

ORIGINAL

UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of:

LONG ISLAND LIGHTING COMPANY

(Shoreham Nuclear Power Station,
Unit 1)

)
)
) Docket No.
) 50-322-OL-3
) (Emergency Planning)
) (School Bus Driver
) Issue)

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1 UNITED STATES NUCLEAR REGULATORY COMMISSION
 2 ATOMIC SAFETY AND LICENSING BOARD

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

6
 7 Monday,
 May 16, 1988

8 State Office Building
 9 Hauppauge, New York

10 The above-entitled matter came on for hearing
 11 at 9:30 a.m.

12 BEFORE: HON. JAMES GLEASON, Chairman of the Board

13 For the Board:

14 JUDGE JERRY KLINE
 15 JUDGE FRED SHON

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17 On behalf of Applicants:

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21 (Continued on next page.)

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I N D E X

WITNESS DIRECT CROSS REDIRECT RECROSS

Panel:

Douglas M. Crocker
Dennis Mileti
Michael K. Lindell
Robert B. Kelly 19406 19433

EXHIBIT NO. FOR IDENT. IN EVIDENCE

No Exhibits Marked This Session.

INSERTS: PAGE #

Testimony of Douglas M. Crocker,
Robert B. Kelly, Michael K. Lindell
and Dennis S. Mileti on the Remanded
Issue of "Role Conflict" of School
Bus Drivers 19431

Attachments for above-mentioned
testimony. 19431

LILCO'S Supplemental Testimony on the
Remanded Issue of "Role Conflict" of
School Bus Drivers 19431

P R O C E E D I N G S

1
2 JUDGE GLEASON: This is an
3 administrative hearing before the Atomic Safety and
4 Licensing Board appointed by the United States
5 Nuclear Regulatory Commission. The hearing has been
6 convened to consider certain issues pertaining to
7 the Long Island Lighting Company's application for
8 an operating license to operate its nuclear power
9 generating facility at Shoreham.

10 The issues which will be heard concern
11 the applicant's emergency plan which is required to
12 be developed and to comply with the NRC's rules and
13 regulations. The emergency plan only becomes
14 operative in the unusual event of an accident
15 occurring at a nuclear facility that is required to
16 be developed before licensing. The parties in this
17 litigation, in addition to the applicant, are
18 Nuclear Regulatory staff, which provides technical
19 oversight and monitoring of license applications;
20 the Federal Emergency Management Agency, which
21 oversees the development of adequate machine plans;
22 and the governments of Suffolk County, State of New
23 York, Town of North Hampton, which oppose the
24 application for a license. Only those parties are
25 entitled to participate in this proceeding.

1 My name is Judge James P. Gleason. I
2 am the Chairman of the Board. On my left is Judge
3 Shon and on my right--Judge Shon, and Judge Jerry
4 Kline.

5 I would like to have the parties
6 identify themselves for the record, please, starting
7 with the applicant.

8 MR. CHRISTMAN: Thank you, Judge.

9 My name is James N. Christman of the
10 law firm of Hunton & Williams, P.O. Box 1535,
11 Richmond, Virginia, 23212. To my right is Mary Jo
12 Leugers. We represent the licensee and applicant,
13 Long Island Lighting Company.

14 JUDGE GLEASON: Mr. Bachmann?

15 MR. BACHMANN: Judge Gleason, my name
16 is Richard G. Bachman. I am with the Office of the
17 General Counsel of the United States Nuclear
18 Regulatory Commission. I represent the technical
19 staff of the United States Nuclear Regulatory
20 Commission. Joining me--I believe her plane may be
21 held up by this fog-- Ms. Mitzi Young, also of the
22 Office of General Counsel of the NRC.

23 MR. McMURRAY: My name is Christopher
24 McMurray. I represent Suffolk County. I am with
25 the law firm of Kirkpatrick & Lockhart. To my left

1 are Lynn Taylor and Michael S. Miller, also
2 representing Suffolk County, also with the firm of
3 Kirkpatrick & Lockhart.

4 MR. ZAHNLEUTER: My name is Richard J.
5 Zahnleuter, Deputy Special Counsel to the Governor.
6 I represent the Governor and the State of New York
7 in these proceedings.

8 JUDGE GLEASON: I want to state at the
9 outset of this proceeding that we are engaged in a
10 litigation to determine whether the proposed
11 resolution of four discrete issues by the Long
12 Island Lighting Company meet the regulatory
13 requirements of the Nuclear Regulatory Commission.
14 The first three involve, first, the availability of
15 school bus drivers during an emergency. Second, the
16 time estimates for evacuating hospital patients
17 during an emergency. Third, the emergency
18 broadcasting system's capability to send messages
19 and operate tone-alert radios. The fourth issue,
20 which may or may not be litigated, depending on a
21 ruling by the board several weeks from now, involves
22 the adequacy of LILCO's emergency plan supplemented
23 by the best efforts of New York State and Suffolk
24 County to manage eight emergency activities if and
25 when it should ever develop.

1 Many aspects of these four issues have
2 been litigated before a licensing hearing board on
3 previous occasions. These discrete issues here have
4 either been remanded or directed to the board for
5 further evaluation and consideration by the NRC's
6 appeal board, the Commission, or both. This
7 proceeding is no different than any other litigated
8 hearing conducted by a Nuclear Regulatory Hearing
9 Board during the past three or four years. It is
10 simply a process with very defined rules and
11 procedure to determine whether LILCO is entitled to
12 an NRC license to operate its nuclear power Shoreham
13 facility to produce electrical energy. This
14 proceeding is however, being conducted in an
15 unusual environment, that being, of course, in the
16 midst of apparently a variety of discussions
17 concerning the possible abandonment of the Shoreham
18 facility and the cessation of efforts by LILCO to
19 obtain an operating license. These activities, of
20 which we take judicial notice, to state for
21 clarification purposes will have no effect on this
22 proceeding, however. These hearings will continue
23 as if they do not exist or until such time as LILCO,
24 if it chooses to do so, withdraws its application
25 for a license.

1 I refer to this matter at the outset to
2 assist in keeping the two activities distinct in the
3 public's mind. In light of the substantial amount
4 of newspaper and media coverage presently existing,
5 it would be easy for citizens to be confused as to
6 why this proceeding is being conducted, why the
7 state and local governments are party to it when
8 there is apparently discussions for abandonment
9 being conducted at the same time by the State of New
10 York and applicant. This board has no alternative
11 but proceeding as if these negotiations do not
12 exist.

13 This board has on a previous occasion
14 indicated that there was no basis in the record of
15 this proceeding to make a conclusion that it would
16 be impossible to fashion and implement an effective
17 emergency plan for the Shoreham facility. We are
18 endeavoring now to ascertain whether the emergency
19 plan which has been developed by LILCO with the
20 resolution it proposes of the four issues,
21 resolutions which are contested in these proceedings
22 by the State, Suffolk County and the Town of North
23 Hampton, will meet NRC's regulatory standards.
24 These hearings are scheduled to run for the next
25 several weeks. They commence after today at 9:00

1 a.m. and run approximately until 5:00 p.m. daily.
2 The hearings, the schedule of witnesses which have
3 been agreed to in the main by the parties, will
4 cover, first, the school board issue, then the
5 hospital evacuation time issue, and the E P. S
6 issue, and finally the best-effort issue in that
7 order. We expected a one or two-week delay to occur
8 while a planned exercise is being conducted sometime
9 in the first part of June before considering the
10 final issue, if that comes to hearing.

11 The applicant, please present your
12 witnesses to be sworn.

13 MR. McMURRAY: Excuse me. Before we
14 move forward, we would like to address a few brief
15 procedural matters if we may.

16 JUDGE GLEASON: Sorry. I should have
17 asked you.

18 MR. MILLER: Judge Gleason, I will keep
19 this very brief. I find interesting your comments
20 just now to open the hearings and I don't believe I
21 will comment in response to your comments, but I do
22 have a couple of questions.

23 You mentioned just now, in terms of the
24 schedule, the scheduling of the EBS issue as the
25 third item on the agenda--

1 JUDGE GLEASON: Excuse me--off the
2 record.

3 (Discussion held off the record.)

4 JUDGE GLEASON: Back on the record.
5 Will you please put the sign down or
6 you will be escorted from the room.

7 Officer, would you escort this
8 individual out of the room.

9 AUDIENCE PARTICIPANT: I can't see why
10 I can't hold a sign. Judge Margulies, we were able
11 to carry signs in--

12 JUDGE GLEASON: They are not being
13 permitted.

14 AUDIENCE PARTICIPANT: Also Judge Fry,
15 we had signs all the time. Why are you different?

16 JUDGE GLEASON: I said they are not
17 being permitted in this room during the hearing.
18 Witnesses--

19 AUDIENCE PARTICIPANT: You don't want
20 to hear the truth.

21 JUDGE GLEASON: Witnesses cannot
22 testify in light of those kind of signs being
23 exhibited. Please put them down or you will have to
24 leave the room.

25 AUDIENCE PARTICIPANT: I think it is

1 because you are afraid of the truth.

2 I am not leaving. I think this is a
3 travesty and I am not leaving. I think the people
4 have a right to speak.

5 JUDGE GLEASON: You will have to put
6 the sign down or you will be asked to leave the
7 room.

8 2ND AUDIENCE PARTICIPANT: Excuse me.
9 Do you also specify photographs?

10 JUDGE GLEASON: Yes. Any kind of sign.
11 The witnesses are supposed to be here to testify
12 without any kind of materials being shown outside
13 the record.

14 2ND AUDIENCE PARTICIPANT: Because we
15 thought that it would be a fair and accurate
16 contribution for a good look as to our Long Island--

17 JUDGE GLEASON: I'm sorry, sir. That
18 information cannot be put in the record. You either
19 have to put the sign down, the pictures down, or you
20 will have to leave the room.

21 AUDIENCE PARTICIPANT: Can you tell us
22 why again?

23 JUDGE GLEASON: I am not telling you
24 any more than I have already told you.

25 3RD AUDIENCE PARTICIPANT: Since this

1 is part of what happened here--

2 JUDGE GLEASON: Off the record at this
3 point.

4 (Discussion off the record.)

5 JUDGE GLEASON: We will have a brief
6 adjournment.

7 (Recess.)

8 JUDGE GLEASON: Mr. Miller, you had
9 some comments you wanted to make. We can proceed
10 with your comments. We may just have to
11 suspend--get the sign put down later, before the
12 testimony starts. But that won't affect you, so--

13 MR. MILLER: Yes, sir. Judge Gleason,
14 very briefly, in your opening comments you mentioned
15 the order, the schedule of the issues to be heard
16 over the next few weeks. Included in your schedule
17 were the issues relating to the proposed LILCO EBS
18 network. I am assuming at this time the board has
19 not received LILCO's statement regarding the EBS
20 proposal.

21 JUDGE GLEASON: No. We were supposed
22 to have that today.

23 MR. CHRISTMAN: You will have that
24 today in hand.

25 JUDGE GLEASON: I didn't mean to have

1 those remarks construed that it was a foregone
2 conclusion that that issue would be heard. It was
3 just I referred to the possible issues.

4 MR. MILLER: Judge Gleason, with regard
5 to the EBS issues, we of course will also await
6 LILCO's filing before we make further comment. The
7 board, on Friday, May 13th, was telecopied a letter
8 by Ms. Leugers regarding the proposed schedule for
9 the upcoming few weeks. I am not sure the board
10 needs or wants to discuss that proposal. It
11 essentially reflects an agreement between Suffolk
12 County, at least, and LILCO as to the order of the
13 issues that will be heard. It is noteworthy that in
14 that letter to the board LILCO does bring to the
15 board's attention a problem with the FEMA EBS
16 witness. I guess we should postpone any discussion
17 of that matter until we decide whether we are going
18 to be litigating the EBS issues.

19 With respect to the remainder of the
20 schedule, Judge Gleason, again, maybe there is no
21 need to address these issues now, there are a few
22 matters, though, that will need to be ironed out and
23 it may be hard for the board to do so because I
24 don't know if LILCO and the County will agree.

25 JUDGE GLEASON: I think it probably

1 will be well to wait until we resolve the EBS issue
2 before we--

3 MR. MILLER: A few other brief matters,
4 some mundane but nonetheless important. We have
5 with us for this proceeding a different court
6 reporting firm than we have over the past years.
7 We had the luxury over the past years of a reporter
8 who got to know everybody quite well. The reporting
9 firm is new. I bring it up for the board, counsel
10 and witnesses to keep in mind we may be using some
11 terms not necessarily familiar to the court
12 reporter.

13 With that in mind, Suffolk County took
14 the luxury of giving to the reporter this morning a
15 list of terms we believe may be used frequently
16 during the hearings. One of our legal assistants,
17 Robert Yourczek, prepared a list and we gave that to
18 the court reporter. Other parties may wish to do
19 the same thing. But I think people should be
20 conscious of the fact some terms may need to be
21 spelled out and spelled out more than in the past.

22 JUDGE GLEASON: Did you provide a list
23 to the other parties?

24 MR. MILLER: We did not. It is just a
25 list with terms like "LERO" and "auxiliary bus

1 drivers." We will give a copy to the other parties.

2 MR. GLEASON: That would be fine.

3 MR. MILLER: One other matter. The
4 board of course last week ruled on motions to strike
5 proposed testimony on all three of the remanded
6 issues. The only issue which is really important at
7 this time from our perspective is the board's ruling
8 concerning the school-related testimony. There are
9 some rulings that were made by the board which
10 Suffolk County would like to seek reconsideration of
11 the board's rulings. I believe it is not necessary
12 to do so in terms of protecting your rights of
13 appeal. But I believe because of the importance of
14 some of the issues we would like to seek briefly at
15 least some reconsideration of some of the rulings
16 made by the board relating to the County's testimony
17 regarding the school's issues. We are prepared to
18 do that at this time if the board would like to do
19 so.

20 JUDGE GLEASON: Mr. Miller, the board
21 spent a great deal of time going over a discrepancy
22 between the two orders that the board issued
23 regarding the rulings to strike, and that is why I
24 said the word "clarification" and/or
25 "reconsideration."

1 Have you received the board's errata
2 sheet with respect to that order?

3 MR. ZAHNLEUTER: Yes, I have. That is
4 what causes me to ask--

5 JUDGE GLEASON: Bring that up at the
6 same time and notify the other parties if you will.

7 MR. ZAHNLEUTER: Thank you.

8 JUDGE GLEASON: We are ready for
9 testimony so we will have to suspend the hearing for
10 a moment until we get the signs removed.

11 (Recess.)

12 JUDGE GLEASON: Would you please
13 present your witnesses to be sworn in, please.

14 MR. CHRISTMAN: Thank you, your Honor.

15 MR. ZAHNLEUTER: Judge Gleason, I will
16 ask the County lawyers to return. Would you please
17 wait.

18 JUDGE GLEASON: Can I swear them in
19 while you are getting them?

20 MR. ZAHNLEUTER: Sure.

21 MR. CHRISTMAN: Let me ask the
22 witnesses each to identify yourself by name so the
23 Judge can swear you in.

24 MR. CROCKER: My name is Douglas
25 Crocker.

1 MR. KELLY: My name is Robert Kelly.

2 MR. LINDELL: My name is Michael

3 Lindell.

4 MR. MILLER: I am Dennis Mileti.

5 Whereupon,

6 DOUGLAS M. CROCKER

7 DENNIS MILETI

8 MICHAEL K. LINDELL

9 ROBERT B. KELLY

10 having been first duly sworn, were examined and
11 testified as follows:

12 JUDGE GLEASON: The witnesses have been
13 sworn in. Will counsel please proceed.

14 MR. CHRISTMAN: Thank you, Judge.

15 DIRECT EXAMINATION

16 BY MR. CHRISTMAN:

17 Q. Mr. Crocker, starting with you, would
18 you state your name again quickly and tell the board
19 just a little, very brief word about what you do for
20 a living?

21 A (Crocker) My name is Douglas Crocker,
22 manager of the nuclear emergency preparedness for
23 Long Island Lighting Company.

24 Q. Mr. Kelly, the same?

25 AUDIENCE PARTICIPANT: What lies are

1 you going to tell us? This is a sham--

2 JUDGE GLEASON: Will somebody please
3 get him outside.

4 AUDIENCE PARTICIPANT: He is being
5 peaceful bringing in signs and you can't even face
6 the truth. That is really a sham. Are you so
7 scared of the truth you can't even see a sign? Just
8 sitting there, not disturbing the courtroom, that is
9 contempt of Court? I have contempt for this Court.
10 I don't believe this. The people of Long Island do
11 not want you here. You can come, come visit, you
12 can go out to Montauk and visit the park. We don't
13 need you here to judge over us.

14 Why don't you just go back to
15 Washington? We don't need you here. We don't want
16 LILCO's lies. We don't want your lies. You can go
17 now. We don't need you. You may be sent here, you
18 may be the hired gun, we don't want you here. We
19 prefer you leave. I don't want to hear anything
20 else from you. The people don't want to hear you.
21 Our governments say they don't want you. You can go
22 back.

23 You can't even face the truth, a few
24 simple signs you can't even face. I don't think
25 what he has done, bringing in signs to make some

1 statement to you, is bad. You are not listening to
2 the problem. I don't think these hearings should
3 continue. We don't want to hear any more of LILCO's
4 lies and deceptions. You think you can squash the
5 truth consistently?

6 MR. IRWIN: I went out in the hall,
7 Judge. There were no security officers in the hall.
8 I went to LILCO security and asked them to summon
9 officers.

10 AUDIENCE PARTICIPANT: LILCO security?
11 We have LILCO security police in hearings, in the
12 State building? That is interesting. Since when
13 does LILCO become the law of the land here? I
14 realize they want to be. They want to be the
15 police. This is amazing.

16 JUDGE GLEASON: Officer, would you
17 please escort this gentleman out of the courtroom
18 and hold him in contempt of court, too, please. He
19 is obstructing the proceedings here.

20 AUDIENCE PARTICIPANT: I intend to
21 obstruct these proceedings. We don't recognize them
22 as valid. You can't silence us. We will be back.

23 (Whereupon, the gentleman was escorted
24 from the courtroom.)

25 JUDGE GLEASON: Let us proceed, please.

1 Q. Mr. Kelly, we were up to you. Would
2 you state your name and tell the board what you do
3 for a living?

4 A. (Kelly) My name is Robert Kelly,
5 senior project manager with the environmental
6 engineering firm of Roy F. Weston, emergency
7 management consultant with the firm.

8 Q. Speak up a little so everybody can hear
9 you.

10 Doctor Lindell, would you do the same?

11 A. (Lindell) My name is Michael Lindell,
12 I am an associate professor of industrial
13 organizational psychology, Michigan State
14 University.

15 Q. Dr. Mileti?

16 A. (Mileti) Dennis Mileti, professor of
17 sociology at Colorado State University and director
18 of Hazards Assessment Laboratory at the same
19 university.

20 MR. CHRISTMAN: Judge Gleason, I am
21 going to describe now LILCO's pre-filed written
22 testimony, including attachments. There are three
23 documents I will describe. Doing what I think is
24 consistent with what the board wanted last summer, I
25 will suggest these three documents be called

1 exhibits rather than bound in the transcript, but
2 that is up to you.

3 JUDGE GLEASON: At this point we are
4 going to put all the testimony in the record, not as
5 exhibits.

6 MR. CHRISTMAN: Fine. Then we will
7 make seven extra copies, but we will do that.

8 Q. Mr. Crocker, I am going to show you a
9 document, 60 pages in length, called "Testimony of
10 Douglas M. Crocker, Robert B. Kelly, Michael K.
11 Lindell and Dennis S. Miletì on the Remanded Issue
12 of Role Conflict of School Bus Drivers." I will ask
13 the four of you gentlemen whether this document was
14 prepared by you or under your direction and
15 supervision.

16 A. (Crocker) Yes, it was.

17 A. (Kelly) Yes, it was.

18 A. (Lindell) Yes.

19 A. (Miletì) Yes.

20 Q. Mr. Crocker, are there penciled
21 corrections or additions you want in the pre-filed
22 testimony?

23 A. (Crocker) Yes.

24 Q. Would you read them so the board and
25 the other parties can get them down? Read slowly

1 and clearly, and if anyone has trouble following I
2 am sure they will speak up.

3 A. (Crocker) The first correction is to
4 page five, second full paragraph, fifth line of that
5 paragraph. You should delete the word "off-site."

6 MR. McMURRAY: Only the word "off-site"
7 and not the word "and"?

8 A. (Crocker) The sentence should read,
9 "for off-site emergency preparedness activities,"
10 period. There was an extra "off-site" at the end
11 there.

12 The next correction is on page 28. On
13 the very top line on the page, the word "is" should
14 be changed to "are."

15 On the same page, near the bottom, the
16 third bullet item under question 22, immediately
17 after the bullet, where it now reads, "With the
18 exception of one case," the words "With the
19 exception of one case, no," those words should be
20 struck and it should be replaced by the words "in
21 three cases."

22 MR. McMURRAY: I didn't catch that, Mr.
23 Crocker.

24 WITNESS CROCKER: Where it now says
25 "With the exception of one case, no," strike

1 everything up to and including the word "no."
2 Replace those words with "in three cases."

3 JUDGE GLEASON: It reads "with the
4 exception in three cases"?

5 WITNESS CROCKER: No. It should now
6 read, "In three cases, bus drivers"--"bus driver"
7 has to be changed to plural--and after the word
8 "driver" insert the words "were reported to have."
9 So the sentence in its entirety as corrected would
10 read, "In three cases bus drivers were reported to
11 have arrived late for duty."

12 In the following sentence, the first
13 four words in that sentence should be stricken. In
14 other words, cross out the words "in the one
15 exception." The first word in that sentence now
16 becomes the word "one" and it should read, "One bus
17 company in the Maryville incident," et cetera.

18 If everyone has that, we would like to
19 add two sentences to the end of that paragraph.

20 JUDGE GLEASON: Page 28?

21 WITNESS CROCKER: Yes. Still on page
22 28. These would be the last two sentences on this
23 page. It would be a continuation of the last
24 paragraph. It begins, "In the Pinellas"--and I will
25 spell that--"incident"--Pinellas is

1 P-i-n-e-l-l-a-s--"incident, about 10 percent of one's
2 bus company's drivers (about 20 drivers), showed up
3 late because they first helped 'take care of
4 families'."

5 That sentence should read in its
6 entirety, "In the Pinellas incident, about 10
7 percent of one bus company's drivers (about 20
8 drivers), showed up late because they first helped
9 'take care of families'."

10 Following that sentence is this short
11 sentence, "In the Miamisburg--Miamisburg is spelled
12 M-i-a-m-i-s-b-u-r-g--"incident, it appears that a
13 few drivers showed up late due to family concerns."
14 That entire sentence should read now, "In the
15 Miamisburg incident, it appears that a few drivers
16 showed up late due to family concerns."

17 On page 29, the very first line, the
18 word "no" should be replaced with the words "only
19 three to five." And after the word "drivers," the
20 words "in one event (Miamisburg)," should be
21 inserted. The sentence should therefore read,
22 "After receiving the duty call, only three to five
23 bus drivers in one event (Miamisburg), helped
24 evacuate their families," et cetera.

25 Moving to page 30, beginning with the

1 first full paragraph that begins with the word "18,"
2 change that word 18 to the word 19.

3 Moving down one line to the sentence
4 that begins with the word "nine," where it now says
5 "nine of the 18," that should be corrected to "ten
6 of the 19." So the first word, "nine," should be
7 replaced by the word "ten," and the numeral 18
8 should be replaced by the numeral 19.

9 On Page 31, in the first full paragraph
10 that begins with the sentence, "We also discovered
11 that 12," et cetera, the fourth line within that
12 paragraph, in the sentence that begins with the word
13 "eight", that word "eight" should be changed to the
14 word "nine."

15 Moving down two lines, where the
16 sentence begins, "Of these eight," that should be
17 corrected to read, "Of these nine." The word "four"
18 that follows that should be replaced by the word
19 "five."

20 I see I have inadvertently skipped one
21 on this page. We have to move up to the first full
22 indented paragraph. That is the paragraph that
23 begins with the words "The remaining five." In the
24 second full sentence in that paragraph, the sentence
25 that begins, "All respondents felt," in the second

1 line of that sentence the words "and felt either no
2 sense or some sense," those should be stricken. I
3 will repeat that. The words "and felt either no
4 sense or some sense" should be stricken. Those
5 words should be replaced by the following words:
6 "to a great extent, (4), or felt some minimal sense,
7 (1)." That is the end of the insertion.

8 The sentence--

9 MR. McMURRAY: Mr. Crocker, what was in
10 the paren, the last one?

11 WITNESS CROCKER: The numeral one.

12 The sentence should now correctly read,
13 "All respondents felt their families could protect
14 themselves to a great extent (4), or felt some
15 minimal sense (1) of responsibility to stay home
16 with their families, questions 13 to 12."

17 Moving to page 32, the very first line,
18 top of the page, the third word in the question is
19 "found." It should be "find." Replace the word
20 "found" with the word "find."

21 Moving down to the seventh line on the
22 page, which is in the first paragraph of the answer,
23 the last sentence in that paragraph, the word "four"
24 should be replaced by the word "five." The sentence
25 would now correctly read, "This was true even for

1 five of the respondents with families at home."

2 We now have to jump ahead to page 47.

3 At page 47, as well as on 48, the entirety of
4 question 41 and its associated answer should be
5 withdrawn. All of 41 and its answer should be
6 withdrawn.

7 On page 50, question 46, the first line
8 of the answer, where it says, 488, that should be
9 replaced by 509. 488 should be replaced by 509.

10 Moving down to the next line, where it
11 says 449, that should be replaced by 470. 449
12 replaced by 470.

13 Moving down to question 47, the second
14 full sentence in the answer to that question, the
15 sentence begins, "Since the Longwood Junior High
16 School is on split session," that entire sentence
17 should be removed. There is no replacement for
18 that.

19 On page 51, question 48, the third
20 sentence in the answer, all the way to the end of
21 that answer, should be removed. The sentence--the
22 first sentence that should be stricken begins, "In
23 1984, all school populations were also reduced by
24 three percent." Everything after that in that
25 answer should be stricken.

1 JUDGE GLEASON: Including the
2 subsequent sentence?

3 WITNESS CROCKER: Yes. The answer
4 should end now with the statement, "LILCO believes
5 they are still valid today."

6 On page 51, question 49, the beginning
7 of the second sentence in the answer, the sentence
8 now reads, "Parochial schools are figured into." In
9 front of the word "parochial" insert the words "bus
10 drivers of." So the sentence would now read, "Bus
11 drivers of parochial schools are figured into this
12 number."

13 On page 52, question 50, the third line
14 in the answer to question 50, where it says 582,
15 that number should be replaced by the number 613.
16 582 should be replaced by 613.

17 Moving to page 53, question 52, the
18 question now reads, "If only 488 bus drivers."
19 Replace the number 488 with 509. 488 replaced by
20 509. Continuing that change, further down in the
21 answer, in the fifth line, in the sentence that
22 begins, "That covers 301 of the 488," that 488
23 should also be changed to 509.

24 Moving down the page three more lines,
25 the sentence that begins, "The remaining 187 bus

1 driver positions," that number 187 should be
2 replaced by the number 208. 187 becomes 208.

3 Moving down two more lines, that line
4 begins, "281 LERO drivers." That number 281 should
5 become 312. And moving a few words down that line,
6 the number 187 should become 208.

7 Moving to question 53 on the same page,
8 the second line of the answer, which refers to
9 Attachment M to this testimony, the letter "M" as in
10 Mary should change to "O" as in Oscar.

11 Moving to page 55, the first line at
12 the top of the page, where it refers to Attachment
13 N, as in Nancy, the letter "N" should be replaced by
14 the letter "P," as in Peter.

15 Moving down one line there is a
16 sentence that reads, "There will be a separate LERO
17 box for each bus yard." That should be amended by
18 removing the article "a" before the word "separate"
19 and making the word "box" plural, so that the
20 sentence will now read, "There will be separate LERO
21 boxes for each bus yard."

22 That is all I have in the testimony.

23 MR. CHRISTMAN: That is fine with
24 respect to this first document.

25 BY MR. CHRISTMAN:

1 Q. Let me ask the witnesses, then, if as
2 corrected this testimony, the 60-page testimony, is
3 true and correct to the best of your knowledge and
4 belief.

5 A. (Crocker) Yes, it is.

6 A. (Kelly) Yes.

7 MR. CHRISTMAN: I will move all three
8 of these into evidence as soon as I get through with
9 all three, if that is all right.

10 JUDGE GLEASON: Yes.

11 Q. Mr. Crocker, let me show you a slightly
12 thicker document called "Attachments for Testimony
13 of Douglas M. Crocker, Robert B. Kelly, Michael K.
14 Lindell and Dennis S. Miletic on the Remanded Issue
15 of Role Conflict of School Bus Drivers," consisting
16 of attachments tab A through N.

17 Do you see that document?

18 A. (Crocker) Yes.

19 Q. Does that constitute the attachments to
20 the testimony that we just described?

21 A. (Crocker) Yes.

22 Q. Are there any corrections you would
23 like to make of that document?

24 A. (Crocker) Yes, there are.

25 Q. Would you read those carefully for

1 people.

2 A. (Crocker) In Attachment G, as in
3 George, page two--

4 MR. McMURRAY: Wait, please.

5 A. (Crocker) Page two, question two, the
6 question now reads, "Did the impact take place
7 before?" That is a typo. It should read, "Did the
8 evacuation take place before?" The first word
9 "impact" should be replaced by the word
10 "evacuation."

11 Moving to page eight in the same
12 attachment, question 37, tabulated under the
13 question are four lines of data. In the line that
14 begins with zero percent--six cases, that numeral
15 six should change to numeral five. So, for zero
16 percent there are five cases.

17 Moving down two lines to the 51
18 percent-plus line, the "two cases" should be
19 replaced by "three cases." The numeral two becomes
20 a numeral 38.

21 Moving to page nine, on question 40,
22 for question 40, opposite the word "no" where it now
23 says "seven," that should become an eight. The
24 numeral seven replaced by the numeral eight.
25 Opposite the word "yes," where it now reads numeral

1 12, that should become numeral 11.

2 The next correction is to Attachment K.
3 On the first page of Attachment K, which is a table,
4 in the left-hand column, the second line from the
5 bottom, where it says, "Longwood JUN," the period
6 should be replaced by a slash and followed by the
7 word "middle." So it should read, "Longwood
8 JUN/Middle," meaning junior/middle.

9 Moving to the right, on the same line,
10 in the third--sorry--the third column of numbers.
11 You will see the number 2,546, which is followed by
12 a division sign, the number two and a few other
13 numbers. Strike the division sign, the numeral two,
14 the equal sign, the number 1,273, and the numeral
15 three that indicates a footnote.

16 Moving one column to the right, where
17 it indicates 22, replace 22 with 43.

18 The last correction to this page is the
19 bottom right-hand corner in the last column, where
20 it indicates "Total, 125." That 125 should be
21 replaced by 146.

22 Moving to the third page of the same
23 attachment, because of the changes I just mentioned,
24 the final total in the bottom right-hand corner of
25 this chart, which presently reads "449," that should

1 be corrected to read 470. That is 470.

2 On the following page, page four, the
3 very top line, under the heading of "Parochial
4 Schools," opposite "St. Izidor's School," we need to
5 change some of those numbers. The first number is
6 233. That should be replaced by 267. Moving to the
7 right one column, the number 11 should be replaced
8 by the number 14. Moving to the right one more
9 column, the number 222 should be replaced by the
10 number 253.

11 On the bottom of page five, there is a
12 footnote three at the bottom of the page. That
13 should be deleted.

14 Finally, Attachment M should be deleted
15 in its entirety because it has been replaced by
16 Attachment O in the supplemental testimony.

17 Attachment N, as in Nancy, should also
18 be deleted in its entirety. It has been replaced by
19 Attachment P, as in Peter, in the supplemental
20 testimony.

21 That is the last of the corrections.

22 Q. Let me ask all the witnesses whether
23 this set of Attachments A through N, two of which
24 have been stricken, were compiled and prepared under
25 your direction or supervision or by you?

1 A. (Crocker) Yes, they were.

2 A. (Kelly) Yes.

3 A. (Lindell) Yes.

4 Q. As corrected, are these attachments
5 true and correct to the best of your knowledge and
6 belief?

7 A. (Crocker) Yes.

8 A. (Kelly) Yes.

9 A. (Lindell) Yes.

10 A. (Mileti) Yes.

11 Q. Mr. Crocker, let me show you a third
12 document. This is only three pages long and has
13 Attachments C and P, which you just mentioned. It
14 is called "LILCO's Supplemental Testimony on the
15 Remanded Issue of Role Conflict of School Bus
16 Drivers." All these questions and answers are
17 sponsored by you, Mr. Crocker, so let me ask you,
18 was this document prepared by you or under your
19 direction and supervision?

20 A. (Crocker) Yes.

21 Q. Do you have any corrections you want to
22 make to it?

23 A. (Crocker) No, I do not.

24 Q. Is this document true and correct to
25 the best of your knowledge and belief, including the

1 two attachments O and P?

2 A. (Crocker) Yes.

3 Q. Do you adopt it as part of your
4 testimony in this proceeding?

5 A. (Crocker) Yes.

6 Q. Mr. Crocker, in all the changes we just
7 went through, apart from minor typos and grammatical
8 corrections, there were two sets, let me call them,
9 of changes of numbers. The last ones you made had
10 to do with the number of bus drivers that would be
11 used in a Shoreham emergency or that are planned
12 for. An earlier set had to do with the number of
13 people who responded to phone questions about past
14 real emergencies such as at Miamisburg.

15 Do you want to explain briefly how the
16 two sets of changes came about or why we had to make
17 those in the testimony today?

18 A. (Crocker) Well, in terms of the number
19 of bus drivers, we made an adjustment to reflect the
20 different treatment of the Longwood Junior/Middle
21 School which was on split session and we have added
22 sufficient drivers to the program to allow us to
23 evacuate the full school population--that is, when
24 both of the shifts, so to speak, are at the school.

25 The other information--I think I will

1 confer with Mr. Kelly. This dealt with his data.

2 A. (Kelly) The testimony just had some
3 inadvertent mistakes with that data. The correct
4 data was, of course, contained in the appendix to
5 the testimony. It just was inadvertently reported
6 in our testimony.

7 MR. CHRISTMAN: Thank you.

8 Judge Gleason, I would like to move
9 these three documents into evidence and ask that
10 they be bound into the transcript as though read and
11 that they constitute LILCO's direct case on this
12 issue.

13 JUDGE GLEASON: Is there objection?

14 MR. McMURRAY: Judge Gleason, I would
15 like to conduct a brief voir dire on some of these
16 changes before I determine whether or not I have an
17 objection.

18 JUDGE GLEASON: Go ahead.

19 VOIR DIRE EXAMINATION

20 BY MR. McMURRAY:

21 Q. Mr. Kelly, let's talk about the
22 adjustments made to the survey data beginning on
23 page 29 and a few pages after that.

24 When did you first become aware that
25 the data in the testimony was not accurate?

1 A. (Kelly) Just when I was preparing over
2 the last couple of days.

3 Q. And you had not read your testimony
4 prior to that time?

5 A. (Kelly) But I just picked up on that
6 in the last couple days.

7 Q. When was it you first picked up on it?

8 A. (Kelly) I believe, Saturday.

9 Q. Did you inform counsel of that?

10 A. (Kelly) Yes, I did.

11 Q. Do you know why we were not informed of
12 those changes prior to today?

13 A. (Kelly) No, I do not.

14 Q. Mr. Crocker, were you aware that there
15 were discrepancies between the actual data and the
16 data in the testimony?

17 A. (Crocker) You are referring to the
18 data you just--

19 Q. That's right.

20 A. (Crocker) I found out about it
21 yesterday when they gave me the list of corrections
22 to read.

23 Q. Let me ask Drs. Mileti and Lindell,
24 were you aware that the data reported in the
25 testimony was not accurate?

1 A. (Lindeil) Not until either Saturday or
2 Sunday.

3 A. (Mileti) I had a hunch that that might
4 be the case on Friday.

5 Q. Did you check the data to see whether
6 your hunch was correct?

7 A. (Mileti) That is how I got the hunch.
8 I was reading the testimony and the attachments and
9 a few other things on the airplane right out here.

10 Q. Did you inform counsel on Friday that
11 it might be incorrect?

12 A. (Mileti) I got to the hotel very late
13 and I didn't see counsel until I encountered them in
14 the restaurant. I had coffee and desert and had
15 missed dinner and said I had a few questions I
16 wanted to talk to people about, and they said,
17 "Let's do that Saturday," and we talked about it on
18 Saturday.

19 Q. Mr. Kelly, are you now confident that
20 the data as represented in the testimony as
21 corrected is accurate?

22 A. (Kelly) Yes. And as I pointed out,
23 the attachments themselves to the testimony were
24 accurate all along.

25 Q. They were accurate all along?

1 A. (Kelly) Yes.

2 Q. You are confident of that now?

3 A. (Kelly) Yes.

4 Q. Were you the one who compiled the data?

5 A. (Kelly) Yes.

6 Q. Were you the one who tabulated the

7 data?

8 A. (Kelly) Yes.

9 Q. Were you the one who added up the

10 numbers?

11 A. (Kelly) Yes.

12 Q. So you now feel--

13 A. (Kelly) I was responsible for that.

14 Q. You now feel confident that it is

15 correct?

16 A. (Kelly) Yes.

17 Q. With no qualifications?

18 A. (Kelly) No. I do want to look at the

19 wording he used in correcting one item on page 31,

20 just to make sure that the wording was properly

21 reflected. But the data itself is correct.

22 Q. Let's look at that item, then. What is

23 the wording you are talking about?

24 A. (Kelly) "All respondents felt their

25 families could protect themselves--" I think the

1 word "and felt either" should have been left in and
2 I think Doug may have suggested it be deleted. The
3 sentence--I believe, without pulling out data,
4 should read "all respondents felt their families
5 could protect themselves and felt either to a great
6 extent, four, or minimal, one, sense of
7 responsibility to stay home with their families."

8 Q. This is joint testimony and I will
9 leave it to witnesses or counsel--

10 JUDGE GLEASON: Which version shall we
11 put in or leave out? Mr. Christman?

12 MR. CHRISTMAN: Why don't the two of
13 you put your heads together there.

14 (Witnesses confer.)

15 WITNESS KELLY: May I just take a
16 moment?

17 JUDGE GLEASON: Sure.

18 MR. McMURRAY: While they do that,
19 Judge Gleason, may I run out?

20 JUDGE GLEASON: We are going to have a
21 recess as soon as this evidence is in so--

22 MR. McMURRAY: Okay.

23 JUDGE GLEASON: Why don't we take a
24 five-minute recess and correct this when we come
25 back.

1 (Brief recess.)

2 JUDGE GLEASON: If we can proceed,
3 then, please? Have you resolved your--

4 WITNESS KELLY: Yes.

5 JUDGE GLEASON: You want to tell us how
6 you want it in the record?

7 WITNESS KELLY: Let me read the
8 corrected sentence as Doug Crocker read it to you.
9 He read it, "All respondents felt their families
10 could protect themselves to a great extent, four, or
11 felt some minimal sense, one, of responsibility,"
12 and so forth. What I would like to do is after the
13 words "to a great extent," insert the following five
14 words: "and felt either no sense (4)," so the new
15 sentence should read, "All respondents felt their
16 families could protect themselves to a great extent
17 and felt either no sense (4), or felt some minimal
18 (1) sense of responsibility to stay home with their
19 families."

20 JUDGE GLEASON: All right.

21 MR. McMURRAY: Judge Gleason, let me
22 also note for the record that the testimony
23 withdrawn by LILCO referred to certain signed
24 statements by the bus drivers. That was one of the
25 issues that we wanted to re-argue later this

1 afternoon. I just informed the board of that.

2 Also, we have objected to the
3 supplemental testimony. As you know, the board has
4 ruled. Other than that, we have no objections to
5 the admission of this testimony.

6 JUDGE GLEASON: Then the testimony as
7 read and as submitted and modified will be received
8 into the record as if read.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

TESTIMONY OF DOUGLAS M. CROCKER,
ROBERT B. KELLY, MICHAEL K. LINDELL, AND
DENNIS S. MILETI ON THE REMANDED ISSUE
OF "ROLE CONFLICT" OF SCHOOL BUS DRIVERS

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Richmond, Virginia 23002

April 13, 1988

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L. IDENTITY AND QUALIFICATIONS OF WITNESSES

Q. Will the witnesses please identify themselves and provide a brief description of their professional qualifications and background?

A. [Crocker] My name is Douglas M. Crocker. As Manager of the Nuclear Emergency Preparedness Division for LILCO, I oversee all aspects of the Shoreham onsite and offsite (LERO) emergency preparedness program. I am responsible for the development and maintenance of facilities, plans, procedures, training, and drill programs to satisfy NRC and FEMA requirements. My professional qualifications, and those of the other witnesses, are Attachments A-D to this testimony.

[Kelly] My name is Robert B. Kelly. I am a Senior Project Manager for Roy F. Weston, Inc., an environmental engineering consulting firm. I have been retained as a consultant by LILCO to collect data on how bus drivers have responded in actual emergencies. I have developed and implemented emergency preparedness programs for federal, state, and local government agencies, chemical plants, pharmaceutical firms, nuclear power plants, and others. I have done a study of 50 major U.S. evacuations that have occurred since 1980. The purpose of this research was to identify those factors which made for a successful evacuation.

