while you are withdrawing rods, that you withdraw a mechanism and the rod doesn't come out with it and then falls of its own accord after that. But there could have been a stuck rod and it could coincidentally have fallen during the power discention. So I don't think we would argue that it is impossible.

Q Dr. Cordaro, let me ask you. Do you believe that Chapter 15 provides the techincal basis upon which emergency planning should be based?

A (Witness Cordaro) Well, my own personal views that I have held, yes. I think it is a firmer base for emergency planning than considering the Class 9 accidents that we consider and which the regulations and guidelines address today, and that is premised on my knowledge of the latest source term issue and a number of other things.

However, the regulations require you to plan on an emergency basis for the Class 9 event as was addressed in NUREG 0396 which established the 10-mile emergency planning zone.

Sim 6-7

Q And, Dr. Cordaro, NUREG 0396 and NUREG 0654, the basis for those NRC guidelines are provided by Class 9 events and not Chapter 15 events; isn't that correct?

A Yes, except one of the requirements of 0396 addresses the classic LOCA accident and the fact that the PAGs are not exceeded within the acceptable zone. That was one of the criteria used in 0396.

Q Mr. Rigert, I just want to come back for a moment to you to make sure I understand what you were telling me a minute ago.

The scoping estimate which you referenced in a couple of your answers, that was provided by counsel for LILCO to Suffolk County on August 25th; isn't that correct?

A (Witness Rigert) I believe that is the date, yes.

Q And I want to make sure I understand your testimony. Is it your testimony that this scoping estimate which you have referenced constitutes an analysis of Class 9 events?

A The basis of our position really is the assessment of the initiating events in Chapter 15, and what we are doing is showing that if you -- that there are no events that could be conceived of that don't propagate out of the initiating events defined in Chapter 15.

It would require interpretation, for instance, that there could be a wide variety of LOCAs, et cetera, but

Sim 6-8

once you identify those events in Chapter 15 and then go beyond Chapter 15 with them, they become degraded events which would in effect make them a Class 9 accident.

Now what we did was that as we distilled the Chapter 15 events down to the pertinent ones for cold shutdown, we came up with only a very small number of ones that had any meaning to them. Basically they would be the loss of AC power, the LOCA and the -- I forget the name -- core coolant temperature increase event which is basically a loss of decay heat removal.

Those events are the only ones that could by any stretch of the imagination really lead into this type of degraded core. We then took those events and we determined that if you wanted to concoct a scenario that would put you into a degraded core, probably the best way, if not the fastest way, one of the fastest ways would be to arbitrarily break the drain line at the bottom of the reactor, and we then did this calculation to find out what the amount of time would be.

Now if you didn't mitigate the event, then the event would be a degraded core accident or a Class 9 accident. That is why this single calculation is the only one that we did to assess this thing and to help formulate our judgment that it is not a credible event because there is so much time avaialable. The reactor is in a passive state and by

Sim 6-9

all the, I guess you could say the laws of physics as well as the regulatory requirements there is no basis for postulating the spontaneous failure of one of these pipes.

But given that it did occur, it could be very easily mitigated by any one of many systems that could replace the coolant in the reactor.

Q Mr. Rigert, let me try again and I am going to request that you give me a yes or a no answer because I would like to try to understand this for myself.

My question is very simply, is it your testimony that LILCO performed an analysis of Class 9 accidents in looking at the issues before the Board?

A I wouldn't ---

Q Yes or no, please.

A Well, I wouldn't want to just say yes or no because you used the word analysis, assessment. I would say, yes we did an assessment.

Q I understand that you considered things and I understand that you made judgments about things, but my question is did you conduct an analysis of Class 9 events? That is my question and yes or no, please.

A What is the meaning of the word analysis?

Q What is your meaning of the word analysis?

A Well, I tend to think of analysis a little bit more mathematically.

Sim 6-10

Q Tell me what your definition of analysis is.

A Well, I use the word assessment as opposed to analysis. In other words, assessment would be the combination of the mathematical analysis as well as the mechanistic review of the way the plant is configured and the way the plant is built and the types of failures that could occur. I call that assessment.

One piece of that assessment was this analysis. I am drawing that distinction. I don't want to use the word analysis. If you think of the word analysis as a mathematical calculation so that our analysis of Class 9 accidents is what I am calling our assessment, and it includes this table which has behind it the FSAR and our judgments and interpretations of it, and it has one analytical basis, one piece of analytical work that went into that assessment.

Q In looking at Chapter 15 events, Mr. Rigert, you did more than make such an assessment of Chapter 15 events, didn't you? You did an analysis of Chapter 15 events, correct?

A If you mean by analysis a non-mathematical analysis, we did a lot of that, yes.

Q Did you do that same type of analysis for Class 9 events?

A Well, as I explained, the Class 9 events accidents evolve out of these events, and in that we did, yes.

Sim 6-11

Q Now, Mr. Stergakos, at your deposition you told us that you did not conduct an analysis of Class 9 events. Do you remember that?

A (Witness Stergakos) Yes.

Q Is that still your testimony?

A It is the testimony. However, you did not pose the same questions that Mr. Rigert was posed at, and I agree with Mr. Rigert right now that we didn't, what exactly he stated. An analysis, a mathematical analysis, to the extent beyond what we have done right now, no, we did not do. That is what I was stating.

A (Witness Cordaro) I think we have to recognize that there are several stages of an analysis. At the initial you examine what the problem is and try to set some bounds and try to determine if it worth performing many detailed calculations in a sophisticated type of analysis.

In this case, we looked at the initiating events and we analyze them to a certain point and try to determine whether there was any plausible sequence of events which would occur that could result in a Class 9 accident and whether it was worth to pursue these on a quantitative basis. And the result of this initial phase of the analysis indicated that we didn't see any worth in pursuing it in a mathematical basis and developing numbers that we felt wouldn't provide any additional guidance than we had at the outset of the

Sim 6-12

analysis.

Q And I take it, Dr. Cordaro, for the same reasons you didn't see any need or necessity for looking at transition steps between full-power operation and cold shutdown?

A No, because as Mr. Rigert stated, that wasn't the basis of our commitment. We are talking about a commitment to bring the plant to cold shutdown in the event of a strike.

We concede that of course some of these theoretical Class 9 accidents could occur in the discention in power. That is, you know, a fact we are not going to refute.

end Sim
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Q Let me try one more time. Mr. Stergakos, did you perform any calculations of core heat up time with respect to Class 9 accidents?

A (Witness Stergakos) I personally did not.

Q Did you, Mr. Rigert, perform any calculations of core heat up time with respect to Class 9 accidents, yes or no, please.

A (Witness Rigert) Did I personally?

Q Did you or anyone working under you perform any calculations of core heat up time for Class 9 accidents?

A Yes.

Q And are those the calculations that you have provided to the County on August 25th?

A Yes.

Q Anything other than that?

A No.

Q Mr. Rigert, earlier in response to questions from Mr. Zeugin, you were talking about the credibility, if you will, of the events that should result during operation of the plant.

I just want to make sure I understand. Is it your testimony that you consider Class 9 events to not be credible because in part they would require multiple system failures?

A No, that is not the reason. The reason is that

Class 9, or what I call degraded core events, are not credible during cold shutdown conditions, because of the time available to mitigate them because of the low pressure and temperature, the low heat production rate of the reactor, the small capacity requirements of any mitigation system that would have to operate.

We have many fall back positions, many alternate systems for mitigating the event. And so, what is credible at full power is different from what is credible at cold shutdown.

Q Let me see if I can understand this in the context of your affidavit, Mr. Rigert. If you look at page 3 in that 6th paragraph, you say the remaining three events that are possible at cold shutdown would have offsite radiological consequences below the PAG limits. Do you see that statement?

A Yes.

Q Now, I gather from your testimony that if there were an additional failure of some plant system, that would not change your conclusion that you would not have offsite consequences in excess of the PAG limits? Is that correct?

A That is correct, because you have to understand those three events. They are not the same three events I referred to earlier, which are part of the thirteen events. Those three events are non-reactor accidents, if you look in the table, and they are really in the sense of degraded

core, they are totally irrelevant and harmless, in that sense. They are miscellaneous spills and rad waste tank ruptures, and things of that sort.

Q Well, could any of the 38 events under Chapter 15 -- those are the ones attached to your affidavit, result in offsite consequences in excess of the PAG limits if there were an additional failure not postulated or assumed by Chapter 15?

A Our conclusion is, no. Because as I stated before, the inherent conditions of the reactor, the reactor is at such a low state of heat production, temperature, and pressure, that many of the accidents really are not mechanistic, they are not capable of happening, and the few that are capable of happening are so very much slower progressing than they would normally be that multiple failures would not affect the outcome of the event.

There would still be more than ample time to mitigate the event, as opposed to at full power, where things happen much more quickly.

Q And your conclusion in that regard, Mr. Rigert, was that specifically looked at in the Chapter 15 analysis which you did perform? Or are you telling me now your judgment?

A It was looked at. We used the worse case analysis. The time available, and combined that with judgment,

knowing that many other events are extremely slow acting.

Some of them would never challenge the reactor.

Q Mr. Scalice, will you look at your affidavit, please? Just a few points of clarification, because some of the things we discussed at your deposition do not appear in the affidavit.

On page 2, you have listed the operational conditions?

A (Witness Scalice) That is correct.

Q And the start-up operational mode does not appear in the affidavit, correct?

A That is correct.

Q And then following that, in paragraph 5, you have listed the actions or the steps, I suppose, that are required to bring the plant to cold shutdown, is that correct?

A I listed a summary of them, yes.

Q And I believe you testified at your deposition that with the exception of step little-f, these steps would normally be performed by reactor operators, correct?

A That is correct.

Q And Step f would be performed by reactor operators and the equipment operator?

A In conjunction with a field operator, correct. Or equipment operator, I should call him.

Q Mr. Scalice, on page 4 of your affidavit, you have in consecutive pragraphs 6 and 7, a time estimate for bringing the plant to cold shutdown, using the normal sequence of activities that you describe in paragraph 5, and then the time required if you have to manually scram the reactor. Do you see that?

A Yes, I do.

Q I take it that the normal sequence of activities is much preferable to the manual scramming of the reactor, is that correct?

A It is preferable.

Q And why is that?

A It is preferable because it allows the operator to take a longer period of time to control the core.

Additionally, scramming of the plant is not something that we like to do, basically, because of some possibility of challenge to some of the equipment.

Q Manually scramming the plant, the reactor would place a greater stress on the equipment, correct?

A I can't answer that quantitatively, you know. What it does, it requests the equipment to operate in a different fashion. That is not necessarily desirable, because the speed at which the occurrences result make a requirement on the operator to do things faster. There is no reason to rush.

Q Mr. Scalice, how many licensed operators are there at Shoreham? Is it 20?

A No, sir. There are presently 38 licensed reactor operators at Shoreham.

Q And how many of those are union members?

A Presently 18.

Q Okay. So, 20 licensed operators presently at Shoreham that are not union members, correct?

A That is correct. I indicate that in response to the discovery. EP-78.

Q Yes, sir. Now, during power operation, Mr. Scalice, three management staff members are required to be on site at all times, is that correct?

A That is correct. That does not include the security management personnel, as I discussed with you previously.

Q The three management personnel that would be required to be on site are the watch engineer, the watch supervisor, and the shift technical advisor, correct?

A That is right.

Q And of these three persons, only two are licensed, is that correct?

A At the present time, only two of them are licensed; senior reactor operator licensed.

Q And these persons are not required to be in the

control room at all times, just on site, correct?

A One of them is required to be in the control room. There is always a requirement for one reactor operator to be in the control room when fuel is in the reactor vessel.

Q And we have talked already about the approximate total staffing at the Shoreham plant.

It is fair to say, isn't it, that during the minimum shift time, and that would be the midnight to eight a.m., shift, there would be as few as -- well, there would be ten personnel on site, excluding security force, correct?

A That is generally correct. I would state to you that eight of those positions are required by technical specifications. The specifications is what we were addressing that number to be. There is security management personnel on site, and there is an HP technician, which is required by the technical specifications.

Q And of those ten persons that would be on site during the midnight shift, seven of those are members of the union, is that correct?

A That is correct.

Q Mr. Scalice, looking at your paragraph 9 of the affidavit, you are presenting some of your observations about the union members and how, in your opinion, they are mature and dedicated individuals and so forth.

I guess it goes without saying, Mr. Scalice, you

are presenting in that paragraph 9 your opinion about the people that work under you, correct?

A Well, those people work under me, and in conversation with them, and I have worked with them for many years, these personnel are reliable. They are mature individuals, as I stated.

Not only that, but even prior to coming to this hearing I had discussed the fact that I was going to come to this hearing with one of the representatives of the union, who happens to be a shop steward in the operating chain, which is under my jurisdiction, yes.

And he was -- he actually took umbrage to the fact that we would be addressing this issue here, because he was concerned that most people wouldn't recognize the fact that these people are professionals, and that they take pride in their job, and that, in fact, they are licensed under the Federal regulations, and that they are aware of those Federal regualtions, and they know that - what the requirements are, and they wouldn't take an action without providing either a shift turnover that would endanger anybody or the health and safety of the public.

Q I want to ask you about that. Towards the end of that paragraph 9, you refer to the provisions of 10 CFR, Part 55, and you say that those provisions govern the licenses and outlying possible causes for revocation, including,

quote, any conduct determined by the Commission to be a hazard to safe operation of the facility.

Do you see that?

A Yes, I do.

Q Now, are you implying there that licensed operators who are union members and who would go out on strike would be subject to having their licenses revoked?

A No, I am not implying that. What I am implying, however, is that they would do so in an orderly fashion, which includes the normal shift turnover, as I indicated in the previous statement.

In fact, during the strike that we just went through, I did state in my affidavit that they performed adequately. As a matter of fact, they performed more than adequately in their shift turnover. As I stated, they changed chart paper, put out new logs, and even cleaned the control room. These people are aware of their responsibility for operating a nuclear reactor.

Q These are the steps that you have described in paragraph 10 of your affidavit, correct, that you are just now mentioning?

A That is right.

Q Now, I take it that you were present at the time the operating crew performed these tasks?

A That is correct. I was on the site.

Q Were you present at the time and where these operating crew were performing these tasks, which you discuss in your affidavit?

A I am aware that they performed those tasks.

Q Well, did you observe them?

A No, I was not in the control room, but after I went into the control room, I actually observed the fact that the control room was in a good fashion. I talked to my watch supervisors, and discussed -- and watch engineers -- and discussed the turnover, and that they classified it as a class turnover.

Q Well, were only union members on duty in the control room at the time?

A No, sir.

Q Were the union members that were on duty instructed to perform these tasks by their supervisors?

A No, they were not.

Q And you determined that by conversations with other people?

A Normal turnover processes in the control room for shift turnover, there are procedures that control and govern how a shift is turned over, and they always respond to that requirement admirably.

Many of these people, or some of these people, anyway, have performed functions in the United States Navy

as submarine watch person, and they recognize the consequences of not performing a normal shift turnover.

Q So, it is your understanding -- just to make sure I understand this paragraph 10, Mr. Scalice, that the task, the things that these -- that were done prior to the last strike, they were carried out by union employees, correct?

A That is correct.

Q And it was the union employees, it wasn't somebody else at LILCO that cleaned the control room and put the paper in the machines and things of that sort?

A That is correct.

Q And you reached that conclusion through discussions with whom?

A Discussions with the supervisory people on shift.

Q Were those people in the control room at the time?

A Yes, they were. And the management people that accepted the turnover.

Q And what conclusions do you draw from all this?

A I draw the conclusion that these people are professionals. That they would, on turnover to the management people in the future, should it occur, that they would repeat the same conduct, and that they are dedicated individuals that would not frivolously walk out of a control room without providing proper relief.

Q Well, let me ask you, Mr. Scalice, what conclusions would you have drawn if they wouldn't have done these things?

A I don't believe that that would ever occur. These people are, as I said, professionals. In the years that I have worked with them, and at other facilities that I have worked with operators, they have continuously performed this way.

Q Yes, sir. But assume with me that -- let me see. Let's assume that they didn't place new chart paper in the recorders, and that they didn't prepare the operator log sheets, and that they didn't clean the control room facilities.

Now, I am asking you, what conclusions would you draw if that would have been the case?

A We would have had a dirty control room. We would have to change the chart paper, and we would have just brought out new logs.

Q But what conclusions would you have drawn, if any, about the personnel?

A I would have not drawn anything significant, because in many cases the chart paper could last for days without being changed, and in that event, we would change it ourselves.

