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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

IN THE MATTER OF:	:	Docket Nos.
CONSOLIDATED EDISON COMPANY OF	:	50-247 SP
NEW YORK (Indian Point Unit 2)	:	
POWER AUTHORITY OF THE STATE OF	:	50-286 SP
NEW YORK) Indian Point Unit 3)	:	

Westchester County Courthouse
111 Grove Street
White Plains, N.Y.
March 31, 1983

The hearing in the above-entitled matter convened, pursuant to notice, at 9 a.m.

BEFORE:

JAMES GLEASON, Chairman
Administrative Judge

OSCAR H. PARIS
Administrative Judge

FREDERICK J. SHON
Administrative Judge

A P P E A R A N C E S:

On Behalf of Licensee, Consolidated Edison Company of New York

BRENT L. BRANDENBURG, ESQ.
Assistant General Counse.

THOMAS L. FARRELLY, ESQ.
Consolidated Edison Company of New York
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On Behalf of Licensee, The Power Authority of the State of New York

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DAVID H. PIKUS, ESQ.
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On Behalf of the Nuclear Regulatory Commission Staff
DONALD HASSELL, ESQ.

On Behalf of the Federal Emergency Management Agency
STEWART GLASS, ESQ.

On Behalf of the Intervenors

Council of the City of New York
CRAIG KAPLAN, ESQ.

Friends of the Earth, Inc., and
New York City Audubon Society
RICHARD HARTZMAN, ESQ.

New York Public Interest Research Group
JOAN HOLT, ESQ.
AMANDA POTTERFIELD, ESQ.
JUDITH KESSLER, ESQ.

C O N T E N T S

C O N T E N T S (Cont'd)

EXHIBITS

NUMBER		IDENTIFIED	RECEIVED
PA-45	N.Y. Times magazine		12442
PA-46	Diagnostic & Statistical Manual	12450	12454
UCS NYPIRG 16			12481

JUDGE GLEASON: If we can proceed, please. I believe the staff witnesses are next in order.

Mr. Hassell?

MR. HASSELL: The staff would like to call Mr. Schwartz and Mr. Sears.

JUDGE GLEASON: Will you gentlemen please step forward.

Mr. Sears, I think you have been sworn in before.

MR. SEARS: Not in his hearing.

Whereupon

SHELDON A. SCHWARTZ and JOHN R. SEARS, were sworn by the Hearing Officer, and testified as follows:

DIRECT EXAMINATION

BY MR. HASSELL:

Q. Would each of you please state your name and occupation for the record?

A. (Witness Schwartz) My name is Sheldon A. Schwartz. I am deputy director of the Division of Emergency Preparedness and Engineering Response at the Nuclear Regulatory Commission.

A. (Witness Sears) my name is John R. Sears. I am a senior reactor safety engineer in

the Emergency Planning Licensing Branch in the Division of Inspection and Enforcement, NRC.

Q. Mr. Schwartz, do you have before you a copy of the testimony of Sheldon A. Schwartz, deputy director, Division of Emergency Preparedness and Engineering Response, NRC, concerning emergency planning contentions relating to questions 3 and 4 consisting of 6 pages, dated March 8, 1983, along with a copy of your professional qualifications, served on all the parties on March 8, 1983?

A. (Witness Schwartz) I do.

Q. Did you prepare this testimony?

A. (Witness Schwartz) Yes, I did.

Q. Do you have any changes or corrections that you would like to make in that testimony?

A. (Witness Schwartz) There are a few minor changes. On page 2, A 5, in the last paragraph, second line, the word "potential" should be "protective."

On page 4, the last paragraph, first line, near the end of the line, it should be "the TMI accident" instead of "TIM."

On page 5, the beginning of the first

paragraph, it says, " The size (about ten miles)"; it should be "after ten miles."

Q. Did you mean to say the second paragraph there?

A. (Witness Schwartz) The second paragraph, that's correct.

In the professional qualifications, the second paragraph, second line, strike "of" after "developing."

On the second page, last line of the first paragraph, it should read, "Committee subject matters for study," not "manners for study."

The last paragraph, second line, end of paren, it is "Widener University." Strike the apostrophe and the S.

The next to the last line, last paragraph, the end of the line it should read, "Pressurized water reactor."

Q. With those corrections is the testimony and statement of professional qualifications now true and correct to the best of your knowledge and belief?

A. (Witness Schwartz) Yes, it is.

Q. You adopt that testimony as your own

for this proceeding?

A. (Witness Schwartz) Yes, I do.

Q. Mr. Sears, do you have before you a copy of the testimony of John R. Sears, NRC Staff Commission questions 3 and 4 dated June 7, 1982, consisting of 59 pages, which has attached a copy of your professional qualifications, which was served on the board and parties on June 7, 1982?

A. (Witness Sears) Yes.

Q. Do you also have before you a copy of the supplemental testimony of John R. Sears relative to commission questions 3 and 4 consisting of 4 pages, which was served on the board and parties on February 18, 1983?

A. (Witness Sears) Yes, sir.

Q. Did you prepare that testimony?

A. (Witness Sears) Yes.

Q. Do you have any changes or corrections that you would like to make in that testimony?

A. (Witness Sears) Yes, sir.

Q. Do you want to begin with the supplemental testimony?

A. (Witness Sears) On page 2, in answer number 5, it says, "Provisions for tech support

center which meets the habitability conditions," not "liability conditions."

JUDGE GLEASON: Excuse me, on the supplemental, page 2?

THE WITNESS: (Witness Sears) Yes, sir.

JUDGE SHON: Mine doesn't have an answer 5 on page 2.

I am sorry, it does.

JUDGE GLEASON: Which line, sir?

THE WITNESS: (Witness Sears) I believe it is line 10 on my copy, sir.

JUDGE GLEASON: What is the correction again?

THE WITNESS: (Witness Sears) The correction is change the word "liability" to "habitability."

JUDGE GLEASON: Change "habitability" to liability," is that what you are saying?

THE WITNESS: (Witness Sears) No, sir. To change the word "liability," which is on my copy here, to "habitability."

JUDGE GLEASON: I have habitability in mine.

MR. HASSELL: Sorry.

THE WITNESS: (Witness Sears) On page 3, at the top of the page, the word should be "representativeness," N E S S.

Three lines directly below that the word "composing" should be "comparing."

That is all on the supplemental testimony.

There are some substantial changes in my prefiled testimony of June 7, 1982. On page 18, where I have

"A. 49."

Strike the word "no."

At the end of that answer, after the word "resolve," please add the following: "During the March 9, 1983 exercise I was" --

JUDGE GLEASON: Hold it now. We are trying to write.

(There was a pause in the proceeding.)

THE WITNESS: (Witness Sears) "I was an NRC observer in the licensee's control room, technical support center, and emergency operations facility. At 9:32 the con Ed" --

JUDGE GLEASON: Is that a.m.?

THE WITNESS: (Witness Sears) Yes, sir. "The con Ed emergency director declared a

site emergency and immediately communicated this declaration to off site officials. At 9:45 the sirens of the public notification system could be heard in the EOF and at 9:48 a warning message was transmitted over the Emergency Broadcast System. A public notification decision was made promptly by state --"

MR. BRANDENBURG: I am going to ask that it be repeated. The witness is talking too fast for me to copy.

JUDGE GLEASON: Excuse me, Mr. Brandenburg?

MR. BRANDENBURG: I can't write as fast as the witness is talking.

JUDGE GLEASON: Would you slow up, please.

JUDGE PARIS: Mr. Brandenburg would like the last sentence read, Mr. Sears.

THE WITNESS: (Witness Sears) "At 9:45 the sirens of the public notification system could be heard in the EOF and at 9:48 a warning message was transmitted over the Emergency Broadcast System. A public notification decision was made promptly by state and local officials, and consequently I conclude, when the appropriate

revisions are made to county plans, that the provisions of 10 CFR 50, appendix E, IV D-3 will be met."

JUDGE GLEASON: Does everybody have that addition?

All right, go ahead.

THE WITNESS: (Witness Sears) There are some further changes of substance, sir, starting on page 55, and these changes were necessary because certain contentions were then eliminated.

JUDGE GLEASON: Go ahead.

THE WITNESS: (Witness Sears) From my testimony eliminate contention 4.5 and the corresponding question, question 145. The first paragraph in the answer of 145 will be moved to an answer on page 57. So if we could just preserve that for the moment, and the only change there, just for the language, will be 10 CFR 50, appendix E, IV D-2, as follows, and repeat everything in that paragraph.

JUDGE GLEASON: Let me follow you again. You are going to move the answer over to page 57, so you are going to strike, on page 55, the answer 145 and that's it?

THE WITNESS: (Witness Sears) We are going to use that paragraph, sir --

JUDGE GLEASON: I understand, but you still have to strike answer 145.

THE WITNESS: (Witness Sears) Yes, sir.

JUDGE GLEASON: So now what do you do after you have stricken all that? Do you now go to page 57?

THE WITNESS: (Witness Sears) Yes, we will be striking everything on page 56.

MR. BRANDENBURG: How about the last two lines on 55?

THE WITNESS: (Witness Sears) Yes, sir, they will be stricken.

JUDGE GLEASON: Everything at page 56 is stricken?

THE WITNESS: (Witness Sears) Yes, sir. And on the top of page 57, that's stricken.

Then where I have answer 148, it will read as follows: "The NRC requirements for educational material are stated in," and then we will move that paragraph which we formerly had on that page 55.

JUDGE GLEASON: All right.

Q. Are you finished with your corrections?

A. (Witness Sears) Yes, sir.

Q. With those corrections, is the testimony now true and correct to the best of your knowledge and belief?

A. (Witness Sears) Yes.

MR. HASSELL: I would move the statements of Sheldon A. Schwartz and John R. Sears, together with their professional qualifications, and ask they be bound in the record as if read.

JUDGE GLEASON: Is there objection?

MS. POTTERFIELD: No objection.

JUDGE GLEASON: Hearing none, the testimony of the witnesses, as modified, will be received in evidence and bound into the record as if read.

(The bound testimony follows.)

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NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
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CONSOLIDATED EDISON COMPANY OF NEW YORK INC. (Indian Point, Unit No. 2)	)	Docket Nos. 50-247 SP 50-286 SP
	)	
POWER AUTHORITY OF THE STATE OF NEW YORK, (Indian Point, Unit No. 3)	)	

TESTIMONY OF SHELDON A. SCHWARTZ, DEPUTY DIRECTOR DIVISION OF EMERGENCY PREPAREDNESS AND ENGINEERING RESPONSE, U.S.N.R.C. CONCERNING EMERGENCY PLANNING CONTENTIONS RELATED TO COMMISSION QUESTIONS 3 & 4

March 8, 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
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CONSOLIDATED EDISON COMPANY OF NEW YORK INC. (Indian Point, Unit No. 2)	)	Docket Nos. 50-247 SP 50-286 SP
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TESTIMONY OF SHELDON A. SCHWARTZ, DEPUTY DIRECTOR DIVISION OF EMERGENCY PREPAREDNESS AND ENGINEERING RESPONSE, U.S.N.R.C. CONCERNING EMERGENCY PLANNING CONTENTIONS RELATED TO COMMISSION QUESTIONS 3 & 4

Q.1 State your name and position with the NRC?

A.1 Sheldon A. Schwartz. I am the Deputy Director, Division of Emergency Preparedness and Engineering Response, Office of Inspection and Enforcement.

Q.2 Have you prepared a statement of professional qualifications?

A.2 Yes, it is attached to this testimony.

Q.3 What is the purpose of this testimony?

A.3 The purpose of this testimony is to address Contention 3.6, in part, and Contention 4.1 related to emergency preparedness for Indian Point Unit 2 and 3.

Q.4 Describe your current role in the Division of Emergency Preparedness and Engineering Response, Office of Inspection and Enforcement.

A.4 I am the Deputy Director of the Division of Emergency Preparedness and Engineering Response in the Office of Inspection and Enforcement. In this position my role includes responsibilities for development of policy and program requirements for licensee emergency preparedness: review and evaluation of emergency plans; support for the regions and the conduct of site appraisals, inspections and emergency planning exercises; review and evaluation of FEMA findings and determinations concerning off-site preparedness; and determinations of the overall NRC evaluation of emergency preparedness.

Contention 3.6 - The emergency plans and proposed protective actions do not adequately take into account the full range of meterological conditions for Indian Point, Units 2 and 3.

Q.5 Describe the extent to which emergency preparedness for Indian Point Units 2 and 3 accounts for a range of accident scenarios and meterological conditions.

A.5 The NRC staff position is that the emergency plans and proposed potential actions for Indian Point take into account both fair and adverse weather conditions, and a range of accident conditions that include Class 9 accidents. The planning basis elements needed to scope the planning effort are (1) the distance to which planning for the initiation of predetermined protective actions is warranted; (2) the time dependent characteristics of potential releases and

exposures and (3) the kinds of radioactive materials that can potentially be released to the environment. The technical basis for each specific planning element is described in NUREG-0396, Planning Basis for the Development of State and local governments, Radiological Emergency Response Plans in support of Light Water Nuclear Power Plants, December 1978.

Contention 4.1 - The plume exposure pathway EPZ should be expanded from its present 10-mile radius in order to meet local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries.

Q.6 Describe the basis for NRC's use of a plume exposure pathway EPZ of about 10 miles for emergency planning around nulcear power plant sites.

A.6 Because of discussions during the seventies with respect to class 9 accidents and particularly the WASH-1400 document, questions arose concerning the basis for off-site emergency planning.

An NRC/EPA task force was formed in 1976 which addressed questions from State groups as to what accidents should be used to prepare emergency plans. In December, 1978, this task force issued its report, NUREG-0396/EPA 520/1-78-016, "Planning Bases for the Development of State and Local Government Radiological Emergency Response Plants in Support of the Light Water Nuclear Power Plants." The principal recommendations of this report were that a spectrum of accidents, including core melt accidents should be considered and that the task force consideration of this accident spectrum led it

to recommend the establishment of Emergency Planning Zones around each nuclear power plant. The conclusion of the task force was that no single accident should be singled out as the planning bases because of the wide variety of conditions and various accident possibilities. If one picked a single accident, even two or three accidents, one could well miss relevant points of other accidents.

The concensus of the task force was as indicated above, that a planning basis would cover a spectrum of accidents, and in this were considered all of the design basis accidents that were then used in the licensing process. All of the WASH-1400 scenarios, including the core melt sequences, were also considered. This is discussed in an Appendix to NUREG-0396.

The task force identified the emergency planning zones, and also gave some guidance on time frames and types of radionuclides which should be considered in developing plans.

Though this report was issued prior to TMI, the TIM accident was considered by the task force when they considered the comments received on NUREG-0396. The TMI accident was judged to reinforce the initial determination of the task force both with respect to the need for planning for a spectrum of accidents and with respect to the concept of and sizes of the emergency zones.

The basis for the establishment by NRC of a plume exposure pathway EPZ of about 10 miles is described in NUREG-0396; EPA 520/1-78-016 "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Power Plants," December 1978 and summarized in NUREG-0654, Revision 1, "Criteria For Preparedness and Evaluation or Radiological Emergency Response Plans and Preparedness In Support of Nuclear Power Plants," November 1980.

The size (about 10-mile radius of the plume exposure EPZ was based on the following considerations:

a. projected doses from the traditional design basis accidents would not exceed Protective Action Guide levels outside the zone;

b. projected doses from most core melt sequences would not exceed Protective Action Guide levels outside the zone;

c. for the worst core melt sequences, immediate life threatening doses would generally not occur outside the zone;

d. detailed planning within 10 miles would provide a substantial base for expansion of response efforts in the event that this proved necessary.

The NUREG-0396 report also illustrates the relative effectiveness of shelter versus evacuation at various distances, and indicates that shelter with subsequent relocation after cloud passage may be as effective as evacuation even in severe accident sequences at distances greater than about 10 miles.

Q.7 In your opinion do you believe the present plume exposure pathway EPZ of about 10 miles is appropriate for emergency planning in the vicinity of the site for Indian Point Units 2 and 3?

A.7 Yes. The selection of a radius of about 10 miles for the plume exposure pathway EPZ was made in the Commission's final emergency preparedness regulations published August 19, 1980, which reference NUREG-0396. I conclude that the rationale for selection of the plume exposure pathway EPZ described above holds for the Indian Point site.

PROFESSIONAL QUALIFICATIONS
SHELDON A. SCHWARTZ
U.S. NUCLEAR REGULATORY COMMISSION

I am Sheldon A. Schwartz, Deputy Director of the Division of Emergency Preparedness and Engineering Response in the Office of Inspection and Enforcement. My role in this position relating to nuclear reactors includes responsibilities for development of policy and program requirements for licensee emergency preparedness: review and evaluation of emergency plans associated with construction permits, operating licenses and amendments; support for the regions and the conduct of site appraisals, inspections and exercises to assure that licensee plans can be implemented review and evaluation of FEMA findings and determinations relating to offsite preparedness by State and local governments; and, determinations of the overall NRC evaluation of onsite/offsite emergency preparedness.

I am a member of the NRC/FEMA Steering Committee which is responsible for developing of policy and guidance to assure that onsite and offsite emergency preparedness is adequate.

From January to November 1980 I was on detail as the Acting Director of Radiological Emergency Preparedness Division at FEMA to carry out a number of tasks relating to upgrading of offsite radiological emergency preparedness around nuclear facilities. This detail was in response to the assignment by the President on December 7, 1979 of responsibility to FEMA for these activities. During this period I was responsible for the development of the basic regulations, policies and procedures for the radiological emergency preparedness program with State and local government. Additionally, I participated as a member of the NRC/FEMA Steering Committee that developed NUREG-0654/FEMA-REP-1, Rev. 1.

From September 1972, when I joined the Commission, to January 1980, my responsibilities in the Office of State Programs were to participate in formalization of policies involving NRC/State cooperation and liaison; development and direct administrative contactual programs for coordinating and integrating Federal and State regulatory activities; providing guidance and support to State, interstate, Regional, and quasi-governmental organizations, NRC Offices and other government agencies on regulatory matters; and, planning, directing and coordinating activities of State Liasion Officers located in the five NRC Regional Offices.

From June 1971 to August 1972 I was the Senior Consultant to the California Legislature Joint Committee on Atomic Development and Space. My primary responsibilities were to: maintain contact with appropriate public and private organizations in California, nationally and internationally, to assure that the Committee was kept informed of the latest developments in the nuclear and aero space field; prepare legislation and reports for the legislatures on current factual information regarding nuclear and aero space related subjects; and, recommend to the Committee subject manners for study.

Prior to joining the California legislature, I spent 8½ years with Aero Jet General Corporation as a designer, project manager, program manager, and senior engineer for various aero space and nuclear programs. I was specifically involved in the Nuclear Engine Program (Nerva) as well as the company's programs with commerical nuclear power plants.

I received my Bachelor Of Science Degree in Mechanical Engineering from Pennsylvania Military College (Widener's University) in 1960 and have taken advance courses at Drexel Institute of Technology and Sacramento State College. I have completed the boiling water reactor and pressurize water reactor manager courses at the NRC Training Center at Chattanooga, TN.

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POWER AUTHORITY OF THE STATE OF NEW YORK (Indian Point, Unit No. 3)	)	

TESTIMONY OF JOHN R. SEARS OF THE NRC STAFF ON COMMISSION QUESTIONS 3 AND 4 AND EMERGENCY PLANNNING CONTENTIONS ADMITTED BY BOARD ORDER OF APRIL 23, 1982 FOR INDIAN POINT, UNIT NO. 2 AND UNIT NO. 3

June 7, 1982

TESTIMONY OF JOHN R. SEARS OF THE NRC STAFF ON
COMMISSION QUESTIONS 3 AND 4 AND EMERGENCY
PLANNNING CONTENTIONS ADMITTED BY BOARD ORDER OF
APRIL 23, 1982 FOR INDIAN POINT, UNIT NO. 2 AND UNIT NO. 3

Q.1. State your name and position with the NRC?

A.1. John R. Sears. I am employed by the U.S. Nuclear Regulatory Commission (NRC) as a Senior Reactor Safety Engineer in the Emergency Preparedness Licensing Branch, Division of Emergency Preparedness, Office of Inspection and Enforcement.

Q.2. Have you prepared a statement of professional qualifications?

A.2. Yes. A copy of my statement of professional qualifications is attached to this testimony.

Q.3. State the nature of the responsibilities that you have had with respect to Indian Point, Units 2 and 3.

A.3. I have been responsible for reviewing and evaluating the Emergency Plan for Indian Point Unit No. 2 and Unit No. 3 for conformance with the planning standards and requirements of 10 CFR Part 50, Appendix E to Part 50 and the evaluation criteria of NUREG-0654, FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (NUREG-0654). As part of my responsibilities in reviewing and evaluating the Emergency Plans for Indian Point Unit No. 2 and Unit No. 3, I am also responsible for addressing Commission Questions 3 and 4, and those emergency planning contentions related to Consolidated Edison Company of New York's

(Con Ed) and Power Authority of the State of New York's (PASNY) Emergency Plans for Indian Point, Units 2 and 3 and onsite emergency planning and preparedness.

Q.4. What is the purpose of this testimony?

A.4. The purpose of this testimony is to address Commission Questions 3 and 4, the admitted emergency planning contentions related to licensees' Emergency Plans and the current state of onsite emergency preparedness. My testimony will address the licensees' state of emergency preparedness as described in the Indian Point Units 2 and 3 Emergency Plan and implementing Emergency Procedures.

Contention 3.1
Emergency planning for Indian Point Units 2 and 3 is inadequate in that the present plans do not meet any of the sixteen mandatory standards of 10 CFR 50.47(b), nor do they meet the standards set forth in Appendix E to 10 CFR Part 50.

Q.5. Do the Emergency Plans for Indian Point Unit 2 and Unit 3 describe the organization for coping with radiological emergencies, including definition of authorities, responsibilities, and duties of individuals assigned to the licensees' emergency organization? Explain.

A.5. Yes. Con Ed Emergency Implementation Procedures 1001 and PASNY Emergency Plan Procedures, pages VI through XVI describe the responsibilities and the actions required by plant personnel for establishing the On-Site Emergency Organization and indicate the preferred candidates to fill each position. The transition from a

normal operating organization to an On-Site Emergency Organization involves three basic steps:

(a) Filling appropriate On-Site Emergency Organization positions on an interim basis with personnel who are immediately available on site at the time of the emergency;

(b) Notifying plant personnel off-site and on-site that their assistance is required; and

(c) Filling positions in the long-term emergency organization with appropriate plant personnel as they arrive at their designated emergency response facilities.

Q.6. Do the licensees' Emergency Plans identify the State, local, federal and private sector organizations that are intended to be part of the overall response organization? Explain.

A.6. Yes. Appendices B to the Con Ed Implementation Procedures, and to the PASNY Emergency Plan Procedures contains a roster of off-site agencies, local, federal and private sector, that will be part of the overall response organization.

Q.7. Do the licensees' Emergency Plans specifically establish the emergency responsibilities of the various onsite support organization? Explain.

A.7. Yes. Section 5.2 of the Emergency Plans for both Con Ed and PASNY describe the responsibilities of both individuals and groups in the On-Site Organization. In both plans, the Shift Supervisor initially is the Emergency Director. This title corresponds to the Emergency

Coordinator of NUREG-0654, E.2. The description of responsibilities includes a description of those responsibilities that may not be delegated.

Q.8. Do the licensees' Emergency Plans delineate the relationship among the principal emergency response organizations? Explain.

A.8. Yes. Both Con Ed in Figure 5.22, and PASNY, in Figure 5-3, of the Emergency Plans include descriptions which delineate the relationship of the principal response organizations, both on and offsite.

Q.9. Do the licensees' Emergency Plans and implementing procedures contain organization assignments that are well-defined? Explain.

A.9. Yes, as stated in response to Question 5, Con Ed Emergency Implementation Procedures 1001 and PASNY Emergency Plan Procedures 1030 and 1032 describe the responsibilities and the actions required by plant personnel for establishing the On-Site Emergency Organization and include the preferred candidates to fill each position.

Q.10. Do the licensees' Emergency Plans identify an individual by title who shall be in charge in the event of a radiological emergency at Indian Point Unit 2 or Unit 3? Explain.

A.10. Yes, both Con Ed and PASNY plans state that initially the Shift Supervisor is the Emergency Director and both plans include a line of succession for the position of Emergency Director.

Q.11 Have you examined the licensees' means for providing 24-hour per day emergency response, including 24-hour per day manning of communications links? Explain.

A.11 Yes, each plant is staffed 24-hours per day, 7 days a week by a minimum staff operating crew of 11 individuals. The operating crew for each reactor will comprise the initial On-Site Emergency Organization. The Emergency Director (initially the Shift Supervisor) will assign a Communicator to notify offsite plant and corporate personnel, and other offsite agencies and organizations.

Q.12 Have you examined the licensees' provisions to respond to an emergency and to augment any initial response on a continuous basis? Explain.

A.12 Yes, the Con Ed plan at Section 9, and the PASNY plan at Section 5.3, describe technical and logistics support assistance available from each organizations' corporate staff for initial and long term response.

Q.13 Do the licensees' Emergency Plans contain adequate written agreements developed between Federal, State, local, and other support organizations concerning concept of operations, information exchange and response functions? Explain.

A.13 Yes, Con Ed and PANSY Emergency Plans contain a Mutual Memorandum of Understanding and copies of agreement letters from the following:

Verplanck Fire Protective Association - Ambulance

Verplanck Fire Protection Association - Fire

Buchanan Engine Co. No. 1, Inc.

New York State Police

Department of Energy, Brookhaven Area Office

State of New York Department of Health

Peekskill Community Hospital

U.S. Coast Guard

Q.14 Do the provisions of the Emergency Plans for Indian Point Emergency Units No. 2 and 3 and the licensees' implementing procedures which you have described in response to Question 5 through 13 above meet the planning standard of 10 CFR Part 50?

A.14 Yes, the licensees' Plan and procedures meet the planning standard of 10 CFR 50.47(b)(1) and the requirements of 10 CFR 50, Appendix E. IV.A.

Q.15 Do the licensee's Emergency Plans describe plant staff emergency assignments for all shifts? Explain.

A.15 Yes, each plant is staffed 24-hours per day, 7 days per week by a shift operating crew who will comprise the initial On-Site Emergency Organization. Con Ed Implementation Procedure 1001 and PASNY Emergency Procedures, pages vi through xvi, describe responsibilities and actions required by plant personnel for the on-site emergency organization.

Q.16 Describe the licensees' Emergency Plan provisions for an emergency coordinator?

A.16 In both Con Ed and PASNY Emergency Plans, the Shift Supervisor initially is the Emergency Director. This position corresponds to the Emergency Coordinator of NUREG-0654, E.2.

Q.17 Are the persons in the line of succession for the emergency coordinator position qualified to assume that role in the event of a radiological emergency at Indian Point Unit 2 or Unit 3?

A.17 Yes, the PASNY Emergncy Plan at Section 5.2 and the Con Ed plan at Sections 5.2.1 and 5.2.1.2, state the line of succession of trained and qualified persons to assume the role of Emergency Director.

Q.18 Do the licensees'Emergency Plans have clear definitions of on-shift personnel responsibilities for emergency response? Explain.

A.18 Yes, Table 5-1 of the PASNY Emergency Plan and Figure 5.2-1 of the Con Ed Emergency Plan list the position of the individuals on-shift and the major functional areas in which each is to operate in an emergency.

Q.19 What provisions have the licensees' made for maintaining a sufficient staff to provide an initial response in key areas to an accident at either Indian Point Unit No. 2 or Unit No. 3?

A.19 As stated in response to Question 11, each plant is staffed 24-hours per day, 7 days per week by a minimum shift operating crew who have

been trained to function in key areas in the initial response to an accident.

Q.20 Describe the provisions of the licensees' Emergency Plans for staffing the onsite emergency organization and for augmenting that staff?

A.20 PASNY Emergency Plan Table 5-1 and Con Ed Emergency Plan Figure 5.2-1 give the minimum staffing for required on-shift personnel and additional staffing within 60 minutes. Controlled copies of Appendix A to both PASNY and Con Ed Procedures contain rosters of response personnel with names and phone numbers.

Q.21 Do the licensees' provisions for staffing described in response to Question 19 and 20 satisfy the staffing requirements of Table B-1 of NUREG-0654? Explain.

A.21 Yes, PASNY Emergency Plan Table 5-1 and Con Ed Emergency Plan Figure 5.2.-1 include all the job functions in Table B-1 of NUREG-0654. The licensees have conducted surveys of all plant personnel on their travel time from home to work. The NRC staff judges that the licensees satisfy the goal of the time response called for by Table B-1, NUREG-0654.

Q.22 Do the licensee's Emergency Plans describe the interfaces among various onsite response activities and offsite support and response activities? Explain.

A.22 Yes, PASNY Figure 5-3 and Con Ed Figure 5.2-2 delineates facility designation and lines of responsibility and lines of communication for the onsite emergency organization to interface with offsite response organizations and for an integrated response by all organizations.

Q.23 Do the licensees' Emergency Plans identify the contractor and private organizations who may be called upon for assistance for emergencies? Explain.

A.23 Yes, both PASNY and Con Ed emergency plans specify that the Nuclear Steam System Supplier, Westinghouse, has an Emergency Response Plan and is available for technical assistance. In addition, Con Ed, PASNY, Niagara Mohawk and Rochester Gas & Electric anticipate entering into a mutual agreement for personnel services and technical assistance in the event of a radiological emergency.

Q.24 Do the licensees' Emergency Plan identify the services to be provided by local offsite agencies for handling emergencies? Explain.

A.24 Yes, both PASNY Emergency Plan at Section 5.23 and Con Ed Emergency Plan at Section 5.32 identify ambulance service by Verplanck and Peekskill Ambulance Corps, hospital service by the Peekskill Community Hospital, firefighting by the Verplanck Fire Department, and police assistance by the Buchanan Police Department.

Q.25 Do the provisions of the Emergency Plans for Indian Point Unit No. 2 and Unit No. 3 which you have described and identified in response to Questions 15 through 24 above meet the planning standard of 10 CFR Section 50.47(b)(2) and the requirements of Appendix E.IV.A. of 10 CFR Part 50?

A.25 Yes, the licensees' Plans and procedures meet the planning standard of 10 CFR 50.47(b)(2) and the requirements of 10 CFR 50, Appendix E.IV.A.

Q.26 Have the licensees made arrangements for requesting and using assistance resources? Explain.

A.26 Yes, the response to Questions 13 and 23 lists letters of agreement with offsite organizations for assistance resources.

Q.27 Have the licensees made arrangements to participate in the Federal Radiological Monitoring and Assessment Program? If yes, explain.

A.27 Yes, each licensee has available to it, upon request, the resources of the IRAP program through the Department of Energy. Both PASNY and Con Ed Emergency Plans include letters of agreement with the Department of Energy. FEMA will coordinate the efforts of Federal organizations through the Federal Radiological Monitoring and Assessment Program.

Q.28 Have the licensees made preparations for the dispatch of a representative to the offsite EOC? Explain.

A.28 Yes, PASNY Emergency Plan at Section 7.1.1 and Con Ed Emergency Plan at Section 6.2 specify that the Emergency Director would send one of his staff to perform liasion duties at the offsite EOC.

Q.29 Do the licensees' Emergency Plans identify radiological laboratories that can be used to provide radiological monitoring and analyses services in the event of an emergency? Explain.

A.29 Yes, both licensees have available the radiological laboratories of Teledyne Isotopes and the Radiological Science Laboratory of the New York State Department of Health.

Q.30 What arrangements have licensees made to accomodate State and local staff at the near-site EOF for Indian Point Unit No. 2 and Unit No. 3?

A.30 Both licensees are working to provide additional space to accomodate State and local staff at the EOF located in the Buchanan Service Center building of Consolidated Edison. The present NRC staff judgment is that the available space is sufficient to accommodate a minimum expected number of response personnel.

Q.31 Do the licensees' Emergency Plans identify organizations (other than Federal, State and local) which can be relied upon to assist in an emergency? Explain.

A.31 Yes, both licensees' plans at Section 5.3.4 specify that the Nuclear Steam Supply System Supplier, Westinghouse, is available for assistance.

Q.32 Have the licensees identified the expected times of arriv Federal resources and the expected availability of radiol laboratories to provide radiological monitoring and analy services?

A.32 Yes. The Federal R diological Monitoring and Assessment operates the Radiological Assistance Program from the reg office at Brookhaven, long Island, which is less than an from Indian Point. The New York State laboratories would available around the clock.

Q.33 Do the arrangements the licensees have made and the resour have identified which you have described in response to Qu through 32 above meet the planning standard of 10 CFR Sect 50.47(b)(3) and Appendix E.IV.A of 10 CFR Part 50?

A.33 The arrangements the licensees have made and the resources identified meet the planning standard of 10 CFR 50.47(b)(3 Appendix E.IV.A. of 10 CFR Part 50. As stated in response Question 30, the licensees are working to provide additiona to accomodate State and local staff in the EOF, since it is in a warehouse building with considerable space available.

Q.34 Have the licensees established an emergency classification emergency action level scheme? Explain.

A.34 Yes, Section 4 of both licensees' Emergency Plans and pr their Implementing Procedures describe the methods and basi for assessment of each of the four classes of emergency.

Notification of Unusual Event, Alert, Site Emergency and General Emergency. The tables of initiating conditions in the procedures specify measureable and observable conditions in the plant instrumentation readings which are the initiating conditions for declaring an emergency.

Q.35 What are the criteria for the licensees' emergency action level schemes?

A.35 The criteria for the licensees' emergency action level schemes conform to the criteria of NUREG-0654, II.D and Appendix 1.

Q.36 Do the licensees' emergency action level schemes account for lead times necessary to implement protective action decisions? Explain.

A.36 Yes, the licensees' emergency action level schemes described in the answer to Question 34 account for lead time necessary to implement protective action decisions in that emergencies are declared on the basis of control room instrumentation readings rather than on the results of down wind surveys and consequently the emergency would be declared before there would be a release of radioactivity from the plant.

Q.37 Are the licensees' schemes that you describe in response to Question 34 consistent with Appendix 1 of NUREG-0654? If yes, explain.

A.37 Yes, the emergency plan implementing procedures for both licensees list each of the conditions in NUREG-0654, Appendix 1 with the

corresponding Indian Point 2 and 3 conditions. I have compared the lists and they are consistent.

Q.38 Have you examined the licensees' procedures for establishing each emergency class? Explain.

A.38 Yes, as stated in response to Question 37, the procedures for classifying an event are consistent with NUREG-0654, Appendix 1. For each plant the postulated accidents analyzed in the Final Safety Analysis Report are encompassed within the emergency classification scheme.

Q.39 Does the licensees' scheme and procedures you have described in response to Question 34 through 38 above meet the planning standard of 10 CFR Section 50.47(b)(4) and the requirements of Appendix E.IV.B and C of 10 CFR Part 50?

A.39 Yes, the licensees' emergency action level classification system and procedures meet the planning standard of 10 CFR Section 50.47(b)(4) and the requirements of Appendix E.IV.B and C of the 10 CFR Part 50.

Q.40 Have you examined the licensees' procedures for notification of State and local response organizations? Explain.

A.40 Yes, Con Ed Proceduree IP-1002 and PASNY Procedure IP-1030 describe the steps to be taken to provide initial and follow-up notifications to Federal, State, local and company offsite emergency organizations when any of the four emergency classes is declared.

Q.41 Do the procedures described in response to Q.40 provide a basis for prompt and accurate notification of State and local response organizations by the licensees of information about the radiological hazards during an emergency? Explain.

A.41 Yes, the initial notification message form of both organizations contain a statement on whether or not there has been a release of radioactivity, recommended protective actions and meteorological information. The follow-up messages contain detailed information about the type of release.

Q.42 Have you examined the licensees' procedures for notifying and mobilizing its emergency response personnel? Explain.

A.42 Yes, as stated in response to Questions 11 and 15, both licensees' procedures direct the Shift Supervisor to appoint a communicator to notify emergency response personnel. The procedures also specify the key persons to be notified.

Q.43 Do the licensees' procedures described in response to questions 40 through 42 meet the planning standard 10 CFR Section 50.47(b)(5) and the requirements of Appendix E.IV.C and D of 10 CFR Part 50?

A.43 Yes, the licensees' procedures meet the planning standard of 10 CFR 50.47(b) (5) and the requirements of Appendix E.IV.C and D of 10 CFR Part 50.

Q.44 Have the licensees' made provisions to work with the State and local offsite organizations in establishing the contents of initial

messages from the plant in the event of a radiological emergency at Indian Point Unit 2 or 3? Explain.

A.44 Yes, both licensees' use nearly identical notification fact sheets as message forms. The licensee's message form is nearly identical with the "New York State Radiological Emergency Preparedness Plan," message form.

Q.45 Describe the licensees' provisions for followup messages from the facility to offsite authorities?

A.45 The licensee's provisions for followup messages are described in PASNY emergency plan implementing procedure IP-1030 and Con Ed's emergency plan implementing procedure IP-1002. The followup messages includes estimates of the quantity, time and duration of release; the chemical and physical form; the iodine, particulate and noble gas quantity; meteorological data; and prognosis for escalation or termination.