[Lindell] My name is Michael K. Lindell. I am an Associate Professor of Psychology at Michigan State University. I am a consultant to LILCO on human behavior in emergencies. My area of research and writing can be

defined broadly as individual and organizational response to emergencies. In this area I have conducted three types of research dealing with (1) "risk perception," (2) "warning response," and (3) "emergency planning."

[Mileti] My name is Dennis S. Mileti. I am Professor of Sociology and Director of the Hazard Assessment Laboratory at Colorado State University. I am a consultant to LILCO on human behavior in emergencies.

2. Q. What emergencies have you actually been to and for which have you personally collected data?

A. [Lindell] My own research has included primary data collection on four communities struck by floods (Sumner, Washington on December 2, 1977; Valley, Nebraska on March 19, 1978; Fillmore, California on March 14, 1978; and Snoqualmie, Washington on December 2, 1977) and four communities (Cougar, Woodland, Longview, and Toutle/Silverlake, Washington) affected by the eruption of Mount St. Helens on May 18, 1980.

[Mileti] I studied the following disasters shortly after they occurred: the Wray, Colorado tornado in 1971; the Rapid City flood in June 1972; and the 1986 eruption of the Nevada del Ruiz volcano in Columbia.

I have also studied actual warnings of earthquakes for which the threat did not materialize: the Wilmington, North Carolina earthquake prediction in 1976; the Kawasaki and Tokyo earthquake predictions in 1975; the Parkfield earthquake prediction in 1985; and the San Diego earthquake prediction in 1985.

I also studied the 1982 Livingston, Louisiana train derailment; the 1983 Coalinga earthquake; and the 1979 Three Mile Island accident, though I was not at these during the immediate impact.

3. Q. What experience have the rest of you had with real emergencies?

A. [Crocker] I was living on Long Island when Hurricane Gloria hit in 1985. While I did not participate in any emergency response during the hurricane, I volunteered to serve in LILCO's restoration efforts and performed survey work for damage in the community and later served as a messenger and coordinator of line crew activities for 7-9 days.

In 1978 I was living in Massachusetts when the state was hit by its worst blizzard in decades. My town was hit hard with snow and coastal flooding. Many beach houses were washed away and parts of the area had to be evacuated. The National Guard was called out to assist the community with traffic and access control.

[Kelly] I have been involved in emergency responses to several natural and technological emergencies: the Lynn, Massachusetts fire in 1982; the 1984 spring floods in western Massachusetts; a 1984 winter storm in eastern Massachusetts; a Massachusetts state employees' strike in 1982; the Salem, Massachusetts fire in 1984; the Cuban refugee program in 1980; the 1980 Hurricane Allen recovery program; and many smaller emergencies.

4. Q. What experience do you have in emergency planning?

A. [Crocker] At the time of the Three Mile Island accident, I was working in Stone & Webster's environmental engineering department. After TMI the area of emergency planning grew extensively, and I was recruited by management to be trained and to participate in an emergency planning project that was just beginning at the William H. Zimmer Nuclear Power Station. From May 1980 to January 1984 I worked on and ended up managing all of Stone & Webster's offsite emergency preparedness activities for the five

counties and two states surrounding Zimmer in conjunction with those counties and states.

From September 1982 to January 1984, I developed the emergency response plans for the Commonwealth of Kentucky and the Kentucky EPZ counties for the Marble Hill Nuclear Generating Station. During this time I was the Project Engineer responsible for all emergency planning work in the New York office of Stone & Webster. This included work for the Salem, Shoreham, Indian Point, and Oyster Creek nuclear power plants.

Since 1984 I have been working for LILCO, first as a Stone & Webster employee and later as a LILCO employee. Initially I worked onsite as the Onsite Emergency Preparedness Supervisor. In 1986 I moved to the equivalent position responsible for offsite emergency preparedness activities ~~offsite~~. Now I oversee both the onsite and offsite emergency preparedness efforts for Shoreham.

[Mileti] My experience regarding emergency planning is of several types. First, I have conducted academic studies that are related to the topic, and I have written publications based on these studies. Second, I have been involved in non-academic practical applications of emergency planning knowledge; I have shared knowledge applicable to emergency planning with varied user groups, for example, through speeches and guest lectures as well as through long-term working relationships.

The academic studies I have performed that are related to emergency planning are varied. These include synthesizing literature reviews as well as collecting primary field data. The former is illustrated by the document entitled Disaster Relief and Rehabilitation in the United States, which appeared in 1975 through the Institute of Behavioral Science at the

University of Colorado and was written as part of work for the National Science Foundation. Another example is the recent report Evacuation: An Assessment of Planning and Research by J. Sorensen, B. Vogt, and me, which appeared in 1987 for the Federal Emergency Management Agency. In the decade between the appearance of these works, I also participated in well over a dozen other efforts to appraise knowledge that was in one way or another related to emergency planning issues, and I wrote several dozen papers and reports related to the topic.

My experience with the collection of primary field data on topics related to emergency planning is illustrated by my most recent trip to a disaster site in January 1986 to study preparedness and response issues related to the eruption of a volcano in Colombia, South America, in which some 24,000 people died. That research was sponsored by the National Academy of Sciences. I have also conducted primary field data collection efforts in other studies that amount to probably several thousand interviews; these were mostly research efforts funded by the National Science Foundation. In 1984 I and others completed the report Interface in Reactor Emergency Planning and Response for the Nuclear Regulatory Commission, in which we sought to determine empirically if current regulations for nuclear power plant preparedness result in integrated emergency plans.

I have also been involved in non-academic practical applications of emergency planning knowledge. For example, I have consulted with about a half-dozen utilities on the topic, as well as a variety of governments and organizations, including the State of California, the City of Los Angeles, the Tokyo Metropolitan Government, the Paris fire brigade, the International and American Red Cross, IBM, the Governor's Office in the State of Colorado, and others.

In 1981 I helped begin the Southern California Earthquake Preparedness Project, which is a California-federal cooperative effort to prepare for a major earthquake. I am also a member of the Committee on Natural Disasters in the National Academy of Sciences (NAS), as well as a member of the Subcommittee on Earthquake Research of the Board on Earth Sciences to the U.S. Geological Survey (USGS), also within the NAS. I recently helped the USGS develop its emergency plan for an impending earthquake prediction.

Finally, from time to time I am called upon to make preparedness-related presentations to seminars on emergency planning and hazard mitigation hosted by, for example, the Federal Emergency Management Agency, General Public Utilities (GPU-Nuclear), and others.

[Kelly] I have worked for FEMA and the Massachusetts Civil Defense Agency. I worked both as an emergency planner and in a emergency operations role.

I have reviewed and developed state-level emergency plans for the Commonwealth of Massachusetts, including the State Emergency Broadcast System Plan, the State In-Place Shelter Plan, the State Comprehensive Emergency Management Plan, and the State Disaster Recovery Plan. I also directed the development of 165 local community emergency plans.

I have also developed and conducted emergency training programs and conducted capability assessments and hazard analyses studies. As a private consultant, I have developed industrial and community emergency preparedness plans.

I have been involved with radiological emergency planning for the Pilgrim, Seabrook, Yankee Rowe, and Vermont Yankee nuclear power

plants. My duties included reviewing local, area, and state emergency plans and implementing those plans during emergency drills and exercises. During these drills and exercises I was in charge of the Emergency Broadcast System and as a member of the operations staff was responsible for intelligence-gathering and resource management.

[Lindell] I would cite my AIF study and the workshop for emergency personnel in the Three Mile Island area. These are mentioned elsewhere in this testimony.

5. Q. What have you done specifically on role conflict?

A. [Lindell] Role conflict is addressed in my study (with Patricia Bolton, Ronald Perry, and others) for the Atomic Industrial Forum entitled Planning Concepts and Decision Criteria for Sheltering and Evacuation in a Nuclear Power Plant Emergency, AIF/NESP-031 (June 1985). I also made an oral presentation on role conflict at the 1986 Three Mile Island area executive seminar on emergency preparedness.

[Mileti] I discussed role conflict in Mileti, Drabek, and Haas, Human Systems in Extreme Environments (1975); Sorensen, Vogt, and Mileti, Evacuation: An Assessment of Planning and Research, (1987); "Emergency Role Performance in Disaster Response Organizations," Environmental Sociology (1985); and "Role Conflict and Abandonment in Emergency Workers," Emergency Management Review (1984). Additionally, as I stated in testimony in this proceeding in 1983, I gathered information with the assistance of a student from organizational respondents concerning role abandonment during the Three Mile Island emergency. I have also gathered information while in Japan about role abandonment from some victims and other informants in reference to the atomic bombing of Hiroshima.

II. "ROLE CONFLICT" OF REGULAR SCHOOL BUS DRIVERS

A. Literature and Theory

6. Q. What does the scholarly literature on disaster behavior tell us about "role conflict"?
- A. [Mileti] Russell Dynes, John Sorensen, and I reviewed the literature in our testimony in this proceeding in 1983. Testimony of Matthew C. Cordaro, Russell R. Dynes, William G. Johnson, Dennis S. Mileti, John H. Sorensen, and John A. Weismantle on Behalf of The Long Island Lighting Company on Phase II Emergency Planning Contention 25 (Role Conflict) (Nov. 18, 1983), ff. Tr. 832, at 51-71.
7. Q. Have there been new publications since you last testified on this issue?
- A. [Mileti] Several publications about role conflict and/or role abandonment have appeared since testimony was originally submitted in these hearings in 1983.

Since then I myself have published two articles on this issue, "Role Conflict and Abandonment in Emergency Workers," Emergency Management Review 2(1):20-22 (1984) and "Emergency Role Performance in Disaster Response Organizations," Environmental Sociology, 42:6-10 (1985). These are little different from each other and little different from my 1983 testimony and its conclusions. The essential point is that emergency workers who have a clear perception of their emergency roles do their jobs in emergencies. The reason is that they use many ways to resolve role conflict other than abandoning their emergency roles.

A recent attempt to summarize findings in the field of disaster research has been provided by Thomas E. Drabek, Human System Responses to Disaster: An Inventory of Sociological Findings (New York:

Springer-Verlag, 1986). At page 145 he makes the following overview conclusion and citations regarding "role conflict" in emergencies:

A few early researchers, especially Killian (1952), proposed that helping behavior might be curbed at times by forms of "role conflict." That is, persons might experience conflicting obligations (Moore et al., 1963). Killian, in particular, argued that disasters would leave many with conflicts between family and organizational responsibilities. But subsequent research has recast the matter significantly (Mileti, Drabek, and Haas, 1975: 67-68). The conclusions of Dynes and Quarantelli appear to be on target (see also, the Proceedings from an NIMH-FEMA sponsored conference, Role Stressors and Supports For Emergency Workers, 1985).

ID2.5 "In our experience over the years, in over 100 disasters and in the course of interviewing over 2,500 different organizational officials, we found that role conflict was not a serious problem which creates a significant loss of manpower. . . . In fact, we have had difficulty in finding any illustrations of the phenomena, let alone documenting the pervasiveness of it" (Dynes and Quarantelli, 1976:237).

ID22.5a(H) [Three propositions as to why role abandonment is not found empirically:] "[1.] The total role structure, thus, becomes more coherently organized around a set of value priorities and, at the same time, irrelevant roles which could produce strain are eliminated until the emergency is over. [p. 239] . . . [2.] Because of the assurance that these organizational members on duty will remain, other organizational members not on duty have the reassurance that they have time to check personal and familial damage and also to engage in limited amounts of non-occupational role behavior before reporting. [p. 240] [3.] . . . family units can make internal allocative decisions which facilitate the assumption of various emergency roles on the part of various family members [e.g., wife may go to EOC with husband and serve as secretary] [p. 240]" (Dynes and Quarantelli, 1976:239-240). (See also

Dynes, 1970a:154-155; Instituut Voor Sociaal Onderzoek Van Het Nederlandse Volk Amsterdam, 1955; Form and Nosow, 1958:102.)

Drabek (at p. 30) also refers to Quarantelli as follows:

III A 1.2 Role conflict experienced by organizational personnel does not precipitate role abandonment; the tendency is to remain on the job, often for too long. (Based on Quarantelli, 1982b:10.)

Reviewing a variety of studies of the type that I will summarize in the next chapter, Quarantelli concluded that organizational planners should recognize that what many fear rarely occurs. That is, upon learning of a disaster, personnel do not flock to their homes. If they reside in the impact area, however, efforts may be made to ascertain family member safety. Instead of role abandonment, ". . . there is a strong tendency for staff members to remain on the job too long, or to overuse all personnel concurrently" (Quarantelli, 1982b:10). Analytic qualities that might define "outlying" events wherein role abandonment may occur remain undefined and controversial.

A 1987 book chapter, "The Concept of Role in Disaster Research," by Russell Dynes also addresses "role conflict." Russell R. Dynes, Bruno de Marchi, and Carlo Penanda, Eds., Sociology of Disasters (Milan: Franco Angeli, 1987), 71-102. In that chapter (see pp. 80-85) Dynes reports on the findings of field experience by the Disaster Research Center regarding role abandonment by emergency workers. He reports the following:

The results . . . show that among those persons at work . . . none abandoned his/her emergency role responsibilities. About 15 percent engaged in search behavior at some time, most of that was done in connection with their job responsibilities (see pp. 82-84). . . . For those who were at home . . . , sixty-two percent were involved in what we called an active response, meaning that they quickly entered the emergency social system, either in their work role or in terms of some reaction to an emergency-created need. The rest were involved in what we called a passive response in that they did not take any immediate action to assume their organizational responsibilities. Such a stance, however, is not necessarily

inappropriate since most worked for organizations which followed a pattern of notifying them if they were needed for work. For those who were neither at work nor at home . . . eighty-two percent were involved in an active response, some went directly to work while others went home before they reported to work or stayed home to await notification (p. 84). . . . In sum, in examining a sample of 443 persons who held positions in emergency-relevant organizations, not one abandoned his/her emergency role obligations to opt for familial-role obligations. For those who were at home, or away from home, or at the work site at the onset of the emergency, the most common response was to report to work, or to react in some fashion to needs created by the emergency. Of those persons who were not at work at the time of the emergency, some 28, or less than one percent of the sample, indicated some delay in reporting to work (p. 84).

Role conflict/abandonment was also considered as part of a comprehensive effort to assess issues and criticisms of evacuation planning for all hazards. This work was performed for the Federal Emergency Management Agency by Oak Ridge National Laboratory. See John H. Sorensen, Barbara M. Vogt, and Dennis S. Mileti, Evacuation: An Assessment of Planning and Research (Oak Ridge, Tennessee: Oak Ridge National Laboratory, 1987).

The conclusion reached (at page 147) is as follows:

Role abandonment has been a controversial issue for some hazards. Research suggests that total role abandonment has not been prevalent in disasters and certainly has not been dysfunctional in organizational behavior. Some people have hypothesized that role abandonment would be greater and likely problematic in a nuclear power plant accident or during a nuclear war threat. This remains somewhat speculative. Research suggests that in the former case there may be an increased potential for conflict and role strain, but emergency functions would not be threatened. In the latter case, the issue is highly uncertain. Additional research on role conflict would be confirmatory but is not of high priority.

A paper, "Role Conflict and Role Abandonment in Disasters: A Need for Empirical Reorientation," by Barbara J. Friedman was presented at the

Annual Meeting of the Eastern Sociological Society in April 1986. This paper is now part of the Preliminary Paper Series at the Disaster Research Center at the University of Delaware. This paper made several observations. Interestingly, at page 17 the author states the following: "In many respects Milet's argument is very similiar and agreeable with the work done by Barton some twenty years earlier." The reference to my work is to my 1985 article in the Emergency Management Review (which is in essence the same as my 1983 testimony in these hearings); the reference to Barton's work is to his book Communities in Disaster, (A. Barton, Communities in Disaster (New York: Doubleday, 1969)), and to his original 1963 report, Social Organization Under Stress: A Sociological Review of Disaster Studies, for the National Academy of Sciences on which his Doubleday book is based.

The conclusions made by Friedman (see pages 22-26) can be paraphrased as follows. First, role conflict does exist during disasters and emergencies just as it does during normal times. Second, role conflict may increase or decrease during disaster, depending on how the researcher defines the term. Third, role conflict and role abandonment are not the same nor indicative of each other. Fourth, it is more than plausible that individuals use other methods of resolving role conflict in disasters besides role abandonment. Finally, future research should be directed at how individuals resolve role conflict in disaster, since many alternatives exist.

Barbara Vogt, a graduate student at the University of Tennessee, is doing a very comprehensive study of evacuations of special facilities. As an adjunct professor at the University of Tennessee, I am on her dissertation committee. I asked her what she has found so far. She said that in general

about twice as many people show up to evacuate special facilities (nursing homes and hospitals) as there are people who need to be evacuated from them.

Finally, James H. Johnson, Jr., a witness for Suffolk County earlier in these proceedings, has published a 1985 article, "Role Conflict in a Radiological Emergency: The Case of Public School Teachers." in the Journal of Environmental Systems 15(1) (1985). This article is based on a survey during normal times of the behavioral intentions of teachers in California with respect to a future, as yet unexperienced emergency. The following conclusion is made on page 83 of this article:

Almost one-third of the teachers surveyed indicated that, under the conditions outlined in the nuclear reactor accident scenario, other loyalties or responsibilities would take precedence over assisting in a full scale evacuation of schools (Table 1).

Similarly, on page 87 of this article the author makes the following statement:

Nearly one-third of the teachers surveyed stated unequivocally that they would not assist in an emergency evacuation of schools. A strong sense of obligation to family in crisis situations and concern for personal safety appear to be the most important factors in distinguishing these teachers (group 2). . . .

These additional publications and research, except for Professor Johnson's, confirm the conclusions reached in our testimony in this proceeding in 1983 regarding the actual behavior of emergency workers and in no way suggest that those conclusions would be inapplicable to school bus drivers. In general, these conclusions are that emergency workers who have clearly defined emergency roles do not abandon their jobs. In other words, role clarity facilitates role performance.

We also concluded in 1983 that training is one means by which role clarity can be achieved. Nothing in the literature since 1983 changes this view; it is consistent with the empirical evidence and prevailing contemporary theory in disaster research.

Professor Johnson, on the other hand, represents a view that is incorrect for the reasons I gave in 1983 and in this testimony.

8. Q. What does this mean for regular school bus drivers in an emergency at Shoreham?

A. [Mileti] Although it is likely that regular bus drivers would understand their emergency job in an actual emergency, they have not yet been trained in the specifics of a radiological emergency, and consequently they have not been exposed to all the factors known to enhance role clarity and emergency role performance.

As a practical matter, however, this would not likely result in their abandoning school children evacuees. In a real emergency, most untrained bus drivers would undoubtedly realize what their role in a school evacuation would be because of the normative overlap between their routine daily job (driving school children to and from school in buses) and their emergency function (driving school children in buses in the evacuation), and then perform that role.

9. Q. Professor Cole has suggested (Deposition of Stephen Cole, Jan. 28, 1988 at 61-80) that bus drivers have low commitment to their jobs. I think the implication is that blue-collar workers or part-time employees or women are more likely to abandon their jobs than, say, police or firemen. What is your opinion of this?

A. [Lindell] Work motivation — people's willingness to expend effort to accomplish their assigned tasks — is commonly considered to be of two types. The first of these is "intrinsic" motivation, which refers to rewards

inherent in the work itself. Intrinsic motivation comes from factors such as the challenge provided by the job or from its significance — the degree to which it "makes a difference." In "extrinsic" motivation, on the other hand, the rewards comes from external inducements such as money and the social approval of others.

The Intervenors' witnesses appear to be saying that in normal circumstances school bus drivers are not likely to be highly committed to their jobs because these jobs provide little intrinsic (job significance) or extrinsic (money or social recognition) reward for performance. But this would not be so in an emergency. The opportunity to play an instrumental role in removing school children from potential danger would have high significance and would be likely to earn these drivers an unusual amount of social approval. So whatever the levels of commitment to their duties these bus drivers may have in normal situations, they are likely to have a high level of motivation to accomplish their tasks under emergency conditions.

[Mileti] There are many different classifications or ways to categorize people (male vs. female, blue-collar workers vs. white-collar, part-time vs. full-time employees, and so on). It is no surprise that sociologists have thought of an elaborate list of such distinctions and then shown that such distinctions correlate with behavior.

This approach to the study of human behavior is labeled "role theory" and is based on the premise that a person's position in a complex stratified modern society influences his behavior. A social psychological explanation or interpretation of the same premise would be, for example, that women are socialized into different roles and adhere to different values and norms from men, perceive the world differently from men, and consequently behave differently from men.

There is an empirical basis for "role theory" regardless of whether one adheres to a sociological or a social psychological interpretation. Typically social categories such as sex and occupational status do correlate with observed variation in human behavior. These statistical correlations are often somewhat weak; they rarely exceed .30 or .35 at best, which suggests that the social category can explain perhaps as much as 9% to 12% of the variance in the human behavior being observed. Also, statistical correlations, particularly weak ones, do not constitute evidence of cause and effect.

Factors such as sex (male vs. female), occupational prestige (blue collar vs. white collar), and employment (full-time vs. part-time), as well as other social categories, might well be found in any particular emergency to correlate with observed variation in behavior in a general public. For example, these categories would likely correlate weakly with the rate at which people in the general public volunteered for emergency response work. For example, Professor Barton has showed that males volunteer more frequently than females. See Barton, Communities in Disaster, at 82-83.

The correlation of social categories with behavior does not necessarily hold, however, for specialized behavior of specialized populations such as emergency workers. Occupational prestige (blue collar vs. white collar) weakly correlates with volunteering from the general public for emergency work, but it does not correlate with variation in performing emergency work by emergency workers. Sex (male vs. female) does correlate with volunteering from the general public for emergency work, but it does not correlate with variation in performing emergency work by emergency

workers. The same is true for employment status (full- or part-time). The reason is that role clarity or specification, not social category, determines the behavior of emergency workers.

In simple terms, less educated, part-time blue-collar females do their emergency work for the same reason that better educated, full-time white-collar males do: role clarity exists.

The notion that being a part-time bus driver (a blue collar worker) is just a job (particularly to women who are more inclined to be interested in other things) is not a surprising opinion. It might be expected to be found among full-time employed, well-educated males in nonemergency times. But it is not likely to characterize the viewpoint of emergency bus drivers during an emergency, be they male or female. The reason is that emergencies re-prioritize the elements of social life and place emphasis on those that are central to health and safety. In such a context, the social system would elevate to prime status the task of evacuating school children. What may now to some appear to be "just a job" would take precedence in an actual emergency over most other routine aspects of social life.

10. Q. Dr. Lindell, does the literature of social psychology tell us anything about the issue of bus driver role abandonment?

A. [Lindell] Yes it does. The literature suggests that those who are trained as bus drivers and who normally drive school children, quite aside from feeling obligated to help in an emergency, are likely to want to help. This conclusion is based on the results of studies on "bystander intervention" that are cited in most introductory social psychology texts, as well as more advanced sources, such as a book by Piliavin, Dovidio, Gaertner, and Clark.

Emergency Intervention (New York: Academic Press, 1981). Deaux's and Wrightsman's Social Psychology in the 80's, for example, contains a chapter that reviews a number of studies of bystander intervention, which can be defined as actions taken by an onlooker to help the victim of an emergency. Deaux and Wrightsman, Social Psychology in the 80's, 4th ed. (Monterey, Calif.: Brooks-Cole Publishing Co., 1984). Bystander intervention involves behavior that is voluntary and which benefits the victim more than the helper.

11. Q. What precisely does the research tell us?

A. [Lindell] Research on bystander intervention has shown that people are motivated to become involved when they see that others have a need that arises from a personal emergency. This research has identified a number of characteristics of the victim, the helper, and the situation that influence whether and how the helper becomes involved.

In general, the factors identified by this body of research are consistent with the idea that bus drivers are likely to be motivated to involve themselves in evacuating school children. The attributes of the victim that tend to invoke the helping response are the following:

1. The need is temporary and basic (i.e., the victim's safety is at risk).
2. The victims are blameless and unable to help themselves.
3. The victims are attractive (especially children) rather than stigmatized (e.g., convicts).

The attributes of the helper that promote the helping response are the following:

1. The helper has the ability to act (for example, the helper is not ill), especially a special competence to act.

2. The helper has a perceived obligation to act.

These are all factors that facilitate a response by the helper. The need to evacuate is temporary; the need is basic (safety); the school children are blameless and unable to evacuate by themselves; they are attractive; and most bus drivers would be able to act and would perceive themselves as having special competence to do so.

The last relevant factor is diffusion of responsibility. If a person feels that he has no more responsibility for a victim than any of a number of other would-be helpers, then his feeling of obligation to help is diminished. Conversely, if a bus driver feels that alternative sources of assistance are not readily available and that there are not others who are as qualified or more qualified as he is, then he is more likely to be motivated to involve himself in contributing to a resolution of the emergency. It is likely that bus drivers whose ordinary job is to drive children would feel especially qualified.

12. Q. Is there anything else?

A. [Lindell] Yes. In addition, as noted above, there is "extrinsic" motivation to help.

13. Q. What do you mean by extrinsic motivation?

A. [Lindell] As contrasted to the "intrinsic" desire to help others, explained above, extrinsic motivation comes from the expectation of the bus driver's employer and community.

The extrinsic motivators are rewards and punishments administered by external sources. In the case of the bus companies' management, an extrinsic motivation to perform arises from managers' ability to monitor bus

drivers' performance of their tasks and willingness to administer rewards for compliance or sanctions for noncompliance with expectations.

Another source of extrinsic motivation would come from the members of the community at large, and specifically the parents of the school children. To the extent that they perceive the bus drivers as failing to act, even though the drivers have especial competence to do so, these parents are likely to be vocal in their disapproval of the bus drivers' failure to act. Conversely, bus drivers who do help evacuate school children are likely to receive social approval, especially by the parents.

[Crocker, Lindell, Mileti] In a real emergency, it would not be just LILCO wanting school bus drivers to drive. Suffolk County and New York State would also be making a "best efforts" response, and they would want the school bus drivers to drive. The school districts would want them to drive. The bus companies would want them to drive. And the community would want them to drive.

14. Q. But Professor Turner says that the community will eventually approve those who protect their own families, even if that means abandoning school children (Deposition of Ralph H. Turner, Feb. 26, 1988 at 27-29).
- A. [Lindell] The community may well tolerate bus drivers going to the aid of their own families. But it is hard to believe they will actually approve their failing to act in their area of special competence, where the bus drivers have a special skill.

Also, Professor Turner's analysis applies in the long run. In the short run (that is, during an accident) what will be obvious is that the bus drivers have the ability to move the children from a place of danger to a place of safety. That is what would be salient at the time of the emergency.

[Mileti] The community's reaction would depend on the plight of the driver's family. The community would indeed be tolerant of a bus driver who left his job to protect a family that was threatened in a direct, drastic way. The community would be much less tolerant of a bus driver who left to be with his relatively unthreatened family and in doing so left threatened school children to shift for themselves.

15. Q. Are you saying that LILCO can rely on nothing more than this tendency of bystanders to intervene in personal emergencies?

A. [Lindell] No, the motivation of bystanders to help is an important factor, but there are other factors that should be considered as well.

The studies of bystander intervention have focused largely on individual, rather than communitywide, emergencies. A communitywide emergency requires an effective organizational mechanism by which to translate high levels of individual motivation into effective communitywide action. This means there should be an effective organizational design that includes planning and training.

16. Q. Have you read Allen Barton's book Communities in Disaster (1969)?

A. [Mileti] Yes, and I do not think Professor Barton and I differ on the essential points. Consider this passage from his book:

The results of [Meda] White's study need careful checking in additional disaster situations, both to overcome the problem of eight-year retrospection and to cover systematically cases of other types, including the Texas City type, where the distribution of certainties is different. It must be emphasized that the finding of White's study is not that "the great majority of people choose their organizational role over their family role" but that they will do so under certain conditions, which prevailed in the three tornado disasters she studied. In other types of disaster -- exemplified by the Texas City explosion -- the distribution of knowledge about the needs of the family may be quite different. In the case of an atomic attack, the visible extent of fires or the

detectable extent of radiation might create a certainty of family danger over a wide area, similar to the Texas City situation.

A. Barton, Communities in Disaster (New York: Doubleday, 1969), 120 (emphasis in original).

The "conditions" that prevailed in the Texas City explosion are also described in Professor Barton's book:

This finding [Meda White's] contradicts the conclusion that has frequently been drawn from the Killian study. White finds an explanation in the unusual ecology of the Texas City disaster studied by Killian: the workers' homes were next to the dock area where the ship exploded. These homes caught fire, and the workers could see that they had caught fire. The distribution of members in the typology of role conflicts was thus heavy in the direct, drastic conflict that is totally missing in White's interviews from the three tornado cities, with their long, narrow strips of destruction surrounded by safe areas.

Id. at 119-20.

[Lindell, Mileti] We believe that the difference between Professor Barton's and Turner's conclusion that a significant level of role abandonment would occur and our conclusion that role abandonment would not be a problem can be accounted for by the difference in the nature of the radiological emergency that is being assumed. We agree with them that bus drivers might not drive buses if a radiological plume threatened their families in a "direct, drastic" way similar to that of a person seeing his own house on fire.

[Crocker, Lindell] However, to assume that such a threat would inevitably occur during a radiological emergency is quite inconsistent with the results of reactor accident consequence analyses.

[Mileti] The difference between the Texas City type of situation and a radiological emergency is this. If a worker sees his house on fire and thinks his family is inside, he is likely to think that there is something he could do to help, if he were there, that his family could not do by itself. In a radiological emergency, if the worker's house were immersed in a radioactive plume, the appropriate protective action would be to shelter or to evacuate. Most workers' families can take those actions with or without the worker's being present.

17. Q. How do you think the Licensing Board should resolve this issue?

A. [Lindell, Mileti] Suffolk County has drawn a conclusion, based on the fact that people care about their families and fear radiation and on their reading of early disaster research and role theory literature. We have a contrary conclusion, based on more recent and more pertinent literature on role abandonment and upon a more accurate understanding of the nature of the radiological emergency — as portrayed by reactor accident consequence analyses.

The best way to resolve the dispute is to look at empirical data in light of the current literature. The history of science is replete with examples of false theories that were thought to be true for a long time, until they fell in the face of empirical data. If one finds that many bus drivers have abandoned their jobs in real-life emergencies, it tends to support Suffolk County. If one finds no such thing, it supports LILCO.

B. Empirical Data

18. Q. Have any of you witnessed, or heard of, role abandonment in real emergencies in which you were involved?

A. [Crocker] No. As Hurricane Gloria approached Long Island in September 1985 LILCO activated two of its emergency response organizations. The SNPS Emergency Response Organization (ERO) and the Emergency Restoration Organization were called out in advance of the hurricane's arrival to wait out the storm at their duty posts. This represented approximately 120 people in the SNPS ERO and 2200 people from the Restoration Organization. Hurricane Gloria made landfall on Long Island at approximately 10:30 a.m. By 8:00 a.m., 1115 people were stationed at 102 substations across Long Island to ride out the storm and then perform the prompt initial damage survey immediately after the storm. An 1100 additional personnel assigned to line crews waited at their normal dispatch centers for the storm to pass. All these personnel left their families to cope with the hurricane while they performed their emergency functions. As far as we know, there were no cases in which LILCO personnel did not report due to family concerns.

Also, none of the approximately 46 emergency planning professionals in LERIO, who have a total of approximately 176 person-years' experience, knows of any actual case of role abandonment in an emergency.

[Kelly] No. As mentioned earlier in my testimony, I have been involved in many natural and technological emergencies. At the state level, I never observed or heard of any instances of role abandonment. I also never heard of instances of role abandonment at the local response level.

[Lindell] No.

[Mileti] No, except as follows. When I was inquiring about role conflict in Japan for my testimony earlier in this proceeding, I did hear anecdotes describing medical personnel who at first attempted to treat victims but then gave up the attempt. These stories, if true, are explained by the unusual nature of the Hiroshima disaster. It was unusual because it resulted in almost total physical destruction. The bomb destroyed all emergency response organizations in the community. What this means is that the only emergency response available was from volunteers. The small percentage of persons with skills relevant to the post-impact situation (for example, doctors and nurses) did volunteer to perform emergency duties, but some of them were overwhelmed and gave up the effort.

19. Q. Have you looked for actual cases of role abandonment?

[Kelly, Lindell, Mileti] Yes.

[Kelly] At LILCO's request, I reviewed information on fifty U.S. evacuations. I had previously collected the information for a project for another client which was unrelated to this project. For that project I narrowed the set of evacuations to 50 based on the following factors: size, type, geographic location, proximity to a nuclear power plant, special problems, and location type (population density). The goal of this narrowing process was to select 50 incidents that tended to entail large, quickly developing, problem-laden evacuations in densely populated areas, particularly if they occurred near a nuclear power plant.

After reviewing the documentation on these 50 cases, I identified 16 large-scale evacuations in which buses had been used to evacuate people. I reviewed secondary sources such as the following:

- articles from major media sources (AP, UPI)
- local newspaper clippings
- after-action reports
- communications logs
- police/emergency services reports
- sociology reports

A review of these secondary sources revealed no evidence that any bus driver had failed to drive. This study is documented in Attachment E to this testimony.

Since that study was completed, I have identified three additional evacuations in which buses were used, making a total of 19.

20. Q. Isn't it possible that there might have been cases of role abandonment that the secondary sources didn't pick up?

A. [Lindell, Milet] It is unlikely. Newspapers are quick to publish reports of looting and panic even when they don't occur. See Cordaro *et al.*, ff. Tr. 832, at 79. Defections of emergency workers would be "news"; if there were even unsubstantiated rumors of such a thing happening, the newspapers would likely mention it.

21. Q. Did you gather any other information?

A. [Kelly, Lindell, Milet] Yes. To gather additional information, Bob Kelly and people under his supervision phoned knowledgeable people who had emergency responsibility at each of the 19 disasters. Two separate studies were done. The first surveyed organizational respondents and the second surveyed bus drivers who actually responded to these emergencies. The survey instrument used in the first study is Attachment F to this testimony

and the results of that study ^{are} ~~is~~ Attachment G. The survey instrument for the bus driver study is Attachment H and its results are found at Attachment I to this testimony.

Of the 19 evacuations investigated, 17 involved technological hazards and two involved natural hazards. The evacuations involved from 1000 to 300,000 people. Most of the evacuations involved the use of buses to evacuate non-school populations; although, four involved the evacuation of two to seven schools.

22. Q. What did the organizational respondents study find?

A. [Kelly, Lindell, Miletic] The completed surveys of the 19 cases showed that all people who needed to be evacuated were in fact evacuated in time. There were no instances of role abandonment by bus drivers. Pertinent findings include the following:

- There were no refusals to drive the buses by any notified bus drivers.
- All bus drivers reported for duty after being contacted. In the Nanticoke incident, one woman was determined to drive an evacuation bus because she thought it was her civic duty — despite her husband's protests. In Marysville, two "mechanics" could not physically make it to the bus yard but proceeded to a nearby rest home to assist in its evacuation.
- ~~With the exception of one case, no bus driver~~ ^{In three cases} ~~arrived late for duty. In the one exception,~~ ⁰ ~~one bus company in the Marysville incident reported that 1 or 2% of the drivers were delayed due to traffic congestion. In the Pisewell incident about 10% of one bus company's drivers (about 20 drivers) showed up late because they first helped "take care of families." In the Miamisburg incident, it appears that a few drivers showed up late due to family concerns.~~ ^{5 were reported to have}

- After receiving the duty call, ^{only 3-5} ~~no~~ bus drivers ^{in one event (Miamiisburg)} helped evacuate their families before showing up for duty, despite the fact that in nine evacuations, 5% to 100% of the drivers had families in the area at risk during the emergency.
- There were no reports of bus drivers not doing their job as well as they could have.
- In seven of the 19 evacuations, bus drivers did not know beforehand that they had an emergency role.
- In all of the evacuations, there were enough drivers to drive evacuation buses. In Denver, rosters of evacuation bus drivers have been prepared as a standard emergency preparedness procedure. Bus drivers wanted to participate in evacuations and volunteered to do it.
- In all cases everyone who needed to be evacuated was evacuated.

There were a few isolated instances of problems such as traffic congestion, and difficulties in contacting drivers due to busy telephone circuits, but in no case did these problems have a negative impact on the outcome of the evacuation.

23. Q. What did you find out from the Bus Driver Interview Study?

A. [Kelly] By the time we wrote this testimony we were able to reach 27 bus drivers who had participated in ten of the 19 evacuation cases we studied.

[Kelly, Lindell, Milet] We found that the data collected from the bus drivers are in line with the data we collected in the organizational respondents study. No bus drivers refused to drive buses during the evacuation

and only two drivers reported doing something else before beginning their bus driver functions. As to these two drivers, the first driver reported a few minutes later and the other 20 minutes later. We have summarized some of our findings below.

^{Nineteen}
~~Eighteen~~ of the 27 respondents had other family members at home when they received the activation message (Question 11). ^{Ten} ¹⁹
~~Nine~~ of the ~~18~~ answered Question 7 about whether they thought their household would be threatened by the hazard agent. Seven of the respondents in this group said that the danger to their homes was either extremely or very likely - even odds. Even with this perceived danger to their households, six ~~one~~ seven proceeded immediately with their bus driver duties (i.e., reported to drive or called other drivers). The one exception in this group took an extra 20 minutes to evacuate her children before reporting to drive an evacuation bus.

With respect to the nine respondents who did not answer the question about the perceived degree of danger to their household, we found the following:

- Two respondents said their families were closer to the impact area than they were (Question 10). Nonetheless, both went directly to the reporting location after being called.
- Two bus drivers said they were with their families in the impact area at the time they received the activation message (Question 10). One driver made arrangements for his family to evacuate and then reported to work a "few minutes" later. The other respondent said he felt a great sense of personal responsibility to help his family by staying at home but instead "gave instruction to [his] son to

evacuate the family." This driver said he "felt [his] obligation [was] to drive the bus and felt [his] son could evacuate the family."

- The remaining five reported that they were with their families outside the impact area or were closer to the impact area than their families were (Question 10). All respondents ^{and felt either no sense} felt their families could protect themselves ^{to a great extent (4) or felt some minimal (1)} and felt either no sense or some sense of responsibility to stay home with their families (Questions 13 and 12).

We also discovered that 12 of the 27 respondents felt that to a "great extent" "those in the risk area would be protected even if [the bus drivers] did not go to help" them (Question 15). Notwithstanding this fact, all bus drivers directly reported to drive or helped call out other drivers. ^{NINE} Eight of those drivers reported even though they had families at home (Question 11). Of these ^{NINE FIVE} eight, four reported even though there was a perceived threat to their household (a threat perceived as extremely or very likely or even odds) (Question 7).

Seven of the 27 drivers reported that, according to the activation message, the people who needed to be evacuated were in only slight danger or that the message indicated no clear sense of threat (Question 3). Nonetheless, six of the bus drivers responded immediately and one driver reported after a "few minutes" (during which he prepared his family to evacuate). Of this group, four of the seven had family at home and two of the four lived in the impact area (Question 10) and one felt that it was very likely that her home would be threatened (Question 7).

24. Q. Did you ^{find} ~~found~~ out anything about the level of training these bus drivers had?

A. [Kelly, Lindell, Mileti] Yes, we did. Seven of the 27 drivers said that they had received no emergency training about their evacuation bus driver role before the emergency began (Question 23). (One said he had received minimal training then later said he hadn't received any.) All reported to drive directly, or, in one case, in a few minutes. This was true even for ^{five} ~~four~~ of the respondents who had families at home.

Ten of the drivers said they had received a minimal amount of emergency training beforehand (Question 23). The training included first aid or CPR training (three respondents), "flood evacuation training" (one respondent), how to operate a wheel chair lift (one respondent), and disaster and evacuation training by the fire department (one respondent). One respondent said she received training at the bus garage during the emergency and another said she was "just told [she] might have to drive." Only one respondent in this category had "in-service training with film strips."

The remaining ten drivers said that they had received a moderate or a great amount of training beforehand. This training included school evacuation and fire drills (three respondents), use of special equipment (oxygen masks and jump suits) (two respondents), and regular school bus driver training (one respondent). Others reported that they train once, twice, or three times a year.

25. Q. Did you look anywhere else for cases of role abandonment?

A. [Kelly] Yes. Since November 1986 FEMA has encouraged local jurisdictions involved in major emergencies to evaluate the strengths and weaknesses of their emergency response operations by completing a Disaster

Response Questionnaire (DRQ). Among other things, these DRQ's are used to report problems encountered during emergencies.

I phoned FEMA headquarters to find out whether the DRQ's show role abandonment to be a significant problem in past emergencies. The person I talked to at FEMA made a quick review of the "problems" section of the DRQ's FEMA has on file and told me that he found nothing to suggest that role abandonment has been a problem.

26. Q. But the Intervenor's will claim that radiological emergencies are different.

A. [Mileti] Yes, but we addressed their theory of the uniqueness of radiation fully in 1983, Cordaro et al., ff. Tr. 832, at 93-98; Cordaro et al., ff. Tr. 1470, at 112-15, and again last summer in the Reception Centers remand proceeding, LILCO Ex. 1 (Crocker et al. direct testimony) at 20-23, 25-29.