Q Mr. Scalice, one of the aspects of the Shoreham

work force which I don't believe we talked about in your deposition, is the fire brigate. Now, you have to have five members assigned to the fire brigade at the plant, is that correct?

A That is correct. That is indicated under the technical specifications that were introduced as EP-77.

End 7.
Sue fols.

#8-1-SueT

Q Am I correct, Mr. Scalice, that the operators cannot be part of that fire brigade?

A (Witness Scalice) No, that's not correct. Operators can be part of the fire brigade.

Q The operators on duty, can they be part of the fire brigade?

A Yes, they can. If you refer to Unit Staff 6.2.2(e).

Q Mr. Stergakos, at your deposition, it was the -- well, excuse me.

(Mr. Miller and Mr. Minor are conferring.)

BY MR. MILLER: (Continuing)

Q Let me start again, Mr. Stergakos. At your deposition, we learned about a conversation you had had with Mr. Hodges of the NRC Staff about a week ago; is that correct?

A (Witness Stergakos) Yes.

Q And let me make sure my memory is correct. Mr. Hodges telephoned you; is that right?

A Yes, he had telephoned us. Not me personally, our licensing people.

Q You personally talked with Mr. Hodges, though; is that correct?

A I did.

Q Now, can you tell us why Mr. Hodges telephoned?

A As I stated in my deposition, he asked us why

#8-2-SueT

we did not include Class 9 accidents in our affidavit.

Q And your response was what?

A As we stated this morning, explained why we did not include those Class 9 accidents in our affidavit with similar statements.

Q Well, I would like to know what, to the best of your recollection, you told Mr. Hodges? What you told Mr. Hodges.

A Yes. That the Class 9 accidents are not credible, because of the time required to respond to any such type of accident is long enough with the propagating event. The propagating forces do not exist at the conditions which we are considering presently; that is, cold shutdown and if those forces which I had in mind were the heat rate generation temperature and pressure, and as they were stated previously, pressure at full power is 950 PSAI, cold shutdown is zero gauge, temperature is 540 at hot -- full power, temperature at cold shutdown is equal or less 200 degrees heat generation,at a hundred percent power at the stage which we are it point five percent.

So, we explain all that and those were our reasons.

Q Now, Mr. Stergakos, was Mr. Hodges talking about why LILCO did not consider Class 9 accidents, for example, at full power level before the descent to cold shutdown

#8-3-SueT

began?

A No.

Q At what stage was he asking about Class 9 accidents, at cold shutdown?

A Yes.

Q And after you explained to Mr. Hodges why you had not done such an analysis, because you said that in your opinion the accidents postulated would not be credible --

A Right.

Q -- was Mr. Hodges satisfied?

A I don't know. He did not express an opinion. I mean, I couldn't see his facial expression, et cetera, so.

Q Did Mr. Hodges respond in any way once you told him why you had not looked at the Class 9 accidents?

A If I remember correctly, he didn't raise any questions or concerns that we had missed something.

Q Had you ever talked with Mr. Hodges prior to about a week ago?

A Pertaining to this subject matter?

Q Pertaining to anything? Have you ever met Mr. Hodges?

A I think I saw Mr. Hodges back in March when LILCO had gone down to ask them for the five percent power thing. I had no conversation with him. I think in that

#8-4-SueT

subject matter I was in a conference call which occurred, I don't know, at that time period somewhere. But at no other time had I spoken to Mr. Hodges that I can remember.

Q It's clear, though, that Mr. Hodges was calling you --

A No. I said --

Q -- specifically about these affidavits, the LILCO affidavits; is that correct?

A He did not call me personally. He called our licensing people and, then, since he was referring to the -- my affidavit and Mr. Rigert's, then, I returned his call.

Q What, if anything, did LILCO do, Mr. Stegakos, in response to the phone conversation you had with Mr. Hodges of the NRC Staff?

A Could you be more explicit to that, please?

Q Well, did you do anything after you talked with Mr. Hodges? Did that lead you to perform some other action, or did you just simply hang up the telephone and go back about your business?

A No. We continued -- as I had stated in my deposition, we were looking at the Class 9 accidents and this, of course, stimulated us to continue with our investigation.

Q Well, what you told us at your deposition is that prior to the telephone conversation with Mr. Hodges,

#8-5-SueT

LILCO had been considering --

A Yes.

Q -- Class 9 accidents, correct?

A Correct.

Q You had not been performing any analysis of Class 9 accidents, had you?

A As I stated in my deposition --

MR. ZEUGIN: Judge Laurenson, I am going to object to that question.

If there are specific statements in the deposition that Mr. Miller would like to explore, I suggest there is a far better way of doing it than having Mr. Miller characterize what was said in the deposition without the actual words of what was asked and answered in the deposition.

JUDGE LAURENSON: I think maybe the way to resolve this question is just to eliminate the reference to the deposition from the question.

But if you are going to attempt to lay a foundation to impeach a witness from the deposition testimony, of course, there is a proper way to do that.

MR. MILLER: Yes, sir, I will remove the words. And I'm not trying to impeach Mr. Stergakos. I'm just trying to get a clear understanding as to the sequence of the actions.

#8-6-SueT1

BY MR. MILLER: (Continuing)

Q Mr. Stergakos, I hope you understand that.

Let me back up. Prior to your phone conversation with Mr. Hodges, you say there were discussions within LILCO about Class 9 accidents?

A Correct.

Q But, had LILCO, anyone within LILCO, to your knowledge, actually analyzed any of these Class 9 accidents?

A Not to my knowledge. I did not know whether they had started putting numbers down or doing any calculations. To my knowledge, no. But I cannot swear to that.

Q And it was after your telephone conversation with Mr. Hodges that LILCO put together the scoping estimates regarding Class 9 accidents that Mr. Rigert has referred to, correct?

A It was after the phone conversation that I had seen any results. That does not necessarily mean that it did not exist. I do not know that to be the fact, okay.

It was after the conversation that I had seen the papers and we discussed the results, the mathematical results.

Q Mr. Stergakos, did you discuss with anyone within LILCO your conversation with Mr. Hodges?

A It was not necessary. It was -- there were people -- it was a conference call.

#8-7-SueT

Q Who else from LILCO was with you on the conference call?

A Mr. Paccione, Mr. John Valente, Mr. Grunseich, are the persons that I do remember right now.

Q And other than the members of that group, you did not discuss with anyone else within LILCO the substance of your conversation with Mr. Hodges?

A That's not correct. We discussed it afterwards, but what I meant before was that the people who were responsible in performing all of -- doing what they were doing in evaluating the Class 9 accidents were present. So, from that aspect I did not discuss it with any other people, but within management, yes, I did discuss it.

Q Okay. Let me make sure I understand. You discussed it among the group that was on the conference call.

A Yes.

Q Did you discuss it with anyone other than the LILCO individuals that were on the conference call with you?

A Yes. I discussed it with my supervisor.

Q And who is that?

A Mr. Tunney. He was acting as my supervisor, because Mr. Youngling was out on vacation at that time.

Q And what did Mr. Tunney tell you once you had

#8-8-SueT1

told him about your conversation with Mr. Hodges?

A Well, he didn't respond that much because it was him individually originally who had thought about Class 9 events, and we proceeded as we had, not agreed upon, but we were doing our job. And that's all after that.

Q Do you know, Mr. Stergakos, if Mr. Tunney reported the conversation to anybody above him?

A I cannot say that.

Q And do you know if the scoping estimates that Mr. Rigert referred to earlier, the ones that were provided to Suffolk County on August 25th, have they been provided to the NRC Staff?

A As far as I know, yes. But to all parties involved, I believe.

Let me add one thing. When I discussed with Mr. Tunney the situation, at present there were Mr. Valente and Mr. Paccione at that particular conversation.

Q Mr. Stergakos, going back to the conference call itself with Mr. Hodges, is it fair to say that Mr. Hodges expressed some dissatisfaction with LILCO's failure to have analyzed the Class 9 accidents?

A I cannot say that. Surely, for him calling us, he must have a reason for calling us, otherwise he would not have called us.

Q And could you tell me the substance of the

#8-9-SueT1

conversations that you had with the other LILCO members following the telephone call with Mr. Hodges?

A The substance of the conversation was that we will proceed as we were doing, discussing and looking at Chapter 9 and see what conclusions we draw.

Q And you decided at that point to put in writing --

A No, I will not say that, because I do not know when the -- I was not the leader of the group that did the calculations, and I will not say that it was at that moment that they started putting numbers down. I do not know. I did not -- I stated that before.

Q Okay. You do not know when it was decided to put in writing any aspects of a Class 9 analysis, correct?

A That's true, but we stated at that meeting we would proceed and finish what we were doing.

MR. MILLER: Judge Laurenson, this would be a good time for the lunch break, I would think.

JUDGE LAURENSON: All right. We will take our luncheon recess now. And we will reconvene here at 2 o'clock.

(Whereupon, the hearing is recessed at 12:23 p.m., to reconvene at 2:03 p.m., this same date.)

#8-10-SueT

A F T E R N O O N P R O C E E D I N G S

(2:03 p.m.)

JUDGE LAURENSON: The hearing is back in session. Any further questions, Mr. Miller?

MR. MILLER: Yes, Judge Laurenson. Before we start, I would like to ask some questions about the document which has been left in front of the witnesses and with the Board. I can't remember the exhibit number for the County.

JUDGE LAURENSON: This will be Suffolk County Exhibit EP-94.

MR. MILLER: Thank you.

(The document referred to is marked Suffolk County Exhibit EP-94 for identification.)

INDEXXXX

MR. MILLER: This was the document we referred to, Judge Laurenson, that was produced under a cover letter dated August 25th that was received by the County yesterday.

#8-11-SueT1

Whereupon,

MATTHEW C. CORDARO,

ELIAS P. STERGAKOS,

JOHN A. RIGERT,

-and-

JOHN A. SCALICE

resumed the stand as witnesses by and on behalf of the Long Island Lighting Company and, having previously been duly sworn, were further examined and testified as follows:

CROSS EXAMINATION

BY MR. MILLER:

Q Mr. Rigert, let me ask you, the document that has been marked as SC Exhibit 94, which consists of fourteen handwritten pages, is this the scoping estimate regarding Class 9 accidents that you have referred to earlier today during your testimony?

A (Witness Rigert) Yes, it is.

Q Was it prepared by you?

A By people who report to me.

Q Reviewed by you?

A It has -- I have reviewed it. It was done while I was away last week. I was on vacation.

Q Mr. Stergakos, did you have anything to do with this document?

A (Witness Stergakos) No, I have not. I didn't

#8-12-SueT1

have anything to do with this as far as preparing it or reviewing it.

Q You have not reviewed this document?

A Not from the technical point of view, no. It's not my responsibility.

Q Has anyone on the panel other than Mr. Rigert reviewed SC EP-94?

A (Witness Scalice) No, I have not.

Q Dr. Cordaro, have you?

A (Witness Cordaro) No.

MR. MILLER: Judge Laurenson, just to make the record clear, because we have had references this morning to LILCO's scoping estimates regarding Class 9 accidents, I would like to offer SC EP-94 into evidence.

JUDGE LAURENSON: Is there any objection?

MR. ZEUGIN: No objection.

MR. ZAHNLEUTER: No objection.

MR. HASSELL: No objection.

JUDGE LAURENSON: Suffolk County Exhibit EP-94 will, then, be received in evidence. And if you will supply copies, it will be bound in the transcript following this page.

MR. MILLER: Thank you.

#8-13-SueT

INDEXXX

(The document previously marked Suffolk County Exhibit EP-94 for identification is admitted in evidence.)

(Suffolk County Exhibit EP-94 follows.)

determine the amount of time, after core is uncovered, that it takes fuel to reach 1600°F, given that the unit was initially at cold shutdown. [Assume accident occurs 24 hours after cold shutdown is initiated]

- We want to determine the rate of heat dissipation from the fuel, we need to determine the average heat transfer coefficient $\bar{h}_c$ using the equation

$$\bar{h}_c = \frac{k}{L}(0.13)(Gr_L Pr)^{1/3}$$

where k = thermal conductivity of air at 700°F = 0.030 Btu/hr ft °F

L = length of fuel rods = 150"

Gr = Grashof number

Pr = Prandtl number = 0.705

ρ = density

g = gravity

$\beta = 1/R$ where R = resistance

T_c = temperature of cladding (1600°F)

T_A = " " air = 900°F

μ = viscosity

where

$$Gr = \frac{\rho^2 g \beta (T_c - T_A) L^3}{\mu^2}$$

If we assume the air heats up from an initial temperature of 200°F to 1600°F then the average air temperature will be $\frac{1600-200}{2} + 200 = 900°F$.

$$Gr = \frac{36 \times 10^3}{°F\ ft^3}(100°F)\left(\frac{150}{12}\right)^3 ft^3$$

$$Gr = 7.03 \times 10^9 \longrightarrow (Gr\,Pr)^{1/3} = 1705$$

then

$$\bar{h}_c = \frac{0.0303 \frac{Btu}{hr\,ft\,°F}(0.13)(1705)}{(150/12)\,ft}$$

$$\boxed{\bar{h}_c = 0.54\ Btu/hr\,ft^2\,°F}$$

152
-208
14'4"

6'4

8.48 x 10^11

...xt we need the heat dissipation due to radiation; $\dot{q}_r$
using the equation

$$\dot{q}_r = \sigma A_{RPV} \epsilon (T_1^4 - T_2^4)$$

where σ = Stephan Boltzmann constant = 0.171×10^{-8} Btu/hr-ft^4 R^4

$A_{RPV} = 2\pi r h$

A = surface area of RPV

r = Radius of RPV = 109"

h = height of fuel = 150"

$A_{RPV} = 713$ ft^2

ε = Emissivity assume 0.1

T1 = temperature of cladding in °R

T2 = " " air in °R

$$\dot{q}_r = 0.171 \times 10^{-8} \frac{Btu}{hr\,ft^2\,R^4} (713\,ft^2)(0.1)(1460^4 - 1360^4)$$

$$\dot{q}_r = 1.37 \times 10^5 \frac{Btu}{hr}$$

... the heat dissipated due to convection is

$$\dot{q}_c = h_c A_F (T_C - T_A)$$

where A_F = total core heat transfer area = 54,879 ft^2

$$= \left(0.54 \frac{Btu}{hr\,ft^2\,°F}\right)(54,879\,ft^2)(100°F)$$

$$\dot{q}_c = 2.96 \times 10^6 \frac{Btu}{hr}$$

∴ the total heat dissipation rate is:

$$\dot{q}_T = \dot{q}_c + \dot{q}_r = (2.96 \times 10^6 + 0.14 \times 10^6) \frac{Btu}{hr}$$

$$\dot{q}_{T} = 3.1 \times 10^6 \text{ Btu/hr.}$$

... twenty four hours, the heat generation rate of the core is:

$$\dot{q}_{24} = 0.0052 \times 2436\,MW \times 3.413 \times 10^6 \frac{Btu/hr}{MW} = 43.2 \times 10^6 \text{ Btu/hr.}$$

So only. $\frac{3.1\times10^6}{43.2\times10^6} \times 100 = 7.2\%$ of the heat generated is dissipated and 92.8% is absorbed by the fuel.

so $Q_{abs} = 43.2\times10^6 - 3.1\times10^6 = 40.1\times10^6$ Btu/hr

Given the above Q_{abs}, we can now determine the amount of time it will take for the fuel to reach 1600°F from an initial temperature of 200°F.