Q.46 Have you examined licensees' means for providing supporting information to offsite authorities for messages intended for the public? Explain.

A.46 Yes, the supporting information in the messages discussed in previous questions includes recommendations for protective actions for the general public. The licensees have arranged with the Verplanck Fire Protection Association to use the organization headquarters building as the Special News Center from which

licensee, State and local media can exchange information to insure that accurate information is presented to the public.

Q.47 Do the licensees' provisions for initial messages, followup messages and messages intended for the public which you have described in response to Questions 44 through 46 meet the planning standard of 10 CFR Section 50.47 (b)(5) and Appendix E.IV.C of 10 CFR Part 50?

A.47 Yes, the licensees' provisions for notification and instruction meet the planning standard of 10 CFR 50.47(b)(5) and Appendix E.IV.C and 10 CFR Part 50.

Q.48 Have you examined the licensees' means for notification and instruction to the populace within the plume exposure pathway EPZ? Explain.

A.48 Yes, the licensees' have installed an Early Warning System consisting of sirens throughout the 10 mile EPZ to provide prompt alerting of the public. Educational material has been distributed that instructs people upon hearing the sirens to turn on radios and television receivers for further information. Local radio and televison stations are notified by county personnel to activiate the Emergency Broadcast System with instructions for the public.

Q.49 Do the licensees' means for notification and instruction to the populace within the plume exposure pathway EPZ which you have described in response to Question 48 above meet the planning

standard of 10 CFR Section 50.47(b).(5) and the requirements of Appendix E.IV.D of 10 CFR Part 50?

A.49 No. I conclude from my review of the siren system for alerting and of the radio-television system for instruction that these systems, when the present deficiencies in the siren system are resolved, will meet the planning standard of 10 CFR 50.47(b)(5) and the requirements of 10 CFR 50 Appendix E.IV.D. However, 10 CFR 50, Appendix E.IV.D.3 includes the following requirements:

> "The licensee shall demonstrate that the State/local officials have the capability to make a public notification decision promptly on being informed by the licensee of an emergency condition."

It is not clear to me from my review of the Westchester Radiological Emergency Response Plan, that the requirement for prompt decision-making will be met. I have discussed this problem with FEMA, County and licensee representatives and I understand that the problem is being resolved.

Q.50 What provisions have licensees made for prompt communications with offsite response organizations?

A.50 PASNY, in Section 7.3 of its emergency plan and Con Ed in Section 7.2 of its emergency plan, have described the means of prompt communication with offsite response organizations.

Q.51 Have licensees established primary and backup means of communication for its emergency response organization? Explain.

A.51 Yes. The communications system for both licensees include a public address paging system onsite, dial phones, direct line phones, inplant audible alarms, radio system, a radio paging (beeper) system, a NAWAS (National Warning System Line) to the County and State Warning Points and the City of Peekskill, and an NRC Emergency Notification System and an NRC Health Physics Network. Figure 7.2-5 of Con Ed's Emergency Plan and Figure 7-2 of PASNY's Emergency Plan diagram the Radiological Emergency Communications System (RECS) which is the primary means of notification between the two reactor control rooms, emergency response facilities and State and County Warning Points.

Q.52 Have licensees made provisions for manning communication links on a 24-hour per day basis to initiate emergency response by the principal offsite response organizations? Explain.

A.52 Yes, the Control Room, and the Emergency Operations Facility, when activated, will be manned 24 hours per day with personnel to man communication links.

Q.53 Have licensees made provisions for communicating between Indian Point, Units 2 and 3 and the licensees' near-site EOF, governmental EOCs, and radiological monitoring teams? Explain.

A.53 Yes, the systems listed in response to Question 51 and illustrated in Con Ed's Emergency Plan Figures 7.1-2 through 7.1-7 and Figures

7.2-1 through 7.2.9 will be used for communicating between Units 2 and 3 and between emergency response centers. Section 7.3.2.1 of Con Ed's Plan describes mobile survey vehicles, for offsite monitoring, that are equipped with two-way radios.

Q.54 What provisions have the licensees made to ensure that a coordinated communication link exists for fixed and mobile medical support facilities?

A.54 Con Ed's Emergency Plan at Section 5.3.2.1 and PASNY's Emergency Plan at Section 5.3.3 state that communications to fixed medical support facilities from the Indian Point site is via telephone, and to mobile medical support facilities from the local hospitals via radio systems.

Q.55 Have you examined the licensees means for activating its emergency response personnel? Explain.

A.55 Yes, as stated in response to Question 11, both licensees emergency plans state that the Shift Supervisor will appoint a Communicator whose responsibility includes notifying plant staff personnel to augment the onshift crew. PASNY's Emergency Plan at Section 7.3 and Con Ed's Emergency Plan at Section 7.2.1 state that operator alert to assemble the on-site organization is initiated from the Control Room consoles by the Public Address Systems.

Q.56 Have licensees made provisions for conducting periodic tests of its entire emergency communications system? Explain.

A.56 Yes, PASNY's Emergency Plan Table 8.1 and Con Ed's Emergency Plan at Section 8.1.2 specify monthly communication checks between the two licensees, State and local governments; quarterly communications checks with Federal agencies, and annual comprehensive drills.

Q.57 Do the licensees' provisions for communicating with principal response organizations and emergency response personnel which you have described in response to Questions 50 through 56 meet the planning standard of 10 CFR Section 50.47(b)(6) and the requirements of Appendix E.IV.C and E of 10 CFR Part 50?

A.57 Yes, the licensees provisions for communications meet the planning standard of 10 CFR Section 50.47(b)(6) and the requirements of Appendix E.IV.C and E of 10 CFR Part 50.

Q.58 Have you examined licensees' provisions for the periodic dissemination of information to the public including the transient population within the plume exposure pathway EPZ as to how the public will be notified and what its initial actions should be in the event of a radiological emergency at Indian Point, Unit No. 2 or Unit No. 3?

A.58 Yes, the licensees have mailed to all residents in the plume exposure pathway EPZ a brochure which I have reviewed and which contains the following information: protective measures; a description of how people will be alerted and notified; and information on radiation. In addition an insertion for telephone books and posters for transient areas have been prepared.

Q.59 Have the licensees distributed information to the public within the plume exposure pathway EPZ concerning how the public will be notified and what its initial actions should be in the event of a radiological emergency at Indian Point, Unit 2 or Unit 3? Explain.

A.59 Yes, the brochure mentioned in answer to Question 58 has been distributed throughout the plume exposure pathway EPZ and it contains information on how the public will be notified and what the initial response should be.

Q.60 Have licensees designated points of contact and physical locations for use by news media during an emergency? Explain.

A.60 Yes, PASNY's Emergency Plan at Section 7.1.6 and Con Ed's Emergency Plan at Section 7.1.5 state that the licensees have arranged with the Verplanck Fire Protection Association to use the organization facilities at the Special News Center for use by the news media during an emergency.

Q.61 Have you examined the licensees' procedures for coordinated dissemination of information to the public, including news media? Explain.

A.61 Yes, as stated in the emergency plan sections referenced in the previous response one of the purposes of the Special News Center is to facilitate coordinated news releases from government officials and licensee representatives so as to insure that accurate information is presented to the public.

Q.62 Have licensees made arrangements for dealing with rumors? Explain.

A.62 Yes, the Special News Center will permit exchanges and updates of information so that jointly agreed upon statements can be made. The availability of centralized and authentic information will provide the antidote to rumors. PASNY's Emergency Plan at Section 7.1.6 states that the Special News Center has twelve dedicated phone lines, whose numbers would be announced over the Emergency Broadcast System in an emergency, reserved for responses to inquiries from the public.

Q.63 Do the licensees' procedures and arrangements for providing information to the public, and the provisions for accomodating news media which you have described in response to Questions 58 through 62 meet the planning standard of 10 CFR Section 50.47(b)(7) and the requirements of Appendix E.IV.D of 10 CFR Part 50?

A.63 Yes, the licensees' plans for providing information to the public and for accomodating the news media meet the planning standard of 10 CFR Section 50.47(b)(7) and the requirements of Appendix E.IV.D of 10 CFR Part 50.

Q.64 Have you examined the licensees' provisions for establishing and activating a Technical Support Center (TSC), Onsite Operation Support (OOSC) and a Emergency Operations Facility (EOF) to support the emergency response? Explain.

A.64 Yes, PASNY Procedures 1045 and 1047 and Con Ed's Procedures 1035 and 1023 describe the activation and operation of each licensees'

Technical Support Center and Operational Support Center. The Emergency Operation Facility is a single facility located at the Indian Point Service Center Complex to be used by either licensee as the focal point for direction of the overall strategy and for response to offsite radiological problems. The activation and operation of the EOF is described in the PASNY's emergency plan at Section 7.1.1 and Con Ed's emergency plan at Section 7.1. Activation of the Alternate Emergency Operations Facility at the East View Service Center is described in Con Ed's Emergency Plan Implementation Procedure IP-1045.

Q.65 Have the licensees established their TSCs and EOFs in accordance with NUREG-0696, Revision 1? Explain.

A.65 The licensees have established and have in operation interim emergency response facilities in response to post TMI upgrading of emergency preparedness as reflected in NUREG-0737. They have described their conceptual plans for permanent emergency response facilities in responses to the NRC request of February 18, 1981 and these responses are under review.

Q.66 Have you examined the licensees' provisions for equipment and staff at their TSCs and EOFs? Explain.

A.66 Yes, the licensee's procedures for activating and operation of these facilities include operation of equipment for monitoring and analysis of plant parameters and offsite conditions. The licensees

notification procedures include rosters of staff and designation of where each person is to report.

Q.67 Have the licensees made provisions for onsite monitoring systems for use in initiating emergency measures? Explain.

A.67 Yes, the licensees procedures for recognizing emergency action levels are based on plant parameters which are monitored by radiological monitoring systems and by process monitoring systems of temperature, pressure, level and flow.

Q.68 Have you examined the licensees' provisions for acquiring data from offsite monitoring and analysis equipment? Explain.

A.68 Yes, PASNY Emergency Plan at Section 7.4.2 and Con Ed's Emergency Plan at Section 7.3.2 describes facilities and equipment for offsite monitoring. PASNY's Emergency Plan Implementation procedure IP-1011, and Con Ed's Emergency Plan Implementation Procedure IP-1015, Offsite Monitoring describes operation of survey teams at fixed sample locations, and the operation of the Reuter-Stokes System of offsite ion chambers which monitor dose rate and telemeter to the MIDAS dose assessment system.

Q.69 Have licensees made provisions for offsite radiological monitoring equipment in the vicinity of Indian Point, Units 2 and 3?

A.69 Yes, in addition to the Reuter-Stokes monitors mentioned in response to Question 68, Table 1 of PANSY's Emergency Plan Implementation Procedure IP-1011, lists locations of continuous air sampling sites,

emergency air sampling sites, TLD stations and location of Ludlum dose rate meters. Con Ed's Emergency Plan Implementation Procedures 1007 and 1015 also have this information.

Q.70 What provisions have the licensees made for obtaining meteorological information?

A.70 PASNY Procedure IP-1003 and Con Ed Procedure IP-1016 describe the acquisiton of meteorological data from the primary 122 meter tower. Wind speed and direction are measured at three levels and stability class is determined by temperature differences from the ground to the 60 meter level, and to the 122 meter level. A 10 meter backup tower is located on the Con Ed Service Center Building (EOF).

Q.71 Have licensees established a central point for receiving and Anlyzing field monitoring data? Explain.

A.71 Yes, the Con Ed Emergency Plan at Section 7.11 specify that the Emergency Operations Facility serves as the focal point for collection, analysis and evaluation of radiological and meteorological information, including field monitoring data.

Q.72 Have you examined the licensees' provisions for protective equipment, communications equipment, radiological monitoring equipment and emergency supplies? Explain.

A.72 Yes, PASNY Procedure IP-1070 and Con Ed Procedure IP-1018 are entitled Periodic Checks of Emergency Preparedness Equipment. These procedures include the location of the equipment, specification of

the equipment, and the frequency of inventory, operational and calibration checks. The equipment includes air sampling and counting equipment, portable survey instruments, dosimetry and respiratory equipment, anticontamination clothing, procedures and maps.

Q.73 Have you examined the licensees' means for maintaining those supplies and equipment? Explain.

A.73 Yes, the procedures for periodic inspection checks mentioned in response to Question 72 provides the means for monitoring those supplies and equipment.

Q.74 Do the licensees' provisions to provide and maintain facilities and equipment which you have described in response to Questions 64 through 73 meet the planning standard of 10 CFR Section 50.47(b)(8) and the requirements of Appendix E.IV.E and G of 10 CFR Part 50?

A.74 Yes, the licensees' provisions to provide facilities and equipment meet the planning standard of 10 CFR Section 50.47(b)(8) and the requirements of Appendix E.IV.E and G of 10 CFR Part 50.

Q.75 Have you examined the licensees' plant systems equipment and methods for assessing and monitoring actual or potential offsite consequences of a radilogical emergency condition? Explain.

A.75 Yes, the licensees' methods for assessing and monitoring actual or potential offsite consequences of a radiological release are described in PASNY Procedure 1002 and Con Ed Procedure DMR-1 through 9, Determination of Magnitude of Release. The method of calculation

uses dispersion factor overlap and a desk top computer for dose calculations. All shift supervisors have been trained in the use of this manual system.

On a site visit, I have observed that the EOF is equipped with a MIDAS computerized system of dose calculations which has a graphical display of dispersion of an effluent. The system accepts input data from radiological monitors and from meteorological instrumentation and calculates live-time dose rates downwind from the source. Terminals of this system are in the Control Room of Indian Point Units 2 and 3.

Q.76 Do the licensees' Atmospheric Release Advisory Capability (ARAC) Systems and the Meteorological Information and Dose Assessment System (MIDAS) provide for a range of accident conditions? If yes, explain.

A.76 Yes, both of these computerized systems of calculation of dose from dispersion of an effluent cover the full range of potential releases for all possible accidents.

Q.77 Do the licensees' accident assessment capabilities provide for rapid assessments of the magnitude and location of radiological releases? Explain.

A.77 Yes, I have observed the computerized system display its results on a cathode ray tube within a minute. It was also demonstrated to me

on a site visit that the manual dose calculation can be performed within a few minutes by trained personnel.

Q.78 Do the methods, systems and equipment available to the licensees for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition described in your response to Question 75 through 79 meet the planning standard of 10 CFR Section 50.47(b)(9) and the requirements of Appendix E.IV.B and E of 10 CFR Part 50?

A.78 Yes, the methods, systems and equipment available to the licensees for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition meet the planning standard of 10 CFR 50.47(b)(9) and the requirements of Appendix E.IV.B and E of 10 CFR Part 50.

Q.79 Why are time estimates for evacuation and for taking other protective action required to be submitted by the licensees pursuant to 10 CFR Part 50, Appendix E.IV?

A.79 Time estimates for evacuation and for taking other protective actions are used for two principal purposes:

(1) to identify those transportation routes, areas or facilities in the vicinity of a site for which special traffic controls during an emergency or other special plans would be desirable;

(2) to provide decisionmakers during an emergency knowledge of the length of time required to effect evacuation under various conditions. This knowledge allows an informed choice of protective actions (e.g., between in-place sheltering and evacuation) during any actual accident situation.

Q.80 For the time estimates which are required to be submitted by the licensees pursuant to Appendix E.IV of 10 CFR Part 50, what criteria must those time estimates meet?

A.80 The time estimates for evacuation are considered acceptable if the criteria of NUREG-0654, II.J and Appendix 4 are met.

Q.81 Have the licensees submitted time estimates for Indian Point Units 2 and 3? If yes, describe the documents.

A.81 Yes, PASNY submitted an analysis of time estimates for evacuation of the plume exposure pathway zone in Evacuation Time Estimates for Areas Near the Site of Indian Point Power Plants, prepared by Parsons, Brinckerhoff Quade and Douglas, Inc., January 31, 1980 and a document, dated November 1981, entitled "Methodology to Calculate Evacuation Travel Time Estimates for the Indian Point Emergency Planning Zone," by the same authors.

Q.82 Describe the extent to which the evacuation time estimate submitted by the licensees is reflected in the licensees emergency plans.

A.82 PASNY Procedure IP-1017 Recommendation of Protective Actions for the Offsite Population states: "When deciding to evacuate consider and weigh the following: (a) duration of release, (b) time it would take to evacuate, (c) exposure people would receive during the evacuation. If it would not offer a substantial benefit to evacuate, sheltering should be continued."

Con Ed Procedure IP-1013 also entitled Recommendation of Protective Actions for Offsite Population instructs the Shift Supervisor/ Emergency Director to estimate the potential duration of the release, determine the affected area, and determine if evacuation can be completed before cloud arrival. The procedure also states a value for sheltering effectiveness to be taken into account in making the recommendation.

Q.83 Have these time estimates been examined for conformance with the criteria you have identified in your response to Question 82 above?

A.83 Yes.

Q.84 Who performed that examination and how was it conducted?

A.84 The examination was performed by a contractor. The evaluation techinque is described in NUREG/CR-1856, an Analysis of Evacuation Time Estimates Around 52 Nuclear Power Plants, and NUREG/CR-1745, Analysis of Techniques for Estimating Evacuation Times for Emergency Planning Zones. The evaluation used a subjective scale requiring professional engineering judgment in determining ratings. The

process then indicates areas where the reviewer considers the analysis to be strong or weak.

Q.85 Describe the results of that evaluation

A.85 The contractors evaluation stated that the licensees report was excellent in all review areas.

Q.86 Have you reviewed the licensees' time estimates which you identified in response to Question 84?

A.86 Yes.

Q.87 In your opinion, do the licensees' time estimates meet the criteria you identified in your response to Question 87? Explain.

A.87 Yes, Appendix 4 of NUREG-0654 includes a description of the material to be covered in an evacuation time assessment study. The NRC contractors evaluation described in answer to Question 85 and 86 covers all of the elements in Appendix 4. I have reviewed the licensees study and the NRC contractors evaluation and I have verified that the licensees study covers all the elements in Appendix 4. The validity of the results of the study will be attested to by Thomas Urbanik II, the NRC contractor, who is expert in this area.

Q.88 Have you examined the licensees' means for advising persons onsite or persons in areas controlled by the licensees in the event of an emergency? Explain.

A.88 Yes, PASNY's Emergency Plan at Section 7.3 and Con Ed's Emergency Plan at Section 7.2 describe their evacuation alarm signals and onsite notification by means of the Public Address System.

Q.89 Have the licensees made provisions for evacuating and transportating onsite individuals in the event of a radiological emergency?

A.89 Yes, PASNY Procedure IP-1053 Evacuation of Site and Con Ed Procedure 1027, Site Personnel Accountability and Evacuation, describes the procedure and evacuation routes for evacuation of onsite non-essential personnel. Evacuation would be by persons using their own vehicles or by company vehicles.

Q.90 Have you examined the licensees' provisions for radiological monitoring and contamination surveys of people evacuated from the site?

A.90 Yes, the licensees' Evacuation and Accountability Procedures state that at the Buchanan Service Center Assembly Area, evacuees would be surveyed for contamination before leaving, and decontamination would be done if necessary. PASNY Procedure IP-1013 and Con Ed Procedure IP-1009 describes the methods and the equipment for checking vehicles for contamination and their subsequent decontamination at the Buchanan Service Center.

Q.91 Have you examined the capability of the licensees to account for individuals onsite at the time of an emergency? Explain.

A.91 Yes, the licensees' evacuation and accountability procedures state that each person within the Protected Area is assigned a pre-designated assembly area. The badge out procedure will be used for accountability. A list of missing persons, if any, would be developed and the Emergency Director would authorize a Search Team.

Q.92 Have you examined the licensees' provisions for protective measures for those individuals remaining or arriving onsite during an emergency? Explain.

A.92 Yes, PASNY's Procedure IP-1070 and Con Ed's Procedure IP-1018 state that protective equipment is maintained and available at primary and alternate EOF's, Health Physics Control Point, Control Rooms and Command Guard House. The equipment consists of protective clothing, respiratory protective devices and survey equipment.

Q.93 Have the licensees made provisions for the use of radioprotective drugs for those individuals remaining or arriving onsite during an emergency? Explain.

A.93 Yes, PASNY's Procedure IP-1070 and Con Ed's Procedure IP-1018 showed that potassium iodide is maintained at the Alternate EOF, the Control Room, the TSC's and the Security Building. A large supply of potassium iodide is available at the Buchanan Service Center. The drug would be administered upon the direction of the Emergency Director.

Q.94 Have you examined the capability of licensees to recommend evacuation or other protective actions to the offsite authorities? Explain.

A.94 Yes, PASNY Procedure IP-1017 and Con Ed Procedure 1013, Recommendations of Protective Action for Offsite Population describes the method to be used by the Shift Supervisor/Emergency Director to determine the protective actions to recommend to the offsite authorities, and the bases for the choice of the protective actions.

Q.95 Do the licensees' Emergency Plans include the bases for the choice of

recommended protective actions for the plume exposure pathway EPZ during an emergency? Explain.

A.95 Yes, the procedures mentioned in response to Question 94 are based on Protective Action Guides of the U.S. Environmental Protection Agency, and also on the basis of plant parameters as described in each licensees' Emergency Action Level Procedures.

Q.96 Are the bases for the choice of recommended protective actions discussed in the response to Question 96 sufficient for the licensees' to make decisions on recommended protective actions? Explain.

A.96 Yes, the basis for the initial recommendation of notifying the general public and recommending shelter as the first protective

measure is the actual status of plant conditions before there is a release of radioactivity from the plant.

Q.97 Do the licensees' provisions for protective response of onsite individuals and its capability to recommend protective actions to offsite authorities for persons within the plume exposure pathway EPZ which you described in response to Questions 89 through 97 meet the planning standards of 10 CFR Section 50.47(b)(10) and the requirements of Appendix E.IV.D and E of 10 CFR Part 50?

A.97 Yes, the licensees' provisions for protective response of onsite individuals and their capability to recommend protective actions to offsite authorities for persons within the plume exposure pathway EPZ meet the planning standard of 10 CFR 50.47(b)(10) and the requirements of Appendix E.IV.D and E of 10 CFR Part 50.

Q.98 Have you examined the means established by licensees for controlling radiological exposures to its emergency workers in the event of a radiological emergency at Indian Point, Units 2 and 3? Explain.

A.98 Yes, PASNY Emergency Plan at Section 6.7.1 and Con Ed's Procedures IP-1038 address required authorization by the Emergency Director, guidance and maximum exposure criteria where it may be necessary for established limits to be exceeded.

Q.99 Do the licensees' means for controlling such radiological exposures include exposure guidelines which are consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides? Explain.

A.99 Yes, both licensees' emergency plans have provisions noted in response to Question 98 for controlling exposures that are based on the EPA Emergency Worker and Lifesaving Activity Protective Actions Guides (EPA 520/1-75/001) and the National Committee on Radiation Protection, Report 39, (1971).

Q.100 Have licensees made provisions for an onsite radiation protection program to be implemented during emergencies, which included a 24-hour-per-day capability to determine doses received by emergency personnel? Explain.

A.100 Yes, the licensees' radiation protection program in force during nonemergency conditions will continue in force during emergency conditions. Exceptions to rules will be under the authority of the Emergency Director. Written agreements exist with the dosimetry processor to provide 24 hour telephone emergency dosimetry service. The licensees have onsite a TLD processor and HP technicians on watch have been trained in its use.

Q.101 Do the means provided by licensees for controlling radiological exposures to emergency personnel during an emergency which you described in response to Questions 98 through 100 meet the planning standard of 10 CFR Section 50.47(b)(11) and the requirements of Appendix E.IV.E of 10 CFR Part 50?

A.101 Yes, the means provided by the licensees for controlling exposure to emergency personnel during an emergency meet the planning standard of 10 CFR 50.47(b)(11) and the requirements of Appendix E.IV.E of 10 CFR Part 50.

Q.102 Have you examined licensees' arrangements for medical services for contaminated injured individuals? Explain.

A.102 Yes, PASNY Procedures IP-1021 and Con Ed Procedures IP-1012 describe the procedure to be followed when an individual is injured and contaminated. The immediate action is to render first aid and then notify the Control Room for additional aid.

Q.103 Have the licensees made provisions for an onsite first aid capability? Explain.

A.103 Yes, there is a two-room First Aid and Decontamination Suite located on the 72 foot elevation of the Unit 1 Nuclear Services Building; an alternate area for treatment of possible radiation casualties at the Con Ed Medical Bureau Service Center at the EOF location; a First Aid Room on the 33 foot level of the IP-3 Turbine Building; a first aid room on the 15 foot level of the administration building; and a First Aid and Decontamination Room at the IP-3 Health Physics Control Point.

Q.104 Have you examined licensees' arrangements for transporting contaminated injured individuals to medical support facilities? Explain.

A.104 Yes, both licensees have letters of agreement with the Verplanck Ambulance Association for 24-hour service for transporting contaminated injured persons to medical support facilities. There is also a letter of agreement with Peekskill Community Hospital to accept an injured and contaminated patient.

Q.105 Do licensees arrangements for medical services for comtaminated injured individuals which you have described in response to Questions 103 through 105 meet the planning standard of 10 CFR Section 50.47(b)(12) and the requirements of Appendix E.IV.E of 10 CFR Part 50?

A.105 Yes, the licensees' arrangement for medical services for contaminated injured individuals meet the planning standard of 10 CFR 50.47(b)(12) and the requirements of Appendix E.IV.E of 10 CFR Part 50.

Q.106 Have you examined the general plans developed by licensees for recovery and reentry? Explain.

A.106 Yes, Section 9 of each licensees' Emergency Plan described general recovery plans. Recovery operations are the responsibility of the individual licensees' Recovery Manager and include re-entry and assessment and repair and return to operations. 10 CFR Part 20 radiation exposure limits will be observed.

Q.107 Do the licensee's plans for recovery and reentry describe the means by which decisions are reached to relax protective measures? Explain.

A.107 Yes, Section 9 of both licensees' Emergency Plan state that it is the responsibility of the individual licensees' Recovery Manager to determine that the facility and the surroundings are safe, and after consultation with his staff and other agencies available to him, to determine that the radioactive release is terminated and that protective measures may be relaxed.

Q.108 Do the licensee's emergency plans establish a method for periodically estimating total population exposure? Explain.

A.108 Yes, Con Ed Procedure IP-1036 describe the method of determining the total integrated whole body and thyroid dose to the population at large within the 10 mile EPZ by multiplying the exposure in each of 160 sector zones by the population therein, and then summing the total. PANSY would use the same procedure.

Q.109 Do the licensee's plans for recovery and reentry which you have described in response to Questions 107 through 109 meet the planning standard of 10 CFR Section 50.47(b)(13) and the requirements of Appendix E.IV.H of 10 CFR Part 50?

A.109 Yes, the licensee's plan for recovery and reentry meet the planning standard of 10 CFR Section 50.47(b)(13) and the requirements of Appendix E.IV.H of 10 CFR Part 50.

Q.110 Are you familiar with the emergency planning exercise conducted on March 3, 1982, for Indian Point, Unit 3? Explain.

A.110 Yes, I have reviewed the report and the individual evaluations made by NRC observers, and the individual evaluation by the licensee's observers.

Q.111 Briefly summarize the onsite scenario for the exercise conducted on March 3, 1982.

A.111 The scenario provided for a sequence of simulated events which required the mobilization of the licensee's emergency organization beginning with an Unusual Event and progressing through sequentially escalating classes to a General Emergency. The scenario included a loss of coolant, failure of reactor protection systems, failure of a containment purge valve, repair team operation, and a contaminated injured person transported to a hospital.

Q.112 What functional areas of the licensees' emergency response organization were tested by the exercise?

A.112 The exercise tested emergency organization and control, accident classification, dose assessment, notification of offsite authorities, augmentation of onsite organization, first aid, transportation of contaminated injured individual, on and offsite monitoring, public information, accountability of personnel.

Q.113 From the standpoint of onsite emergency preparedness and licensees' response and licensees' emergency preparedness, what were the results of the exercise?

A.113 As noted in the NRC exercise evaluation report, the exercise demonstrated the licensees' overall capability to respond to an emergency, and the NRC observers found that the licensees' actions to be adequate to protect the health and safety of the public. The licensee was informed through the critique of his own observers and through the critique of NRC observers where there are areas for improvement, and the licensee has taken action to implement the recommendations.

Q.114 Explain the process whereby the licensees' deficiencies noted during exercises or drills will be corrected.

A.114 Within the licensee's organization, responsible individuals are identified and assigned responsibility for assuring that deficiencies are corrected.

Q.115 How will the Office of Inspection and Enforcement assure that problem areas identifed during the exercise are corrected by the licensees?

A.115 The Office of Inspection and Enforcement assures that problem areas identified during the exercise are corrected through its onsite inspection process.

Q.116 Have licensees established provisions for implementing the corrective actions? Explain.

A.116 Yes, recommended procedure changes have been made and retraining of personnel is being accomplished. The issue of the size of the EOF has been brought to the attention of Con Ed senior management.

Q.117 Have you examined the licensees' provisions for conducting drills in the functional areas of emergency response identified in NUREG-0654, II.N.2? Explain.

A.117 Yes, Con Ed's emergency plan Section 8.1.2 and PASNY's Plan Table 8-1 summarize exercises and drills, the participants and the frequency of the drills. These include communications, fire, medical emergency, radiological monitoring and health physics drills.

Q.118 Have you examined the licensees' provisions for when exercises and drills are to be conducted? Explain.

A.118 Yes, as stated in response to Question 117, both licensees' plans describe the frequency of drills and exercises.

Q.119 Are exercises or drills useful where the participants have prior knowledge of the date, time and other details of the exercise or drill? Explain.

A.119 All drills or exercises, regardless of prior knowledge, are useful as a training medium. In this exercise, care was taken by the licensee to insure that participants did not have prior knowledge of

the details of the exercise scenario. The reports of the NRC observers state that they did not perceive evidence of prior knowledge of the scenario.

Q.120 Do the licensees' provisions for taking corrective action, their performance during the March 3, 1982 exercise and their provisions for conducting exercises and drills which you have described in response to Questions 110 through 119 meet the planning standard of 10 CFR Section 50.47(b)(14) and the requirements of Appendix E.IV.F of 10 CFR Part 50?

A.120 **Yes, the licensees' provisions for conducting drills and exercises and for taking corrective actions meet the planning standard for 10 CFR 50.47(b)(14) and the requirements of 10 CFR Part 50 Appendix E.IV.F.**

Q.121 **Have you examined the licensees' provisions for radiological emergency response training to those who may be called on to assist in an emergency? Explain.**

A.121 Yes, each licensee has developed an Emergency Planning Training program that defines the program and specifies the training requirements and responsibilities. The program contains detailed lesson plans appropriate to each emergency function. Plans, procedures, lecture notes and visual aids are used in the training program.

Q.122 Have you examined those provisions of the licensee's training program for the specialized training and periodic retraining in the categories identified in NUREG-0654, II.O.4, particularly with respect to radiological monitoring and radiological analysis personnel? Explain.

A.122 Yes, Con Ed has developed a table which is a matrix of training courses versus the appropriate persons to take such training. I have reviewed this matrix and it includes the categories identified in NUREG-0654 II.O.4 and radiological monitoring and dose assessment personnel taking courses in these subjects. PASNY has a similar system.

Q.123 Have the licensees established means for assuring that emergency response personnel will receive necessary training? Explain.

A.123 Yes, both licensees' emergency plans in Section 8 of each licensees' emergency plan include tables that summarize the required training and its frequency, and the personnel to take the training. Both licensees' employ a computerized system of record keeping to insure that retraining is accomplished according to schedule.

Q.124 Does the radiological emergency response training provided by licensees which you have described in response to Questions 121 through 123 meet the planning standard of 10 CFR Section 50.47(b)(15) and the requirements of Appendix E.IV.F of 10 CFR Part 50?

A.124 Yes, the licensees program of radiological emergency response training and retraining meet the planning standard of 10 CFR Section 50.47 (b)(15) and the requirements of Appendix E.IV.F of 10 CFR Part 50.

Q.125 Have licensees established responsibilities for emergency plan development? Explain.

A.125 Yes, PASNY's Emergency Plan at Section 8.1 has designated the Assistant to the Radiological and Environmental Services Superintendent to be the Emergency Planning Coordinator. Con Ed's Emergency Plan at Section 8.1.3 has designated as Emergency Planning Director a member of the normal station staff who reports to the General Environmental Health and Safety.

Q.126 Have the licensees made provisions for updating their Emergency Plans? Explain.

A.126 Yes, Section 8 of both licensee's emergency plans state that the PASNY Emergency Planning Coordinator and the Con Ed Director of Emergency Planning are responsible for reviewing all proposed changes to the emergency plan and procedures and for processing them through PASNY's Plant Operations Review Committee and Con Ed's Nuclear Safety Committee.

Q.127 Have the licensees established responsibilities for distribution of emergency plans? Explain.

A.127 Yes, Section 8 of both licensee's emergency plans state that distribution of changes to plans and procedures is the responsibility of PASNY's Emergency Planning Coordinator and Con Ed's Director of Emergency Planning.

Q.128 Describe the licensees' administration and implementation of their Emergency Plans? A.128 In both site visits and in my reviews, I have observed that changes to plans or procedures are issued with the revised pages marked to indicate the changes. The revised pages are distributed to all controlled copy holders. A return receipt routing sheet is issued with all changes.

Q.129 Have you reviewed the licensees' provisions for training the emergency response planners?

A.129 Yes, emergency response planners are included in the training plans mentioned in response to Question 122.

Q.130 Have you reviewed the licensees' arrangements for having independent reviews conducted periodically of their emergency preparedness programs? Explain.

A.130 Yes, Section 8.2. of Con Ed's emergency plan states that an annual audit of Con Ed's emergency preparedness program is performed by Con Ed's Quality Assurance Organization, and a report made to the Nuclear Facilities' Safety Committee. Section 8.4 of PANSY's emergency plan states that PASNY also arranges for an annual independent review of the emergency preparedness program which is

reported to the Safety Review Committee and the Plant Operating Review Committee.

Q.131 Do licensees' Emergency Plans provide for (1) a listing of supporting plans and their sources, (2) an appendix listing procedures required to implement the plan, and (3) a specific table of contents? Explain.

A.131 Yes, both licensees plans include a table of contents and a cross index to NUREG-0654, a listing of implementing procedures, letters of agreement, and, in separate documents, supporting plans of State and local emergency response organizations.

Q.132 Do the licensees' development, periodic review and distribution of emergency plans which you have described in response to Questions 125 through 131 meet the planning standard of 10 CFR Part 50(b)(16) and the requirements of 10 CFR 50 Appendix E.IV.F.?

A.132 Yes, the licensees' development, periodic review and distribution of emergency plans meet the planning standard of 10 CFR Section 50.47(b)(16) and the requirements of Appendix E.IV.F of 10 CFR Part 50.

Q.133 Have the licensees submitted (or provided the appropriate reference to) radiological emergency response plans of the State and local governmental entities that are wholly or partially within the plume exposure pathway EPZ as required by 10 CFR Section 50.54(s)(1)? Explain.

A.133 Yes, the licensees have submitted the radiological emergency response plans of the State of New York and the Counties of Westchester, Orange, Putnam and Rockland as required by 10 CFR Section 50.54(s)(1).

Q.134 Have the licensees submitted (or provided the appropriate reference to) radiological emergency response plans of State governments wholly or partly within the ingestion pathway EPZ as required by 10 CFR Section 50.54(s)(1)? If yes, explain.

A.134 Yes, in addition to the plans mentioned in response to Question 134, the licensees have submitted the Radiological Emergency Response Plans of the States of Pennsylvania, New Jersey and Connecticut.

Contention 3.4 The licensees cannot be depended upon to notify the proper authorities of an emergency promptly and accurately enough to assure effective response.

Q.135 For Contention 3.4, describe the Commission'srequirements and guidance concerning the provisions for notifying appropriate offsite authorities in the event of a radiological emergency, and compare the provisions made by licensees with those required by regulation and/or recommended in NUREG-0654.

A.135 10 CFR 50 Appendix E.IV.D3 states, "A licensee shall have the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency". For each class of emergency the guidance in NUREG-0654, Appendix 1 states, under licensee actions "1. Promptly informs State and/or local

offsite authorities...". PASNY's procedure IP-1030 states specifically, "Offsite agencies should be notified within 15 minutes of the declaration of an emergency classification". Con Ed procedure IP-1002 lists the procedural steps to be followed by Control Room personnel. The first step for the communicator, after he has received the Notification Form from the Shift Supervisor is to notify New York State and the four counties via the party hot line, the Radiological Emergency Communications System (RECS).

Q.136 Have you examined the licensees' bases for notification of offsite authorities for the four classes of Emergency Action Levels? Explain.

A.136 Yes, as noted in response to Questions 34 and 35, the bases for notification of offsite authorities is that events have occured that are measureable or observable to plant operators that make declaration of an emergency class appropriate.

Q.137 Have you examined the licensees' procedures for notifying offsite authorities in the event of a radiological emergency at Indian Point, Unit 2 and Unit 3? Explain.