If one is inclined to take their theory seriously, he should look at the empirical data from radiological emergencies, Three Mile Island and Ginna being the principal candidates. (In 1983 we addressed Hiroshima and Nagasaki as well. Cordaro et al., ff. Tr. 832, at 46-51.)

Three Mile Island was perhaps the "worst case" for producing role conflict. Risk information was terrible; offsite emergency plans were poor or nonexistent; the Catholic Church granted general absolution of sins, presumably on the theory that many people would die; and the expert agency (the NRC) predicted that the reactor would explode, which probably meant a nuclear bomb-type explosion to many people. Yet, as we testified in 1983, there is no evidence of role abandonment by emergency workers at TMI. Cordaro et al., ff. Tr. 832, at 73-76.

27. Q. Professors Cole, Zeigler, and Johnson, in their testimony in the Seabrook proceeding, cited a number of papers about shortages of medical personnel during the Three Mile Island accident. Do these demonstrate role abandonment?

A. [Mileti] Earlier in these hearings LILCO (Cordaro et al., ff. Tr. 832, at 72, 83-85) and Suffolk County witnesses discussed several publications that, on the surface, appeared to reveal role abandonment by hospital workers during the Three Mile Island accident. See, for example, Christopher Maxwell, "Hospital Organizational Response to the Nuclear Accident at Three Mile Island: Implications for Future-Orientated Disaster Planning," American Journal of Public Health 72(3): 275-79 (1982); J. Stanley Smith, Jr., and James H. Fisher, "Three Mile Island: The Silent Disaster," Journal of the American Medical Association 245(16): 1656-59 (1981); Gordon K. Macleod, "Some Public Health Lessons from Three Mile Island: A Case Study in Chaos," AMBIO 10(1): 18-23 (1981).

Other publications apparently reach the same general conclusion. See, for example, Dennis L. Breo, "Nuclear Scare Tests Hospital's Disaster Plan," Hospitals, J.A.H.A. (1 May): 33-36 (1979); K. Haglund, "At Hershey: Medical Systems Near Failure During Three Mile Island," New Physician 28(6): 24-25 (1979); E. Kuntz, "Hospitals Prepare Radiation Plans in Wake of Nuclear Plant Accident," Modern Healthcare (9 July): 16 (1979); E. Kuntz, "Ready to Evacuate Area? Nuclear and Chemical Accidents Test Hospital Disaster Plans," Modern Healthcare (May): 14-16 (1979); Stanislav V. Kasl, Rupert F. Chisholm, and Brenda Eskenazi, "The Impact of the Accident at the Three Mile Island On the Behavior and Well-Being of Nuclear Workers, Part I: Perceptions and Evaluations, Behavioral Responses and Work-Related Attitudes and Feelings," American Journal of Public Health 71(5): 472-83 (1981); Stanislav V. Kasl, Rupert F. Chisholm and Brenda

Eskenazi, "The Impact of the Accident at the Three Mile Island on the Behavior and Well-Being of Nuclear Workers, Part II: Job Tension, Psychophysiological Symptoms, and Indices of Distress," American Journal of Public Health 71(5): 484-95 (1981); William A. Weidner, Kenneth L. Miller, Robert F. Latshaw, and G. Victor Rohrer, "The Impact of a Nuclear Crisis on a Radiology Department," Radiology 135 (June): 717-23 (1980); William E. DeMuth, Jr., and Joseph J. Trautlein, "The Luck of Three Mile Island," The Journal of Trauma 19: 792-94 (1979); and others.

These publications do not, however, reveal role abandonment by emergency workers during the Three Mile Island accident. They document the need for emergency planning at hospitals for emergency response in which the hospital is a "victim." At no time during Three Mile Island was there a medical emergency. Hospital workers who were off for the weekend or in San Francisco at a convention did not abandon emergency roles by not inventing one during the accident.

Suffolk County witnesses have also pointed to a publication by the Pennsylvania National Guard (After Action Report: Three Mile Island Nuclear Incident (Pennsylvania: Department of Military Affairs, 1979)) as evidence of role abandonment by national guardsmen during the accident. In fact, this report states the following at page 12:

a. Personnel. A review of personnel problems of PNG personnel revealed that an evacuation could have resulted in significant conflicts between personal responsibility to the members family and the individual responsibility to the PNG when mobilized to deal with the emergency. This was evidenced when many Guard personnel residing in the immediate vicinity of TMI could not be contacted during the condition white of the operation. It was later learned that many personnel evacuated their families from the area before being notified of possible NG participation. These problems were compounded when the radius of the area to be evacuated increased from five to ten and eventually 20

miles. Additional complications could have resulted from the confusion and frustration of a direct mass evacuation.

It is difficult to understand how guardsmen who evacuated with their families can be cast as persons who abandoned their emergency roles, since those roles were not activated when their evacuation occurred.

28. Q. Does the experience at Chernobyl tell us anything?

A. [Mileti] We must make the usual caveats that (1) the Soviets do not freely make information available, (2) their culture is different from ours, and (3) no one of whom we are aware has done systematic research on human behavior at Chernobyl. We can say, however, that many people were evacuated from the Chernobyl accident. Reportedly city buses from Kiev were used:

Soviet officials began to evacuate the local population in the town of Pripyat about 36 hours after the explosion. The evacuation was carried out by 1,100 city buses brought in from Kiev, 130 kilometers to the south. The town of Chernobyl was evacuated beginning May 2.

C. Hohenemser, M. Deicher, A. Ernst, H. Hofsass, G. Linder, and E. Recknagel, "Chernobyl: An Early Report," Environment 28(5): 6-13, 30-43 (1986), at 13. We have been able to find no evidence that any Soviet bus driver failed to perform. In fact, all we have been able to find on the point is the following:

The revelation [by Pravda] that 1,100 buses were marshaled for the evacuation was coupled with the assertion that no Kiev driver refused to volunteer, and the fact that 92,000 people were evacuated was couched in an account of the care taken of the refugees.

Serge Schmemmann, "Reporter's Notebook: Bit by Bit, Soviet Gets News," New York Times, 14 May 1986, Section A, p. 10, col. 3. There were also

reports of some officials shirking their duties, of firemen displaying extraordinary heroism, and of discontent and strikes by Estonians conscripted to decontaminate the area. But nothing that we can find suggests role abandonment by bus drivers.

29. Q. But if the bus drivers came from Kiev, their families wouldn't have been in danger.

A. [Lindell, Milet] Yes. But, as we testified last summer, people in Kiev were advised to keep their windows closed and wash their fruits and vegetables. LILCO Ex. 1 (Crocker et al. direct testimony) at 22 in the Reception Centers remand proceeding (June-July 1987). We were responding to a County witness's claim in her deposition (which she did not offer in her written testimony) that there had been a "near riot" at the Kiev train station. Id. at 26. Apparently people did perceive that there was a radiological risk in Kiev.

30. Q. Newspaper articles don't count as scientifically reliable data, do they?

A. [Lindell, Milet] No. But there are no scientifically sound, reliable reports of role abandonment in radiological emergencies. We have therefore looked for any reports of role abandonment at Chernobyl — even if they are of uncertain reliability — and still we find few or none.

[Milet] In the same spirit, we have looked for anecdotal accounts of role abandonment in other radiological emergencies, and again we find few reports at all and none that is reliable. There have been several radiological accidents; some of them may not have required an offsite emergency response but did require an emergency response of some sort. Examples are the NRX reactor accident at Chalk River, Canada in 1952; the Windscale

fire in England in 1957; the SL-1 accident in Idaho in 1961; the Fermi Unit 1 accident in Detroit in 1966; the Browns Ferry fire in 1975; the rupture of a cylinder of UF₆ at the Sequoyah Fuels Facility in Gore, Oklahoma in 1986; and contamination by cesium-137 in Goiania, Brazil in 1987.

The only thing we have found suggesting "role conflict" in these events is a popular account that a reporter interviewed a scientist who had packed his wife and children off when the fire broke out at the Windscale plant. See John G. Fuller, We Almost Lost Detroit (New York: Reader's Digest Press, 1975), 85. For obvious reasons, we have reason to doubt even this report.

31. Q. Professor Cole mentioned a case of a policeman who had abandoned his role.
- A. [Mileti] I am aware of that case. It was so remarkable it was featured on the Phil Donahue Show.

As I recollect the television program, the policeman in question was assigned to man a desk and take phone calls during the emergency, which was a flood in Illinois. While performing his duties, the policeman phoned home to check on his wife and two young daughters. His wife told him that the floodwaters had covered the first story of their house and were rising; she had no one to help her evacuate. The policeman called several friends and relatives to help but reached none of them.

At this point the policeman asked his superior if he could leave to help his wife. The superior (who allegedly was looking for an excuse to fire this particular police officer) said no. The policeman left anyway to help his family. Reportedly, he intended to return to work after helping his family, but when he called the station, he was told he had been suspended.

This anecdote illustrates the process people typically go through in a "role conflict" situation. This police officer went through the usual steps:

1. He called his wife. Often the threatened spouse is able to evacuate without help, but in this unusual case she could not.
2. He called friends and relatives. Often there are others who can help the threatened spouse, but in this unusual case there were not.
3. He asked his boss if the organization could cover for him while he left temporarily. Usually the organization can.

In short, this case illustrates a highly improbable case in which all of the usual role conflict resolution mechanisms did not work. Moreover, the policeman's job (taking phone calls) may or may not have been essential to the emergency response, but it seems to have been of the type that others could cover.

Of course, an interview of this policeman on the Donahue Show, with his lawyer present, does not constitute good sociological data. If the facts are as stated, all the case of the policeman shows is that role abandonment can occur, which we have never denied.

32. Q. Will you summarize?

A. [Kelly, Lindell, Mileti] If you look at the empirical facts, Suffolk County's theory of role conflict simply does not hold up.

In 19 cases of nonradiological emergencies in which real bus drivers were used to evacuate real people, no reports of role abandonment were found.

In the peacetime radiological emergencies that have been addressed in this proceeding (particularly Three Mile Island, Ginna, and Chernobyl) there is likewise no evidence of role abandonment such as Suffolk County predicts.

C. Polls

33. Q. Why do you say that measures of behavioral intentions (polls, for example) do not predict actual behavior?

A. [Mileti] I have repeatedly stated in testimony in these hearings that behavioral intentions poll data gathered in non-emergency times should not be taken as indicative of behavior in future, unexperienced actual emergencies. I will not repeat all the reasons I have already stated in prior testimony for why I hold this opinion. I would, however, like to give an empirical example of how pre-event behavior intentions did not match actual behavior when an event actually did occur.

I and several others conducted one of the largest, most elaborate, and perhaps best-funded surveys of behavioral intentions in relation to disasters or emergencies ever performed. This study sought to explore the impacts and response of people to a scientifically credible prediction or warning of an earthquake. We interviewed well over one hundred organizations and several hundred families to ask what people would do if scientists were to predict an earthquake. Our interview techniques were detailed and complex; they went to great lengths to present people with detailed scenarios and questions about behavioral intentions.

The interviews with families are illustrative. We interviewed families as a group. Prediction scenarios were tape recorded and even visually illustrated on flip-charts. We interviewed respondents in a face-to-face situation. We played the audio tapes that described the prediction at the same time that flip-charts illustrated the scenarios. At pre-designated points the audio and visual presentations were stopped, questions were asked, and behavioral intentions were measured.

Our study concluded that a scientifically credible earthquake prediction would result in large social and economic costs for society resulting from the response to the prediction. Subsequently, a "near-prediction" was actually issued. It was empirically studied by Professor Ralph Turner and colleagues to determine actual public response to this actual event. Their study did not document any behavior that supported the conclusion we had reached based on our behavioral intentions study. Professor Turner concluded, for example, that "the people of Los Angeles County showed few of the perverse effects that are often given as reasons for withholding soundly based but uncertain earthquake forecasts"; that there was an "absence of negative effects" (see Ralph H. Turner, "Waiting for Disaster: Changing Reactions to Earthquake Forecasts in Southern California," International Journal of Mass Emergencies and Disasters 1(2): 333, 334 (1983)); that "the earthquake threat was not salient in relation to other everyday concerns" (see Ralph H. Turner, "Individual and Group Response to Earthquake Prediction," paper presented to the International Symposium on Earthquake Prediction, Unesco Headquarters, Paris, p. 7 (26 Feb. 1987)); and that "[e]xcept for a great deal of informal discussion and attention to media reports and occasional massive rumor waves, life went on as usual" (see Ralph H. Turner, Joanne M. Nigg, and Denise Heller Paz, Waiting for Disaster: Earthquake Watch in California (Los Angeles: University of California Press, 1986), 416).

There are many reasons why these two studies may have documented a wide gap between behavioral intentions and actual behavior. For example, behavioral intentions and behavior are different, particularly in regard to emergency behavior. Also, the prediction scenarios used in the study of

intentions differed from the prediction situation that actually occurred. Consequently, what people took into account or were thinking when they offered intentions was not an accurate estimate of what was operating in the actual situation when it was experienced. But that is precisely the point.

34. Q. What is your assessment of the practical significance of Stephen Cole's behavioral intention polls?

A. [Lindell, Miletic] Suffolk County appears to have concluded that the reported intentions of respondents can be taken at face value — that is, that the bus drivers do not presently intend to, nor will they in the future, drive buses to evacuate school children in a radiological emergency. We, and others, are mindful of the limitations of behavioral intentions data. As Gordon Wood has written:

Some people who claim that they would intervene in fact would do so. However, in other cases, the self-report procedure (relative measure) would yield a different set of results from the nonreactive measure obtained by actually staging a crisis. If you were to ask a number of people whether they would come to the aid of an elderly person being mugged, it is likely that a number of the respondents would indicate a willingness to help. We have no idea, however, whether they actually would help a victim in a real mugging. Imagine that a close relative (brother, sister) needs a kidney transplant. Would you be willing to donate one of your kidneys? Most of us are likely to say yes when the need is far distant (in a hypothetical situation). How many of us would actually give up a kidney? We simply do not know unless faced with the situation.

Gordon Wood, Fundamentals of Psychological Research, 3d ed. (Boston: Little, Brown and Co., 1981), 35. We believe, moreover, that there are other, more plausible interpretations of these data and their relevance to the LERO emergency plan.

35. Q. What are these alternative interpretations?

A. [Lindell, Mileti] One alternative explanation for these data is that the questions that were asked are assessing only the bus drivers' attitudes toward protecting their families. The fact that they have clear concerns about family safety does not mean that they would refuse to help in an actual emergency in the future.

Another alternative is that the survey questions are assessing the bus drivers' attitudes toward the utility company. The fact that the respondents have negative attitudes toward LILCO in normal circumstances does not imply that they would refuse to help children in an emergency. Both the social entity (LILCO vs. school children) and the situational referent (normal circumstances vs. an emergency) differ between the circumstances of questionnaire administration and the circumstances under which the action would be performed.

36. Q. Suppose that one were to accept the interpretation that the polls do in fact mean that bus drivers do not intend to cooperate. Doesn't this present a problem to LERO?

A. [Lindell, Mileti] Not necessarily, even if the bus drivers' current intention is to refuse to cooperate. In fact, Professor Cole's questionnaire itself has helped to communicate to bus drivers what behavior is expected of them in an emergency, and thus may help, however slightly, to clearly communicate the expectation that they drive an evacuation bus in a radiological emergency.

Moreover, a bus driver's present decision not to drive is not irreversible. Respondents may drive (and we believe that they are likely to drive) in an emergency even if they currently are not inclined to do so. The reason they would be inclined to participate in an emergency is the high

degree of helping behavior that has been demonstrated in emergencies, ranging in scope from minor individual emergencies to communitywide disasters involving threats to life and health.

In light of the evidence we have cited regarding the strong motivations that people have for helping in a broad range of emergencies, we are extremely skeptical that the role rejection that may have been expressed in order to prevent LILCO from obtaining an operating license would be extended into an emergency situation when the health and safety of school children would be at stake.

37. Q. What do you think of the methodology of the County's polls?

A. [Mileti] As I testified in 1983, I believe there are several methodological flaws in the way the questions are worded and the order in which they were asked. Cordaro et al., ff. Tr. 832, at 89-93. The 1983 testimony is Attachment J to this testimony.

[Lindell, Mileti] However, we think that focusing on such flaws in behavioral intention polls diverts attention from the main point, which is that such polls, no matter how well constructed, cannot predict actual behavior in future, unexperienced emergencies.

38. Q. Suffolk County witness Stephen Cole has conducted another firemen survey in March 1988. Do you have any comments on the new survey?

A. [Mileti] I was provided a copy of one of the survey answer forms only a few days ago, and thus I have not had time for an in-depth review. I do have a few comments though, based upon a necessarily brief review.

My first impression of Dr. Cole's new fireman survey is that it appears that the sorts of factors that scientific, empirical data have shown to be the determinants or causes of behavior in emergencies could not be operating in this survey of intentions. As a matter of fact, it appears that no attempt was made to have them operate in this poll at all. I do believe, however, that Dr. Cole agrees that these factors are important, because he did try to include some of these factors in the survey he presented last summer during the OL-5 exercise hearing.

39. Q. Could you give us some examples of what you mean by this?

A. [Mileti] Yes, I can. For example, Question 26 reads as follows:

If there was an accident at Shoreham requiring the evacuation of people within a ten mile zone of the plant, do you think that it would be dangerous for you to spend a day working within the evacuation zone?

As this question shows, no attempt was made to simulate what would be going on during an evacuation. The respondent here doesn't have the benefit of the vast array of information that would be available to him during an emergency, such as EBS messages or what his supervisors would tell him. Also, in answering this question, the respondent has no idea what he would be doing, where he would be located in the 10-mile EPZ, or whether he would have special protective clothing or dosimetry, all of which would influence his opinion about how safe it was to be in the EPZ. To more accurately measure the fireman's behavioral intentions, the respondent should have been given more situation-specific factors before being asked to make any judgment about what he thought he might do in the situation.

Question 8 also has methodological flaws in it. First, this question presumes that people who have children in school will want to check on them. (Of course, we all believe that they would in absence of information about school children, but from a methodological standpoint it is incorrect to automatically assume this is so.) Second, this question also did not permit the respondents to take any other situational factors into consideration before stating their behavioral intentions. For example, the respondents weren't told that there are protective measures in place for school children.

Another flaw in Dr. Cole's most recent survey is evident in Question 6. This question asks the respondents what they would do first. The notion in this question of what they would do "first" precludes all other behavior (especially since the survey didn't inquire how long the "first" action would take or what the respondents would do next). The respondent is given no opportunity to respond that he would do more than one thing. In reality, though, if a person says he would make sure his family was safe first, that does not mean that he wouldn't report to work a few minutes later. The results from our bus driver interview study bear out this fact.

Also, Question 6 in Professor Cole's latest poll and its answers are confusing because the question has the respondent assuming at the start that he is already at work. But the first answer to this question has the respondent reporting to work. Why would the respondent pick this answer if he were already at work?

40. Q. Suffolk County's witnesses argue that emergency planners should use opinion polls in planning. What is your opinion?
- A. [Lindell, Miletic] If we accept their thesis, we conclude that planners

should provide more personnel than are necessary to carry out an emergency response because a large percentage of personnel will not be available because of role conflict. But the empirical fact, demonstrated in many past emergencies, is that there is often an oversupply of personnel. See Cordaro et al., ff. Tr. 832, at 17.

[Mileti] That is why I have advised against using opinion polls, at least in the way Suffolk County urges, for emergency planning. It is not just that they are unreliable; they are harmful. If believed, they focus the planner on the wrong problem — indeed on a hypothetical problem that is the opposite of what actually happens in emergencies.

[Crocker] Even in the unlikely event that regular school bus drivers were not available, LILCO has alternate provisions for evacuating school children. We have provided many additional bus drivers so that, even if we assume many defections by regular bus drivers, we can still get the job done, as I discuss in Part III of this testimony below.

41 Q. Apparently a number of school bus drivers on Long Island have signed statements saying that they "cannot and will not agree to drive a school bus in the event of an accident at Shoreham." Does this mean that the signers would in fact not help evacuate school children in a radiological emergency?

A. [Lindell, Mileti] No. It is likely that these statements, like Professor Cole's polls, reflect opposition to the utility or the nuclear plant rather than real future behavior.

[Mileti] I testified in 1983 that I had no doubt that school teachers could be found to come forward, in advance of an emergency, and say they would not help in an emergency. Cordaro et al., ff. Tr. 832, at 36. The same is

true of bus drivers. That does not mean these people would not drive in an emergency, no matter what they may say now.

[Lindell] It is possible that the bus drivers who signed the statements are slightly less likely than others to drive, because in a sense they have made a public "commitment" not to drive. To this small extent the soliciting of such statements may lessen the public safety. But this has little or nothing to do with "role conflict." More important, I would not expect this commitment to override the extrinsic and intrinsic motivation to drive that I discussed above.

D. Conclusion

42. Q. So what is your conclusion?

A. [Lindell] Whenever I have raised the hypothetical problem of role conflict with people associated with offsite preparedness for emergencies at nuclear power plants (for example, at a workshop for emergency planning personnel sponsored by General Public Utilities in the Three Mile Island area in 1985), reaction has ranged from surprise to indignation that anyone would think it would happen. Emergency planning professionals simply do not regard "role conflict" as a real problem in emergencies.

[Mileti] It is inconceivable to me that third-graders (for example) would be left on the curb with no transportation during a radiological emergency because their drivers had "role conflict" or for any other reason. I know of no scrap of empirical evidence that any such thing has ever happened in any emergency of any kind.

III. LILCO'S AUXILIARY SCHOOL BUS DRIVER PROCEDURE

43. Q. Mr. Crocker, would you please give us a brief overview of LERO's auxiliary school bus driver procedure?

A. [Crocker] Yes. First of all, LILCO believes that the regular school bus drivers will do their job in an emergency. LERO provides enough LERO school bus drivers, however, to evacuate all public and private schools in the 10-mile EPZ around Shoreham in a single wave. With LERO's auxiliary school bus driver procedure, there will be a "backup" LERO school bus driver for every regular school bus driver. The LERO "backup" driver would drive a school bus only if a regular driver was unable to drive, or decided not to drive, during a Shoreham emergency. Also, there will be enough additional LERO auxiliary school bus drivers to drive the extra number of buses needed to evacuate all EPZ schools in a single wave. These extra drivers are referred to as "primary" LERO school bus drivers.

Briefly stated, LERO's procedure requires that all LERO auxiliary school bus drivers, that is both backup and primary drivers, will be called out to help evacuate schools during an emergency at Shoreham. They will report directly to pre-designated bus yards and (1), if they are "primary" bus drivers, they will pick up a bus and go directly to one of the schools or (2), if they are "backup" drivers, they will inform the bus company dispatcher that they are ready to drive an evacuation bus in place of a regular bus driver if they are needed. Once at the school, the LERO bus drivers will let the school officials in charge know that they are ready to help evacuate the school children. At the direction of school personnel, the LERO bus drivers will evacuate the children to safety.

44. Q. What do you mean by a "single-wave" evacuation?

A. [Crocker] A single-wave evacuation means that enough buses and drivers are allocated to each school to ensure that no driver makes more than one trip. As a result, all schools are evacuated as quickly as possible. This practice is consistent with the school evacuation plans for counties around other nuclear power plants in New York State.

45. Q. If LILCO believes that the regular school bus drivers will drive during a Shoreham emergency, why did LILCO develop this procedure?

A. [Crocker] LILCO developed its auxiliary school bus driver procedure to remove any lingering doubt that there won't be enough bus drivers to transport school children safely out of the EPZ. LILCO also developed this plan so that all EPZ schools could be evacuated as quickly as possible in a single wave.

46. Q. How many school bus drivers are needed to evacuate all schools in the EPZ in a single wave?

A. [Crocker] In all, ⁵⁰⁹488 school bus drivers are needed to evacuate all public and private schools in the EPZ: ⁴⁷⁰449 are needed for public schools, 15 for parochial schools, and 24 for nursery schools.

47. Q. How did LILCO arrive at these numbers?

A. [Crocker] For the public and parochial schools we first determined the population of each school, reduced that number by 5% for daily absences, and then further reduced the number for high schools by an additional 20% to account for students who would evacuate in their own cars or with someone else. ~~Since the Longwood Junior High School is on split session, we also reduced its student population by half.~~ The final number for each school is the number of students who might need to be evacuated by bus for

that school. For nursery schools we used the student population numbers given to us by the nursery schools themselves.

Next we calculated the number of buses needed to evacuate each school based on 40 students per bus for high school and 60 students per bus for lower grades. These bus capacities are standardly applied in the industry. The results of these calculations are Attachment K to this testimony.

48. Q. Why did you reduce the school populations by 5% for daily absences and by 20% for those students using other transportation?

A. [Crocker] These assumptions are the same assumptions litigated during the 1984 emergency planning hearings. See Cordaro et al., ff. Tr. 9154, Vol. II, at 55. LILCO believes they are still valid today. ~~In 1984 all school populations were also reduced by 3% for split sessions. Since only one school is on split sessions, however, we reduced only that school's population number by half in our current calculations to more accurately reflect its population at any given time.~~

49. Q. How many regular school bus drivers are used by the school districts to transport students who go to school inside the 10-mile EPZ?

A. [Crocker] According to information LERO has been collecting over the past several months, there are approximately 301 regular school bus drivers contracted to or employed by the school districts to drive school buses for public and parochial schools in the EPZ. ^{Bus drivers of} Parochial schools are figured into this number because public school districts regularly transport parochial school children. Attachment L to this testimony shows the breakdown of regular school bus drivers per school district.

Since nursery schools normally do not provide transportation for their students, LERO will provide all of their transportation needs unless

they decide to provide their own. This practice is consistent with earlier revisions of the LERO Plan. Recently one nursery school told us that it would provide its own transportation during a Shoreham emergency. Thus, LERO will not provide this school any additional transportation.

50. Q. How many LERO emergency workers will be auxiliary school bus drivers?
- A. [Crocker] Presently LERO is training LERO emergency workers to be auxiliary school bus drivers. Once the training is completed, LERO expects to have ⁶¹³~~582~~ auxiliary school bus drivers to implement its school bus driver procedure. The number of drivers will be adjusted yearly according to current school-student populations to ensure that there are always enough bus drivers to do the job.

51. Q. How many of the LERO auxiliary school bus drivers live in the 10-mile EPZ?
- A. [Crocker] I don't have an exact count of the number of LERO school bus drivers who live in the EPZ. In response to an interrogatory from Suffolk County, I asked my staff to figure a best estimation of the number based on the street addresses of all LERO school bus drivers. Based on that count, about 46 of 562 bus drivers recruited at that time live in the EPZ.

This number is conservatively high, because a LERO worker was considered to live in the EPZ if we were unsure from his address whether he lived just inside or just outside the boundary. Of course, some bus drivers who do not live in the EPZ may have relatives who do live in it. Conversely some drivers who live in the EPZ may have no family living in the EPZ. Consequently 46 of 562 is likely to be a slightly conservative estimate of the LERO drivers who might have family in the EPZ.

52. Q. If only ⁵⁰⁹488 bus drivers are needed, why are there so many more when you add the number of LERO and regular bus drivers together?

A. [Crocker] In the interest of conservatism LERO customarily recruits more emergency workers than are needed, providing a 150% call-out for all of its LERO emergency worker positions. LERO's auxiliary school bus driver procedure has enough auxiliary school bus drivers to back up all 301 regular school bus drivers on a one-to-one basis. That covers 301 of the ⁵⁰⁹488 bus driver positions needed for a one-wave evacuation, which, when counting both regular and LERO school bus drivers, provides 200% coverage for the 301 regular bus driver positions. The remaining ²⁰⁸187 bus driver positions will be covered by the rest of the LERO school bus drivers; that is, ³¹²224 LERO drivers will fill the ²⁰⁸187 positions. This provides 150% coverage for these positions.

53. Q. When and how would LERO mobilize the auxiliary school bus drivers?

A. [Crocker] According to page II-20a of the LERO Plan, which is Attachment ⁰M to this testimony, LERO will mobilize its school bus drivers if one of the following events occurs during an emergency at Shoreham:

- 1) LERO makes a recommendation to evacuate or shelter schools; or
- 2) A public school district decides not to dismiss early or cancel classes when recommended by LERO.

To mobilize the LERO school bus drivers, pagers would be set off to a selected group of bus drivers, who in turn would call the rest of the bus drivers. The callers would instruct the bus drivers to report to their pre-assigned bus company yard. This procedure is similar to how the rest of LERO's emergency workers are mobilized.

54. Q. How will the LERO school bus drivers know where to go?
- A. [Crocker] LERO school bus drivers will be trained to report directly to a pre-designated bus yard.

55. Q. What will they do once they get to the bus yard?
- A. [Crocker] LERO auxiliary school bus drivers will serve either as "backup" or "primary" drivers. A LERO "backup" driver will go to a pre-designated bus yard that normally services an EPZ school. Once there, he will tell the bus company dispatcher that he is available to drive a bus if any of the regular school bus drivers elect not to drive. A LERO "backup" driver will drive only if the bus company dispatcher directs him to. If the bus dispatcher asks the LERO driver to drive, the driver will select an Assignment Packet from the LERO box, put on dosimetry, and fill out the emergency worker dose record form. Then he will obtain a bus from the dispatcher and head to the school indicated in the Assignment Packet.

A "primary" LERO school bus driver will go directly to a pre-designated bus yard that does not normally service an EPZ school and select an Assignment Packet from the LERO box. After putting on dosimetry and completing the necessary forms in the packet, the LERO primary bus driver will request that a bus be provided to him according to existing contracts between LILCO and the bus company. He will then drive directly to the school indicated in the packet.

56. Q. Explain what the "LERO boxes" are and tell us where they will be kept.
- A. [Crocker] LERO boxes contain the Assignment Packets that will be used by the bus drivers who will drive school evacuation buses during an emergency at Shoreham. The contents of the Assignment Packet is listed in the

"LERO School Bus Driver Procedure" which is Attachment ^PX to this testimony. There will be ~~a~~ separate LERO box^{es} for each bus yard that normally serves an EPZ school and for each additional bus yard that LERO will use to supplement the number of buses needed for a single-wave evacuation. LERO boxes will be stored at each bus yard or will be brought to the bus yard at the beginning of the emergency if LERO has not received permission to keep it there. Almost all boxes will be kept at the bus yards however.

57. Q. How will the bus company dispatchers know what to do?

A. [Crocker] Each LERO box will contain instructions for the bus company dispatcher explaining what he should do. Also, LERO's procedures provide that the LERO bus coordinator in the EOC will explain the process to him over the phone on the day of the emergency. We also intend to explain LERO's procedure to the bus company dispatchers beforehand.

58. Q. How will the drivers know when to go to the schools?

A. [Crocker] LERO primary school bus drivers will go directly to the schools indicated in the Assignment Packets once they pick up their buses. A back-up LERO school bus driver will go to the school indicated in the Assignment Packet only after the bus company dispatcher asks for his help and assigns a bus to him.

59. Q. How do the auxiliary school bus drivers know how to get to the schools?

A. [Crocker] All LERO auxiliary school bus drivers will be trained, like all other LERO bus drivers, on which routes they must take. For example, road rallies and/or drills may be used. In addition, each Assignment Packet will contain a map to the evacuating school.

60. Q. What will they do at the schools?

A. [Crocker] Once at the schools, each LERO school bus driver will report to the school personnel coordinating the evacuation and tell them that he is a LERO bus driver ready to drive the school children out of the EPZ. At the direction of school personnel, the LERO bus driver will help load children onto the bus. Before leaving the school the LERO bus driver will request that a school staff member accompany the children. The regular school bus drivers will also help evacuate the schools in the same manner.

61. Q. Who will supervise the school children before and after getting on the bus?

A. [Crocker] Teachers and other school personnel will supervise the school children before getting on the bus in the same manner they do every day or during early dismissal. We expect that at least one teacher will accompany the children and provide supervision on each bus.

62. Q. Then what?

A. [Crocker] After the bus is loaded, the school bus drivers will drive to the school relocation center designated for that school in the Assignment Packet (or proceed to another facility, if directed to do so by the school personnel on the bus).

63. Q. How will the school personnel know what to do?

A. [Crocker] We continually offer training to the school districts and have repeatedly expressed our interest in discussing school evacuation plans with them. Furthermore, we intend to provide each school in the 10-mile EPZ with guidelines on what to do in the event of an emergency at Shoreham. Also, LERO's Public and Private School Coordinators in the EOC will talk with each public school district and private school during the emergency

about what is happening. In addition, each bus driver will be able to explain the evacuation procedures to school personnel.

64. Q. Why do you believe LERO school bus drivers are qualified to drive school buses during a Shoreham emergency?

A. [Crocker] LERO auxiliary school bus drivers are qualified to transport school children during a Shoreham emergency because they will have the necessary New York State Class 2 operator's license and will be trained in their job-specific and other emergency procedures. We do not believe that LERO's auxiliary school bus drivers would need any other training to transport children, since the evacuation would be a one-time occurrence and since at least one teacher would be on the bus to supervise the children.

65. Q. Are regular school bus drivers approved of by the school districts in the EPZ to drive school buses?

A. [Crocker] According to my staff, bus drivers must be approved before they can drive a bus for a particular school district, either as a regular school bus driver or as a substitute for a regular school bus driver. Various Suffolk County witnesses who are school officials have testified to this fact in their depositions.

66. Q. Will LERO school bus drivers receive the same type of approval? If not, why not?

A. [Crocker] No. LERO does not intend to obtain the school districts' approval for its auxiliary school bus drivers. LILCO does not believe that emergency workers who are used to evacuate schools in a radiological emergency need the approval of the school districts, since they are not being employed as regular or substitute school bus drivers and will drive school buses only in the event of an emergency at Shoreham. We do not

believe that the approval process was intended to apply to such an exceptional situation. Furthermore, if the concern raised here is about supervision, each bus will have at least one teacher on it to provide the necessary care and supervision.

67. Q. Do you know anything about how schools are evacuated in the counties around the other nuclear power plants in New York?

A. [Crocker] Yes. I asked one of LILCO's consultants, Mr. Richard Watts, to call all of the counties within the 10-mile EPZ's of the other nuclear power plants in New York State to find out how they evacuate schools in their EPZ's. The planners he talked with are from Monroe, Oswego, Orange, Putnam, Rockland, Wayne, and Westchester counties. Mr. Watts discovered that all counties evacuate schools in a single wave using both the school districts' regular school bus drivers and other available bus drivers from other bus companies that do not normally serve those schools. Mr. Watts also asked the counties if the additional "non-school" bus drivers were approved by the school districts. Basically, they responded that they had never heard of any requirement that the extra drivers needed the school districts' approval before driving during a radiological emergency.

68. Q. Why do you believe that the school districts in the EPZ will let LERO school bus drivers transport their children out of the EPZ during an emergency at Shoreham?

A. [Crocker, Kelly, Lindell, Mileti] We believe that school authorities will use whatever resources are available to them to evacuate their schools. This means that the school districts would use LERO's buses and drivers as well as their own. To take any other course of action would go against the best interest of the children and might endanger their health and safety. If the school districts are concerned about adequate supervision of the

children on the buses, having teachers accompany the children resolves this concern.

69. Q. Will LILCO train regular school bus drivers to implement its school bus driver procedure?

A. [Crocker] LILCO has offered through the school districts to train all regular school bus drivers. This training would address emergency procedures, the drivers' emergency role as a bus driver, radiological information, provisions for families, information about Shoreham, and the use of dosimetry. Recently we offered the same training to the school bus drivers at two of the bus companies that service EPZ schools. That training will be coordinated through the bus companies. We intend to offer training through the other bus companies in the future.

Any regular bus driver who participates in LILCO's school bus driver program will be compensated for his time in training and will receive an annual bonus. In an emergency these drivers would also participate in LERO's family tracking system, and those with families living in the EPZ would be eligible to have their families stay at LERO family congregate care centers.

70. Q. What if a regular school bus driver wants to help with the evacuation but hasn't been trained in LILCO's procedures. How will she know what to do?

A. [Crocker] The bus company dispatcher will know in advance that regular school bus drivers should also use the Assignment Packets to determine what they need to do. So if the regular school bus drivers haven't been trained by LERO and want to help evacuate schools, the bus company dispatcher will tell them to take an Assignment Packet and help evacuate the school described in it. Also, the LERO auxiliary school bus drivers will help

the regular drivers understand what they need to do. If there are a sufficient number of drivers LERO drivers may accompany regular school bus drivers on their assignments.

71. Q. LERO Drivers will have dosimetry. What will the regular bus drivers use?
- A. [Crocker] Dosimetry will be available in the LERO boxes for all school bus drivers. Each Assignment Packet will contain two direct reading dosimeters (DRD's) and two thermo-luminescent dosimeters (TLD's). LERO drivers, who will be fully trained in the use of these devices, will use the two DRD's and one of the TLD's. The other TLD will be used by the regular school bus driver who hasn't been trained in dosimetry, so that her exposure may be recorded.

In addition, each Assignment Packet will contain two potassium iodide (KI) tablets, one each for the LERO driver and the regular driver who might together fulfill the bus driver assignment.

72. Q. If, as LILCO believes, the regular bus drivers will assist in the evacuation, what will the extra "backup" drivers do?
- A. [Crocker] When all the required buses have been dispatched, the remaining LERO backup drivers will report to the Patchogue Staging Area for possible reassignment.
73. Q. Does this conclude your testimony?
- A. [Crocker, Kelly, Lindell, Milet] Yes.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)

LONG ISLAND LIGHTING COMPANY)

(Shoreham Nuclear Power Station
Unit 1))

) Docket No. 50-322-OL-3
) (Emergency Planning)
) (School Bus Driver Issue)
)

ATTACHMENTS FOR
TESTIMONY OF DOUGLAS M. CROCKER,
ROBERT B. KELLY, MICHAEL K. LINDELL, AND
DENNIS S. MILETI ON THE REMANDED ISSUE
OF "ROLE CONFLICT" OF SCHOOL BUS DRIVERS

Hunton & Williams
707 East Main Street
P.O. Box 1535
Richmond, Virginia 23212

April 13, 1988

"ROLE CONFLICT" OF SCHOOL BUS
DRIVERS TESTIMONY ATTACHMENTS INDEX

- A. Resume of Douglas M. Crocker
- B. Resume of Robert B. Kelly
- C. Resume of Michael K. Lindell
- D. Resume of Dennis S. Miletì
- E. "Role Abandonment by Bus Drivers During Major Emergency Evacuations" by Robert B. Kelly
- F. Interview Schedule for Bus Driver Study for Organizational Respondents
- G. Results of the Bus Driver Study for Organizational Respondents
- H. Bus Driver Interview Schedule
- I. Results of the Bus Driver Interview Study
- J. LILCO's 1984 testimony, Cordaro et al., ff. Tr. 832 at 88-93.
- K. "School Transportation Requirements For a One-Wave Evacuation" Chart
- L. "Regular Bus Drivers Employed By or On Contract to School Districts in the Shoreham 10-mile EPZ" Chart
- M. Pages II-19 through II-21 of App. A of the LILCO Plan (Draft)
- N. OPIP 3.6.5, Attachment 14, "LERO School Bus Driver Procedure" (Draft)

ATTACHMENT A

DOUGLAS M. CROCKER

MANAGER, NUCLEAR EMERGENCY PREPAREDNESS DIVISION
NUCLEAR OPERATIONS SUPPORT DEPARTMENT
LONG ISLAND LIGHTING COMPANY

EDUCATION

Stevens Institute of Technology - B.E. with Honor in Mechanical Engineering, 1972

State University of New York at Stony Brook - M.S. in Marine Environmental Science, 1978

Stone & Webster Radiological Safety Course

Medical Aspects of Radiological Emergencies Course, New York Academy of Medicine, 1983

Harvard School of Public Health, "Planning for Nuclear Emergencies," 1985

Harvard School of Public Health, "Advanced Planning for Nuclear Emergencies," 1986

EXPERIENCE SUMMARY

During the period May 1980 to the present, Mr. Crocker was generally responsible for preparing emergency plans, procedures, training programs, exercise scenarios, and other emergency planning activities. He was actively involved in ASLB licensing hearings on emergency planning. He has participated in many practice exercises and has observed many emergency plan exercises.

Mr. Crocker is presently Nuclear Emergency Preparedness Manager responsible for the SNPS Onsite and Offsite (LERO) Emergency Preparedness Programs. This consists of developing and maintaining facilities, plans, procedures, training, and drill programs to satisfy NRC and FEMA requirements in support of the SNPS licensing effort. He directs a staff of 45 LILCO and consultant personnel.

From May 1986 to December 1987, Mr. Crocker served as Supervisor - Offsite Emergency Preparedness in addition to his duties as Manager of Nuclear Emergency Preparedness.

During the period March 1985 to June 1986, Mr. Crocker was Onsite Emergency Preparedness Supervisor responsible for all onsite planning activities including the onsite portion of the 1986 NRC observed exercise.

From September 1982 to February 1985 Mr. Crocker was Project Engineer responsible for all Stone & Webster Engineering Corp. - N.Y. emergency planning projects. In this capacity, he directed a staff of forty-five engineers and planners in the execution of up to five simultaneous projects for utility clients.