$Q_{abs} = mC_p \frac{\Delta T}{\Delta t}$ where m = mass of fuel = 2.56×10^5 lbs

$C_p = 0.08$ (Btu/lb°F)

$\Delta T = 1600°F - 200°F = 1400°F$

$$\Delta t = \frac{(2.56\times10^5 \text{ lbs})(0.08 \frac{\text{Btu}}{\text{lb°F}})(1400°F)}{40.1\times10^6 \text{ Btu/hr}}$$

$\Delta t = 0.715$ hr = 43 minutes for $\Delta T = 100°F$ ✓

If we assume $T_c = 1600°F$ and $T_s = 600°F$

then

$$\frac{\rho^2 g \beta}{\mu^2} = \frac{0.106\times10^6}{°F\ ft^3}$$

$Gr = 2.07\times10^{11}$ $k = 0.0250 \frac{\text{Btu}}{\text{hr ft °F}}$

$Pr = 0.685$

$(Gr\ Pr)^{1/3} = 5215$

$h_c = 1.36$ Btu/hr ft² °F

$\dot{q}_r = 2.04 \times 10^6$ Btu/hr

$\dot{q}_c = (1.36)(54)(1000)$

$\dot{q}_c = 74.6 \times 10^6$ Btu/hr

$\dot{q}_T = 76.6 \times 10^6$ Btu/hr > $\dot{q}_{gen.}$ for $\Delta T = 1000°F$

$P = \frac{0.106 \times 10^{-}}{°F}$

$= 1.04 \times 10^{11}$

$= 4145$

$= 1.02$ Btu/hr-ft-°F

$\dot{q}_r = \sigma A \epsilon (T_1^4 - T_2^4)$ $T_1 = 1500°R$

$\dot{q}_r = 5.3 \times 10^5$ Btu/hr $T_2 = 1120°R$

$\dot{q}_c =$

$\dot{q}_c = 29.6 \times 10^6$ Btu/hr

$\dot{q}_T = 30.1 \times 10^6$ Btu/hr

$=$ %

$\dot{q}_{gen} = 42.3 - 30.1 = 12.2 \times 10^6$ Btu/hr $= 12.2 \times 10^6$ Btu/hr

12.2×10^6 Btu/hr $= 2.56 \times 10^5$ lbs (0.08 Btu/lb-°F)

$\Delta t = 2.35$ hrs $= 141$ minutes Δt ($\epsilon = 0.7$) - For $\Delta T = 500°F$

If we assume $T_c = 900°F$ and $T_A = 875°F$

then $\frac{\rho^2 g \beta}{\mu^2} = \frac{39.5 \times 10^3}{ft^3 °F}$

$Gr = 1.93 \times 10^9 \qquad k = 0.0290$

$Pr = 0.703$

$(Gr\ Pr)^{1/3} = 1107$

$h_c = 0.334$ Btu/hr ft² °F

$\dot{q}_r = 3.6 \times 10^5$

$\dot{q}_c = 4.6 \times 10^5$ Btu/ft²

$\dot{q}_{Absorbed} = 42.3 - .46) \times 10^6$ Btu/ft² = 41.84×10^6 Btu/ft².

$41.84 \times 10^6 = \frac{m C_p \Delta T}{\Delta t} = (2.56 \times 10^4$ lbs$)(0.02 \frac{Btu}{lb °F})(1600 - 200)$,

$\Delta t = 0.685$ hr = 41.1 min

End of Cycle 1 hot fuel → R_im ≈ 5% release

270 psia at ≈ 1000°F

avg gap T-p

PV = nRT

P ∝ T

say at 2000°F

P = 540 psia

$$\sigma_\theta = \frac{\Delta p\, r}{t}$$

$$\sigma_\theta = \frac{\Delta p\,(.2244")}{(.032")}$$

$$\sigma_\theta = \frac{(540)(.2244)}{.032} = 3787 = 3.787\ \text{kpsi}$$

$T_{Burst} \approx 850°C = 1562°F$

$\Delta T = 215°C$

$= 430°F$

$\frac{\Delta T}{2} = 215°F$

clad temp $T_c \approx 700°F$

270 psia at ≈ 915°F

... at 1600°F

... $\frac{1600}{915}$ ...

P_x = 470 psia

σ_θ = 3.3 Kpsia

$T_{BURST} \approx$ 870°C $\approx$ 1600°F

WREM & BURST TEMPERATURE CURVES

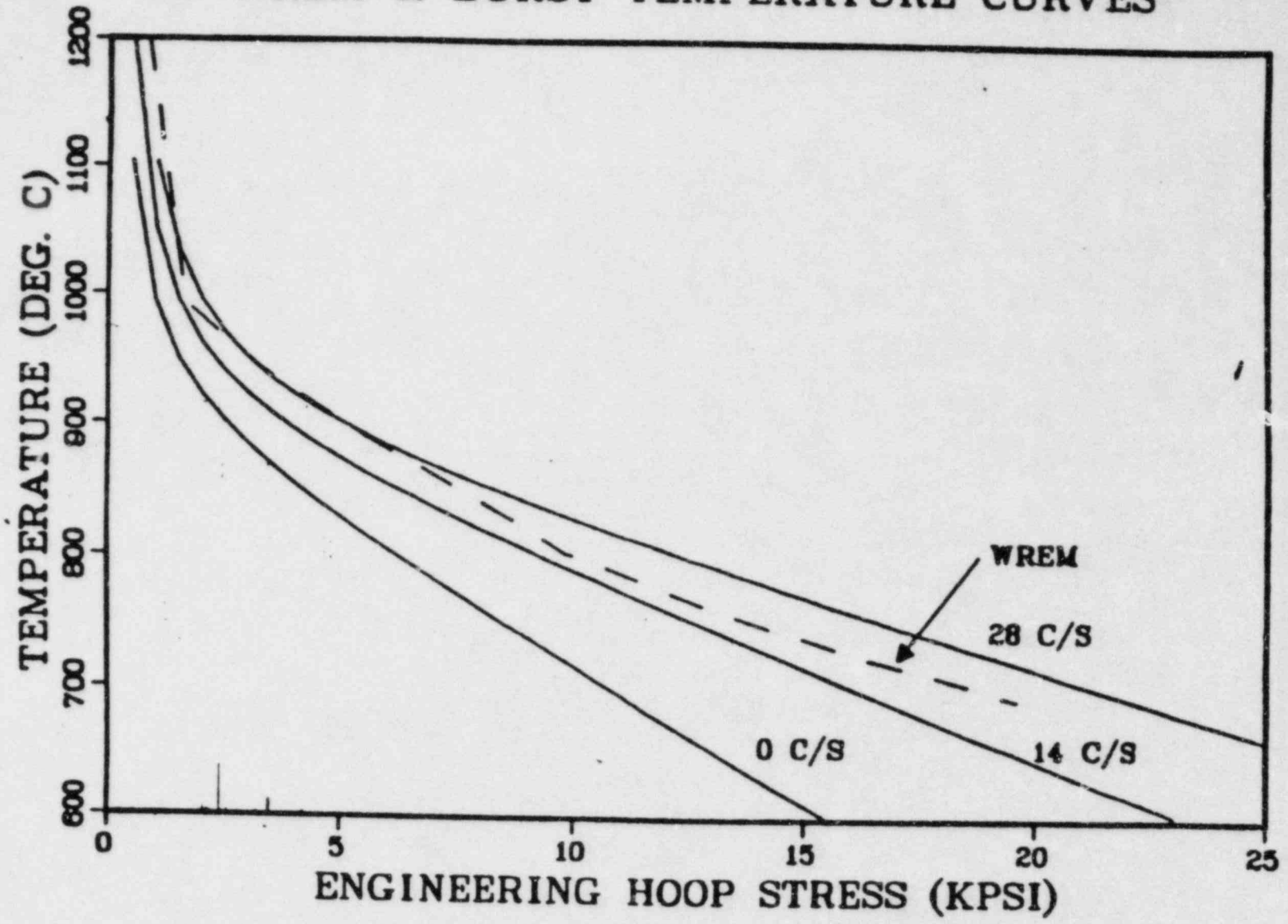


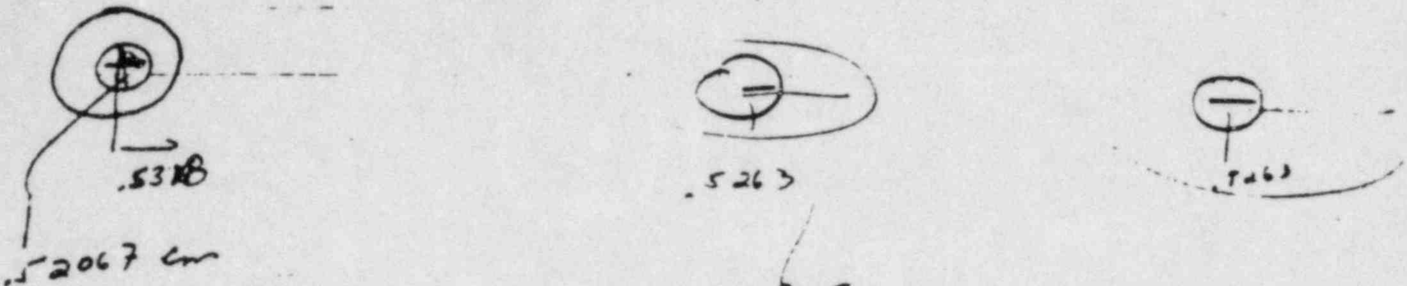
FIGURE 16

Effect of free Volume Expansion due to CLAD Temperature increase to 1600°F

Area 6 4

P_1 P_2 P_3

Cold ~~Hot~~ H.T



$T = 295.4 T$
$+ 27.4$
$322.89°C$

613

1600°F

$\alpha = 3.0 \times 10^{-6} \frac{in/in}{°F}$

for 1000°F increase $\alpha = 3.5 \times 10^{-3}$ cm/cm / 1000°F

or .36

Free ~~volume~~ area is

$$\pi (r_1^2 - r_0^2)$$

$$\pi (.5326^2 - (.5063)^2) = .021 \text{ cm}^2$$

Now with an increase

$$P = 2\pi r$$

$$\frac{1}{1.0036} = \frac{P_2}{P_3} = \frac{2\pi r_2}{2\pi r_3} = \frac{r_2}{r_3}$$

$$r_3 = 1.0036\, r_2$$

$$r_3 = .5345$$

then

free Area = $\pi (r_3^2 - r_2^2)$

$= \pi (.5345 - .5263) = .0273\ cm^2$

$$\left.\frac{A_3}{A_2}\right|_{free} = \frac{\pi r_3^2}{\pi r_2^2} \doteq \frac{.027}{.021} \quad 1.30\%$$

Assume area increase by 30% in gap

and

$$\left.\frac{A_3}{A_2}\right|_{plen} = \frac{\pi r_3^2}{\pi r_2^2} = (1.0036)^2 = 1.00722\%$$

$h_{...} = 160°$

$h_{...} = 160 \times 3.6\times10^{-3} = .575°$

So total free length = 10"

... = 10.575"

So % chg = $\frac{10.575}{10}$ = 5.75%

So plen area increases by 1.0072 ~ .72%

Vol = L × area = $\frac{1.0575}{1.003} \times 1.0072$ = 6.5%

Vol of gap = $(.021) 150 \times 2.54$ in/cm = ~~.529 cc~~ 8.00 cc

Vol of plen $\pi (.5326)^2 10" \times 2.54 \frac{cm}{in}$ = 22.6 cc

total free Volume ... 30.6 cc

Plen = 0

$\frac{8}{30} \times 30\% + \frac{22}{30} \times 6.5\% = 4.7 + 8 = 12.7\%$

free volume (gap + plenum) increase by 12.7% due to heating to 1600°F from normal hot temp ≈ 600°F

Then

$P \propto T/V$

$$\frac{P_2}{P_1} \propto \frac{T_2/V_2}{T_1/V_1} = \frac{\frac{1600+460}{1.127 V_1}}{\frac{915+460}{V_1}} \quad \frac{\frac{2060}{1.127}}{\frac{1375}{1}} = 1.33$$

$$\boxed{P_2 = 1.33 P_1}$$

Then for a hot pin avg Burnup of 20,000 MWD/T — the internal pressure = 455 psia

GE shows peak pressure for rod peak exposure of ≈ 25 GWD/T ≈ 230 psia

this would then give 306 psi

$\sigma_\theta = \frac{(306)(r)}{t} \approx 2.2$ Kpsi $\Big\} \ll \sigma_{BURST}$

BLOWDOWN

2" line

$$\Delta P = \frac{\rho v^2}{2 g_c}$$

$A = \pi r^2$

$A = \pi\left(\frac{2}{(2)12}\right)^2 = .0218\ ft^2$

$\rho_f \Big|_{sat}^{1427\,psia} = 59.8\ \frac{lb}{ft^3}$

$$v = \sqrt{\frac{\Delta P\, 2 g_c}{\rho}}$$

$\Delta P = \frac{\rho g h}{g_c}$

$$v = \sqrt{\frac{\rho g h}{g_c}\frac{2 g_c}{\rho}}$$

h = normal water level = 46.46 ft.

$$v = \sqrt{2gh} = 8\sqrt{h} = 8\sqrt{\frac{557.5}{12}}$$

$$\boxed{v = 54\ ft/sec}$$

$$\dot{m} = \rho v A = (59.8)(54)(.0218) = 70.4\ \frac{lb}{sec}$$

Liquid above 2/3 core height $4123\,ft^3 \times \frac{60\,lb}{ft^3} = 2.47 \times 10^5$

time to uncover to 2/3 height

$$= \frac{2.47\times10^5\ lb}{70.4\ lb/sec} = 3514\ sec = 58.6\ min$$

$t = 1\ hr$

[illegible]

then

free Area = $\pi (r_3^2 - r_2^2)$

= $\pi (.5345 - .5263)$ = .0273 cm^2

$\frac{A_3}{A_2}\Big|_{free} = \frac{\pi r_3^2}{\pi r_2^2} \doteq \frac{.027}{.021}$ 1.30%

Bottom area increases by 30% = gap

and

$\frac{A_3}{A_2}\Big|_{Plen} = \frac{\pi r_3^2}{\pi r_2^2}$ = $(1.0036)^2 = 1.0072$%

$h_{as} = 160''$

h_{new} = 160 × 3.6×10⁻³ = .575''

so tot. free length = 10''

new = 10.575''

So % chg = $\frac{10.575}{10}$ = 5.7%

So Plen area increases by 1.0072 or .72% Vol = $\sum$ h × area = $\frac{1.0575}{1.000}$ × 1.0072 = 6.5%

Vol of gap = $(.021)^2$ 150 × 2.54 in/cm = ~~.529 cc~~ 8.00 cc

Vol of plen $\pi (.5326)^2$ 10'' × 2.54 cm/in = 22.6 cc

total free Volume ← ... 30.: cc

Plen = 2·

$\frac{8}{30} \times 30\% + \frac{22}{30} \times 6.5\% = 4.77 + 8 = 12.7\%$

free Volume (gap + Plenum) increases by 12.7% due to heating to 1600°F from normal Hot T of 600°F

Then

$P \propto T/V$

$$\frac{P_2}{P_1} \propto \frac{T_2/V_2}{T_1/V_1} = \frac{\frac{1600+460}{1.127 V_2}}{\frac{915+460}{V_2}} \quad \frac{\frac{2060}{1.127}}{\frac{1375}{1}} = 1.33$$

$$\boxed{P_2 = 1.33 P_1}$$

Then for a hot pin avg Burnup of 20,000 MWD/T
a total pressure = 458 psia

GE shows peak pressure for rod peak exposure of ≈ 25 GWD/T ≈ 230 psia
then would then give 306 psi

$\sigma_\theta = \frac{(306)(r)}{t} = 2.2$ Kpsi

Conclusion

* For a 2" line drain down using full elevation head (assume drain is at normal 0 if lower than the drawing will be question)

we drain to 2/3 core height in ≈ 1 hr.

* At .5% of full power the boil off rate is 6.23 min per ft of core height.

#8-14-SueT1

BY MR. MILLER: Continuing)

Q I would like to look at the proposed license conditions, gentlemen. Dr. Cordaro, let me start with you.

The proposed condition is attached to your affidavit I believe, or it's part of your affidavit actually.

A (Witness Cordaro) Yes.

Q Could you tell me, first of all, Dr. Cordaro, who drafted this proposed license condition?

A To my knowledge, it was a combination of people. Initially, it was produced by the Hunton & Williams' staff in consultation with our operating people.

Then, I was asked to review it and give my opinion and observations.

Q And --

A Actually, initially it was -- the condition itself was an outgrowth of a recommendation or a decision that I made some time ago when the strike issue began to emerge in these proceedings. This initial thought about bringing the plant to cold shutdown was my idea and then translated into language by the Hunton & Williams lawyers and reviewed with the operating people.

end #8
MM flws

T9 MM/mml

Q Do any of those operating people include anyone on the LILCO panel?

A (Witness Scalice) Yes.

Q Mr. Scalice, you reviewed -- or worked with Hunton & Williams in preparing the draft of the license condition?

A That's true.

Q Any one else on the panel?

A (Witness Rigert) I believe we all did review.

Q In terms of working in the drafting of the condition, were you involved in that practice, Mr. Rigert?

A Not in the drafting, but in review of it.

Q And Mr. Stergakos, were you involved in the drafting of this license condition?

A (Witness Stergakos) No, I was not.

Q Dr. Cordaro, you say it was your idea that it was drafted by Hunton & Williams working with operating people at the plant?

A Another name that immediately comes into mind as having input into this is Mr. Weismantle, too.