A.137 Yes, PASNY's Procedure IP-1030 and Con Ed's Procedure IP-1002 are the procedures that describe the initial notification required when an emergency is declared. I have interviewed the PASNY and Con Ed Shift Supervisors and have verified that they understand these procedures and their responsibility for implementing them.

Q.138 Do the licensees' bases and procedures for notifying offsite authorities conform to the requirements of NRC's regulations and the recommendations in NUREG-0654?

A.138 Yes, as noted in response to Question 41 the licensees bases and procedures for notifying offsite authorities conform to 10 CFR 50 Appendix E.IV.D.3 and the criteria of NUREG-0654, Appendix 1.

Contention 3.6 The emergency plans and proposed protective actions do not adequately take into account the full range of accident scenarios and meteorological conditions for Indian Point, Units 2 and 3.

Q.139 For Contention 3.6, describe the Commission's requirements and guidance concerning the capability of acquiring and evaluating meteorological information for onsite emergency preparedness, and compare the capability established by the licensees with that required by regulation and/or recommend in NUREG-0654.

A.139 10 CFR 50 Appendix E.IV.B requires a description of "The means to be used for determining the magnitude of and for continually assessing the impact of the release of radioactive material. The applicable guidance in NUREG-0654 I.5 states, "Each licensee shall have the capability of acquiring and evaluating meteorological information sufficient to meet the criteria of Appendix 2." The licensees equipment exceed the criteria of Appendix 2, since 3 towers are in operation, the 122 meter tower, the 30 meter on the EOF site, and a third backup tower. The meteorological program meets the regulatory requirements.

Q.140 For Contention 3.6, describe the Commission's requirements and guidance regarding the spectrum of off-normal conditions and postulated accidents to be used as a basis for onsite emergency preparedness, and compare the off-normal conditions and postulated accidents used by the licensees with those required and/or recommended in NUREG-0654.

A.140 10 CFR 50 Appendix E.IV.B requires "emergency action levels that are to be used as criteria for notification....The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring." The guidance in NUREG-0654 I.1. states "each licensee shall identify plant system and effluent parameter values characteristic of a spectrum of off-normal conditions and accidents and shall identify the plant parameter values or other information which correspond to the example initiating conditions in Appendix 1." The licensees have developed implementing procedures for classifying accidents. The procedures list each of the conditions in NUREG-0654, Appendix 1 with the corresponding Indian Point Units 2 and 3 conditions. The licensees emergency action levels are based on specific indications of plant parameters. I have compared the list in NUREG-0654 and the licensees Emergency Action Levels and they are consistent.

Contention 4.2 (c) The following specific feasible offsite procedures should be taken to protect the public:

(c) License conditions should prohibit power operation of Units 2 and 3 when the roadway network becomes degraded because of adverse weather conditions.

Q.141 With respect to Contention 4.2(c), describe how recommendations for protective actions are developed based on plant conditions.

A.141 Recommendations for the protective action of shelter is the initial recommendation. This recommendation is made on the basis of a degraded plant condition before there is a release of activity from the plant. If subsequent plant conditions degrade further the recommendation may be made to evacuate out to a minimum radius. NUREG-0654 Appendix 1 gives specific recommendations which have been repeated in the licensee's procedures.

Q.142 For Contention 4.2(c), describe the extent to which adverse weather conditions have been accounted for in the emergency preparedness at Indian Point, Unit 2 and Unit 3.

A.142 Adverse weather may have the effect of increasing the time necessary to evacuate an area. The evacuation time estimates made by the licensees have included an estimate of evacuation times during adverse weather. Local officials would take these factors into account in making subsequent recommendations after the initial recommendation to take shelter.

Q.143 For Contention 4.2(c), describe how protective action recommendations would account for adverse weather conditions.

A.143 As stated in response to Question 141 and 142, in any case, the initial recommendation would be to take shelter and listen to further instructions on the EBS system. If weather systems were such that evacuation would not be feasible, more specific shelter options might be broadcast, e.g., to employ ad hoc respiratory protection, or to take shelter in a basement.

Q.144 Would there be a significant increase in the protection afforded the public within the plume exposure pathway EPZ by emergency preparedness at Indian Point, Unit 2 and Unit 3, if a license condition prohibited power operation during adverse weather which degraded the road network in the vicinity of Indian Point, Unit 2 and Unit 3? Explain.

A.144 There would be come reduction in risk to the public for those periods when the reactors are not in operation. However, this may be off set by frequent startups and shutdown transients and by the reduction of grid reliability for the delivery of electricity under adverse weather conditions. Because the preferred protective action for severe, fast release accident scenarios is sheltering until after plume passage and subsequent relocation from any area subject to ground contamination the reduction in individual risk from shutting down in anticipation of such scenarios would not depend on calculated evacuation times. We would expect that a more significant increase in overall protection during such conditions would be afforded by the licensees making recommendations to alert the general public at the site emergency level rather than the

general emergency level during any accident warranting these classifications, thus giving the public more time to take effective action (e.g., to make preparations for any precautionary evacuation that might be ordered by offsite authorities).

Contention 4.5 Specific steps must be taken by NRC, State, and local officials to promote a public awareness that nuclear power plant accidents with substantial offsite risks are possible at Indian Point.

Q.145 For Contention 4.5, describe the Commission's requirements and guidance for public education and information concerning emergency planning, and compare the provisions made by licensees for public education and information.

A.145 10 CFR 50 Appendix E.IV.D.2 states, "Provisions should be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency. Signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs."

The licensees have complied with the first part of this requirement by distributing through the mail a brochure which addresses all of

the issues in that sentence. For the transient population, the licensees are committed to have a telephone page insert in the Fall, 1982, edition of the local telephone books, which will extract pertinent information from the brochure. The telephone page information will be available to all telephone users, both permanent residents and businesses, and transients wherever a telephone book is available, e.g., motel rooms. The licensees are planning to distribute a poster for places of public gathering, e.g., movies, meeting rooms. The poster is planned to have similar information as the telephone insert.

Contention 4.6 A maximum acceptable level of radiation exposure for the public must be established before any objective basis will exist for adequate emergency planning.

Q.146 For Contention 4.6, describe the Commission's requirements and guidance concerning acceptable levles of radiation exposure for the general public in the event of a reactor accident.

A.146 There are no acceptable levels of radiation exposure for the general public in the event of a reactor accident in the Commission's regulations.

Q.147 For Contention 4.6, describe the overall objective of emergency planning and your views on whether an objective basis exists for adequate emergency planning.

A.147 The overall objective of radiological emergency preparedness is to minimize the radiation dose that people might receive due to a reactor accident. With that object in mind, the NRC requires the

licensee to declare the emergency on the basis of plant parameters before there is a release of radioactivity, and with that same object in mind the local authorities are to activate an alarm system promptly, and that alarm system is to alert and notify people as quickly as possible.

Contention 4.7 The present emergency planning brochures and present means of alerting and informing the population of an emergency do not give adequate attention to problems associated with persons who are deaf, blind, too young to understand the instructions, or who do not speak English.

Q.148 For Contention 4.7, describe the Commission's requirements and guidance for alerting and informing the public and compare the provisions made by licensees to those requirements and/or recommendations of NUREG-0654.

A.148 The NRC requirements for educational material are stated in response to question 147. The requirements for alerting and informing the public are in 10 CFR 50.IV.D3..."the nuclear power reactor licensee shall demonstrate that administrative and physical means have been established for alerting and providing prompt instructions to the public within the plume exposure EPZ." The siren system that has been installed has the objective of prompt alerting of the public within the 10 mile EPZ. Arrangements have been made for radio and TV stations in the Emergency Broadcast System (EBS) to broadcast messages to notify the public on what to do in a specific radiological emergency.

The comment concerning handicapped or young or non-English Speaking people can be made about many aspects of modern life. Boy Scouts help elderly people across the street because some elderly are confused by traffic signs and lights. Blind people need assistance in coping with emergencies.

The educational brochures referred to in response to Question 58 included a questionaire for people who would need assistance in an emergency. The questionaire was in the form of a stamped, self addressed series of questions. The response to this questionaire has been transmitted to local county authorities for a registry of residents for whom special arrangements would be made.

The public information staffs of both PASNY and Con Ed have underway a public information program of meetings with citizens groups, church groups, PTAs, organizations such as Rotary to explain what could happen in an emergency and what people should be prepared to do. This program should also help to get the word out to people with special problems.

The NRC staff, in promulgating regulations and guidance, and in requiring licensees to disseminate information to the public, does not expect immediate 100% understanding by all the general public. We expect, in a severe emergency that people will help one another. This is what happens in all other kinds of emergency situations

where everyone is subject to the same conditions; we have no reason to expect that it would not happen in a radiological accident.

JOHN R. SEARS

RESUME'

Prior to 1952, I was employed in field jobs in various aspects of mechanical engineering. In 1952, I joined Brookhaven National Laboratory as a Reactor Shift Supervisor on the Brookhaven Graphite Reactor. While at Brookhaven, I completed a series of courses given by the Nuclear Engineering Department in nuclear engineering. These courses were patterned on the ORSORT programs. In 1956, I was appointed Project Engineer on the Brookhaven Medical Research Reactor. I was a member of the design group, participated in critical design experiments, wrote specifications, coauthored the hazards report, was responsible for field inspection and contractor liaison, trained operators and loaded and started up the reactor. About three months after start-up, in 1959, following the successful completion of proof tests and demonstration of the reactor in its design operating mode for boron capture therapy of brain cancer, I accepted a position as reactor inspector with the Division of Inspection, U. S. Atomic Energy Commission. In 1960, I transferred, as a reactor inpsector, to the newly-formed Division of Compliance. I was responsible for the inspection, for safety and compliance with license requirements, of the licensed reactors and the fuel fabrication and fuel processing plants. which use more than critical amounts of special nuclear material, in the Eastern United States.

In September 1968, I transferred to the Operational Safety Branch, Directorate of Licensing. My responsibility included development of appropriate guides for evaluatio of operational aspect of license applications and staff assistance in review of power reactor applicants submittals in the areas of Organization and Management.. Personnel Qualifications, Training Programs, Procedures and Administrative Control, Review and Audit, Start-up Testing Programs Industrial Security and Emergency Planning

The Branch was reorganized as the Industrial Security and Emergency Planning anch in April 1974 to place increased emphasis and attention upon areas of physical security and emergency planning.

In 1976 I transferred to the Divison of Operating Reactors as the sole reviewer responsible for review of emergency planning for all the operating reactors in the United States.

New York City College, 1950 - Mechanical Engineering

Argonne International School of Reactor Technology, 1961 - Reactor Control Course

GE BWR System Design Course, 1972

Popo-U.S. Army, 1974 - Course in Industrial Defense and Disaster Planning

Instructor at DCPA , 1976, 1977 - Course in Emergency Planning

Director, 1962 - Reactor Program, Atoms for Peace Exhibit, Bangkok, Thailand

Director, 1966 - Atoms for Peace Exhibit, Utrecht, Holland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CONSOLIDATED EDISON OF NEW YORK (Indian Point, Unit 2)	)	Docket Nos. 50-247-SP 50-286-SP
	)	
POWER AUTHORITY OF THE STATE OF NEW YORK (Indian Point, Unit 3)	)	

SUPPLEMENTAL TESTIMONY OF JOHN R. SEARS RELATIVE TO COMMISSION QUESTION 3

Q.1 State your name and position with the NRC.

A.1 My name is John R. Sears. I am a Senior Reactor Safety Engineer in the Emergency Preparedness Licensing Branch, Office of Inspection and Enforcement.

Q.2 Have you prepared a statement of your qualifications?

A.2 Yes, they are attached to my June 7, 1982 prefiled testimony.

Q.3 What is the nature of your responsibilities with respect to Indian Point, Units 2 and 3?

A.3 My responsibilities are described in response to Question 3 of my June 7, 1982 prefiled testimony.

Q.4 What is the purpose of this tesimony?

A.4 The purpose of this testimony is to address identified deficiencies in the onsite preparedness program for Indian Point, Units 2 and 3 which remain as "open items" and the licensees plans for improvements.

Q.5 Have you identified any deficiencies in the licensees' onsite emergency preparedness?

A.5 Yes, the following items were considered to be open items.

OPEN ITEM

Indian Point, Unit 2

Provisions for a TSC (Technical Support Center) which meets liability conditions, and which has the space, equipment, supplies, communications and protective means required to fulfill its functions during the various accident conditions.

The TSC for Indian Point, Unit 2 was formerly located in the administrative office space in the No. 1 Administrative Building and comprised several adjoining offices. In a letter dated June 1, 1981, Con Ed described their plans for a permanent Technical Support Center which was described to have the same radiological habitability requirements as the Control Room under accident conditions. This permanent facility has now been completed and will be manned during the March 9, 1983 exercise. An onsite appraisal for conformance to NRC guidance will be made by an NRC team during 1983.

OPEN ITEM

Indian Point, Unit 3

Determination of the representatives of post accident airborne effluent particulate sampling.

The licensee plans to determine the amount of deposition in sampling lines by analyzing and composing samples at the head and the tail of sampling lines. The program requires that the plant be operating to obtain data for comparison.

Q.6 What is the significance of these open items in the onsite emergency preparedness programs for Indian Point, Units 2 and 3?

A.6 1. The purpose of a Technical Support Center is to provide space outside the control room and information for qualified technical personnel to analyze the reactor situation and to provide counsel to the operators. The March 9, 1983 exercise will afford the first opportunity for observers to critique how well the new Technical Support Center operates.

2. Line losses in sampling lines is a generic problem. Analysis of the sample may indicate activity less than that actually present in the component being sampled. The licensee's program should lead to an understanding of the representativeness of the sample, and what, if anything, needs to be done to resolve the situation.

Q.7 Do these open items in the onsite emergency preparedness program of Indian Point, Units 2 and 3 alter the conclusions you reached in your prefiled testimony of June 7, 1982?

A.7 No; my conclusion remains that the emergency plans and procedures form an adequate basis for an acceptable state on onsite preparedness.

JUDGE GLEASON: I would like to suggest, Mr. Hassell, that in the future we could save a lot of time if we had these changes in written form supplied to the board in advance.

MR. HASSELL: I now tender the panel for cross-examination.

JUDGE GLEASON: Go ahead, Ms. Potterfield.

CROSS-EXAMINATION

BY MS. POTTERFIELD:

Q. My name is Amanda Potterfield. I represent the New York Public Interest Research Group, Intervenors.

I want to first ask Mr. Schwartz about his testimony. I understood, Mr. Schwartz, that you had adopted the testimony previously filed by Brian Grimes; am I mistaken about that that?

A. (Witness Schwartz) Ms. Potterfield, you are not mistaken. Mr. Grimes' prefiled testimony on, I think it was, June 7, and since that time he has been re-assigned other responsibilities at the commission. I reviewed the testimony that he prefiled, made some minor modification to that testimony, and filed it on

March 8 and adopted it as it was filed today.

Q. Well, as I look at the testimony it appears to me that you have taken from Mr. Grimes' testimony his remarks on contention 3.6, beginning at page 10 of his testimony, and going through to page 12, and that apart from that you have not adopted the first ten pages of his testimony, am I right?

A. (Witness Schwartz) I am sorry, I don't have that testimony in front of me.

JUDGE GLEASON: Excuse me, let's get something straight here, Ms. Potterfield, because I think all of us have to have the same understanding.

The only thing that has been admitted into the record that I am aware of is Mr. Schwartz's testimony as delivered to the parties on the date of March 8, 1983.

MS. POTTERFIELD: I understood that, too, but I wanted to clear up a previous understanding that I had that he was also adopting Mr. Grimes' testimony.

JUDGE GLEASON: The point is that has not been offered. So if you want to ask him questions about -- he may have changed that. You

have to do it in that line. Let's not confuse the testimony before us.

Am I incorrect, Mr. Hassell?

MR. HASSELL: You are correct.

JUDGE GLEASON: I am not trying to stop your questions.

MS. POTTERFIELD: That's all right. I have it clarified. Thank you.

Q. Then, as I understand it, you reviewed Mr. Grimes' testimony and changed part of it and used that as your testimony, is that right?

A. (Witness Schwartz) What I did was strike some of the material that was originally filed by Mr. Grimes and reread it and made sure I agreed with it and then filed it as my own.

Q. But you didn't make any changes, did you, to the testimony filed by Mr. Grimes beginning, well, on contention 3.6 and contention 4.1, which begins on page 2 of your testimony and goes through to page 6?

MR. HASSELL: Ms. Potterfield, can you indicate the areas of the Grimes testimony that you are referring to?

MS. POTTERFIELD: It begins on page 10 and continues to the end, page 12.

A. (Witness Schwartz) If you give me a moment, I will review it.

Q. Thank you.

(There was a pause in the proceeding.)

A. (Witness Schwartz) I believe that's essentially correct.

Q. You are now the deputy director of the Division of Emergency Preparedness and Engineering Response in the office of Inspection and Enforcement, is that right?

A. (Witness Schwartz) That's correct.

Q. Mr. Grimes had been be the director of that same department, is that right?

A. (Witness Schwartz) That's not totally true. There was a consolidation in the Office of Inspection and Enforcement and the Division of Emergency Preparedness was folded into a new division, which is now called the Division of Emergency Preparedness and Engineering Response. There is no Division of Emergency Preparedness per se at the Nuclear Regulatory Commission.

Q. But there is now a Division of Emergency Preparedness and Engineering Response?

A. (Witness Schwartz) That's correct. All the responsibilities of that old Division of

Emergency Preparedness was subsumed by this new division.

Q. Is there a director of this new division?

A. Yes, there is.

Q. What his his name?

A. (Witness Schwartz) Edward Jordan.

Q. Did he also review your testimony before you filed it here?

A. (Witness Schwartz) I can't say for certain whether he did or not. I know I discussed it with him as late as yesterday afternoon over the phone, what my conclusions were on the testimony, and he agreed with me.

Q. Now, Mr. Schwartz, do I understand that it is you and Mr. Jordan who have the responsibility within the NRC for review of emergency plans to determine whether or not those plans meet the requirements of NUREG 0654?

A. (Witness Schwartz) It is the division's responsibility, that's correct.

Q. And you and Mr. Jordan are the top two people in that division, am I right?

A. (Witness Schwartz) That is correct.

Q. So that the two of you are those who

are responsible for the imposition of the 120 clock at Indian Point most recently?

A. (Witness Schwartz) I would have to go back in my memory to remember when exactly that time was. I think Mr. Grimes was the division director at the time of the imposition of the four-month clock.

Q. It was in August.

A. It was Mr. Grimes that was in charge of the division at that time.

Q. What were your responsibilities in August of 1982?

A. (Witness Schwartz) I was the deputy director of that division.

Q. So you held a position that was just under Mr. Grimes at that point?

A. (Witness Schwartz) That's correct.

Q. And Mr. Jordan, was he also in your division at that point?

A. (Witness Schwartz) No. Mr. Jordan was the director of another division in the Office of Inspection and Enforcement.

Q. What role did you play in the decision to impose that 120 day clock last August?

A. (Witness Schwartz) I guess in the

context of that decision, it was advisory and supportive of the director's decision.

Q. Did you review the findings of the Federal Emergency Management Agency about the deficiencies in the emergency plans around Indian Point?

MR. BRANDENBURG: Mr. Chairman, at this time I have to interpose an objection. This topic has not been covered by this gentleman's direct testimony, and consequently I object to this line of questioning as beyond the scope of the witness' direct testimony.

JUDGE GLEASON: Objection is denied. Proceed.

A. (Witness Schwartz) Please repeat the question.

Q. In the course of your participation in the decision to impose a 120 day clock last August, did you review the findings of the Federal Emergency Management Agency about the deficiencies in the Indian Point emergency plan?

A. (Witness Schwartz) I believe I did, yes.

Q. And do I understand, then, from the imposition of the 120 day clock that you and Mr.

Grimes concurred in those findings?

MR. CZAJA: I am unclear as to the question, Judge. Is the question whether this witness concurs in all of FEMA's findings?

JUDGE GLEASON: Those findings.

MR. CZAJA: I am trying to find out what those findings are.

JUDGE GLEASON: What are those findings?

MS. POTTERFIELD: This is a witness who testifies as part of his job. He is Mr. Hassell's witness and he can be protected by Mr. Hassell. He doesn't need Mr. Czaja's question. If he is unclear about the question, he can tell me he is.

JUDGE GLEASON: Are you unclear about the question?

THE WITNESS: (Witness Schwartz) If you are describing the FEMA findings relating to, I believe it was the exercise that was the basis for the imposition of the four-month clock as provided in the regulation? Yes, I was a party to it.

Q. And since you and Mr. Grimes and your department participated in the decision to impose

the 120 day clock, may I infer from that that you concurred in those findings?

A. (Witness Schwartz) That's correct.

Q. So that the review of emergency plans for nuclear power sites is a regular part of your job at the NRC?

A. (Witness Schwartz) Yes, it is a regular part of my job, although not the total job.

Q. How much of your time is spent in reviewing emergency response plans?

A. (Witness Schwartz) I don't particularly review emergency response plans myself. I review the results of the reviews done by the branch responsible for that, and that's the Emergency Preparedness Branch within the division.

Q. How does it happen, then, administratively that plans would come to your attention from the Emergency Preparedness Division of your department?

A. (Witness Schwartz) As they are reviewed by the project leaders in the division, I would see the results of those findings.

Q. My question really is, Mr. Schwartz, whether you see their findings with regard to every set of emergency response plans they review

or whether you only see those that come to your attention for some special reason?

A. (Witness Schwartz) The responsibility, the day-to-day responsibility for those reviews rests with the branch. I will see copies of those from time to time when they are completed, or when there are some matters of policy that need some discussion.

Q. How is it that the Indian Point emergency response plans came to your attention?

A. (Witness Schwartz) I believe that you were talking, if I am to not mistaken, about the findings of FEMA, and I am discussing the staff review of the Indian Point emergency response plan. Unless you switched somewhere.

I want to make clear what it is you believe I am looking at.

Q. Let me be clear. I understand that the Indian Point emergency response plans did not come to your attention as part of your normal, the normal processes of review at the emergency preparedness group, is that right?

A. (Witness Schwartz) That's correct.

Q. They came to your attention only because FEMA had found some deficiencies in those

plans, is that correct?

A. (Witness Schwartz) Not in the plans but in the preparedness as a result of the exercise. I believe that's what we discussed a couple of minutes ago as to the letter or findings of FEMA that we were were discussing earlier, not the plans.

Q. So that if I understand your testimony, the emergency preparedness group in your department reviews plans in two different ways. One way is a general review of plans and the second way is a review of FEMA's findings about preparedness or about plans?

MR. HASSELL: Would you clarify which plans you are referring to, off site, on site? There are five different sets of plans for Indian Point.

Q. Let me ask you, do you review both off site and on site plans?

A. (Witness Schwartz) We only review the on site plans.

Q. So that in terms of the on site plans does your department review them in two different ways: One as a general review and one as a review of FEMA findings?

A. (Witness Schwartz) The review of the on site plans are done by the emergency preparedness branch. The review of the FEMA findings are done by that branch as well.

Q. Is there a third way that emergency response plans come to your attention on site?

A. (Witness Schwartz) I can't think of any.

Q. Now, since your focus is basically --

A. (Witness Schwartz) Excuse me, I just want to make clear again that we are saying we are mixing FEMA findings and on site plans. FEMA findings only relate to the off site capability.

There is another component which is, I think, germane to your questioning, and that is that FEMA -- NRC also has a responsibility of reviewing the exercise on site as well.

There is a plan review and an exercise review done by the staff for on site and comparable work done by FEMA.

Q. But your involvement in the off site plans is limited to a review of FEMA findings on preparedness?

A. (Witness Schwartz) That's correct.

Q. So that you never would review a set of off site emergency response plans as a matter of course?

A. (Witness Schwartz) As a general matter of course, no. That's correct.

Q. Did you ever have an opportunity to review the off site emergency response plans for Indian Point, apart from the FEMA findings this last August?

A. (Witness Schwartz) No.

Q. However, part of your responsibility, if I understand it right, and correct me if I am wrong, is to review emergency planning zones, plume exposure pathway planning zones around nuclear facility sites?

A. (Witness Schwartz) That's correct.

Q. Do you do that as a matter of course?

A. As far as the licensee's plan goes, yes, to be sure that he has provided for the decision-making process internally to promptly classify the accident and to properly notify the off site authorities as to what the status of the plant is as any particular time in the event of an emergency.

Q. I wasn't clear in my question. What

I was asking about particularly was the configuration of the plume exposure pathway in the Emergency Planning Zone.

A. (Witness Schwartz) Yes, that is something we review.

Q. Is that part of your on site routine emergency response plans, or how does that come to your attention otherwise?

A. (Witness Schwartz) Since it is part of the licensee's emergency response plan, yes, we review it.

JUDGE GLEASON: Ms. Potterfield, could I ask one question, because I am confused?

MS. POTTERFIELD: Yes, your Honor.

JUDGE GLEASON: Does not your department review the adequacy of FEMA's review of off site planning?

THE WITNESS: (Witness Schwartz) We review their findings, yes, on off site preparedness.

JUDGE GLEASON: Thank you.

Go ahead, Ms. Potterfield.

Q. Maybe I am not clear then either, Mr. Schwartz. When you review FEMA's findings about off site preparedness, do you in the course of

that review also look at the emergency response plans for off site?

A. (Witness Schwartz) I don't personally do it but the division may do it.

Q. Somebody in your division looks at the actual plans?

A. (Witness Schwartz) There are occasions where they would.

Q. Did they look at the actual plans in the Indian Point case?

A. (Witness Schwartz) Since Mr. Sears is the project leader on this particular case, I would have to consult with him on the answer to that.

A. (Witness Sears) Yes, I review all off site plans. I figure this is part of my overall responsibility. I do not dot the kind of review that FEMA does. I look for certain, significant, important items in these off site plans. But I do review all of the local plans and the state plans on every plant that I am responsible for.

Q. Mr. Sears, how do you become responsible for a set of plans?

A. (Witness Sears) I guess I don't understand. I am responsible, period. It is

embodied in the word "responsibility."

Q. So that are you responsible as part of your job to review the off site emergency response plans for all of the nuclear power plant sites across the country?

A. (Witness Sears) No. For those for which I am the team leader or reviewer or project leader.

Q. That's my question, how do you get assigned to be the team leader or reviewer?

A. (Witness Sears) My branch chief would have job assignments and I am assigned to a certain number of plants.

Q. You don't have a particular geographical area that you are responsible for?

A. (Witness Sears) No. I have been spread all over.

Q. Were you also responsible for reviewing the Indian Point off site emergency response plans during the imposition of the first 120 day clock in 1981?

A. (Witness Sears) Well, I have been on and off -- no, I wouldn't say that. Another person was responsible at that time.

Q. Did you work on that team or that

project in 1981?

A. (Witness Sears) In 1981 I don't believe so.

Q. If I understand your testimony here today, Mr. Sears, your testimony is fairly well limited to the on site plans, is that right?

MR. CZAJA: I object to the form of that question.

JUDGE GLEASON: Let him answer. The form sounds fine to me.

Go ahead, Mr. Sears.

MR. CZAJA: His testimony speaks for itself, I would suggest.

JUDGE GLEASON: The objection is denied.

Respond to the question, Mr. Sears.

A. (Witness Sears) I review the licensee's on site plan. That's my primary responsibility. In addition I read -- I wouldn't say I review all of the off site plans, I read them because I am looking for certain specific, important items in there.

These plans, as you know, are quite voluminous and quite detailed. I figure this is FEMA's responsibility to look at t hose details.

I look for certain important, significant items in them.

Q. But in terms of your testimony that you filed before this proceeding, your testimony concerns itself with the on site plans and not with the off site plans, is that right?

A. (Witness Sears) That's correct. Except for, you may have noticed, in my response to question 49 that I just changed, that I said there that I had -- I don't know if I used the word "review," but I certainly read the Westchester County plan at that time.

Q. Now, will you tell us, Mr. Sears, what important things you looked for when you review FEMA's findings for an off site emergency response plan?

A. (Witness Sears) I look for the capability of the off site officials to make a prompt decision.

Q. Anything else?

A. That's the most important thing. That's what I look for.

Q. Then you don't concern yourself, if I understand your testimony, with the capability for implementation of the logistical problems, the

buses, the evacuation routes, those kinds of things?

A. (Witness Sears) No. I look at that but that's FEMA's responsibility. No, I don't. I read it but I wouldn't say I review that.

The significant item I review is prompt decision-making capability.

Q. Well, was that the extent of your review in August but just before the imposition of the 120 day clock?

A. (Witness Sears) Yes.

Q. That was all that you looked at?

A. (Witness Sears) That's the important thing. That's what I look for, the important things, yes, ma'am.

Q. And when you made your report to Mr. Schwartz and Mr. Jordan about your review of the FEMA findings, was that report in writing?

A. (Witness Sears) No.

Q. As project leader, was it your decision primarily to concur in FEMA's findings and to recommend the imposition of a 120 day clock?

A. (Witness Sears) No, ma'am. Mr. Grimes did that.

Q. But Mr. Grimes didn't review the plan

or the FEMA findings?

A. (Witness Sears) you would have to ask him.

Q. There was no written memorandum or other report that you prepared for Mr. Grimes and Mr. Schwartz in the course of your review of FEMA's findings on the Indian Point off site plans?

A. (Witness Sears) No, ma'am. Mr. Grimes more or less took over that by himself, and he reviewed those findings himself.

JUDGE GLEASON: Excuse me, Ms. Potterfield.

Mr. Grimes does the review of the FEMA findings of the off site plans, is that what your testimony is?

THE WITNESS: (Witness Sears) No, my testimony was in this 120 day clock situation, that Mr. Grimes himself had reviewed the FEMA findings.

JUDGE GLEASON: Who does the review that is required under 50.47 B, or A; who does the review at NRC of FEMA's off site findings?

THE WITNESS: (Witness Sears) The team leader. It would be my responsibility in the usual course of events.

I say in this situation Mr. Grimes took this upon himself.

JUDGE GLEASON: And if you were doing it, you say that you only look at the capability of responding to the emergency, that's the thing you are looking for?

THE WITNESS: (Witness Sears) No, sir, that's not what I say. On other cases I review the complete FEMA findings. In this particular case Mr. Grimes took it over. When I read -- and I don't use the word "review" -- the state and local plans, I am looking for a couple of important, significant things in there to see that they are there. For many of the other details I depend upon the FEMA reviewers.

JUDGE SHON: In short, in most cases you would look at the on site plans and you would look at the FEMA findings and make any recommendations that might be made as to imposing the 120 day clock, but in this particular case you did only the first of these jobs and Brian Grimes did the second, is that right?

THE WITNESS: (Witness Sears) That's correct, yes, sir.

Q. Mr. Grimes still works for the NRC,

does he not?

A. (Witness Sears) Yes, ma'am.

Q. What is his present position?

A. (Witness Schwartz) He is deputy director of another division within the Office of Inspection and Enforcement.

Q. And what is the name of that other division?

A. (Witness Schwartz) I knew you would ask. It is a long title. It is the Division of Quality Assurance and about four or five other titles.

Q. I take it, it doesn't have to do with emergency planning?

A. (Witness Schwartz) That is correct.

JUDGE SHON: I think, gentlemen, one of the things that is bothering the board a little bit is the fact that we are now confronted by the situation, with the passage of time, where the person who did the actual review of the FEMA findings in this case is not before us to testify. Is that not correct?

THE WITNESS: (Witness Schwartz) That's correct. In making the decision on the 120 day clock, that's correct.

JUDGE SHON: So that anything about how that decision was made, anything that we might want to do to penetrate under the bare fact that it was made, is difficult to do for us because we don't have one of the important people who helped to make that decision, who did the actual review present, isn't that correct?

THE WITNESS: (Witness Schwartz) That's correct.

JUDGE GLEASON: Go ahead, Ms. Potterfield.

Q. Mr. Sears, I don't mean to belabor a point, but I am a little bit confused and I am looking forward to an opportunity to question you about it. As I read the regulations of the Nuclear Regulatory Commission, and particularly 50.54 S-3 -- would you have a copy you can hand to Mr. Sears so he can see what I am questioning on?

(There was a pause in the proceeding.)

JUDGE GLEASON: What is the citation?

MS. POTTERFIELD: 50.54 S, sub3.

JUDGE PARIS: What page are you on?

MS. POTTERFIELD: 87. "The NRC will base its finding on FEMA's findings as to whether state or emergency plans are adequate and capable

of being implemented and on the NRC assessment as to whether the licensee's plans are adequate and capable of being implemented."

Q. Are you with me, Mr. Sears?

A. (Witness Sears) I haven't left.

Q. Does that mean in practice, in your department, that it is the Federal Emergency Management Agency that reviews the off site plans and that it is your department that reviews the on site plans as a matter of course?

A. (Witness Sears) Yes, that's essentially correct, with the provision, as I said before, that I read the off site plans, looking for certain specific, important items.

Q. That's when you are the project director?

A. (Witness Sears) That's correct.

Q. But there are other project directors or team leaders within your division, are there not?

A. (Witness Sears) There are indeed.

Q. Do you know whether or not they follow that same practice?

A. (Witness Sears) I can't vouch for all of them. I know many of them do. I would assume

they do, but I am not their boss and I am not looking over their shoulder. But in discussions with them I assume so.

Q. As I understand from your testimony, the main factor you look for is that prompt decision-making ability about which you testified in your answer number 49?

A. (Witness Sears) That's correct.

Q. And were you able to recall or are there any other special factors that you look for?

A. (Witness Sears) That's the principal one.

Q. Now, Mr. Schwartz, getting back to my earlier question about the configuration of the plume exposure pathway EPZ and your department's role in reviewing those configurations for nuclear power plant sites across the country, I understood your testimony to be that it was -- that these plume exposure pathway EPZs were reviewed as a matter of course as part of the review of the on site plans?

A. (Witness Schwartz) That's correct.

Q. Do you do this review yourself, personally?

A. (Witness Schwartz) I do not.

Q. Who does this review?

A. (Witness Schwartz) That is done by the project leader in the Emergency Preparedness Branch.

Q. So that also would be Mr. Sears in the case of Indian Point?

A. (Witness Schwartz) That's correct.

Q. However, it is your testimony that the plume exposure pathway EPZ for Indian Point is appropriate, is it not?

A. (Witness Schwartz) That's correct.

Q. Did you, yourself, make an independent review of this particular EPZ?

A. I reviewed it from the sense that I looked at the definition, the line that was drawn, and the communities involved.

Q. Was this part of your normal routine and part of your job as reviewing on site plans, or did it come to your attention specially because it was Indian Point?

A. (Witness Schwartz) I guess it came to my attention in the detail that it did because of the pendency of this hearing.

Q. So that you reviewed the Indian Point EPZ to prepare for your testimony here today?

A. (Witness Schwartz) I would say that's fair, yes.

Q. You testified in other proceedings like this about other nuclear power plant sites, have you not?

A. (Witness Schwartz) I have not.

Q. You have never testified before about the appropriateness of the configuration of a plume exposure pathway EPZ?

A. (Witness Schwartz) Not in a licensing hearing.

Q. Have you so testified in any ASLB hearing?

A. (Witness Schwartz) I have not.

Q. Now, in reaching your conclusion that the Indian Point EPZ is appropriate, you adopted the language and the conclusions of Brian Grimes, isn't that right?

A. (Witness Schwartz) That's correct.

Q. In your review of the EPZ to prepare for your testimony, I assume you reviewed, then, the demography around the Indian Point area?

A. (Witness Schwartz) Generally, yes, that's correct.

Q. What is it about the demography

around this nuclear power plant site that led you to believe thereat the present configuration of the plume exposure path way EPZ was appropriate?

A. (Witness Schwartz) That in the task force report, the joint NRC task report, that I discussed as NUREG 0396, takes into consideration in their evaluation of the need for an Emergency Planning Zone the demography and topography, and that in this case the ten miles is appropriate.

Q. I understand from your answer that you relied on NUREG 0396 which indicates that you should review demography and topography, is that right?

A. (Witness Schwartz) That's correct.

Q. My question is what is it about the demography and topography around the Indian Point area that led you to your conclusion in adopting Mr. Grimes' conclusion that the present EPZ is appropriate?

A. (Witness Schwartz) My conclusion is based on the present EPZ of ten miles is appropriate, which supports the generic nature of the ten mile emergency planning zones that is currently in the Nuclear Regulatory Commission regulations, and that generic ten mile EPZ is

appropriate for the Indian Point site.

Q. Well, what is it about the population density in Westchester County and around the Indian Point plants that made you conclude that the ten mile EPZ was appropriate?

A. (Witness Schwartz) The planning base in the ten mile EPZ, the plans, preparedness, and my discussion with Mr. Sears, and others, is that there is -- that that base is the one presumed to be the planning base used in the 10 mile EPZ, whether or not it is around Indian Point or any other location, and that the public health and safety could be protected within the ten miles.

Q. Your testimony is that NUREG 0396 establishes a presumption that ten miles is appropriate and your conclusion is based on that presumption?

A. (Witness Schwartz) That's correct.

Q. Well, did you look at the topography around the Indian Point site in reaching your conclusion?

A. (Witness Schwartz) Yes, I did.

Q. What is it about the lay of the land around the Indian Point site that made you conclude that ten miles was an appropriate EPZ?