Mr. Crocker joined Stone & Webster Engineering Corporation (SWEC) in May 1976 as an Engineer in the Environmental Engineering Division. Working in the Environmental Impact Analysis Group, his activities included the mathematical modeling of cooling tower visible

plumes, coastal storm surge, and wave effects on shoreline intake structures. He has also had experience with the modeling of thermal discharges from power plants and with the collection and analysis of hydrothermal data. His past assignments include circulating water system performance tests at Shoreham Nuclear Power Station and the preparation of industrial energy survey reports for the petroleum refining and olefins industry. At Shoreham, Mr. Crocker was responsible for the collection and analysis of hydraulic transient data.

Prior to joining SWEC, Mr. Crocker worked as a Research Assistant at the Marine Science Research Center at the State University of New York at Stony Brook, collecting and analyzing oceanographic data during his graduate study from 1974 to 1976.

From 1972 to 1973, Mr. Crocker worked as an Estimator for L. K. Comstock and Co., Inc., preparing bids for electrical construction projects.

PUBLICATIONS

"Radiological Protection Issues Associated with the Establishment and Operation of Public Evacuee Reception Centers on Long Island," D. M. Crocker, D. P. Dreikorn, and R. J. Watts, to be presented at the Health Physics Society Annual Meeting, Boston, Mass., July, 1988.

"Development and Verification of a Synthetic Northeaster Model in Application to Coastal Flooding," Y. J. Tsai, D. M. Crocker, T. J. Burda, and F. K. Chou, Proceedings of National Symposium on Urban Storm Water Management in Coastal Areas, 1980.

"Intake Screenwall Surging Caused by Wave Dynamics," Y. J. Tsai, Y. C. Chang, and D. M. Crocker, Hydraulics in the Coastal Zone, 1979.

"EN-129: Cooling Tower Visible Plume Model - User's Manual," Y. J. Tsai and D. M. Crocker, Stone & Webster Engineering Corp., April 1977.

"EM-128 - Intake Surge Model - User's Manual," D. M. Crocker and Y. C. Chang, Stone & Webster Engineering Corp., August 1977.

AWARDS

Stone & Webster Engineering Corporation's "Ten Best Papers Award," 1980.

DETAILED EXPERIENCE RECORD
DOUGLAS M. CROCKER

LONG ISLAND LIGHTING COMPANY, SHOREHAM NUCLEAR POWER STATION (May 1984 to present)

Manager, Nuclear Emergency Preparedness Division (July 1986 to present)

Mr. Crocker is responsible for all Nuclear Emergency Preparedness activities for the Shoreham Nuclear Power Station. He oversees the onsite and offsite (LERO) emergency preparedness programs to ensure a satisfactory level of preparedness. He is responsible for plans, procedures, drills, training, exercises, and facilities for the 3600 member emergency response organization. In this effort, he directs a staff of 45 LILCO and consultant personnel. Additional duties include providing technical support and testimony in ASLB licensing hearings, coordinating with legal support organizations, and coordinating exercise activities with NRC and FEMA. During the period July 1986 to December 1987, Mr. Crocker also served as Acting Offsite Emergency Preparedness Supervisor.

Offsite Emergency Preparedness Supervisor (May 1986 to July 1986)

Mr. Crocker was responsible for the development and maintenance of the Local Emergency Response Organization (LERO). He was responsible for the LERO plan and procedures, training, drills, and facility maintenance. He supervised a staff of twelve LILCO and consultant personnel. Additional duties included support of ASLB licensing hearings on emergency preparedness issues and the resolution of FEMA plan and exercise comments.

Onsite Emergency Preparedness Supervisor (March 1985 to May 1986)

Mr. Crocker was responsible for the Onsite Emergency Preparedness Program. He directed the preparation and maintenance of: (1) SNPS Emergency Plan and Procedures, (2) Emergency Response facilities, (3) Emergency Preparedness Training Program, and (4) Emergency Preparedness Drill Program. He was responsible for preparations for the successful onsite portions of the first NRC observed exercise. He directed a staff of ten LILCO and consultant personnel in this effort.

Onsite Emergency Preparedness Coordinator (acting) (May 1984 to February 1985)

Mr. Crocker came to SNPS as a Stone & Webster employee in May 1984 to serve as an interim replacement for the departing LILCO coordinator. He was responsible for the onsite emergency preparedness preparations for the first NRC observed exercise. Mr. Crocker left Stone & Webster to work for LILCO in the same capacity.

STONE & WEBSTER ENGINEERING CORPORATION, NEW YORK, N.Y. (May 1976 to February 1985)

Appointments:

Project Engineer - 1982

Environmental Engineer - 1982

Engineer - Environmental - May 1976

Emergency Planning, SWEC-NY (September 1982 to February 1985)

Mr. Crocker was PROJECT ENGINEER, responsible for all emergency planning work in SWEC-NY, supervising a group of approximately forty-five planners.

Long Island Lighting Company (September 1982 to February 1985)

Mr. Crocker was PROJECT ENGINEER, coordinating planning support services by SWEC personnel at LILCO headquarters and the Shoreham site.

Public Service Company of Indiana (September 1982 to January 1984)

Mr. Crocker was PROJECT ENGINEER for emergency planning for the Kentucky portions of the Marble Hill NGS emergency planning zone. He was responsible for the preparation of state and county plans, procedures and training.

State of Delaware (September 1982 to November 1983)

Mr. Crocker was PROJECT ENGINEER, directing emergency plan, procedure, and training program development for the Delaware Department of Emergency Planning and Operations.

Cincinnati Gas & Electric Company (May 1980 to January 1984)

Mr. Crocker was PROJECT ENGINEER for emergency planning for the Wm. H. Zimmer Nuclear Power Station in Moscow, Ohio. He was responsible for all offsite emergency plans, procedures, and training, and provided licensing support to CG&E during its ASLB hearings.

Brookhaven National Laboratory (March 1980 to April 1980)

Mr. Crocker was assigned to a feasibility study of alternative fuel uses in industrial boilers and furnaces.

Long Island Lighting Company (November 1979 to February 1980)

Mr. Crocker was assigned to the pressure and performance testing of the cooling water circulating system at the Shoreham Nuclear Power Station, where he was responsible for data collection and analysis.

U.S. Department of Housing and Urban Development, Federal Flood Insurance Administration (FIA) (March 1978 to December 1978)

Mr. Crocker conducted Flood Insurance Studies for nine coastal communities in Maine. He was PRINCIPAL COASTAL INVESTIGATOR, responsible for the development of a synthetic northeaster storm model and for the analysis of coastal flood elevations.

U.S. Department of Housing and Urban Development, Federal Flood Insurance Administration (FIA) (June 1977 to March 1978)

Mr. Crocker was SUPPORT COASTAL ENGINEER for the Maine flood study. He was assigned to northeaster computer model development.

National Oil Company, Libya (May 1977 to June 1977)

He was responsible for a wave and surge study for intake design. Mr. Crocker determined design parameters of an intake structure located on the Mediterranean Sea.

Indiana Power & Light Company (March 1977 to July 1977)

Mr. Crocker analyzed the hydrothermal characteristics of a cooling tower blowdown discharge into the Ohio River.

Millstone Unit No. 3, Northeast Utilities (May 1977)

Mr. Crocker conducted a hurricane surge and wave study for the design of a cooling water intake structure.

Long Island Lighting Company (January 1977 to April 1977)

Mr. Crocker participated in hurricane surge and wave analysis. He developed a computer model of intake screenwell surging in response to storm waves. He also calculated storm surge elevations caused by a modified probable maximum hurricane.

Koshkonong Units 1 and 2, Wisconsin Electric Power (January 1977 to March 1977)

He analyzed hydrothermal characteristics of a cooling tower blowdown discharge into the Rock River.

Mystic Station Unit No. 7, Boston Edison Company (August 1976 to January 1977)

Mr. Crocker conducted a hydrothermal field survey and data analysis. He was responsible for a temperature and dye field survey and subsequent analysis to determine the hydrothermal characteristics of a fossil power plant once through cooling system discharge and its effects on circulation in the Mystic River Estuary.

Jamesport Units 1 and 2, Long Island Lighting Company (July 1976 to August 1986)

Mr. Crocker conducted an analysis of wave forces in the interior of the cooling water intake structure.

Montague Units 1 and 2, Northeast Utilities (May 1976 to July 1976)

Mr. Crocker was responsible for the modification and verification of a cooling tower visible plume model. He incorporated upper air sounding data into the analysis of plumes.

State University of New York at Stony Brook (1975 to 1976)

As a RESEARCH ASSISTANT, Mr. Crocker developed computer models of tidal circulation in New York Harbor and the Peconic Estuary.

ATTACHMENT B

RESUME OF ROBERT B. KELLY

EDUCATION

Lesley College, M.S., Management, 1984
Tufts University, B.A., Political Science, 1980
Federal Emergency Management Agency-Professional Development
Courses

FEMA Courses and Seminars:

- Nuclear Civil Protection Seminars
- Emergency Management - Introduction
- Radiological Home Monitoring Course
- Radiological Defense Officers Course
- Shelter Seminar
- Population Protection Seminar

EXPERIENCE

Roy F. Weston, Inc., 1987 to Present
NUS Corporation, 1985 - 1987
Massachusetts Civil Defense Agency, 1981 - 1985
Federal Emergency Management Agency, 1980 - 1981

Roy F. Weston, Inc. - As a Senior Project Manager in the Expert Systems Department, is responsible for developing emergency management and community right-to-know programs for clients. Currently is managing a major evacuation database project; developing functional specifications for an emergency response expert system; and working on other emergency management programs.

NUS Corporation - As Supervisor of the Emergency Preparedness Section, directed the development of emergency preparedness programs for nuclear utilities, chemical plants, hospitals, and other industrial facilities, and government agencies. Prepared emergency plans and implementing procedures and conducted capability assessments to ensure program effectiveness. Reviewed and integrated facility and local response agency preparedness programs to ensure compatibility and compliance with government regulations. Developed and presented training programs for emergency planning and response. Developed emergency drill and exercise programs including scenario preparation, MSEs, exercise conduct, and evaluation reports.

Examples of projects at NUS:

- Reviewed the emergency plan for a community near a DOE facility
- Reviewed a waste water treatment plant's emergency preparedness program
- Developed an emergency plan for a waste water treatment plant

- Reviewed the emergency plan for a pharmaceutical plant, a chemical plant, and an electronics facility
- Developed an industrial park emergency plan
- Developed an industrial emergency annex of a city emergency operations plan
- Designed exercise plans (MSEL, scenario development, etc.) for two community exercises
- Evaluated drills and exercises (community and plant level)
- Developed an audit procedure for hospital emergency plans
- Developed an emergency public information booklet for a pharmaceutical plant
- Conducted a training needs analysis for a pharmaceutical plant
- Developed a video-based training program for a major industry association
- Developed and conducted a course for industrial emergency preparedness for the American Society of Safety Engineers

Massachusetts Civil Defense Agency - As Assistant Planning Director, managed professional planning office staff. Coordinated the Commonwealth's Disaster Assistance Program. Responsible for the development and implementation of the State's Comprehensive Emergency Management Plan, Emergency Broadcast System plan, and nuclear civil protection plans. Developed programs for disaster recovery activities. Developed public information and educational programs. Developed emergency management databases. Directed development of comprehensive emergency management plans and hazard analyses studies for 165 local communities.

In conjunction with local officials, developed training programs and exercises. Assisted in testing the State's radiological emergency plan. Coordinated the Agency's medical services advisory committee. Analyzed current and proposed legislation and prepared impact reports for the Director. Developed the State's Hazard Analysis Study.

As a junior planner for the State, developed support plans covering medical care, hospital relocation, and transportation routes. Educated local officials through seminars and meetings. Assisted in development of radiological plans for local communities. Participated in various emergency operations including but not limited to: Lynn fire, 1984 spring floods, winter storms, Salem fire and State employees strike.

Federal Emergency Management Agency - As Emergency Management Specialist, worked on various disaster response and recovery projects. Coordinated in-processing and out-processing at the Fort McCoy Cuban Refugee Relocation Camp. Served as Verification Specialist during recovery operations in Texas following Hurricane Allen. Responsible for review of damage survey reports and insurance settlements.

Developed after action reports of Cuban Refugee project for the FEMA Regional Director.

Assisted in the recovery program for the "Blizzard of 1978" winter storm.

MEMBERSHIPS

American Society of Safety Engineers
Emergency Management Committee of the International
Association of Fire Chiefs
Association of International Disaster Experts
National Coordinating Council on Emergency Management
American Society for Public Administration

PUBLICATIONS AND TECHNICAL PRESENTATIONS

"Dealing with the Media During Emergencies," HAZMAT 86 Workshop, June 1986.

"Beyond Contingency Planning: Development Strong Emergency Preparedness Capability," Presented at HAZTECH, August 1986.

"Choosing and Developing the Proper Emergency Plans for Your Facility," National Health and Safety News, November 1986.

Presentation to the Buffalo Chapter of the American Society of Safety Engineers - Developing Emergency Plans.

Presentation to the Pittsburgh Chapter of the Association of Industrial Hygienists - Developing Effective Emergency Preparedness Programs.

Presentation to the Louisiana Loss Control Association - Developing Effective Emergency Preparedness Programs.

ATTACHMENT C

MICHAEL K. LINDELL

April 1988

EDUCATION

Ph D Social/Quantitative Psychology, University of Colorado, 1975
BA Psychology, University of Colorado, 1969

PROFESSIONAL POSITIONS

1987 to Associate Professor of Psychology
present Michigan State University

1987 to Adjunct Faculty Federal Emergency Management Agency
present National Emergency Training Center

1986 to Visiting Associate Professor of Psychology
1987 Georgia Institute of Technology

1981 to Adjunct Assistant Professor of Psychology
1987 University of Washington

1974 to Research Scientist
present Battelle Human Affairs Research Centers

1981 Visiting Lecturer in Educational Psychology
School of Education, University of Washington

1974 Research Psychologist, K.R. Hammond Associates

1972 to Data Analyst/Computer Programmer
1974 University of Colorado

1971 to Teaching Assistant
1972 University of Colorado

1970 to Research Assistant
1971 University of Colorado

PROFESSIONAL ASSOCIATIONS

American Statistical Association
Human Factors Society
Society for Risk Analysis
Judgment/Decisionmaking Society
American Society of Civil Engineers (Affiliate Member)

PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR

National Institute of Mental Health. Consequences of natural hazards for mental health, 5/77-2/78, \$10,000.

Office of Naval Research. Effects of social structure, technology and job design on job satisfaction, 3/77-8/80, \$77,000.

Energy Research and Development Administration. Public perception and evaluation of risk associated with nuclear waste, 10/77-9/78, \$50,000.

Private Corporation. Analysis of position evaluation system, 5/79-12/79, \$15,000.

Department of Energy. Consumer response to gasoline shortage, 7/79-1/80, \$30,000.

Nuclear Regulatory Commission. Technical assistance in implementing emergency preparedness requirements, 9/79-9/82, \$355,000.

Nuclear Regulatory Commission. Evaluation of licensee emergency response facility designs, 6/81-10/81, \$56,000.

Nuclear Regulatory Commission. Design assistance for NRC headquarters and regional operations centers, 9/81-3/84, \$105,000.

Nuclear Regulatory Commission. Evaluation of emergency exercises at nuclear power plants, 10/81-9/82, \$114,000.

Nuclear Regulatory Commission. Analysis of emergency staffing, 10/82-3/84, \$59,000.

Atomic Industrial Forum. Planning concepts and decision criteria for sheltering and evacuation, 8/83-5/84, \$110,000.

National Science Foundation. Contingent conditions for research-based local emergency planning, 6/83-5/85, \$21,000.

National Science Foundation. Behavioral response to technological hazards, 8/84-11/85, \$60,000.

Westinghouse Corporation. Human factors assistance for the Hanford Emergency Control Center, 1/85-9/85, \$26,000.

Private Corporation. Toxic chemical emergency response plan, 1/86-7/86, \$44,000.

Department of Energy. Human factors assistance for the DOE headquarters emergency operations center, 2/86-11/86, \$66,000.

Nuclear Regulatory Commission. Evaluation of licensee emergency response facilities, 5/86-9/86, \$19,000.

SCIENTIFIC JOURNAL AD HOC REVIEWS

Academy of Management Review
Risk Analysis
Disasters
International Journal of Mass Emergencies and Disasters
Nuclear Safety
Journal of Applied Psychology
Professional Psychology

SCIENTIFIC PEER REVIEW PANEL MEMBERSHIP

National Science Foundation, Community Water Management Program
National Science Foundation, Applied Science and Research Applications
Directorate
National Science Foundation, Earthquake Hazards Mitigation Program
National Science Foundation, Decision and Management Science Program
Brookhaven National Laboratory, Department of Nuclear Energy
University of Washington, Department of Family Medicine
Pennsylvania State University College of Medicine, Department of Behavioral
Science
University of Pittsburgh, University Center for Social and Urban Research
University of Southern California, Institute of Safety and Systems Management
National Science Foundation, Geography and Regional Science Program
Argonne National Laboratory, Energy and Environmental Systems Division

EXPERT TESTIMONY

Public Forum on the Operation of the Shoreham Nuclear Power Plant sponsored
by Scientists and Engineers for Secure Energy

Public Hearing on the Operation of the Pilgrim Nuclear Power Plant sponsored
by the Plymouth Board of Selectmen and Boston Edison Company

Litigation of Long Island Lighting Company's Application for an operating
license for the Shoreham Nuclear Power Station conducted by the U.S.
Nuclear Regulatory Commission Atomic Safety and Licensing Board,
Dockets 50-322-OL-3 (Emergency Planning) and -OL-5 (Emergency
Exercise Performance)

PROFESSIONAL COMMITTEES

Committee Member--American National Standards Institute/American Nuclear
Society Committee on Criteria for Emergency Response Facilities

Conference Chair--American Society of Civil Engineers Specialty Conference on
Planning for Hazardous Facilities

Committee Member—Academy of Management Program Committee

BOOKS AND CHAPTERS

- Perry, R.W., Lindell, M.K. and Greene, M.R. Evacuation Planning in Emergency Management, Lexington, MA: Health Lexington Books, 1981.
- Perry, R.W. and Lindell, M.K. Human Adjustment to Volcano Hazards, Pullman, WA: Washington State University Press, in press.
- Perry, R.W. and Lindell, M.K. Handbook of Emergency Response Planning, New York: Hemisphere Publishing, in press.
- Stewart, T.R., Joyce C.R.B. and Lindell, M.K. New analyses: application of judgment theory to physicians' judgments of drug effects. In K.R. Hammond and C.R.B. Joyce (Eds.) Psychoactive Drugs and Social Judgment Theory and Research, New York: Wiley Interscience, 1975.
- Earle, T.C. and Lindell, M.K. Public perception of industrial risks: a free response approach. In R.A. Waller and V.T. Covello (Eds.) Low Probability High Consequence Risk Analysis Issues, Methods and Case Studies, New York: Plenum Press, 1984.
- Perry, R.W. and Lindell, M.K. Communicating threat information for volcano hazards. In L. Walters (Ed.) Communication in Disaster Disseminating Bad News, in press.

JOURNAL ARTICLES

- Lindell, M.K. and Stewart, T.R. The effects of redundancy in multiple cue probability learning. American Journal of Psychology 1974, 87, 393-398.
- Lindell, M.K. Cognitive and outcome feedback in multiple cue probability learning tasks. Journal of Experimental Psychology Human Learning and Memory 1976, 2, 739-745.
- Lindell, M.K. Interpretation of the R^2 index in regression models of judgment. Educational and Psychological Measurement 1978, 38, 69-74.
- Perry, R.W. and Lindell, M.K. Psychological consequences of natural disaster. Mass Emergencies 1978, 3, 105-115.
- Lindell, M.K. and Drexler, J.A., Jr., Issues in using survey methods for measuring organizational change. Academy of Management Review 1979, 4, 13-19.
- Lindell, M.K. and Drexler, J.A., Jr., Equivocality of factor incongruence as an indicator of type of change in OD interventions. Academy of Management Review 1980, 5, 105-107.

- Lindell, M.K. and Perry, R.W. Evaluation criteria for emergency response plans in radiological transportation Journal of Hazardous Materials 1980, 3, 335-345.
- Lindell, M.K. and St. Clair, J.B. TUKKNIFE A jackknife supplement to canned statistical packages. Educational and Psychological Measurement 1980, 40, 71-74.
- Perry, R.W., Greene, M.R. and Lindell, M.K. Enhancing evacuation warning compliance suggestions for emergency planning. Disasters 1980, 4, 433-449.
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- Drexler, J.A., Jr. and Lindell, M.K. Training/job fit and worker satisfaction. Human Relations 1981, 34, 907-915.
- Southwick, L., Steele, C., Marlatt, A. and Lindell, M. Alcohol-related expectancies defined by phase of intoxication and drinking experience. Journal of Consulting and Clinical Psychology 1981, 49, 713-721.
- Perry, R.W., Lindell, M.K. and Greene, M.R. Threat perception and public response to volcano hazard. Journal of Social Psychology, 1982, 116, 199-204.
- Lindell, M.K., Perry, R.W. and Greene, M.R. Individual response to emergency preparedness planning near Mt. St. Helens. Disaster Management, 1983, 3, 5-11.
- Perry, R.W., Lindell, M.K. and Greene, M.R. Crisis communications, ethnic differentials in interpreting and responding to disaster warnings. Social Behavior and Personality, 1982, 10, 97-104.
- Lindell, M.K. and Earle, T.C. How close is close enough: public perceptions of the risks of industrial facilities. Risk Analysis, 1983, 3, 245-253.
- Houts, P.S., Lindell, M.K., Hu, T.W., Cleary, P.D., Tokuhata, G. and Flynn, C.B. The protective action decision model applied to evacuation during the Three Mile Island crisis. International Journal of Mass Emergencies and Disasters, 1984, 2, 27-39.
- Lindell, M.K. and Barnes, V.D. Protective response to technological emergency risk perception and behavioral intention. Nuclear Safety, 1986, 27, 457-467.
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- Kartez, J.D. and Lindell, M.K. Planning for uncertainty: the case of local disaster planning. Journal of the American Planning Association, in press.

Lindell, M.K. and Perry, R.W. Warning mechanisms in emergency response systems. International Journal of Mass Emergencies and Disasters, in press.

OTHER ARTICLES

Lindell, M.K., Perry, R.W. and Greene, M.R. Mount St. Helens: Washingtonians View Their Volcano. Hazard Monthly, 1980, 1(2), 1-3.

Perry, R.W., Lindell, M.K. and Greene, M.R. Flood Warning: How People React After the Warning. Hazard Monthly, 1981, 1(11), 1-6.

Lindell, M.K. and Perry, R.W. Nuclear power plant emergency warning: how would the public respond? Nuclear News, 1983, 26, 49-53.

Lindell, M.K. Review of "Warning and Response to the Mt. St. Helens Eruption" by Saarinen and Sell. Disasters, 1985, 9, 230-232.

Perry, R.W. and Lindell, M.K. Source Credibility in Volcanic Hazard Information. Volcano News, 1986, 22(12), 7-10.

PRESENTATIONS

Lindell, M.K., 1976. Assessment of social values in nuclear waste disposal. Western Psychological Association.

Lindell, M.K. and Maynard, W.S., 1976. Interchange of technical information and public beliefs in energy decisionmaking. Western Psychological Association.

Drexler, J.A. Jr. and Lindell, M.K., 1976. Training/ job fit and worker satisfaction. Western Psychological Association.

Lindell, M.K., 1978. Jackknife, ridge and ordinary least squares estimators of regression parameters: a monte carlo comparison. Psychometric Society.

Lindell, M.K. and Drexler, J.A., Jr., 1978. Issues in using survey methods for measuring organizational change. Western Psychological Association.

Lindell, M.K., 1978. Equal vs. differential predictor weights; testing hypotheses and estimates with restricted regression models. Psychometric Society.

Perry, R.W. and Lindell, M.K., 1979. Predisaster planning to promote compliance with evacuation warnings. National Conference on Hurricanes and Coastal Storms.

Lindell, M.K., Earle, T.C., and Perry, R.W., 1979. Radioactive wastes; public attitudes toward disposal facilities. American Nuclear Society.

- Lindell, M.K., 1980. Ridge and ordinary least squares estimators of relative weights in regression analysis. Psychometric Society.
- Lindell, M.K., Perry, R.W. and Greene, M.R., 1980. Race and disaster warning response. Pacific Sociological Association.
- Lindell, M.K., Perry, R.W. and Greene, M.R., 1980. Consistency of attitudes and behavior related to nuclear power. Western Psychological Association.
- Greene, M.R., Perry, R.W. and Lindell, M.K., 1981. Citizen perception of public action. Western Political Science Association.
- Lindell, M.K., Perry, R.W. and Greene, M.R., 1981. Individual response to emergency preparedness planning. Western Social Science Association.
- Lindell, M.K., Perry, R.W. and Greene, M.R., 1981. Social and psychological factors affecting evacuation decisionmaking. American Psychological Association.
- McGuire, M.V., Lindell, M.K. and Walsh, M.E., 1981. Law enforcement response to an investigative innovation. American Psychology Law Society.
- Perry, R.W., Greene, M.R. and Lindell, M.K., 1981. Evacuation behavior during the May 18th eruption of Mt. St. Helens. Pacific Sociological Association.
- Bolton, P.A., Perry, R.W., Lindell, M.K. and Greene, M.R., 1981. Hazard experience and warning response of older persons. Gerontological Society of America.
- Earle, T.C. and Lindell, M.K., 1982. Public perceptions of industrial risks. Society for Risk Analysis Workshop on Low Probability-High Consequence Risk Analysis.
- Lindell, M.K. and Earle, T.C., 1982. How close is close enough: public perceptions of the risks of industrial facilities. Society for Risk Analysis Workshop on Low Probability-High Consequence Risk Analysis.
- Lindell, M.K., 1982. Judgments, values and the management of conflict over nuclear waste. First International Conference on Social Impact Assessment.
- Lindell, M.K., 1982. Development of a design for the Nuclear Regulatory Commission's emergency operations center. Human Factors Society.
- Lindell, M.K. and Perry, R.W., 1982. Protective action recommendations; how would the public respond? American Nuclear Society.
- Lindell, M.K. and Southwick, L.L., 1982. An analysis of information integration using free response data. American Psychological Association.
- Southwick, L.L., Lindell, M.K. and Earle, T.C., 1982. Attitude polarization in public issues: the roles of cognitive complexity, evaluative consistency and issue importance. Washington State Psychological Association.

- Hansvick, C. Archea, J., Hanson, H., Keating, J., Lindell, M.K. and Wise, J.A., 1983. Designing for personal control in hazards and disasters. Environmental Design Research Association.
- Lindell, M.K., 1983. Analysis of emergency staffing for nuclear power plants. Human Factors Society.
- Lindell, M.K., Moeller, P.A. and Renner, M.S., 1984. Offsite response considerations for appropriate protective actions. American Nuclear Society.
- Lindell, M.K. and Perry, R.W., 1984. Social psychological processes and personal risk assessment. Society for Risk Analysis.
- Lindell, M.K., 1984. Communicating risk information to the public: a review of research on natural hazards. NSF/EPA Workshop on Risk Communication.
- Lindell, M.K., 1985. Tukey's "jackknife" in theory and in practice. American Psychological Association.
- Lindell, M.K., 1985. Decision criteria for sheltering or evacuating medical facilities in radiological and hazardous materials incidents. Association for the Advancement of Medical Instrumentation.

SHORT COURSES AND OTHER LECTURES

- Lindell, M.K., 1983. Perception of risk at nuclear waste disposal sites and power plants. Lecture for Pacific Lutheran University Center for the Study of Public Policy.
- Lindell, M.K., 1983. Emergency preparedness at nuclear power plants. Lecture to University of Washington Department of Environmental Health and Nuclear Engineering.
- Lindell, M.K., 1983. Design of emergency response facilities. Pacific Northwest Laboratory Short Course in Emergency Planning.
- Lindell, M.K., 1983. Emergency public information. Pacific Northwest Laboratory Short Course in Emergency Planning.
- Lindell, M.K., 1984. Emergency staffing. Pacific Northwest Laboratory Short Course in Emergency Planning.
- Lindell, M.K., 1984. Emergency public information. Pacific Northwest Laboratory Short Course in Emergency Planning.
- Lindell, M.K., 1985. Protective action decisionmaking. Pacific Northwest Laboratory Short Course in Emergency Planning.
- Lindell, M.K., 1985. Emergency public information. Pacific Northwest Laboratory Short Course in Emergency Planning.

- Lindell, M.K., 1985. Social and political aspects of nuclear power plant emergency planning. Health Physics Society Short Course on Emergency Planning.
- Lindell, M.K., 1985. Social response to the Mt. St. Helens eruptions. University of Washington Extension Course on Mt. St. Helens.
- Lindell, M.K., 1985. Emergency management planning principles for large-scale emergencies involving technological and natural hazards in developed and developing nations. Administrative Staff College of India Workshop in Risk Analysis in Developing Countries.
- Lindell, M.K., 1986. Concerns about offsite response in a nuclear power plant emergency. GPU Nuclear Annual Training Workshop for TMI Area Emergency Response Agencies.
- Lindell, M.K., 1987. Public Response Considerations and Public Information. Federal Emergency Management Agency National Emergency Training Center Short Course on Evacuation Planning and Response Simulation. Also given in January 1988 and May 1988.
- Lindell, M.K., 1988. Disaster Psychology. Federal Emergency Management Agency National Emergency Training Center Short Course on Multi Hazard Planning (given in February and May).

TECHNICAL REPORTS

Over 40 technical reports to governmental and corporate sponsors of grants and contracts. Titles available on request, reports available through the Battelle Human Affairs Research Centers Technical Library.

ATTACHMENT D

ACADEMIC VITA OF DENNIS S. MILETI
March, 1988

PERSONAL

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Department of Sociology
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Hazards Assessment Laboratory
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Fort Collins, Colorado 80523

EDUCATION

University of Colorado, Boulder: PhD, Sociology, 1974
California State University, Los Angeles: MA, Sociology, 1971
University of California, Los Angeles: BA, Sociology, 1968

SPECIALIZATIONS

Complex Organizations, Applied (Hazards and Policy), Methods

APPOINTMENTS

1974-date	Faculty, Department of Sociology, Colorado State University, Fort Collins (1985-date, Professor; 1978-1985, Associate Professor; 1974-1978, Assistant Professor).
1984-date	Director, Hazards Assessment Laboratory, Colorado State University, Fort Collins.
1986-date	Adjunct Professor, Department of Sociology, University of Tennessee, Knoxville.
1981-year	Policy Analyst, Seismic Safety Commission, State of California, Sacramento (on leave from university).
1978-1979	Invited Instructor, American Association for the Advancement of Science, Chautauqua Short Course Program.
1975-year	Visiting Assistant Professor, University of Southern California, Graduate School of Public Administration, Intensive Seminar Program.
1971-1972	Instructor, Department of Sociology, University of Colorado, Boulder.

AWARDS

1983-1984	Alumni Honor Faculty Award, Colorado State University Alumni Association for excellence in teaching, research and service
1981-year	Cited in Outstanding Young Men of America
1978-1977	Cited for excellence in teaching, research and service by the Dean, College of Arts, Humanities and Social Sciences

MEMBERSHIPS

American Sociological Association, International Sociological Association, Pacific Sociological Association, Midwest Sociological Society, Earthquake Engineering Research Institute, National Coordinating Council on Emergency Management, Western Social Science Association

RESEARCH GRANTS AND CONTRACTS

1987-1988 Associate Investigator, "Preparation of a Model Response Plan for the Three Mile Island Reactor," Public Education and Warnings Group, subcontract from Clark University for the Three Mile Island Public Health Fund.

1987-1988 Principal Investigator, "Research Applications for Emergency Preparedness," contract for Public Service Company of New Hampshire.

1987-year Associate Investigator, "Socioeconomic Impacts of the Proposed High-Level Radioactive Waste Site at Hanford, Washington," Risk Assessment Team, subcontract from Social Impact Assessment, Inc. for the State of Washington.

1987-year Principal Investigator, "Public Perception of Seismic Risk in Santa Clara County," grant from the Bay Area Regional Earthquake Preparedness Project and the California Seismic Safety Commission.

1986-1987 Coprincipal Investigator, "Warning Systems: A State of the Art Review," subcontract from Oak Ridge National Laboratory for the Federal Emergency Management Agency.

1984-1985 Associate Investigator, "Evacuation Liability Issues," subcontract from Oak Ridge National Laboratory for the U. S. Department of Energy.

1984-1985 Principal Investigator, "Assessment of Human Stress Impacts from the Livingston Train Derailment and Chemical Emergency," contract for Illinois Central Gulf Railroad.

1984-1985 Associate Investigator, "State-of-the-Art Assessment: Evacuation," subcontract from Oak Ridge National Laboratory for the Federal Emergency Management Agency.

1984-1985 Associate Investigator, "International Study of Disaster Impact on Domestic Assets," subcontract from the University of Georgia for the National Science Foundation.

1983-1984 Principal Investigator, "Research and Applications for Emergency Preparedness," contract for Long Island Lighting Company (reactivated for 1987-1988).

1983-1984 Principal Investigator, "Intended and Forgotten Audiences for Emergency Warnings," quick-response grant from the Natural Hazards Research Applications and Information Center.

1982-1983 Associate Investigator, "Organizational Interface for Nuclear Reactor Emergency Preparedness," subcontract from Oak Ridge National Laboratories for the Nuclear Regulatory Commission.

1981-year Principal Investigator, "Nuclear Hazard Warnings and Emergency Evacuation Preparedness," contract for Pacific Gas and Electric Company.

1980-1983 Principal Investigator, "Local Land Use Policy Decisions," Colorado State University Experiment Station.

1979-1982 Principal Investigator, "Behavioral Aspects of the Three Mile Island Incident and Re-start," contract for General Public Utilities via Shaw, Pittman, Potts and Trowbridge.

1977-1980 Principal Investigator, "Migration Impacts of Non-metropolitan Areas in the West," Colorado State University Experiment Station.

1977-1979 Principal Investigator, "Adoption and Organizational Implementation of Policy for Land Use Regulations," grant from the National Science Foundation.

1975-1977 Coprincipal Investigator, "Socioeconomic, Organizational and Political Consequences of Earthquake Prediction," grant from the National Science Foundation.

1972-1974 Research Sociologist, "Assessment of Research on Natural Hazards," grant from the National Science Foundation.

COMMITTEE MEMBERSHIPS

1987-year Expert panel on Disaster Research and Planning at the National Center for Earthquake Engineering Research at the State University of New York at Buffalo.

1984-1986 National Academy of Science, National Research Council, Commission on Engineering and Technical Systems, Committee on Natural Disasters

1984-1988 National Academy of Sciences, National Research Council, Commission on Physical Sciences, Mathematics, and Resources, Board on Earth Sciences, Subcommittee on Earthquake Research.

1984-1986 National Institute of Mental Health, Public Health Service, Center for Mental Health Studies of Emergencies, Advisory Panel.

1983-year National Science Foundation, U.S. Delegate on Earthquake Prediction Research to Japan, International Scientific Exchange Section.

1983-1986 Front Range Consortium on Natural Hazards Studies, Colorado State University, University of Colorado, University of Denver.

1983-date International Sociological Association, Research Committee on Disasters.

1982-1983 Pacific Sociological Association, Nominations Committee for the Standing Committees for 1983.

1982-date Earthquake Engineering Research Institute, Chair, Committee on Social Science Research, Berkeley.

1981-1983 U.S. Department of the Interior, Geological Survey, Advisory Panel on the Earthquake Studies Program.

1981-1982 Pacific Sociological Association, Program Committee for the 1982 Annual Meetings in San Diego.

1981-1982 Governor's Emergency Task Force on Earthquakes, Threat and Reconstruction Committees, State of California, Sacramento.

1980-1981 Governor's Science and Technology Advisory Council, Committee on the Relocation of Uranium Mill Tailings, State of Colorado.

1979-year American Association for the Advancement of Science, Committee on Intergovernmental Research and Development on Fire Safety and Disaster Preparedness, Washington, D.C.

1976-1978

National Academy of Sciences, National Research Council,
Commission on Sociotechnical Systems, Committee on
Socioeconomic Effects of Earthquake Prediction,
Washington, D.C.

BOOKS, MONOGRAPHS AND CHAPTERS

- Mileti, Dennis S., and John H. Sorensen. 1988. "Planning and Implementing Warning Systems." Pp. 204-218 in Mary Lystad (Ed.) Mental Health Response to Mass Emergencies. Larchmont, N.Y.: Brunner-Mazel.
- Tapay, Nenita E., Alan C. Early and Dennis S. Mileti. 1987. "Irrigation Organization in the Philippines: Structure and Effectiveness of National Communal Types." Pp. 209-221 in Harry K. Schwarzweller (Ed.) Research in Rural Sociology and Development. Volume 3. Greenwich, Connecticut: JAI Press Inc.
- Mileti, Dennis S. 1987. "Stress from Risk Uncertainties." Pp. 123-128 in Vincent T. Covello, Lester B. Lave, Alan Moghissi and V.R.R. Uppuluri (Eds.) Uncertainty in Risk Assessment, Risk Management, and Decision Making. New York: Plenum Press.
- Mileti, Dennis S. 1987. "Sociological Methods and Disaster Research." Pp. 57-70 in Russell R. Dynes, B. de Marchi and C. Pelanda (Eds.) Sociology of Disasters: Contributions of Sociology to Disaster Research. Milan, Italy: Franco Angeli Libri.
- Sorensen, John H., and Dennis S. Mileti. 1987. "Programs that Encourage the Adoption of Precautions Against Natural Hazards: Review and Evaluation." Pp. 208-230 in Neil D. Weinstein (Ed.) Taking Care: Understanding and Encouraging Self-Protective Behavior. New York: Cambridge.
- Mileti, Dennis S., and John H. Sorensen. 1987. "Natural Hazards and Precautionary Behavior." Pp. 189-207 in Neil D. Weinstein (Ed.) Taking Care: Understanding and Encouraging Self-Protective Behavior. New York: Cambridge.
- Cochrane, Hall and Dennis S. Mileti. 1986. "The Consequences of Nuclear War: An Economic and Social Perspective." Pp. 381-409 in F. Solomon and R.Q. Martson (Eds.) The Medical Implication of Nuclear War. Washington, D.C.: National Academy Press.
- Mileti, Dennis S., and Joanne Nigg. 1986. "Social Science Earthquake Investigations." Pp. 167-188 in Scholl (Ed.) Lessons Learned from Recent Earthquakes. Berkeley: Earthquake Engineering Research Institute.
- Williams, Gary, and Dennis S. Mileti. 1986. "Inclusion of Social Variables in Models of Risk Assessment." Pp. 375-379 in Geotechnical and Geohydrological Aspects of Waste Management. Boston: Rottendam.
- Harwell, Christine C. (Ed.) 1985. "Experiences and Extrapolations from Hiroshima and Nagasaki." Pp. 427-467 in M.A. Harwell and T.C. Hutchinson (Eds.) Environmental Consequences of Nuclear War Volume II: Ecological and Agricultural Effects. New York: John Wiley and Sons.
- Hartsough, Donald M., and Dennis S. Mileti. 1985. "The Media in Disasters." Pp. 282-294 in J. Laube and S. Murphy (Eds.) Perspectives in Disaster Recovery. Norwalk, Connecticut: Appleton-Century-Crofts.
- Sorenson, John, Janice Hutton and Dennis S. Mileti. 1984. "Institutional Management of Risk Information Following Earthquake Predictions." Pp. 913-924 in K. Oshida (Ed.), Earthquake Prediction. Tokyo: Terra Scientific Publishers for UNESCO. Reprinted in Song Shouquan and Li

- Huaying (Ed.) A Collection of Papers on World Seismo-Sociology. Beijing, China: Institute of Geophysics, State Seismological Bureau, pp. 119-126.
- Mileti, Dennis S., Janice Hutton and John Sorensen. 1984. "Social Factors Affecting the Response of Groups to Earthquake Prediction." Pp. 649-658 in K. Oshida (Ed.), Earthquake Prediction. Tokyo: Terra Scientific Publishers for UNESCO. Reprinted in Song Shouquan and Li Huaying (Eds.) A Collection of Papers on World Seismo-Sociology. Beijing, China: Institute of Geophysics, State Seismological Bureau, pp. 17-22.
- Hutton, Janice, Dennis S. Mileti and John Sorensen. 1984. "Factors Affecting Earthquake Warning System Effectiveness." Pp. 947-956 in K. Oshida (Ed.), Earthquake Prediction. Tokyo: Terra Scientific Publishers for UNESCO. Reprinted in Song Shouquan and Li Huaying (Eds.) A Collection of Papers on World Seismo-Sociology. Beijing, China: Institute of Geophysics, State Seismological Bureau, pp. 139-143.
- Mileti, Dennis S. 1982 "A Bibliography for Graduate Research Methods." Pp. 249-255 in Russel Schutt, Alan Orenstein and Theodore C. Wagenaar (Eds.). Research Methods Courses: Syllabi, Assignments and Projects. Washington, D.C.: American Sociological Association.
- Mileti, Dennis S., Janice Hutton and John Sorensen. 1981. Earthquake Prediction Response and Options for Public Policy. Boulder: Institute of Behavioral Science.
- Hutton, Janice, John Sorensen and Dennis S. Mileti. 1981. "Earthquake Prediction and Public Reaction." Pp. 129-166 in T. Rikitake (Ed.). Current Research in Earthquake Prediction. Boston: Reidel Publishing Company, Tokyo: Center for Academic Publications.
- Mileti, Dennis S. 1981. "Planning Initiatives for Seismic Hazard Mitigation." Pp. 44-53 in J. Isenberg (Ed.). Social and Economic Impact of Earthquakes on Utility Lifelines. New York: American Society of Civil Engineers.
- Gillespie, David F., and Dennis S. Mileti. 1979. Technostructures and Interorganizational Relations. Lexington, Massachusetts: Lexington Books.
- Committee on Socioeconomic Effects of Earthquake Prediction. 1978. A Program of Studies on the Socioeconomic Effects of Earthquake Prediction. Washington, D.C.: National Academy of Sciences - National Research Council.
- Gillespie, David F., Dennis S. Mileti and Ronald Perry. 1976. Organizational Response to Changing Community Systems Kent, Ohio: Kent State University Press.
- Mileti, Dennis S., Thomas E. Drabek and J. Eugene Haas. 1975. Human Systems in Extreme Environments: A Sociological Perspective. Boulder: Institute of Behavioral Science.
- Mileti, Dennis S. 1975. Natural Hazard Warning Systems in the United States. Boulder: Institute of Behavioral Science, Monograph 12. Portions reprinted in Joseph Perry and Meredith Pugh, Collective Behavior: Response to Stress, 1978.
- Erickson, Neil, John Sorensen and Dennis S. Mileti. 1975. Landslide Hazards in the United States: A Research Assessment. Boulder: Institute of Behavioral Science.
- Mileti, Dennis S. 1975. Disaster Relief and Rehabilitation in the United States. Boulder: Institute of Behavioral Science.
- Ayre, Robert, Dennis S. Mileti and Patricia Trainer. 1975. Earthquake and Tsunami Hazards in the United States: A Research Assessment. Boulder: Institute of Behavioral Science.