Q Did the proposed license condition change in any way following your review, Dr. Cordaro?

A No. I don't believe so. Although the last version before it was typed finally had some pencil corrections and modifications. But as I recall it, there was not change from that version to the final version.

mm2

Q Do you recall, Dr. Cordaro, whether you made any substantive changes to any version of the proposed condition as drafted by Hunton & Williams and your operating personnel?

A I recall asking some questions about the legalese implicit in some of the language to make sure that I understood the intent to be my intent in making the suggestion I did.

And, after I made those inquiries I was satisfied that indeed the intent of the final draft was what I originally had intended.

Q Well, can you point me in the present proposed license condition to the language which raised inquiries in your mind, or has that language been removed?

A Well, it is the whole style. It is not necessarily any particular sentence. It is the style of the condition itself.

I would have thought that it could have been simpler, but after I discussed some of the ramifications of the condition and the need to be somewhat more specific in the legal sense, I was satisfied with it.

Q Okay. I think I understand now.

So basically, having read a version of the proposed condition which is similar to the version now before the Board, you simply had questions you want clarified based upon the language and the way the proposed condition is

mm3

written, is that a fair statement?

A Yes.

Q Can you tell me, Dr. Cordaro, was the proposed license condition shown to the NRC Staff at any time prior to the filing of LILCO's August 3rd paper seeking Summary Judgment on the strike issues?

A Not that I know of.

Q So this was strictly a LILCO proposal, it was not discussed with the Staff in any way?

A Not that I know of, of my personal knowledge. I don't know of any discussions with the Staff prior to its admission.

Q To your knowledge have there been any discussions with the Staff since August 3rd regarding the acceptability of this proposed license condition?

A Other than the telephone conference that was mentioned earlier, I'm not aware of any myself.

Q Okay. I take it then it is fair to say that this is not in any way a negotiated proposed license condition between LILCO and the Staff?

A To my knowledge, that's correct.

Q Now do you believe, Dr. Cordaro, that this license condition as written, resolves any conflict or clarifies what limitations regarding operation of the plant would be necessary in the event of a strike?

mm4

A I think it is rather specific and straightforward and clearly states what condition we are willing to accept in the event of a strike, a condition on our license we are willing to accept because of the possibility of a strike and because of the unique nature of LERO as contrasted to other offsite plans.

Q Do you believe the proposed condition -- you say it is rather straightforward. I guess that means you think it is clear and unambiguous?

A Yes.

Q That is notwithstanding the fact that you just told me that a previous similar version to this proposed condition raised questions in your mind that you need clarification of?

A Yes. My answer still stands. I was concerned, as I am always concerned, when things are written by lawyers, and they have a certain style associated with them. And I find it very, very necessary throughout my career to ask questions about it to protect myself.

Q Well, I want to ask some questions about the way this is written, also, Dr. Cordaro. Let's see if we can establish how clear and unambiguous this proposed condition really is.

Tell me, first of all -- I am just going to start at the beginning and go through it. It states that so long

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as LILCO relies on the offsite response organization consisting entirely or primarily of LILCO employees. Do you see that?

A Yes.

Q Now, what does primarily mean?

A For the most part.

Q Anything over 50 percent?

A I would assume that's a fair assessment, yes.

Q Then it goes on to say, "then in anticipation of the commencement of a strike by a union representing LILCO employees."

"In anticipation of a commencement of a strike." When would that be?

A At least 24 hours prior to the commencement of a strike, as it is specified later on in the conditions.

Q And that assumes that LILCO will have at least 24 hours notice of the strike, correct?

A Yes. And we believe that that is the case.

Q And what happens in the event LILCO will not have such notice?

A Well, first of all we just anticipate that ever being the case. But, even in the remote possibility that that would occur, we would proceed to bring the reactor to cold shutdown as soon as possible.

Q Then it says "commencement of a strike by a union."

mm7

Now I take it that is either of the two unions which presently represent LILCO employees?

A Yes.

Q It goes on to talk about "then LILCO would bring the plant to cold shutdown condition."

A Just to go back to that last one, or it might be a future union that would represent the employees.

This is openended enough where it covers situations which may exist in the future, which aren't necessarily the case now. It is general enough to encompass that. But it could mean one of the unions that are representing the workers today or if, indeed, these two unions became one by some action out in time, it would be that union. Whatever union entity was representing the workers.

Q So what you are saying, Dr. Cordaro, is any union representing LILCO employees. If that union would go on strike, LILCO would commit to what is proposed in this license condition?

A Yes.

Q Regardless of the number of LILCO employees represented by that union, I take it?

A Yes.

Q Okay.

Now you go on,and it says in the condition, "LILCO shall bring the plant to cold shutdown using normal

mm8

operating procedures."

The normal operating procedures, those are the ones discussed in, I believe, Mr. Scalice's affidavit, the ones that take approximately 12 to 16 hours, is that correct?

A Yes.

Q The next sentence, "LILCO shall commence bringing Shoreham to cold shutdown conditions 24 hours prior to the commencement of such strike, or immediately upon receipt of less than 24 hours notice."

Do you see that?

A Yes.

Q Tell me, how do you define strike?

A A work action by an organized labor force whereupon they cease performing their duties, their normal duties.

Q And how do you define work action?

A Walk off the job.

Q What about a sickout?

Would that be a strike under the terms of this proposed condition?

A A sickout would be a job action, and such a job action could be construed as a strike under this condition because if there is anything that prevents us from having availability of the union personnel necessary to carry out the full LERO function, we would commence going to cold shutdown.

mm9

Q Dr. Cordaro, you said a sickout could be construed to be a strike.

Would it be construed to be a strike?

A In the sense of this condition, yes. A massive sickout where essential personnel did call in sick, and it was an obvious job action.

Q In that circumstance, LILCO would commit to automatically bringing the plant to the cold shutdown stage of operation?

A Yes.

Q And then the determination has to be, I guess, under your last statement, the extent of the sickout, correct?

A Of course.

Q And the impact upon essential personnel?

A Yes.

Q And who would make those determinations?

A LILCO management.

Q What about a work slowdown, is that a strike under the terms of this proposed condition?

A The reason I have trouble responding to that is throughout the history of this company, we haven't been exposed to things such as sickouts or work slowdowns because of the cooperative nature of the agreement and the relationship we have with the union. And that even extended into

mm10

this latest strike situation.

I wouldn't conceive of a work slowdown ever occurring at LILCO. I can't see the purpose for which it would be employed. If, indeed, such a thing might occur and it hampered the company's ability to react to fulfill its responsibilities under LERO, then we would assume it would be a strike action and take appropriate action such as ordering the plant to be brought to cold shutdown.

Q So then the question for LILCO management would be again the impact of the job action upon LILCO?

A Yes. And a lot of these things are very, very obvious. In the case of a sickout, if one or two building maintenance people, or the building maintenance force in our Riverhead operations center decides to call in sick one day, that is not going to necessarily impair our ability to react to an accident situation.

The same is if those building maintenance people at Riverhead operations center or Greenlawn operations center decided to effect a slowdown, that necessarily wouldn't hamper our operations.

However, if a vast majority of our employees involved in the LERO Operation did participate in some of these actions, job actions, then it would be obvious that our ability to respond would be affected, and we would have to take appropriate action.

mml

Q I am trying to understand, Dr. Cordaro -- I think you can appreciate this -- the definition which you have used in this proposed condition of a strike. And what I am hearing is that there is going to be a level of discretion and judgment built into determination of a strike, unless you have a formal union vote to strike and a subsequent walkout of the union employees.

Is that a fair statement?

A Well, you have introduced a new concept here. You started to define strike in other terms which, as a company, we are not generally familiar with because we haven't been exposed to it, we don't really see the possibility of occurring.

I know these sort of things happen a lot in municipal-type jobs with policemen and sanitation workers and teachers, where there is some legal requirement that they cannot go on strike, and so they engage in these other activities such as job actions. And this sort of thing could affect the operation or response to a strike if, in fact, Suffolk County were responsible for the offsite plan instead of LILCO.

As far as LILCO is concerned,since the ability to strike exists, the capability of a strike exists, the probability of having a sickout or some other type of job action is extremely a remote possibility. In all probability

mm12

you'd have a strike such as occurred this past July.

Q Well let's, then, focus on the actual formal strike situation.

Whatwould be the commencement of a strike? Would it be the notice that there is going to be a strike from the union?

Would it be the actual work stoppage?

Would it be the union vote?

What is the commencement?

A The commencement of a strike would be the time at which union employees would not show up to perform their job duties.

Q And are you saying that from the time LILCO employees do not show up to perform job duties, within 24 hours you will have initiated the steps to bring the plant to cold shutdown?

A Yes.

Q Now again Dr. Cordaro, I am a little bothered by that de finition,because that builds in the necessity to determine when LILCO employees do not show up to perform job actions.

Are we talking about all LILCO employees?

Are we talking about a majority of LILCO employees?

Are we talking about enough LILCO employees to impact adversely the company's functions?

mm13

What is the definition?

A Since again you have injected this concept of strike which we didn't have in our minds, because of the ability of our workers to be able to utilize the strike type of situation under the agreement we have with them, we didn't specifically have that in mind in proposing this licensing condition.

However, the licensing condition is flexible enough to accommodate that and is flexible enough to accommodate that because of the judgment that could be exercised. And the bottom line of the judgment involved is that the company makes a commitment that by job action, sickout, work slowdown or whatever, if there is any possibility that our ability to mobilize LERO and have it function properly in the event of a strike or in the event of an accident is jeopardized, we would immediately act to bring the plant to cold shutdown, to eliminate any possibility of a problem occurring in the event of an accident occurring at the plant during a strike.

JUDGE LAURENSON: Excuse me, Dr. Cordaro, I am getting confused here.

I understood one of your last answers to be that you understood this condition that has been offered by LILCO to mean that from the time employees failed to report for work, then LILCO would bring the reactor to cold

mm14

shutdown within 24 hours of that point, is that correct?

WITNESS CORDARO: If I answered in that way, I didn't mean it in that way. I meant 24 hours before that time period, if we have advance notice of a strike.

JUDGE LAURENSON: It would be prior to that time?

WITNESS CORDARO: Right. 24 hours before the commencement of a strike.

BY MR. MILLER:

Q Dr. Cordaro, to make sure I understand the commencement of a strike, are you defining that to be from the moment that it is determined by LILCO management that wokers are not showing up to perform their job tasks?

A (Witness Cordaro) Yes. In the case of the strike that took place July 10th, we knew at a specific time that strike was going to commence. That workers would not be showing up at some particular point in time.

In the event that Shoreham was operating during the strike, we would have begun bringing the plant to cold shut-down 24 hours prior to that time.

Q Now, what happens in a situation where some workers decide not to honor the strike's vote, and show up to work. Other workers, of course, honor the strike vote and do not show up for work.

At what point do you make the determination that there is a strike which activates, if you will, this proposed

mm15

license condition?

A That became an issue, excluding Shoreham for a moment, during the past strike. There was a possibility that one of the unions might accept the contract offer, or that individuals within the unions would want to come to work regardless of what decisions the bargaining unit made.

The company decision at that point was to not allow these people to come to work and to assume that a strike was in effect.

And that would be the case with Shoreham in operation, namely that if one of the unions decided to strike, or if even members of the union wanted to come to work even though the bargaining unit had decided there was a strike, we would consider it a strike and take whatever appropriate actions were called for.

Q And in the event of a wildcat strike, what is LILCO's position?

A You mean a wildcat, not a specific -- presuming that there is a possibility of a wildcat strike occurring?

Q Yes.

A We would shut down the plant immediately.

We don't see that happening. It is not our experience in discussions with the unions. It doesn't seem their intent to ever rely on that approach to bargaining

mm16

with the company or trying to maneuver the company into a favorable bargaining position.

And on top of that we do have licensed reactor operators in the plant, as Mr. Scalice had reference, they do have a license which represents their livelihood from the NRC, and they would have to take the appropriate professional action in turning over the plant properly to some relief shift in the event of a strike.

Q Okay. That same sentence we have been looking at goes on to say that, "or immediately upon receipt of less than 24 hours notice of the impending commencement of a strike."

I take it that -- or at least the way I read that sentence, LILCO has the choice in when it would commence cold shutdown operations, is that correct?

A No, that doesn't mean that to me.

It means if we have 24 hours notice we will shut down the plant. And possibly if we don't have 24 hours notice we will shut down the plant as soon as we can, or as soon as we do have notice.

end T9

Sim 10-1

Q Well, it says you are to have the goal of having the plant in cold shutdown by the time the strike commences, right?

A (Witness Cordaro) Yes.

Q And I take it that so long as LILCO has this goal in mind, cold shutdown commences at LILCO's discretion; isn't that what that says?

A No, I don't think so. I think it says if we have 24 hours advance notice, our goal is to shut down the plant and we will shut down the plant at that time. If we have less than 24 hours advance notice, we will shut it down as soon as we do have notice.

Q Let me give you the situation, Dr. Cordaro, where you have 24 hours notice of a strike and you are sure that the strike is going to happen in 24 hours. You are also very confident that going through the normal steps that Mr. Scalice has talked about that you need 12 to 16 hours to bring the plant to cold shutdown.

I take it that under that scenario LILCO under this proposed condition could wait eight hours and start its cold shutdown process at 16 hours prior to the commencement of the strike and still be within the terms of this licensed condition; isn't that correct?

A Yes, we could do that.

Q Now going on in the proposed condition, it says

Sim 10-2

essentially that LILCO will keep the plant in cold shutdown until the end of the strike, except with the prior approval of the NRC staff, LILCO shall be permitted, and the first is, to take the reactor to a refueling mode or other operations requiring access to the reactor core. Do you see that?

A Yes.

Q Now could you tell me what other operations requiring access to the reactor core have been contemplated by LILCO drafting this proposed condition?

A Replacing a fuel channel or something related to a refueling operation or something you do during a refueling operation.

Q Okay. You are saying that, and I will call it subset one of the proposed condition, only includes refueling or other operations directly related to refueling?

A Yes.

Q And when it says that LILCO will be required to show that such operations cannot result in the occurrence of any events requiring offsite emergency response capability, how would LILCO make such a showing to the NRC staff?

A Well, you would specify exactly what you wanted to do. You would relate it to all the potential accidents which could occur in taking that particular action such as the standard refueling type of accident. You would refer to the amount of time that the plant has been shut down and

Sim 10-3

the activity of the fuel related to the accident analyses you have provided the NRC in the past in your FSAR demonstrating that perhaps the activity level is even below the activity level of the accident you analyzed.

So that you can demonstrate that, you know, if an accident should occur, it wouldn't require any offsite emergency response that you might require the services of LERO union workers.

Of course, knowing how the NRC functions, there would be a great many inquiries and questions which would result and you would probably have to perform other calculations and provide other information to the NRC until they were satisfied that indeed no hazard existed.

Q Okay. That is what I wanted to get at, Dr. Cordaro. Under the way this condition is drafted would the showing necessary to the NRC mandate LILCO having conducted analyses and calculations which demonstrate there could be no offsite consequences requiring LERO's implementation?

A I think that is implicit in this.

Q Is it explicit in this?

A Well, it is explicit if you know how the NRC fuctions and if you have ever attempted to get some sort of approval from them that this is obviously the type of information that would be required.

Q And when you talk about in terms of events

Sim 10-4

requiring offsite emergency response capability, that is another way of saying I take it that you would have to demonstrate there could be no offsite release in excess of the PAG limits; is that correct?

A No offsite release that would result in the PAG limits being exceeded.

Q Okay. Let's look at the subset two. This is where LILCO upon prior approval of the NRC staff could conduct such other operations as the staff shall approve. Now what other operations are contemplated by LILCO in this section of the proposed condition?

A Maintenance type activities and certain kinds of inspections that you might carry out during a refueling outage, inspecting the core spray system and perhaps changing a control rod blade, doing some instrument work, instrument repairs and things of that general nature, things that go more into the maintenance type function other than the strict replacement of fuel in the reactor vessel.

Q So subset one, Dr. Cordaro, is refueling and matters directly related to refueling, and subset two is essentially the maintenance and repair operations that could be required?

A In the reactor vessel, yes.

Q Is there anything contemplated by LILCO other than maintenance and repair activities in the reactor vessel

Sim 10-5

under this second condition?

A Not to my knowledge, unless someone else on the panel has something in the back of his mind such as Mr. Scalice.

A (Witness Scalice) No, there is nothing.

Q Now, Mr. Scalice, at your deposition I believe we talked a little bit about this second subset and you believe that the way this is written and presented essentially anything would be permitted so long as the staff approved the activity beforehand, correct?