A. (Witness Schwartz) Well, looking at topography and demography of the area, with the population centers and the distribution of the population --

Q. Try to be as specific as you can. What is it about the population centers and what distributions of population?

A. (Witness Schwartz) Well, if you look north, south and west, you are looking at the major population centers. Peakskill, Ossining, and then west to -- what is it?

Q. Haverstraw?

A. (Witness Schwartz) Haverstraw, Hempstead and West Hempstead, I guess those are the five major EREAs.

Q. Let me show you a map that has been marked Con Edison Exhibit 8 so that you can show me and the board what it is about the population distribution and the topography that led you to conclude that this EPZ is appropriate? The EPZ is marked in this purple line that goes around.

A. (Witness Schwartz) The population centers, the major population centers are located here in Ossining. I don't remember what number that was. I think that was about 30,000 people.

Then about 20,000, 19 or so, in Peakskill, and then the Haverstraw area, the Hempstead area, the West Hempstead area, the five areas of major population.

Based on the plans for preparedness and comparing that to the information provided in 0396 for all sites for ten miles, I felt that ten miles was appropriate for the Indian Point site.

JUDGE PARIS: Would you point to the high density Haverstraw area in there? Is it West Haverstraw?

THE WITNESS: (Witness Schwartz) It is Haverstraw, and if I had the ERPA map I could identify the number of the ERPA.

JUDGE PARIS: It is marked here West Haverstraw and Haverstraw along the river there?

THE WITNESS: (Witness Schwartz) That's correct. It is Haverstraw, with about 19,000, and then there is Hempstead and the West Hempstead area, bounded by Palisades Interstate highway and Route 306, in that general area there is another population area.

Q. But my question, then, Mr. Schwartz is whether or not you looked at any population centers that are not within the currently drawn

EPZ to see if the EPZ could have been drawn in a better way than the was?

A. (Witness Schwartz) I didn't look much beyond the currently drawn Emergency Planning Zone.

Q. So you didn't look to the North Bronx or to New York City at all?

MR. HASSELL: Objection. Asked and answered.

JUDGE GLEASON: Well, answer the question. He leaves a little room for answering that. Answer the question.

A. (Witness Schwartz) The answer is no.

Q. Now, I take it, Mr. Schwartz, that you considered the access routes around the Indian Point area in making your determination that the presently defined EPZ was appropriate, did you not?

A. (Witness Schwartz) Yes, generally I looked at the access routes. In fact, I did drive some of those routes personally. Although I am not a transportation expert.

Q. What is it about those routes -- and please name them, if you can -- that led you to believe that the presently drawn EPZ was the appropriate configuration for Indian Point?

A. (Witness Schwartz) I think around the

Peakskill area and then down below the plant within around two, three miles of the plant, within the area described in the Peakskill and the Ossining area, Route 94, Route 9, 9 A.

Q. What is it about Route 9 A and Route 9 that led you to believe that the presently drawn EPZ is appropriate?

A. (Witness Schwartz) It is not just the review of those particular roadways, but it is a review of the evacuation time estimates -- the reading of the evacuation time estimates that were done by the licensing contractor.

Q. But in your review of the access routes around Indian Point, you noticed, did you not, that there was very level east-west access, egress or ingress around the EPZ?

A. (Witness Schwartz) Correct. I guess I will have to agree with you, yes.

Q. You notice that up around Peakskill, the area that you were describing, that there is a very narrow two-lane bridge, Bear Mountain Bridge, that goes across the Hudson, did you not?

A. (Witness Schwartz) Yes.

Q. Did those observations influence you in any way in your conclusion that the presently

drawn EPZ is appropriate?

A. (Witness Schwartz) No, it did not.

Q. What about jurisdictional boundaries, you looked at jurisdictional boundaries in concluding that the EPZ was appropriate, did you not?

A. (Witness Schwartz) Yes.

Q. Tell me what it is about the local jurisdictional municipal and county boundaries around Indian Point that led you to conclude that the ten mile EPZ was appropriate?

A. (Witness Schwartz) I think it is my notion that counties themselves, I guess the Four County Committee that was established to put together a response plan, a coordinated effort, was the kind of response base that was presumed to be in place that reflects the emergency planning regulations of the commission in 0396 in the establishment of the ten miles, and the progress being made by that organization to take care of the population within the ten miles leads me to believe that any extensions of recommendations, decision-making, and coordination with the state agencies, could be done.

Q. Well, what is it about the existence

of the Four County Nuclear Safety Committee -- you are aware that that's no longer a four county committee, aren't you, Mr. Schwartz?

A. (Witness Schwartz) Yes, I am.

Q. Did that change your mind at all about the appropriateness of the jurisdictional boundaries for the ten mile EPZ?

A. (Witness Schwartz) I don't think it did because, in looking, and I was here for the exercise that was conducted on March 9, to try and witness, although I didn't go beyond the emergency operations facility, I didn't visit each of the EOCs, but I did listen and discuss with some of the FEMA people, and also the state, their response.

Q. We are talking about jurisdictional boundaries and I don't follow your response.

MR. CZAJA: I don't think that was the question, Judge.

JUDGE GLEASON: Let her ask the question, please.

Go ahead.

Q. I wonder what it is about the existence of a committee that used to be a four county committee and is now, if anything, a three

county committee, what it is about the existence of that committee that led you to believe that in terms of jurisdictional boundaries the present EPZ is appropriate?

A. (Witness Schwartz) That the counties that were in the ten mile EPZ saw fit to get together to put together an integrated planning effort that would be responsive to potential accidents at the Indian Point site.

And that level of cooperation, the standardization of the various categories of emergencies is very important so that everybody understands when an emergency takes place, that everybody understands what actions are to be taken and they all can concur in those actions, and that they can agree to what roadways ought to be used.

Q. So it is your understanding of the Indian Point emergency response plans that they are plans that have been integrated and coordinated among all the counties involved?

A. (Witness Schwartz) There is an attempt to do that, and I think it is working.

Q. And your conclusion that this is working is based, at least in part, on the existence of the Four County Nuclear Safety

Committee?

A. (Witness Schwartz) The organizational aspects, but more importantly I think it is the work being done in the individual counties and the state level.

Q. You are aware that the Four County Nuclear Safety Committee is staffed by a person funded by the licensee?

A. (Witness Schwartz) Yes.

Q. It is not staffed by people who work for the counties?

A. (Witness Schwartz) Yes.

MR. CZAJA: I object to the form of the question.

JUDGE GLEASON: Objection denied. He has already answered it.

Q. When you looked at the jurisdictional boundaries in the presently defined EPZ, Mr. Schwartz, did you notice that the boundary for the town of Clarkstown in Rockland, that that municipal subdivision is cut in half by the EPZ? I am not sure it shows on the map that you have in front of you.

A. (Witness Schwartz) I see it, yes. In fact, the name Clarkstown is obliterated by the

ten mile EPZ.

Q. Did that make any difference to you in reaching your conclusion that the presently drawn EPZ was appropriate in terms of jurisdictional boundaries?

A. (Witness Schwartz) No, I did not.

Q. Now --

JUDGE GLEASON: I didn't understand your response, no, you did not.

THE WITNESS: (Witness Schwartz) I did not look at it as being meaningful.

Q. Now, the regulations require, do they not, Mr. Schwartz, that you also look at land characteristics in reviewing the configuration of a plume exposure pathway EPZ in determining where that should be drawn?

A. (Witness Schwartz) Yes, I believe that's correct.

Q. What is your department's interpretation of land characteristics as it reads in the regulation?

A. (Witness Schwartz) I will have to defer on that question to Mr. Sears.

A. (Witness Sears) What we are referring to here are things like dead-end areas. Let us

say swamps, cliffs, and so forth, that could possibly impede evacuation.

For example, on the coastal sites, the fact that you have a lot of water out there and there may be boaters and that kind of thing. These are all part of looking at land characteristics.

Q. You must have looked at land characteristics to reach your conclusion, Mr. Schwartz, that the EPZ around Indian Point was appropriate, did you not?

A. (Witness Schwartz) Yes.

Q. What is it about the land characteristics around Indian Point that led you to conclude that it was an appropriate EPZ?

A. That there was adequate -- that there were not dead areas, but I didn't review every single point.

Q. Basically, in reaching your conclusion, Mr. Schwartz, if I understand your testimony, is you relied on the presumption in 0396 that says that EPZs should be about ten miles?

A. (Witness Schwartz) That's correct.

Q. Now, are you familiar with the report that was done for the NRC by Sandia in September

1982 or October 1982 about reactor accident consequences?

A. (Witness Schwartz) There have been a number of reports but I am not sure which one you are referring to.

Q. This is a report that bears the Sandia number 82-1110, prepared for the NRC in September of 1982.

A. (Witness Schwartz) What is the substance of that report?

MR. HASSELL: Can you give him the title? Can you show him a copy?

MS. POTTERFIELD: I don't have a copy with me.

Q. I understand that the title of the report is, "Reactor accident consequences." It is a report that got so much play about what the potential consequences of the worst case accident in a nuclear power plant might be.

A. (Witness Schwartz) I guess I am only familiar with it in the sense that it did get wide play, but I did not review it.

Q. And it didn't, then, get distributed to your department?

A. (Witness Schwartz) I am not familiar

with it as far as I know.

Q. Assuming, hypothetically, Mr. Schwartz, if you will, that Sandia reached the conclusion that in a worst case accident consequences is Indian Point could reach a radius of up to 17 miles. Assuming that, would that change your opinion about the appropriateness of the EPZ as it is presently drawn on around the Indian Point area?

A. (Witness Schwartz) It would not.

Q. I direct your attention, Mr. Schwartz, to your testimony on page 5, in which you give several considerations taken into account in NUREG 0396 for a ten mile EPZ, and under C of those considerations, you state, "For the worst core melt sequences immediate life threatening doses would generally not occur outside the zone."

Is that your testimony?

A. (Witness Schwartz) That's correct.

Q. Now, assuming hypothetically the report that I just referred you to said that in a worst case accident at Indian Point the consequences for life threatening doses could go out to a radius of 17 miles, would that change your testimony?

A. (Witness Schwartz) I would have to review it, but I don't think it would change my testimony because it is based on the premise that the emergency base, the base for emergency response could be extended and there would be adequate time to make judgments, notifications and decisions. And that the emergency preparedness program is based on not after release, but the program is based on that the licensee would characterize the event, would have understanding based on plant conditions what is going on in a reactor, and make some protective action or recommendations, hopefully prior to any release.

Q. But directing your attention, again, to your testimony, paragraph C, for the worst of the core melt sequences that, immediate life threatening doses would generally not occur outside the zone, my question to you again is would even that part of your testimony change, assuming hypothetically that Sandia had found that at Indian Point, for worst core melt sequences immediate life threatening doses would occur at 17 miles?

A. (Witness Schwartz) I would have to review the basis that they made those conclusions

on. Without being familiar with it, there is an awful lot of assumptions that can be made in that study as to times for action. And without understanding what the basis of that is, I cannot make any other conclusion.

Q. Turning to page 6 of your testimony, Mr. Schwartz, you indicate that sheltering may be a preferable protective response to evacuation. I am at the top of that page.

Your testimony says that "sheltering and subsequent relocation after cloud passage may be as effective as evacuation even in severe accident sequences in distances greater than ten miles." Is that your testimony?

A. (Witness Schwartz) That's correct.

Q. What review or study has the NRC undertaken with regard to the sheltering capabilities of the ten mile EPZ around Indian Point?

A. (Witness Schwartz) By "shelter," I am not referring to fall-out shelters or bomb shelters. I am referring to staying in the house and turning off the air conditioner and turning off anything that can move the air within the house and bring the outside air in. I am not

talking about shelters in that context.

Q. So your testimony at the top of page 6 is based on no particular study of sheltering capabilities around the ten mile EPZ but rather on the idea that any shelter at all would prove effective?

A. (Witness Schwartz) Will provide some measure of protection.

Q. Mr. Sears, I would like to direct your attention to page 13 of your testimony, beginning with question and answer 34, which is on page 12, the answer goes from page 12 to page 13. You indicate that both licensee's emergency plans provide for the four classes of emergencies, notification of unusual events, alert, site emergency, and general emergency.

Is that your testimony?

A. (Witness Sears) That is my testimony as written here, yes.

Q. Now, I understand from my reading of the Power Authority emergency plan procedures document -- have you seen that document, by the way?

A. (Witness Sears) I have reviewed it.

Q. Are you familiar with it?

A. (Witness Sears) I am familiar with it.

Q. I understand that they have an additional emergency classification that's labled "nonradiological alert classification." Were you aware of that?

A. (Witness Sears) I am aware of it.

Q. What is the rationale behind the additional emergency classification of nonradiological alert classification, if you know?

A. (Witness Sears) Well, there may be other kinds of emergencies at the plants which have nothing to do with radiation and that there is no possibility of their being a radiation release as a result of that kind of accident.

Q. Well, did you compare PASNY's nonradiological alert classification with the appendix one to NUREG 0654?

A. (Witness Sears) No.

Q. You are aware generally, are you not, of the format of appendix one to NUREG 0654?

A. (Witness Sears) Yes, sir.

Q. Would you like to see a copy?

A. (Witness Sears) Yes.

MS. POTTERFIELD: Mr. Hassell, do you have a copy or shall I show him mine?

MR. HASSELL: I have a copy.

(There was a pause in the proceeding.)

JUDGE GLEASON: What are we looking at?

MS. POTTERFIELD: At particularly page 1-9 of NUREG 0654 in appendix one, relating to emergency classifications.

Q. Are you on page 1-9, Mr. Sears?

A. (Witness Sears) Yes.

Q. Now, on that page is a list of example initiating conditions for the alert classification, isn't that right?

A. (Witness Sears) That's correct.

Q. Now, assuming, hypothetically, that within PASNY's classification of nonradiological alert there were at least eight of the same conditions that are included on page 1-9 as initiating conditions for an alert classification, then I ask you again what is the rationale for PASNY's inclusion in their emergency classification system of a classification less serious than alert, called a nonradiological alert?

MR. CZAJA: I object to the form of that question.

JUDGE GLEASON: Do you understand the question, Mr. Sears?

THE WITNESS: (Witness Sears) Yes, sir.

I don't know what is their rationale for creating this other classification.

I can assume, if you will, why they created this other situation. Simply to separate things easier for the operators to be able to recognize and classify accidents.

But from our point of view of why we have these in the first place, it is really irrelevant because the whole purpose of these EALs is give the operator a very simple kind of go-no go gauge, if you will, by which he recognizes the accident and then he gets back to the work of trying to see that the accident doesn't go any further. This is his primary job.

We want these classification systems to be as simple as possible. We have no objection to people having subsets of these kinds of classifications. The important thing is can the operators use them.

Q. Well, the inclusion of an additional classification which requires for a different response would not simplify the situation, would it, Mr. Sears?

A. (Witness Sears) No, that is not true.

Q. The complicates the situation, doesn't it?

A. (Witness Sears) That's not true at all.

JUDGE GLEASON: Is neither one of those true?

THE WITNESS: (Witness Sears) I guess with so many negatives maybe I got confused.

JUDGE GLEASON: She asked you if adding a fifth classification, when your testimony was that the scheme of having four was designed to simplify matters and to allow an operator to get at controling something that might happen, would actually then complicate matters?

THE WITNESS: (Witness Sears) No, it would not complicate matters to have this additional classification.

Q. You understand my hypothetical, Mr. Sears, that in this additional classification there is some difference in the response that should be made?

A. (Witness Sears) No difference in response. No, ma'am, no difference in the response. The operator's job is to prevent an

accident from going further and these emergency action levels, the purpose of these is to have some clear, observable, measurable indication in the control room which the operator sees and picks up the phone and makes notifications off site, and then immediately gets back to work, which is his primary job, seeing that the accident doesn't go any further.

MR. HASSELL: Judge Gleason, I hate to interrupt the cross. Is it possible to take a five-minute break? The witnesses have been on about an hour and a half.

JUDGE GLEASON: Let's take a ten-minute break.

(There was a short recess.)

JUDGE GLEASON: Let's commence, please. I think we stopped -- I didn't mean to interfere with the line of questioning, Ms. Potterfield, but you may pick up.

Q. Mr. Sears, have you had an opportunity during the break to consider the PASNY's fifth emergency level classification?

MR. CZAJA: I object to the form of the question. I don't think it has been established that there are five emergency level

classifications.

JUDGE GLEASON: I think that has been established and the objection is denied.

Answer the question, please.

A. (Witness Sears) I have considered it before the hearing, as I mentioned before, and it is really of no consequence as far as the operator declaring the emergency.

Q. Now, you are aware, are you not, that for a nonradiological alert, under PASNY emergency procedure plans, the operator may decide not to activate emergency support centers?

A. (Witness Sears) He may decide not to activate the emergency support centers? I believe this is correct.

Q. So that the response of the operators to the nonradiological alert and to the radiological alert are different, are they not?

A. (Witness Sears) No, not really. Not of the operator, no.

Q. Who is it that makes the decision whether or not to activate the emergency support centers?

A. (Witness Sears) The emergency director who initially is the shift supervisor.

And he will make the decision at that time whether he needs any help or not.

Q. So you are drawing a distinction in your testimony between the operator of the facility himself or herself and the shift supervisor?

A. (Witness Sears) When I say the shift supervisor, he is the emergency director. The shift supervisor on watch is the man in charge and he is the initial emergency director. He makes the decision whether or not or what kind of help he needs.

Q. But under the appendix one in NUREG 0654, in an alert situation that person is supposed to activate the emergency support centers, isn't that right?

A. (Witness Sears) Yes, that's correct.

Q. And now under PASNY's fifth nonradiological alert classification, he has an extra decision to make, isn't that right?

A. (Witness Sears) It is not an extra decision. His initial job, as I point out again and again, is to cope with what is going on with his machine right there and then, and on the basis of what he sees with his reactor, he makes the

decision whether he can cope with it right then or whether he needs some help.

If he needs some help, he then proceeds to call in other people who then man the tech support center, and so forth.

Q. But the purpose of the emergency classification system outlined in NUREG 0654 is to simplify those judgmental decisions by the operator, is it not?

A. (Witness Sears) No, I wouldn't say that. The purpose of the emergency action levels is to insure that the operator can make a declaration of the emergency and notify off site officials and then, as I say, get back to his job of trying to mitigate the consequences of whatever is going on with his machine.

Q. Mr. Sears, are you aware of a proposed revision to the Westchester County emergency response plan that would provide for the children to be dismissed during an alert situation?

A. (Witness Sears) That is a proposal. I have read the February 1983 revision, and the first time I saw it was last night as a matter of fact, and I don't see that language in that revision. I have heard it discussed by people,

and I believe it has been discussed in this hearing, but I haven't seen any language as yet in a revision of the plan.

Q. Assuming, if you will, Mr. Sears, that Westchester County and the State of New York and the Federal Emergency Management Agency decide to include that provision in their emergency response plan, would it make any difference to you then whether or not PASNY had a separate level of alert classification than just one level?

A. (Witness Sears) Then it would make sense to have one alert level to get rid of this fifth classification, yes.

JUDGE SHON: Ms. Potterfield, I think you have confused me a bit now. The classifications of emergency mentioned at page 13 of Mr. Sears testimony, notification of unusual event, alert, site emergency and general emergency" contain the word "alert."

Is it your understanding -- I must tell you it was not mine -- that school children would be sent home whenever the classification alert, that is just above the notification of unusual event, occurred at this plant

Q. It was my understanding that one was

with a capital A in the O'Rourke plan and one was in general. I don't believe Mr. O'Rourke was clear on that.

JUDGE GLEASON: If I could, let me say that the testimony is confusing, not specific. Mr. O'Rourke use the words that they would be sent home in an alert stage or some other serious development condition. That's where the testimony lays at the present time.

JUDGE SHON: Inasmuch as it is unclear to us and apparently unclear also to you, I think it is sort of unfair to ask this witness to give detailed opinions on the advisability of the situation. I say it is inadvisable that it remains unclear, but aside from that I think the line of questioning can only confuse the witness, don't you?

MS. POTTERFIELD: I think we got an answer and it was based on a hypothetical situation since none of us know. I believe Judge Paris asked one of the on site panel when a control center might be established in the event of an alert plan and that might be called early. I think it is important to have this in the record in the event the O'Rourke plan states that the

children go home then.

JUDGE GLEASON: Go ahead and proceed.

Q. I want to direct your attention to page 29 of your testimony beginning with question and answer 79, you discuss in your testimony your evaluation of the evacuation time estimates for Indian Point. You state in your answer to question 83 that these time estimates have been examined for conformance with the above criteria that you discuss in answer 82, do you not?

A. (Witness Sears) Yes.

Q. And in answer 87 you testified that the licensee's time estimates meet the criteria that you identified earlier on in your testimony, do you not?

A. (Witness Sears) Yes.

Q. My question to you is, that conclusion you reach is based on the examination of the time estimates done by Mr. Urbanic, isn't it?

A. (Witness Sears) Yes.

Q. You didn't review those time estimates yourself independently?

A. (Witness Sears) Yes, I did.

Q. You also did review them yourself?

A. (Witness Sears) Yes.

Q. What did you look for?

A. (Witness Sears) I looked to see that the time estimates, the way they arrived at their time estimates was in conformance with the appropriate part of 0654.

Q. I have to ask you to be more specific, Mr. Sears. What do you mean by the way they arrived at their time estimates?

A. Well, the 0654 has a description in it, in one of of the appendices, on acceptable methods of arriving at these time estimates, and what should be included in a time estimate study.

I reviewed the documents to see that it had in there what is described in appendix 4 of 0654.

Q. Do you not have any independent recollection of the criteria you used?

A. The criteria here in 0654.

Q. So will you tell us which ones you used and what you determined as you look at your appendix 4 to 0654?

A. (Witness Sears) All of it. The criteria here in 0654, they are here. I reviewed the documents and looked at 0654 and saw whether

Q. Now, on page 44 of your testimony, if you will, please, Mr. Sears, beginning with question and answer 121, you testify that you have examined the licensee's provision for radiological emergency response training to those who may be called on to assist in an emergency.

Do I understand from your testimony that you have reviewed the provisions for training of people who may be called on site as well as training of people who may have to perform emergency duties off site?

A. (Witness Sears) Yes, I believe so. I believe the licensee had plans for training local fire departments, for example, who may be called on site, yes.

Q. But did you also look at any training programs for emergency workers who would be required to perform duties off site in the community in the event of an accident?

A. Well (Witness Sears) Just lately I have been asked to review a document of, I believe, created by New York State and is called emergency workers, emergency training manual, something of that kind; and, yes, I have reviewed that.

Q. You have reviewed the emergency

workers manual for New York State?

A. (Witness Sears) Yes, I have.

Q. Have you also reviewed the testimony that's been submitted in this proceeding by policemen and firemen about the content of the training they have received from New York State?

A. (Witness Sears) No, I haven't.

Q. Now, turning to page 45, your answer to question 123, the question asks whether or not the licensees have established means for assuring that emergency response personnel will receive training. Your answer to that is yes.

My question is, is your answer based only on the tables in their emergency procedures that summarize the training, or do you have other outside information on which you base that answer?

A. (Witness Sears) Well, my answer there refers to the training of on site people, their own people. It does not refer to the off site people.

Q. It does not?

A. (Witness Sears) No.

MS. POTTERFIELD: No further questions.

JUDGE GLEASON: Any redirect?

MR. CZAJA: I believe we have some

cross-examination.

JUDGE GLEASON: I am sorry.

MR. CZAJA: Mr. Brandenburg will go first.

JUDGE GLEASON: Mr. Hassell, do you want to redirect or do you prefer to wait?

MR. HASSELL: I prefer to wait, Judge.

CROSS-EXAMINATION

BY MR. BRANDENBURG:

Q. Mr. Mr. Schwartz, you were asked on cross-examination about your involvement in the 120 day clock that was started by the commission in early August of 1982. My question relates to the end of that process rather than to the beginning of it.

Are you familiar with the fact that FEMA issued a document which they called an update report on December 16, 1982, at the conclusion of that 120 clock period?

A. (Witness Schwartz) Yes.

Q. Now, did you review that document at or about the time it was released?

A. (Witness Schwartz) I read it but I really don't remember the details of it, to be honest with you.

Q. Now, as I understand the commission's 120 clock procedures with respect to off site preparedness, they receive evaluation materials from FEMA, and then your division makes some independent assessment of that information with respect to off site preparedness, and then proceeds to make recommendations to the commissioners and regulatory decisions based on that, and so on, is that a fair statement?

A. (Witness Schwartz) That's essentially correct.

Q. Now, I would like to zero in on the depthfulness, if you will, of the independent assessment that the NRC staff makes of the material provided to it by FEMA.

A. (Witnes Schwarz) I didn't quite hear what you said.

Q. I would like to zero in on the depthfulness, if you will --

JUDGE GLEASON: What word are you using? Deft, D E F T?

MR. BRANDENBURG: I will try it again. Depthfulness.

Q. How intensive, Mr. Schwartz, is the review that the NRC staff gives of the material

that it receives from FEMA?

A. (Witness Schwartz) It depends on the kind of report that we receive. The one you referred to as off site planning?

Q. That was at the end of the process --

JUDGE GLEASON: Mr. Brandenburg, it is impossible to hear anything if you are going to interrupt an answer. Let him respond, and then ask him another question.

A. (Witness Schwartz) Is this generally?

Q. Let's take it generally, sure.

A. (Witness Schwartz) When we receive a finding, and that's what we have been receiving from FEMA in most cases, findings on plans of preparedness, if we have any questions as to the meaning of their discussions, we will go back to them.

We review it and accept essentially their judgment, because they have the depth in reviewing, through the regional assistance committees, the planning effort being done to support any particular nuclear facility around the country.

Q. Does your review of -- when I say "your" I mean the NRC staff -- review of a FEMA

interim finding embrace the inquiring into the extent to which FEMA conducted its own inquiry? For example, if FEMA were to make a conclusion about the adequacy of an off site decontamination center, and so on, do you go to FEMA and say: Now, did you visit the place, did you interview the people who would be conducting the activity, and things of that sort? What is the quality of the dialogue between you and FEMA with respect to your independent assessment?

A. (Witness Schwartz) If there is a question on our part as to the meaning of their statement on adequacy, we will go back to them. We have not at this point in time gone back and looked at the depth of their review and interrogated any of the reviewers.

Q. Now, you had stated, I believe, that you had reviewed the FEMA update report.

A. (Witness Schwartz) I read the FEMA update report.

Q. And do you recall that in that update report the FEMA people concluded that there were two planning standards within which FEMA continued to feel there were some inadequacies? This is at the end of the 120 clock period.

JUDGE GLEASON: If you know what they are, why don't you tell him.

A. (Witness Schwartz) I don't really particularly remember.

Q. To refresh your recollection, they related to the bus situation in Westchester County and to the nonparticipation of Rockland County.

A. (Witness Schwartz) I do remember that.

Q. Since the issuance of that update report has the NRC assessed early school dismissal in the Indian Point EPZ as it affects the sufficiency of the buses in Westchester County or elsewhere?

A. (Witness Schwartz) I would say only in the context of what was demonstrated during the exercise. I think Mr. Sears has addressed that.

Q. Now, since the issuance of the FEMA update report on December 16, 1982, has the NRC staff assessed the phenomona of ride sharing, whereby evacuees would take other evacuees with them in their automobiles, as a factor relating to the sufficient cease of bus transportation at the Indian Point EPZ?

A. (Witness Schwartz) Not to my knowledge.

Q. Now, with respect to the first of those, the early school dismissal, has the NRC, in the wake of the March 9 exercise, formed any independent opinion on the status of the Westchester bus situation?

A. (Witness Schwartz) I have not.

Q. Mr. Sears, based on your --

JUDGE GLEASON: Mr. Brandenburg, I believe his testimony was that he just read the O'Rourke plan last night.

Did you not listen to that?

MR. BRANDENBURG: I did, sir. He also stated that he had participated in the exercise on March 9, and I understood Mr. Schwartz just to say that the NRC had formulated some opinions on the sufficiency of bus transportation based upon the observations of the March 9 exercise.

THE WITNESS: (Witness Schwartz) I didn't say that. I would like to correct that.

MR. HASSELL: That's not my recollection.

THE WITNESS: (Witness Schwartz) Do you want to rephrase your question?

Q. What effect does the NRC staff currently feel the early school dismissal option

has upon the sufficiency of bus transportation in the Indian Point EPZ?

A. (Witness Sears) I will give my opinion. My opinion is that --

JUDGE GLEASON: Mr. Sears, didn't you indicate that you just read that last night, about the O'Rourke plan?

THE WITNESS: (Witness Sears) Yes, sir, that's correct.

Q. Did you observe that O'Rourke plan being modeled in the March 9 exercise, Mr. Sears?

A. (Witness Sears) I am not that familiar with the O'Rourke plan. I am familiar with the fact that during the exercise, the recommendation, at the alert stage, that the children be dismissed from school, if that's what you are getting at.

JUDGE PARIS: That's the O'Rourke plan, Mr. Sears.

THE WITNESS: (Witness Sears) Yes, that was done during the exercise.

Q. Mr. Sears, has the NRC staff ever tried to tie that up with the earlier concerns about the sufficiency of bus transportation as to whether that helps the situation?

A. (Witness Sears) Not specifically with the sufficiency of the bus transportation, but with the fact that it simply facilitates the whole business of protecting the health and safety of the public. If indeed you get the children home from school at the alert stage, this is well before there is any kind of release of radioactivity, and bus drivers would possibly feel less apprehension in driving the children because there will be no radioactivity they would have to contend with.

So, in my opinion, it is my personal professional opinion, if you will, as an emergency planner, it just makes good sense.

Q. Now, Mr. Schwartz, the second of the two inadequacies that, I believe, we have agreed FEMA felt were still present after the end of the 120 day clock related to the Westchester County participation in emergency planning. My question is whether or not the -- since the issuance of the FEMA report on December 16 ---

THE WITNESS: (Witness Schwartz) are you referring to Rockland County?

MR. BRANDENBURG: I misspoke.

Q. Whether the NRC has ever assessed the

significance of the resolution passed by the Rockland County legislature on December 7, whereby the Rockland County legislature stated they would welcome state utility, NRC and FEMA assistance in their emergency planning efforts.

Have you assessed the significance of that resolution in terms of the Rockland County situation?

A. (Witness Schwartz) I understand that during the exercise, and that's the only update that I have, that there were state officials in Rockland County taking an active role in decision making and assessment. And as to whether there were Rockland County officials observing as to the sufficiency of that arrangement I don't know yet, I have not heard a report on that as yet.

MR. HASSELL: If I may, Mr. Brandenburg, I kind of let this line of questioning go for a while, but I think it is clear the staff is saying the assessment comes off after the FEMA report and I want to be careful about how far you are taking these witnesses now.

MR. BRANDENBURG: I am tying these to activ ies subsequent to the December 6, 1982 FEMA pdate report.

JUDGE GLEASON: You are tying most of this to the drill.

MR. BRANDENBURG: I am not, the witnesses are.

JUDGE GLEASON: You are asking questions as to whether they saw the demonstrations, O'Rourke plan during the drill and what is your evaluation of that. Didn't you ask that question?

MR. BRANDENBURG: I may have asked it as a follow-up question, Mr. Chairman. This overall line of questioning relates to what the NRC staff has done subsequent to December 6, 1982, about the concerns expressed in the FEMA update report. And if the sole addressing of these matters by the NRC staff was in the March 8 exercise, I would like to establish that.

JUDGE GLEASON: Go ahead with your questions, Mr. Brandenburg.

Q. Maybe I should ask this a little broader. I don't mean to tie you up to the exercise.

Subsequent to the FEMA update report in December 1982, what has the staff done in terms of inquiring further into the concerns FEMA

expressed about the nonparticipation of Rockland County?

A. (Witness Schwartz) To my knowledge there has been no effort of the staff at this point.

Q. Has the staff inquired into or examined the efficacy of the state's compensatory actions for Rockland County, whereby state officials would perform in the place of any nonparticipating county workers in the event of a serious accident?

A. (Witness Schwartz) Again, I will have to answer you the way I answered you before. I understand there was compensatory measures in the exercise. I have not seen anything, and I would have to turn to Mr. Sears to see if he has seen anything on paper, that described the compensatory measures that the state would put in place.

Again, I have to tie my answer to the sufficiency of the way that system worked or did not work at the exercise.

Q. Mr. Sears, have you formed an opinion as to the efficacy of the state's compensatory actions over the Rockland County situation?

JUDGE GLEASON: You are talking about

things after the drill, right? The time of the drill?

MR. BRANDENBURG: I am talking about anything subsequent to the FEMA update report.

JUDGE GLEASON: You are talking about the compensatory emergency efforts made which we have already have had testimony in from the state witnesses last week, which you know of.

MR. BRANDENBURG: But the NRC staff gives them a report card, Mr. Chairman. I think the state testimony was generally that those worked quite well, that the person who was sitting in judgment of the the sufficiency of those measures are these gentlemen here.

JUDGE GLEASON: I thought Mr. Schwartz testified they are waiting until they get a report from FEMA.

MR. BRANDENBURG: That related to the March 9 drill. The state compensatory action plan has been in existence --

JUDGE GLEASON: I give up, Mr. Brandenburg. Joe go ahead with your questions.

Q. Mr. Sears, have you made any examination of the efficacy of the states's compensatory action plans? Have you reviewed it?

Have you formed a conclusion as to how well it would, in your judgment, likely work in the event it was called upon, things of that sort?

A. (Witness Sears) I have read it. I read the documents that came in that described these compensatory actions, and as Mr. Schwartz has already testified, these were demonstrated during the drill and at this point, as my counsel says, we are awaiting for FEMA evaluation of how well that worked.

Mr. Schwartz and I were in the EOF, licensee EOF; we were not out there in the Rockland County EOC. Naturally, we have heard people talking about how well it worked, and so forth, but I think any final judgment has to wait until we see what FEMA says. We certainly don't want to to prior guess them, if you will.

Q. Mr. Schwartz, let let's move on to page 56 your testimony, if we may. You were asked a number of questions about NUREG 0396 earlier, and my question is what assumptions does NUREG 0396 make about the source terms of the severe accidents that were modeled in that document; that is to say, the quantity and composition of radionucleides that would be released to the

environment in the event of a severe accident?

A. (Witness Schwartz) I believe the source terms in 0396 were the same source terms that were used in the WASH 14000 study.

Q. Now, are you aware of statements that have been made by NRC officials to the general effect that those source terms tend to overstate the consequences of the various accidents that were modeled in WASH 14000?

A. (Witness Schwartz) I need you to give me a little more than that.

Q. Are you aware of any memorandum that was authored by Mr. Victor Stello and sent to the commissioners about seven or eight months ago, that received a good deal of attention in the trade press, and so on, suggesting that the source terms were overstated?

A. (Witness Schwartz) Do you want to go further?

Q. Surely. Well, I mean are you aware of that generally?

A. (Witness Schwartz) Yes, I am.

Q. And have you formed an opinion as to the effect that the possible overstatement of source terms would have on the conclusions reached

in NUREG 0396 about the size of plume exposure pathway?

A. I think there have been a number of studies done, a number of conclusions reached by a number of organizations, with various assumptions.

The commission has just recently, within the last couple of months, established a source term program office to sort out these things. And until such time as they do their job, I don't think I am going to make any statements about that because I don't know.

Q. Now, did you review the licensee's testimony submitted on question one in this proceeding?

A. (Witness Schwartz) I did not.

Q. Mr. Schwartz, we have a contention in this proceeding, which is contention 4.1, you were asked a number of questions about it already, that relates to the size of the plume exposure pathway.

Do you have a copy possibly of that contention before you?

A. (Witness Schwartz) If it is not reprinted correctly in my testimony, then --

Q. It is quoted on page 3 of your testimony.

A. (Witness Schwartz) That's correct.

Q. Now, the latter part of that contention tracks word-for-word the reference to the plume exposure pathway an in 10 CFR. Do you recognize that, where we start with demography, topography, and so forth?

A. (Witness Schwartz) yes, I think we talked about that a little earlier.

Q. That was covered at great length. My question is whether or not your understanding of that list of factors to consider, starting with demography, and so on, also includes the modeling of accidents, or is it just the physical characteristics of the site, where the people live, where the hills are, where the roads are, and so forth?

MS. POTTERFIELD: Objection, nonadversarial.

JUDGE GLEASON: I am not sure that it isn't. I am not sure where it is going. So I will deny the objection currently.

A. (Witness Schwartz) I think in my answer to contention 3.6, I think it goes -- the planning basis, on page 2 and 3, I think I deal with that, and recognize that the releases and

exposures and the kinds of radiological release during the environment is discussed.

Q. That's the reason I am asking the questions. You actually discuss the modeling of accidents extensively in your testimony on pages 2 and 3. I am zeroing in on the standards set forth in the regulations for the size of the EPZ, which are demography, topography, land characteristics, and so on.

Setting aside the contention 3.6 part about full range of conditions, and so on, and focusing in just on the NRC's regulations, standards for the EPZ, demography, topography, and so forth, whether it is your understanding that those criteria embrace accident modeling considerations, or if they instead merely focus upon site characteristics, where the people are, where the hills are, where the roads are, and so on?