ARTICLES

- Mileti, Dennis S., and John H. Sorensen. 1987. "Determinants of Organizational Effectiveness in Responding to Low Probability Catastrophic Events," Columbia Journal of World Business. XXII (1): 13-21.
- Sorensen, John H., and Dennis S. Mileti. 1986. "Decision Making Uncertainty in Warning System Organizations," Mass Emergencies and Disasters (accepted and forthcoming).
- Mileti, Dennis S., and David F. Gillespie. 1985. "The Effects of Legitimacy on Goal Change and Formalization in Organizations," Journal of Contemporary Sociology 22(1,2): 33-53.
- Mileti, Dennis S. 1985. "The Human Equation in Earthquake Prediction and Warning," Policy Studies Review 4(4):725-733.
- Sorensen, John H., and Dennis S. Mileti, and Emily Copenhaver. 1985. "Inter and Intraorganizational Cohesion in Emergencies," Mass Emergencies and Disaster 3(3):27-52.
- Mileti, Dennis S. 1985. "Emergency Role Performance in Disaster Response Organizations," Environmental Sociology (42):6-10.
- Mileti, Dennis S., Donald Hartsough, Patti Madson and Rick Hufnagel. 1984. "The Three Mile Island Incident: A Study in Behavioral Indicators of Human Stress," Mass Emergencies and Disasters 2(1):89-114.
- Mileti, Dennis S. 1984. "Role Conflict and Abandonment in Emergency Workers," Emergency Management Review 2(1):20-22.
- Mileti, Dennis S. 1984. "Earthquakes and Human Behavior," Earthquake Spectra 1(1):89-106.
- Mileti, Dennis S. 1983. "Societal Comparisons of Organizational Response to Earthquake Prediction: Japan vs the United States." Mass Emergencies and Disasters 1(3):399-414.
- Mileti, Dennis S. 1983. "Public Perceptions of Seismic Hazards and Critical Facilities," Bulletin of the Seismological Society of America 72(6):13-18.
- Gillespie, David F., and Dennis S. Mileti. 1982. "Differentiation in Organizations," Social Forces 60(4):1172-1175.
- Mileti, Dennis S. 1982. "Structure and Process in the Implementation of Public Policy," Political Science Review 21(1):1-34.
- Mileti, Dennis S. 1982. "A Review of Research on Public Policy Adoption," Public Administration Review (accepted and forthcoming).
- Mileti, Dennis S., Doug Timmer and David F. Gillespie. 1982. "Intra and Interorganizational Determinants of Decentralization," Pacific Sociological Review 25(2):163-183.
- Mileti, Dennis S., David F. Gillespie and Stan Eitzen. 1981. "The Multidimensionality of Organizational Size," Sociology and Social Research 65(4):400-414.
- Gillespie, David F., and Dennis S. Mileti. 1981. "Heterogeneous Samples in Organizational Research," Sociological Methods and Research 9(3):327-388.
- Mileti, Dennis S. 1980. "Human Adjustment to the Risk of Environmental Extremes," Sociology and Social Research 64(3):327-347.
- Gillespie, David F., and Dennis S. Mileti. 1980. "Determinants of Planning in Organizations," Administrative Science Review 10(3):21-32.
- Mileti, Dennis S., and David F. Gillespie. 1980. "Organizational and Technological Interdependencies," Journal of Contemporary Sociology 17(3-4):132-158.

- Gillespie, David F., Ronald Perry and Dennis S. Mileti. 1980. "Stress and Transformation," Journal of Social Research 21(2):139-147.
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- "Factors to Consider in the Dissemination of Public Information Regarding Recent Scientific Evidence Concerning Earthquake Risk in California," Meeting of the National Earthquake Prediction Evaluation Council, Menlo Park, California: February, 1988.
- "Current Knowledge on Communicating Hazards and Risk Information," Workshop on Continuing Actions to Reduce Potential Losses from Earthquakes Along the Wasatch Front, Utah, Salt Lake City: December, 1987.
- "Human Response to Emergencies," Emergency Preparedness Executive Seminar by General Public Utilities, Forked River, New Jersey: September, 1987.
- "Human and Social Aspects of Hazards Mitigation," Colorado Society for Natural Hazards Research, Denver: September, 1987.
- "Have We Gotten Any Better at Informing and Educating the Public About Risks?" Hazards Research and Application Workshop, Boulder: July, 1987.
- "Overview of Current Knowledge About Communicating Hazards and Risk Information," Workshop on the U.S. Geological Survey's Role in Hazard Warnings, Golden, Colorado: February, 1987.

"Industrial Crisis Response," Fluid Mechanics and Wind Engineering Program, College of Engineering, Colorado State University, Fort Collins: November, 1986.

"Emergency Preparedness and Mitigation Measures: The November 1985 Columbia Nevada del Ruiz Volcano Eruption," Committee on Natural Disasters, Commission on Engineering and Technical Systems, National Research Council, National Academy of Sciences, Washington, D.C.: October, 1986.

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"Armero, Columbia: What are the Lessons for Hazards Management in the United States," Plenary Session, Hazards Research and Applications Workshop, Boulder, Colorado: July, 1986.

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"Social Aspects of Risk Communication," Conference on Communications in Emergencies, Wyoming Disaster and Civil Defense Division, Cheyenne: April, 1986.

"Earthquake Prediction: A General Overview," Emergency Preparedness Commission for the Cities and County of Los Angeles, Carson, California: April, 1986.

"What Do We Know About Human Behavior and Earthquakes," Annual Meeting of the Earthquake Engineering Research Institute, San Francisco: February, 1986.
"Social Aspects of the Parkfield, California Earthquake Prediction," Annual Meeting of the American Geophysical Union, Session on Parkfield Earthquake Studies, San Francisco: December, 1985.

"Social Impacts and Lessons from the Parkfield Earthquake Prediction," Earthquake Prediction Warning and Response System Workshop, Governor's Office of Emergency Services, Asilomar, California: July, 1985.

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"Warnings: Applying Research in the Private Sector," Plenary Session on Hazards Research and Management: Assessments of a Maturing Field, Natural Hazards Research Applications Workshop, Boulder: July, 1984.

"Human Response to Emergencies," Emergency Preparedness Executive Seminar for County Commissioners of the Commonwealth of Pennsylvania, GPU Nuclear Corporation, Harrisburg: March, 1984.

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"Human Response in Disasters," American Red Cross, Mile High Chapter, Boulder Region, Boulder: July, 1983.

"Integrated Emergency Management: Challenges and Opportunities," Plenary Session of the Natural Hazards Research Applications Workshop, Boulder: July, 1983.

"Public Response to Flood Disasters," Conference on the Need for Teamwork in Managing Flood Hazards, Association of State Floodplain Manager, Sacramento: April, 1983.

"Natural Hazards, Disasters and Public Policy," Environmental Management Institute, University of Southern California, Los Angeles: April, 1982.

"Myths of Disaster Response," Earthquake Planning Conference for Business and Industry, Los Angeles: May, 1982.

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"Social Causes of Earthquake Prediction-warning Response: Implications for the Design of California's Warning System and Information Dissemination," Southern California Earthquake Preparedness Project, Van Nuys: October, 1981.

"Assessment of Research on Natural Hazards: What Have We Learned and What Problems Demand Further Attention," Natural Hazards Research Applications Workshop, Boulder: July, 1981.

"Disaster Reconstruction: Patterns to Guide Planning," Governor's Task Force for Earthquake Emergency Preparedness, Committee on Long Range Reconstruction, Sacramento, July, 1981.

"Socio-cultural Dimensions of Earthquake Risk," Governor's Emergency Task Force on Earthquakes, General Assembly, Sacramento: May, 1981.

Interorganizational Relations and Service Delivery Systems," Health Sciences Center, University of Colorado, Denver: October, 1980.

"Social Response to Earthquake Prediction: Local Policy Issues," Southern California Emergency Services Association, Montebello: February, 1980.

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"Natural Hazards, Disasters and Social Research," Department of Sociology, University of Denver: December, 1980, 1979.

"Measuring Implementation of Public Policy for Floodplain Land Use Controls," Natural Hazards Research Applications Workshop, Boulder: August, 1978.

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"Population, Resources and Policy for Social Change," College of Natural Resources, Colorado State University: September, 1977; February, 1978; February, 1980.

"The Behavior of Government and Corporate Organizations in an Earthquake Prediction," American Society for Public Administration, Colorado Chapter, Denver: April, 1976,.

"The Social and Economic Aspects of Scientifically Credible Earthquake Predictions," California State Seminar on Emergency Preparedness and Earthquake Prediction, Palm Springs: June, 1976.

"Preparing to Make Use of Earthquake Predictions," Emergency Preparedness Commission for the County and Cities of Los Angeles, Montebello: February, 1976.

"The Social Organization of Hazard Warning Systems," Engineering Foundation Conference on Decision Making for Natural Hazards, Pacific Grove: March, 1976.

"Briefing on the Likely Social and Economic Impacts of Earthquake Prediction," Governor's Conference Room, Sacramento: May, 1975; Mayor's Conference Room, Los Angeles: October, 1975.

"Social, Economic and Legal Aspects of Earthquake Prediction," General Assembly of the International Union of Geodesy and Geophysics, Grenoble: September, 1975.

"Earthquake Prediction and Its Implications for Emergency Preparedness," Center for Community Studies, Tokyo: September, 1975.

"Social Impacts of Earthquake Prediction: Implications for Policy," California Water and Power Earthquake Engineering Forum, San Francisco: April, 1975.

OTHER PROFESSIONAL SERVICE

Organizer and Presider

Sessions on the Sociology of Disaster, Annual Meeting of the American Sociological Association, New York City: August, 1986; Session on Nuclear Power, Third International Congress on Emergencies, Washington, D.C.: May, 1985;

Session on Applied Sociology, Pacific Sociological Association, Seattle: April, 1984; Session on Theoretical Assessments, Western Social Science Association, San Diego: April, 1984; Session on Methodological Approaches in the Study of Health Care Delivery Systems, Western Social Science Association, San Diego: April, 1984; Session on Earthquake Hazard Reduction: Is the National Earthquake Hazard Reduction Program Meeting its Congressional Mandate, Seventh Annual Workshop on Natural Hazards Research Applications, Boulder: July, 1982; Session on Disasters and Cataclysms: Can Sociology Help, Pacific Sociological Association, San Diego: April, 1982; Session on Collective Behavior, American Sociological Association, New York: August, 1980; Session on Complex Organizations, Pacific Sociological Association, San Francisco: April, 1980; Session on Complex Organizations, Western Social Science Association, Tempe, 1976.

Discussant

Session on Theoretical Assessments, Western Social Science Association, San Diego: April, 1984; Session on Societal Response to Hazards, American Sociological Association, San Antonio: August, 1984; Session on Public Response to Earth Science Information, Natural Hazards Research Applications Workshop, Boulder: July, 1980; Session on Warning Systems, National Conference on Natural Hazards, Boulder: June, 1976; Session on Warning Systems, National Conference on Natural Hazards, Boulder: July, 1975; Session on Disaster Relief and Warning Systems, National Conference on Natural Hazards, Estes Park: June, 1973.

Participant

Workshop on Research Applications of the National Earthquake Hazards Reduction Program in the Western United States, U.S. Geological Survey, Denver: September, 1987; Review Panel on Disaster Research and Planning, National Center for Earthquake Engineering Research, State University of New York at Buffalo: August, 1987; Use of the Crisis Response Conclusion Retrieval System, University of Pittsburgh Center for Social and Urban Research, Pittsburgh: December, 1985; Panel on Disaster Research, Its Funding and Future, American Sociological Association, San Antonio: August, 1984; Review Panel, Corresponding Member, Task Group on Social and Economic Aspects of Earthquakes, National Academy of Sciences, National Research Council, Commission on Sociotechnical Systems, Washington, D.C.: 1982; Workshop on Disseminating Lessons Learned from Recent Earthquakes, Earthquake Engineering Research Institute, Los Altos: December 1982; Tennessee Valley Authority Flood Plain Evaluation Panel, Boulder: November, 1982; Earthquake Prediction Warning Task Force Workshop, Southern California Earthquake Preparedness Project, Asilomar: December, 1981; Symposium on Earthquake Prediction, Preparedness and Human Response, San Fernando: June, 1976; Seminar on Disaster Research, Colorado State University, Fort Collins: February, 1975; Symposium on Complex Organizations: Research and Applications, Western Social Science Association, El Paso: April, 1974.

Editorships

Member of the Editorial Advisory Board for Industrial Crisis Quarterly, 1986-date; Associate Editor for social science, Earthquake Spectra, Journal of the Earthquake Engineering Research Institute, 1984-date; Corresponding Editor, Organizations and Occupations, Newsletter of the American Sociological Association, Western Region 1984-85; Corresponding Editor on Hazards and

Disaster, Environmental Sociology, Newsletter of the Section on Environmental Sociology of the American Sociological Association, 1981-1985; Guest editor, special issue on Environmental Stress, Threat and Social System Response, Mass Emergencies 1(4): 247-346, 1976.

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ATTACHMENT E

Role Abandonment by Bus Drivers
During Major Emergency Evacuations

Confidential Work Product
Prepared in Contemplation of Litigation

Prepared by:
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Contents

- I. Purpose
- II. Methodology
- III. Findings
- IV. Conclusions
- V. Appendices
 - A. List of Fifty Major Evacuations
 - B. References

Purpose

The purpose of this report is to summarize research findings concerning role abandonment by bus drivers during emergencies. Additionally, documentation of fifty major U.S. evacuations was reviewed in order to identify incidents in which buses were used as a means of transporting evacuees out of the the endangered area, and to identify cases where bus drivers refused to participate in the evacuation.

Methodology

A wide range of documents on the general topic of evacuation as well as incident-specific evacuation experiences were reviewed.

In order to accomplish the objective of identifying and summarizing research findings concerning role abandonment of bus drivers, the following sources were consulted:

- Federal agency publication centers and libraries, including:
 - Federal Emergency Management Agency
 - FEMA's Emergency Management Institute Library
 - Department of Transportation
 - National Technical Information Service
- The Natural Disaster Resource Referral Service (PO Box 2208, Arlington, VA)
- The Natural Hazards Research Information and Application Center of the University of Colorado
- The Disaster Research Center at the University of Delaware
- Penn State University

WESTON staff also reviewed case histories and documentation of fifty major U.S. evacuations which have occurred since 1980.¹ These case histories contain one or more of the following:

- articles from major media sources (AP, UPI);
- local newspaper clippings;
- after-action reports;
- communications logs;
- Police/Emergency Services reports;
- sociology reports; and
- others

The primary question asked during the review of these evacuation case histories was: were buses used to transport people out of the endangered area, and if so, did bus drivers refuse to assist in the evacuation? The results of this secondary source analysis are also presented in the following section.

¹ Note: Data on these cases were collected for an ongoing, in-depth study of evacuations for another client. In that study, secondary sources along with some interviews will form the basis of a comprehensive database of major evacuations.

Findings

Several studies have addressed the issue of role abandonment by emergency workers. Some of this research is summarized in a document entitled, "*Planning Concepts and Decision Criteria for Sheltering and Evacuation in a Nuclear Power Plant Emergency*."² A relevant excerpt from this study states:

"A corresponding concern sometimes expressed by the public is that emergency response personnel will abandon their jobs in order to protect themselves, their families or their property. However, Dynes has stated that in disasters "abandonment of organizational roles simply does not occur" (Dynes, 1974, p.153). In his analysis of the reasons for the absence of role abandonment, he emphasizes the operation of two groups of mechanisms suggested by Barton (1969). The first group, priority mechanisms, are established by training members of emergency organizations to give first priority to their jobs and by making organizational membership visible (especially through uniforms) and by the strength of primary group loyalties among organization members that would make the individual feel personally responsible to his or her colleagues, as well as to the community at large. The second set consists of avoidance mechanisms. These operate when members of the emergency organization come from outside the affected area (and, thus, families are unaffected) and when they have few or no family ties within the area. Avoidance mechanisms also operate when members of emergency organizations have unequivocal information about the extent of the affected area that indicates that their families are not threatened, have made prior arrangements for their families to take protective action without their assistance or have established communication with their families to verify that they are safe."

The study goes on to say:³

"Section 4.2.4 noted that designated emergency workers (e.g., police, fire and emergency services personnel) do not abandon their roles during disasters. It is important to recognize, however, that this conclusion does not automatically extend to a group that might be referred to as emergency auxiliary personnel. These can be defined as those members of "emergency relevant" organizations (those possessing resources that may be needed in an emergency) or "community relevant organizations" (those with an orientation toward community service, see Dynes, 1974, p. 18) who may be needed to perform specific emergency tasks. Bus drivers, for example, could be classified within this group. Although they may be needed to assist in evacuating residents of affected areas during a nuclear power plant emergency, bus drivers could not be assumed to have developed priority and avoidance mechanisms to the same degree as designated

² Lindeil, M., Bolton, P., and Perry, R. (1985). *Planning Concepts and Decision Criteria for Sheltering and Evacuation in a Nuclear Power Plant Emergency*. AIF/NESP-031, National Environmental Studies Program of the Atomic Industrial Forum, Washington D.C., July 1985, pp. 4-15 to 4-20.

³ Ibid, p. 8-16

emergency workers. As a result, special provisions may need to be made in order to assure their availability in a nuclear power plant emergency. This can be achieved by special training that explains their role in the emergency response effort. In addition, this training should describe the nature of the radiation hazards to which the emergency auxiliary personnel might be exposed, emphasize the measures that will be taken to avoid exposure, and explain the procedures and equipment that would be used to monitor the magnitude of the exposures if they do occur. Finally, emergency auxiliaries should be informed of actions that will be taken to assist their families in taking protective action, if their homes are located in an affected area. Procedures planned in advance of an emergency would be expected to be particularly effective in avoiding the types of role conflict that could potentially result in role abandonment."

Sorenson, Vogt, and Mileti, in their 1987 study entitled, "*Evacuation: An Assessment of Planning and Research*,"⁴ wrote:

"Mileti (1985) has recently examined the concept as first conceptualized by Killian (1952) and later discussed by Moore (1958), Fritz (1961), Bates et al. (1963), Dynes (1970), Barton (1969), and Quarentelli (no date). The prevailing line of thought on role conflict is that, while people likely will experience conflict between family and organizational responsibilities, roles are rarely abandoned, and performing multiple roles does not jeopardize emergency duties.

Mileti (1985) concludes that when emergency work roles are "certain" perhaps through training, emergency workers do not abandon work roles to attend to roles involving intimate relationships. When emergency work roles are not "certain", than role conflict can occur, and would-be workers could attend to personal or family duties before attending to emergency duties."

They went on to say:⁵

"Role abandonment has been a controversial issue for some hazards. Research suggests that total role abandonment has not been prevalent in disasters and certainly has not been dysfunctional in organizational behavior. Some people have hypothesized that role abandonment would be greater and likely problematic in a nuclear power plant accident or during a nuclear war threat. This remains somewhat speculative. Research suggests that in the former case, there may be an increased potential for conflict and role strain, but emergency functions would not be threatened. In the latter case, the issue is highly uncertain."

4 Sorenson, J., Vogt, B., and Mileti, D. (1987). *Evacuation: An assessment of Planning and Research*. Federal Emergency Management Agency, Washington D.C., July, 1987. p. 90.

5 Ibid p.147

Case Histories:

In a review of reports, articles, and other documents concerning fifty major U.S. evacuations, it was reported that in 16 cases, buses were used to transport people from endangered areas. The other cases did not report the use of buses in the evacuation, however this does not mean that they were not used. There were no documented cases of bus drivers not cooperating or refusing to drive the buses.

The sixteen evacuation incidents that reportedly used buses during the evacuation were:

<u>Date</u>	<u>Location</u>	<u>State</u>	<u>Cause</u>	<u>Number of Evacuees</u>
3 March 87	Nanticoke	PA	Metal Plant Fire	14000
12 June 85	Pine Bluff	AK	Train Derailment	12000
20 February 86	Marysville	CA	Flood	20000
29 August 85	Pinellas County	FL	Hurricane Elena	300000
12 April 87	Pittsburgh	PA	Train Derailment	17000
4 September 85	Canton	OH	Chemical Plant Explosion	2000
29 May 86	Springfield	MA	Chemical Spill	10000
4 August 85	Checotah	OK	Bomb Transportation Accident	6000
14 November 85	Malden	WV	Chemical Plant Explosion	6000
6 May 82	Superior	WI	Chemical Plant Explosion	10000
4 April 83	Denver	CO	Train Derailment	9000
29 March 85	Greenfield	MA	Train Derailment	2000
11 December 82	Taft	LA	Chemical Plant Explosion	17000
28 May 87	Woodburn	IN	Warehouse Accident	5000
14 April 87	Gary	IN	Chemical Tank Leak	2000
3 April 80	Somerville	MA	Train Yard Accident	17000

Conclusions

In conclusion, existing research and an examination of recent major U.S. evacuations suggest that bus drivers would probably not abandon their role during an evacuation and that through training and planning, this possibility can be minimized.

Appendix A

FIFTY MAJOR EVACUATIONS

Date	Location	St	Cause	Evacs
870324	Naticoke	PA	Metal Plant Fire	14000
850716	Cedar Rapids	IA	Fire - Sewage Treatment Plant	20000
860804	St Petersburg	FL	Chemical Plant Accident	6800
860702	Miamisburg	OH	Train Derailment	20000
821211	Teft	LA	Chemical Plant Explosion	17000
850624	Anaheim	CA	Warehouse Fire	7500
850708	San Luis Obispo	CA	Forest Fire	10000
870414	Gary	IN	Storage Tank Leak	2000
850904	Canton	OH	Chemical Plant Accident	2000
870822	Pittsburgh	PA	Train Derailment	5100
870528	Woodburn	IN	Indust. Accident	5000
870412	Pittsburgh	PA	Train Derailment	17000
860529	Springfield	MA	Chemical Spill	10000
851029	New Orleans	LA	Hurricane Juan	6000
850926	Ocean City	MD	Hurricane Gloria	50000
850829	Pinellas County	FL	Hurricane Elena	300000
850321	Plainfield	KY	Transportation Accident	8250
800403	Somerville	MA	Train Yard Accident	17000
860630	Beaumont	TX	Hurricane Bonnie	30000
851114	Malden	WY	Chemical Plant Explosion	6000
850925	Dare County	NC	Hurricane Gloria	37000
850804	Checotah	OK	Bomb Explosion	6000
850612	Pine Bluff	AK	Train Derailment	12000
850902	LaPlace	LA	Hurricane Elena	15000
841231	Little Rock	AK	Train Car Leak	2500
870404	Minot	ND	Chemical Warehouse Explosion	15000
831118	Lynn	MA	Fire	5600
830816	Houston	TX	Hurricane Alicia	42000
820928	Livingston	LA	Train Derailment	3300
800805	Corpus Christi	TX	Hurricane Allen	400000
861016	Columbus	OH	Dynamite Threat	1500
860609	San Antonio	TX	Train Derailment	1700
860220	Marysville	CA	Flood	20000
840909	Jekyll County	GA	Hurricane Diana	14500
821131	Orange	CA	Chemical Plant Explosion	3000
821112	Irvine	CA	Chemical Plant Accident	2000
820506	Superior	WI	Chemical Plant Explosion	10000
870725	Avon	IN	RR Tanker Leak	2500
870410	Lawrence	MA	Floods	3600
861010	King of Prussia	PA	Gasoline Pipe Rupture	3000
851116	Bay County	FL	Hurricane Kate	2000
850308	Peoria	IL	Floods	3000
830404	Denver	CO	Train Derailment	9000
870602	Cambridge	OH	Transport. Accident	2500
860225	Saline	MI	Chemical Spill - Tr. Luene	2000
850810	Springfield	MO	Industrial Accident	3000
850703	Dowington	PA	Chemical Spill	2800
850524	Hollywood	FL	Chlorine Tank Rupture	5000
850329	Greenfield	MA	Train Derailment	2000
840902	Omaha	NE	Unknown	10000

Appendix B

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ATTACHMENT F

INTERVIEW SCHEDULE

BUS DRIVER STUDY
FOR
ORGANIZATIONAL RESPONDENTS

Incident _____
Location _____
Interviewer
Name _____
Job Title _____
Phone Number _____

READ: Hello, my name is _____ (insert name). I'm calling from the research firm of Weston, Inc. in West Chester, Pennsylvania. We are doing a study of emergency evacuations, and the _____ (insert name) emergency that occurred in your community has been chosen for study. I'd like to ask you some questions about the emergency and the evacuation. Is now a good time to talk; if not I can call back at a more convenient time.

There are several kinds of questions I will ask you. If you don't know an answer, please feel free to say so; in cases where you don't know an answer to a question I'd very much appreciate it if you could give me the name and number of someone who might know.

A. The first set of questions I will ask you are general questions about the evacuation that took place as a result of the _____ (hazard agent) on _____ (date).

1. What was the time of impact? By this I mean what was the time at which the _____ (hazard agent) actually became a direct threat to public safety? [Verify that for hazard release, this is time of release, not time of initiating event, such as derailment, if these took place at different times]. _____ AM/PM

2. Did the evacuation take place before, during or after impact?

_____ Before

_____ After

_____ During (Explain) _____

_____ Mixed (Explain) _____

3a. Did emergency response personnel and/or public officials have any advance warning prior to the impact?

_____ No (go to 4)

_____ Yes (go to 3b)

3b. How much time was there between the first notification of emergency personnel and/or public officials and the time of impact? _____ : _____ (hours/minutes)

4. When did the evacuation begin and when did it end?

	<u>Begin</u>	<u>End</u>
Time	_____	_____
Day	_____	_____
Month	_____	_____
Year	_____	_____

5. How large was the geographical area that was evacuated?

_____ square miles

6. How many people were there in the area that needed to be evacuated?

_____ number of people

B. READ: The next set of questions are about the people who needed to be evacuated by evacuation buses.

7. How many people in total needed to be evacuated by bus?

_____ number of people

8. How many schools needed to be evacuated by bus?

_____ number of schools

9. How many school children needed to be evacuated by bus?

_____ number of school children

10. Excluding school children, where were the people who needed to be evacuated by bus located? (Record and define each type of location)

C. READ: The following questions concern the mobilization of bus drivers to drive evacuation buses during the emergency.

11. How many buses were used to evacuate people?

_____ number of buses

12. How many bus drivers were thought to be needed to drive evacuation buses when bus driver mobilization began?

_____ number of drivers

13. How many bus drivers were attempted to be contacted?

_____ number of drivers

14. Of these, how many were actually contacted?

_____ number contacted

15. Why couldn't all bus drivers be contacted? (Explain) _____

16. Of those bus drivers contacted, what percentage refused to drive evacuation buses during the emergency?

_____ percentage (if "0," go to 18)

17. Why did these drivers refuse to drive evacuation buses during the emergency? (Explain) _____

18. Did any of these refusals occur because bus drivers were concerned about the safety of their family?

_____ No

_____ Yes (What ___%) (Explain) _____

19. Of those bus drivers contacted, what percentage did not refuse to drive evacuation buses, but simply did not report for work?

_____ percentage (if "0", go to 21)

20. Why didn't these drivers show up? (Explain) _____

21. Did any of these "no-shows" not report for driving because they were concerned about the safety of their family?

_____ No

_____ Yes (what _____%) (Explain)_____

22. Of those bus drivers contacted who did show up to drive evacuation buses, what percentage showed up late? (That is, they took noticeably longer to arrive than would be expected given the distance from their house to the bus yard.)

_____ percentage (if "0," go to 24)

23. Why did those drivers show up late? (Explain)_____

24. Did any of the bus drivers who showed up late do so because of concern about the safety of their family?

_____ No

_____ Yes (what _____%) (Explain)_____

25. What was the length of delay in reporting for driving evacuation buses among drivers who were concerned about the safety of their family?

- a. Longest delay (_____ hrs; _____ minutes)
- b. Shortest delay (_____ hrs; _____ minutes)
- c. Average delay (_____ hrs; _____ minutes)

26. Did any evacuation bus drivers help to evacuate their family before showing up for duty to drive evacuation buses?

- _____ No
- _____ Yes (what _____%)

27. Did any person volunteer to drive evacuation buses (by volunteer we mean people who did not have evacuation bus driving as their job before the emergency began)?

- _____ No
- _____ Yes (how many _____) (Explain who they were) _____
- _____
- _____
- _____

D. READ: The questions which now follow address the performance of the bus drivers who actually did drive evacuation buses during the emergency.

28. What percentage of the drivers who actually did drive evacuation buses did not do their job as well as they could have?

_____ percentage (if "0," go to 30)

29. What sort of problems did these drivers have? (Explain)

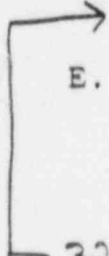
30. Why did they have these problems? (Explain) _____

31. Did any of the drivers who did drive evacuation buses have any problems because of concern about their family's safety?

_____ No
_____ Yes (what _____%) (Explain) _____

32. Approximately how much time did evacuation bus drivers spend in the evacuation zone driving evacuation buses?

- a. Longest stay (_____ hrs; _____ minutes)
- b. Average stay (_____ hrs; _____ minutes)
- c. Shortest stay (_____ hrs; _____ minutes)



E. READ: The next set of questions address the kind of things that evacuation bus drivers might or could have thought as they drove evacuation buses.

32a. Did any bus drivers make more than one trip into the evacuation area?

- _____ No
- _____ Yes
- _____ Don't know
- _____ No answer

33. Do you know if any evacuation bus drivers thought that they themselves were in danger during the time that they were driving buses in the evacuation zone?

_____ No, they didn't think they were in danger.

_____ Yes, they did think they were in danger. (What ____%)
(Explain why) _____

34. Do you know if any evacuation bus driver thought that they would receive adequate forewarning of any danger to themselves were it to occur during the time that they were driving buses in the evacuation zone?

_____ No, they didn't expect adequate forewarning (explain why) _____

_____ Yes, they did expect adequate warning (what ____%)
(Explain why) _____

35. Do you know if any evacuation bus drivers thought that they could personally detect any danger to themselves without relying on specialized equipment during the time that they were driving buses in the evacuation zone?

_____ No, they didn't think they could personally monitor
(Explain why) _____

_____ Yes (what ____%) (Explain why) _____

36. Do you know if any evacuation bus drivers thought that they could easily reach safety if the hazard impacted where they were during the time that they were driving buses in the evacuation zone?

_____ No, they didn't think they could easily reach safety.
(Explain why) _____

_____ Yes (what _____ %) (Explain why) _____

F. READ: The next few questions concern some background factors about all the bus drivers who were contacted and asked (either successfully or unsuccessfully) to report for evacuation bus driving duty during the emergency.

37. What percentage of these potential bus drivers had families in the area at risk during the emergency?

_____ percentage (if "0," go to 38)

38. What percentage of these families were capable of acting without assistance from the family member who was needed to drive an evacuation bus?

_____ percentage

G. READ: The next two questions focus on the training, if any, of evacuation bus drivers that occurred before the emergency we have been discussing occurred.

39. Did evacuation bus drivers receive any kind of emergency training about their evacuation bus driver role before the emergency began?

_____ No

_____ Yes (what _____% of drivers received the training)
(Explain the training) _____

40. Did evacuation bus drivers know before the emergency began that they had the role of evacuation bus driver in an emergency like the one experienced?

_____ No

_____ Yes (what _____%) (Explain how known) _____

H. READ: There are only two questions left.

41. Were there enough bus drivers to drive evacuation buses in the emergency?

_____ No (what _____% were available) (Explain why) _____

_____ Yes (Explain why) _____

42. Did everyone who needed to be evacuated by evacuation bus get out in time?

_____ No (what _____% did not) (Explain why)_____

_____ Yes (Explain why)_____

Thank you very much for your help. I appreciate it very much.

ATTACHMENT G

Results of the Bus Driver Study
for Organizational Respondents

People familiar with the emergency operations during 19 major evacuations were surveyed for this study. Respondents included emergency managers (i.e., fire chiefs, police, civil defense officials, etc.) who were interviewed for basic information about the emergency (usually questions 1-10) and bus company officials (i.e., owners, managers, dispatchers, etc.) who were interviewed to answer the remaining questions.

The evacuation cases and the number of emergency managers and bus company officials interviewed are listed below:

<u>Case</u>	<u># Emergency Managers</u>	<u>#Bus Company Officials</u>
1. Canton	0	1
2. Pittsburgh	1	1
3. Superior	1	2
4. Malden	1	1
5. Checotah	1	1
6. Pine Bluff	1	1
7. Springfield	1	2
8. Greenfield	2	2
9. Nanticoke	1	1
10. Taft	2	1
11. Denver	1	1
12. Somerville	1	1
13. Elkhart	1	1
14. Gary	1	2
15. Marysville	1	4
16. Pinellas	1	2
17. Miamisburg	1	2
18. Hicksville/Woodburn	1	1
19. Minot	2	1

The Questions and Results:

1. What was the time of impact?

Morning (6:00 am - 11:59 am)	5
Afternoon (12 pm - 5:59 pm)	6
Evening (6:00 pm - 11:59 pm)	3
Night (12:00 am - 5:59 am)	4
No answer	1

2. Did the ^{EVACUATION} ~~impact~~ take place before, during or after impact?

Before	4
During	5
After	5
No answer	1

3. Did emergency response personnel and/or public officials have any advance warning prior to the impact?

No	13
Yes	5
No answer	1

3b. How much time was there between the first notification of emergency personnel and/or public officials and the time of impact?

Minimum - No advance warning
Maximum - From 6 hours to 4 days (Pinellas).

4. When did the evacuation begin and when did it end?

The date and time of the evacuations varied.

5. How large was the geographical area that was evacuated?

Smallest area	-	.5 mile radius
Average	-	2-20 square miles
Largest area	-	280 square miles

6. How many people were there in the area that needed to be evacuated?

Minimum	-	1,000 (Malden)
Maximum	-	300,000 (Pinellas)

7. How many people in total needed to be evacuated by bus?

Minimum	-	0 (At Pine Bluff people were loaded onto buses but not evacuated)
Maximum	-	5,000 to 10,000 (Pinellas)

8. How many schools needed to be evacuated by bus?

Minimum	-	0
Maximum	-	7 (Springfield)

9. How many school children needed to be evacuated by bus?

Minimum - 0
Maximum - 6,000

10. Excluding school children, where were the people who needed to be evacuated by bus located?

Nursing homes, shopping malls, hospitals, a barrier island, elderly housing, mobile home parks, old age homes, a beach area, residential areas, a college, a housing project, apartment complexes, a manufacturing plant, and business districts.

11. How many buses were used to evacuate people?

Minimum - 3
Maximum - 235 (Pinellas)

12. How many bus drivers were thought to be needed to drive evacuation buses when bus driver mobilization began?

Answers varied from "I can't remember" or "Don't know" to between 2 and 240.

13. How many bus drivers were attempted to be contacted?

Answers varied from "don't know" to "only those on duty were contacted" to between 3 and 80.

14. Of these, how many were actually contacted?

Answers varied. Answers to question 14 are most relevant when taken together with answers to question 13.

In the 12 cases that had reported firm numbers for both questions, one case reported that more drivers were actually contacted than the number of drivers attempted to be contacted primarily because a number of drivers volunteered after their normal routes were disrupted.

In 3 cases, fewer actual contacts were made than attempted due to the reasons stated in response to question 15.

The remaining 8 cases reported actual contact with all attempts. Respondents in other cases either could not recall or did not know.

15. Why couldn't all bus drivers be contacted?

Reasons varied, but included: not home, Easter, out of town, phone busy, radio system problems, vacation period, and that some drivers were already out on the road.

16. Of those bus drivers contacted, what percentage refused to drive evacuation buses during the evacuation?

No one in any of the cases studied refused to drive evacuation buses.

In the Taft case, a discrepancy exists because there was a report of testimony about the role abandonment of two or three drivers. The emergency coordinator, his assistant, and the transportation officer do not recall any instance of bus driver abandonment.

17. Why did these drivers refuse to drive evacuation buses during the emergency?

N/A

18. Did any of these refusals occur because bus drivers were concerned about the safety of their family?

N/A

19. Of those bus drivers contacted, what percentage did not refuse to drive evacuation buses, but simply did not report for work?

All drivers reported for work in all cases, with two minor exceptions in the Marysville evacuation. According to the information on the Marysville case two "mechanics could not physically reach the bus yard," presumably due to flood waters damaging access roads. Since they were unable to reach the bus yard, the two mechanics proceeded to a nearby nursing home to help in its evacuation.

20. Why didn't these bus drivers show up?

See answer to question 19 above.

21. Did any of these "no-shows" not report for driving because they were concerned about the safety of their family?

N/A

22. Of those bus drivers contacted who did show up to drive evacuation buses, what percentage showed up late? (That is, they took noticeably longer to arrive than would be expected given the distances from their house to the bus yard.)

None of the drivers "showed up late" in 16 of the 19 cases.

One bus company in Marysville reported that 1-2% showed up late due to traffic congestions. This particular company utilized about twenty drivers so presumably the respondent meant 1 or 2 drivers, not 1 or 2% of the drivers showed up late.

During the Pinellas evacuation, about 10% of one bus company's drivers showed up late because they first helped "take care of family."

One bus company in Miamisburg reported that 0% or an unknown number of drivers showed up late. In response to question 24, the respondent stated that "1 or 2 people who had to get families situated first" showed up late.

23. Why did those drivers show up late?

See answer to question 22 above.

24. Did any of the bus drivers who showed up late do so because of concern about the safety of their family?

See answer to question 22 above.

25. What was the length of delay in reporting for driving evacuation buses among drivers who were concerned about the safety of their family?

In the Pinellas case the delay caused by drivers reporting to work late ranged from 20 minutes to 3 hours with an average delay of 1 hour.

26. Did any evacuation bus drivers help to evacuate their family before showing up for duty to drive evacuation buses?

No	-	15 cases
Don't Know	-	2 cases
Yes	-	2 cases

Three to five drivers evacuated their families first during the Miamisburg evacuation.

One driver in the Woodburn/Hicksville evacuation evacuated his family first. However, this was before the evacuation order was given and before the report calls went out to the drivers.

Even though Pinellas respondents said that 10% showed up late in answer to question 22, they responded no to this question.

27. Did any person volunteer to drive evacuation buses (by volunteer we mean people who did not have evacuation bus driving as their job before the emergency began)?

Yes	-	10
No	-	9

In the Checotah case, the respondent answered yes to this question but that was because the drivers were not paid.

28. What percentage of the drivers who actually did drive evacuation buses did not do their job as well as they could have?

All cases - 0%

29. What sort of problems did these drivers have?

While all cases reported 0% to question 28 above, some respondents reported problems such as traffic jams, confusion as to where to go or what to do, confusion of law enforcement about access to evacuation areas, people wanting to take possessions with them, and flood waters impeding the roadways.

30. Why did they have these problems?

Most answers to this question were n/a.

While all cases reported 0% to question 28 above, a few respondents provided the following:

At the Superior evacuation, traffic jams were created because parents went to pick up their children.

During the Columbus evacuation, there was a lack of communication early on among the police, disaster services, and the bus company. This was corrected later by placing a transit company supervisor in the EOC.

31. Did any of the drivers who did drive evacuation buses have any problems because of concern about their family's safety?

No	-	17
Yes	-	2

During the Greenfield evacuation, half of the drivers heard rumors and were scared for families, apparently because the exact nature of the incident and the threat was not known.

During the Pinellas evacuation, officials told drivers they could leave to go home and take care of their families if they so desired. About 1% did so.

32. Approximately how much time did evacuation bus drivers spend in the evacuation zone driving evacuation buses?

Minimum	-	10 minutes
Maximum	-	30 hours

- 32a. Did any bus drivers make more than one trip into the evacuation area?