A Well, I think what I said at the time was that we didn't do an exhaustive list of activities in preparation of this license condition.

However, it would include such things as a change in nuclear instrumentation and maybe changing out control blades and things of that nature if I recall my deposition correctly. There was no exhaustive list. It might be other jobs in the facility that we might want to attempt to complete.

Q And again, Dr. Cordaro, how would LILCO demonstrate or make the showing required by this second subsection? Would it be through the analyses and the calculations as with the first subset?

A (Witness Cordaro) Yes. I think they might even be more extensive in this regard because they perhaps might not meet the classic Chapter 15 format as to the kind of

Sim 10-6

operations involved. You might have to explore the potential for an accident a little bit more fully.

Of course, as I said earlier, when I introduced this contention and this condition in my direct testimony, it is flexible to attempt to account for situations which may exist in the future such as perhaps a change in the source term situation such that it is really never conceived that any massive evacuation would be required even under the worst accidents.

But, however, you would have to make a demonstration in getting the approval from the NRC that indeed the operation you wanted to carry out wouldn't result in an accident that would depend on its severity or its consequences on LILCO's ability to implement its offsite emergency preparedness plans.

Q Let me focus for a second on this possibility of a reduction in source terms, Dr. Cordaro. You mentioned that earlier. I take it that what you are saying is that should there be a reduction in source terms that would be applicable to the Shoreham plant, that could lead to the conclusion that the LERO force could be manned with substantially less people than is presently envisioned by LILCO?

A Yes.

Q And that, in turn, could lead to the conclusion that even in the event of a strike by union members LILCO

Sim 10-7

could sufficient man and activate LERO?

A That is possible in the future, yes.

JUDGE LAURENSON: Let me just follow up on that for a second, Dr. Cordaro. It seems the way the first sentence of this condition is drafted that if your unions went on strike you would have to shut down the reactor even if not a single member of the union belonged to LERO.

WITNESS CORDARO: Yes. But LERO as a concept right now, and as we can foresee, definitely requires the participation of union personnel.

BY MR. MILLER:

Q Dr. Cordaro, the last statement about reduction in source terms and how that could lead to a reduction in the LERO work force, that would require the NRC's reducting the source terms as they presently exist, correct?

A Yes. There would have to be some formal acceptance by the appropriate regulatory authorities that indeed the accidents situations we were dealing with were a lot different than the ones we are actually dealing with in this proceeding in addressing the requirements of 0654 and 0396 and so forth.

Q Now I take it that in your opinion if you had that kind of reduction in source terms you could also well have changes in the NRC emergency planning regulations as they are presently constituted?

Sim 10-8

A Yes.

Q Leading to a smaller emergency planning zone?

A Yes.

Q Looking at the last paragraph, Dr. Cordaro, "This condition shall terminate at such time as any or any such combination of agencies of the Federal, New York State or Suffolk County Governments shall provide notice to the NRC and agree to assume legal responsibility for the implementation of an offisite plan for Shoreham."

What do you mean when you say effectuation of offsite emergency response, what is encompassed in that?

A Assume responsibility in the legal sense for offsite response in the event of an emergency.

Q Are you saying all aspects of offsite response or what if, for example, EPA agreed to be legall responsible for conducting field monitoring activities during an emergency at Shoreham? Would that be sufficient to lift this condition?

A If the circumstances of the situation was such that FEMA saw that this would be an appropriate action, yes. I think one of the provisions there is that FEMA has to review the terms and conditions of this to make sure that it is acceptable to them and that an effective emergency plan does not depend on any association with unions.

Q Well, this just says that FEMA would have to review whatever offsite emergency response any agency or

Sim 10-9

combination of agencies would provide. So let me go back to my hypothetical. EPA comes in and says to LILCO and to FEMA in turn that they will accept legal responsibility for performing field monitoring fucntions during an emergency at Shoreham. Now there you have an agency, a Federal agency which would have assumed the legal responsibility for effectuating at least one aspect of offsite response, and my question is under the terms of this paragraph that therefore leads to the conclusion that the condition would be terminated; isn't that correct?

A You would have to run that by me again. I am getting a little confused in looking at this and listening to what you said. Could you rephrase that perhaps?

Q I am just wondering, Dr. Cordaro, if some agency, and I have used EPA as an example, commenced to performing a certain aspect of offsite response and that commitment is found to be legally acceptable to FEMA, does that therefore not lead to the conclusion that the licensed condition proposed by LILCO would be terminated?

A Oh, yes, because it is obvious in this case that FEMA would have to be satisfied that the offsite emergency plan didn't depend on any entity which, you know, might not be in place in the event of an accident. I am sure that that would be an obvious requirement that would be included under the terms and conditions approved by FEMA.

Sim 10-10

Q And what would happen, Dr. Cordaro, in the situation where some agency, federal agency let's say, agrees to perform command and control functions in the event of an emergency at Shoreham, but LERO would still be depended upon to carry out and implement the LILCO plan?

A Well, obviously if LERO was still depended on to carry out and implement the plan and union personnel from the company were required to do that, then the condition, this licensing condition would still hold and the reactor would have to be brought to cold shutdown in the event of a strike.

Q But under the terms of this paragraph that would not be the case, would it?

A I don't think so. I think it is a very general statement when we mention that this has to be approved under the terms and conditions viewed by FEMA as being essential, and I am sure FEMA in their review would require that appropriate personnel be available in the event of an emergency at Shoreham. This would be an essential condition that they would require.

Q I don't see the word essential, Dr. Cordaro, in that paragraph. Is that a word that you are now adding to the paragraph?

A Well, I am just interpreting this as any person would in just a common sense basis.

Sim 10-11

Q Has FEMA agreed to perform the review of agency actions to determine whether those actions would suffice in terms of the proposed license condition?

A No. I don't believe there is any formal agreement with FEMA regarding this at present.

Q Has it been discussed with FEMA?

A Not to my knowledge. I assume that if we are successful in getting a license and that this condition becomes part of the license that FEMA will consult with the NRC to develop whatever requirements which may be called for.

end Sim
Joe fols

Q Dr. Cordaro, let me try to make sure -- I am going to try to characterize what you and I have been talking about for the last fifteen minutes.

You tell me if my statement is a fair statement. It sounds like what you told me, is that here is a proposed licensed condition which LILCO has drafted, LILCO has not discussed it with the NRC Staff. LILCO has not discussed it with FEMA. LILCO is submitting it to this Board in an effort to try to resolve the strike issues presently before the Board.

The license condition could change. At this time LILCO has made a proposal, and this is it. Is that a fair statement?

A Almost, it is close. There are a couple of things in there which you have to qualify to some extent. First of all, to my knowledge we haven't had any contact with the NRC or FEMA other than the phone conversation that may have been mentioned here.

I think that that is the case, but that is my knowledge of the situation. So, I can't be a hundred percent sure that no member of the Company has had any contact or any discussion with anyone in the NRC, but to my knowledge none has taken place.

We do propose this to -- to propose this licensing condition to address the strike concerns and the specific questions that were raised by the Board in this proceeding,

and we believe that this should satisfy that concern, namely that a situation won't exist such that in the event of a union strike at the Company the Company could not respond to an emergency event at the Shoreham nuclear power station, or an event could occur in which the health and protection of the public couldn't be assured.

Q Would you expect, Dr. Cordaro, to see changes in this proposed condition if it should be accepted by the Board?

A Just hypothesizing for a moment, I think if circumstances change out in time, I assume we always have the right to appeal for a change in this licensing condition if the circumstances warrant it. I can't think of anything else off the top of my head that would immediately change this unless the agencies involved in this proceeding, the NRC or FEMA, would propose a change that the Board would take into consideration and possibly adopt as part of the condition.

Q I am not sure I worded my question very well, or if you understood it. The proposed condition as you are presenting it to the Board now, do you expect this proposal to be accepted by the Board based upon some of the matters we have discussed and based upon maybe your initial questions regarding the proposal, would you expect to see changes made to this proposal that has now been offered?

A Changes made by LILCO?

Q Changes made by the Board.

A Of course, I can't know what is in the Board's mind or what the ultimate decision will be. I think this should be satisfactory to satisfy the concerns raised by the strike issue as they affect emergency planning, and I believe this is sufficient and shouldn't require any change.

MR. MILLER: Judge Laurenson, the County has no further questions.

JUDGE LAURENSON: Mr. Zahnleuter?

CROSS EXAMINATION

BY MR. ZAHNLEUTER:

Q Dr. Cordaro, I am still a little confused about what you mean in the proposed license condition, where you state that LILCO shall commence bringing Shoreham to cold shutdown condition 24 hours prior to the commencement of the strike.

If LILCO does receive 24 hours notice, are you saying that under all circumstances the plant will be in cold shutdown before 24 hours expires?

A Yes, unless an event occurs which I really can't think of right now. I would have to say, yes.

Q So under the scenario that I just described, it is not that LILCO will commence bringing the plant to cold shutdown, but it will have the plant in cold shutdown before

the expiration of 24 hours, is that correct?

A Well, we will actually commence taking what initial actions are necessary to bring the plant down within this 24 hour period. 24 hours in advance of the strike. There are a lot of things which some people might not include as part of the shutdown process, which may be procedures which have to take place in advance, which we would include in this 24 hour period, but activity would be initiated 24 hours in advance of the strike period to bring the plant to cold shutdown.

Q Mr. Scalice's affidavit states that it will take 12 to 16 hours to bring the plant to cold shutdown, and barring any unforeseen events during the descent, then you are saying that the 12 to 16 hours would be part of the 24 hours for the strike?

A Yes.

Q Okay. Now, in the same vein, but moving to the end of the strike, what exactly do you mean in the proposed licensed condition by the phrase, 'end of the strike?'

A When the union force is back on the job.

Q So, is it your testimony that the startup will not commence until the LERO force is fully on the job?

A Yes.

Q Do you know how long a startup would take?

A I would defer to Mr. Scalice on that.

A (Witness Scalice) What do you mean? Do you mean just -- to get to what, a hundred percent power? To get to some full power condition? Well, that becomes a little bit of a more complex issue, depending on the power history of the reactor.

It wouldn't take a significant period of time, but to go from let's say ninety five percent power to a hundred percent power, depending on the length of the strike, would take varied degrees of time, because of the effects of xenon in the core.

Xenon is an absorber of neutrons, and therefore we would have to, perhaps, wait for that xenon condition to burn out. I know that is a little complicated here, but there is some time frame involved in that.

If the strike occurred, and then 24 hours into the strike it ended again, I wouldn't suspect I would get up to a hundred percent power immediately. It would take some time to be able to overcome the effects of this negative reactivity.

Q Okay. That is fine.

JUDGE SHON: If you will excuse me. I think what Mr. Zahnleuter really meant to inquire was assuming the xenon is all decayed out, because that is only a matter of a few days, and strikes normally last weeks or months, weeks or months later if the strike were over, then how long would

it take to get back to power? Can you give us some idea of that? Isn't that about what you meant?

MR. ZAHNLEUTER: Yes, sir.

WITNESS SCALICE: It would take a day or so.

BY MR. ZAHNLEUTER: (Continuing)

Q Dr. Cordaro, if LILCO were to receive less than 24 hours notice of a strike, and if the descent takes about 12 to 16 hours, is there a possibility that there would be a time when there would be no LERO organization in force yet? The plant would not be in cold shutdown?

A (Witness Cordaro) It is probably very unlikely. First of all, we are very, very sure that we have at least 24 hours notice. We are very sure, also, that we have the cooperation of the unionized reactor operating people so that they would be present to bring the plant down to cold shutdown.

The other thing is that I think Mr. Scalice is very conservative in his estimates of the time required to bring the plant to cold shutdown, and that actually he could possibly do it a lot faster. He would rather not, as he has suggested or implied in some of his statements, but there is the ability to bring down that plant a lot faster than in 12 to 16 hours.

Q If you received, say, five hours notice of a strike, would there be a time period in which the plant would

not be in cold shutdown, but the LERO people would be on strike?

A (Witness Scalice) That is possible. If I have five hours notice, I said in my affidavit that about the minimum time to get it to a cold shutdown condition would be eight hours.

MR. ZAHNLEUTER: Thank you. I have no other questions.

JUDGE LAURENSON: Mr. Hassell?

MR. HASSELL: The Staff has no questions.

JUDGE LAURENSON: At this point, the Board has some questions for the LILCO panel, and we will lead off with Judge Shon. In order that he can see the witnesses and they can see him, we are going to switch chairs here.

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BOARD EXAMINATION

BY JUDGE SHON:

Q Gentlemen, I would like to emphasize to begin with that these truly are Board questions. They are not just me asking them. I just got stuck with that particular job.

We can assume if they are smart questions, one of the other two thought them up. They may, from time to time, wish to interrupt, and since they, I am sure, have certain proprietary interest in some of the questions.

The first subject I would like to discuss with

you is the matter of a comparison that has struck the Board as possibly being fundamental, possibly not. The Commission does not require that an offsite response organization be in place, generally speaking, for a new reactor that has never operated above five percent of full power. I think you are aware of that.

In establishing that, the Commission said this was primarily because of three things. The first was the lower fission product inventory. The second was the longer available response times for a reactor that is at low power. And the third was that at lower power, there would be lest challenge to the engineered safety features of the reactor.

I would like to discuss each of these in turn, and talk about how a reactor that has operated, indeed has run at full power for a considerable time, compares in each of these aspects to one that has never operated above five percent.

In doing so, when I talk about one that has operated for full time for fission product inventory, for example, I would like to make it what seems off hand probably the worst case, that is a reactor with an equilibrium core or essentially equilibrium core, that is essentially at end of life for that particular fueling cycle, okay?

How long, for example, would such a reactor have to sit before the fission product inventory, say on the basis

of total curies, was the same as the fission product inventory in a reactor that had just been at low power testing less than five percent?

A (Witness Stergakos) We have not performed such a calculation. I assume when you say five percent, I assume you mean five percent equilibrium.

Q Well, I mean for some reasonable length of time. Perhaps a month or something like that.

A The fission products which we are looking here, as correctly stated before, are relatively speaking short-lived. Thus, if you are operating about thirty days continuously at full power -- at five percent power, perhaps reaching 60 days, you will have reached equilibrium with the fission products that we are concerned, noble gases, special handling halogens.

So, there, it doesn't take very long time to reach equilibrium for the gases that we are concerned. For the isotobes, rather, which were our concern.

Q With that as a given, then, how long would the reactor that had operated at full power have to be shut down before its hazard from that standpoint was comparable to one that had never run above five percent?

A If we assume that the whole core failed -- sir, I cannot answer you that. I do not know how long we will have to wait. If we take specific accidents as such, like let's

say the fuel handling accident, where we have -- let's say assume a 125 rods failed, et cetera, then we can and have determined that would take approximately anywhere from 14 to 20 days, depending on the history, to reach a point where the PAGs will not be exceeded.

Q That is a fuel handling accident.

A Right, sir.

Q But you say that would not be the same sort of thing for major core damage.

A No. If we postulate that the whole core is all of a sudden degradated, I cannot answer that.

Q Well, perhaps we will come back to that. How long, and this I think you can answer off hand, would it take before the heat dissipation was comparable to a reactor operating at five percent?

A Well, we know that within 24 hours the heat -- the rate of heat generation would be .5 percent, so we are far below five percent within 24 hours.

Q Fine, so it is a matter of hours.

A Right, sir.

Q As to the matter of available response times, I see that you have done some things on calculating how long it takes cores to heat up and such. How do the available response times compare for a reactor in case of an accident or an off-normal trangient for a reactor that has operated

to having an equilibrium core with one that has only operated at five percent?

A I will let Mr. Rigert answer that, but I will say what I know to be the case, and what we have evaluated right now, we -- in dealing with ours, and the evaluation which has been done in the FSAR for design basis accidents, we assumed that the operator would have responded within ten minutes to any events, to mitigate events. But I will let Mr. Rigert proceed on that.

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#12-1-SueT

(Witness Rigert) Well, if I could try to compare the work that was done in the low power license to the work that was done here for this strike issue, the time we came up in LERO in the strike issue, as we said earlier, was in the range of a hundred minutes if you conceived of a LOCA to restore cooling to the reactor before fuel failure would be experienced, in the case of the five percent LOCA. And in that case it was different because at five percent the reactor was at pressure and temperature and LOCAs are credible under those circumstances, although, of course, that in itself is a subject of controvery, whether it's mechanistic to assume pipe ruptures at all.