MS. POTTERFIELD: Objection. It is nonadversarial. He is trying to rehabilitate the witness.

JUDGE GLEASON: I don't think he is. I really don't know what he is trying to do, to be honest with you, Ms. Potterfield, and I am very

interested in trying to find out what he is trying to do. So I will deny the objection.

Can you respond to his question?

THE WITNESS: (Witness Schwartz) I am sorry, I am not sure where he is going.

JUDGE GLEASON: You are not to testify where he is going but ---

THE WITNESS: (Witness Schwartz) I don't understand the question.

JUDGE GLEASON: I don't understand it either.

Q. We have an NRC delineating the plume exposure pathway of the EPZ. It says it is about ten miles, is that correct?

A. That's correct.

Q. It says the precise border should be arrived at by considering such factors as demography, topography, land characteristics, access routes and jurisdictional boundaries, is that correct?

A. That's correct.

Q. Does that include or exclude considerations about the model of accidents? Does demography, topography, land characteristics, access routes and jurisdictional boundaries only

relate to where the villages are, where the town boundaries are, where the hills are, and where the roads are, that sort of thing? Or does it also include considerations about the modeling of accidents as you understand the regulation?

A. (Witness Schwartz) As I understand the regulation, it includes the modeling of accidents with respect to the bases and the planning basis as described in 0396, and the time characteristics and all the details in there with those assumptions.

Q. Well, which of these characteristics and conditions does that fit under? Is that demography, is that topography or what?

A. (Witness Schwartz) I think if you look at the accident modeling, you see what the results are and you apply that to the site as you find it and make whatever -- in your evacuation or sheltering analysis, or dose projections, you then decide whether there is sufficiency or not.

Q. 0396 was generic, is that correct?

A. (Witness Schwartz) That's correct.

Q. So it did not assess the likely consequences of accidents from any particular reactor?

A. (Witness Schwartz) That's right. 0396 philosophy says that you look at a spectrum of accidents, a spectrum of consequences and that's how the ten mile EPZ was arrived at, not one particular event.

Q. Now, focusing into the site specific characteristics that the NRC regulations intend to be considered in delineating the precise border of the plume EPZ, what are those characteristics?

A. (Witness Schwartz) I guess --

Q. We got to the about ten miles concept, did we not, by looking at 0396 and the range of conditions, and so forth.

A. (Witness Schwartz) Yes.

Q. We then go and try and apply that in a practical way to this site, to that site, various reactor sites around the country, is that correct?

A. (Witness Schwartz) That's correct.

Q. In terms of the characteristics of each specific site, a site in Indiana, in New York, things of that sort, what are the site specific characteristics, as you understand it, the NRC plume EPZ regulations require be looked at?

JUDGE GLEASON: Excuse me, do you mean

other than demography?

A. (Witness Schwartz) Other the ones you described here?

Q. Yes.

A. Other than demography, topography, land access routes and jurisdictional boundaries? There are none other.

Q. Are there any site specific accident modeling considerations that you understand the regulations require be looked at?

MR. HASSELL: Objection. Asked and answered.

JUDGE GLEASON: It has been answered several times. Objection sustained.

MR. BRANDENBURG: The answer, Mr. Chairman, goes back to 0396 but then we established that 0396 was generic. Now this question relates to either site specific or plant specific accident considerations that the regulations require be looked at, and I don't think I have had an answer to that yet.

MR. HASSELL: That could conceivably go beyond emergency planning regulations also. I would argue that --

JUDGE GLEASON: What is it you are

trying to develop, Mr. Brandenburg? Then maybe we could help you.

MR. BRANDENBURG: We have a contention here that the EPZ is inappropriately drawn. Ms. Potterfield walked him through, at great length, demography, topography, et cetera. She also talked about accident consequences.

I am asking this witness' understanding of what site specific plant or accident considerations are, and I am entering site specific that this witness understands ought be considered in arriving at the precise border of an EPZ at any particular site. I think it is very clear and I don't think we have an answer.

(There was a pause in the proceeding.)

(Continued on next page.)

JUDGE SHON: Mr. Brandenburg, as we understand the exchange, the witness told you that in assessing the suitability of this particular emergency planning zone, he used 0396, which is the grounds for the finding of approximately ten miles and that he then assessed the specific matters mentioned in the regulatons, that is access routes, land characteristics, topography, demography and so on, and found that it conformed in any of the adjustments made to ten miles to that.

You then asked him, "Are there any other sites' specific things that you considered," and he said, "No."

And you said "Well, what about accidents? Did you consider those?" And he already said, "No," he had not considered the site specific matters, including accidents.

Is that not right Mr. Schwartz?.

MR. BRANDENBURG: That's the missing link.

JUDGE GLEASON: Didn't you answer that?

MR. SCHWARTZ: That's correct.

JUDGE GLEASON: I heard it and the

Board heard it and you said you didn't hear it or that you are saying now you didn't hear it.

MR. BRANDENBURG: If the witness's testimony is that he, in concluding that the border of the EPZ of the plume exposure EPZ at Indian Point is adequate that in reaching that conclusion, did he not find that he is to consider site specific accident considerations, then I'm through with this line of questioning. I've established my purpose. I don't believe he's answer that had yet.

JUDGE SHON: Was that not your answer?

MR. SCHWARTZ: That's my answer.

MR. BRANDENBURG: Thank you.

Q. Mr. Sears, let's turn to page 18 of your testimony, if we could.

A. (Witness Sears) Yes, sir.

Q. Now, relating to your Answer 49, there was a conditional statement made there, "If the present deficiencies result..." and so on that relate to the siren system.

Of course, your testimony on this language is vintage, June of 1982. Can you tell us if subsequent to that time, you

formed a conclusion as to the sufficiency of the alert notification system at the Indian Point site?

A. (Witness Sears) Yes, sir.

Q. And can you tell us what that conclusion is?

A. (Witness Sears) The conclusion is it complies with our regulatons. It is now accurate.

Q. Now, in the middle of Question A-49, you have a quotation there referring to the capability of the state and local officials to make a prompt notification decision.

Subsequent to June of 1982, have you formed a conclusion as to whether or not state and local officials in fact have that capability at Indian Point?

A. (Witness Sears) As I attempted to point out in my testimony that I changed this morning, I have not seen the appropriate changes yet in the local county plans that would persuade me that, yes, indeed, they complied with this regulation.

However, I also pointed out that in the exercise, there was a clear demonstration that it did work, that there was a prompt notification

decision made by offsite officials.

Q. Thank you. Mr. Sears, on page 54 of your testimony, in Answer 144, you address the desirability of alerting the general public at the site emergency EAL, rather than the general emergency EAL; is that correct?

A. (Witness Sears) Yes.

Q. Can you state the basis for believing that that would be an improvement?

A. (Witness Sears) Yes, sir.

Q. What is that?

A. (Witness Sears) The basis is very simple. You give people more time to be prepared to take protective actions. At the site emergency level, there would not be as yet a significant release if any or all of radioactivity.

Q. Would this giving of more time to people to get prepared be a consideration that would apply equally to all sites?

A. (Witness Sears) To all sites? Well, it would apply -- it certainly would apply to all sites, yes. The more time you give people, the better it is, but it certainly complies particularly to this site.

Q. Can you state why it would apply

particularly to this site here?

A. (Witness Sears) Because of the higher density of population.

Q. Now, have you or has anyone else in your or Mr. Schwartz' division of the NRC suggested such earlier alerting of the general public for any sites other than Indian Point?

A. (Witness Sears) I haven't. I don't know if anybody else in our division has.

Q. Now, you have reviewed and you were asked some questions about the Parsons Brinkerhoff time estimates; is that correct?

A. (Witness Sears) Yes, sir.

Q. Are you also aware that -- maybe we should refer to page 31 of your testimony -- that estimates have also been prepared independent of the Parsons estimates by a company named CONSAD Research Corporation on a contract to the NRC.

MS. POTTERFIELD: Objection. That's not adversarial.

JUDGE GLEASON: Objection sustained.

Q. Well, you refer here to NUREG-1856; is that correct, an analysis of the evacuation time estimates around 52 nuclear power plants?

A. (Witness Sears) I do refer to it,

yes, sir.

Q. And do you recall whether the evacuation time estimates for the Indian Point site referred to in that document are the Parsons Brinkerhoff estimates or some others?

A. (Witness Sears) I couldn't tell you at this point, sir.

Once again, I reviewed this sometime ago, and I mentioned this document, 1856, simply to illustrate that the evaluation technique is described in that document.

Q. Are you aware of the fact that the evacuation time estimates for the Indian Point site range with the estimates for other sites both of higher and lower population densities?

JUDGE GLEASON: Excuse me. I didn't even hear the question, let alone understand it. Would you please --

Q. Are you aware of how the evacuation time estimates for the Indian Point site compare to comparable estimates for other sites, generally?

A. (Witness Sears) Generally, yes.

Q. And how would you characterize that relationship?

A. (Witness Sears) Generally, the

evacuation time estimates for the Indian Point site are somewhat higher than for other sites.

Q. Is it your opinion that there are a number of other sites whose evacuation time estimates are comparable to those at Indian Point?

A. There are some which are comparable, yes, sir.

Q. And referring to your rationale for this recommendation to alert the general public at the site emergency level rather than the general emergency level, would your rationale for that recommendation also apply to other sites whose evacuation time estimates were at least as high as those at Indian Point?

A. (Witness Sears) Yes, sir, it certainly would.

Q. Now, Mr. Sears, are you aware of since the promulgation of EALs on how many occasions a site emergency has been declared?

A. For Indian Point, sir?

Q. No, for any site?

A. (Witness Sears) For any site? Just let me just check.

We are trying to recollect here, sir. Ginna was a site emergency. I believe that was

the only one. There may have been another one, but at this point, we can't recall.

Q. Now, if your recommendation set forth here in Answer 144 of your testimony were to have been followed at Ginna, that would have meant that the alert notification system at Ginna would have been sounded; is that correct?

A. (Witness Sears) Had Ginna been at Indian Point, yes, sir.

Q. Well, or had the procedure that you refer to in Answer 144 been in effect at that site?

A. (Witness Sears) Well, the procedure, as I say, would -- we are recommending this procedure at this site, as I pointed out before, because this site is a high -- more people around it.

The whole purpose of alerting, everything we are doing is to get the people out.

Q. Right. We agree on that. My question is, and it is indeed a hypothetical one, had this procedure been in place at Ginna at the time of that accident, because I believe you have established that a site emergency was declared there, then if the recommendation had been in

effect at that site, the alert notification system would have needed to have been sounded. That's correct?

A. (Witness Sears) In line with your hypothetical question, the answer is yes, sure.

Q. Now, based on your familiarity with that event and with the benefit of 20/20 hindsight, do you think it would have been desirable to have sounded the alert notification system at the Ginna site?

A. (Witness Sears) Sir, 20/20 hindsight I am not going to discuss here.

The point is that the whole purpose of emergency action levels is for the operator to declare an emergency and, as I say, before then, get back to work.

Now, it could very well happen that using this system we have, that there are going to be occasions when the alert notification system will go off when it would not have been necessary to which I say so what.

The important thing is to get the word out to people as quickly as possible. It may or may not have been necessary at Ginna.

Q. Have you considered whether or not

sounding the alert notification system unnecessarily might have some extremely unattractive consequences?

A. (Witness Sears) Sir, I lived in a community where every Saturday morning they ran the fire siren very close to my house. We got used to it after a while.

We also have gotten some letters from people who have objected to the sirens being tested because the sirens bother some animals and so forth.

We have that system in there because we felt for a long time that this was the one final link which was missing in all of our emergency planning procedures, and we -- this system is there. It's a good system. It may bother people somewhat by going off sometimes but the purpose of a siren system is not to tell people to evacuate or to do anything other than to listen to the radio or TV for some further information, simply to alert people as quickly as possible.

Q. In formulating the recommendation contained in an 144 of your testimony, did you discuss --

A. (Witness Sears) That's 144?

Q. Answer 144, yes.

A. (Witness Sears) Let me get to it, sir.

Q. That's what we have been talking about. I hope that's where you are. I'm on page 54.

A. (Witness Sears) Yes, sir.

Q. In formulating this recommendation, did you discuss with any of the problemistic risk assessment people at the NRC staff as to how many site emergencies would likely lead to a significant offsite release?

A. (Witness Sears) No, sir.

Q. Do you think that would be useful to assess?

A. (Witness Sears) No, sir, it would not.

Q. Now, as an alternative to the proposal contained in Answer 144 in your testimony, did you consider whether the event that should occur at the site emergency is some mobilization preplanning with offsite officials rather than the general public?

A. (Witness Sears) The last part of your question was unclear, sir.

Q. Well, instead of sounding the alert

notification system for the general public at the site emergency level stage, had you considered as an alternative to that procedure one in which extensive mobilization activities would commence not with the general public offsite but rather with offsite officials?

A. (Witness Sears) No, sir, absolutely not. The important people are not the offsite officials. The important people are the people who may be affected by an accident.

MR. BRANDENBURG: I have no further questions Mr. Chairman.

JUDGE GLEASON: Mr. Czaja?

MR. CZAJA: Yes, I have a few questions.

CROSS-EXAMINATION

BY MR. CZAJA:

Q. Just remaining for a moment, Mr Sears, on your suggestion in Answer 144 of your testimony, as I understand your recommendation, it is that the offsite officials who control the siren system, under your proposal would not have any discretion in the event of a site area emergency in the sense that they would have to sound the sirens and make a broadcast over the emergency broadcast system;

is that the essence of your proposal?

A. (Witness Sears) The essence of my proposal, yes, sir, because the offsite officials have to depend upon information from the control room operators. They are the only people in the world who know what is going on with that reactor at that time.

The offsite officials have to depend -- all of us have to -- NRC, FEMA, everything, state, local officials, all of us have to depend upon the people in that control room. They are the only people that know how bad the situation is and they are the only people that can make a judgment on whether or not they are going to be able to turn the situation around.

Q. But your recommendation relates to the action of the offsite officials; am I correct?

A. (Witness Sears) No, sir.

Q. The onsite --

A. (Witness Sears) No, sir, not the offsite officials. Frankly, I couldn't careless about the offsite officials. I am concerned about people.

The only important thing is to get the word out to people that, "Indeed, there is a

situation developing here at the plant and you may or may not have to do something about it. We are giving you plenty of prewarning in case we have to do something."

Q. Well, could we agree, Mr. Sears, that it is the offsite officials who, in effect, push the button that starts the sirens in the emergency system?

A. (Witness Sears) In this reactor it is. In some other reactors, there is the provision that if the offsite officials fail to press the button in ten minutes, then the reactor operator has a button in his control room, and he does it.

Q. But your recommendation, as it relates to this site, is that, in effect, the offsite officials be required in the event of a site area emergency when they are notified of that, to press the button and activate the sirens; is that correct?

A. (Witness Sears) Yes, that's correct.

Q. Is there any reason why under the present plans in the event of a site area emergency, the offsite officials did determine that it was in the best interest of the public to activate the alert system, they could not activate

that system?

A. (Witness Sears) I guess I lost a little something.

Q. Well, the point is, you are recommending, in effect, that the offsite officials no longer have the discretion in the site area emergency situation to activate the sirens. You would mandate that they do activate those sirens.

My question is simply whether in the present situation, absent your recommendation, there is any reason that if the offsite site officials deemed it advisable in the event of a site area emergency, they could not activate the sirens?

A. (Witness Sears) They certainly could, certainly

MR. CZAJA: I have no further questions.

JUDGE GLEASON: Have redirect?

MR. HASSELL: Yes, just a few questions.

REDIRECT EXAMINATION

BY MR. HASSELL:

Q. Mr. Schwartz, in response to a

question from Ms. Potterfield concerning the hypothetical -- concerning the Sandia report and she talked about the consequences out to about 17 miles and whether that would change your opinion about the appropriateness of the ten-mile EPZ. Do you recall that?

A. (Witness Schwarktz) Yes, I recall that question.

Q. As I recall, you indicated that your opinion would not change because you would need to know more about the assumptions.

My question to you is this: Would you identify what kinds of assumptions you would have to be aware of?

A. (Witness Schwartz) Yes. I think it goes back to a little bit of my response to Mr. Brandenburg as well, that there are a number of studies that have been done on source term and on the effects, and without knowing the assumptions -- and the assumptions are how long it takes, what protective actions are assumed in this study and the timing of those protective actions -- and without knowing that, I can't make a judgment, also the source term used.

MR. HASSELL: I don't have any

further questions. I will point out to the Board, however, that Mr. Sears had specifically prepared in answer to the Board's questions regarding PA-42 and the Licensees, the improvements of the notification.

JUDGE GLEASON: All right.

JUDGE PARIS: Mr. Hassell, we would like to ask questions about the Emergency Workers -- the reference manual, but we'd like to ask some questions about the other written testimony first.

MR. HASSELL: Fine.

JUDGE PARIS: So shall I go?

JUDGE SHON: Yes.

JUDGE PARIS: Okay.

I'm looking at page 54 of Mr. Sears' testimony and page 2 of Mr. Schwartz' testimony where you testify with respect to protective action during adverse weather conditions, and I am specifically thinking about the February 11 storm which hit Washington and which hit this area.

We had some testimony yesterday that indicated that on roadways in Putnam County and in Orange County, there were some abandoned vehicles that blocked traffic lanes. This occurred in

Washington, I know, and the Board was up here, and drove back to New York City the morning after the storm. We encountered some vehicles abandoned and blocking traffic lanes.

My question is, in your view, would sheltering followed by subsequent relocation of ground deposition radioactivity indicated be necessary? Do you think that would be adequate for situations like that, where it might be many hours before roads could be cleared and traffic could be evacuated?

MR. SEARS: As we point out, at that point, it's the only thing to do, sir. Clearly, again, you can't evacuate if the roads simply are impassable.

You know, it depends on exactly when you have this accident. If it happens in the height of a snowstorm, in all probability the radioactivity will not go very far. The deposition will probably be very close to the plant.

If it happens the day after the storm, yes, there's a considerable problem, and it will take sometime, as it does, certainly in the Washington area, to clear the roads.

Up here they are a little bit more used to having snowstorms. I would hope that they would clear the roads much faster than they do down in our part of the world, but the day after the storm, there may be more of a problem, and sheltering would give you a factor of two possibilities.

But we could not depend on much more than that. You'd get a little bit more from having the snow on the roof, of course, but I guess that's my answer.

JUDGE PARIS: Can you give us any idea how close to the plant heavy snowfall could cause most of the particulate matter to be deposited? I'm thinking in terms of Peekskill now which is only what, three miles from the plant with a fairly high population density.

Could it all fall out at Peekskill?

MR. SEARS: In my opinion, it wouldn't reach Peekskill, sir.

I base this opinion on discussions I have had with meteorologists. This is one of the kinds of experiments that it is intended to be done in the next year as part of this program when Mr. Schwartz was mentioning this source term

program office, to look into the kind of problem you have where you have got a very energetic release and there is a possibility that the atmosphere will be so supper saturated with water containing radioactivity that there will be a tremendous amount of rain out very, very close to the plant.

So that's about all I know about it at this time.

I'm not a meteorologist, but it is my understanding that the deposition would not go very far from the plant, a mile or two at most

JUDGE PARIS: Is that on the basis of your discussion with meteorologists? When you say "a mile or two at the most," that it would not reach Peekskill?

MR. SEARS: Yes, sir, exactly.

JUDGE PARIS: I see. Okay. Let me ask you a question about total alert with radios, Mr. Sears.

We have had testimony indicating that a number of them have been distributed to schools and nurseries in the EPZ.

I recently was reading an advertisement for a tone alerting weather radio

that contained the sentence that it might be useful if you lived near a nuclear plant. The insinuation being that a tone alerting broadcast on emergency broadcast system with regard to an emergency on a nuclear plant would alert a weather radio.

Do they broadcast on the same frequencies, do you know?

MR. SEARS: I think there are -- well, my understanding of it, sir, is that there are different frequencies. The weather radio is on its own frequency, but some tone alerts that they are putting up in the country here have been on a different frequency, have not been on the weather radio frequency.

It seems to me that it could be, you know, you could set up the system a number of different ways.

Now, I think out in the Mid-West in tornedo country, yes, sir tone alerts are quite common out there on the weather radio system.

JUDGE PARIS: Well, I think weather radio systems all over the U.S. use the tone alert warning.

MR. SEARS: Right.

JUDGE PARIS: As all the weather radios.

MR. SEARS: Right, but I do believe in some places where we have tone alerts, they are not on the weather radio system -- on the weather radio frequency. They are on something else.

JUDGE PARIS: Okay.

MR. SEARS: Different frequency.

JUDGE PARIS: I just wondered if everyone who happened to have a weather radio would get an alert from the Emergency Broadcast System from Indian Point.

MR. SEARS: I think not.

JUDGE PARIS: We don't know. Do you have something you want to add to that, Mr. Schwartz?

MR. SCHWARTZ: I was just saying that it depends on the frequency they are operating on here. I have no knowledge as to whether it's on the NOAA channel or it's a separate channel.

JUDGE PARIS: Mr. Schwartz, I would like to explore a little bit about the Four-County Nuclear Safety Committee, as you understand it.

You testified, I think, that the role

played by the Four-County Nuclear Safety Committee contributed to your confidence in the emergency preparedness; is that correct?

MR. SCHWARTZ: That's correct, sir

JUDGE PARIS: Who appoints the Four-County Nuclear Safety Committee?

MR. SCHWARTZ: I have no knowledge of that. I do not know.

JUDGE PARIS: Do you know who the members are, how they are affiliated with the counties?

MR. SCHWARTZ: It is my understanding, sir, that they were the Civil Defense representatives of the counties.

JUDGE PARIS: Your understanding is that they are the Civil Defense representatives?

MR. SCHWARTZ: They are Civil Defense representatives of the counties.

JUDGE PARIS: Is the chairman of it one of those Civil Defense representatives?

MR. SCHWARTZ: I do not know.

JUDGE PARIS: You, I think, answered that or were asked whether you knew that the Licensees contributed support to the Four-County Safety Committee. What do you know about that?

MR. SCHWARTZ: I just knew that there was some contribution by the Licensee to support that organization.

JUDGE PARIS: Do you know what that support is used for?

MR. SCHWARTZ: I don't. I can presume but I do not know specifically.

JUDGE PARIS: What do you presume?

MR. SCHWARTZ: I presume -- I read the brochures that -- the public information brochures and they were endorsed by the four counties, and I would expect that that was part of the contribution by the Licensees.

JUDGE PARIS: What public information brochures were these?

MR. SCHWARTZ: These are the ones that went out to the general public in each of the areas.

JUDGE PARIS: "Indian Point Emergency Planning And You"? Is that what you are talking about?

MR. SCHWARTZ: I believe so. The one I saw was just a small piece. Maybe that's a reprint.

JUDGE PARIS: This is a Xerox copy.

MR. HASSELL: Here.

MR. SCHWARTZ: Yes. Those are the ones here.

JUDGE PARIS: Okay. I think that's all I have. Thank you.

JUDGE SHON: I believe you said, Mr Hassell, that these witnesses were prepared to say something about the training path if we asked the question.

MR. HASSELL: Yes. We had specifically asked them to focus on pages --

JUDGE SHON: Hang on a minute. The Chairman wants to ask a couple questions on something else.

JUDGE GLEASON: I am still a bit confused. I think maybe that it's just me, but I want to make sure that if it is more than myself that the record is adequate as to -- I'm not concerned about what your individual responsibilities are, now. Although, I gather from your prior testimony, Mr. Sears, that you are responsible for responding to commission's questions as well as the specific contentions you are talking about as well as the onsite planning.

One of those questions was the status,

of course, of the offsite emergency plans.

What I am specifically trying to get to is, what is it that the staff does in reviewing FEMA's review to find that it is adequate, the offsite emergency plans? What do you specifically do?

Now, either one of you can answer, but I want to know what the staff does specifically.

MR. SCHWARTZ: When the staff receives -- there are a number of documents that we would recieve from -- let me try to go through those and help you understand, if I can.

During the pendancy of licensing cases, we request FEMA to give final determinations on the adequacy of an individual applicant on his offsite preparedness.

We received those judgments from FEMA for the licensing cases. We review them for clarity so that we assure ourselves, one, that they are clear in their judgments and understandable and, two, that they deal with all the 16 planning standards in 0654 in enough detail, particularly if there are any areas that are deficient, and I use that term very broadly.

If there are any questions in the Staff's mind, we will go back to FEMA to ask them to clarify what it is they mean on those particular issues.

Once they are in, they go -- once we are satisfied that we understand, then they will go in as part of the record.

JUDGE GLEASON: All right. So at that point, Mr. Schwartz, you are not doing, in effect, a de novo review. You are doing an adequacy review, in other words, when FEMA comes in with its reports? I presume there is some kind of bases for their conclusions that they submit to you.

MR. SCHWARTZ: That's correct.

JUDGE GLEASON: And you are looking to see if the scope of the review has been adequate and that that has been adequate, therefore, to just their conclusions as having met the criteria in the standards of the regulatons?

MR. SCHWARTZ: Exactly. So there's a full body of information that they have offered that covers all the points.

JUDGE GLEASON: All right.

MR. SCHWARTZ: That's in the

licensing proceedings, and I guess the regulatons provide -- I'm not an attorney -- but the words are in the regulatons saying that FEMA findings are what they call a rebuttable presumption in those proceedings.

JUDGE GLEASON: Right.

MR. SCHWARTZ: This is the licensing proceedings.

In the case of operating reactors, FEMA's judgment comes to us, I guess, in two ways: One is during the review of the plans and they have a proposed rule that is called 10 C.F.R. 350.

Now, under that proposed rule, it sets up an administrative process that ends up in FEMA approving an offsite plan for a particular site, offsite including state, local and whatever jurisdictions. And during that proceeding, we will be party -- we, NRC, will be party to reviewing the adequacy of that and commenting on the adequacy, during that approval cycle.

JUDGE GLEASON: Because you are dealing here in with a time problem, right?

MR. SCHWARTZ: Yes.

JUDGE GLEASON: Because you are dealing already with operating reactors that you

have to, in effect, catch up with?

MR. SCHWARTZ: That's correct and this is a multiagency review. The NRC reviews certain portions of that plan with respect to the radiological consequences and assesses and those functions, and there are other federal agencies, EPA and others involved in commenting on another portion.

Once that is done, the NRC and all the other federal agencies have the judgment to say, "Yes, we concur," or, "We do not concur to go in and approve."

The other leg, the other piece of information that we get from FEMA, is the review of -- is the report or the evaluation after an exercise, and that is something FEMA gives to the NRC as part of its continuing review of the adequacy of offsite planning.

When we recieve those, we will review them see if there is a significant deficiency or not and then decide whether we take action.

If there are deficiencies noted, that we understand or not understand, we'll go back to FEMA and say, "It might be diffuse and we'd like to have more information as to what the problem

really is."

Sometimes, it ends up as being rather a diffuse finding, and we can't pin our handle on if we are going to take regulatory action or enforcement action against the Licensee. We couldn't exactly point out what the deficiency was.

So we'll go back and ask them to make sure of what needs to be done.

In some cases, there's an action plan offered that says, here is -- here are the actions that will be taken to cure the ills.

In other cases as was mentioned earlier, we have gotten all the information necessary and the commission will take a position to apply the four-month clock as provided for in the regulatons to cure the deficiencies noted by FEMA.

JUDGE GLEASON: All right. That's very helpful.

Now, if you could, in that context, Mr. Sears, if it is within that context -- if it is not, then, explain why it is not -- if I ask again as to how, when you are doing a review, you are looking at the -- you are looking just for

several things, and one of the things that -- the most significant thing that you are looking for is the notification process to see whether that's in place.

How how does that fit in with what Mr. Schwartz said? Or is this entirely a separate action?

MR. SEARS: Well, those were the whole procedures that Mr. Schwartz described with FEMA, but what I was testifying to before, that I go above and beyond that.

Very possible it's because you may notice from my resume or my qualification, before Three-Mile Island, I was the sole man in the Division of Operating Reactors who worked on emergency planning.

And so at that time, I reviewed everything by myself. I still do it. I figure it's part of my responsibility.

I don't want to use the word "review" because do I not review in detail every single item in offsite plans.

As I mentioned before, I am looking specifically in there for this prompt decision-making capability by the offsite

authorities.

The reason I do that, sir, is to go back in what we consider to be important.

We have set up these ELAs because we want the operator to act very quickly in notifying somebody offsite.

We have now made people have a prompt notification system, for getting the word out to people as quickly as possible.

Then the big gap that we have seen very often is that it takes too long for the offsite officials to make up their mind about pressing the button for the sirens.

So this, you know, this site is not unique.

As I say, as I mentioned in the exercise, it worked here, but that's the biggest problem that I see around the country in all these reactors, is because elected officials, for whatever reason, seem to want to get together and they have a meeting and one of their reasons in my originally filed testimony for putting it in there was that it took about an hour and a half in the previous exercise about a year ago for the county officials to make the decision.

This is the reason that I focus on that. I looked very carefully in the revised Westchester plan to see that that provision was in there. I still don't see it in this revised Westchester plan.

JUDGE GLEASON: So you did not intend to imply that that's the only thing that's reviewed?

MR. SEARS: No, sir, it is not.

JUDGE GLEASON: That was the impression.

MR. SEARS: No, sir, by no means.

JUDGE GLEASON: What you are saying is that in your experience, that that's the key point? That's what you got to look at?

MR. SEARS: Right.

JUDGE GLEASON: If you don't have that, you have got nothing.

MR. SEARS: Right.

JUDGE GLEASON: Thank you. Appreciate it.

MR. HASSELL: If I may, I believe Mr. Schwartz misspoke himself when you said that the 350 process was 10 C.F.R. 50.

JUDGE GLEASON: No, that's not. I

understand that's a FEMA.

MR. SCHWARTZ: 40.40 C.F.R. is the citing.

JUDGE GLEASON: It's a proposed regulation.

MR. HASSELL: Mr. Sears is the one that's particularly prepared to handle questions about the manual.

JUDGE SHON: Fine. I guess what we have asked -- I don't have the transcript here and I don't recall exactly -- is that you look over this manual, that you look over -- I think it was especially pages 14 through 22 or thereabouts, 14 and following.

We have just glanced at them, and they seem both to Dr. Paris and myself -- both of us have been instructors in this sort of thing for at least -- or at least instructors of graduate classes. They seem at best confusing and at worst simply wrong.

For example, I would direct your attention to page 24 of this document. There's an equation at the bottom of page 24, and it says, "REM equals REM times quality factor."

Now, that's clearly wrong, but it's

not only wrong, it's very confusing to somebody who only met the REM a paragraph or so above.

MR. SEARS: I agree with you, sir.

JUDGE SHON: I think we all know what it should be. It should read RADs time quality factor.

MR. SEARS: Right.

JUDGE SHON: On page 14, they start out talking about radiation at the top of the page.

The second sentence in the first paragraph starts out, "Alpha and beta particles are classified as particle radiation while x-rays and gamma rays are defined as energy electromagnetic radiation," and this goes on. That's surely not wrong.

Then it says, "The following discussion will describe the nature and characteristics of these forms of radiation."

The next sentence says, "In the discussion of radiation, it is important to understand the concept of half life."

To me, that's throwing the student a terrible curve right there. It can do very little but confuse him. Half life has nothing to do with alphas and betas and gammas or at least the

connection is only tenuous.

The middle of the next paragraph then refers to particulate radiation such as cesium 137, contrasting it with xenon 133 and this is certainly going to add to the conclusion.

Has anybody looked at this training manual and tried to decide whether somebody coming through a course like that is going to know anything whatever?

We have had witnesses appear before us who shall here remain nameless that make deliberate distinctions that were completely incorrect. They have the wrong slant on things at the level at which this training is taking place, and that's what started us looking at this to begin with.

There was a gentleman here who asserted flat out that protective clothing protects you against radiation but not against contamination and things of that order.

What we wanted to know, has the staff ever looked over the kind of training these people are getting to see whether it's right and whether it's confusing? Can you answer that question?

MR. SEARS: I will try, sir. I

reviewed this document -- two words that Mr. Hassell gave me were "accuracy and adequacy."

I have many complaints about its accuracy.

For example, they have the half lifes of a number of these isotopes wrong, not by much but wrong. They, in my opinion, if this is to be presented to people like bus drivers, for example, I think you are giving them too much, and you will just confuse them. You give a bus driver this once and maybe once again some day, he's not going to remember an awful lot of this. It's --

JUDGE GLEASON: I think perhaps we could straighten out on this, is that this is the basic training manual that is to go to policemen and firemen, those kinds of emergency workers. So it's not --

MR. SEARS: Yes, sir. Well, that's my point. I think it could be on a more basic general laymen's kind of level, and I think it would be much better than it is.

It's trying to be someplace in between that level and the kind of thing you would give to an entering EP tech, for example, and I, as I say, I don't think it's very good for the

purpose for which it is supposed to be designed.

One of the big deficiencies, as I see it, is -- well, there are a couple of them.

They mention taking -- I don't know if I was supposed to look at this. I read the whole thing. They talk about taking KI, but they don't say anything about the fact that KI is only effective if you take it quickly in the first couple of hours, that -- you give me a pill and I take it tomorrow doesn't do me much good.

They don't make the point that you take it within two hours.

JUDGE GLEASON: Which seems to be an important problem.

JUDGE SHON: I didn't realize that.

MR. SEARS: It's further on in this.

JUDGE PARIS: In fact, if they delayed up to a certain point, it could make the situation worse, could it not?

MR. SEARS: Well, it certainly wouldn't do any good, yes, sir.

One thing that, in my opinion, should be in here and that's the fact that what we are trying to do in this emergency planning business and especially with these ELAs is to alert the

general public before there's a release of radioactivity from the plant. That's the whole purpose of, if you know, the background of everything we are trying to do.

I think, you know, that's the whole purpose in this so-called O'Rourke plan in getting the school children home at the alert stage, which I think is a good thing.

It's why we set up these various stages of ELAS, and the point being that you declare the emergency on the basis of what is happening right there in the control room on plant conditions, not on the basis of the downwind monitoring.

Now, if I were a local fireman or policeman reading this, I would get the idea that I'm going to be out there doing my job while there is a lot of radioactivity around.

Whereas if you follow with what our hope and plan is, that they would be doing their job before there's any radioactivity around.

I think this would be reassuring to them, that it's very possible they too would have left the area before this release of radioactivity.

I understand up in this area, there's

quite a bit of apprehension from bus drivers and so forth that they will or will not do their job because of fear of radiation, but the school children would have gotten in the buses and gone home long before there's any radioactivity in the air.

I think that concept is not gone into in this document and is a very simple idea that you declare the emergency on the basis of plant conditions, not on the basis of EPA PAGs, that they are a backup, and finally, a release goes out.

Yes, you use the EPA PAGs but first you declare the emergency and you alert the people on the basis of plant conditions.

JUDGE PARIS: Would you put into the record what EPA PAGs are?

MR. SEARS: Yes, sir. The EPA is the US Environmental Protection Agency, and PAGs are Protective Action Guides. They are guides for projected doses which trigger action. They are not permissable doses, allowable doses, anything like that.

They are dose levels, doses, rather, which, if you project that somebody would recieve

that dose, then you take some protective action.

JUDGE SHON: Mr. Sears, I think we all agree that it would be very fine if they could always get everybody out before anything radioactive got near it.

However, unfortunately, we have heard often in this case and, indeed, those people who have most carefully analyzed the accidents, the problemistic risk assessment people, have frequently investigated scenarios which they assume could happen which involve the release of radioactivity, either before evacuation could take place or scenarios such as a shelter and then relocate scenario, which would have people, various people, moving through contaminated areas.

Certainly it is true that emergency workers, ambulance drivers, policemen, firemen so on, might, under certain conditions, simply have to enter contaminated areas.

I think, therefore, the purpose of this Emergency Worker Reference Manual cannot be dismissed as something that -- well, we don't need that because nobody is going to go where there's any radioactivity.

It is necessary in our present day

and age, whether we like it or not, that policemen, firemen, ambulance workers and the like, should know something about how to comport themselves in the presence of radioactive contamination.

Our worry is that this is passed off upon these people as a manner -- as a way, a means, of training them when in point of fact, it looks to us as if it is not.

It mostly confuses them and, perhaps, misinforms them. I think we are going to have to do something about it.

MR. SEARS: I agree with you, sir. May I make one comment? You mentioned the problemistic risk analysis studies that have been discussed here.

Part of my job in going to the plant -- I think it should be pointed out that these, PRA studies assume an accident happens and that nobody does anything about it. That's not true.

For example, the dominant risk, as I understand it from internal events, is this interfacing LOCA and it is a fact that at both plants they have procedures to cope with the interfacing LOCA.

I have discussed these with shift

supervisors. They understand what to do, and, so, yes. The PRA fellows can assume that the accident happens, but then, the consequences go on from there, but they never give credit to the fact that at the plant, the operator's job is to see that the accident doesn't go any further, and it is -- as I say, I want to emphasize that, that the operators at these plants do have procedures for coping with these accidents.

JUDGE PARIS: Mr. Hassell, when we have Staff witnesses on Question 5, the Board would like to have someone who could testify to the question of whether heavy snowfall would cause fallout to be deposited very close to the plant and decrease the extent in which it is dispersed. Do you think that would be possible?