No	-	2
Yes	-	13
Don't Know	-	1
n/a	-	1
No Answer	-	2

33. Do you know if any evacuation bus drivers thought that they themselves were in danger during the time that they were driving buses in the evacuation zone?

No	-	13
Yes	-	5
Don't Know	-	1

34. Do you know if any evacuation bus driver thought that they would receive adequate forewarning of any danger to themselves were it to occur during the time that they were driving buses in the evacuation zone?

No	-	1
Yes	-	18

35. Do you know if any evacuation bus drivers thought that they could personally detect any danger to themselves without relying on specialized equipment during the time that they were driving buses in the evacuation zone?

No	-	7
Yes	-	10
Don't Know	-	2

36. Do you know if any evacuation bus drivers thought that they could easily reach safety if the hazard impacted where they were during the time that they were driving buses in the evacuation zone?

No	-	11
Yes	-	15
Don't Know	-	3

37. What percentage of these potential bus drivers had families in the area at risk during the emergency?

0%	-	⁵ 0 cases
1%-50%	-	6 cases
51%+	-	37 cases
Unknown	-	5 cases

38. What percentage of these families were capable of acting without assistance from the family member who was needed to drive an evacuation bus?

0%	-	0
1%-50%	-	0
51%+	-	6
Unknown	-	8
n/a	-	5

In two cases, Pine Bluff and Taft, the respondents said, in response to question 37, that none of the bus drivers lived in the area. Here they said that most (greater than 51%) of the families could act without assistance from the bus driver.

39. Did evacuation bus drivers receive any kind of emergency training about their evacuation bus driver role before the emergency began?

No	-	10
Yes	-	9

In Marysville, some bus companies reported yes while others reported no. This case was considered a yes in this summary.

40. Did evacuation bus drivers know before the emergency began that they had the role of evacuation bus driver in an emergency like the one experienced?

No	-	7 8
Yes	-	12 11

In Marysville, some bus companies reported yes while others reported no. This case was considered a yes in this summary.

41. Were there enough bus drivers to drive evacuation buses in the emergency?

All cases - yes

42. Did everyone who needed to be evacuated by evacuation bus get out in time?

All cases - yes

In Pittsburgh, there were some refusals but all who wanted to get out by bus were evacuated.

ATTACHMENT H

BUS DRIVER INTERVIEW SCHEDULE

INCIDENT _____

LOCATION _____

INTERVIEWEE NAME _____

JOB TITLE _____

PHONE NUMBER _____

READ: Hello, my name is _____ (insert name).
I'm calling from the research firm of Weston, Inc. in West
Chester, Pennsylvania. We are doing a study of emergency evacua-
tions and the _____ (insert incident)
emergency that occurred in your community during _____
_____ (insert date) has been chosen for study. I'd like to ask
you some questions about the emergency and the evacuation. Is
now a good time to talk? If not, I can call back at a more con-
venient time.

Your name was provided to me as a person who drove buses
during this emergency. Is that correct?

____ Yes

____ No (if no, do not proceed, thank them for their time)

A. READ: The first set of questions I will ask you are about your "activation message." By "activation message" I mean the request you received in which you were specifically asked to drive an evacuation bus during the incident.

1. Who did you receive this message from? _____

2. Where were you told to report? _____

3. Which of the following statements best describes the degree of threat to those in the risk area - that is, those who needed to be evacuated - as it was described in the activation message?

- ___ People in the risk area are in severe danger.
- ___ People in the risk area are in moderate danger.
- ___ People in the risk area are in slight danger.
- ___ There was no clear sense of threat in the message.
- ___ (Do not read) I don't remember.

4. Which of the following statements best describes the degree of urgency - the need for immediate - action as it was described in the activation message?

- ___ You are needed now.
- ___ You will be needed soon.
- ___ You will be needed later.
- ___ You may be needed later.
- ___ There was no clear sense of urgency in the message.
- ___ (Do not read) I don't remember.

- B. READ: The next set of questions I will ask you are about emergency information that you might have received prior to the activation message.
5. Were you aware that there was an emergency prior to receiving your activation message?
- ___ No (skip to 10)
- ___ Yes
6. How did you find out about the emergency? _____
- _____
7. As a result of the information that you received prior to the activation message, how likely did you think it was that your home would be threatened by the _____ (hazard event)?
- ___ Extremely likely
- ___ Very likely
- ___ Even odds
- ___ Very unlikely
- ___ Extremely unlikely
- ___ (Do not read) I don't remember
8. Did you or the members of your household take any protective action prior to receipt of your activation message?
- ___ Continued normal activities
- ___ Sought additional information
- ___ Prepared to evacuate
- ___ One or more household members evacuated
- ___ Other (specify) _____

9. How much time was there between:

When you first found out about the emergency, and when you received your activation message?

_____ hours/minutes

C. READ: The next set of questions I will ask you are about your reactions to the activation message.

10. Where were you located at the time of the impact? By this I mean where were at the time the _____ (hazard agent) actually became a direct threat to public safety?

___ With family in impact area.

___ With family in periphery.

___ With family outside area.

___ Separated from family, family closer to impact.

___ Separated from family, respondent closer to impact.

11. What members of your household were at home when you received the activation message?

___ Self

___ Spouse

___ Number of children under 18

___ Number of other dependents (specify) _____

___ Number of others (specify) _____

12. To what extent did you feel a sense of personal responsibility to help those in your household by staying home to help them cope with the emergency?

- Great extent
- Moderate extent
- Minimal extent
- Not at all
- (Do not read) I don't remember.

13. To what extent did you feel that the members of your household would be protected even if you did not stay to help them?

- Great extent
- Moderate extent
- Minimal extent
- Not at all
- (Do not read) I don't remember.

14. To what extent did you feel a personal responsibility to help those in the risk area by reporting for duty to drive an evacuation bus?

- Great extent
- Moderate extent
- Minimal extent
- Not at all
- (Do not read) I don't remember.

15. To what extent did you feel that those in the risk area would be protected even if you did not go to help them?

- Great extent
- Moderate extent
- Minimal extent
- Not at all
- (Do not read) I don't remember.

16. After you received your activation message, did you do anything other than proceed directly to the location where you were told to report. (Do not read alternatives).

- No, I went directly to the reporting location (go to 17).
 - Yes, I tried to get additional information.
 - Yes, I helped my household prepare to evacuate.
 - Yes, I took other actions (specify) _____
- _____
- _____

17. If you did take any actions between receiving your activation message and arriving at your reporting location, about how much more time did you take than would have been required if you had proceeded directly?

_____ hours and minutes

- D. READ: The next set of questions I will ask you are about your reactions during the time you were driving an evacuation bus.
18. How would you describe the sense of threat that you experienced during the time that you were in the risk area?
- I was in severe danger.
 - I was in moderate danger.
 - I was in slight danger.
 - I had no sense of threat whatsoever.
 - (Do not read) I don't remember.
19. To what extent did you feel that you would receive adequate forewarning of any danger to yourself during the time that you were driving a bus in the evacuation zone?
- Very great extent.
 - Moderate extent.
 - Minimal extent.
 - Not at all.
 - (Do not read) I don't remember.
20. To what extent did you believe that you would be able to detect any danger to yourself by means of environmental cues such as sights, sounds or smells?
- Very great extent.
 - Moderate extent.
 - Minimal extent.
 - Not at all.
 - (Do not read) I don't remember.

21. To what extent did you believe that you could easily reach safety if the hazard impacted where you were during the time that you were driving a bus in the evacuation zone?

- Very great extent.
- Moderate extent.
- Minimal extent
- Not at all
- (Do not read) I don't remember.

22. Were you or any members of your family injured as a result of this emergency?

- Family member injured. State relationship to respondent. _____
- Respondent injured.
- Family members uninjured.

E. READ: The next set of questions I will ask you are about any advance preparation that you might have received regarding your role as an emergency evacuation bus driver.

23. To what extent did you receive any kind of emergency training about your evacuation bus driver role before the emergency began?

- Very great extent.
- Moderate extent.
- Minimal extent.
- Not at all (Go to 23).
- (Do not read) I don't remember.

24. What type of training was this? _____

25. Did anyone tell you before the emergency began that you might be asked to drive an evacuation bus during an emergency?

___ No (Go to 25).

___ Yes.

26. Please explain who told you, when they told you, and what you were told. _____

F. READ: The next question is about the "lessons learned" from your experience.

27. Are there any lessons that you think would be valuable to pass on to planners so that they could prepare better plans, procedures and training for emergency evacuations? _____

G. READ: I only have one more question that I would like to ask you.

28. How old were you during the time of the emergency?

Under 20.

20-44.

45 plus.

DO NOT READ: Below mark the sex of the respondent.

Male

Female

Thank you very much for your help. I appreciate it very much.

ATTACHMENT I

Results Of The Bus
Driver Interview Study

As a follow-up to the Bus Driver Study for Organizational Respondents, LILCO talked with individual bus drivers who responded to ten of the 19 emergencies addressed in the previous study. Twenty-seven (27) bus drivers were surveyed who had participated in 10 of the 19 evacuation cases. The evacuation cases and the number of drivers surveyed are listed below:

<u>Case</u>	<u># Bus Drivers Surveyed</u>
1. Marysville	10
2. Greenfield	1
3. Malden	2
4. Taft	3
5. Canton	1
6. Miamisburg	1
7. Springfield	4
8. Pine Bluff	2
9. National City	1
10. Hicksville	2

The Questions and the Results:

1. Who did you receive this message from?

Activation messages were received from co-workers, transportation supervisors, bus dispatchers, transportation directors, emergency coordinators, sheriff's departments, over the television, and by word of mouth.

2. Where were you told to report?

Drivers were told to report to one of the following places: bus garages, nursing homes, senior citizens' homes, downtown areas, central offices, command centers, and police stations.

3. Which of the following statements best describes the degree of threat to those in the risk area - that is, those who needed to be evacuated - as it was described in the activation message?

- 12 People in the risk area are in severe danger.
- 6 People in the risk area are in moderate danger.
- 3 People in the risk area are in slight danger.
- 5 There was no clear sense of threat in the message.
- 1 I don't remember.

4. Which of the following statements best describes the degree of urgency - the need for immediate - action as it was described in the activation message?

- 24 You are needed now.
- 1 You will be needed soon.
- 0 You will be needed later.
- 0 You may be needed later.
- 1 There was no clear sense of urgency in the message.
- 1 I don't remember.

5. Were you aware that there was an emergency prior to receiving your activation message?

- 12 No
- 15 Yes

6. How did you find out about the emergency?

Answers included: over the radio or scanner; on the television; by supervisor, word of mouth, or passerby; from friends; or by actually seeing the threat.

7. As a result of the information that you received prior to the activation message, how likely did you think it was that your home would be threatened by the hazard event?

- 3 Extremely likely
- 3 Very likely
- 3 Even odds
- 3 Very unlikely
- 3 Extremely unlikely

8. Did you or the members of your household take any protective action prior to receipt of your activation message?

- 6 Continued normal activities
- 1 Sought additional information
- 5 Prepared to evacuate
- 2 One or more household members evacuated
- 1 Other

9. How much time was there between: When you first found out about the emergency, and when you received your activation message?

Answers ranged from a few minutes (most answers) to about 1-3 hours and in one case 3 days.

10. Where were you located at the time of the impact? By this I mean where were [you] at the time the hazard agent actually became a direct threat to public safety?

- 2 With family in impact area.
- 2 With family in periphery.
- 11 With family outside area.
- 4 Separated from family, family closer to impact.
- 8 Separated from family, respondent closer to impact.

11. What members of your household were at home when you received the activation message?

- 6 Self
- 10 Spouse
- 10 Number of children under 18
- 2 Number of other dependents
- 4 Number of others
- 7 N/A

12. To what extent did you feel a sense of personal responsibility to help those in your household by staying home to help them cope with the emergency?

- 1 Great extent
- 3 Moderate extent
- 8 Minimal extent
- 11 Not at all
- 4 N/A

One person who responded "not at all" said she took her family with her. Another who responded "minimal extent" said "family [was] already out and safe."

13. To what extent did you feel that the members of your household would be protected even if you did not stay to help them?

- 19 Great extent
- 2 Moderate extent
- 0 Minimal extent
- 3 Not at all
- 3 N/A

14. To what extent did you feel a personal responsibility to help those in the risk area by reporting for duty to drive an evacuation bus?

25 Great extent

2 Moderate extent

0 Minimal extent

0 Not at all

15. To what extent did you feel that those in the risk area would be protected even if you did not go to help them?

12 Great extent

4 Moderate extent

6 Minimal extent

5 Not at all

Comments: "duty to go and help;" "Felt he was needed to insure the safety of the residents. Did not think about the situation."

16. After you received your activation message, did you do anything other than proceed directly to the location where you were told to report.

23 No, I went directly to the reporting location.

0 Yes, I tried to get additional information.

1 Yes, I helped my household prepare to evacuate.

3 Yes, I took other actions (specify).

The driver who helped his household prepare to evacuate said that only took a "few minutes." The driver was with his family (spouse and one child) in the impact area at the time he received his activation message.

Those that took other actions did the following: two made phone calls to get out other drivers, and the other evacuated her children (which took 20 extra minutes) because she did not want to leave them alone.

17. If you did take any actions between receiving your activation message and arriving at your reporting location, about how much more time did you take than would have been required if you had proceeded directly?

One respondent said 10 minutes, one said 15 minutes, and the respondent who helped her family evacuate said she took 20 extra minutes.

18. How would you describe the sense of threat that you experienced during the time that you were in the risk area?

- 7 I was in severe danger.
- 5 I was in moderate danger.
- 5 I was in slight danger.
- 9 I had no sense of threat whatsoever.
- 1 N/A

One did not respond because was not in risk area but in "standby area."

19. To what extent did you feel that you would receive adequate forewarning of any danger to yourself during the time that you were driving a bus in the evacuation zone?

- 15 Very great extent
- 7 Moderate extent
- 1 Minimal extent
- 4 Not at all

Comments: "Never thought about it - bus had communications;" used radios; "3 times got wrong information - Drivers were telling police what was going on."

20. To what extent did you believe that you would be able to detect any danger to yourself by means of environmental cues such as sights, sounds or smells?

- 13 Very great extent
- 6 Moderate extent
- 2 Minimal extent
- 6 Not at all

21. To what extent did you believe that you could easily reach safety if the hazard impacted where you were during the time that you were driving a bus in the evacuation zone?

15 Very great extent

6 Moderate extent

2 Minimal extent

2 Not at all

2 N/A

Comments: "Never thought about this, had an obligation to evacuate the residents and was concerned about only this." One person who responded "not at all" said that she "didn't think of ability to reach safety."

22. Were you or any members of your family injured as a result of this emergency?

0 Family member injured. State relationship to respondent.

0 Respondent injured.

27 Family members uninjured.

23. To what extent did you receive any kind of emergency training about your evacuation bus driver role before the emergency began?

7 Very great extent

3 Moderate extent

11 Minimal extent

6 Not at all

24. What type of training was this?

Seven drivers reported receiving no training before the evacuation. Others received minimal training such as first aid, CPR, and how to operate a wheel chair lift. Others received more training, to include school evacuation and fire drills, use of special equipment, and regular school bus driver training. Some reported training occurred once, twice, or three times a year.

25. Did anyone tell you before the emergency began that you might be asked to drive an evacuation bus during an emergency?

11 No

15 Yes

26. Please explain who told you, when they told you, and what you were told.

Respondents indicated that they were told by their supervisors, emergency planning councils, school boards, or at routine meetings concerning evacuation. One respondent answered that she was told to be "always prepared" to transport school children during an emergency. Another indicated that he was told that his "primary role" during an emergency is to evacuate school children.

27. Are there any lessons that you think would be valuable to pass on to planners so that they could prepare better plans, procedures and training for emergency evacuations?

Comments included that the evacuations went well; everything was perfect; "that those in charge did an excellent job;" that radios should be used to keep drivers posted; have drills once a week; let drivers know which routes are best to take; that it would help if drivers were told what the emergency was all about; communications is most important. One said that it took too long to get out because there were only two main roads out of risk area.

28. How old were you during the time of the emergency?

0 Under 20

16 20-44

9 45 plus

Breakdown of Respondents by Sex:

2 Male

15 Female

ATTACHMENT J

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)

LONG ISLAND LIGHTING COMPANY)

(Shoreham Nuclear Power Station,)
Unit 1)

) Docket No. 50-322-OL-3
) (Emergency Planning
) Proceeding)

TESTIMONY OF MATTHEW C. CORDARO,
RUSSELL R. DYNES, WILLIAM G. JOHNSON,
DENNIS S. MILETI, JOHN H. SORENSEN,
AND JOHN A. WEISMANTLE ON BEHALF OF
THE LONG ISLAND LIGHTING COMPANY ON PHASE II
EMERGENCY PLANNING CONTENTION 25 (ROLE CONFLICT)

PURPOSE

The intervenors' Contention 25 is entitled "Role Conflict of Emergency Workers." The contention alleges that "Role conflict . . . creates the possibility that significant numbers of emergency personnel will look to the needs of their families or others for which they have responsibility (including themselves) before they report (if at all) to their designated emergency response positions or otherwise respond to a request by LILCO for assistance."

In general, then, a poll is unnecessary (1) because it is not a valid and reliable instrument for predicting future behavior, (2) because it would not upgrade the list of factors a plan should address, (3) because a plan is mostly based on the actions of organizations, and (4) because past experience suggests that emergency workers perform their assignments.

This is not to say that particular types of surveys might not make important contributions to emergency planning. For example, a survey could be used to identify people who are willing to perform volunteer emergency work. The people identified by the survey could then be given an emergency role and trained. Also, a survey could be useful to help identify facts important to know about for planning; for example, the identification of people with special evacuation needs.

68. Q. Mr. Johnson and Dr. Miletì, have you reviewed the County's survey of bus drivers and volunteer firemen in Suffolk County?

A. [Johnson, Miletì] Yes.

69. Q. What is your opinion of that survey? Does it have any shortcomings?

A. [Johnson, Miletic] Questions ~~12~~¹⁰ through ~~16~~¹⁷ on the survey instrument for volunteer firemen and Questions ~~7-11~~⁴⁻⁸ on the survey for school bus drivers are the same as questions 11-16 and 18-19 of the County's survey of the public in general, and thus are subject to the same criticisms as have been mentioned for those questions in LILCO's written testimony on Contention 23.

Question ~~18~~¹⁹ of the survey of volunteer firemen is as follows:

18²⁰. Assuming that the Shoreham nuclear power plant is licensed and begins to operate, we are interested in knowing what you think you would do if there was an accident at the plant. Suppose that you were at work on a weekday morning and there was an accident at Shoreham. Everyone living within 10 miles of the plant was advised to evacuate. Volunteer firemen were expected to help with the evacuation. What do you think you would do first?

1 = first, you would report to the fire station so that you could help with fire fighting and evacuation in the evacuation zone. *or*

- 2 = first, you would make sure that your family was safely out of the evacuation zone, *or*
- 3 = first, you would leave the evacuation zone to make sure that you were in a safe place, *or*
- 4 = first, you would do something else (specify) _____.

The response categories to this question are neither mutually exclusive nor exhaustive. Also, the question itself tends to confuse respondents by asking what they think they would do "first." A volunteer fireman could both check to see that his or her family was safely out of the evacuation zone and also help with firefighting and evacuation in the evacuation zone. It is conceivable that a volunteer fireman could be working outside of the so-called evacuation zone when an accident took place. No effort was made to determine if the volunteer fireman does in fact normally work outside the 10-mile evacuation zone.

Question ²³~~21~~ states as follows:

23 ~~21~~. If there was a nuclear accident at Shoreham requiring the evacuation of people within a ten mile zone, how dangerous do you think it would be for you to spend a day working within the evacuation zone?

It is impossible to determine what is meant by the term "spend a day working within the evacuation zone." If this was meant to mean a 24-hour day, an 8-hour day, or somewhere in between, it should have been so stated. The way the question is worded now would be subject to different interpretations by different responders.

Question ⁹~~12~~ of the school bus driver questionnaire states as follows:

... Suppose that you had completed your morning run ~~on a school day~~ and there was an accident at Shoreham. Everyone living within ten miles of the plant was advised to evacuate. Schoolbus drivers were expected to help evacuate school children. What do you think you would do first?

1. ^{First, I would} report to duty so that ^I you could pick up school children in the evacuation zone and drive them to a shelter. First, I would report to work
2. ^{First, I would} ~~go to~~ make sure that ^{my} your family members were safe. ~~were safely~~ ^{out} of the evacuation zone
3. ^{First, I would} leave the evacuation zone to make sure that ~~you were~~ ^{I was} in a safe place.
4. ^{First, I would} do something else _____
(Please specify)

Once again, the suggested response categories are neither mutually exclusive nor exhaustive. Also,

if everyone were advised to evacuate, why would school bus drivers be expected to help evacuate school children? ~~The same comments apply to question 13 of the County survey.~~

Question ¹⁰14 asks "how dangerous" does the respondent think it would be to spend "several hours" driving school children out of the evacuation zone. The term "several" in this question leaves much to the imagination of the school bus drivers.

Finally, a serious problem with the survey is that it was self-administered; that is, respondents were given the survey instrument and asked to complete it. It is very possible that the respondents' answers to particular questions were influenced by information or questions that occurred later in the questionnaire.

70. Q. The County polled the opinions of volunteer firemen. What firemen were polled?
- A. [Cordaro, Weismantle]. The poll was done by phone to 291 firemen at Miller Place, Ridge, Rocky Point, Sand Beach, and Riverhead.

71. Q. What were the firemen told to assume?

A. [Cordaro, Weismantle] Among other things, they were told (in Question 18) to suppose that volunteer firemen were expected to help with the evacuation.

72. Q. Have these volunteer firemen been assigned a clear role in helping with an evacuation?

A. [Cordaro, Weismantle] No.

73. Q. Did emergency workers abandon their emergency roles during the Ginna steam generator tube rupture incident on June 25, 1982?

A. [Weismantle] No, not at all, as indicated in the NRC report on the Ginna accident, NUREG-0909 (Attachment 8).

F. The "Uniqueness" of Radiation

74. Q. What is your opinion of the County's theory that radiological emergencies are "unique," so that experience with, for example, hurricanes and floods provides little guidance?

A. [Dynes, Miletic, Sorensen]. The ability to transfer the principles of human behavior in emergencies is

ATTACHMENT K

SCHOOL TRANSPORTATION REQUIREMENTS
FOR A ONE-WAVE EVACUATION

SCHOOLS	SCHOOL POPULATION		5% ¹		20% ²	BUSES AND DRIVERS NEEDED FOR ONE WAVE
<u>Shoreham-Wading River Central School District</u>						
Briarcliff	170	-	8	=	162	3
Miller Ave.	274	-	13	=	261	5
S-W River Mid.	498	-	25	=	473	8
S-W River High	788	-	39	=	749 - 150 = 599	15 (40 per)
Wading River	386	-	19	=	367	7
					Total	<u>38</u> ==
<u>Rocky Point School District</u>						
Jos. A. Edgar	550	-	27	=	523	9
Rocky Pt. El.	900	-	45	=	855	15
Rocky Pt.-Jun.	400	-	20	=	380	7
-Sen.	800	-	40	=	760 - 152 = 608	16 (40 per)
					Total	<u>47</u> ==
<u>Longwood Central School District</u>						
Ridge El.	1,275	-	63	=	1,212	21
W. Mid. Isl. El.	600	-	40	=	766	13
Coram El.	951	-	49	=	942	16
Walters El.	1,042	-	52	=	990	17
Longwood Jun./Middle	2,680	-	134	=	2,546 + 2 = 2,548	22 + 3
Longwood High	1,879	-	93	=	1,786 - 357 = 1,429	36 (40 per)
					Total	<u>125</u> 146 ==

SCHOOLS	SCHOOL POPULATION		5% ¹		20% ²	BUSES AND DRIVERS NEEDED FOR ONE WAVE
<u>Miller Place School District</u>						
N. Country Rd.	425	-	21	=	404	7
Muller Prim.	786	-	39	=	747	13
Sound Beach	600	-	30	=	570	10
Miller Pl. High	807	-	40	=	767 - 153 = 614	16 (40 per)
					Total	46
						==
<u>Port Jefferson School District</u>						
Pt. Jeff Jun.	289	-	14	=	275	5
Pt. Jeff El.	563	-	28	=	535	9
Vandermeulen High	1,150	-	57	=	1,093 - 218 = 875	22 (40 per)
					Total	36
						==
<u>Comsewogue School District</u>						
Clinton Ave El.	492	-	24	=	468	8
Comsewogue Sen.	1,355	-	67	=	1,288 - 257 = 1,031	26 (40 per)
Terryville El.	402	-	20	=	382	7
J.F. Kennedy	589	-	29	=	560	10
					Total	51
						==
<u>Patchogue-Medford School District</u>						
Eagle El.	814	-	40	=	774	13
					Total	13
						==

SCHOOLS	SCHOOL POPULATION		51 ¹	=	201 ²	BUSES AND DRIVERS NEEDED FOR ONE WAVE
<u>Riverhead Central School District</u>						
Riley Ave. El.	331	-	16	=	315	6
Pulaski Str. El.	544	-	27	=	517	9
Riverhead Jun.	755	-	37	=	718	12
Riverhead High	1,019	-	51	=	968 - 193 = 775	20 (40 per)
					Total	47
						==
<u>South Manor School District</u>						
South Street	500	-	25	=	475	8
Dayton Ave.	425	-	21	=	404	7
					Total	15
						==
<u>Mt. Sinai School District</u>						
Mt. Sinai El.	960	-	48	=	912	16
Mt. Sinai Jun.	854	-	42	=	812	14
					Total	30
						==
<u>BOCES Mid-Island Arena</u>						
	5(a.m.)	-	0	=	5	1 (a.m. & p.m.)
	22(p.m.)	-			22	
					Total	1
						==
					Final Total	449 470
						==

NOTE: Little Flower Union Free School District is not listed here because LE: 0 treats the one school in its district as a special facility since its students live there and the school does not have its own transportation.

SCHOOLS	SCHOOL POPULATION	5% ¹	20% ²	BUSES AND DRIVERS NEEDED FOR ONE WAVE		
<u>Parochial Schools</u>						
St. Isidore	233 ²⁶⁷	-	11 ¹⁴	=	222 ²⁵³	5
Infant Jesus	369	-	18	=	351	6
N. Shore Christian	207	-	10	=	197	4
					Total	<u>15</u> ==
<u>Nursery Schools</u>						
Alphabetland Child Enrichment Center	50	-	0	=	50	1
Brookhaven Country Day School	45	-	0	=	45	1
Central Brookhaven Head Start	75	-	0	=	75	2
Coram Child Care Center	50	-	0	=	50	1
Harbor View Nursery School	16	-	0	=	16	1
Just Kids Early Childhood Learning Center	120	-	0	=	120	3
Middle Island Nursery School	13	-	0	=	13	1
Neighborhood Nursery School	12	-	0	=	12	1
Rainbow Cottage	14	-	0	=	14	1
Riverhead Cooperative Nursery School	12	-	0	=	12	1
Sea Port Pre-School	20	-	0	=	20	1
St. Anselm's Nursery School	38	-	0	=	38	1
St. John's Pre-School	17	-	0	=	17	1

SCHOOLS	SCHOOL POPULATION		5% ¹		20% ²		BUSES AND DRIVERS NEEDED FOR ONE WAVE
Sound Beach Pre-School Co-op	19	-	0	=	19		1
Step-by-Step Early Learning Center	30	-	0	=	30		1
Tots'n Toys Pre-School Learning Center	35	-	0	=	35		1
Trinity Lutheran Nursery School	50	-	0	=	50		1
Wading River Cooperative Play School	32	-	0	=	32		1
Whispering Wonders Pre-School	50	-	0	=	50		1
World of Children Pre-School	60	-	0	=	60		<u>2</u>
	100	-	0	=	100		
	(summer pop.)				(summer pop.)		
						Total	<u>24</u> ==

¹ Reduction for daily absences.

² Reduction for those who drive to school or ride with someone who drives to school -- for high schools only.

³ ~~Reduced by half for split session.~~

ATTACHMENT L

REGULAR BUS DRIVERS EMPLOYED
BY OR ON CONTRACT TO SCHOOL
DISTRICTS IN THE SHOREHAM
10-MILE EPZ

<u>School Districts</u>	<u>Number of Regular School Bus Drivers</u>
Shoreham-Wading River Central School District	30
Rocky Point School District	26
Longwood Central School District	94
Miller Place School District	21
Port Jefferson School District	14
Comsewogue School District*	21
Patchogue-Medford School District*	11
Riverhead Central School District*	47
South Manor School District	10
Mt. Sinai School District	27

* These school districts have schools located both
inside and outside of the Shoreham 10-mile EPZ.

ATTACHMENT M

For a complete summary of each organization, and its transportation and relocation plans, refer to the Evacuation Procedures of this Appendix.

Schools

This section covers public and private schools, including nursery schools, which are listed in Section IV of this Appendix.

Officials of public and private schools located in the 10-mile Emergency Planning Zone (EPZ) as well as schools located outside the EPZ but with students who live in the EPZ have the responsibility in a radiological emergency of providing their students with the best possible protection. There are three general alternatives available to provide for the safety of the children during an emergency. The first alternative is an early dismissal, whereby all students would be returned to their homes. The second alternative is evacuation, whereby all students would be relocated to reception centers outside the 10-mile Emergency Planning Zone (EPZ). The third alternative is sheltering students at their schools until conditions are safe for the children to either return home or be relocated. The best alternative will depend on the nature of the emergency, plant conditions, weather conditions, and time of day. The specific course of action recommended for each emergency classification is discussed below.

In the event of an emergency, schools in session will be notified of any Alert or higher emergency classification by the Emergency Broadcast System and by telephone. Each public school district, parochial school, and nursery school in the EPZ will have a tone alert receiver which will automatically activate and transmit the EBS message. The EBS message will advise the schools to implement specific protective actions and may contain general information about the condition of the plant, radiological conditions, etc. In addition, each school district superintendent and individual in charge of the private schools in the EPZ will be contacted by telephone by either the Public Schools Coordinator or Private Schools Coordinator to verify that the EBS message was received and to receive requests for additional assistance.

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17 While LERO will advise the school officials on what protective actions should be
18 taken, the final decision lies with the School District Superintendant and private school ad-
20 ministrators. LERO will broadcast EBS messages announcing the protective actions taken
21 by each school district and private school.

23
24 If an Alert or higher emergency classification is declared when schools are in the
25 process of opening, and no protective action recommendation has been given to the public,
26 school officials will be advised to have arriving buses return their students to their homes,
28 and to have students who do not normally use buses return home in their usual manner. If
30 school is not in session and an Alert or higher emergency classification is declared, school
31 officials will be advised to cancel classes for all schools in the EPZ until the emergency is
33 terminated.

34
35 If an Alert or Site Area Emergency is declared while schools are in session, schools
36 will be advised to dismiss their students early. If any school district informs LERO that
37 they are not implementing early dismissal, then LERO will mobilize the LERO school bus
39 drivers for all schools. If a parochial or nursery school informs LERO that they are not im-
40 plementing early dismissal, then LERO will mobilize the needed buses from the Patchogue
42 Staging Area as a special dispatch.

43
44 If schools within the EPZ are still in session when a protective action is recom-
45 mended for the general public in any area of the EPZ, the schools will be advised to take
46 the same protective action. That is, if some combination of sheltering and no action is rec-
48 ommended for the general public, then the schools would be advised to shelter and put their
49 buses on standby. If some combination of sheltering and evacuation is recommended for the
51 general public, then the schools would be advised to evacuate to the School Relocation Cen-
52 ters. If schools are in the process of opening, then they will be advised to implement shel-
54 tering or evacuation, as appropriate, when their students arrive.

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Upon a decision by school officials to evacuate schools in the EPZ, school children will be transported by bus directly to one of two centers outside the EPZ that have been designated as relocation centers: the Nassau Coliseum or the Nassau Community College. Facilities at the Coliseum and the Community College are adequate to accommodate all of the approximately 28,000 children enrolled in public and private schools in the EPZ. Some schools, however, have made arrangements to use other facilities as relocation centers.

School districts on Long Island provide bus transportation for approximately one half of their students. School districts also provide some transportation for parochial schools. Private schools provide minimal transportation. Thus, in the event of an emergency requiring evacuation, school districts in the EPZ would be unable by themselves to evacuate all students at the same time. To provide for the capability of a "one-wave" evacuation, LERO has arranged with various bus companies on Long Island to obtain "first-call" rights to enough additional buses so that when combined with buses already provided by the schools, all school children could be evacuated in one "wave" of buses. The number of buses required is based upon 40 high school students per bus or 60 elementary school students per bus.

LERO will provide additional trained auxiliary bus drivers to ensure that all necessary buses are manned. LERO bus drivers will be pre-assigned to designated bus yards and will be mobilized automatically if an evacuation is recommended or if any public school district does not implement early dismissal while schools are in session. Bus drivers will pick up dosimetry and school assignments at the bus yards. This equipment will be either stored at the bus yard or brought by a LERO school bus driver to the bus yard. LERO bus drivers will be available to drive LERO-supplied buses and any regular school bus for which a regular driver is not available. The plan provides enough LERO bus drivers to ensure 150 percent of total bus driver needs.

Students will be transported by bus to a pre-assigned location either at the Nassau Coliseum or the Nassau Community College where they will wait to be picked up by their parents or guardians. LERO bus drivers will park their buses and assist teachers and parents at the school relocation centers. Regular bus drivers will proceed to the EWDF for monitoring and, if necessary, decontamination .

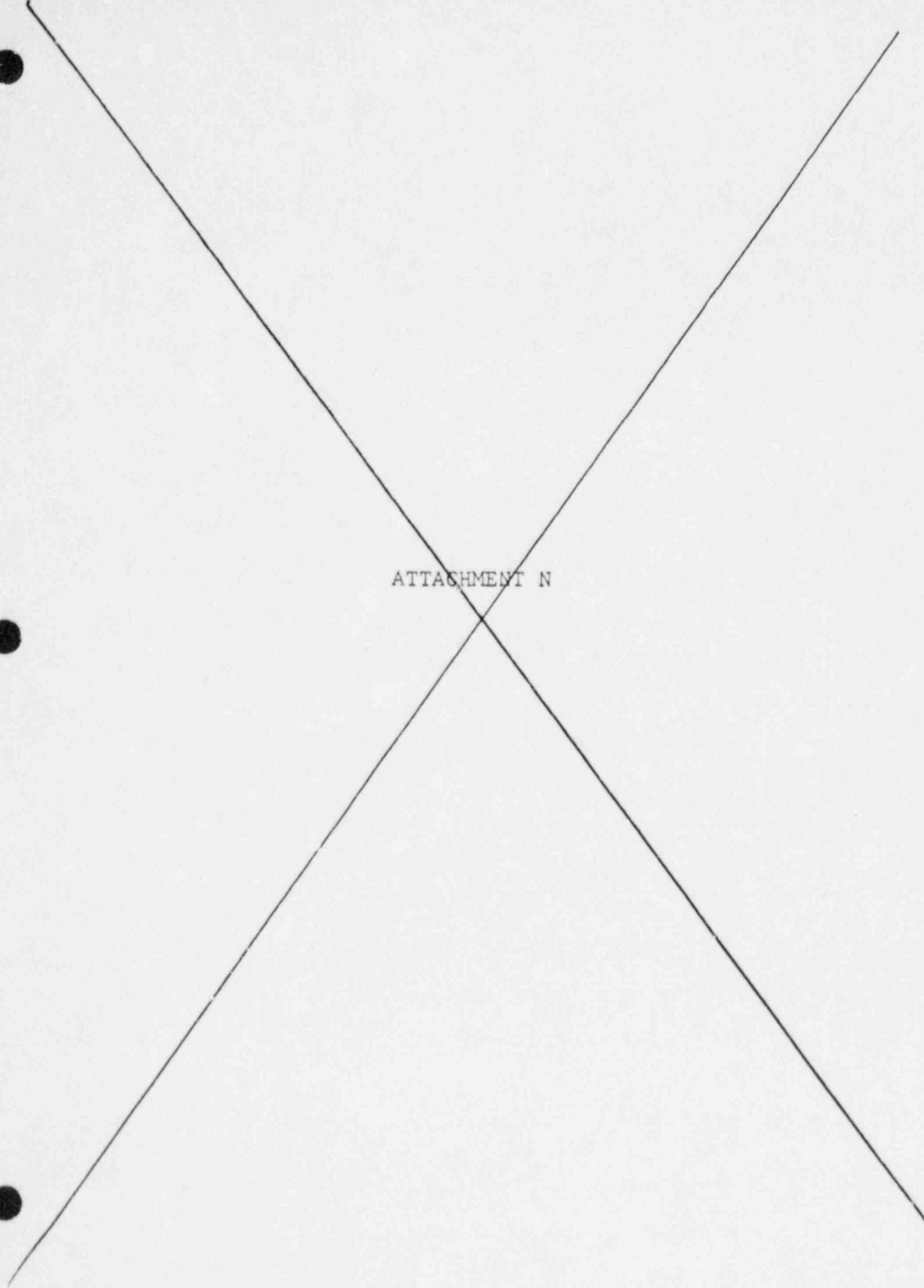
In those situations where school officials have pre-designated relocation facilities on their own, LERO will provide transportation assistance to these facilities as requested.

Those schools outside the EPZ which have students living in the EPZ will be requested to retain those students at the school when the school day ends, if any protective actions are recommended for the general public in any area of the EPZ.

Nursery Schools

Nursery schools will be advised to implement the same protective actions as the public and private schools for each

emergency classification and recommended protective action. If the nursery schools are advised to evacuate the children to reception centers, LERO will provide the necessary transportation.



ATTACHMENT N

LERO SCHOOL BUS DRIVER PROCEDURE

1. Upon callout LERO School Bus Drivers should report to bus yard designated on callout sheet. Listen to WPLR (99.1 FM) or other EBS radio station for emergency status. The callout sheet also indicates if you are a primary or backup driver.*
2. At bus yard, proceed to the bus yard dispatcher's office. Inform the bus yard dispatcher that:
 - a) There is a Shoreham emergency and that you are a LERO School Bus Driver.
 - b) You have a current New York State Class 2 Driver's License.
 - c1) (If you are a backup driver)
You are available if needed to drive a bus to support an evacuation of the school children or accompany a regular school bus driver.
 - c2) (If you are a primary driver)
Request that a bus be assigned to you.
3. After a bus has been assigned to you, obtain an Assignment Packet from the LERO box. (The LERO box will either be stored in the bus yard dispatcher's office or brought by one of the LERO bus drivers). If accompanying a regular bus driver, pick a packet for that bus drivers regular school assignment. If all packets have already been taken, report to the Bus Dispatcher at the Patchogue Staging Area.
4. Ensure the Assignment Packet contains:
 - a) One 0-200 mR Direct Reading Dosimeter (DRD)
 - b) One 0-5R DRD
 - c) One Thermoluminescent Dosimeter (TLD)
 - d) Two KI tablets
 - e) Emergency Worker Dose Record Form (OPIP 3.9.1, Att. 2)
 - f) Emergency Worker Bus Driver Badge
 - g) Bus Lease Receipt Form (OPIP 3.6.4, Att. 14)
 - h) Directions to School

* See definition on page 3 of 3

LERO SCHOOL BUS DRIVER PROCEDURE

(Continued)

- 1) Directions to School Relocation Center
 - j) Directions to the EWDF
 - k) Directions to Patchogue Staging Area
 - l) School Relocation Center Area Diagram
 - m) School Relocation Center Location Assignments
 - n) School Children Log Out Form
 - o) LERO School bus driver procedure
 - p) Directions to the EWDF
 - q) Pen or Pencil
5. If you heard that a general emergency has been declared, swallow one KI tablet. If you are riding a bus with a Regular Driver provide her with a KI tablet if she has received dosimetry training.
 6. Fill out Part I of the Emergency Worker Dose Record Form. Check both DRDs to ensure they are reading between zero and 20% of full scale. If necessary zero the dosimeter using a dosimeter charger in the box. Enter the readings in the column marked "Initial" in Part II of the Emergency Worker Dose Record Form. Keep all 3 parts of this form with you.
 7. Clip both DRDs and the TLD to your outer clothing on the upper part of your body. Read DRD's every 15 minutes.
 8. Primary Bus Drivers should examine the assigned bus and fill out Bus Lease Receipt Form. Leave Pink Copy with the bus yard dispatcher.
 9. Proceed to the designated school. Identify yourself to a school staff member and inform them you are available to assist in evacuating the school if needed.
 10. When directed by school personnel assist in loading children. Request that a school staff member accompanies the children.

LERO SCHOOL BUS DRIVER PROCEDURE

(Continued)

11. Take the children to the designated relocation center, unless told differently by the school staff member. The school representative has final say on the bus destination.
12. Provide the school representative with the School Relocation Center Location Assignments and the School Children Log Out Form.
13. Upon arrival at the School Relocation Center drop off children at the location designated on the School Relocation Center Area Diagram.
14. Park the bus and take the keys with you.
15. Proceed to the School Relocation Center Assignment Station shown on the School Relocation Center Area Maps and pick up an assignment packet.
16. Perform the assignment identified in the packet.
17. When told that your job is completed by a School Relocation Center Staff member, proceed to the EWDF.
18. At the EWDF, turn in your dosimetry, two copies of Emergency Worker Dose Record Form and the Yellow Copy of your Bus Lease Receipt Form.
19. Return to the Bus Yard.
20. Primary Bus Drivers fill out Part II of the Bus Lease Receipt Form. Ensure that you sign the form. Give the completed form to the bus company dispatcher before leaving the bus yard.