But assuming at that case you did have a large break accident at five percent power, we came up with a family of answers, depending on the level of conservatism. The number that was most prominently used as a reflood time was 86 minutes.

Q So, then, you are telling me they are quite comparable?

A They are in the same range. The characteristics are different, in that in this case at a hundred percent power 24 hours after shutdown, you are down about a half a percent decay heat but you are very flat because you are out on the curve and it's not going to change a whole

#12-2-SueT

lot by hour by hour. It would take quite a few more days to get down to perhaps a quarter of a percent, whereas in the five percent case, operating at five percent with a new core, you are initially at high power, you have a lot of stored energy in the fuel and in the reactor itself, thermal energy.

Once the reactor is shut down, it drops on to a decay curve of its own which will, of course, get it down below half a percent quite fast. Its long term decay heat is different than this case.

Q Sure. The longer-lived isotopes haven't built in yet is what you are telling me --

A Well, it's just that the -- it's not so much that as the fact that a reactor shutting down from five percent will -- even if you shut a reactor down at five percent 24 hours after shutting a reactor down at a hundred percent, its decay curve is going to go down.

In other words, a half a percent decay heat on a five percent reactor is far less than a half a percent decay heat on a hundred percent reactor.

Q Right. I see what you mean. How about other failures? For example, failure of the decay heat removal system after some long time. It would seem as if at five percent, since the decay heat is much less, you could have a complete failure of the decay heat removal

#12-3-SueT

system and you wouldn't have to do anything in a hurry to get it back.

With the equilibrium core, that might be different. You might have to do something rather quickly to get the decay heat system back.

Is this not true?

A That would be true. We had previously addressed the issue of station blackout at several years from a hundred percent power and demonstrated the ability to survive 24 hours without AC power. The low power license, where we were dealing with five percent, we also addressed that issue and we were able to come up with the thirty day range for survivability without AC power, using the passive heat syncs of the primary containment.

This event would be somewhere in between, in that since you are at a pretty flat point on the decay curve, you wouldn't be as low at decay heat production rate as a five percent reactor but you would be far less than a reactor that was running at a hundred percent power at the time the reactor became isolated and lost its decay heat removal ability.

Q Then, you would expect to be able to survive something more than a day but something less than a month roughly?

A Yes. Yes.

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Q Finally, what differences do you see in the matter of a challenge to engineered safety features between the five percent case and the shutdown equilibrium core case?

A Well, the challenges would probably -- the main difference would be in the frequency I think, that at cold shutdown there is no active equipment to speak of that would be of any real concern in causing initiators of transients and accidents. The reactors in shutdown cooling mode, you really don't have a feedwater system. If anything, the CRD flow entering the reactor is creating an excess of water which is then typically let down by reactor water cleanup.

So, it's basically a closed loop and you are just circulating water through a heat exchanger. You are not operating the plant as you would be at five percent power or a hundred percent power where there are many, many instrument systems and trip channels that could cause events to occur, isolations and scrams and so on.

So that it's very unlikely that anything would ever happen to even perturb the reactor in cold shutdown.

Q So, what you are saying, as I understand the bottom line, is that even the five percent case represents more of a challenge to more different kinds of engineered

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safety features than does the shutdown case; is that right?

A With the reactor in operation like that, yes.

Q We heard the other day from a staff witness, John Sears, the flat statement that ten to the fourth r per hour in the containment would trigger protective action recommendations such as evacuation.

It occurred to us to wonder what one would do if you did get a level of ten to the fourth r per hour in containment when there was no LERO because of the strike and couldn't make such a recommendation. Now, is that simply an impossible situation?

Could you never have levels like that? Or, could you have that level and then have to violate in some way your ground rules?

A (Witness Stergakos) We cannot foresee a ten to the fourth r per hour in primary containment. We looked into the possible events that could occur, and such radio-isotopes release into the primary containment we cannot foresee unless we really went into incredible accidents.

Q What about releasing the entire gap inventory, for example?

A Well, that's what we discussed all this morning, that it is something which we cannot see happening because,

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as Mr. Rigert just said, at cold shutdown we don't have that many systems operating. Almost all of the systems are passive, and what we have is RHR operating.

So, to assume such a thing we have to really not be credible.

Q Fine. I would like to discuss that particular point a little further and then perhaps come back to two others, the residual heat removel, the decay heat removal system.

A Right.

Q You and Mr. Rigert both have said that there are simply no degraded core events possible in cold shutdown essentially.

Are you aware of, I believe it is, unresolved Safety Issue Number 45?

A (Witness Rigert) Yes, sir.

Q Are you also aware that the ACRS has just this month gotten pretty deeply into some things that have been proposed as standards for that?

A Not the latest developments, no.

Q Well, one of the things, as I understand it, and I will read a sentence or two to you from inside NRC, is that the NRC staff has encountered some industry resistance to an analytical system they want to set up to measure vulnerability to decay heat removal system failures.

#12-7-SueT

It says: The analytical system postulates that no more than twenty percent of the core melt risk in BWRs and thirty percent in PWRs should come from decay heat removal systems.

Now, it seemed to the Board that if indeed the staff wants to limit the amount of core melt risk, a fraction of the core melt risk, that comes from the decay heat removal system to thirty percent of the total core melt risk, that's not negligible. If it's, you know, thirty percent is like a quarter or a third, one can't say that no degraded core events are possible in cold shutdown, because it appears that the staff is worried that some appreciable fraction of the melt down risk is contributed by the decay heat removal system failure possibility.

Would you care to comment on that?

Q Yeah. I think that what they are referring to there is that in full plant PRAs, one of the significant risk contributors, we call it the TW sequence, is initiators, transients, largely I think it's in the transient category where you isolate the reactor and then you go into -- in an isolated mode, of course, the reactor automatically scrams but there is a tremendous amount of stored heat in the reactor that's discharged to the suppression pool very rapidly.

#12-8-SueT1

And I think this puts a large demand on the decay heat removal systems to recover the plant from that isolation condition. It's very much different in terms of from a thermohydraulic point of view as well as a frequency point of view as compared to a reactor that is already in cold shutdown and stable.

A reactor that is in cold shutdown and stable, the initiator frequency, I guess I would venture to say, would be orders of magnitude lower. There are no real initiators other than just maybe a tripping of the RHR pump or something of its own accord. And there are four of them; you only need one.

Q What about things like station blackout?

A Well, station blackout alone, yes. Although, then we only need one diesel to support decay heat removal and at this very low power level which -- well, the decay heat level only, I shouldn't even call it power level, there is such a long period of time.

The reactor is already cold and depressurized. There are many hours built in just for the reactor to re-pressurize before you even begin discharging heat into the suppression pool where at full power when you go into an isolation event the heat is almost instantaneously discharging into the pool through the SRVs, the safety release valves.

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There are these alternate methods that we could use as a last resort if we had to, ultimate cooling or even our fire pump or -- I see John is eager to explain some of the steps.

(Witness Scalice) Well, as the reactor would pressurize under that event, we still have the reactor core isolation cooling system that is a DC-powered system. As the reactor pressurizes above the isolation setpoint, which at the Shoreham plant is 57 pounds, before we reach any substantial pressure in the reactor we can deliver flow back into -- an inventory back into the vessel and remove heat by the steam that comes off the main steam line supplying the turbine itself that runs that reactor core isolation cooling turbine.

Additionally, that there is the high pressure coolant injection system that can add to that if necessary.

Q So, what you are telling me is fundamentally that any major contribution from the decay heat removal cooling system to the core melt risk probability arises through a chain of events that occur within a very short time after a shutdown and does not involve things like station blackout?

A (Witness Rigert) Well, it involves operating plants that are then maybe subjected to a loss of power or a reactor isolation. I'm sure if you were to look into

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the basis for the number I'm quite sure that you would find that the thirty percent risk is drawn out of typical PRAs like WASH 1400 where they didn't even bother to quantify the risk from cold shutdown. That was so far down in the negligible realm of risk that all the risks that they are talking about are from operating reactors.

And they consider a successful end state in a PRA to be bringing the plant to hot shutdown stable condition, and that's considered a success point. Beyond that is not even analyzed. So, we are beyond the end point before we even start.

Q Fine. Finally, on the little list that I had here, we have the question of fuel pool incidents and accidents. It's evident that the fuel pool doesn't change much, whether the reactor is running or not. And it occurs to the Board that no one seemed to have asked, so far, that the fuel pool represents the same hazard as it always did.

Are there, or have there been, analyzed any fuel pool accidents that result in off-site doses and hence might call forth a response from LERO?

It's evident that before the reactors run, you don't have any fuel there so it doesn't matter. After it's run, that's different.

A (Witness Stergakos) Well, the possible accident

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that could occur is similar to that of fuel handling, and we will take the same precautions.

Fuel pool cooling, yeah, but the thing is -- okay. If it's about this fuel cooling system I will let Mr. John Rigert. But if it's for the isotopic type of inventory that's --

Q There are several things you can think of. You know, you can think of an invertent criticality of some sort perhaps. You can think of fuel pool loss of cooling and boiling away, and you can think of things like a cask drop or a fuel element drop or something like that.

And I'm just asking, are there any of these things that have been analyzed that result in off-site doses and would require a -- which would require a LERO response?

A (Witness Rigert) I'm not aware of any postulated accident that would result in off-site doses simply from the loss of cooling, because the pool is so passive. The water up to and above the fuel itself in the racks cannot in any way drain out. There are no openings at the lower end of the pool.

There are, of course, redundant cooling systems. There are so many conceivable back-ups. Of course, there is the RHR system as a back-up that has tie-ins to the

#12-12-SueT1

fuel pool cooling. And the system, because of the large inventory of the pool, is slow responding.

I know that we don't ever postulate a boil out of the pool where it actually goes dry and the fuel heats up and fails.

Q You say you have not postulated that, so you don't know what that would do?

A No. I can't offhand quote what the FSAR says about this event. I wish I could. I believe it is just put in the category of not a credible event. It's not even in the Chapter 15 area.

(Witness Stergakos) I may add on to this that this type of thinking went -- we did such type of thinking and we did come to the conclusion which Mr. Rigert just mentioned. I do not remember whether he was present in that meeting that we had pertaining to a fuel pool.

So, we did contemplate such type of action. But along the same line as Mr. Rigert just said.

(Witness Rigert) Ultimately, I guess what you would resort to is just adding make-up to the pool even if it was by manual means, hoses or whatever. There is a normal make-up system.

(Witness Scalice) That isn't necessarily required. In terms of putting inventory back into the pool, we have several ways of doing such, the least of not -- of

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which is the fact that we can put ultimate cooling water back into the pool controlled from the control room and injecting service water, salt water, into the pool if necessary. We can make up water quite easily into the pool through the normal condensate transfer system, which is also available to us, or in the event that the reactor cavity was open to the pool through the RHR system as such in the fuel pool assist mode, fuel pool cooling assist mode which occurs and is only needed at the time that we unload the core simultaneously with the spent fuel if it should be in the case of the latter or refueling outage.

I guess that's what you are making the assumption on. Then, that's when that system can be utilized.

Q Okay. I see that what you are telling me is that you have many alternate methods of keeping fuel pool water level up, and that's true. I recognize that.

But, you have not analyzed what would happen if you lost it or the probabilities that you might be able to lose all of these separate things, I take it?

A No.

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Q And you haven't analyzed something like a shipping cask being dropped on top of several fuel elements in the pool or anything like that?

A (Witness Rigert) That is not even a postulated event.

Q I see.

A We have a redundant load path crane, and its pathway does not pass over the fuel. I don't know, I guess I would venture to say we wouldn't be loading spent fuel gases during a strike, either. That would be a fuel handling action that would be taking place.

Q I see.

JUDGE SHON: Thank you. I think I have come to the end of the little list that we have prepared.

Do you have anything else, gentlemen?

JUDGE KLINE: Yes.

BY JUDGE KLINE:

Q I just wanted to clarify on the question of fuel handling accidents in Dr. Cordaro's testimony or statement, on page 3, that the fuel handling accident would not result in accidents having offsite consequences, provided sufficient time has passed following the attainment of cold shutdown.

With regard to fuel handling, I wasn't clear if we got an answer as to how long that time was. I think I

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heard 14 to 22 days.

Is that the time you had in mind?

A (Witness Stergakos) That is what we evaluated assuming an equilibrium situation.

However, that could vary if we at that time take full consideration of the core history, et cetera.

Q Okay.

But as a practical matter then, in the event of a strike and then a shutdown of the reactor, and then some subsequent decision to refuel the reactor, that would not take place until sometime on that order of 14 to 20 some odd days.

A Yes, sir.

Q Okay. Now with regard to the licensing condition which specifies the end of the strike as being a time when the reactor could be brought back to power.

Is it assumed that -- or is there a basis for assuming that LERO is automatically reconstituted at the time that the strike ends?

Or, is there a possibility that the strike could end but LERO, for some reason would not be reconstituted?

A (Witness Cordaro) That assumes that LERO is reconstituted with the strike end. We would not start up the reactor if, indeed, that wasn't the case.

Q Is it possible to define, with regard to the fission product inventory in the core and its decay rate,

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is it possible to define a time after commencement of shutdown procedures wherein one didn't have to rely on any engineered safety features at all, that the laws of nature simply prevented an accident with offsite consequences?

And by that I mean that the amount of energy generated, or the amount of fission product existing was simply too low to create an offsite consequence?

A (Witness Rigert) It would be too long a time to consider for this action.

Q Too long a time. So you are dependent on engineered safety features?

A Yes.

Q How does the reactor core -- at what time in the decay of the reactor core which is operated at full power and near equilibrium, how long does it take to decay to a level which is equivalent to 5 percent power at operation without any decay?

A Seconds.

Q Seconds?

A It passes through that point very quickly.

Q It passes through that point quickly. Okay.

A Well, 30 seconds.

Q Well, discuss it and then answer it again.

(Witnesses conferring)

Q Okay, go ahead.

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A 10 seconds.

A (Witness Stergakos) 10 seconds.

Q We are a little confused now. I thought I asked with respect to fission product inventory. Did you answer with respect to inventory or power?

A (Witness Rigert) Heat production.

Q How about the fission product inventory?

Or at least the gross disintegration rate? That's a little harder to answer?

A (Witness Stergakos) It is harder, and I wouldn't attempt to do an analysis on it.

JUDGE SHON: I think that was the question that I had asked you rather early on that you said you could not answer offhand. I can understand why.

BY JUDGE KLINE:

Q Do you understand now? I am not comparing the case of the reactor at full power shutdown with the case of the 5 percent power in shutdown. But, I am comparing the case of the full power reactor being shut down with the 5 percent case in operation at 5 percent.

A (Witness Stergakos) If the reactor is still at full 5 percent power, there the fission products more or less are as you are at -- well, lower than that, but they are quite high.

Here the fission products will have, after 24

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hours, decayed drastically because most of the half lives we are dealing with, except one or two, they are in the terms of hours.

So, within seven half lives, for example, you are down one hundredth of the original value. So, when you are at 5 percent power, you are still generating fission products. When you shut down you don't generate fission products.

Q I understand that. I just want to know when the curve intersects the level that the 5 percent operating reactor is at.

When the decay curve intersects that.

A I do not know. But at 5 percent power you still have a lot of -- the curve drop would be very small compared to 100 percent power.

Q Okay.

During this past strike, when it was necessary for management to take over some of the operation, what kind of work schedules or shifts did management follow?

A (Witness Cordaro) Well, in general, companywide, we started off in the first week with a 12-hour day, seven days a week.

And, after the first week, we started to back off from that and we went to a six-day week, 12-hour day.

At that point, we started to cut back on a

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case-by-case basis depending on the nature of the job. Some people went to 10-hour days. Some people in nonessential functions went to 8-hour days. So, it varied depending on the need.

But the initial attempt was to put enough people in the field, putting enough hours in, so we could neutralize the effect of the strike immediately, and then learn and take actions from there.

As far as the plant staff is concerned, we didn't have an operating plant, although they were on in a strike schedule.

Perhaps John, you could mention exactly what that was.

A (Witness Scalice) We were working, as Dr. Cordaro has stated, initially a seven-day week, 12-hour day.

And then did cut back to six days a week, 12 hours.

And in some cases, even with the operating crew, personnel that were operating the equipment and maintaining the surveillances that we do, that would be equivalent to those in a cold shutdown condition, some people even went down to five days, 12 hours a day.

And, inbetween, depending on circumstances of individuals.