MR. HASSELL: We will try and have someone here to cover that area.

JUDGE PARIS: All right. Fine. To follow up on what Mr. Sears told us.

JUDGE GLEASON: It's obvious that as referred to by the Board, the blizzard of '83 has made an impression on us.

Let me ask just one final question on this training, and if you don't want to answer it,

I can certainly understand it.

In light of your comments with respect to the adequacy and the accuracy of the training manner and manual and all that which you say -- I recognize that no two people are going to write something the same way, but keeping in mind there is a basic responsibility to not give information that is misleading or unhelpful but the responsibility somewhere to give training information that is, indeed, constructive, would you think that there is some responsibility on the part of the Nuclear Regulatory Commission to provide pamphlets or information to assist or -- on the part of FEMA -- to assist state and local governments to more accurately and for -- I don't know whether I want to use the word competently but more sufficiently to train people in the event of an emergency?

MR. SCHWARTZ: Mr. Chairman, FEMA has three courses that I know of that deal with different facets of emergency preparedness with respect to nuclear power plants.

One deals with a course on how to do planning.

Another one deals with accident

assessment for state -- these are all for state and local officials.

Thirdly, there is a handson course that's taught out at the National Nuclear Reactor Training Center outside of Las Vegas that has a full handson course in radiation with the extra suit, and go out and run some scenarios that are fairly realistic with respect to transportation and reactor accidents.

So there are some of those courses already available through FEMA.

JUDGE GLEASON: I understand that but despite that, there is out of this whole process -- I really asked the question at some point about those courses. I believe the answer that came back was that New York State was providing adequate training and people were not getting the training from FEMA.

Although some people indicated they had attended some courses by FEMA, it seemed to me.

There still is, you know, out of this process, this training booklet that has come, and obviously -- perhaps other people have commented on that before, but whose responsibility would it be or should it be to look over the adequacy of

materials that are being used? Do you think or if as I say, we have a --

MR. SCHWARTZ: Maybe one more piece of information will be useful for you, sir.

FEMA also has, the last couple of years, as far as I know, been involved in preparing an information booklet on radiation, on health effects of radiation, nuclear power and how it works. I can't remember the name of it, and I think it is near publication. It is for state and local officials with proposal to put out some companion pieces on the individual -- on individual segments for fire, police and so on down the line.

I know the Department of Transportation has some training packages going on also for fire and policemen also.

JUDGE GLEASON: It's your understanding that this is due to break the horizon?

MR. SCHWARTZ: I cannot project that but for a while --

JUDGE GLEASON: Maybe we can get some information from FEMA, Mr. Hassell, on that particular publication.

JUDGE SHON: Mr. Hassell, I'd like to know a little bit more about exactly who around here is taking what training. I don't know whether you'll be able to present that or the Licensees or somebody from FEMA, perhaps, but -- I see Mr. Glass coming down the aisle.

One of the reasons I ask this is that we had a witness here yesterday, Mr. Schmer, who was from Orange County who said that his people had been taking the training course given at Las Vegas out near the test site and he was remarkably well informed. He seemed to know a good bit about it and I trust his people do also.

It seemed to us to present quite a startling contrast with others that we have heard from the same area.

I guess what I'm asking FEMA to do is check to see whether, in the manner of radiological preparedness and the way to enter a radiologically contaminated area, are the emergency people around here all getting the same training? Is it high quality and if not why not?

MR. GLASS: There are different training courses being given. There are some being given out of the facility that FEMA operates,

and I will get that information for you, if it's available in a format that can be deduced so we show who is receiving training in this particular area.

I was also informed by Mr. Feinberg that as an attachment to the testimony filed by New York State that they had submitted, I think it was Attachment 9 but I may be mistaken with the number -- that they had submitted the training courses that had been taken in this area or given in this area and concluded a list of those individuals who had taken those courses.

Those are the ones provided by New York State.

JUDGE SHON: That may well be.

JUDGE GLEASON: I'm not sure that that letter mentions that certainly. If it is not, we would like to have it in the record.

MR. GLASS: I'll be in touch with Mr. Feinberg then.

MR. HASSELL: I just have one other matter before you dismiss this panel.

I thought you wanted the Staff's comments about -- you may recall that there is some testimony by the Licensees concerning the

improvement in their reporting to NRC.

I thought you had asked that a staff member be prepared to address or at least give the Staff's view on the latest improvement.

JUDGE GLEASON: Thank you for reminding me.

We wanted to have something in the record as to whether they would comment on the Licensees' testimony that there had been a specific improvement in their reporting to the NRC of events and occurences that took place, yes. Whoever can do that.

MR. CZAJA: Judge, before the witnesses start, I would like one clarification.

I think the original question as phrased by the board was directed toward Con Ed. I have no problem with him answering it on behalf to the Power Authority's situation but just so he can make clear whether it's referring to Con Ed, Power Authority or both.

JUDGE GLEASON: Oh, yes. I forget which it was now, but whichever it was it was.

MR. CZAJA: I have no problem dealing with both, but just so the record is clear so he could specify.

JUDGE GLEASON: All right. Specify as to the response.

MR. CZAJA: As to who is making --

MR. SEARS: He just complicated my life, sir.

JUDGE GLEASON: I did; he didn't.

MR. BRANDENBURG: I'm reluctant to add, other than Mr. Czaja's wise comments, Mr. Chairman, but it presumes that there might be a difference, if I understand Mr. Czaja's remarks, between the two units.

I certainly don't want to leave the witness with the impression that we are proposing that or suggesting that.

JUDGE PARIS: Don't you boys fight now.

MR. SEARS: Okay. Sir, NRC has an incident response center, which is manned 24 hours a day seven days a week; and nowadays it is manned by reactor engineers so that when a report comes in, there is somebody there who can understand the import of what is being told.

I have reviewed the log books that are kept by these incident response engineers for the past three years. I can break it down if I

have to between Indian Point 2 and Indian Point 3, but let me just say initially that in 1980, there were 46 reports from Indian Point, both plants.

And in 1981, there were 142.

In 1982, there were 58, and in 1983, so far, there have been nine.

Now, our regulation, 50.72 requires the Licensee to report any of a whole host of incidents, if you will, and the regulation states "within one hour" -- well, I believe it states "as quickly as possible" or something to that effect and at the most within one hour.

Now, in my review of these reports, they were all within one hour. Some of them were very quick; some of them five minutes.

In other words, the shift supervisor saw something wrong and immediately picked up the phone.

Most of them were relatively innocuous kinds of things. There were many of them that were just industrial injuries to people who were then brought to the local hospital. There were a couple of bomb threats. There were a number of seismic reports, but it turns out that

the way the Indian Point people are interpreting the regulation is the following: They have a seismic consultant, and any report that that seismic consultant gets from any event in this area must immediately be reported, and they have been doing that.

For quite a while, there was a blast thing out there on, what is it, Route 9, and these would give a seismic indication at the plant.

So in talking to the engineers and our incident response center and the general impression I got from talking to them was that the Indian Point people report more quickly and more completely than any other plant we have in the country.

There is one other point that I think should be made: Is that within the recent past, our regional office has sent to the Indian Point Licensees a copy of the report form that the incident report people use to help facilitate the kind of information that we are going to ask them.

One of the questions on this form is, "Have you informed local officials about this incident?" That of course is simply to remind the Licensee if he has not -- if it is the kind

of incident that should be reported -- to remind him that if he has not, to get on the phone and do it. I guess that sums up my testimony.

JUDGE GLEASON: Would you like to be excluded from the table?

MR. CZAJA: No; best in the country.

JUDGE GLEASON: I thought you'd like to change your statement.

Gentlemen, we appreciate your testimony. You are excused. Thank you.

MS. FLEISHER: Your Honor, I have a bit of business, if I may.

JUDGE GLEASON: All right. Let me see what time it is, first, Mrs. Fleisher.

MS. FLEISHER: It is just before lunch.

JUDGE GLEASON: Go ahead, Mrs. Fleisher.

MS. FLEISHER: I spoke to Mr. Blum last evening, and he said that he had attended the deposition of Mr. Rosen and Mr. Corren yesterday and that he thought that that would remove any objections to, you know, the motion with regard for the information for the motion and hoped that you would dismiss it.

He will be here on Tuesday, Mr. Blum will.

JUDGE GLEASON: Excuse me. You spoke to Mr. Blum yesterday, and --

MS. FLEISHER: Last evening.

JUDGE GLEASON: We are talking about the deposition of Mr. Corren?

MS. FLEISHER: Right.

JUDGE GLEASON: And he thought, Mr. Blum thought, that that would dispose of things?

MS. FLEISHER: He thought that the objection would be removed because the Licensees are --

JUDGE GLEASON: Well, we don't have any response from the Licensees yet.

MS. FLEISHER: I should have expected them to report it. I asked just now and seemingly it had not been reported.

JUDGE GLEASON: It has not been reported and in light of yesterday that we did have some emergency.

MR. LEVIN: If I might --

MS. FLEISHER: But you did, your Honor, ask if Mr. Blum would be present, so I called him.

JUDGE GLEASON: Oh, no.

MS. FLEISHER: You forget that, huh?

JUDGE GLEASON: No, I didn't forget that. I asked about Mr. Blum, when he is going to be present, because we have another matter dealing with a consultant that the Board wants to -- we have a response, and I wanted to get Mr. Blum either in to specify his objections or not but I can't do it if he's not here. I was trying to find out when he was going to be here.

JUDGE SHON: This is on entirely separate matters, Mrs. Fleisher.

MS. FLEISHER: I'm just delivering the message he asked me to give you. I don't know. I haven't been following it particularly.

JUDGE SHON: Thank you very much.

MR. LEVIN: Your Honor, if I might, for the record, I told Mr. Lewis this morning that those depositions had been concluded yesterday and that we will have further papers to file on that just as soon as possible.

JUDGE GLEASON: Yes. Mr. Lewis just advised me of that. You heard his response on that, Mrs. Fleisher?

MS. FLEISHER: Well, then, if it's

agreeable with all of you, Mr. Ingenito has finally been caught. He came over to testify. He's a legislator, and I'm sure you have all had his testimony, but I have some copies to distribute right now.

He came over to testify and lost his way. I can't imagine how, but he couldn't make it somehow into this room, and Mr. Thorsen is not here today and asked me to introduce it and hope that you would hear his testimony. He's legislator from Rockland County.

JUDGE GLEASON: Is he going to make a limited appearance?

MS. FLEISHER: No, I think not. Testimony has already been filed for quite a while.

JUDGE GLEASON: Well --

MS. FLEISHER: We had him on the list, sir.

JUDGE GLEASON: Well, you know, you had a lot of people on the list, but when the time comes for people to be here, they are not here.

MS. FLEISHER: Well, Ms. Potterfield did announce it, I believe, -- rather Mr. Thorsen did, and the purpose, I believe, now was -- first of all, the teachers all have holidays

and he was able to come today during the day, and the other is that he would like to make a statement, I think, to defend what he says in his testimony.

I think he didn't understand nor did I that you wouldn't have some spare time now between now and Dr. Lifton.

JUDGE GLEASON: Well, we are certainly not going to take him after Dr. Lifton.

MS. FLEISHER: No, sir, I hadn't planned to but I believe Mrs. Potterfield said Dr. Lifton was coming on at three.

MS. POTTERFIELD: I might say, Judge Gleason, we have been successful in obtaining the commitment of Dr. Zelman to come at 2:15 with the Board's permission.

I did indicate yesterday that we were trying to get him to appear, and I understood your response to be that if they were time, he might be able to testify.

JUDGE GLEASON: What is the other individual's name?

MS. FLEISHER: Ingenito. He's the Chairman of the Multiservices Committee which is responsible for the Citizens' Committee to make a

plan in Rockland County. You know, he's not just like every other legislator, let's say.

JUDGE GLEASON: Excuse me. He's chairman of what?

MS. FLEISHER: Multiservices Committee in the Rockland legislature and that committee is the one that's working on -- they supervise the work of the Volunteer Committee to make the plan.

JUDGE GLEASON: The advisory plan?

MS. FLEISHER: Yes.

JUDGE GLEASON: What --

MR. CZAJA: I object, Judge.

First I was prepared for Dr. Kagen and Dr. Lifton today. Then Kagen is out. Then Zelman is supposed to be coming in, now Ingenito. I object.

MS. FLEISHER: No. Let me say something, please. If we put up with them yesterday, they can put up with us today. We have no testimony, that's right, we have no testimony at all from Mr. Schmer.

We sat here scrambling trying to get --

JUDGE GLEASON: Do you have a copy of

his testimony?

MS. FLEISHER: Yes.

JUDGE GLEASON: Let me see it, please.

MS. FLEISHER: Yes.

JUDGE GLEASON: Have you read his testimony, Mr. Brandenburg?

MR. BRANDENBURG: Mr. Chairman, I don't even have a copy with me until it was handed to me a couple of minutes ago.

JUDGE GLEASON: I understand that. That's what I am asking you, if you would take a brief minute to read it.

MS. FLEISHER: Your Honor --

MR. BRANDENBURG: I did scan it. I think it's principally a limited Intervenor nature.

JUDGE GLEASON: It's a limited --

MS. FLEISHER: Your Honor --

JUDGE GLEASON: Pardon, Mrs. Fleisher. Would you mind if I talk once in a while, Mrs. Fleisher? Thank you.

I would like to suggest that -- when is your witness available? 12:15 or 2:15?

MS. POTTERFIELD: 2:15. Then Dr. Lifton will be here at 3:00.

JUDGE GLEASON: Which witness is

this?

MS. POTTERFIELD: He's number ten. Dr. Zelman, I announced that he might be coming yesterday evening.

JUDGE GLEASON: Do you have a copy of his testimony?

MS. POTTERFIELD: Yes, sir.

JUDGE GLEASON: That I might look at.

MR. HASSELL: May I inquire, Judge Gleason, if I may?

JUDGE GLEASON: Yes.

MR. HASSELL: May I inquire, was Dr. Zelman listed, Amanda, on that list as a person that you might call this week? Because yesterday was my first recollection that the person may appear today.

MS. POTTERFIELD: He was listed during the five days that Intervenors had and he was here but we didn't get to him.

That's why I asked whether or not the Board would permit him to testify today if he came.

MR. HASSELL: Why didn't you ask at the time you were asking about Lifton?

MS. POTTERFIELD: Because Dr. Zelman was available during the week that we didn't get

to him because we had -- because the other witnesses took up too much time.

MR. HASSELL: I understand that.

MS. POTTERFIELD: Since we have two hours between our usual lunch and -- an hour and a half between our usual lunch and Dr. Lifton, I just thought --

MR. HASSELL: I understand that. My question goes to notices as to who is going to testify on what day. That obviously affects preparation time.

MS. FLEISHER: Mr. Ingenito was to testify last week on the afternoon that Mr. Thorsen had. What would that be? The 24th? 23rd? -- 24th.

JUDGE GLEASON: Well, the problem that we face, obviously, is one of fairness and whether or not bringing witnesses at this time without adequate opportunity for other parties to review the testimony and prepare their cross-examination is really a test of fairness. That is the issue.

I don't know whether we can get over that.

MS. FLEISHER: Why doesn't that apply

to what took place yesterday? We had two subpoenaed witnesses with no testimony whatsoever. This man's testimony at least has been given in for the previous week and these people had plenty of time to review it.

In fact --

JUDGE GLEASON: Well --

MS. FLEISHER: Just a minute. They made a correction -- an objection to his testimony on the basis of hearsay. So they have read it.

JUDGE GLEASON: Well, obviously, that couldn't apply to testimony yesterday because there wasn't just for the reason you said there wasn't any prefile testimony. No one had any testimony.

MS. FLEISHER: Don't you think that's worse?

JUDGE GLEASON: Well, it's not a question of whether I think it's worse. It's a question of fairness. Presumably, no one was in any different position than anyone else is.

MS. FLEISHER: Your Honor, three hours were spent on --

JUDGE GLEASON: The only thing I can

say at this point is that it's up to the parties who want to bring these witnesses here. We will consider this matter, consider -- we are going to go now into recess until 2:00, which is an hour an 12 minutes from now.

During that time, I will ask the other parties, the Licensees and the Staff, to read these two pieces of testimony, and at 2:00, I will ask if they have any objections and I'll consider those objections. If the Board will have to rule on the basis of that, and if the Board rules against them, we'll hear the testimony; and if it rules in favor of them, we will not. That's the only way I can --

MS. FLEISHER: Your Honor, may I ask that we have the lunch for just one hour? That would help.

JUDGE GLEASON: Well, one hour and ten minutes is pretty close to an hour.

MS. FLEISHER: Okay.

(Hearing adjourned at 12 50 p.m.)

(Hearing reconvened at 2:00 p.m.)

JUDGE GLEASON: Could we begin? Are we ready to begin, Mrs. Fleisher?

The Board has decided that it will

not permit the statement of Mr. Ingenito to be entered into the record as evidence, because it is, in our view, cummulative, irrelevant and immaterial.

It would permit, if Mr. Ingenito would like to, we will provide him this opportunity to read his statement in the record as a limited appearance.

Would you like to do that, sir?

MR. INGENITO: Yes. Thank you, your Honor.

My name is Kenneth Ingenito. I am County Legislator from Rockland County representing the Town of Stony Point which geographically is adjacent to the Indian Point Plant one mile in proximity.

Because of my long residency in Stony Point, there are certain facts about this town which are apparent to all residents and which indicate impossibilities or at least the unlikelihood that Stony Point could adequately react to an emergency at Indian Point.

First, in our proximity of Indian Point the entire town is within the ten-mile EPZ and at its nearest points is nuclear reactors are

just across the Hudson river.

Obviously, any radioactive material can reach Stony Point almost immediately if the wind were blowing our way.

I don't think anybody has to be an expert to come to that conclusion.

With just a ten miles per hour wind, Indian Point air would reach the center of our town in less than one half hour.

Secondly, many people of Stony Point would not become aware of an emergency if one were called. Stony Point is a mountainous, semi-rural town.

The people are not all located at any one place and many people have homes out in the woods away from other residents and in sheltered areas where neither their neighbors nor any siren would reach them.

There are also many recreational areas in the town so that hikers, hunters, people on the Hudson River or shores may not be notified of an emergency.

Third, sheltering is not adequately available in the town. Many homes here do not have basements. They are 30, 40 years old and

there are few airraid shelters and even less with supplies in.

Finally, because of the topography of Stony Point and its system of roads, it would be very difficult to evacuate the town if this was deemed necessary.

For example, Wayne Avenue, which is a major route, according to the evacuation plan or proposed one, is less than 20 feet in width and in some areas will go down to 15 feet, which I have measured, and ends up in a bottleneck before it reaches Route 210 where three country roads will merge onto Wayne Avenue.

There are homes immediately on the road. There are front lawns immediately on the road. There is no availability of parking space off the road if a car breaks down.

It is impossible, in my opinion, to put heavy traffic on a mountain road such as Wayne Avenue.

Route 9W is the main artery through the town. It is a twisting, two-lane road with many intersections and will be under construction in 1984.

So there will be temporary detours of

this road which means heavy congestion will be placed on the country roads and the back roads.

There is also heavy congestion on Route 9W during a normal day.

If there were an emergency, people would be trying to travel in both directions on this road, because many people would demand to return to their family or demand the fastest way out of the area.

A single accident could tie up traffic and does tie up traffic. This is especially so since town volunteer services would have difficulty responding to an accident on a congested narrow road.

The Palisades Parkway would seem a means of evacuation for most of the town.

However, there are big difficulties in getting people to the Parkway and then knowing whether the Parkway can handle the traffic in its present state.

Already the Palisades Parkway gets congestion during the rush hour and at times is bumper to bumper during summer weekends and occasionally -- and you can verify this with the New York State trooper. They do have to change

the direction of the traffic entering onto the entrances of the Parkway because it ties up traffic on the back roads entering to the entrances of the Palisades Parkway.

My experience as a teacher in the North Rockland Central School Distric, which has been since 1964, tells me there would be many significant problems associated with evacuating school children from the area in the event of a radiological emergency.

First, the reactions of teachers, children and parents not be predicted and can produce hysteria or at least mass confusion.

You are dealing in the community of Stony Point and Haverstraw with the largest high school in Rockland County, housing approximately 2,800 students.

Second, it is uncertain whether adequate means of transportation could be found to evacuate the school children.

Note well that we must maintain staggered hours throughout the school district in order to use our limited amount of school buses. North Rockland buses over 78 percent of its students and this has been verified by my

conversations with the Director of Transportation, Mr. Bernard Hughes, of the North Rockland School District.

We also have over 200 students who utilize cars at the same time at the North Rockland High School adding to further congestion.

Since we are on a staggered busing systems schedule, Mr. Hughes has informed me that we could not, at one time, evacuate more than 4,000 of the almost 8,000 students from the area.

Third, there would be extreme distress in both children and parents by their separation in the emergency.

Many homes have two parents working and, therefore, no one may be at home to care for a child in an emergency if returned home.

As a teacher in the school district for so long, 90 percent of my parental conferences must be held in the morning or must be held in the late afternoon because there is no parent available during the day, and any conversations I have with parents during the day have to be at their place of business since we have a large percentage of our parents who hold

down two jobs and there's no way of even getting them home, because there has been talk in Westchester County about the possibility of early dismissal, and when we have early dismissal, we have problems.

Since I have been elected to the office in January, 1979, as a representative of the Township of Stony Point, many, many individuals have approached me relating to their concern regarding Indian Points' threat to the community, its people in the environment.

I have voted to suspend the operating license of Indian Point on the Town Board

This action had to be taken out of desperation, not irresponsibility. We took that step out of desperation when the legislature passed the resolution sponsored by Legislators Reisman, Gdanski, Goreman and myself.

To withdraw from the evacuation plan would prohibit any county monies or personnel from participating in this nonexistant plan.

We included to this resolution the immediate suspension of the operating license of Indian Point.

The opponents of this resolution have

been screaming that we will lose a great deal of money.

First, the amount was $5 million. They are leaving the taxpayer with the impression that this resolution has caused Rockland County to lose $5 million that was guaranteed to the county which is not true.

How much money will the county be receiving now? We have received $30,000, which at one time we had a question whether or not we would be getting it.

A large part of the so-called aid is in sophisticated communications equipment when they were predicting how much would be needed for an evacuation plan. I believe this sophisticated communications equipment which was originally stated is probably highly inflated since it is common to inflate requests in case cutbacks are made, especially if money is coming from federal, state or other sources besides the immediate taxpayer.

Highly sophisticated communications equipment needed to direct the people, to direct them where, to tell them what, to direct them to the nearest traffic jam, to lead into the nearest

bottleneck, to tell them, "You are now in the middle of a traffic jam"?

I believe the opponents to this move on the part of the county is taking the position of not participating and pulling out of the evacuation plan and shutting down Indian Point is attempting to cloud the issue by quoting exaggerated figures.

When they take a member of their family to the doctor, the doctor informs them, "You have an incurable disease," and the doctor states, "Your alternative is two-fold. It can be corrected by surgically removing the disease."

I feel this disease is Indian Point.

Basically, I would sum up by stating right here as a representative of the town immediately adjacent to Indian Point in Rockland County that it is the contention of the people of Stony Point, it is the contention of the Rockland County legislator, and I am, gentlemen, not a no-nuke. I am not against nuclear energy and so forth, but no one has convinced me to this day as a member of the Rockland County legislature that Indian Point is a safe installation.

Until it is, I advocate publicly as I

have on a number of occasions, that a workable evacuation plan must be established; and until it is, Indian Point must be shut down.

We cannot always wait for the child to be killed and then put up the traffic light.

Thank you.

JUDGE GLEASON: Thank you. Your other witness is not here?

MS. POTTERFIELD: No, sir. I expect him any moment.

JUDGE GLEASON: Let's hold on a minute and get something else done.

The Board has considered the motion to the intervenors for the production of documents, and it decides as follows: The FEMA and the staff -- well let's take FEMA first.

FEMA will turn over to, make available to, the Licensees and to the Intervenors, I mean, the summary reports of the exercise of March 3, 1983, or as it's called "team execretes," and it will also turn over the log of phone calls as requested by Intervenors with the proviso that that information shall not be made public until and after FEMA concludes its report.

Is that the requirement that you want

to make, Mr. Glass?

MR. GLASS: The team execretes, I assume, would never be made public. The team execretes would not be made public; and as to the information contained in the surveys and their request labeled B, dealing with verification, that would be the --

JUDGE GLEASON: Well, with respect to the team execretes not being made public, I don't really understand that part of it because if they want to use that in cross-examination --

MR. GLASS: I have no objection to that but I just do not want to find those things on the front pages of newpapers or handed out in public in that regard.

JUDGE GLEASON: They are public documents. They are public information, are they not?

MR. GLASS: No, they would not be covered under public information. This is work product produced by the agency. It's internal material. It's not material that would be transmitted from one agency necessarily to another.

It is internal work done by the agency. It's part of the preliminary material

that goes into the report. It would not normally be covered under the Freedom of Information Act.

JUDGE GLEASON: Mrs. Potterfield?

MS. POTTERFIELD: I understand, Judge, that we could use it in cross-examination and we are quite willing to agree to handing it over in their present state to the --

MR. GLASS: As far as the surveys that would not be made public, they can -- we will produce the actual duplicate copies of all the surveys done in the verification process.

We also ask that that not be made public until after our report comes out.

JUDGE GLEASON: What are you talking about?

MR. GLASS: They have two requests. They have Request A which you are granting them the team execretes which we have just dealt with.

They have Request B --

JUDGE GLEASON: Right.

MR. GLASS: That deals with our verification effort as undertaken through Argon Laboratories.

JUDGE GLEASON: Well, the first two, if I read it right, is a log of phone calls.

MR. GLASS: I'm trying to explain what we actually had. What we ended up producing actually survey forms with all the information, and we are willing to turn over everything we have.

JUDGE GLEASON: If that's what the log is, that's fine.

MR. GLASS: We are willing to turn those over. We are asking they not be made public until after our report comes out.

JUDGE GLEASON: They will not be made public and Mrs. Potterfield assumes responsibility for that.

MS. POTTERFIELD: Yes, I do.

MR. GLASS: Thank you.

JUDGE GLEASON: Now, with respect to the Staff, we, the Board, rules that the Intervenors are entitled to have their motion granted with respect to the summary documents relating to the onsite aspects of that exercise, which you referred to yesterday, and -- go ahead.

MR. HASSELL: Let me just see if I'm clear. I believe I referred to two items: One is this final report. Is that what you mean by

summary?

JUDGE GLEASON: The staff final report.

MR. HASSELL: Yes. That brings it all together.

JUDGE GLEASON: Right. That's right.

MR. HASSELL: Okay. Fine.

JUDGE GLEASON: And I understood that you had one problem and that was dealing with confidentiality.

MR. HASSELL: Proprietary --

JUDGE GLEASON: And the Licensees have committed themselves to address that issue in the immediate future. We have a time problem with respect to the production of these documents so that they'll have to be in the Intervenors' hands in time for them to prepare their testimony.

MR. HASSELL: I understand. The Staff will make every effort to get that document to Intervenors early next week.

MR. BRANDENBURG: It was in the vein, Mr. Chairman, of our understanding that we would have that testimony on the 11th, but we committed to try and cut the red tape on the proprietary review process and so forth.

JUDGE GLEASON: Now, we have not heard -- we have communicated with Mr. Feinberg on behalf of New York State, and we were to recieve a telephone call this afternoon, but we have not received that as yet, but it is our impression that Mr. Feinberg wants to respond in writing, and he has indicated that he'll have that in our hands by Monday at which time we'll make our determination with respect to that part of the motion.

So that concludes the Board's action with respect to the Intervenors' motion, except for the reservation on the part of the New York State.

MR. BRANDENBURG: Mr. Chairman, before we leave that topic, might I request the Board to amend its ruling with respect to this motion to include the provision that these documents will be supplied by FEMA and the NRC Staff to all parties and not just to the intervenors?

JUDGE GLEASON: Well, this gets to be a little bit difficult in respect to this confidentiality.

MR. HASSELL: Since Staff will be

providing it subsequent to the confidentiality review, I'd be willing to provide it to the Board, all the parties, service lists.

JUDGE GLEASON: All right.

MR. BRANDENBURG: I was particularly interested in Mr. Glass' team execretes and so on and so forth. I would be happy on behalf of Con Edison to be bound by the same bases that others are.

JUDGE GLEASON: I'm sure the same degree of confidentiality that they requested of the Intervenors, I'm sure --

MR. BRANDENBURG: Given the shortness of the time period to prepare for cross-examination of this material, though my interest was in receiving it the same time the Intervenors do.

MR. GLASS: I intend to have it ready for distribution early next week.

JUDGE GLEASON: Does the Power Authority commit themselves to that degree of confidentiality?

MR. CZAJA: That's correct, Judge.

JUDGE GLEASON: Now, let's see. Where is that thing?

Yes, I guess we are argueing Mr. Zelman's testimony. I throw this now to the Licensees and Staff as to whether they have objection to considering his testimony at 2:15.

MR. CZAJA: Judge, we objected to Dr. Zelman's testimony in a motion of March 14, page 10.

We believe that the testimony should be stricken.

JUDGE GLEASON: All right. Let me get, first of all, you are not objecting to considering it if it were admissible; is that correct, Mr. Czaja?

MR. CZAJA: Yes, that would be -- it's incorrect, Judge. That would be my one point I would argue that we have had in it because of the scheduling changes. The testimony should not be admitted for that additional reason.

JUDGE GLEASON: All right. Mr. Brandenburg?

(Continued to next page; no context lost.)

MR. BRANDENBURG: Con Edison similarly objects to the admission of the testimony for a number of reasons, one of which is the shortness of time.

JUDGE GLEASON: Mr. Hassell?

MR. HASSELL: The staff would be willing to go forward with the testimony today.

JUDGE GLEASON: The staff overrules that part of the objection, and it's up for consideration. So would you like to -- if it's all right with you could we argue the admissibility of it?

MS. POTTERFIELD: Yes.

MR. CZAJA: Judge, first of all, we believe the testimony of Dr. Zelman is irrelevant on the grounds that it really addresses the sociological effects on children of the existence of the Indian Point plant. We believe that issue has been ruled out of this proceeding.

He is not dealing with the response of children during an emergency or an evacuation. Rather, his argument is the existence of the plants has adverse sociological consequences because either you don't tell children about the

emergency plans, in which case they feel insecure, or if you tell children about the emergency plans then there is adverse consequences from telling them about that.

So really Dr. Zelman's argument boils down to, one, that for a segment of the population the plants have an adverse policy. I believe the rulings of the board on this type of issue would bar Dr. Zelman's testimony.

To the extent that it could be considered, we would also say the testimony is cumulative from a great deal of other testimony that we have heard from other intervenor witnesses.

MR. BRANDENBURG: Con Edison objects to the testimony with regard to the issues. It precludes the stress issues. It is one of the pieces of intervenor testimony that is the subject of our motion dated March 14, 1982, at page 22, and we respectfully refer the Board to that.

In particular the failure of this testimony to address either the adequacy of the Indian Point emergency plans under the NRC regulations, or to recommend any specific feasible ways of improving that emergency plan.

MR. HASSELL: The staff essentially

takes the position expressed by Mr. Czaja that this testimony would be irrelevant because it does concern psychological effects which, it is my understanding, have been precluded from this proceeding.

JUDGE GLEASON: Ms. Potterfield?

MS. POTTERFIELD: Yes, Judge Gleason.

The testimony, as is clear from the first page, beginning with the fourth full paragraph, discusses the measures that should be taken in order to inform children about evacuation plans, and the problems that arise from planning for an evacuation, planning for an emergency at Indian Point.

It clearly is relevant to the issue of how to best inform the public, and particularly this sector of the public, about evacuation planning and the dangers that may or may not exist at Indian Point. It's an expert's opinion on the best possible way to deal with children on this issue.

As we know, the question of how best to protect the children has been an important part of this proceeding. Dr. Zelman offers to the board information on how best to inform children and how

best to deal with them in sociological terms, so that important sector of the population may also be informed and able to respond in the event of an emergency.

(The Board conferred.)

JUDGE GLEASON: The Board has to conclude, Ms. Potterfield, that this testimony is violative of the commission's edicts about not considering sociological impacts in these proceedings, and therefore rules that the testimony of Dr. Zelman should not be received.

MS. POTTERFIELD: My objection is noted.

JUDGE GLEASON: Yes.

Is there anything else that we can profitably discuss?

MR. CZAJA: I have two matters.

JUDGE GLEASON: What I would like to say is that the Board anticipates, because it has some meetings tomorrow, being able to catch a flight out of here sometime this afternoon, and so I have had the clerk communicate with you that I hope your cross examination is not duplicative, and cumulative and is pointed, and can be done in an hour's time.

MR. CZAJA: An hour's time seems reasonable to me, judge, once he gets here.

JUDGE GLEASON: Well, I understand that you can't predict all the vagaries and cross ways and pathways of cross examination.

MR. BRANDENBURG: Mr. Chairman, I am pleased to report to the Board that the parties have agreed on a schedule for next week on question 5.

The second matter, I will just mention it now, has to do with some apparent insipient disagreements on the route for the road tour the week following.

Let me get to the more pleasant topic first, and that is the subject of next week's schedule.

After consultation with Mr. Blum and counsel for the NRC staff and the licensees and their witnesses, we have all agreed upon the following schedule.

On Tuesday --

JUDGE GLEASON: What's that date?

MR. BRANDENBURG: This is the 5th, I believe.

JUDGE GLEASON: All right.

MS. POTTERFIELD: The lead off witnesses will be Dr. Meyer and Mr. Pratt, the carryover witnesses from question one on the containment response.

They will be followed by the testimony of Mr. Bernaro source term issues.

JUDGE PARIS: Why don't you give us the party, also.

MR. BRANDENBURG: Mr. Bernaro is a staff witness on source term.

JUDGE GLEASON: All right.

MR. BRANDENBURG: Following Mr. Bernaro on Tuesday, if there is any time left, we will start with the licensees' panel on question 5 issues. That panel will be completed, we envision, sometime Wednesday morning.

JUDGE GLEASON: Who is on that panel?

MR. BRANDENBURG: It's Dr. Bley, Mr. Paddleford, Mr. Potter, and Mr. Richardson.

JUDGE GLEASON: Who was the second person?

MR. BRANDENBURG: Mr. Paddleford, P A D D L E F O R D. With the exception of Mr. Paddleford, all the other witnesses have previously appeared before the Board either in

connection with question 1 or question 2.

Following those gentlemen will be the testimony of Mr. Sholly on question 5. Mr. Sholly is a witness being offered by UCS NYPIRG.

JUDGE GLEASON: Yes.

Now, with respect to the less agreeable matter?

MR. BRANDENBURG: Well, there are more witnesses.

Following Mr. Sholly will be the licensees' testimony of Mr. Potter on commission question 5. He is doing a solo.

JUDGE GLEASON: Wait a minute. Excuse me. Following Mr. Sholly --

MR. BRANDENBURG: Will be the individual testimony of Mr. Potter, which is a separate piece on commission question 5.

JUDGE PARIS: Can you tell me where we are in time by this time?

MR. BRANDENBURG: Probably late Wednesday afternoon, I suspect, Dr. Paris. Of course, in each instance we are trying to anticipate Mr. Blum, and vice versa. There is some uncertainty.

Following Mr. Potter's individual

testimony, and we suspect this will be sometime on Thursday, well have the staff testimony on question 5 of Dr. Rowsome and Dr. Blond.

Following that will be licensees' testimony on the containment strength issue. This relates to the letter of January 4, 1983, that sets forth the basis for the recalculation of the ground acceleration that the containments would withstand.

After discussion with Mr. Blum, the Board asked that the persons responsible for that reanalysis, which was part of the question 1 testimony, be put forth for cross examination by the parties. Well we will be offering two witnesses on that topic, Dr. Wesley, and Dr. Perla for cross examination on the subject of that.

JUDGE GLEASON: How do you spell Perla?

MR. BRANDENBURG: P E R L A.

JUDGE GLEASON: Is her testimony already in?

MR. BRANDENBURG: It's not testimony, per se. We plan to offer into the record, Mr. Chairman, the letter from Dr. Wesley to the licensees that was, itself, an attachment to the

January 4 letter that was sent to all the parties to this proceeding as testimony.

JUDGE GLEASON: Has that letter been distributed?

MR. BRANDENBURG: Oh, yes. As I said, it was sent to all parties on January 4.

JUDGE GLEASON: All right.

MR. BRANDENBURG: And the last two witnesses next week would be the respective licensee witnesses on the low leakage fuel pattern matter that was of some interest to Judge Shon earlier.

Con Edison will be offering testimony by Dr. Lee and the Power Authority will be offering a separate but substantially parallel piece of testimony.

JUDGE GLEASON: From who?

MR. BRANDENBURG: I don't have the gentleman's name at this point.

JUDGE GLEASON: The witness --

MR. BRANDENBURG: It's a Power Authority witness.

We envision that some time might be then available on Friday, and would like to propose that the Board request the parties to meet

to see if some mutually agreeable arrangements cannot be made for the site tour, which will be the following week.