NOTE: If you have any problems contact the Special Facilities Evacuation Coordinator at the EOC at _____

LERO SCHOOL BUS DRIVER PROCEDURE

(Continued)

Definitions

- Primary Driver - LERO School Bus Driver who drives a bus from a bus yard that does not normally provide buses to schools within the EPZ.
- Backup Driver - LERO School Bus Driver who drives a bus from a bus yard that normally provides buses to schools within the EPZ. The drivers will drive buses when directed by the bus yard dispatcher or accompany the regular driver.
- Regular Driver - A bus driver who regularly drives school buses on a daily basis. An employee of the Bus Company or School District.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

LILCO'S SUPPLEMENTAL TESTIMONY ON THE REMANDED
ISSUE OF "ROLE CONFLICT" OF SCHOOL BUS DRIVERS

1. Q. Please state your name and business address.
A. [Crocker] My name is Douglas M. Crocker. My business address is Long Island Lighting Company, 131 Hoffman Lane, Central Islip, New York 11722.
2. Q. Please state your professional qualifications.
A. [Crocker] My professional qualifications and background are detailed on pages 1 and 4-5 of our earlier testimony, Testimony of Crocker, et al. on the Remanded Issue of 'Role Conflict' of School Bus Drivers, dated April 13, 1988. My resume is Attachment 1 to that testimony.
3. Q. Would you briefly describe the purpose and scope of this supplemental testimony?
A. [Crocker] This testimony does three things: 1) it replaces Attachment M (draft pages II-19 through II-21 of the plan) and Attachment N (draft OPIP 3.6.3, Attachment 14) to our earlier testimony on "role conflict" with Attachments O and P, respectively, which contain the Revision 10 versions of those pages and procedure, 2) it describes the changes that were made to those draft portions of the plan, and 3) it describes two additional changes in Revision 10 that effect LERO's school bus driver program.

4. What is Revision 10 of the LERO Plan?

A. [Crocker] Revision 10 is the most recent update of the LERO Plan. It incorporates the FEMA RAC's comments on Revision 9 and addresses some of the concerns raised by the Frye Board in its initial decision on the 1986 Shoreham exercise. Revision 10 will be distributed to the Board and all parties within the next two weeks. Those portions of the LERO Plan that are attached to this testimony and that are discussed here are the same portions that will appear in Revision 10.

5. What changes have been made in Revision 10 that are different from that contained in Attachments M and N to your earlier testimony?

A. [Crocker] Revision 10 makes one change to the plan pages in Attachment M. That is, page II-20a of Revision 10 now states LILCO's understanding that some regular school bus drivers take their buses home during the school day. It further states LILCO's belief that these drivers, at a minimum, will return their buses to the bus yard to pick up their own vehicle before evacuating if they decide not to drive during a Shoreham emergency.

Revision 10 also makes some minor changes to the LERO School Bus Driver Procedure, OPIP 3.6.5, Attachment 14, which is Attachment N to LILCO's earlier testimony. Generally, it elaborates on what each LERO school bus driver will do if called upon to evacuate schools. It also states that each bus should be loaded with 2 students per seat for high school and 3 per seat for elementary and junior high. These additions to the procedure conform with what I said in my earlier testimony. The procedure also states LERO's intention to provide each regular bus driver who has not received LERO training with KI (potassium iodide) and a TLD for her use if

one of our drivers accompanies her on the bus. (If the regular driver drives alone, then she would receive the complete assignment packet herself.)

6. Are there other changes in Revision 10 that affect LILCO's approach to its school bus driver program?

A. [Crocker] Yes, there are two other minor changes. First, LERO has decided to provide 21 extra LERO drivers to evacuate the Longwood Middle/Junior High School. See OPIP 3.6.5, Attachment 3a (Rev. 10). In Revision 9 of the Plan we provided only enough drivers to transport half of the student population, since this school is on split sessions. We have since decided, however, to provide enough drivers to evacuate the total student population at this school, because there is a small window of time when all of the students are at the school at the same time.

The other change in Revision 10 affects how LERO would provide transportation for handicapped students who attend school in the EPZ. If schools are in session, LERO's Revision 9 procedures provide that the LERO school coordinators in the EOC will call each school district and private school to see what action the schools intend to take and to see if they need assistance. Under Revision 10, they will also ask each school district and private schools if they need any special vehicles to evacuate handicapped students. See OPIP 3.6.5, Attachment 1 (Rev. 10). If the schools do need special vehicles, LERO will dispatch ambulettes to the schools to evacuate the handicapped students.

7. Does this conclude your supplemental testimony?

A. [Crocker] Yes.

For a complete summary of each organization, and its transportation and relocation plans, refer to the Evacuation Procedures of this Appendix.

Schools

This section covers public and private schools, including nursery schools, which are listed in Section IV of this Appendix.

Officials of public and private schools located in the 10-mile Emergency Planning Zone (EPZ) as well as schools located outside the EPZ but with students who live in the EPZ have the responsibility in a radiological emergency of providing their students with the best possible protection. There are three general alternatives available to provide for the safety of the children during an emergency. The first alternative is an early dismissal, whereby all students would be returned to their homes. The second alternative is evacuation, whereby all students would be relocated to reception centers outside the 10-mile Emergency Planning Zone (EPZ). The third alternative is sheltering students at their schools until conditions are safe for the children to either return home or be relocated. The best alternative will depend on the nature of the emergency, plant conditions, weather conditions, and time of day. The specific course of action recommended for each emergency classification is discussed below.

In the event of an emergency, schools in session will be notified of any Alert or higher emergency classification by the Emergency Broadcast System and by telephone. Each public school district, parochial school, and nursery school in the EPZ will have a tone alert receiver which will automatically activate and transmit the EBS message. The EBS message will advise the schools to implement specific protective actions and may contain general information about the condition of the plant, radiological conditions, etc. In addition, each school district superintendent and individual in charge of the private schools in the EPZ will be contacted by telephone by either the Public Schools Coordinator or Private Schools Coordinator to verify that the EBS message was received and to receive requests for additional assistance.

While LERO will advise the school officials on what protective actions should be taken, the final decision lies with the School District Superintendent and private school administrators. LERO will broadcast EBS messages announcing the protective actions taken by each school district and private school.

If an Alert or higher emergency classification is declared when schools are in the process of opening, and no protective action recommendation has been given to the public, school officials will be advised to have arriving buses return their students to their homes, and to have students who do not normally use buses return home in their usual manner. If school is not in session and an Alert or higher emergency classification is declared, school officials will be advised to cancel classes for all schools in the EPZ until the emergency is terminated.

If an Alert or Site Area Emergency is declared while schools are in session, schools will be advised to either cancel school or dismiss their students early. If any school district informs LERO that they are not implementing the recommended action, then LERO will mobilize the LERO school bus driver for all schools. If a parochial or nursery school informs LERO that they are not implementing early dismissal, then LERO will mobilize the needed buses from the Patchogue Staging Area as a special dispatch.

If schools within the EPZ are still in session when a protective action is recommended for the general public in any area of the EPZ, the schools will be advised to take the same protective action. That is, if some combination of sheltering and no action is recommended for the general public, then the schools would be advised to shelter and put their buses on standby. If some combination of sheltering and evacuation is recommended for the general public, then the schools would be advised to evacuate to the School Relocation Centers. If schools are in the process of opening, then they will be advised to implement sheltering or evacuation, as appropriate, when their students arrive.

Upon a decision by school officials to evacuate schools in the EPZ, school children will be transported by bus directly to one of two centers outside the EPZ that have been designated as relocation centers: the Nassau Coliseum or the Nassau Community College. Facilities at the Coliseum and the Community College are adequate to accommodate all of the approximately 28,000 children enrolled in public and private schools in the EPZ. Some schools, however, have made arrangements to use other facilities as relocation centers.

School districts on Long Island provide bus transportation for approximately one half of their students. School districts also provide some transportation for parochial schools. Private schools provide minimal transportation. Thus, in the event of an emergency requiring evacuation, school districts in the EPZ would be unable by themselves to evacuate all students at the same time. To provide for the capability of a "one-wave" evacuation, LERO has arranged with various bus companies on Long Island to obtain "first-call" rights to enough additional buses so that when combined with buses already provided by the schools, all school children could be evacuated in one "wave" of buses. The number of buses required is based upon 40 high school students per bus or 60 elementary school students per bus.

It is often the case that the regular school bus drivers take their buses home during the school day. In the case of an evacuation, these buses will be mobilized by the low yard dispatcher. Even if the regular school bus driver decides not to drive their bus during a Shoreham emergency it is presumed (s)he would return in the bus to the bus yard to pick up her personal car; thus making the bus available for a LERO bus driver.

LERO will provide additional trained auxiliary bus drivers to ensure that all necessary buses are manned. LERO bus drivers will be pre-assigned to designated bus yards and will be mobilized automatically if an evacuation is recommended or if any public

school district does not implement early dismissal while schools are in session. Bus drivers will pick up dosimetry and school assignments at the bus yards. This equipment will be either stored at the bus yard or brought by a LERO school bus driver to the bus yard. LERO bus drivers will be available to drive LERO-supplied buses and any regular school bus for which a regular driver is not available. The plan provides enough LERO bus drivers to ensure 150 percent of total bus driver needs.

Students will be transported by bus to a pre-assigned location either at the Nassau Coliseum or the Nassau Community College where they will wait to be picked up by their parents or guardians. LERO bus drivers will park their buses and assist teachers and parents at the school relocation centers. Regular bus drivers will proceed to the EWDF for monitoring and, if necessary, decontamination .

In those situations where school officials have pre-designated relocation facilities on their own, LERO will provide transportation assistance to these facilities as requested.

Those schools outside the EPZ which have students living in the EPZ will be requested to retain those students at the school when the school day ends, if any protective actions are recommended for the general public in any area of the EPZ.

Nursery Schools

Nursery schools will be advised to implement the same protective actions as the public and private schools for each

emergency classification and recommended protective action. If the nursery schools are advised to evacuate the children to reception centers, LERO will provide the necessary transportation.

LERO SCHOOL BUS DRIVER PROCEDURE

1. Upon callout LERO School Bus Drivers should report to bus yard designated on callout sheet. Listen to WPLR (99.1 FM) or other EBS radio station for emergency status. The callout sheet also indicates if you are a primary or backup driver.*
2. At bus yard, proceed to the bus yard dispatcher's office. Inform the bus yard dispatcher that:
 - a) There is a Shoreham emergency and that you are a LERO School Bus Driver.
 - b) You have a current New York State Class 2 Driver's License.
 - c1) (If you are a backup driver)
You are available if needed to drive a bus to support an evacuation of the school children or to accompany a regular school bus driver.
 - c2) (If you are a primary driver)
Request that a bus be assigned to you.
3. After a bus has been assigned to you, obtain an Assignment Packet from the LERO box. (The LERO box will either be stored in the bus yard dispatcher's office or brought to the bus yard by one of the LERO bus drivers). If accompanying a regular bus driver, pick a packet for one of that bus driver's regular school assignment. If all packets have already been taken, report to the Bus Dispatcher at the Patchogue Staging Area. Directions to the Patchogue Staging Area are contained in the LERO box.
4. Ensure the Assignment Packet contains:
 - a) One 0-200 mR Direct Reading Dosimeter (DRD)
 - b) One 0-5R DRD
 - c) Two Thermoluminescent Dosimeter (TLD)
 - d) Two KI tablets
 - e) Emergency Worker Dose Record Form (OPIP 3.9.1, Att. 2)
 - f) Emergency Worker Bus Driver Badge

* See definition on page 3a of 3

LERO SCHOOL BUS DRIVER PROCEDURE
(continued)

- g) Bus Lease Receipt Form (OPIP 3.6.4, Att. 14)
 - h) Map to School
 - i) Map to School Relocation Center
 - j) Map to the EWDF
 - k) KI Manufacturer's Brochure
 - l) School Relocation Center Area Diagram
 - m) School Relocation Center Location Assignments
 - n) School Children Log Out Form
 - o) LERO School bus driver procedure
 - p) Suffolk and Nassau Road Atlas
 - q) Pens or Pencils
5. If you have heard that a general emergency has been declared, swallow one KI tablet. If you are riding a bus with a Regular Driver provide her with the second KI tablet and ask her to read the KI brochure.
 6. Fill out Part I of the Emergency Worker Dose Record Form. Check both DRDs to ensure they are reading between zero and 20% of full scale. If necessary zero the dosimeter using a dosimeter charger in the box. Enter the readings in the column marked "Initial" in Part II of the Emergency Worker Dose Record Form. Keep all 3 parts of this form with you.
 7. Clip both DRDs and the TLD to your outer clothing on the upper part of your body. Read DRD's every 15 minutes. If riding the bus with a regular driver provide the second TLD to her.
 8. Primary Bus Drivers should examine the assigned bus and fill out Bus Lease Receipt Form. Leave Pink Copy with the bus yard dispatcher.

LERO SCHOOL BUS DRIVER PROCEDURE
(continued)

9. Proceed to the designated school. Identify yourself to a school staff member and inform them you are available to assist in evacuating the school if needed.
10. When directed by school personnel assist in loading children. Ask them to fill each bus completely (2 per seat for high school, 3 per seat for elementary/junior high). Request that at least one school staff member accompanies the children.
11. Take the children to the designated relocation center, unless told differently by the school staff member. The school representative has final say on the bus destination.
12. Provide the school representative with the School Relocation Center Location Assignments and the School Children Log Out Form. Ask the school representative to fill out the log out form.
13. Upon arrival at the School Relocation Center drop off children at the location designated on the School Relocation Center Area Diagram.
14. Park the bus and take the keys with you.
15. Proceed to the School Relocation Center Assignment Station shown on the School Relocation Center Area Maps and pick up an assignment packet.
16. Perform the assignment identified in the packet.
17. When told that your job is completed by a School Relocation Center Staff member, proceed to the EWDF.
18. At the EWDF, turn in your dosimetry and two copies of Emergency Worker Dose Record Form. If two drivers were on the same bus, have the Dosimetry Recordkeeper fill out a Dose Record Form for the driver who did not fill one out previously.
19. Primary drivers should also turn in the yellow copy of the bus lease receipt form.

LERO SCHOOL BUS DRIVER PROCEDURE
(continued)

20. Return to the Bus Yard.
21. Primary Bus Drivers fill out Part II of the Bus Lease Receipt Form. Ensure that you sign the form. Give the completed form to the bus company dispatcher before leaving the bus yard.

NOTE: If you have any problems contact the Special Facilities Evacuation Coordinator at the EOC at _____.

Definitions

- Primary Driver - LERO School Bus Driver who drives a bus from a bus yard that does not normally provide buses to schools within the EPZ.
- Backup Driver - LERO School Bus Driver who drives a bus from a bus yard that normally provides buses to schools within the EPZ. The drivers will drive buses when directed by the bus yard dispatcher or will accompany the regular driver.
- Regular Driver - A bus driver who regularly drives school buses on a daily basis. An employee of the Bus Company or School District.

CERTIFICATE OF SERVICE

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

I hereby certify that copies of LILCO'S MOTION FOR LEAVE TO FILE SUPPLEMENTAL TESTIMONY and LILCO'S SUPPLEMENTAL TESTIMONY ON THE REMANDED ISSUE OF "ROLE CONFLICT" OF SCHOOL BUS DRIVERS were served this date upon the following by telecopier as indicated by one asterisk, by Federal Express as indicated by two asterisks, or by first-class mail, postage prepaid.

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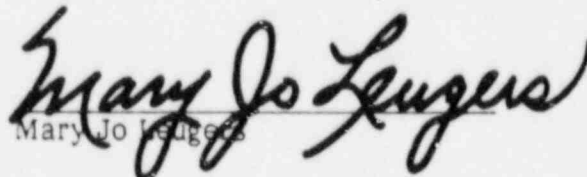
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1 MR. ZAHNLEUTER: The State has no
2 objection subject to those qualifications.

3 JUDGE GLEASON: Yes. I apologize, Mr.
4 Zahnleuter. I look at you as one at times. I know
5 you are separate.

6 MR. CHRISTMAN: Thank you, Judge
7 Gleason. With that, the witnesses are available for
8 cross-examination.

9 JUDGE GLEASON: Let me take up a
10 technical matter. It would be very, very helpful,
11 Mr. Christman--I say this to other parties,
12 too--when we have extensive changes like this, minor
13 or major, if we are given the changes ahead of time
14 and all the parties--and we can save ourselves a lot
15 of time when we get into a proceeding like this.

16 MR. McMURRAY: I might also add, Judge
17 Gleason, it would be proper, if it is known just a
18 couple days ahead of time, that the party be given
19 notices of the changes. Some of the changes were
20 substantial changes and substantive changes. I have
21 prepared based on testimony that is no longer there.

22 JUDGE GLEASON: I agree with you, Mr.
23 McMurray. Without characterizing the dimensions of
24 the 278, it really is not fair to all parties to
25 have to deal with this thing on the day of hearing

1 itself.

2 MR. CHRISTMAN: We will certainly do
3 that in the future.

4 JUDGE GLEASON: Thank you.

5 All right, gentlemen. The witnesses
6 are available for your cross-examination.

7 CROSS-EXAMINATION

8 BY MR. McMURRAY:

9 Q. Mr. Kelly, you are a new player in this
10 game so let me start with you first.

11 You work for the Roy F. Weston, Inc.
12 company. Is that right?

13 A. (Kelly) Incorporated. Correct.

14 Q. Does it have anything to do with
15 emergency planning?

16 A. (Kelly) The consulting firm is
17 involved in a wide range of environmental areas, one
18 of which is emergency planning.

19 Q. Are you the sole emergency planner at
20 Weston?

21 A. (Kelly) No. There are a number of
22 people who have emergency planning experience
23 similar to my own.

24 Q. The issue we are going to be
25 at least for the rest of today, is role

1 conflict. Have you ever studied or evaluated the
2 issue of role conflict prior to being hired by
3 LILCO?

4 A. (Kelly) To a small extent, this was
5 part--this issue was addressed on another study I
6 was doing for another client.

7 Q. What study is that?

8 A. (Kelly) It is a study of evacuations
9 that we are performing for another client.

10 Q. Was role conflict specifically one of
11 the issues you were asked to address with respect to
12 that other client?

13 A. (Kelly) The other study was more
14 broadly based than just this issue and only, I
15 believe, two elements of the entire study addressed
16 that. Those specifically were one question that we
17 tried to get answers on in that study concerning
18 school bus drivers abandoning their roles, if you
19 will. Another question addressed emergency
20 organizations, role abandonment.

21 Q. Was the issue role abandonment because
22 of role conflict or just role abandonment, period?

23 A. (Kelly) Basically, the questions asked
24 if either these emergency organizations or
25 specifically on the other question, the school

1 buses, failed to perform their roles, their
2 emergency functions. It was primarily role
3 abandonment.

4 Q. For that study, I believe you looked at
5 50 emergencies. Is that correct?

6 A. (Kelly) 52.

7 Q. 52. And in those, how many involved
8 bus drivers?

9 A. (Kelly) I believe, 19 in total.

10 Q. Basically, for this testimony, you are
11 looking at the same data base that you compiled for
12 your other client, is that correct?

13 A. (Kelly) Initially, that's correct. We
14 looked at that data base.

15 Q. Have you ever read the literature on
16 role conflict prior to being hired by LILCO?

17 A. (Kelly) I have read numerous disaster
18 research books that I know contain information on
19 that, but I didn't specifically read that because of
20 role conflict.

21 Q. Well, is this an issue that you were
22 aware of as emergency planning concern prior to
23 being hired by LILCO?

24 A. (Kelly) Not really, because it was
25 never really an issue in any other cases that I was

1 involved in that I can recall.

2 Q. You say you have been retained as a
3 consultant by LILCO to collect data on bus drivers.
4 I take it from your previous answers that you have
5 also, aside from collecting that data, tabulated
6 that data?

7 A. (Kelly) That's correct.

8 Q. And, now, the data we are talking about
9 now are survey data? Correct?

10 A. (Kelly) That's correct.

11 Q. Did you also interpret that data in any
12 way?

13 A. (Kelly) Yes. I looked at that and
14 tabulated it and looked for interesting items, along
15 with the other two people who were involved in that
16 survey.

17 Q. Did you actually compile the raw data
18 or did you have someone else do it?

19 A. (Kelly) We had a number of people at
20 Weston that actually talked to the individuals that
21 we interviewed.

22 Q. We will get into that more later.

23 Did your study for your other client
24 involve at all the behavior of emergency workers?
25 You may have said it involved role abandonment in

1 general.

2 A. (Kelly) Role abandonment of bus
3 drivers and generally role abandonment by emergency
4 organizations. But that was the extent.

5 Q. Why was your other client concerned
6 specifically about bus drivers and then in general
7 other emergency workers?

8 A. (Kelly) They--we were retained by this
9 client to look at evacuations to help determine what
10 factors make for successful evacuations. One of
11 those issues just happened to be role abandonment
12 and that was suggested by the client.

13 Q. Why did the client specifically select
14 bus drivers as a specific group to be looked at?

15 A. (Kelly) They had suggested in their--I
16 believe it was probably contained in their request
17 for proposal, a number of items that were to be
18 looked at, and that was one of them. To be honest
19 with you, I never really requested why that specific
20 item was there as opposed to any other item.

21 Q. Was there a suggestion that bus drivers
22 might be more susceptible to role conflict than
23 other emergency workers?

24 A. (Kelly) That was never discussed.

25 Q. But, nevertheless, they were singled

1 out as a group to be looked at?

2 A. (Kelly) That's correct.

3 Q. Dr. Lindell, on page three of your
4 testimony, you state that you have conducted three
5 types of research, two of them risk perception and
6 warning response, seem fairly specific to me. The
7 third one is emergency planning. Does your research
8 on emergency planning include any specific research
9 on role conflict?

10 A. (Lindell) No. The research that is
11 referenced there has to do with the factors that
12 induce local organizations or actually communities
13 to become involved and make commitments to become
14 involved in emergency planning. So, the answer is
15 in that, we did not specifically look at role
16 conflict.

17 Q. Just below that, you talk about
18 emergencies in which you have performed--in which
19 you have personally collected data. Did any of the
20 data that you gathered in these emergencies deal
21 with role conflict?

22 A. (Lindell) No, it did not. We were
23 looking at how people responded to evacuation
24 warnings. We also collected some additional
25 information about how emergency personnel responded.

1 We did not specifically ask questions about role
2 conflict because we had read the literature at that
3 time and there was no indication that role conflict
4 was a problem.

5 Q. You are talking about the literature
6 such as you have cited in your testimony by Dr.
7 Mileti and others?

8 A. (Lindell) That is correct.

9 Q. Have you ever done any data collection
10 on role conflict?

11 A. (Lindell) We have not--I had not
12 previously gone out and asked questions specifically
13 about role conflict. When we talked to people in
14 these evacuations we asked questions of the
15 organizational informants as to what problems they
16 had. In none of those cases did people volunteer
17 the information that they had experienced role
18 conflict to the degree that it resulted in role
19 abandonment.

20 Q. They didn't volunteer it but you didn't
21 specifically ask about it; correct?

22 A. (Lindell) That's correct.

23 Q. Mr. Crocker, you mention on page four
24 that you didn't participate in emergency response to
25 Hurricane Gloria. Did you experience role conflict?

1 A. (Crocker) No, sir. The day before the
2 hurricane I was up at the Ginna Station in New York
3 City. In fact, I was observing their annual
4 exercise with the NRC. We caught the last plane in
5 and a lot of these arrangements had already been set
6 up before I even landed. I was effectively out of
7 action.

8 Q. You state that you volunteered to serve
9 in LILCO's restoration efforts, et cetera. Your
10 efforts were post-impact. Correct?

11 A. (Crocker) Yes. The day after the
12 hurricane. We were struggling to recover from a
13 large amount of damage. We needed every able body.
14 It was after the hurricane had passed.

15 Q. You also mentioned an event in
16 Massachusetts as a result of a blizzard. Did you
17 play any emergency role in that incident?

18 A. (Crocker) No. I would characterize
19 myself as victim in that one.

20 Q. Were you evacuated?

21 A. (Crocker) No. Evacuees were relocated
22 to where I was.

23 Q. You were a victim because you didn't
24 want any evacuees where you were?

25 A. (Crocker) Well, they were pretty nice

1 people but we were snowed in for the better part of
2 a week. We weren't allowed to drive. The National
3 Guard had essentially taken over the town. It was
4 half fun and half very annoying.

5 Q. You were not an emergency worker in
6 that?

7 A. (Crocker) I clearly was not.

8 Q. Mr. Kelly, you state you have been
9 involved in emergency responses to several natural
10 and technological emergencies. Is that correct?

11 A. (Kelly) That's correct.

12 Q. Were any of those radiological
13 emergencies?

14 A. (Kelly) No, with the possible
15 exception of a nuclear weapon threat that may have
16 occurred shortly after I joined--I was involved in a
17 discussion of that, and I don't know if it was a
18 post-accident, but that did not require any major
19 emergency response by anyone other than the Federal
20 Government.

21 But to answer your question more
22 directly, for the most part, no, none of these were
23 radiological incidents.

24 Q. Was the incident you were talking about
25 regarding the nuclear weapon one of the incidents

1 listed here on page four of your testimony?

2 A. (Kelly) No, it was not.

3 Q. You were involved more in discussions
4 with other people about it?

5 A. (Kelly) That's correct. The State was
6 notified that the incident occurred. But beyond
7 that, they had no involvement.

8 Q. What was the nature of your role in the
9 other emergencies you set out here on page four?

10 A. (Kelly) Okay. Starting with the Lynn
11 fire, in 1982 I received a call from the night
12 person at the Massachusetts Civil Defense Agency who
13 was relaying a message to me from the Deputy of
14 Defense Director to report to the emergency
15 operations center due to a large fire in Lynn,
16 Massachusetts, which he characterized as being a
17 conflagration similar to what happened in Chelsea,
18 Massachusetts, about 10 years before.

19 I went to the emergency operation
20 center. I was the first person to report. This is
21 the State headquarters, by the way, located in
22 Framingham, Massachusetts.

23 At that time I contacted the Deputy
24 Director. He asked, as I recall, that I get in
25 touch with the local authorities as well as the

1 Secretary of Public Safety for the state. He may
2 have asked me to notify some other state-level
3 officials but I can't recall specifically. And
4 essentially at that point I was receiving
5 information about the emergency, passing that along
6 to other officials. That was--that started around
7 2:00 a.m. By about 7:00 a.m., as I recall, the fire
8 was not out--nowhere near being out but it was
9 relatively under control or was about to be under
10 control, and we started working towards the issue of
11 collecting data about the damage. We went up to
12 Lynn later on that morning to collect additional
13 information.

14 To shorten this up, eventually I was
15 responsible for collecting all the data and
16 justifying to FEMA that a presidential disaster
17 declaration was required for that area and the
18 President did declare that area a federal disaster
19 area.

20 Q. Let me follow up on that. Was any of
21 your data collection concerning the behavior of
22 emergency workers?

23 A. (Kelly) No. It principally dealt with
24 damages that were incurred, although part of the
25 request to the President must contain information

1 about the emergency response. Before the President
2 can grant a disaster declaration, he has to be
3 certain that to the best of the state's and local's
4 ability, they responded appropriately, did all they
5 could, and that federal funding was now necessary
6 for recovery.

7 Q. But you weren't specifically gathering
8 information on role abandonment?

9 A. (Kelly) No. I would never have asked
10 that question.

11 Q. Let me see if I can shorten this up a
12 little bit.

13 In any of these emergencies, were
14 evacuations involved?

15 A. (Kelly) To some extent, I believe,
16 winter storm may have involved some evacuation of
17 people due to utilities being out. They needed to
18 get into a shelter with heat and so forth. The
19 floods out in the western part of the state also
20 involved some evacuations. The State employee
21 strike did not involve an evacuation. Lynn, of
22 course, did involve evacuation. Salem,
23 Massachusetts, I believe, involved a small
24 evacuation. The Cuban refugee program, which was
25 when I was working with FEMA, I don't know if I

1 would classify that as an evacuation. It was a
2 relocation of Cubans from Cuba to the United States.
3 Then Hurricane Alan had involved an evacuation. I
4 believe it was a spontaneous evacuation as opposed
5 to an ordered evacuation. But the portion that I
6 dealt with was the recovery program.

7 Beyond that, there may have been other
8 of that small-scale evacuations that could have
9 occurred with other emergencies that would occur on
10 a daily basis. For instance, a small chemical spill
11 that we were notified of on a highway may have
12 involved a small evacuation of people but State
13 resources may not have really been required in those
14 situations.

15 Q. For any of these emergencies that you
16 have said involve some sort of evacuation, were
17 evacuations by bus drivers involved?

18 A. (Kelly) I can't be certain that they
19 were or were not used. I don't know.

20 Q. Why didn't you determine that so that
21 you could decide to include it or not include it in
22 your data base?

23 A. (Kelly) Well, the question was
24 directed at our experience with real emergencies,
25 and that is what the answers were directed at.

1 Q. My question is, for the work you have
2 done for LILCO, why have you not included these
3 emergencies--

4 A. (Kelly) Oh--

5 Q. --in that data base?

6 A. (Kelly) None of those emergencies,
7 with the exception of Lynn, were in our original set
8 of data that we collected from which the study we
9 did for LILCO grew out of. For instance, the floods
10 in Massachusetts weren't part of our data set, nor
11 were any of the others.

12 Q. Dr. Lindell, let me go back to the
13 emergencies you set out on page three. Did any of
14 those involve evacuations of people by bus?

15 A. (Lindell) No. The closest they came
16 to evacuation by bus were the only multi-occupant
17 vehicles that were used other than personal vehicles
18 took place in Snoqualmie, Washington, where they
19 used a fire truck.

20 Q. Dr. Mileti, on page six of your
21 testimony you discuss eruption of a volcano in
22 Colombia, South America. Was role conflict one of
23 the issues you were researching there?

24 A. (Mileti) We went to do as
25 comprehensive post-impact assessment as we could,

1 and if we got data on something; we took account of
2 it. We didn't explicitly look for role conflict.
3 There wasn't an evacuation, which was the problem.

4 Q. There was no evacuation?

5 A. (Mileti) That is why so many people
6 died in that event.

7 Q. I take it the emergency workers who
8 helped in the post-impact stage were mostly from
9 outside the area?

10 A. (Mileti) Well, there were several
11 categories of emergency workers. Some of them were
12 the people who happened to survive. But that was
13 coincidental, just the people who lived on the
14 fringe of the town, and that was volunteering in
15 obviously an ad hoc response.

16 There also was response by emergency
17 workers, for example, from the Red Cross, which in
18 that country has a very different role than it does
19 in this country. It has a very active role in
20 disaster management as opposed to just taking care
21 of victims. And those persons, some of them
22 mobilized and responded in--after the news that the
23 volcano had erupted but they didn't get to town from
24 where they were going in time. They came from
25 neighboring communities. The people in the Red

1 Cross in the cities that were inundated all died.

2 Q. You speak in the first full paragraph
3 about collection of primary field data on topics
4 related to emergency planning. What primary field
5 data have you collected on role conflict?

6 A. (Mileti) I have only actually
7 purposefully asked questions about role conflict
8 and/or role abandonment in two emergencies. They
9 are coincidentally both radiological emergencies,
10 the first being Three Mile Island, and I presented
11 in my testimony in reference to role conflict the
12 results of that study back here in '83 or
13 thereabouts. And then again in assessing, way after
14 the emergency but nevertheless with actual victims
15 or people who knew many of the victims, the issue of
16 role performance, role conflict and role abandonment
17 as it might have occurred or did occur in reference
18 to the bombing of Hiroshima.

19 JUDGE GLEASON: In reference to what?

20 WITNESS MILETI: The bombing of
21 Hiroshima, a study I did while I was in Japan. So
22 it is only in those two events, as I recollect, that
23 I actually asked questions about that issue.

24 Q. Let me just go to the first item. If
25 you could refresh our recollections, briefly tell us

1 what the study was that you did at TMI?

2 A. (Mileti) I wanted to find out if any
3 organizations that responded to the Three Mile
4 Island incident had any employees who abandoned
5 their job--that is, didn't show up for work. And I
6 was doing that research because I thought it would
7 be interesting information to have in getting ready
8 to write testimony on this issue in these hearings
9 for Shoreham.

10 And I had a graduate student,
11 therefore, decide--he was one who spent a good deal
12 of time helping me do my original field work of the
13 emergency and post-impact stress team when I was
14 working for GPU, assessing the impacts of the
15 emergency--I had him decide what organizations were
16 relevant, thinking that would make the data base
17 seem more legitimate because I was going to present
18 it in this setting. I thought he might appear more
19 bias-free from your point of view, for example.

20 And I sat down and helped him develop
21 an informal--I guess a form checklist of the kinds
22 of questions to ask when he called up organizations.
23 I gave him a handful of instructions. For example,
24 when you call the organizations, try to find
25 somebody who is not so high up in the bureaucratic

1 structure that they don't know about the work that
2 actually goes on and not so low that they don't know
3 about how other workers are working, and simply to
4 ask those key informants whether or not people who
5 worked in the organization did or did not come to
6 work during the accident at Three Mile Island.

7 As I recollect, one of the
8 organizations he got data on didn't, to any of us,
9 when you cross-examined me on it, didn't seem
10 relevant to emergency work, but that is because he
11 chose it. I forget which department it was. Others
12 seemed to be very relevant to emergency work. We
13 found by and large that most people went to work,
14 who had a job.

15 It was that kind of study. It was
16 certainly not the kind of study that lends itself to
17 statistical analysis or it wasn't a randomly
18 selected study. It was just to find out on a dozen
19 or more so organizations that went through Three
20 Mile Island in that area of the country, whether or
21 not employees went to work. We didn't interview
22 employees. We interviewed people who knew whether
23 employees were there or not.

24 I'm sorry. Did your question also
25 include the study in Japan?

1 Q. Not yet.

2 You interviewed, or your graduate
3 student interviewed people who you thought would
4 know whether people abandoned their roles or not,
5 right?

6 A. (Mileti) Yes. He interviewed
7 organizational respondents to speak for the
8 organization in reference to the number of workers
9 who did or didn't come to work.

10 Q. And what assurances do you have that
11 the people interviewed actually had the information
12 that was requested?

13 A. (Mileti) Well, I would hope that--it
14 is hard for me to recollect precisely what I told
15 him in terms of determining who to talk to. I would
16 hope that whoever he talked to were the right people
17 to talk to and if they weren't, that they might have
18 said they didn't know. So, I have the assurances
19 that I might have in reference to the behavior of a
20 potential Ph.D. in the department.

21 It is possible he may have been able to
22 find more appropriate respondents than the ones that
23 he did, but I hope that he was able to discern
24 between people who were making things up, which I
25 don't believe people did, that he in fact got in

1 touch with people who would be able to speak on
2 behalf of the organization.

3 Q. Couldn't respondents give as much
4 information as they have but still not have all the
5 relevant information regarding whether role
6 abandonment happened?

7 A. (Mileti) I suppose--I am famous for
8 saying anything is possible, especially in reference
9 to human behavior, so of course that is possible.
10 But I don't think that the respondents, if they were
11 saying "X amount of our employees came to work and X
12 amount didn't, the normal absentee rate is"
13 whatever, that they would be pulling that
14 information out of the air.

15 Q. Well, were there respondents who did
16 not know how many people responded and how many
17 stayed home?

18 A. (Mileti) I don't know. It is
19 possible. But the assignment that I gave the
20 graduate student was that if that happened, he was
21 talking to the wrong organizational informant and he
22 should have found out who to talk to until he could
23 find out what went on in that organization.

24 Q. After he collected the data, did you do
25 anything to assure yourself that he had spoken to

1 the right people?

2 A. (Mileti) Not after. I thought I did
3 it before by selecting a graduate student that I
4 thought could perform the job adequately.

5 Q. Other than that, you didn't do anything
6 to assure yourself that he had done the job right?

7 A. (Mileti) No. I didn't do second
8 checks or do the study myself. As I recollect
9 saying in 1983, I was too busy writing testimony on
10 this case which is why I didn't do the study myself.

11 Q. Were bus drivers involved at all in
12 evacuating people at Three Mile Island?

13 A. (Mileti) Well, it depends on how you
14 define "evacuation." The Governor's advisory was
15 issued at 12:30 on Friday afternoon. And the
16 information from the Governor's advisory was
17 disseminated to schools. Schools were closed. And
18 I presume that schools use buses to send people home
19 in response to hearing that the emergency was going
20 on and that an evacuation advisement was issued, in
21 that there were a lot of schools there. Many were
22 in somewhat rural areas. One would have to presume
23 that buses were used. But I wouldn't consider that
24 an evacuation. Well, it wasn't--well, in a way it
25 was an evacuation of the school. What it was was an

1 early dismissal of the schools.

2 I am not sure if buses were used for
3 any of the other people who left the Three Mile
4 Island area. 144,000 people left. Odds are pretty
5 good somebody was in a bus of some sort but it
6 certainly wasn't the kind of evacuation that would
7 use buses.

8 Q. There wasn't an organized evacuation by
9 bus?

10 A. (Mileti) I certainly have no
11 organization on that at all. The people--there were
12 people getting ready to potentially evacuate a very
13 large area, and a good many evacuation plans were
14 put together on the spot. Off the top of my head, I
15 don't remember if any of them involved buses but I
16 would be real surprised if they didn't. But I don't
17 think that plan was implemented. Beyond the
18 potential use of buses to close the schools, I don't
19 believe buses were involved.

20 Q. I think you mentioned earlier the
21 possibility of early dismissal of schools. Is that
22 something you are certain of or are you speculating?

23 A. (Mileti) Not a possibility of early
24 dismissal of schools. Schools closed on Friday,
25 closed early. They closed in response and after

1 hearing the Governor's advisory issued at 12:30,
2 early afternoon, that broadcast--I was interviewing
3 for a couple of hours the school principal at the
4 high school and he broadcasted the Governor's
5 advisory over a loud speaker in the different
6 classrooms. They definitely closed before normal,
7 probably three o'clock or whatever. They closed the
8 schools early.

9 Q. Did the organizations called by your
10 graduate student include any of the bus companies
11 providing these bus drivers?

12 A. (Mileti) I don't believe so. I would
13 be willing to say no.

14 Q. Do you know whether anybody has looked
15 into whether or not those bus drivers--were any of
16 those bus drivers evacuated with their families
17 rather than participating in the early dismissal?

18 A. (Mileti) I don't know that anyone has
19 gathered data on that. I wish you asked me that
20 question in a deposition. I probably would have
21 done it.

22 Q. Maybe that is why we didn't ask.

23 Q. You say there were about 12
24 organizations? Do you recall?

25 A. (Mileti) I don't remember precisely.

1 I would have to look at my testimony from the 1983
2 or '84 hearings here on this issue. It could have
3 been half a dozen. Could have been as much as a
4 dozen. It was thereabouts.

5 Q. Did the organizations called include
6 any hospitals?

7 A. (Mileti) Again, I would have to look
8 at the record in this case. I don't remember the
9 organizations that he called.

10 Q. How many respondents responded for each
11 organization? Just one?

12 A. (Mileti) Again, I don't remember. I
13 would have to look at the record. It is possible.
14 And I would presume that some respondents were the
15 wrong ones and additional phone calls would have to
16 have been made. I don't remember the details. It
17 has been about five to six years.