Q Okay. I'm looking at, in the exhibit, EP LILCO Exhibit 77, section 6.2.2 Part F, which indicate administrative

mm7

procedures governing shift staffing, and I am wondering if you have plans as to how reactor operators would be treated, or management in lieu of reactor operators would be treated in the event of a strike with regard to work hours, consecutive days of work and that sort of thing.

And I would like you to comment on that.

A Yes, sir, we have.

In my answer to discovery request I had stated that four rotating shifts were available with five licensed senior reactor operators on each shift.

That four rotating shift complement would allow us to maintain the hours as indicated in the technical specifications where no individual worked more than 16 in 24; 24 in 48; or 72 in a 7-day work period.

That would be utilized in this event, too. And we have sufficient numbers to do that.

Q Okay.

JUDGE KLINE: I believe that is all I have.

JUDGE LAURENSON: Before I ask Judge Shon to consider a request for an afternoon recess, I would like to put one question-- a mixed question of law and fact on the table.

I don't request an answer now, but perhaps after the break when people get a chance to consider this and that is, that there is no NRC provision for a power reactor to

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operate above 5 percent power without an emergency response plan in place.

A question that the Board has is, what standard should we apply to the situation that we have before us?

In particular, are we going to be applying the standard that a condition, any condition would be as safe as the emergency response plans required under the regulation?

Should we apply a standard that says that a condition would assure that the provision is adequate?

Third, is this analogous to the low-power situation that Judge Shon addressed in some of his questions to the panel?

So, these are questions that eventually we are going to ask for briefs on when you submit your proposed findings. But to the extent that these may be mixed questions of fact and law, I want to put them on the table now so that each one of the witnesses who appears here has an opportunity to submit their views on what standards should be applied by the Board, and whether their particular proposal meets those standards.

So, with that, I would request that Judge Shon declare a recess for the afternoon.

JUDGE SHON: We will stand in recess until 4:00 o'clock.

(Recess.)

mm9

JUDGE LAURENSON: We are back on the record now.

Before we turn to the redirect examination by LILCO, I will just inquire whether anyone on the panel of witnesses has anything to offer in connection with the mixed question of law and fact that I raised before our afternoon recess?

WITNESS CORDARO: I will try to stay away from the legal aspect of things.

Our initial reaction to this is that you know the situation posed from an emergency planning standpoint, the 5 percent power case, represents a more challenging situation from emergency planning standpoint, than the condition of a reactor operated at full power, which has been at cold shutdown.

We say this on the basis of the condition's presence to the fact that the reactor is at pressure and temperature -- there are many more initiators of the kinds of accidents that we fear in the emergency planning case.

One thing that we want to do, however, to also satisfy one of the questions that went unanswered, one of the Board questions, we want tomake an attempt to see and to quickly calculate what the fission product inventories are in the 5 percent case.

And in the case of a reactor operated at full power, which has been brought to cold shutdown. So that we

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would have that missing factor in this to further support our judgment in this regard.

And, we will try to have that for you tomorrow.

JUDGE LAURENSON: Thank you, Dr. Cordaro.

Mr. Zeugin, any redirect?

MR. ZEUGIN: Yes, I think I have one question.

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REDIRECT EXAMINATION

BY MR. ZEUGIN:

Q Dr. Cordaro, if there were a strike by LILCO unions, what kind of offsite response could be mounted by LERO?

A (Witness Cordaro) Yes. We have to recall that there are many facets to the LERO organization and the LERO function, and that there are one-third of the somewhat 1700-odd people in LERO, are management people.

In the event of an accident, theoretically LERO could perform many of its functions. The EOC could be manned, public information center could be manned, the dose assessment function could be carried out, EBS messages could be broadcast, the sirens could be activated.

The only area that we would have problems, because of the fact that union people are used to staff these functions, is in the traffic guide area, and the principal areas and in the busdriver areas, because those are, as I said, staffed by union people.

mm11

However, it would be possible to perform the other functions I cited, and to alert the public of the need to take an action even though we couldn't provide the bus service or the service of the traffic guides.

MR. ZEUGIN: Thank you, Dr. Cordaro.

LILCO has no further redirect questions.

JUDGE LAURENSON: Any further questions by the County, Mr. Miller?

MR. MILLER: Just a few, Judge Laurenson.

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RECROSS EXAMINATION

BY MR. MILLER:

Q Dr. Cordaro, let me follow up on that last remark. I am not sure. Are you now saying that in the event of a strike, LILCO could still rely upon LERO to carry out off-site response functions with the exception of the traffic guide and the busdriver duties?

A (Witness Cordaro) Yes.

What I am saying is certain LERO function could be carried out, even in a strike situation and the nonparticipation of union help.

end T13

Sim 14-1

Q So I gather you are telling us now that the roughly 600 management personnel that make up LERO could carry out all functions under LERO with the exception of traffic guides and the bus driver functions?

A (Witness Cordaro) The primary functions. Of course, there are some clerks in the office and secretaries, which are part of the union and wouldn't participate, but I am assuming their functions could be taken over by others.

The most important functions carried out by the union personnel are the bus driving function and the traffic guide function.

Q Well, doesn't LILCO rely on union personnel to carry out essentially all of the field personnel functions under LERO and that would include traffic guides and bus drivers but also jobs such as route spotters and road crews and route alert drivers?

A Yes. I didn't want to get into too much detail. Of course, there are some other functions where union personnel do perform a function. But from a vital standpoint and to summarize in a brief fashion, I made the judgment that the major functions from a numbers standpoint, if nothing else, are the bus driving functions and the traffic guide functions. We have something like 150-odd traffic guides, and maybe even 200 trained, I am not sure of that, and there is roughly four to five hundred bus drivers. So there is 700 people

Sim 14-2

right there in the function. So primary union involvement is in those two important fucntions.

Q Well, assuming the worst case scenario, that is the general emergency requiring evacuation of the 10-mile EPZ, are you saying that in the event of a strike LERO could still be activated and carry out the functions necessary to an evacuation under the LILCO plan?

A No, that is not what I am saying. Of course, not in the optimal sense, but LERO could be activated and could perform certain functions such as alerting the public of the need to evacuate which would be a very important function, sounding the sirens and then broadcasting the EBS message.

Q But on the other hand, a number of functions, some of which we have now gone through, could not be carried out absent the union members of LILCO?

A That is correct.

Q And, Dr. Cordaro, I want to make one more attempt to clarify the licensed condition, one particular part of that proposed licensed condition, if you have it in front of you.

There is a statement. It is about seven lines down where it talks about LILCO shall commence bringing Shoreham to cold shutdown condition 24 hours prior to the commencement of such strike. So you see that?

A Yes.

Sim 14-3

Q It is the commencement of bringing the reactor to cold shutdown that I want to clarify. Is the commencement of cold shutdown the beginning of the sequence of steps outlined in Mr. Scalice's affidavit in paragraph 5, or is the beginning when those steps have been completed and the switch, mode switch is put in the shutdown position?

A No, I think it is the beginning of those steps, plus any preparatory steps which Mr. Scalice has to take, and I defer to him if he has any specific initial steps that he would take even above and beyond what is listed in the procedure.

A (Witness Scalice) No. What that meant to say was that we would commence shutdown. The steps were outlined in my affidavit that said that we would. For instance, the first step was to commence the reduction of reactor recirculation flow to reduce power. That is what we meant by commencing shutdown to cold shutdown.

Q Let me just ask that question of clarification of Mr. Stergakos or Mr. Rigert. The propsal Dr. Cordaro made about your attempts this evening to come up with the calculations on fission products, do you intend to try to make that in terms of curves?

A (Witness Stergakos) No.

Q How do you intend to make your calculations then?

Sim 14-4

A I didn't say I was going to make calculations. The information might exist in our files pertaining to other studies that we have done because this is information that we might have presently and we will look at the five percent power inventory of fission products and at zero percent power after some decay and we will give the Board the answer which was asked of us.

If we do not have that, then we will try to do something. To contemplate what I will do tonight, I can't go beyond that.

A (Witness Cordaro) We are also going to concentrate our attention on the radioactive isotopes that are important from an emergency planning standpoint.

A (Witness Stergakos) Yes, that is true.

MR. MILLER: Judge Laurenson, we have no further questions.

JUDGE LAURENSON: Any other questions?

MR. ZAHNLEUTER: Yes.

JUDGE LAURENSON: Mr. Zahnleuter.

RECROSS-EXAMINATION

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BY MR. ZAHNLEUTER:

Q Dr. Cordaro, could you look at paragraph 3 of your affidavit that deals with the possible impairment of LERO in the event of a LILCO strike.

Do you still subscribe to the statements in that

Sim 14-5

paragraph?

A (Witness Cordaro) Yes.

MR. ZAHNLEUTER: Thank you.

No other questions.

JUDGE LAURENSON: Anything else, Mr. Hassell?

MR. HASSELL: The staff has no questions.

JUDGE LAURENSON: No further questions from LILCO?

MR. ZEUGIN: No further questions.

JUDGE LAURENSON: All right. At this time then the LILCO panel is excused.

(Witness panel excused.)

I understand that under the arrangements that are being made then that one or more members of the panel will be back tomorrow morning to fill us in on what you have found and come up with overnight.

The Board has considered the New York motion to reconsider the ruling concerning the order of witnesses. While again we reiterate the fact that we are sorry that New York was omitted from the conference call yesterday and that it was inadvertent, nothing presented in the argument changes our decision concerning the order of witnesses.

So the next witness will be the County's witness on the sua sponte issues, and I understand their witness is Mr. Minor.

Sim 14-6

MR. McMURRAY: Judge Laurenson, at this time the County would like to suggest that for the balance of today we forego any cross-examination or testimony by Mr. Minor and talk about the procedural issues.

As the Board is aware, the staff is not scheduled to appear until 11 o'clock tomorrow morning.

Mr. Minor, it is only going to take about 20 minutes to put on the County's direct case. I have been told by the staff that they do not intend to conduct any cross-examination, and as far as LILCO goes, their estimate is between one hour and two hours, depending on what Mr. Minor says.

Given the gap of time we have tomorrow morning, I would like to suggest that we go ahead with Mr. Minor tomorrow morning and that we do the procedure now, which is scheduled to be heard anyway just 45 minutes from now and not break up Mr. Minor's testimony.

MR. HASSELL: I just have one minor correction. I said I didn't contemplate any cross.

MR. ZEUGIN: Judge Laurenson, I guess I would object to the request of Suffolk County and perhaps I could provide an alternative, and that is that Mr. Minor is only going to take 20 minutes to have his direct case on and I would suggest that we put the direct case on this evening and put off cross-examination until tomorrow morning.

Our estimate of an hour to two hours was based pretty much on conjecture about what Mr. Minor may say. At his deposition on Friday there were a number of issues that Mr. Minor stated that he had either not formed an opinion as of yet or had only preliminary views.

So, therefore, guessing the time required for cross-examination is to a certain degree like shooting in the dark because we are still somewhat unclear as to what Mr. Minor's positions are. It may be that we have very little cross-examination. But I think it would be far more beneficial to have the direct testimony put on this evening and then any cross-examination that needs to be conducted conducted tomorrow morning, because in any case following the presentation of the direct testimony, we would ask for a little bit of time to think about cross-examination we would like to ask Mr. Minor.

MR. McMURRAY: Judge Laurenson, while I don't have any problem with LILCO asking for a break after Mr. Minor testified, I don't think it is fair to let LILCO have overnight to consider whatever cross-examination it wants of Mr. Minor. The County didn't have that opportunity, and I just renew my request.

MR. ZEUGIN: I would merely note at the deposition on Friday I informed the County, with the exception of the questions I asked orally, exactly what LILCO was going to

Sim 14-8

put on as its direct case. I told them we were going to submit the affidavits and I also told them the other two exhibits.

So they weren't that surprised.

JUDGE LAURENSON: Let me ask for an update from the NRC staff concerning the availability of its witnesses. Is it still your position that your witnesses will not be available prior to 11?

MR. HASSELL: That is my current understanding, Judge Laurenson.

JUDGE LAURENSON: Is that because they are not here?

MR. HASSELL: They are not physically here, right.

(Pause while the Board confers.)

JUDGE LAURENSON: Before we rule on this request, we have a question for the County's attorneys, and that is to tell us exactly why you are requesting that Mr. Minor be held over until tomorrow morning. Is it just a matter of the scheduling that you are talking about, or is there some reason that Mr. Minor is not prepared to present his testimony this afternoon?

MR. McMURRAY: Judge Laurenson, I think there are two factors. First, we don't want to break up his testimony, that is either have his direct testimony presented today and have him cross-examined tomorrow, or have his cross-

Sim 14-9

examination cut off sometime in the middle.

Furthermore, it is somewhat a question of preparation. As you know, the County has informed the Board that this schedule has placed some burdens on the County and its experts in preparing its case, and that is still true despite the fact tnat the issues have been narrowed.

The County, if it were to go forward, would put on Mr. Minor today. But if we could have the opportunity to prepare our case a little bit better overnight, I think that the County's case would be just that much stronger and that much more focused.

So it is a question of preparation.

(Pause while the Board confers.)

JUDGE LAURENSON: All right, we will grant the County's request. We will hear Mr. Minor the first thing tomorrow morning at 9 o'clock.

As long as we are still talking about scheduling for this week, do any of the parties have any estimates concerning the length of time that we will take to hear the testimony of the NRC staff witnesses?

MR. HASSELL: I think the NRC's direct case should last approximately 20 minutes.

MR. McMURRAY: Judge Laurenson, there hasn't really been any discovery of the NRC staff other than some discussions with Mr. Hassell. So it is really hard for me to say how

Sim 15-10

long it is going to take, but I cannot see it taking any longer than the cross-examination of LILCO's panel today and it would probably be shorter.

JUDGE LAURENSON: How about LILCO?

MR. ZEUGIN: I expect we will have very few questions of the staff, a half hour at most.

JUDGE LAURENSON: Okay. Then we are quite certain to be finished with the case tomorrow afternoon then. Is that a fair statement?

MR. McMURRAY: Yes.

JUDGE LAURENSON: All right. I think we are ready then to discuss the other issues that we have talked about. There won't be any further testimony this afternoon.

I would suggest that after we finish this discussion that counsel get together and decide how to work in the LILCO panel on just that one question that they are going to be looking into tonight.

As to the other issues, we have some housekeeping matters and we also plan to hear oral argument on the Suffolk County motion to admit a new contention. We did receive the LILCO written response to that yesterday, but I think it was by agreement that the NRC staff and the State of New York would present their arguments in oral form here today.

So let me ask counsel whether you want to go

Sim 14-11

ahead with the oral argument on the motion to admit a new contention first or would you rather take up the housekeeping details of closing the record here?

No one seems to have a preference?

MR. ZAHNLEUTER: I am prepared.

JUDGE LAURENSON: All right. We will go with the oral argument then. We will first hear from New York and we will then hear the NRC staff. Then we will be taking up the other matters that have been on our continuing calendar here.

Mr. Zahnleuter.

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MR. ZAHNLEUTER: The State supports the County's motion to admit the new contention. The County's motion is not a motion to litigate the normal attitudes or motivations of the members of LERO, but the new contention expressly limits itself to the effects of a strike involving the LILCO workers who are members of LERO .

We heard testimony today from Dr. Cordaro that LILCO was concerned about pre-strike departure from work problems, including vandalism and nuisance activities and other problems associated with bad attitudes.

This new contention emphasizes that LILCO also must be prepared to deal with post-strike return to work problems. These problems range from the failure of LERO to reconstitute itself, as Judge Kline mentioned earlier today, to the operational and motivational deficiencies of LERO should it be able to reconstitute itself.

The State was interested in litigating this subject ever since the State submitted, along with the County, the discovery request on August 1st. However, at the conference of counsel on August 8th, the State was informed that this subject was not envisioned by the Board when the Board issued its order of July 24th.

Nevertheless, the Board's order did state at page 3, that the Board finds that the issue of whether the current strike and the potential for future strikes by union

members of LERO impair the ability of the Applicant to implement the response to a radiological emergency is a serious question affecting the public health and safety.

The new contention is a fair variation of this theme. Accordingly, the State urges that the Board admit the new contention.

JUDGE LAURENSON: Thank you. Mr. Hassell?

MR. HASSELL: Judge Laurenson, after reading LILCO's answer to the motion of Suffolk County to admit new contention, the Staff realizes that it has not much to add. Essentially, the outline I have prepared contains all of the same reasons that LILCO has set forth in its August 27th 1984 motion, except in one significant respect.

With respect to 10 CFR 2.714 A.1, there are five factors that are set forth for governing the late filed contentions. With respect to factor 2, the availability of other means whereby the petitioner's intest will be protected, we believe that the County has met its burden with respect to Factor 2, but has not met its burden with respect to Factor 1, that is, good cause if any, for failure to file on time, for the reasons set forth in LILCO's answer.