MR. LEVIN: Your Honor, I have the name of the unknown witness. It's Theodore A. Meyer, M E Y E R.

MS. FLEISHER: How do you spell that?

MR. LEVIN: M E Y E R.

MS. FLEISHER: When will we get testimony from these people?

MR. LEVIN: Very soon.

MR. BRANDENBURG: For the discussion among the parties on the site tour arrangements, I did not envision that the board's presence would be necessary. I thought Mr. Lewis could be with us. That brings me to the second matter I thought it might be fruitful to discuss. That is the site tour.

We have thus far provided to the intervenors the licensees' recommended off site tour plan, which would meet the Board's request that all of the EOCs for all four counties be visited, and would take the Board into all four of the counties within the EPZ.

We have thus far been supplied a

recommended route by Ms. Fleisher for Rockland County.

We also have a disconnected, I say disconnected because it's a separate document, route for Putnam County.

After repeated requests we have been told that later this afternoon well be receiving a proposed route for Westchester County, and I am told that the intervenors do not propose to recommend a particular route for Orange County.

Now, based upon our review of the Rockland and Putnam routes recommended by the intervenors, contrasting it with the route that we had developed ourselves, it appears that there has been substantial emphasis upon the narrow winding roads we have heard so much about throughout the entire tour, as proposed by the intervenors, whereas our routes, generally speaking, have proposed to seek a more balanced route with emphasis primarily on the primary and secondary evacuation routes, and those routes have been omitted substantially from the fragmentary routes that he have seen so far from the intervenors.

Some guidance, I think, from the board as to whether it wishes to concentrate on

primary, secondary routes might be useful to us and might bring the parties closer together.

MR. LEVIN: I would like to clear up one matter, Your Honor. The Westchester Putnam proposal was available yesterday. We were not prepared with ours at that time to sit down and talk about it, so it's not a question of the intervenors not having been prepared.

On the question of the differences between what we proposed, using Rockland County as an illustration, as opposed to what Rockland County has proposed, we have not yet had an opportunity to sit down with Ms. Fleisher or with any of the other intervenors and make some effort to reconcile as much as we can before we burden the Board with the kind of problems that may arise.

I think I do agree that it would be useful to have some indication from the board as to exactly what kind of routes the Board is interested in. That might facilitate negotiations.

We are making an effort, I would hope Monday, if that proves possible, to get with the intervenors and get to some resolution, or at least diminish the number of conflicts we have.

JUDGE GLEASON: Ms. Fleisher.

MS. FLEISHER: Your Honor, I am sorry, but I wish they were under oath. I would have some good questions.

Number one, the primary routes are all chosen for Rockland County. Sometimes, indeed, you have to take a tiny road to get to the big ones, but the route we suggested we thought was very well balanced. You have his word against mine. We

MS. FLEISHER: Your Honor, I am sorry, but I wish they were under oath. I would have some good questions.

Number one, the primary routes are all chosen for Rockland County. Sometimes, indeed, you have to take a tiny road to get to the big ones, but the route we suggested we thought was very well balanced. You have his word against mine. We know the roads in Rockland County better than he does.

There is also the question of the meeting. If you come into Rockland County from the south, and you go northward, you would be going in the opposite direction of any traffic flow that we would have in an evacuation.

One of the things we would like you to see is the characteristic of the roads, that they do not widen, even though they would be bearing more traffic. So we made a circle, whereby you would go in a loop and then proceed northward. And they have a more tortuous way.

I think that Mrs. Kessler and I worked very hard on that, and that his characterization of the Rockland route is erroneous.

I would say Mr. Levin is erroneous to say that we should meet on Monday. I don't see why we can't have the meeting on a regular session day. We have until 3:30 right now.

JUDGE GLEASON: Three o'clock.

MS. FLEISHER: Not during a session, before, or after. I don't see why we should come to White Plains to have a special meeting, especially when they can't work with us by characterizing ours incorrectly.

JUDGE GLEASON: Thank you, Ms. Fleisher. We have to talk to our --

MS. FLEISHER: I would like to suggest --

(The Board conferred.).

JUDGE GLEASON: The Board really once again despairs of you people not being able to come to some agreement. We have an adequate amount of time to travel a substantial portion of the evacuation routes listed on this map in the EPZ.

And we, of course, want to see, you know, obviously without traveling every inch of the evacuation network, we want to see an adequate part of the evacuation circuit, if you will, or network, that includes, you know, at least a

portion or part of the roads that the intervenors are objecting to, or have objected to in the sense of their inadequacy. And so, you know, without our dictating where these roads should be, you have to include the good and the bad in that sense.

We think you people ought to have enough ability to sit down and work this thing out. As I say, we are providing practically two days for this thing, so that certainly is enough time

JUDGE PARIS: We don't want to spend a lot of time on parkways and thruways that we already know.

MR. LEVIN: Let me assure Your Honor that the proposal that we have made does not do that, and it was an effort to be representative.

This whole business is premature, as I say. I think we can work out the problems we have with a sufficient amount of --

JUDGE GLEASON: Work it out, and work with Mr. Lewis, and see if you can work it out. The Board would rather not tell the bus driver where to go ourselves.

Let's take a ten minute recess, please. Maybe you can do a little work in ten minutes.

(There was a brief recess.)

JUDGE GLEASON: Are we ready to proceed, please?

Thereupon

DR. ROBERT JAY LIFTON

was sworn by the Administrative Law Judge and testified as follows.

DIRECT EXAMINATION

BY MS. POTTERFIELD:

Q. Would you please state your name and address for the record?

A. Robert J. Lifton. My home address is 300 Central Park West, New York City.

Q. And your professional address, Dr. Lifton?

A. My professional address Department of Psychiatry, Yale University, 25 Park Street, New Haven, Connecticut.

Q. Dr. Lifton, do you have before you two documents, one entitled Testimony of Robert Jay Lifton, M.D., and one entitled Errata Sheet for Testimony of Robert Jay Lifton?

A. Yes, I do.

Q. Do those two documents together represent the testimony that you wish to submit

before the Atomic Safety and Licensing Board?

A. Yes, they do.

Q. Do you have any additions or corrections?

A. I do. Shall I go ahead with them?

JUDGE GLEASON: In addition to the errata sheet?

THE WITNESS: These are the errata sheet.

JUDGE GLEASON: Well, no. You don't have to add those. If you have any corrections in addition to the errata sheet?

THE WITNESS: No, I don't.

Q. With the additions that you make on your errata sheet is your testimony true and correct?

A. Yes, it is.

MS. POTTERFIELD: I move that the testimony be admitted and bound into the transcript as if read.

JUDGE GLEASON: Hearing no objection --

MR. BRANDENBURG: There is objection, Mr. Chairman.

JUDGE GLEASON: Go ahead, Mr. Brandenburg.

MR. BRANDENBURG: With respect to the main testimony I respectfully submit that for the same grounds that the Board ruled that the testimony of Mr. Zelman was inappropriate, that that logic applies equally, if not even more so, to the testimony of this witness.

If one reviews the dozen or so pages of testimony of this witness as originally filed, we find that the subject of emergency planning I don't even believe is referred to. Evacuation is not referred to once.

What we have here is a lengthy discourse on the psychological effects of postulated accidents. This is precisely the type of topic that is forclosed in the proceedings before the commission under the commission's rulings.

Now, with respect to the so-called errata sheet, we were just handed this literally before the lunch break, Mr. Chairman. I have had a chance to review it only very briefly.

The brief review I have had indicates an entirely new subject matter is raised in this so-called errata sheet, including such topics as commentary on topography, conduct of police chiefs,

and other things. This is entirely new subject matter that is not the subject of the witness' main testimony.

I respectfully submit that the parties have not had an opportunity to study and review the so called errata sheet, which, as I emphasize, brings up an entirely new and fairly substantial subject matter.

JUDGE GLEASON: Ms. Potterfield?

MS. POTTERFIELD: Judge Gleason, what we have here is testimony very much in the same vein as the testimony presented by the licensees yesterday about whether or not a natural disaster is different from a radiological disaster.

If the Board will remember, we heard at length from Doctors Lecker and Dynes about the similarity between disasters. We heard them tell us that it was the agent of the disaster, that that didn't make any difference.

We are presenting this testimony for the same purpose as the licensees presented that testimony, except our position is radically different. In fact, its contradictory. Certainly, though, it's on the same subject matter and not any more irrelevant than the testimony of Doctors

Dynes and Lecker.

MR. BRANDENBURG: The testimony of Doctors Lecker and Dynes, that was just yesterday, I'm sure we can all remember it well, the burden of their testimony related entirely to how the evacuation response, the emergency response, contemplated by the NRC regulations would unfold.

Now, that is simply not the subject of this testimony. This testimony talks about trauma occurring years later, et cetera, et cetera. It is not at all related to the emergency response contemplated by NRC regulations, and to that extent is entirely different from the testimony of Doctors Lecker and Dynes.

It is, I submit, virtually indistinguishable from the testimony of Dr. Zelman. As I had emphasized before, the subject of emergency response I don't believe is even mentioned in the main testimony, and it's, in my view, I submit, simply precluded by the opinions of the commission following the TMI restart procedures.

(The Board conferred.).

JUDGE GLEASON: I am going to say, Mr. Brandenburg, that your point might have better

validity if the licensees had not offered witnesses offering the same type of testimony, only with different conclusions. There are a number of contentions that this testimony could be addressing itself to. So the objections are denied, and will you please proceed with your cross examination?

MS. POTTERFIELD: Your Honor--

JUDGE GLEASON: The testimony is admitted into the record as evidence and bound into the record as if read.

(Bound testimony follows.)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CONSOLIDATED EDISON COMPANY OF NEW YORK	)	Docket Nos. 50-247 SP
(Indian Point Unit 2)	)	50-286 SP
	)	
POWER AUTHORITY OF THE STATE OF NEW YORK	)	
(Indian Point Unit 3)	)	

TESTIMONY OF ROBERT JAY LIFTON, M.D.

My name is Robert Jay Lifton. I am currently Foundations' Fund Research Professor of Psychiatry at the Yale School of Medicine in New Haven, Connecticut. I have held this position for the past 20 years, and before that held teaching and research appointments at Harvard University, the Washington School of Psychiatry, and the Walter Reed Army Institute of Research. I received my M.D. from New York Medical College in 1948, served my psychiatric residency at the Down State Medical Center in Brooklyn, New York, from 1949-1951 and at the Walter Reed Army Institute of Research, 1955-1956, and had additional psychoanalytic training at the Boston Psychoanalytic Institute from 1957 to 1960.

For the past 28 years I have engaged in professional study of human responses to catastrophe and to various kinds of "extreme situations." This interest began with my first major piece of research on victims of Chinese thought reform ("brainwashing"), conducted in 1954-5, as reported in my book, Thought Reform and the Psychology of Totalism: A Study of "Brainwashing" in China. In 1962, I made the first psychiatric and psychological studies of the survivors of Hiroshima, as described in my book, Death in Life, which won the National Book Award in the Sciences in 1969.

In the early 1970's, I did research and therapeutic work with Viet Nam veterans, focusing on their experience as war survivors, which I described in my book, Home from the War, which was nominated for the National Book Award in 1974. Recently, I have worked with both victims and perpetrators of the Nazi Holocaust.

I worked extensively with victims of the Buffalo Creek flood disaster of 1972, and the paper I wrote on that experience, "The Human Meaning of Total Disaster: The Buffalo Creek Experience," has been widely referred to in connection with various forms of disaster. Over the last few years, I have collaborated with Professor Kai Erikson in evaluating human responses to the accident at Three Mile Island.

My principal investigative instrument has been the intensive psychiatric interview, but I have also made extensive use of library materials, and am generally familiar with the disaster literature.

On the basis of two decades of intensive research, a great deal of it focused on the victims of radiological disasters, I have come to see that disasters involving ionizing radiation are strongly and decisively different from the natural catastrophes that make up the subject matter of most disaster research. Therefore, the accumulated experience of emergency and disaster workers with the vast majority of past disasters, in particular with the behavior of both the public and emergency workers, has limited relevance to planning for radiological emergencies.

First, I would divide all disasters into two great groups:

Type A: Natural disasters (sometimes called "Acts of God"), such as hurricanes, tornadoes, tidal waves, earthquakes, floods resulting from heavy precipitation, etc.

Type B: Man-made disasters, such as fires, war, the failure of dams, chemical spills, and other large-scale sudden threats to groups or populations of people resulting from purposeful human activity.

Though there are many borderline and intermediate cases, the distinction is useful, since people are much more likely to accept the former, Type A, as part of the unavoidable risks of life, while Type B disasters are understood to result from

human enterprises (often experienced as human callousness) and are viewed as preventable. The distinction has great psychological importance, since victims of disasters in this second category tend to experience particularly intense and long-lasting psychological effects having to do with anger, bitterness, confusion, and a sense of having been devalued as human beings.

An accident at Indian Point, or any other nuclear plant, would clearly fall into this second category. People would not accept the accident as a product of necessary risk in modern life, but would almost certainly feel particular resentment because the peril to life, health, and property could have been prevented, especially when the persons victimized have made prior efforts to block the activity that produced the danger. Hence, one could expect widespread lawsuits against the utilities, as anticipated by the latter themselves in seeking and gaining legislation protecting them from such lawsuits. In other words, the distinction between Type A and Type B disasters is well known to corporate and legal authorities, even if frequently ignored or denied. And since all radiological disasters are of the Type B variety, much that is said about natural disasters has only limited application to them.

But there is a further distinction among Type B, or man-made disasters that is perhaps even more crucial. I refer here to a significant sub-category in which the principal danger is what I have called <u>invisible contamination</u>. That is, harm is threatened or delivered not by a visible or otherwise perceptible agent, like fire or water, from which one can flee to a position of obvious safety, but by something far more insidious and terrifying because it cannot be detected by the human senses. Agents of invisible contamination can be noxious and toxic chemicals of various types that are released into the environment by accidents or by careless industrial practices. These may range from such a tasteless and odorless gas as carbon monoxide to toxic chemicals such as mercury and other heavy metals and organics like dioxin, many of which are detectable by taste or smell at high concentrations but which can

severely damage the body even when so diluted as to be imperceptible. Many have delayed effects which can include cancers and genetic mutations.

Disasters involving radiation exemplify this category of invisible contamination, and are likely to be the most destructive and the most feared in that category.

I do not claim, therefore, that radiological disasters are absolutely unique. They have some characteristics in common with all other disasters (for example, in causing fear and efforts to escape), with all man-made disasters (for example, in arousing specific resentments), and with others involving invisible contaminants. Yet, there is evidence of a special aura of terror that has grown up around the radiological threat, making a nuclear accident more dreaded than even others involving invisible contamination. In a study done by Yankelovich, Skelly, and White[1] in the ten-mile zone around Indian Point last year, citizens were read brief descriptions of emergencies involving power loss, flooding, a spillage of toxic chemicals and an accident at Indian Point. The surveyors comment, "No other emergency is considered serious by so many people": 81% rated a radiation accident as serious, as compared to 63% for a chemical accident and 59% for the other two types. That is consistent with the findings of Slovic, Fischoff, and Lichtenstein[2], that nuclear power is considered by nonexpert citizens to be at the top of a list of 30 dangerous technologies in terms of overall risk and especially as a source of dread, a "gut reaction" of extraordinary fearfulness.

It is important to recognize that such a reaction need not be qualitatively unique to Indian Point to have uniquely serious consequences there. We are considering the difficulties of evacuating a frightened population of unparalleled size and density from a topographically constricted area with an anachronistic and inadequate network of roads.

The traditional preparation of people for a disaster is to tell them what to do in order to perform socially useful actions and to prepare them psychologically. When a disaster involves radiation, the combination of limited knowledge and diffuse fear

is such that this kind of psychological preparation may not be possible. Indeed, full acquaintance with what is known about potential radiation effects could make people more fearful and further interfere with evacuation arrangements. In any case, the kinds of fear engendered by radiation disasters are likely to interfere with any kind of evacuation plans.

To understand this special aura of terror around ionizing radiation, it is helpful to review some of my first experiences with survivors of Hiroshima, the hibakusha. Many, during the days after the bomb fell, began to experience a grotesque set of symptoms - bleeding from the various bodily orifices, purplish spots from bleeding into the skin, severe gastro-intestinal symptoms, extreme weakness, high fever, and often a progressive course until death. Moreover, these symptoms of acute radiation effects could occur in people who had seemed physically untouched by the bomb. And years later, an increased incidence, first of leukemia and then of various forms of cancer, was noted among Hiroshima and Nagasaki survivors, even in those who had not experienced the acute early symptoms. Hiroshima survivors had a sense of a strange invisible poison, left behind in their bodies, that could strike them down at any time.

Once exposed, if a person developed symptoms he easily became convinced he could not expect to become well again. The very realization that it is impossible ever to be certain whether past irradiation plays a part in current symptoms is profoundly unsettling. And as it becomes known that radiation effects could be genetically transmitted, survivors had the sense, expressed to me by one of them, that "A dark feeling is passed on through the generations."

Survivors were thus left with a permanent anxiety, a readiness to interpret all untoward bodily feelings, even ordinary fatigue, as aftereffects of radiation and perhaps even early signs of leukemia or cancer. The sense of being contaminated became a permanent encounter with death, a sense of ineradicable death taint.

My subsequent conversations with American victims of ionizing radiation, and my evaluation of recent studies, have taught me that the theme of invisible contamination emerges wherever people have been exposed to radiation. A-bomb survivors were the first to develop what is now called the Radiation Response Syndrome (RRS). In Japan it was known as "A-bomb neurosis," a lifelong preoccupation with radiation damage, resembling hypochondriasis, to the point where the victim's life becomes severely constricted. Once physical symptoms become associated with memories of having been irradiated, the individual cannot shake off the sense of invisible contamination and the associated death imagery. The hibakusha's characteristic preoccupation with blood counts became not only an effort to measure his or her contamination but also a means of physically locating it and giving it form. No one is ever certain where radiation effects and psychological manifestations begin, for psychic conflict directly influences the outcome of whatever radiation effects may be present. Survivors feel themselves involved in an endless chain of potentially lethal impairment, which, if it does not manifest itself in one year -- or one generation -- may well make itself felt in the next.

An especially dreadful aspect of the syndrome is the fear of passing on the taint to future generations. Survivors would watch their children anxiously, ready to attribute any failure to thrive and be fully well to the genetically transmitted contamination. Even when the children themselves were normal, the fear remained that latent or recessive effects would appear in some later generation.

In none of the disaster literature with which I am familiar is there anything remotely resembling this ineradicable sense of harboring within oneself an insidious, deadly process that at any moment may strike with mysterious ailments, deformity, or death to oneself or one's descendants. In a very real sense, a radiological disaster never ends for its victims. A few will develop post-traumatic stress disorders; more will be incapacitated by the Radiation Response Syndrome, which makes normal life and work impossible. Everyone who has been exposed is vulnerable to lingering anxiety and

hypochondriacal overconcern about the functioning of the contaminated body.

Moreover, it is not just the victims themselves who have the sense that exposure to radiation produces an uncanny contamination. Many Japanese who had had experience with other disasters such as earthquakes reported that there was less of the usual spirit of selfless cooperation and helpfulness toward the victims of Hiroshima. There was only a slight and uncertain rise of the usual "post-disaster utopia" of compassionate action, and it broke down shortly afterward. Driven by a strong unconscious wish to separate themselves from the afflicted group, those who had not been harmed tended to avoid those who had been. Again, such a reaction is virtually unreported in disasters not involving contamination, and emergency planning cannot afford to ignore this phenomenon. The fear and avoidance of victims is likely to crop up often enough to cause a significant interference with rescue efforts.

I have read the statements of a police chief, volunteer ambulance driver, teachers, and a health professional, submitted as testimony in this hearing, all of whose devotion to duty is presupposed by emergency planning. In all of these cases, the statements make clear that such key people cannot be counted upon to carry out their assigned roles.

The special nature of the radiological threat is also seen in the fact that many persons exposed to it have developed a new medical condition, not reported among victims of other disasters: the RRS (Radiation Response Syndrome). Once a person who has reason to believe that he has been irradiated becomes aware of the causal link between exposure to ionizing radiation and subsequent body pathology, like radiation sickness and cancer, he or she becomes vulnerable to the RRS.

The Radiation Response Syndrome has been formulated on the basis of my own work with Hiroshima survivors, observations by others and myself at Three Mile Island, and the work of others (notably Dr. Henry M. Vyner[3] of the Radiation Research Institute of Berkeley, California) on American military personnel and civilians exposed to

radiation from nuclear weapons testing. I have also observed it in workers at the Pilgrim nuclear power plant in Massachusetts whom I have interviewed. This syndrome consists primarily of psychological symptoms, which tend to occur with exposure to varying levels of ionizing radiation. It is, however, a psychobiological condition in which it is impossible to sort out the strictly somatic effects of radiation and the secondary reverberations of fearful fantasies, the conviction of having been poisoned or invaded by a mysterious invisible contaminant that cannot be detected or eradicated, and which will ultimately prove fatal. Such fears of delayed, lethal radiation influences are often mixed with a need to believe oneself safe and free from such influences, which further complicates the picture.

While the Radiation Reaction Syndrome is a chronic condition hitherto developed only slowly over time, there is now good reason to believe that it may start to impair the effectiveness of victims' behavior during the process of evacuation from the Indian Point region. Formerly, people who believed they had been irradiated knew little or nothing about the possible consequences; today, the population around Indian Point has lived through the post-Three Mile Island period of public education about the possible genetic and health effects of ionizing radiation, and has learned more from reports of testimony given in these hearings. Instead of having to inform themselves gradually in an attempt to understand their own mysterious symptoms, like past radiation victims, the people of Indian Point already know that radiation causes cancer and other diseases including damaged heredity, and know that these effects are delayed results of damage that cannot be detected by the senses or medical examination.

Moreover, a large proportion of citizens living near Indian Point already distrust the utilities and other authorities, already are angry at being victimized, and thus have low thresholds for more intense reactions after a serious accident. Thus, even during the first hours of a crisis, such people could well suspect that they were not being told the truth, and that they and those they love had already been irreversibly damaged. They could well experience a combination of fear and anger that could cloud their judgment, lower their threshold for impulsive and noncooperative

actions, and in various ways interfere with the whole evacuation effort.

The principal constituents of the RRS are as follows:

1. The sense of having been exposed to invisible contamination: to a substance that is harmful to the point of being deadly, and that is additionally mysterious in that its effects do not seem to be fully understood or perhaps understandable.

2. The element of delayed effects -- the idea that one could seem all right for a while but the "poison" could suddenly strike one down at any time in the future. Here the psychological response reflects the specific tendency of ionizing radiation to cause delayed physical consequences. Also of great importance here is the fact that the psychological responses, it has been found, can also be periodic, variable, and delayed.

3. A persistent fear of cancer. The sufferer typically is haunted by the recurrent image of dying from an insidious internal attack, or the sense that parts of one's own body are going out of control without one's awareness and invading all other organs and systems. Such popular conceptions of cancer make it one of the most dreaded of all diseases.

4. Diffuse symptoms that overwhelm and confuse the patient, and often confuse physicians as well. Pre-existing vulnerabilities and pathological tendencies are directly and indirectly exacerbated, and even intercurrent illnesses of quite unrelated origin may form an inextricable part of the total configuration of organismic malfunction. Patients typically report the experience of a beginning total disintegration, of "falling apart." Some symptoms may be neurological (e.g., dizziness, headaches), others psychiatric (e.g., anxiety, depression, psychic numbing, paranoid ideas), while somatic symptoms entail the malfunction of virtually all bodily systems (dermatological, gastro-intestinal, skeleto-muscular, etc.) .

5. Extreme anger toward, and distrust of, authorities, and the sense of having been made into a "guinea pig." This sense of having been unwittingly treated as a subhuman creature in some chillingly impersonal experiment has occurred in persons

exposed to ionizing radiation in many different ways, and is related to the unknown and mysterious dimensions of irradiation. The powerful manipulators who have treated the victims so degradingly are themselves seen as not fully knowledgeable about potential consequences, though indifferent toward them. While angry distrust of authority can occur with other forms of man-made disaster, it is given a special quality and greatly added intensity by this constellation of guinea-pig imagery and feeling that occurs in relation to irradiation. The responses of doctors and other representatives of medical institutions run by the government or industry held responsible for the original exposure often exacerbate the anger. If they attempt to minimize or give reassurances, they are disbelieved; if they deny responsibility or say that the patient must prove that his symptoms were caused by the exposure to radiation -- an impossible task -- he perceives that as an unfair imposition and an infuriating instance of "blaming the victim." A prominent part of the RRS, therefore, is fantasies of revenge against responsible institutions seen as cold, unsympathetic, or vindictive.

6. Beyond individual symptoms, the sense that one's whole life has been mysteriously altered. The victim may lose interest in most activities and find himself increasingly isolated, a different person who cannot find much meaning in various aspects of his life. It is difficult to find meaning and maintain one's sense of identity in a world in which one can be subjected to an extreme, even ultimate threat and then have one's pain and protest ignored.

7. Finally, relationships not just with authorities, but with all other human beings tend to become impaired. As the RRS patient becomes more and more preoccupied with the above types of thought content, which increasingly dominate his conversation, it becomes impossible for him to work, and his human relationships suffer. One friend after another drops away, unable to tolerate the unrelenting preoccupations, sometimes including family members and spouses. Even when the latter feel sympathetic and allied, they tend to view the victim as tainted by death, not only a sick patient, but

a marked man likely to be claimed by death at any time. The person exposed to radiation shares the sense of taint. He feels himself to be a carrier of deadly poison or infection, which can be transmitted to future generation through defective genes. One response to an encounter with death is to assert the impulse toward the continuity of life through having children, but it powerfully conflicts with the fear of having deformed, defective, even monstrous offspring and descendants. The effects upon marriage and family life can be devastating.

I wish to stress that the RRS is a recognizable, clinical entity that has been found in Japan, among victims of radiation exposure after bomb tests and in various parts of the nuclear energy industry, among persons who have received overdoses of radiation in various types of misguided medical applications of x-rays, and, most recently, in residents of the Three Mile Island area. Until more research is done, we will not have reliable indices of its incidence in such populations, but Dr. Vyner reports having found the RRS in three of 17 persons living in or near Middletown, Pennsylvania, whom he selected for interview because they had expressed public concern about TMI. In addition, twelve more of the subjects reported some, though not all, of the symptoms of the RRS in the intensive psychiatric interviews conducted by Dr. Vyner; only two of those studied were symptom-free. Moreover, a public opinion survey conducted by the Field Research Corporation for Metropolitan Edison[4] found a substantial and growing number of persons who have what Dr. Vyner calls the core negative belief from which the syndrome grows. Samples of persons living within five miles of the reactors and from 5 to 25 miles away were asked, "Do you believe you got a dangerous dose of radiation during the TMI accident?" in June and again in September 1980. Close in, the positive responses went from 14% to 22%; further out, from 8% to 14%. Evidently, thousands of people believe that they have suffered damage by radiation as a result of the 1979 accident, and even more -- over half of both samples -- believe that they may receive dangerous doses of radiation in the future if either reactor is restarted. There is a real danger that

many of these persons are at risk to develop the full Radiation Response Syndrome. There is an urgent need for epidemiological research to ascertain the incidence of the component symptoms of the RRS in all populations of persons who believe that they have been exposed to ionizing radiation.

In the data I just cited from the study by the Field Research Corporation, I wish to call special attention to the fact that over a year after the accident at TMI, the percentage of persons who felt that they had been injured by it grew substantially over a three-month period. That is only one of numerous indications from other studies in the region of a phenomenon not reported in any part of the disaster literature known to me. Houts[5], for example, found steadily increasing numbers of persons reporting behavioral and somatic symptoms in April 1979, July 1979, January 1980, and October 1980, at all distances from the reactors up to 55 miles. It should be emphasized that there was no known incentive for up to 40% of the population of this area of eastern Pennsylvania to exaggerate the incidence of symptoms, and different subjects were approached on each occasion. Houts believes that some seasonal effects may confound his findings, but they cannot account for all of this strong linear trend. Moreover, as between January and October 1980, increasing numbers of respondents to Houts' surveys attributed their symptoms to TMI, again regardless of distance: within 5 miles, from 25 to 28%; at 41 to 55 miles, from 4 to 12%.

In summary: In a number of major respects, human responses to emergencies growing out of serious accidents at nuclear power plants are so strikingly different from those reported in the general disaster literature that the latter is a dangerously unreliable guide on which to base radiological emergency planning.

Robert J. Lifton, M.D.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CONSOLIDATED EDISON COMPANY OF NEW YORK (Indian Point Unit 2)	)	Docket Nos. 50-247 SP 50-286 SP
	)	
POWER AUTHORITY OF THE STATE OF NEW YORK (Indian Point Unit 3)	)	March 31, 1983

ERRATA SHEET FOR TESTIMONY
OF ROBERT JAY LIFTON, M.D.
OFFERED ON BEHALF OF UCS
AND NYPIRG

Page 2-- Add to the very end of the page:

Therefore, the accumulated experience of emergency and disaster workers with the vast majority of past disasters, in particular with the behavior of both the public and emergency workers, has limited relevance to planning for radiological emergencies.

Page 5-- Add to the very end of the page:

It is important to recognize that such a reaction need not be qualitatively unique to Indian Point to have uniquely serious consequences there. We are considering the difficulties of evacuating a frightened population of unparalleled size and density from a topographically constricted area with an anachronistic and inadequate network of roads.

The traditional preparation of people for a disaster is to tell them what to do in order to perform socially useful actions and to prepare them psychologically. When a disaster involves radiation, the

combination of limited knowledge and diffuse fear is such that this kind of psychological preparation may not be possible. Indeed, full acquaintance with what is known about potential radiation effects could make people more fearful and further interfere with evacuation arrangements. In any case, the kinds of fear engendered by radiation disasters are likely to interfe e with any kind of evacuation plans.

Page 8 -- Add to the very end of the page:

I have read the statements of a police chief, volunteer ambulance driver, teachers and a health professional, submitted as testimony in this hearing, all of whose devotion to duty is presupposed by emergency planning. In all of these cases, the statements make clear that such key people cannot be counted upon to carry out their assigned roles.

Page 9 -- Insert sentence after first sentence of second paragraph.

I have also observed it in workers at the Pilgrim nuclear power plant in Massachusetts whom I have interviewed.

-- Insert as new paragraph after second paragraph:

While the Radiation Reaction Syndrome is a chronic condition hitherto developed only slowly over time, there is now good reason to believe that it may start to impair the effectiveness of victims' behavior during the process of evacuation from the Indian Point region. Formerly, people who believed they had been irradiated knew little or nothing about the possible consequences; today, the population around Indian Point has lived through the post-Three Mile Island period of public education about the possible genetic and health effects of ionizing radiation, and has learned more from reports of testimony given in these hearings. Instead

of having to inform themselves gradually in an attempt to understand their own mysterious symptoms, like past radiation victims, the people of Indian Point already know that radiation causes cancer and other diseases including damaged heredity, and know that these effects are delayed results of damage that cannot be detected by the senses or by medical examination. Moreover, a large proportion of citizens living near Indian Point already distrust the utilities and other authorities, already are angry at being victimized, and thus have low thresholds for more intense reactions after a serious accident. Thus, even during the first hours of a crisis, such people could well suspect that they were not being told the truth, and that they and those they love had already been irreversibly damaged. They could well experience a combination of fear and anger that could cloud their judgment, lower their threshold for impulsive and noncooperative actions, and in various ways interfere with the whole evacuation effort.

Page 14 -- Add to the very end:

Any emergency plans, or any estimates of time to evacuate the Indian Point region, must take account of the special human responses to the dangers of ionizing radiation or they will be seriously biased in the direction of unrealistic optimism.

MR. BRANDENBURG: Might I also, if the court would make a ruling with respect to the new matter.

JUDGE GLEASON: I think you have had ample time to read that. As far as the changes in the errata sheet, it's a little more extensive than things we have had, and I am sure you are a very fast reader. I think you have had adequate time, more than adequate time.

CROSS EXAMINATION

BY MR. CZAJA:

Q. Dr. Lifton, my names is Richard Czaja. I represent the Power Authority of the State of New York in this proceeding.

At page 2 of your original testimony you site your work in connection with the Buffalo Creek flood disaster of 1972.

In your view can one extrapolate from the individual responses to the Buffalo Creek flood disaster to human being response in the radiological emergency situation?

A. One can, but to a limited extent. I think there is a lot of confusion about this, and I have noted it in some of the previous discussion and testimony.

In making it an either or situation, of course there are aspects of disaster that are valued for all considerations of disaster. But there is an added dimension, in my view, and as a result of my study, I would say, that is rather special to radiation disaster.

Q. Well, can we agree that there is sufficient similarity that you think it is useful to mention your Buffalo Creek in your testimony? ?

A. Could you repeat the question?

Q. As I understand, you feel there are some similarities between the Buffalo Creek situation and radiological emergency. Is that correct?

A. That's correct.

Q. But there are sufficient similarity that you have mentioned the Buffalo Creek in your testimony?

A. That's correct.

Q. And in part, at least, your conclusions are based in part on your work on the Buffalo Creek disaster?

A. Very little, because my work on Hiroshima and my consultations at Three Mile Island, and my reading of Three Mile Island and

additional Hiroshima and Nagasaki literature have more relevance for the emphasis in my testimony on the special dimension of radiation disasters.

Q. Very well. Let's turn to the Hiroshima Nagasaki experience.

In your view can one extrapolate from that response to human response to a radiological emergency of the type that we are concerned with in this proceeding?

A. One can do so in limited but important ways.

Q. Could you elaborate on that?

A. Yes. The significant way in which Hiroshima is relevant for our considerations here, that is for potential accidents and evacuation problems with nuclear power, has to do with the common psychological response to the threat of radiation events. I speak of that as invisible contamination, or the fear of invisible contamination.

The fear of invisible contamination and the form of invisible contamination that occurs with radiation is common to both events.

Q. Were there other aspect of the Hiroshima experience that would not be common?

And by that I am referring to aspects of that that were not invisible. Obviously there were very visible effects to the explosion of the atomic bomb.

A. Of course. The Hiroshima experience was the effect of the first atomic bomb dropped on a human population. It was a bomb, it was a weapon. That, in itself, is different from what we are talking about.

And the widespread destruction is, of course, different and not the same as what we are talking about.

The common dimension is the fear of radiation effects, and, indeed, the actual danger of radiation effects, and that has to do with invisible contamination.

Q. In your view would Hiroshima be a closer analogy to the situation we are dealing with here than that of Buffalo Creek flood type experience?

A. It's not a yes or no answer question, in my view.

Hiroshima is a much closer analogy in terms of problem of the physical contamination.

Q. How about the difference in the

survival rate in a Hiroshima type situation and in an accident in a nuclear power plant? We can agree that the anticipated survival rates would be quite different. Is that correct?

A. By and large any use of a nuclear weapon will kill more people than a nuclear accident.

Q. And would that difference have psychological consequences?

A. It certainly would.

Q. And what would be the nature of those psychological consequences?

A. The more people killed in an event, the more a particular kind of sense of threat and stress occurs, so that in Hiroshima the large mortality, the large numbers of people killed, add to the stress and to the reaction.

Q. Let's turn to one specific reaction which you discuss in the Hiroshima situation. Page 9 of your testimony.

The second full paragraph on that page you state, "Moreover, it is not just the victims, themselves, who have the sense of..."

A. Pardon me.

Q. It's page 9. Do you have that?

A. Our paging seems to be different.

Q. Page 8, second full paragraph begins with the word moreover?

A. Yes?

Q. Moreover?

A. Mine reads, "Moreover, a large proportion of citizens living near Indian Point..." Is that --

JUDGE GLEASON: No. That's not it.

MS. POTTERFIELD: It may be that Dr. Lifton has before him his testimony as revised with the errata sheet. May I offer to show him the original testimony?

JUDGE GLEASON: Yes, if you would.

Q. Do you have the reference now, doctor?

A. Yes, I do.

Q. Page 8, the second full paragraph, you state, "Moreover, it is not just the victims, themselves, who have the sense that exposure to radiation produces an uncanny contamination. Many Japanese who had had experience with other disasters, such as earthquakes, reported that there was less of the usual spirit of selfless cooperation and helpfulness toward the victims of Hiroshima."

Now, with that would that particular phenomenon be affected by the survival rate from a nuclear weapon, as contrasted with an accident at a nuclear power plant?

A. I would say it would be a combination of the destructive nuclear weapon and the high mortality, along with the special feature of invisible contamination. So I would emphasize both aspects.

Q. Is it possible for you to give us an opinion as to the magnitude of those two effects, as to how they contribute to the phenomenon on page 8?

A. I would just say they would both be very relevant.

Q. And to the extent one reduced the factors of destruction and widespread death the phenomenon would be less likely to be observed?

A. You know, I think I would have to explain that more.

The common important issue here is that the victims are perceived to be contaminated. You know, at Hiroshima a person was legally considered a so-called Hibacha, survivor, if he or she came into the area within three weeks after

the bomb was dropped, because they were thought to be contaminated. Therefore, the interference with the usual so-called post disaster Utopia has very specifically to do with invisible contamination.

Now, of course, it has also to do with the extraordinary scope of the disaster, and the inability to help of most people. That's why I emphasize both factors.

Q. At what point in the period after the Hiroshima explosion was this phenomenon of individuals not assisting others observed? Did I understand you to say that this was during a three week period, or was it immediately after the explosion?

A. I don't think it has that precise a time frame.

At the very beginning when the bomb fell there was very little ability of anyone to help anyone else. People returned to help their family members, and had great difficulty helping anyone else. That was their first impulse. And most people moved away from the city, as you know, and tried to leave.

Over a period of weeks people began to drift back into the city, but over this period

there was very little general spirit of helping. There was a sense of confusion and of muted behavior, and there was later a something in addition and even feelings of guilt and shame over how little people were able to help each other. And that lasted for months.

In fact, the appearance of a post disaster Utopia, or intense cooperation in the Hiroshima experience, was only periodic and partial, and never too strong.

And then over time, of course, things could be rebuilt.

Q. Let me turn for a moment to the phenomenon of psychic numbing. What do you believe psychic numbing to mean?

A. Psychic numbing is a term that I use, for better or worse, I have coined, which means diminished capacity or inclination to feel.

In terms of describing what I mean by that, it includes most of what we call the standard defense mechanisms, isolation, denial, repression, are elements of these.

The reason I think it is useful to use such a term is we need a parameter, feeling and nonfeeling to understand this phenomenon.

That's perhaps a beginning definition that may serve your purpose.

Q. Well, let me try a different way.

You also discuss in your testimony something you describe as the radiation response symdrome. That's correct?

A. Yes.

Q. What is the relation of psychic numbing to the radiation response syndrome?

A. Well, psychic numbing is a very general term. It occurs routinely under any form of stress. It also occurs in everyday life.

But it occurs in extreme form in severe trauma or disaster, so it has been incorporated as one of the symptoms one can expect in the post-traumatic symdrome.

It contributes to the radiation response symdrome because it continues long after its use, long after its constructive use, for the person. That is ordinarily psychic numbing is a defensive maneuver, even though unconscious, that helps one to get through a extreme threat.

The difficulty is that with radiation disasters the sense of inner threat continues, and therefore there is a tendency to call forth in

some cases additional psychic numbing that contributes to the radiation response symdrome. It may contribute to aspects that I described in terms of impaired human relationships in general, and impaired vitality.

Q. So psychic numbing would be one contributor to--

A. It's a contributor, but it's not the psychic numbing as such. It's the fear of invisible contamination.

Q. In the short term could psychic numbing have beneficial effects?

A. What I have found is that a certain amount of numbering is necessary because one can't afford psychologically to react in normal ways to this overwhelming situation.

On the other hand, if psychic numbing is too extreme, one can become incapacitated and it can become harmful to one's own survival.

Q. Am I correct in stating that in your opinion that basic to the process of psychic numbing is its relationship to the death encounter?

A. Yes. It's relationship to the death encounter, the extreme threat with which death or the idea of death might be associated.

Q. Let me turn to a slightly different subject, doctor.

Have you reviewed the emergency plans that are the subject of this proceeding, plans that relate to the Indian Point area?

A. No, I haven't.

Q. Have you ever reviewed radiological plans for any other nuclear power plant unit?

A. No, I haven't. I haven't been systematically involved in studying radiation plans or nuclear power situations of that sort.

Q. So to your knowledge you would not know one way or the other whether any radiological emergency response plan for any reactor in the United States adequately takes into account the phenomenon that you discuss in your testimony?

A. Well, it would be -- I wouldn't know precisely, but I would add that it would be difficult for an evacuation plan to take adequately into account the phenomenon I discuss in my testimony. you would have to, to do that, to consider the special features of radiation and the unreliability of disaster behavior in nonradiation disasters, for a complete guide or predictive means in evaluating radiation disasters.

Q. Then would I be correct in saying that in some sense the notion that one could plan for such an emergency would run counter to the theories you set forth in your testimony?

A. I would have an open mind to that. I would want to see the plan but it would make very strong demands on any such plan.

Q. And you haven't seen such a plan yet?

A. No.

Q. And I take it you are also not familiar with the regulations of the Nuclear Regulatory Commission and the Federal Management Agency relating to how one goes about drawing up emergency response plans?

A. No.

Q. In your view is there any way in which the planning process or the fact that such plans exist and are known to people, could those contribute to psychological consequences that you describe?

JUDGE GLEASON: Would you go over that one more time?

MR. CZAJA: Yes. The question is whether, in Dr. Lifton's opinion, the fact that these plans exist or that they have been drawn up,

and that people are aware that they were drawn up, could contribute to the existence of the psychological difficulties that he describes in his testimony, for example the radiation response symdrome?

A. Are you asking whether the plan to contribute to the syndrome?

Q. Yes.

A. Could increase the symdrome?

Q. Yes.

A. Well, the psychological response to the plan, I think, would depend upon its believability to the people concerned.

In other words, as I say in this testimony, and I have written in other places, ordinarily a disaster plan is a must in any kind of situation because it helps people to understand what is expected of them, and that both serves socially useful purposes as well as helps them psychologically.

The difficulty begins where the plan is perceived by people as unreliable or as unlikely to help them prevent dire consequences to themselves and their family. And if that happens, if a plan is so perceived negatively, then I think

the plan could contribute to emotions that, yes, become part of the radiation response symdrome.

Q. Doctor, do you have -- withdrawn.

Would you have a bottom line view as to whether emergency planning for accidents at nuclear power plants is a good thing or a bad thing?

A. I think that for any kind of enterprise, including nuclear power, there should be a very careful effort to estimate risk, and the kinds of dangers that could occur from that modality. And then yes, some sort of efforts to deal with those risks.

But the real issue is whether the efforts or the plans that are drawn are adequate to what our reasonable estimate of the risks, and a reasonable estimate based on experience and knowledge of the behavior of people in response to those risks.

So yes, plans are a good idea if they can serve those functions.

Q. Well, turning to the risk, in your opinion is the risk involved in the operation of nuclear plants such as to justify their continued operation?

A. I have doubt about nuclear power. I think it would be useful to pursue ways of rendering it safe, but -- and if nuclear power could really be safe in virtually every way I am sure it would be a fine technology. I have doubt about whether that is possible.

Q. So at present you are sceptical?

A. I have some scepticism, and I have concern about nuclear power because of its potential harmful effects on people, a deep concern about it.

Q. And I understand that you believe that the Three Mile Island incident had very great adverse psychological effects on people in that area?

A. It had significant psychological effects, I would say.

Q. And am I correct in saying that in your view the psychological effects of Three Mile Island on the people in that area were similar in some respects to the psychological effects of the Nazi genocide in World War II?

A. It seems like a big jump.

Q. Well, it's a jump as I read your article, doctor. I will ask Mr. Pikus to give you

an article from the New York Times Magazine, and I am going to ask that that be marked as Power Authority --

A. I have a feeling you slightly misstated my article.

JUDGE GLEASON: What will it be marked as?

MR. CZAJA: Power Authority 45, judge.

JUDGE GLEASON: So marked.

(Exhibit PA 45 was marked for identification.)

Q. Page 58, the left hand column, the last paragraph at at bottom of the page. You state:

"A series of more recent events and concerns has contributed to the image of technological extinction. I would include Nazi genocide during World War II; various accidents involving nuclear weapons and nuclear energy (most dramatically, the Three Mile Island incident of 1979); the potential destruction of the ozone layer and the using up of the earth's resources of food and energy."

A. Shall I explain that statement?

Q. Yes. Could you?

A. This is an article entirely about

nuclear weapons threat. It comes from a new book I wrote together with Richard Falk. It's about weapons, not nuclear energy. I am talking here about what I call imagery of extension.

Imagery of extension really means a new image that came into the world on a wide scale at the end of World War II from the use of the two atomic bombs, and to some extent from the Nazi genocide. That is our image of our capacity to cause our own extinction.

I then go on to say that although that imagery comes primarily from those two sources, it is also contributed to by other experiences around which we have some kind of related imagery, and among those I included the list that you read, Nazi genocide, various accidents involving nuclear weapons and nuclear energy, and also the potential destruction of the ozone layer and the fear of using up the earth's resources. All these contribute in some degree to imagery of extension.

That's different from the way I heard you express it.

Q. Let's turn to page 5 of your testimony, doctor. You site a study by Slovic et

al..

To your understanding did that study include any findings with regard to individuals' reaction to other sources of radiation, for example radium insertion by a physician, or x-rays given by a physician?

A. I would have to look at it and see. I recall that it specifically included what I have said here, the high range of radiation fear among other things that are sources of fear. But I would have to look to see whether it included radiation from x-rays. Probably not. Not to that extent.

Q. Do you have the study with you?

A. Yes, I do.

Q. Well, let's not take the time now. Perhaps if we have a chance before conclusion of the proceedings today we can look into what that study says.

A. Sure.

Q. Let's turn to page 10. Now, at paragraph 2 of your testimony on that page you are discussing principal constituents of the radiation response symdrome, and at page 10, paragraph 2, you state that one of the constituents is that its effects are delayed.

How long would that delay last?

A. It's unknown by scientific investigaters.

For instance, in Hiroshima the effects of invisible contamination began within twenty-four hours, and sometimes less, and they are still being felt. They are being felt by discovery of increaesed incidences of various types of cancer which seem to have a delay of up to forty or fifty years. So the delayed effects is at least as long as the time from World War II to the present, and apparently considerably longer.

If one considers the transmission of potential radiation effects to subsequent generations, then, of course, one could see the delayed effects as being longer.

Q. I am sorry, doctor. I was looking at the other side of the time span in which the effects would be observed.

When would the effects commence? In other words, in the Hiroshima situation I believe your answer was within twenty-four hours?

A. Yes. In some cases. They began sometimes weeks or months after.

Q. This is the radiation response

syndrome we are talking about?

A. Well, the radiation response symdrome, as Viner describes it, is a chronic symdrome that occurs over the course of one's life, and it is built up from these immediate effects that I described, and then from other life struggles that become associated with these effects of invisible contamination. So that it's hard to indicate the exact moment at which the radiation response symdrome begins.

One can say that one is vulnerable to it insofar as one experiences a fear of having been harmed by radiation effects.

Q. Well, let's try to relate this time span to what we are dealing with in this proceeding.

Are you familiar at all with any scenario as to what might happen in a radiological emergency involving a nuclear power plant?

A. Yes, but why don't you be specific about it?

Q. Well, let's say that hypothetically the public is instructed through the media that individuals in a certain area are to evacuate.

As I understand your testimony, and

correct me if I am wrong, it's your opinion that the radiation response symdrome would somehow impede the ability of those individuals to accomplish that evacuation. Is that correct?

A. The early responses to radiation danger which go into the radiation response symdrome could almost immediately, in fact immediately, affect responses to the evacuation instructions.

Q. And in what instances have the symptoms of the radiation response symdrome been observed almost immediately after the issuing of them?

A. If you look at Three Mile Island, for instance, and you look at the data and discover that many more people, whatever it is, fifty times the amount asked to evacuate did evacuate, it's hard to say that is the radiation response symdrome that led them to do it, but it is the fear. So the potential beginings of the radiation response syndrome contribute to that behavior around evacuation.

Q. I am sorry, doctor, we seem to be on different tracks here. My question was somewhat simpler than I understand your answer.

In what circumstances have you observed, or is there discussion in the literature, of the onset of the radiation response symdrome almost immediately after the initial event, if you are aware of such occurrences?

A. The radiation response syndrome as described by Viner is a chronic symdrome that occurs later.

I am talking about the response to fear of radiation which contributes to the formation of the radiation response syndrome.

Q. And how much later would you expect the radiation response syndrome to appear?

A. Well, the full -- the lifelong sense of impaired human relationships and questions about loss of the meaning of life, and so on, would occur over years. But the initial part of it, the fear of invisible contamination, and the fear of cancer, or the fear of delayed effects, things of that sort, could begin almost immediately.

Q. Doctor, are you familiar with a volume entitled Diagnostic and Statistical Manual of Mental Disorders, Third Edition?

A. Yes, I am.

Q. And briefly could you tell us the

nature of that volume?

A. It's a volume which is the more or less official American Psychiatric Association manual for criteria for diagnosing psychiatric syndromes, and pretty well lays out those syndromes systematically.

Q. And what is your own relationship to that work? Were you involved in the preparation of that work?

A. I was involved in the preparation of the section on post traumatic response as part of a committee that was called to consult on that area.

Q. Is the radiation response symdrome mentioned in that work?

A. No. The radiation response syndrome has just been thought about in recent years.

Q. Is the fear of radiation discussed in that volume?

A. No. It doesn't -- I must explain that the volume is not a specific rendition of every kind of stress, but it's, rather, the more common ones witnessed in psychiatric work.

Q. When did Viner first describe the radiation response syndrome?

A. Last two or three years.

Q. And when did the Diagnostic and Statistical Manual --

A. Well, it was in preparation over some time. Perhaps four or five years ago. I would have to check on it.

Q. Well, I am going to ask Mr. Pikus to show you an excerpt from the Diagnostic and Statistical Manual dealing with post traumatic stress disorder, and I would ask that this document be marked as Power Authority Exhibit 46.

JUDGE GLEASON: So marked.

(Exhibit PA 46 was marked for identification.)

Q. Doctor, am I correct in my descriptions of this document as an excerpt from the Diagnostic and Statistical Manual, the excerpt being the portion that deals with post traumatic stress disorder?

A. Yes, you are.

Q. Now, does the discussion of post traumatic stress disorder in the document that has been marked as Power Authority Exhibit 46 recognize the distinction between natural or type A disasters and the man-made or type B disasters

that you describe on page 3 of your direct testimony?

A. I am not sure that it does because it is a very limited, very condensed, brief, summary of disasters in general.

Q. Well, let's first of all agree, if we can, that the exhibit in front of you does not make that distinction?

A. No. I have to modify that slightly. There is a sentence, for instance:

"Stressors producing this disorder include natural disasters (floods, earthquakes), accidental man-made disasters (car accidents with serious physical injury, airplane crashes, large fires), or deliberate man-made disasters (bombing, torture, deathcamps)."

So there is at least the distinction made that there is some distinction.

Q. But my point is, doctor, is not the manual discussing here both the stress resulting from natural disasters and the stress resulting from man-made disasters under the same heading post traumatic stress disorder?

A. As a matter of fact, there is a further distinction made. In the same paragraph it

says:

"The disorder is apparently more severe and longer lasting when the stressor is of human design."

So that is a clearcut distinction between the two.

Q. Why, then, are both categories grouped under --

A. Because, as I tried to explain before, there are certain common features to all disasters, and certain distinctions. In this case the common features are described, and a distinction is here made about the longer lasting and more serve effect of stress by human design.

Q. But at least for the purposes of this volume they have not grouped the stresses resulting from natural disasters in different categories than those resulting from man-made disasters, as you do in your testimony. Am I correct on that?

A. Before you do that, if you have a copy of the whole manual I would like to take a look at that, because there is a reference to an earlier portion.

MR. CZAJA: Let the record reflect

that I am giving Dr. Lifton a copy of the manual.

THE WITNESS: Thank you.

A. What this reference to here is in the last phrase in that same paragraph it says, "The severity of stresses should be recorded..." page 26. And what that tells us is that there are different stressors that are thought to affect responses.

It's still a rather crude rendition, and there they have a scale from the degree of response that can be expected from different levels of stress from relatively none to very extreme. And toward the bottom are things like death of a close relative or divorce, and after that concentration camp experience or devastating natural disaster, including also multiple family deaths, and so on.

So they include both there, but they are both put in a very severe realm.

Q. Doctor, I believe you said you had some role in the preparation of this volume?

A. I was a consultant, yes.

Q. And were you consultant for the portion of the volume that has been marked as Exhibit PA 46?

A. Yes, I was.

MR. CZAJA: I would offer PA 46 in evidence.

JUDGE GLEASON: Is there an objection?

MS. POTTERFIELD: No objection.

JUDGE GLEASON: Hearing none, the exhibit will be listed in the transcript as evidence.

Q. Dr. Lifton, as a consultant involved in the preparation of PA 46, what is your understanding of the fact that both natural and man-made disasters are included under the category post traumatic stress disorder?

MS. POTTERFIELD: I do object to that, Judge Gleason. It's been asked and answered three times now.

JUDGE GLEASON: Well, let him answer it again, because I haven't heard it asked that way.

A. Well, I don't /SPEP accept assumption of the question. They are grouped together, but they are also distinguished.

Q. My question simply is what you gather from the fact that these are both discussed under the same heading? If you gather nothing from that

fact, tell us so.

A. I gather that since they are both discussed under the same heading, as well as distinguished, that the assumption is that they show common features, although a distinction involving difference is also indicated. I think that's clear.

Q. One other point, doctor. As long as you have volume in front of you can you tell me when the book was published?

JUDGE GLEASON: Does it say?

A. First printing February, 1980. But, you know, I should tell you that the consultation probably took place three or four years before that. There is a certain lag time in all this because they put together consultations from all groups.

Q. When did you do your Three Mile Island work, doctor?

A. Three Mile Island work I did at around that time, 1980, approximately.

Q. And I take it as a consultant you did not run to the publisher and suggest that they make a correction based on your Three Mile Island work?

A. I didn't run to the publisher about any corrections. It was long in press before that happened. Anyhow, I am not in the habit of running to publishers.

Q. Doctor, I believe you have testified in response to some of my earlier questions that developing a Radiological Emergency Response Plan that would be responsive to the concerns in your testimony, would be difficult?

A. Yes.

Q. And you have not seen such a plan to date?

A. Yes.

Q. Can you give us any description, however general, of what, in your opinion, such a plan would look like and what types of procedures would be contained in such a plan?

A. It would probably require, prior to the plan, itself, a situation that inspired confidence that an accident would be limited and manageable.

Q. And do you believe that, given what you understand --

JUDGE GLEASON: Excuse me.

Do you have actual experience to to

that effect?

THE WITNESS: In other words, a situation that would necessitate using the evacuation plan, some sort of accident, would be very limited and manageable, so that a plan would then inspire confidence that it could, indeed, protect people, and that one's children were not in danger if they were separated from one, and that one could safely do all the things asked in the plan without one's family lives being endangered.

Q. And given what you understand regarding the risks of nuclear power, do you believe that such a feeling of confidence that a plan could work would be possible to instill, or that people could reasonably have such confidence?

A. It's possible that it could happen if there were further and very careful improvements made upon the safety of nuclear power plants.

Q. What type of improvements would be encompassed in that?

A. I wouldn't extend any claim to technical expertise to be able to list them. But it would be the sort of arrangements that would enable virtually all appropriate observers in both

a technical and general way to feel that it was safe.

Q. But the present state of the technology is such that, in your view, no emergency plan could engender the confidence that it would avoid the pitfalls in your testimony?

A. The way I would explain it is that it would be very difficult for such a plan to be formulated, but I would leave the matter open.

JUDGE GLEASON: I think his testimony is clear to the board.

MR. CZAJA: I have no further questions.

JUDGE GLEASON: Mr. Brandenburg. No repitition, please.

CROSS EXAMINATION

BY MR. BRANDENBURG:

Q. Dr. Lifton, you state that a good deal of the conclusions that you reached about the psychological events were derived from your studies of Hiroshima. Is that correct?

A. Yes, and also my work at Three Mile Island and my reading of those studies.

Q. And you established in your questioning by Mr. Czaja that a good deal of the

factors that were present in the Hiroshima disaster would not be present in the event of a serious accident at a nuclear power plant. Is that correct?

A. The way that I put it, since I prefer my own words, was that the destructive dimension of the Hiroshima bomb would not be present, but the invisible contamination, which is the heart of the argument of my testimony, would be present.

Q. Taking your words, of the destructive component which is bomb related, and the radiation component, which is, as I understand your argument, not necessarily bomb related, do you know --

A. Not just my argument. The technology.

Q. -- Do you know anyone who has attempted to distinguish the consequences, in terms of the origin, the radiation response symdrome, the reaction you have observed, and attribute it to the destruction component on the one hand versus the radiation component on the other?

A. No. Because you see the radiation response syndrome had been developed around observations of common responses to different situations. And the common responses are around

the fear of prolonged radiation effects.

Q. Are you aware of studies that have been performed of the psychological effects of nonwartime releases of radiation, other than Three Mile Island?

A. A little, but you could probably refresh my memory on it.

Q. Well, are you familiar with an event in Palmara, Spain that occurred in 1966, where there was an airplane collision, and there was a release of plutonium?

A. Yes, I remember it.

Q. And has that event been studied from the standpoint of the radiation response syndrome, to your knowledge?

A. I honestly don't know.

Q. Now, turning to the radiation response, I am going to use your term here, the response to the invisible component, as distinguished from the response to the destructive component, is it your experience that people who are receiving therapeutic radiation for treatment of disease, and things of that sort, develop radiation response symdrome?

A. Mostly not because the radiation

response symdrome has been described in response to massive exposure, large numbers of people being exposed, and the effects of radiation have only -- and especially relatively low level radiation, have only begun to be understood in terms of physical effects and psychological responses relatively recently.

But I think that increasingly people are becoming wary of individual x-rays, and some people are expressing aspects of radiation response syndrome. That's a kind of informal observation I have made. I have talked to radiologists and dentists and other physicians who use radiation, and they notice in the population increasing concern about radiation effects.

Q. Well, given the difficulty of extrapolating the Hiroshima data when one is endeavoring to ascertain the response of a population that had been in the area of a nuclear power plant accident because of the difference between the bomb situation and the nuclear power plant situation, do you not agree that the type of psychological responses that we observe of people receiving radiation in a therapeutic situation would be valuable?

A. I think you have to remember --

Q. Is there a lack of translatability between the bomb situation and the nuclear power plant situation because of the destructive component?

A. No. What I said is that in certain historical models they are partly relevant and partly not. The relevance is very significant, even though some aspects are not relevant.

So what is relatively common, in both cases, the invisible contamination. I can't go along with your study.

Q. In the Hiroshima studies there was the destructive component attributable to the concussion, fires, and that sort of thing?

A. That's right.

Q. And that would not be present at the nuclear power plant?

A. That's right.

Q. So we have a lack of comparability?

A. No. There is a partial comparability. That doesn't mean it's fully comparable. It's partially comparable in very specific ways.

Q. Given the partial comparability, would you not place high value upon the responses

that are observed to persons who are receiving radiation in a therapeutic context, when one was attempting to predict the likely responses that would be exhibited on people that had been living in the vicinity of a power plant accident?

MS. POTTERFIELD: I object, Your Honor. He's asking the question that presumes that the previous question had to do with the difference between therapeutic radiation and Hiroshima, when, in fact, the previous question had to do with the difference between Hiroshima and a nuclear power plant. He's making a jump here that doesn't follow.

JUDGE GLEASON: Well, he's asking a question, but he really is taking a very convoluted way.

He is saying why don't you take surveys, or why don't you develop, since you developed this thing based on partially the results of what happened at Hiroshima, why don't you take what the results are of people that take x-rays for their teeth, or therapeutic purposes, and use that as a basis for a symdrome of some kind if it exists, or no symdrome, which I think he is after, in dealing with radiation?

Is that an understandable question?

THE WITNESS: Yes. If you ask it that way.

The comparable situation with regard to x-rays, if you look at the Hiroshima situation, would be to find that not just through dental x-rays, but for massive radiation, there was then discovered in such people who had it an increased incidence of a whole series of deadly conditions like leukemia, and a whole series of deadly cancers. That has happened to Hiroshima survivors.

If you had a comparable population, then of course you could have comparable studies and I would be very much in favor of them.

JUDGE GLEASON: Did you have a different question than that? If you did, I didn't understand it.

Q. In the Hiroshima situation we have the destruction component and the invisible component.

Now, if we are attempting to try to parcel those out, what part of the syndrome is attributable to the destruction component and and what part to the radiation component?

We turn to therapeutic experience.

And there we have populations that are not exposed to the destruction component but they are exposed to the radiation component.

And you observe no radiation response syndrome, or very limited effects of the radiation response syndrome. Is that right?

A. I can't answer yes or no. I don't think you were listen to my last response. The two situations are not comparable because in Hiroshima there has been a systematic, careful, and accurate series of studies by both Americans and Japanese revealing increased incidence of leukemia and many forms of major cancers.

There has not been a population comparably exposed with people who have taken x-rays. So you couldn't render relevant the therapeutic x-ray experience unless it had that degree of lethal conditions from the x-rays if you wanted to compare it to Hiroshima.

Q. Is it your testimony, Dr. Lifton, that there is not as rigorous an investigation in the literature of persons who have been exposed to therapeutic radiation than for the people exposed to Hiroshima?

A. Well, people exposed to therapeutic

radiation are exposed individually, and as radiology has come of age as a specialty physicians have become more and more sensitive to limiting radiation, limited x-rays, limiting radiation treatment to what is necessary, and to balancing the risks with what the potential therapeutic effects are.

So Hiroshima is a single event in which there is a vast population of people who have been affected and who have to be understood if one is to learn about radiation effect.

JUDGE SHON: Are you familiar with the work of Dr. Alice Stewart on a group of people haveing ankylosing spondylitis?

THE WITNESS: I have heard of the work, but I don't know the study

JUDGE SHON: Are you familiar with the studies that were made some FORTY years ago of radium DIAL painters?

THE WITNESS: Yes. And later incidence of cancer in that group.

JUDGE SHON: There have been studies of people who obtained low level radiation exposures for various reasons, including therapeutic reasons, and they have shown increases

in cancer, so I don't see why the difference that you want to make in that way exists between them and the Hiroshima people.

THE WITNESS: Well, the similarity there, I agree with you, is that they have been exposed, and yes, there have been studies showing increase in cancer.

The difference is that it hasn't been a large scale exposure of a large scale population which has become widely known and widely perceived by a still wider population. And that is the kind of situation that contributes to the radiation response syndrome.

And it is also true that as a consequence of those findings that the increasing caution of radiologists in applying the therapy because of actual radiation damage, and now I think increased of fear of radiation by people who require x-rays, which then I suppose contributes to almost the beginnings of a potential radiation response syndrome that physicians want to avoid.

JUDGE SHON: Is it possible, then, that the radiation response syndrome is in part induced only by radiation situations that have been given wide publicity?

THE WITNESS: No, it's not only wide publicity.

I think that here if one studied some of Dr. Stewart's patients, the people that she was concerned with, very carefully, and took the trouble to evaluate their psychological state, I would guess that there would be a good liklihood that you would have aspects of the radiation response syndrome.

Often when a symdrome hasn't been observed it can be not yet knowing the questions to ask. So at least raise that as a real possibility.

So having said that I would agree with part of your inference that in a large scale event the elements of radiation response syndrome are likely to be stronger.

MR. CZAJA: Judge, on that point Dr. Lifton did say he had the Slovic article here. I wonder if he could produce that, and I could skim through it while Mr. Brandenburg is questioning.

I just thought it might be efficient.

JUDGE GLEASON: Mr. Brandenburg, it's your witness. Let's go ahead.

Q. I am still back at trying to

distinguish between the radiological component and the destruction component in the post Hiroshima experience, Dr. Lifton, and I would like to ask you whether there were any responses observed in the post Hiroshima victims that would not have been expected to be found among persons who had been the victims of a conventional bombing?

A. Oh, yes. Considerable. Because in some ways it's a lot easier to dehe limit the specific effect of the fear of the invisible contamination than the destruction. Those effects have to do with the strong fear of delayed radiation effects.

And it became understood under the euphemism atomic bomb disease, and that had nothing to do with the destruction. It had to do with the fear of bodily effects.

As I wrote in my book, once those early acute symptome came out, and they are very grotesque and frightening, they develop in people the sense that the bomb can not only kill things, but it leaves behind in their body a deadly disease that can strike them down at any time.

That was continued into lifelong fear of radiation effects. It was furthered with the

appearance of the increased incidence of leukemia three years later, when that was discovered.

So to answer your question, those are very specific effects having to do with invisible contamination.

Q. Dr. Lifton, let's turn to Power Authority 46. Turning your attention to page 236, relating to post traumatic stress disorders, can you point to any responses there that would not be experienced by persons who had been the victims of a conventional bombing?

A. Well, all of them --

Q. Could only be experienced by persons who had been --

A. Well, all these responses would be experienced by people exposed to any kind of extreme trauma, or could be experienced.

Q. Now, turning again to the Hiroshima victims, doctor, what portion of the anxiety that was experienced by those survivors are you prepared to acknowledge was due to the physical destruction they saw, the destroyed buildings, the dead bodies, and so forth?

A. Of course their anxiety was related to the extraordinary scope of the destructiveness

of that atomic weapon.

But they didn't have to see anything to experience fear of invisible contamination. By definition the fear stems from invisible sources and causes.

Had they seen nothing in the way of destruction, and had they come to know, as they would have to have by the medical studies, the effect of radiation over time, he they would have experienced the entire array of symptoms pertaining to what came to be called atomic bomb disease, or continuing life long fear of some sort of inner poisoning from invisible contamination. Had they seen nothing they would have had those fears.

Q. Are you aware of studies that were performed as to the different responses of people who saw the bomb on the one hand, the explosion, and those who did not?

A. The Hiroshima bomb?

Q. Yes.

A. Well, I don't know. I am not sure of what systematic studies have been done. I am not sure any systematic studies have been done on that.

Q. You mentioned the invisible feature

of this, and this is referred to on page 4 of your testimony and elsewhere.

Is it your testimony, doctor, that people fear invisible tar and nicotine, invisible cholesterol, things of that sort?

A. I don't think I would use the word invisible in the same way that I am using it here in terms of cholesterol and nicotine because there is a kind of choice about eating the meat with the cholesterol or smoking the cigarette with the nicotine. There is a thing that you eat or smoke that contains the stuff. It's a little different.

Of course, there is also, as I presume you know, relative difference in the consequences, as well.

Q. You do draw an analogy, though, between the invisible component of the nuclear power plant and dioxin and mercury poisoning?

A. Yes. There's a partial parallel between the invisibility and the incompletely understood long term effects.

But it's partial because in radiation there is mention of an entire body of knowledge of the harmful effects of radiation. And that's why even the principal of knowledge creating some kind

of security and overcoming fear doesn't work, in my view, with radiation disaster because the knowledge is knowledge of potential harm.

Q. Dr. Lifton, I would like to ask you to produce the Slovic article that you stated you had with you and to which you referred in your testimony.

A. Perhaps somebody can give it to me. I thought I had it with me, and I still think I do, but I am not sure where.

JUDGE GLEASON: All right. He doesn't have it with him.

THE WITNESS: Can someone show it to me?

MR. BRANDENBURG: I don't have it.

JUDGE GLEASON: All right. He doesn't have it with him.

Q. You have no recollection as to whether or not the relative ranking of x-rays and things of that sort --

A. I don't remember whether or not x-rays were included in the list. I don't, no. If you would like to, you know, raise it, I would be happy to discuss it with you.

Q. We don't have a copy.

A. Oh. All right.

MR. BRANDENBURG: No further questions, Mr. Chairman.

JUDGE GLEASON: Mr. Hassell.

CROSS EXAMINATON

BY MR. HASSELL:

Q. Good afternoon. My name is Mr. Hassell, representing the NRC staff. I just have a few questions.

I would like to turn to page 3 of the errata sheet.

A. Of my testimony?

Q. Yes. Roughly the 6th line down, where the sentence begins, "Moreover, a large proportion of the citizens..."

A. This is page 3?

Q. Yes.

A. Oh, of the errata sheet?

Q. Of the errata sheet.

A. Right.

Q. Do you have any idea of the number of residents living in the vicinity of Indian Point that are within the ten mile EPZ for Indian Point?

A. I don't know the exact figure.

Q. Well, can you give me an estimate of

that large proportion of the citizens you are referring to?

A. There I was referring to the findings of Altshuler, and I am not sure how much he pinpointed the distrust or scepticism that he found in people living in the area toward utilities and authorities, so I can't give you an exact numerical answer, but that's what the sentence is based on.

Q. Turning again to radiation response syndrome, I have some basic questions because I am not clear on some things.

First, does the radiation response syndrome manifest itself after an individual has been exposed to radiation?

A. Yes. And of great importance is the awareness and fear of having been exposed to significant amounts of radiation.

Q. Does the radiation response syndrome manifest itself regardless of the amount of radiation an individual is exposed to? I mean is that your view?

A. Well, it can. It can manifest itself in very varying amounts of exposure.

But I think the degree of exposure

can be very important. If you know you have been exposed to a very great amount of radiation, and you have symptoms you attribute to radiation, and which are not fully understood by the physicians, then I think the manifestations of the radiation response syndrome are likely to be especially severe.

Q. Can you give me any idea at what level of exposure that radiation response syndrome might manifest itself?

A. Well, it's very hard to say a level of exposure. I am not sure I can give a figure there.

To give an example, in Hiroshima people had precisely what we are now calling radiation response syndrome. They were more likely to have it if they were close to the hypocenter, therefore their exposure being greater. Yet many people quite far away from the hypocenter, up to three thousand meters and more, could have manifestations.

Q. As I recall your earlier testimony in response to a question from Mr. Czaja, you indicated that it was very difficult for you to pinpoint a time within which you would expect the

radiation response syndrome to manifest itself after an individual had been exposed. Is that a fair representation?

A. Yes. The radiation response symdrome so far had been described mainly in chronic terms, lifelong terms. And then it takes a period of months or years as to develop as it is defined.

But you could consider a acute version of it, an early version of it, to begin with the immediate fear of radiation that you have been exposed to because that fear is tied in almost immediately in many cases now, given the public awareness, with fear of cancer and delayed effects.

Q. But the only way to know that is with further study. Is that so?

A. There is evidence that that is so already, but we need further study.

Q. Could you give me a range of time within which you expect the radiation response syndrome to manifest itself?

A. The beginnings I would expect to manifest themselves immediately upon exposure to radiation that is considered dangerous.

MR. HASSELL: I have no more

questions.

REDIRECT EXAMINATION

BY MS. POTTERFIELD:

Q. Dr. Lifton, the question on the invisible nature of contamination, I wonder if you could tell us whether you have an opinion on whether this invisible quality would affect the evacuation process, itself?

A. Yes. I think it has to affect the evacuation process, itself, because it's very hard to know how far the danger extends. I have been thinking about this question recently.

Ordinarily in most disaster either once the disaster occurs the danger is over, or there still may be a harmful agent at the center, such as a flood, for instance.

But in the case of radiation disasters, in addition to the fact that the dangerous agent is still there closest to the disaster center, we know that it drifts out in ways that we can't exactly follow or understand.

Therefore people try to move away from it, and they can never know, nor can anyone know, exactly, how dangerous it is to people at a particular place. And that's rather special, I

think, to radiation disasters.

Q. With regard to your work at TMI and the readings of other people's studies, can you tell us whether or not this invisible quality or effect on the evacuation could be observed?

A. It really could be observed, because the TMI data show that such a large number of people evacuated, many, many, times the number that were asked to evacuate, or for whom it was suggested that they evacuate.

I had the experience of visiting that area just recently as a visiting professor or at Penn State, Hershey Medical Center, for a couple of days, and I talked to the people in the medical area about their experience.

And the chairman of the Department of Psychiatry told me that the entire Department of Psychiatry personnel simply left because they were concerned about their children. They went up to the mountains.

I asked him, "Suppose you had a plan, would they then stay?"

He said, "I don't think so. We would be concerned about our children because we don't know whether they would be in danger or not."

MS. POTTERFIELD: I have no further questions.

JUDGE PARIS: Dr. Lifton, on page 12 of your testimony you mention victims of radiation exposure after bomb tests and in various parts of the nuclear energy industry as suffering from RRS, and I wonder if you could cite some examples or some instances of persons in the nuclear energy industry suffering from that.

THE WITNESS: I had some direct experience with that in a limited way when I was asked by a law firm in Boston to examine two men who had been exposed to what was thought to be dangerous levels of radiation at Pilgrim 1 nuclear power plant. That exposure was in November, 1977.

I examined them in May, 1981. They manifested rather severe examples of the radiation response syndrome in all the categories that I listed.

In their case they had gone into a room that was heavily contaminated. They maintained they had been falsely directed there. And they had high contamination levels, and had had various decontamination treatments.

JUDGE PARIS: Thank you.

JUDGE GLEASON: Thank you, Dr. Lifton, for your testimony. You are excused.

That will conclude the --

MS. POTTERFIELD: Judge Gleason, before you conclude, I appologize, but it was brought to my attention that UCS NYPIRG 16, which was marked at the time of Mr. Davidoff's testimony. It is the study that New York State relies on in deciding not to publish brochures in languages other than English. I intended to move it into evidence, and I ask if there would be any objection.

JUDGE GLEASON: Without it is so admitted into evidence.

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before

THE ATOMIC SAFETY AND LICENSING BOARD

in the matter of: CONSOLIDATED EDISON COMPANY OF NEW YORK (Indian Point Unit 2) - POWER AUTHORITY OF THE STATE OF NEW YORK (Indian Point Unit 3)

Date of Proceeding: March 31, 1983

Docket Number: 50-247 SP and 50-286 SP

Place of Proceeding: White Plains, New York

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

Raymond DeSimone
Official Reporter

Ruth Bennett
Official Reporter

Ryta Roncher
Official Reporter