And it has failed to satisfy its burden with respect to Factor 3, the extent to which the petitioner's participation may be reasonably expected to assist in developing a sound record, and we do not believe that the

County has met its burden with respect to Factor 5, the extent to which the petitioner's participation will broaden the issues or delay the proceeding.

And I have really nothing to add to the reasons that are set forth in LILCO's answer, dated August 27, 1984.

JUDGE LAURENSON: So the Staff's position is the same as LILCO's in terms of the final recommendation; that is, the Staff opposes the admission of this contention?

MR. HASSELL: The Staff does oppose the admission with respect to the County's failure to carry its burden, with respect to three of the five factors, not four.

JUDGE LAURENSON: All right. Any further argument concerning this? I don't know if there is anything new that required any response by the County.

(Note: No response.)

Let's turn to the matter of the page limits of findings of fact and conclusions of law. After we heard the arguments here last week, the Board realized that one matter was raised that we hadn't previously considered, and that was the question of whether there should be a page limit on the reply brief filed by the Applicant. We have set up a five hundred page limit for the initial filings of all parties, but we haven't set any limit on reply, as it was pointed out in the argument last Thursday, I believe, and we wanted to raise this at this time as to whether this

is a matter that should be set forth with a page limit.

Whether that page limit should be a total aggregate amount of pages, which the Applicant could then divide among its two briefs, or whether, in fact, LILCO should be given an additional amount of pages to file the reply brief, since the NRC regulation gives it the right to file an additional brief.

So, I am sure there will be agreement on this subject, --

MR. CHRISTMAN: You can count on it. I can't imagine why I would argue in favor of imposing page limits on myself, because I propose to use self-discipline in that regard. I propose that we live by the original page limits that were set down, which I believe is five hundred pages per person, and that there be no limit on our reply as far as the pages.

I will sure try to exercise self-discipline, but the reason for my proposal is that we have the burden of proof and we have the multi-billion dollar facility out there that is at risk, and that is the short of it.

JUDGE LAURENSON: Let's just take a wild assumption that the Board decided to set some page limit for the reply.

Let me ask LILCO if they have a number that they would like to have the Board consider under that

circumstance.

MR. CHRISTMAN: Well, since a reply brief depends so much on the answering brief, which of course we haven't seen, it is very difficult, but I would say minimum 250 pages.

JUDGE LAURENSON: Does everyone agree with that?

MR. McMURRAY: I am sure it comes as no surprise to the Board that we don't. Judge Laurenson, the fact that LILCO has the burden of proof, and that it has a multi-billion dollar facility, I don't think gives it the right to more pages or more due process than any other party. If the Baord, in fact, is inclined to impose page limits which we, of course oppose, then those page limits should apply equally to all parties, and whatever page limit is imposed, LILCO should divide that page limit between its initial brief and its reply brief.

The County and the State are in the position of also having to reply to a brief, that is, LILCO's brief. We are going to have to do that within the five hundred pages allotted to us. There is no reason why LILCO should not have to do that.

When I use five hundred pages, I hope I was speaking theoretically.

MR. ZAHNLEUTER: The County's suggestion seems to be a good one. It is true that the regulations assign the

burden of proof to LILCO, and it is true that the regulations give LILCO the opportunity to submit a reply brief, but the regulations don't mention at all a page limitation,

So, I think that in light of a page limitation, you have to consider that things should be equal. And again, the County's suggestion is a good one.

JUDGE LAURENSON: Does the Staff have a position on this?

MR. BORDENICK: In the Staff's view, we believe of course, that any page limitation that the Board sets for the findings in chief ought to be equal, but we don't think that LILCO's reply findings should necessarily be included in whatever page limitation the Board sets.

On the other hand, it strikes me that 250 pages to respond is quite much, and so I would suggest that the Board think in a smaller number of pages. I don't have a specific number in mind. But 250 did strike me as being excessive for purposes of reply findings.

So, I don't have a specific recommendation. I think it is clearly within the Board's discretion to set page limitation for the reply findings.

So, in summary, I don't think that the reply findings ought to come out of the page limitation for their findings in chief, whatever ultimately the Board decides on that, but I think 250 pages to reply to, say, 500 pages of

findings by the County, State, and Staff might be a little excessive.

JUDGE LAURENSON: Does anyone else have anything they wish to submit to the Board for consideration on the question of establishing the final order concerning the schedule and the page limits for the findings of fact and conclusions of law.

We have been through this several times, and we have said that we are still flexible up to this point, but when the hearing is over, and that will be tomorrow, we set our final order concerning this. As far as the Board is concerned, at that point the matter is then set in concrete and it is going to take some rather unusual circumstances to affect any change, and we just don't anticipate any such change being made.

So, this is the last opportunity as far as we are concerned. If there is something that hasn't been said that we should consider, this is your opportunity to do that.

We will announce our decision on these two factors tomorrow. As far as the motion to admit a new contention, we will not decide that here. That will be a written order which we will issue when we get back probably next week some time.

All right. Let's turn then to the other matters that we carried over from last week. I think there was some

discussion about the submission this week of a uniform table of contents. Has that been completed?

MR. CHRISTMAN: Yes, sir. I believe so. We have copies of this document I can give to the Board right now if you would like to see it.

I will just hand it out now. I have a correction, I guess, to make in it, but it is essentially the way you will see it, and let the record note that I am handing to the Board a copy of my letter of August 24, 1984 to Messrs. Bordenick, McMurray and Zahnleuter, along -- asking them for a final review of the attachment, which is a three page document headed, Table of Contents, and I should also note that Mr. Zahnleuter pointed out to me today, and I will check this, but I believe that under Item Roman X, Relocation Centers, where one of the contentions listed is 24.D, that should be 24.O. I think that is a typo.

JUDGE LAURENSON: Is it correct that this is agreed to by all parties?

MR. ZAHNLEUTER: Well, this morning I also mentioned to Mr. Christman that I thought 24.F.2 belonged in the category of Buses for the Public, underneath the category, Evacuation, rather than Schools.

And I thought that there was an agreement on that.

MR. CHRISTMAN: I think that is right. 24.F.2 is

as you said, and the rest of 24.F is under Schools, and I believe there is agreement on that.

JUDGE LAURENSON: I am sorry, I didn't follow that. Have you made the change in here, or are we supposed to do that by inter-lineation.

MR. CHRISTMAN: Let's do it by inter-lineation. Under -- I was mistaken, it is a two-page table of contents, and on the second page where you will find evacuation, Item d,-- that is Roman IX, Item d is Buses for the Public. In addition to 24.I. we should have 24. F.2, between 24.I and 67, and under Schools, which is Item 12, you can leave that the way it is. The rest of 24.F is under schools, and that is already shown.

So, the two corrections that need to be made in short, are under Item Romar IX, D, add the Contention 24.F. 2, and under Item Roman X, make 24.D as in Dog, into 24.O, as in onery.

JUDGE LAURENSON: With those corrections, is there now agreement among all parties that this will be the Uniform Table of Contents for the submission of proposed Findings of Fact and Conclusions of Law?

MR. McMURRAY: The County agrees.

MR. ZAHNLEUTER: The State agrees.

MR. BORDENICK: Judge Laurenson, I don't think there is going to be a problem, but I have yet to see

the final version. I would like a few minutes to review that before I sign off on it.

I don't think there is a problem.

JUDGE LAURENSON: Well, we will assume that the NRC Staff also concurs, unless you tell us otherwise before we conclude the hearing.

MR. BORDENICK: That will be satisfactory. I don't think there would be a problem, but I would like to see it. We can let you know for sure in the morning.

MR. CHRISTMAN: I will give you a copy.

JUDGE LAURENSON: Is there any proposed date for the submission of the other three lists that we have talked about or appendices?

MR. CHRISTMAN: Yes, sir. We have those other three documents. They should be completed this afternoon, but only up through the hearings of, I believe, last Tuesday. I propose that we bring those up to date up to the end of the hearings through tomorrow, and circulate them to anybody who wants a copy, say, early next week; perhaps Monday or Tuesday.

Now, nobody but us has seen those documents, so it would have to be subject to other parties piping up if they find a mistake in it.

JUDGE LAURENSON: This is going to be available tomorrow morning, at least the initial draft?

MR. CHRISTMAN: Yes. But the initial draft only covers the hearings through about a week ago. There will be a document ready by tomorrow.

JUDGE LAURENSON: Is there any objection to this proposal?

MR. McMURRAY: Well, if I understand the proposal, it is that the parties will be able to see this I guess a draft tomorrow, and then the final sometime early next week, and as long as we are able to look at it and agree to the format and its accuracy, then I have -- I just need a few days to do that.

MR. CHRISTMAN: Actually, I don't see a whole lot of need to circulate a 95 percent copy tomorrow. I would rather wait and do the whole thing on Monday, and yeah, I would certainly propose that the parties could look at it, and if they have problems with it, speak up. But I propose to wait until Monday and circulate a document that covers the entire course of the hearings?

Oh, sorry. Monday is Labor Day, I guess. Make it Tuesday.

JUDGE LAURENSON: All right. Then you would expect to have agreement reached by the end of next week on a final copy of those?

MR. CHRISTMAN: Don't see why not.

JUDGE LAURENSON: Is everyone going to be available

next week to review this?

MR. McMURRAY: I will be available to review it, and I don't see why there wouldn't be agreement.

JUDGE LAURENSON: We will carry this then for September 7th reporting date that the Board will expect to hopefully have the final documents on the 7th, but in any event, if there is a problem to at least receive a report from the parties.

Just for the record, these three documents are the exhibit list, the witness list and the sequence of witnesses.

MR. CHRISTMAN: And I take it the Board doesn't need to see our first attempt next Tuesday. That should just go to the parties, and you are willing to wait until they have had a chance to look at it.

JUDGE LAURENSON: That is correct. I think Mr. Christman was going to report to us on Revision 3, how to put it in the record?

MR. CHRISTMAN: Right. But it is not a very exciting proposal. I propose to put into the record two documents; the first document I would put into the record is the package of insert pages. That is, the amendment that constituted the difference between Rev. 2 and Rev. 3.

That is, the inserts that if inserted would make Rev. 2 into Rev. 3, and secondly, I would propose to

insert into the record a complete copy of Rev. 3 -- that is, the entire document. So if someone in the future has that record and wants to go have a complete set, he would have that.

If somebody in the future wanted to go and point out how voluminous or unvoluminous the change between Rev. 2 and Rev. 3 was, he could do that. In short, just about any configuration that he wanted to find he could find in the record.

Obviously, he could also find Rev. 2 if, for some reason he wanted to, because that is already in. I guess I would propose to designate the amendment as LILCO Exhibit -- if we do it now it would be 79, and a complete set of Rev. 3 as LILCO Exhibit 80, and that Exhibit 80 would be a four volume set, consisting of two volumes of procedures, one of the plan, and one of Appendix A.

JUDGE LAURENSON: Is this agreed to by all parties?

MR. CHRISTMAN: I have a letter from the County agreeing, but I think maybe the other parties may not have agreed.

MR. BORDENICK: The Staff has no objection.

JUDGE LAURENSON: Does the State have any objection?

MR. ZAHNLEUTER: The State agrees.

MR. CHRISTMAN: Would you like to designate them -- give them the numbers I suggested now, and we will provide them to the docketing and service section, or the court reporter, or whoever needs them.

JUDGE LAURENSON: Okay. These, obviously, will not be transcribed or bound anywhere. They will become part of the official record on the case.

MR. McMURRAY: Judge Laurenson, I am not quite sure what letter Mr. Christman is referring to, but I don't see any problem with this.

MR. CHRISTMAN: The letter of April 10, 1984, from Carla Letsche to me, saying: This is in response to your letter to me and Larry dated March 28, 1984 which contained the proposal for putting Rev. 3 of the LILCO plan into the record. We have no problem with your proposal.

And the proposal I made was the one I recited to the Board.

MR. McMURRAY: Like I said, I don't think we have any problem with this.

JUDGE LAURENSON: All right. For the record, LILCO Exhibit EP-79 will be identified as the insert pages which are used to transform Revision 2 to Revision 3, and then LILCO EP-80 will be a complete set of Revision 3, is that correct?

MR. CHRISTMAN: That is absolutely correct.

JUDGE LAURENSON: And there is no objection to the admission in evidence of LILCO Exhibits 79 and 80, and they will be received in evidence and become part of the record in this case.

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(The above referred to documents identified as LILCO Exhibits EP-79 and EP-80, are received in evidence.)

(Above referred to exhibits are not bound into the transcript.)

End 15.
Sue fols.

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MR. CHRISTMAN: Thank you.

JUDGE LAURENSON: Have the parties agreed upon a date and procedure for correcting errate in the transcript?

MR. CHRISTMAN: We haven't really agreed on it, but I make the following proposal. I think we should -- we will be making proposed transcript corrections as we go through the transcripts and do the findings. So, I don't think it's very feasible for us to submit proposed transcript corrections until the time that we submit our initial proposed findings.

And one proposal might be that the Applicant submit its proposed transcript corrections. The other parties could then either object to those, any of those that they found wrong in their judgment, and also supplement them as they saw fit along with their findings.

JUDGE LAURENSON: All right. If you haven't discussed any specifics I would suggest before we spend a lot of time on the record today talking about this that perhaps when we adjourn this session you could work out the dates and procedures, and we could wrap this up tomorrow, then.

Is that agreeable?

MR. CHRISTMAN: Sounds fine.

MR. MC MURRAY: That's fine.

JUDGE LAURENSON: The last thing I have on the

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list is how to put the videotapes that were submitted to us concerning training into the record.

MR. CHRISTMAN: Right. We do not propose that they be bound into the transcript. For the record, the videotapes, there are four in number. They were consisting of Modules 1, 3, 8-A and 14, which were labeled Attachments 28, 29, 30 and 31, respectively, to the LILCO training testimony.

We propose to treat them like a murder weapon or steering gear on an automobile and submit one copy of those with a label attached to the Docketing and Service Section. The parties involved in this proceeding already have their own copies and we think it's just a mechanical problem of slapping a label on one additional set and sending it to whoever is the custodian of the official record in these cases. I think the Docketing and Service Section perhaps.

JUDGE LAURENSON: Is that agreeable?

MR. MC MURRAY: I do agree with Mr. Christman's suggestion that the training tapes be treated as a murder weapon.

(Laughter.)

And I think what he is proposing is reasonable.

JUDGE LAURENSON: Mr. Zahnleuter.

MR. ZAHNLEUTER: The State agrees.

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MR. HASSELL: Staff agrees.

JUDGE LAURENSON: All right. This completes my list.

MR. BORDENICK: Judge Laurenson --

JUDGE LAURENSON: Yes.

MR. BORDENICK: Just to close the loop, I have had a chance to look at the Uniform Table of Contents. I have no problem with it.

JUDGE LAURENSON: Okay. One other thing, when we were talking before about the reply findings submitted by LILCO, I don't think we specified in any great detail what those should contain. But I guess this is the time where we should indicate that we do indeed -- will indeed hold LILCO to a reply, and that is that they must address specific proposed findings by paragraph number asserted by the County, that no new material may be submitted in such reply findings that is not indeed a reply, and that we will adhere to that rule.

I don't think there should be any doubt about that, but that rule will be enforced by the Board.

Are there any other pending matters that should be discussed or decided before the hearing ends tomorrow?

(No reply.)

All right. We will be adjourned until 9 a.m.

#16-4-SueT

(Whereupon, at 4:49 p.m. the hearing is adjourned, to reconvene at 9 a.m., Wednesday, August 29, 1984.)

* * * * * * * * * * *

ENDDDDDD

CERTIFICATE OF PROCEEDINGS

This is to certify that the attached proceedings before the NRC COMMISSION

In the matter of: Long Island Lighting Company, Emergency Planning

Date of Proceeding: Tuesday, August 28, 1984

Place of Proceeding: Hauppauge, New York

were held as herein appears, and that this is the original transcript for the file of the Commission.

Garrett J. Walsh, Jr.
Official Reporter - Typed

Garrett J. Walsh Jr.
Official Reporter - Signature

MYRTLE H. TRAYLOR
Official Reporter - Typed

Myrtle H. Traylor
Official Reporter - Signature

MARY SIMONS
Official Reporter - Typed

Mary C Simons
Official Reporter - Signature

MIMIE MELTZER
Official Reporter - Typed

Mimie Meltzer
Official Reporter - Signature