18 MR. CHRISTMAN: I'm sorry, Chris, I
19 didn't want to interrupt. I think I can find copies
20 of our '83 testimony, which is what Mr. McMurray is
21 cross-examining on, Judge Gleason. If that would
22 help or if it would help develop the record for Dr.
23 Mileti to look at it before answering the questions,
24 it has been quite a while since we filed the
25 testimony and since it was cross-examined on in 1983

IMAGE EVALUATION
TEST TARGET (MT-3)

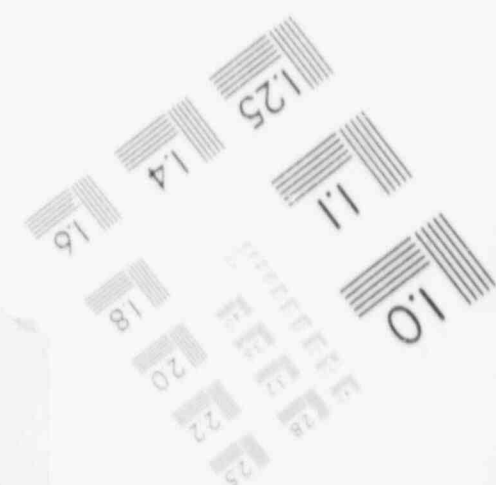
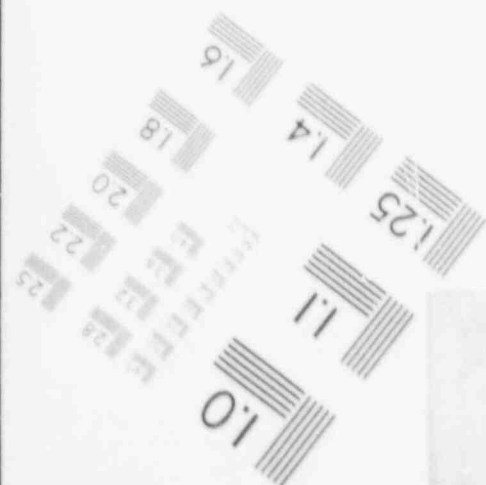
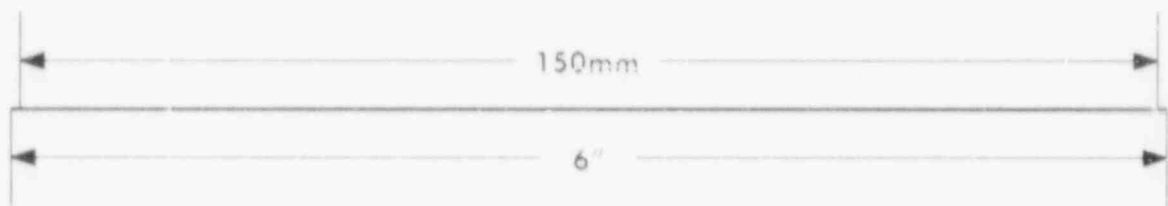
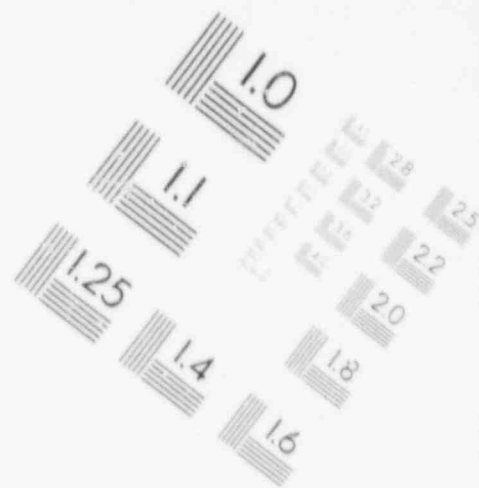
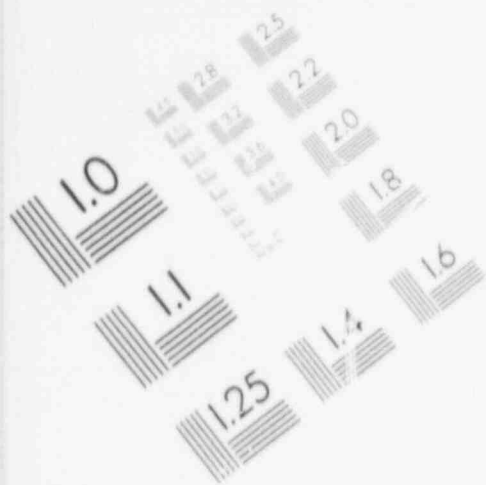
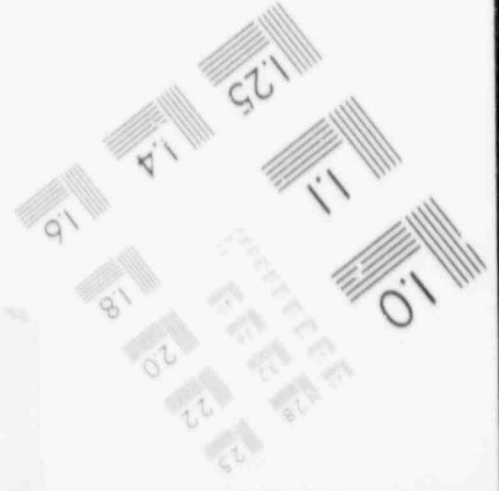
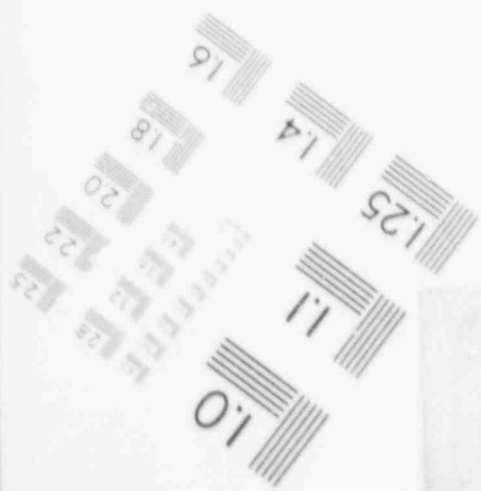
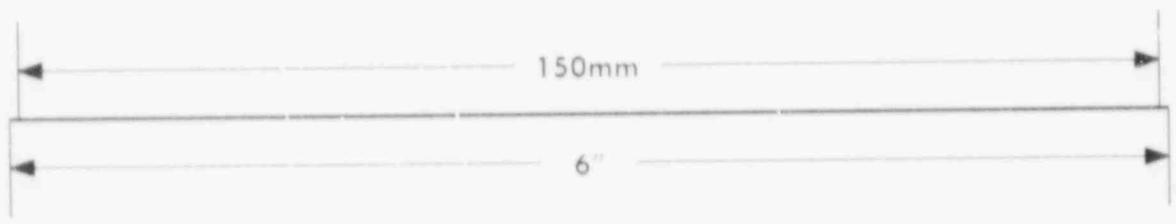
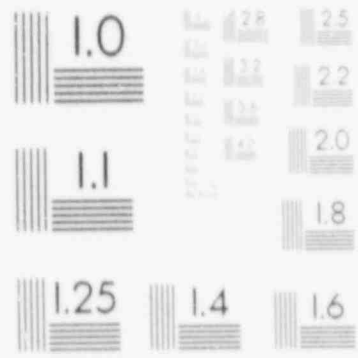
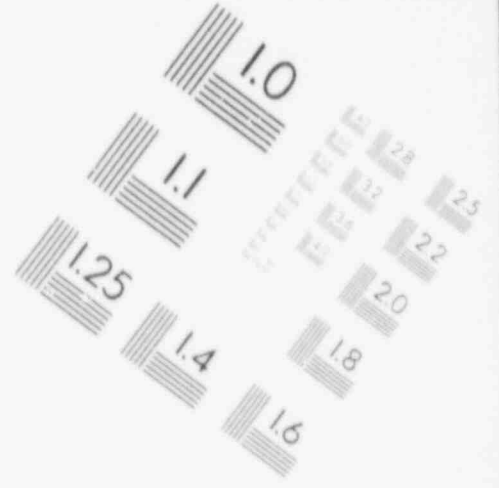
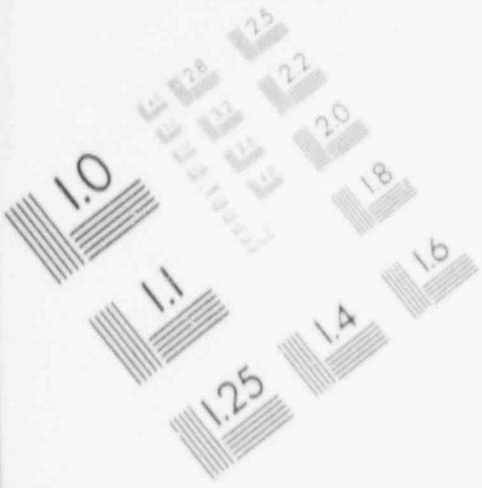


IMAGE EVALUATION
TEST TARGET (MT-3)



1 and '84.

2 JUDGE GLEASON: Mr. McMurray--

3 MR. McMURRAY: I have no objection, but
4 I don't see a need for it right now.

5 JUDGE GLEASON: All right. Continue.

6 Q. Were the data collected by your
7 graduate student ever published anywhere?

8 A. (Mileti) No.

9 Q. I take it that more work would have to
10 be done before those data would be publishable?
11 Would you agree?

12 A. (Mileti) No, I totally disagree. And
13 I tell this--it turns out, it is very easy to
14 publish in the social sciences. The variable that
15 is significant is the quality of the journal you get
16 to publish in. The data from this study, which is
17 interviewing key organizational informants about the
18 behavior of an organization in an emergency, could
19 have been readily published or still could be
20 readily published as a research note. It wasn't an
21 elaborate enough study to call or make into a
22 journal article, but it certainly could be a
23 research note.

24 Q. Have the data that were collected ever
25 been verified by anyone?

1 A. (Mileti) Well, I have already said
2 that I didn't do anything along those lines after he
3 collected his data. I don't know of anyone else who
4 may have. I certainly haven't been involved in
5 that, as I have already said.

6 If I just might add to that, it did
7 happen that a few months ago I encountered a report
8 from the National Guard in Pennsylvania and--the
9 National Guard was one of the organizations that he
10 interviewed, now that I recollect. We ended up in
11 our testimony saying that they reported no role
12 abandonment during Three Mile Island. James
13 Johnson, Jr., I think Stephen Cole and Don Zeigler,
14 some of your witnesses at Seabrook suggested the
15 National Guard was an organization in which there
16 was role abandonment. So when I encountered this
17 rogue report from the National Guard, I wanted to
18 see whether I thought it confirmed what I said in
19 the hearings versus what they said at Seabrook. It
20 clearly confirmed what I said at these hearings.

21 Q. Is that the excerpt you have in your
22 testimony here?

23 A. (Mileti) As I recollect, there is
24 reference to that National Guard study in this
25 testimony, but let me check.

1 JUDGE GLEASON: Do you have a page
2 reference, Mr. McMurray?

3 MR. McMURRAY: I think that is what Dr.
4 Mileti is looking for, sir.

5 JUDGE GLEASON: I realize that.

6 MR. McMURRAY: I am not about to ask
7 questions on it right now.

8 MR. CHRISTMAN: Sir, it is on page 35
9 and 36 of the testimony.

10 WITNESS MILETI: Yes, Mr. McMurray.
11 That is the report I was talking about.

12 Q. We will reach that later.

13 You mentioned a study done at
14 Hiroshima. Could you please describe how that
15 involved questions about role conflict?

16 A. (Mileti) Yes. It was purposefully
17 done specifically to study nothing other than role
18 abandonment amongst emergency workers in the
19 aftermath of the bombing of Hiroshima. It turned
20 out that I was going to Japan for a conference at
21 the time LILCO first hired me to address this issue.
22 And much to my surprise they said that they would
23 pay the costs of me doing a study of role
24 abandonment in the aftermath of Hiroshima. When I
25 finished the conference, I went there first, to go

1 to--I did stay on.

2 What I--this was gathering data
3 approximately 40 years after the event, and there is
4 an issue of how well people can remember, of course.
5 But nevertheless, I was provided with the
6 opportunity to talk to some people.

7 It turns out that a good friend of mine
8 named Professor Nakano who used to teach at Tokyo
9 University, now retired, he is familiar with most of
10 the people who survived in Hiroshima, because what
11 happened after that bomb was that many of the
12 survivors didn't have family left, and Japanese
13 society, given how it is structured, totally
14 excluded them not because so much--although it
15 included--they went through the bomb, but they had
16 no intimates to then introduce them into society.
17 You can't get married unless you have a father to
18 arrange it, et cetera. Very different kind of
19 society.

20 Well, Nakano opened up his house and
21 said he would sponsor all the survivors from the
22 atomic blast and, in essence, became their parents.
23 At one point in time almost all of the survivors
24 literally were in his home. He helped introduce
25 them so they could get back into the mainstream of

1 Japanese life.

2 Other stories could be spun having
3 little to do with what you asked.

4 I asked him as far as Professor
5 Nakano--I said that--Professor Abe and Kazama and a
6 few other social scientist also there if they could
7 help arrange for me to talk to some survivors. One
8 of the things I spent most of my time doing was
9 talking to Professor Nakano because he knew the
10 people that were survivors. He knew most of the
11 tales, et cetera.

12 So I interviewed him and talked to him
13 extensively. Also, I interviewed approximately--not
14 many, as I recollect, in the neighborhood of only
15 half a dozen actual survivors, with translators,
16 that I arranged. Wasn't an elaborate study but it
17 was certainly more information than I had before I
18 went to Japan as to what happened, which I think is
19 informative because it adds a lot more insight than
20 we have in in our record, basically Lipton's book.
21 I haven't published that data yet--you didn't ask.

22 Q. Are you planning on it?

23 A. (Mileti) Yes. I have a sabbatical
24 coming up and I will write the book I always wanted
25 to write and that will be the theme of that chapter.

1 Not the disaster but the things I learned from it.
2 It is more useful to publish that limited data in
3 that way than a journal article.

4 Q. What conclusions did you draw about
5 role and and at Hiroshima?

6 A. (Mileti) Well, in general, it was hard
7 to consider that role abandonment occurred in that
8 most of the organizations if not all the emergency
9 response organizations in Hiroshima blew away.
10 There were none left. There were, however, strong
11 tales, and I pursued this because there were tales
12 in our literature about people
13 becoming--normlessness or withdrawn or wandering
14 around aimlessly in the aftermath of the bombing,
15 and also that that occurred with hospital workers.

16 And there were, in--I don't remember
17 right now if it was Hiroshima or Nagasaki--I think
18 in both but I have to qualify that. I don't
19 remember--there was a group of hospital workers,
20 nurses and doctors both, only perhaps a small
21 percentage of those who resided in, let's just say
22 it was Hiroshima, who immediately assembled in a
23 junior high school or grammar school to set
24 up--volunteered, albeit, they had their role before
25 the emergency, but their organization disappeared

1 when the bomb exploded. They set up a headquarters
2 to service people who would be hurt. And they
3 worked very diligently and very hard.

4 And it was the typical altruistic
5 response we observe so often in emergencies. But
6 they simply became overwhelmed. After it became
7 grossly clear that there was no way that they could
8 accomplish any good, that there were thousands upon
9 thousands of victims for a handful of doctors and
10 nurses, and they indeed did give up at that point.

11 I think that is food for an interesting
12 theoretical yarn that I would like to spin in my
13 book.

14 Q. Did you collect any data regarding what
15 percentage of all doctors and nurses who survived in
16 that area volunteered and went to that school and
17 participated?

18 A. (Mileti) No. I didn't collect--I
19 didn't collect quantitative data. There was no--you
20 could put numbers on any qualitative sociological
21 data. That is usually what we do when we want to
22 call it quantitative, but it is still really
23 qualitative data. I didn't ask people to try to
24 estimate that. I would have had--it would have been
25 an extremely elaborate study that I don't think I

1 would have trusted in the long run. I simply asked
2 how many people was--was there an altruistic
3 response?

4 There also are a few publications that
5 document the all-pervasiveness of the death of the
6 public health communities after those bombs. In a
7 qualitative way I can make a quantitative judgment
8 that a handful of nurses and doctors was just about
9 all that were left.

10 Q. You don't know, really, whether those
11 who went to the school to participate in serving the
12 community in a medical way was a large proportion or
13 small proportion of those who survived? Is that
14 correct?

15 A. (Mileti) I would have to say I can
16 only answer that question as I just did, and that is
17 qualitatively, that I would make the judgment that a
18 handful of them were the only ones left and at least
19 a handful of them showed up in this one high school
20 or junior high or grammar school or whatever it was.

21 Q. What would be the basis for your
22 judgment?

23 A. (Mileti) Documented records that
24 detail what percentage of the people who were nurses
25 survived the explosion in Hiroshima as well as the

1 percentage of doctors that survived in both areas.
2 That kind of information is catalogued in extreme
3 detail. And I think, taking those records about how
4 many people survived in those helping categories and
5 then pitting that against the qualitative stories
6 about how nurses and doctors did try to come
7 together and help, volunteering, of course--there
8 was no organization left. It was blown up--leads me
9 to conclude that most people tried. That
10 explanation is consistent with the generic findings
11 from disaster research.

12 Q. Have you actually looked at those
13 records to determine how many doctors and nurses did
14 survive?

15 A. (Mileti) I have looked at the records
16 that detail that information, yes. There is a book
17 published in this country that is a summary of every
18 report that has ever been done that would be of
19 interest to social scientists as well as, I suspect,
20 physical scientists, that catalogs those
21 percentages. That was one of the first things I did
22 before I started doing my interviews, was buy that
23 book when I was in Tokyo.

24 Q. How many doctors and nurses did
25 survive?

1 A. (Mileti) In Hiroshima or Nagasaki?

2 Q. In Hiroshima. Concentrate on
3 Hiroshima.

4 A. (Mileti) I would have to look it up.

5 Q. Have you made a comparison of those
6 numbers against those who did report?

7 A. (Mileti) I did when I was in Japan
8 doing this report. I haven't done it recently. I
9 can do it right now if you like.

10 Q. Do you have the book?

11 A. (Mileti) Yes.

12 Q. Why don't you do it at the lunch hour.

13 A. (Mileti) Carrying all these references
14 around has made a difference.

15 Q. We will do that at the lunch hour.

16 MR. CHRISTMAN: I want to make sure the
17 question is real, real clear if we are going to do
18 this research so we don't come back with the wrong
19 answer.

20 JUDGE GLEASON: Do you have any
21 misunderstanding as to what question you are looking
22 up the answer for? I thought it was precisely what
23 percentage of the doctors survived in Hiroshima.

24 Is that right, Mr. McMurray, how many
25 doctors survived?

1 MR. McMURRAY: How many doctors
2 survived, and from that I would like us to be able
3 to find out what percentage reported to perform
4 medical services. I understand that this can
5 probably be done from a book Dr. Mileti has brought
6 with him. I don't think we should waste the board's
7 time having him search right now for that. We can
8 do it at lunch hour.

9 JUDGE SHON: I think Dr. Mileti may
10 have put it a little differently than you did. What
11 you are searching for, as I understand it, is the
12 number of doctors and nurses who survived and the
13 fraction thereof who reported for duty. Is that
14 right?

15 MR. McMURRAY: Correct. Not the
16 proportion who survived.

17 JUDGE SHON: Not the fraction that
18 survived and the number that reported for duty, but
19 the other way around.

20 JUDGE GLEASON: Is there any
21 misunderstanding in your mind?

22 WITNESS MILETI: I think I am confused
23 now. I thought I was clear before we attempted to
24 clear it up. I apologize. I am to find out the
25 percentage of doctors that survived--

1 MR. McMURRAY: No. The absolute
2 number.

3 JUDGE GLEASON: The number.

4 WITNESS MILETI: The number of doctors
5 that survived.

6 MR. McMURRAY: And nurses.

7 WITNESS MILETI: And nurses? Number
8 of doctors who survived and the number of nurses who
9 survived?

10 MR. McMURRAY: Correct.

11 WITNESS MILETI: That is it?

12 MR. McMURRAY: Then we would like a
13 comparison with how many actually showed up at that
14 school, so what percentage of those that survived
15 showed up at the school.

16 WITNESS MILETI: As I recollect
17 saying, I based that on the qualitative data I
18 collected when I was there. I am happy to look to
19 see if there are quantitative estimates as well in
20 the book that I reviewed.

21 Q. You are telling me you don't know the
22 actual number who went to report?

23 A. (Mileti) I am telling you, to the best
24 of my recollection, I recall that there is a table
25 in the book I have brought with me that estimates--I

1 don't remember if it is number or percentage, but a
2 quantitative estimate of the number of doctors who
3 survived and even the nurses who survived, I
4 believe, in either or both Hiroshima and Nagasaki.

5 I suspect, but I don't recollect for
6 sure, that there may be some quantitative numbers
7 about how many engaged in helping behavior after the
8 bomb, who then eventually stopped doing that, but I
9 remember clearly saying that I was basing my
10 judgment on the qualitative data about how many of
11 them engaged in helping behavior when I was talking
12 to the people who experienced the event and
13 Professor Nakano in Japan.

14 Q. What I would like to find out is
15 whether there is any quantitative basis for your
16 qualitative judgment.

17 A. (Mileti) Happy to look.

18 JUDGE GLEASON: Is this a good place to
19 take a recess?

20 MR. McMURRAY: Sure.

21 JUDGE GLEASON: We will stand in recess
22 until 1:30.

23 (Whereupon, a luncheon recess was
24 taken.)

25 A F T E R N O O N _ _ _ S E S S I O N

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(1:15 p.m.)

JUDGE GLEASON: All right gentlemen. I apologize for being six minutes late. You may proceed.

MR. McMURRAY: I want to note, Judge Gleason, we have put before the board and given to the parties a list of matters we would like to discuss for reconsideration later this afternoon.

EXAMINATION BY MR. McMURRAY:

Q. Dr. Mileti, before we broke for lunch, we were going to look up some data; is that correct?

A. (Mileti) That is correct.

Q. Have you done so?

A. (Mileti) Yes, I have.

Q. I believe the first question put on the table was the number of doctors and nurses who survived the Hiroshima atomic bomb blast.

Do you have that information?

A. (Mileti) Yes.

In the document I reviewed, I had to calculate those numbers, because I was given the numbers in the book that were casualties and the percentage of the profession that they represented.

There were 270 physicians in that profession in Hiroshima. 90 percent were casualties

1 and I estimated, therefore, that 30 were survivors.
2 There were 650 nurses that were casualties, which
3 represented 93 percent of the nursing profession. I
4 estimated that that would mean 124 nurses survived.

5 Q. Did anybody check your calculations to
6 make sure you did them right?

7 A. (Mileti) Yes, but it was me. I did
8 them twice.

9 Q. Could you tell me what the name of the
10 document is from which you got the figures, from
11 which you calculated these figures?

12 A. (Mileti) It is a book entitled
13 "Hiroshima and Nagasaki, the Physical, Medical and
14 Social Effect of the Atomic Bomb."

15 Q. Who is the author?

16 A. (Mileti) The author was the Committee
17 for the Compilation of Materials on Damage Caused By
18 the Atomic Bomb in Hiroshima and Nagasaki. Let me
19 see if there are people named.

20 Q. I think that is sufficient. Thank you.

21 You stated that a handful of physicians
22 and nurses reported to a school of some sort in
23 Hiroshima after the blast; have you been able to
24 pinpoint any better the number who actually did
25 report to perform medical services?

1 A. (Mileti) Based on the review that I
2 did at lunch, I was unable to locate in this
3 document any reference to any number regarding how
4 many physicians and nurses volunteered for emergency
5 work in Hiroshima after the bomb.

6 Q. Do you believe that those data are in
7 that book?

8 A. (Mileti) I'd have to say that I don't
9 believe that, because I had made a list of the pages
10 on which I thought anything might be relevant for
11 the notion of role conflict, and I examined all
12 those pages at lunch and found no reference to that.

13 Q. Other than your statement that a
14 handful of doctors and nurses reported, do you have
15 any quantitative data that that would help us to
16 determine exactly how many reported?

17 A. (Mileti) Not in reference to
18 Hiroshima, no.

19 Q. Nagasaki?

20 A. (Mileti) There were data in reference
21 to Nagasaki, yes.

22 Q. Do you know what those data are?

23 A. (Mileti) Yes. I did write them down.

24 Q. What are they?

25 A. (Mileti) In Nagasaki, the data in the

1 reference document was that--

2 Q. Is this the same reference document?

3 A. (Mileti) Yes.

4 --was that there were 70 doctors in
5 that profession prior to the bomb going off. 20
6 were dead, 20 were injured, and that left 30 who
7 were not dead and not injured by the bomb in
8 Nagasaki. In that reference document, the only
9 quantitative reference to them doing emergency work
10 after the bomb went off, is the following quote at
11 page 382: "Leaving hardly 30 to help."

12 Q. But it doesn't state whether they did
13 help or not?

14 A. (Mileti) That is all it says in
15 reference to those 30.

16 Q. Did it say anything about nurses in
17 Nagasaki?

18 A. (Mileti) I don't remember. I was just
19 looking at the data for Hiroshima. It was only
20 inadvertent that I took the data down in reference
21 to Nagasaki about doctors.

22 Q. On page six of your testimony, you
23 state that you and others completed a report called
24 "Interface in Reactor Emergency Planning and
25 Response" for the NRC. Do you see that?

1 A. (Mileti) Yes, I do.

2 Q. Did this document at all pertain to
3 role conflict?

4 A. (Mileti) Not to my recollection. As I
5 recall, it applied to the degree to which off-site
6 emergency organizations that would be involved in an
7 emergency response were participating in developing
8 plans and the type of plans they were developing and
9 whether or not they would represent a cohesive
10 response.

11 Q. You state also that you also engaged in
12 some nonacademic practical applications of emergency
13 planning knowledge. This is on page six, by the
14 way. You say, for example, "I have consulted with
15 about a half-dozen utilities on the topic."

16 Has your consulting services with these
17 utilities included expert witness testimony?

18 A. (Mileti) Some of it has and some of it
19 hasn't.

20 Q. Out of how many of the half-dozen
21 utilities have you appeared as an expert witness?

22 A. (Mileti) I recollect two for whom I
23 did not appear as an expert witness. And so, all
24 the others.

25 Q. Have you ever testified against the

1 position taken by a utility in a NRC licensing
2 proceeding?

3 A. (Mileti) No, I haven't. But I have
4 worked for the TMI Public Health Fund through Clark
5 University, which is a group of intervenors, and
6 evaluated the warning system and public education
7 aspects of emergency planning for that nuclear--that
8 operating nuclear reactor. I have no idea if that
9 will end up in litigation.

10 Q. So, you haven't testified on behalf of
11 that intervenor group yet in a NRC licensing
12 proceeding?

13 A. (Mileti) I haven't been invited to. I
14 have no idea whether I would say "yes" or "no."

15 Q. So, is it fair to say you have
16 testified as an expert witness in NRC licensing
17 proceedings for four utilities--that is a half-dozen
18 minus the two you know you didn't appear as an
19 expert witness for?

20 A. (Mileti) That math is correct, but I
21 would have to list the ones to make sure whether it
22 was four or five or what have you, that I actually
23 did--

24 Q. It could be more than four?

25 A. (Mileti) It is possible.

1 I said about half a dozen. It could be
2 seven, could be five. I have them listed on my
3 professional qualifications.

4 Q. Mr. Kelly, let me get back to you. On
5 page seven of your testimony you state that you have
6 developed and conducted emergency training programs
7 and conducted capability assessments and hazard
8 analyses studies. Do you see that?

9 A. (Kelly) Yes, I do.

10 Q. You have also, as consultant, developed
11 industry and community emergency preparedness plans;
12 is that correct.

13 A. (Kelly) That's correct.

14 Q. In developin, these industrial and
15 community emergency preparedness plans, how have
16 these plans, if at all, taken account of role
17 conflict?

18 A. (Kelly) I don't think they address the
19 subject that specifically. The plans do address
20 resource management and coordination of resources,
21 including human resources, to take care of whatever
22 needs might arise during emergency. But the issue
23 of role conflict, well, it was not an issue in these
24 cases.

25 Q. Well, you also mention training

1 programs. In the course of your work in developing
2 and running training programs, does any of your
3 training include steps to alleviate potential role
4 conflict?

5 A. (Kelly) The courses--well, two courses
6 that I call to mind, one I conduct for the American
7 Society of Safety Engineers, and another one, which
8 I will be conducting for George Washington
9 University, they are general in nature. They do
10 review lots of different planning guidelines,
11 including NUREG 0654.

12 To be honest with you, you just don't
13 talk about it all that much in these courses, if at
14 all. I just don't recall talking about it.

15 Q. I think earlier you said that you do
16 discuss resource management; is that right?

17 A. (Kelly) In the plans, that's correct.

18 Q. Are any of those steps the kind of
19 steps that should be included in an attempt to
20 alleviate role conflict?

21 A. (Kelly) The procedures are written
22 flexibly enough where if some group needed to be
23 evacuated and they needed bus drivers, this
24 procedure could handle that type of issue, that type
25 of problem.

1 Q. Let's step back. What procedure are
2 you talking about?

3 A. (Kelly) The resource management
4 procedures. If there were problems, requests for
5 resources would come into a central operating,
6 emergency operating center. And at that point,
7 local officials would refer to various lists of
8 emergency resources they might have and apply
9 whatever resources they need to that particular
10 situation.

11 If you are talking about a school that
12 will need evacuation, buses, bus companies are
13 generally listed in resource management plans, so
14 they could call up the appropriate bus companies and
15 dispatch buses to evacuate these people.

16 Q. Does this procedure include any way to
17 account for the possibility that bus drivers, some
18 bus drivers, may not be available?

19 A. (Kelly) Not specifically.

20 Q. Does it take into account any steps to
21 assign bus drivers so that they would be unlikely to
22 experience role conflict if asked to perform?

23 A. (Kelly) Training programs or the like?

24 Q. Well, that may be one.

25 A. (Kelly) In these cases that you are

1 referring to, I don't believe that was addressed,
2 no.

3 Q. What are the types of emergencies that
4 you are referring to here that you have developed
5 plans and training programs for?

6 A. (Kelly) Okay. As far as the emergency
7 training programs that I have conducted, as I
8 mentioned, American Society of Safety Engineers,
9 George Washington University. I developed a course
10 based on those courses for a former employer, and
11 they periodically conduct that course for industrial
12 clients.

13 Q. Excuse me. Let me follow-up on that.
14 Does it pertain to any particular kind
15 of accident?

16 A. (Kelly) It is a course on
17 comprehensive emergency management, so that would
18 include all forms of hazards.

19 Q. Including radiological accidents?

20 A. (Kelly) That's correct.

21 Q. I'm sorry. I didn't mean to interrupt
22 you. Go ahead.

23 A. (Kelly) In Massachusetts there were a
24 number of seminars that I would prepare presentation
25 for, for local civil defense directors and other

1 local officials. And I can't recall any of those
2 that had role conflict, per se.

3 Now, the next sentence, about
4 developing emergency preparedness plans, dealt with
5 a variety of industries. We were developing
6 emergency plans, as you are probably aware, the
7 industry is required to develop the detailed plans
8 that the nuclear industry is required to develop. I
9 feel pretty certain that none of those get into any
10 specifics about bus drivers and role conflict.

11 Q. You say bus drivers or role conflict?

12 A. (Kelly) Or role conflict.

13 Q. So, other than the work you did
14 previously with the 50 emergencies for your prior
15 client and the work you have done for LILCO, role
16 conflict is not an issue that you deal with; is that
17 correct?

18 A. (Kelly) I would say that that's
19 correct because it is not an issue.

20 Q. Gentlemen, let's get into some of the
21 literature that you have cited--

22 A. (Kelly) Excuse me. There were, of
23 course, radiological plans that I worked on in the
24 state of Massachusetts that probably did contain
25 information on bus drivers, more specific than I had

1 outlined. But I was not involved in those
2 particular aspects of the plan. I just wanted to
3 clarify that, because that was another paragraph you
4 didn't refer to.

5 Q. Mr. Kelly, you are going to have to
6 keep your voice up.

7 A. (Kelly) Sorry. Did you hear me?

8 Q. Not the last part of your sentence.

9 A. (Kelly) You were referring to that one
10 paragraph and that is what I directed my response
11 to, but I didn't want it to be misleading. There
12 are other plans that I worked on that did involve
13 radiological--well, nuclear power plants in the
14 state of Massachusetts, and those, I believe,
15 probably dealt with school bus drivers more
16 specifically. But those were not portions of the
17 plan that I was ever involved in.

18 Q. So, you didn't have occasion to address
19 the possibility of role abandonment by bus drivers
20 with respect to those plans?

21 A. (Kelly) That's right. To the best of
22 my recollection it wasn't an issue there either.

23 Q. Dr. Lindell, on page eight of your
24 testimony you cite a publication of yours, published
25 by the Atomic Industrial Forum, entitled "Planning

1 Concepts and Decision Criteria for Sheltering and
2 Evacuation In a Nuclear Power Plant Emergency."

3 Do you see that?

4 A. (Lindell) Yes, I do.

5 Q. Let's go to attachment A of the LILCO
6 testimony.

7 A. (Lindell) Which attachment?

8 Q. Did I say A? Attachment E.

9 Let me ask Mr. Kelly first: Mr. Kelly,
10 what is attachment E?

11 A. (Kelly) Attachment E is a report I
12 developed for LILCO.

13 Q. This was developed by you as part of
14 your work for LILCO in connection with these
15 proceedings. Correct?

16 A. (Kelly) That's correct.

17 Q. And on page two, and going over to page
18 three, Mr. Kelly, you have excerpted parts of the
19 article that I just referenced by Mr. Lindell. Is
20 that correct?

21 A. (Kelly) That is correct.

22 Q. Dr. Lindell, let me refer you to this
23 excerpt. Actually, it is two excerpts from
24 different parts of the article. The excerpt
25 addresses role conflict, doesn't it?

1 A. (Lindell) Yes, it does.

2 Q. And the article itself was written by
3 you with Ronald Perry and Patricia Bolton?

4 A. (Lindell) That's correct.

5 Q. Ronald Perry is a noted expert in
6 emergency planning, isn't he?

7 A. (Lindell) I guess he is.

8 Q. Who is Patricia Bolton?

9 A. (Lindell) Patricia Bolton is also a
10 noted expert in emergency response and disaster
11 research.

12 Q. I take it here that the discussion,
13 based upon your earlier answers--the discussion in
14 these excerpts is based on a survey of the
15 literature and not on field studies conducted by
16 you. Is that correct?

17 A. (Lindell) That's correct.

18 Q. And it is based on much of the
19 literature which is cited in your testimony by Dr.
20 Mileti and Russell Dynes, Warren Kelly and others.
21 Correct?

22 A. (Lindell) That's correct. Most of the
23 direct citations in that report go to Russell Dynes'
24 book, "Organized Behavior and Disasters."

25 Q. Let's start on page two of attachment

1 E. The excerpt first mentions Dynes stating that
2 role abandonment does not occur. Do you see that?
3 I believe it is the second sentence.

4 A. (Lindell) I see that, yes.

5 Q. The article then notes that Dynes gives
6 two primary reasons for this, one being priority
7 mechanisms and the other being avoidance mechanisms.
8 Is that correct?

9 A. (Lindell) That is correct.

10 Q. The priority mechanisms come from, I
11 think you say in the excerpt, training members of
12 the emergency organizations to give priority to
13 their emergency jobs. Correct?

14 A. (Lindell) That's correct.

15 Q. And also doing such things like making
16 organizational membership visible, like wearing
17 uniforms, right?

18 A. (Lindell) That's right.

19 Q. You also--the other reason given by
20 Dynes is avoidance mechanisms. The first avoidance
21 mechanism given in the excerpt is having members of
22 the emergency organization come from outside the
23 affected area, where they will have few or no family
24 ties within the area. Have I stated that correctly?

25 A. (Lindell) Yes, you have.

1 Q. And they also operate--avoidance
2 mechanisms will also operate, it says here, when
3 members of the emergency organizations have
4 unequivocal information about the nature of the
5 emergency. Is that right?

6 A. (Lindell) That's also correct.

7 Q. By "unequivocal," that means very clear
8 and certain information, correct?

9 A. (Lindell) Yes.

10 Q. Where they have made prior arrangements
11 with their families to take protective actions
12 before the emergency, right? That is another
13 avoidance mechanism?

14 A. (Lindell) That is another avoidance
15 mechanism, yes.

16 Q. And another one is the establishment of
17 communications with their families to verify that
18 they are safe. Correct?

19 A. (Lindell) Yes.

20 Q. Now, after going through all of that,
21 your article in another section, which is also
22 excerpted below, then makes a distinction between
23 designated emergency workers and what you call
24 emergency auxiliary personnel.

25 Isn't that correct?

1 A. (Lindell) Yes, we did make that
2 distinction.

3 MR. CHRISTMAN: Judge Gleason, I have
4 to object to further questions along this line. We
5 have gone 15 minutes now reading these two passages
6 that are already in the record with very little
7 being added to them, and I don't think that is
8 appropriate for cross-examination. So I object to
9 the further questions asking the witnesses to simply
10 read what is already in the record without asking
11 questions about it.

12 JUDGE GLEASON: I presume Mr. Christman
13 is heading somewhere, so let's give him a chance to
14 proceed.

15 Q. As an example of emergency auxiliary
16 personnel, you cite specifically bus drivers. Isn't
17 that correct, Dr. Lindell?

18 A. (Lindell) That is correct.

19 Q. And with respect to emergency auxiliary
20 personnel such as bus drivers, you state that it is
21 important to recognize--let me backup.

22 You first note that in the previous
23 section you said that designated emergency workers
24 do not abandon their roles, but that with respect to
25 emergency auxiliary personnel, including bus

1 drivers, this conclusion does not automatically
2 extend to that group. Isn't that what this says?

3 A. (Lindell) That is exactly what that
4 says. You cannot assume automatically that it
5 extends to that group.

6 Q. So that there must be special
7 provisions, as you state on the top of page 3, that
8 need to be made in order to assure their
9 availability in a nuclear power plant emergency.
10 Correct?

11 A. (Lindell) I think the wording in the
12 text says "special provisions may need to be made."

13 Q. And under what conditions would they
14 not need to be made.

15 A. (Lindell) If the bus drivers have a
16 prior experience in responding to emergencies, which
17 as we found out in a number of instances is the
18 case.

19 Q. You mean in other disasters?

20 A. (Lindell) Yes.

21 Q. You are not talking about the Shoreham
22 bus drivers specifically?

23 A. (Lindell) No. As a matter of fact, I
24 was thinking of other examples, such as Drabek found
25 in Denver where bus drivers were used on a number of

1 occasions, and as we subsequently found out in our
2 data collection, that bus drivers in Denver are
3 routinely used and, as a matter of fact, even
4 volunteer to take part in evacuations.

5 Q. That is because they are on a special
6 roster. Isn't that correct?

7 A. (Lindell) They volunteer for the
8 roster.

9 Q. They volunteer for a roster prepared
10 before emergencies, correct?

11 A. (Lindell) That's right. In Denver,
12 that is the case.

13 Q. You don't know whether there is a
14 roster similar to that containing names of local bus
15 drivers that LILCO would expect to perform in a
16 Shoreham radiological emergency, do you?

17 A. (Lindell) Could you repeat the
18 question?

19 Q. Is there a similar roster that exists
20 here on Long Island, applicable to the LILCO bus
21 drivers that LILCO would expect to perform in a
22 radiological emergency at Shoreham?

23 A. (Lindell) I am afraid I have no
24 knowledge of that.

25 JUDGE SHON: Mr. McMurray, I would like

1 a little clarification of that immediately prior
2 question.

3 When you said "LILCO bus drivers," did
4 you mean the school bus drivers who were originally
5 at issue, or the LILCO LERO personnel whom LILCO
6 then selected? Because in a sense, if it is the
7 latter, they are, per se, are they not, a
8 specialist?

9 MR. McMURRAY: Yes, sir. I think I
10 didn't speak clearly. I thought I said local, and
11 maybe I should avoid using that word at all.

12 JUDGE SHON: You said "local"?

13 MR. McMURRAY: I thought so. I may
14 have said LILCO.

15 JUDGE GLEASON: I understood you to say
16 "LILCO."

17 Q. Since we are confused--

18 A. (Lindell) I thought you said "local."
19 I didn't assume you said LILCO. I know LERO does
20 have lists of bus drivers.

21 Q. Let's all assume, please, for the rest
22 of the day, if I am talking about bus drivers, I am
23 talking about the non-LERO, local bus drivers who
24 drive school buses for the various school districts
25 in the EPZ. Is that understood?

1 A. (Mileti) Yes.

2 MR. McMURRAY: Thank you, Judge Shon.

3 I'm sorry to cause the confusion.

4 JUDGE SHON: Fine. Thank you.

5 Q. Among the provisions which you suggest
6 for assuring the availability of bus drivers, other
7 than the roster that you have just mentioned, is
8 also training. Is that correct, Dr. Lindell?

9 A. (Lindell) Yes. We suggested training.

10 Q. We will get to training later, but let
11 me ask you this first. I will ask you and then if
12 Mr. Crocker wants to jump in, he can.

13 Do you know whether or not any training
14 has been offered to any of the local bus drivers
15 that LILCO expects to perform in a radiological
16 emergency?

17 A. (Lindell) My understanding is that
18 training has been offered to all the bus companies.

19 Q. Do you know whether there has actually
20 been any training of any of the local bus drivers?

21 A. (Lindell) I couldn't speak as to
22 whether there actually has been training of the
23 local bus drivers.

24 Q. Mr. Crocker, has there actually been
25 training of any of the local bus drivers?

1 A. (Crocker) There have been meetings
2 held with some of the bus drivers employed by the
3 local school bus companies. Training is scheduled
4 to take place--it should begin within the next few
5 weeks. I am not sure of the exact date.

6 Q. What school bus companies are those?

7 A. (Crocker) To my recollection, the
8 Seaman Bus Company, S-E-A-M-A-N; Suburbia Bus
9 Company.

10 Give me a moment and I will look
11 something up.

12 (Pause.)

13 We made offers to the Adelwerth,
14 Riverhead, Harbor View, Seaman, Medibus and Suburbia
15 Bus Companies, and United Bus Company. We have
16 received responses from some of them and we are
17 setting up training for them. Responses are still
18 outstanding for some of the others.

19 Q. Let me ask you this: Of the bus
20 companies you just named, which have accepted
21 training for their bus drivers?

22 A. (Crocker) Okay. Seaman, Medibus, and
23 Suburbia. We believe we will be doing training
24 there. We have had verbal responses, but we don't
25 have the paper yet. The rest we are still waiting

1 to hear.

2 Q. Have any of them declined to accept
3 training?

4 A. (Crocker) There is three bus companies
5 or organizations that don't talk to us at all. That
6 is Adelwerth, Riverhead and Harbor View. We sent
7 them the letter. No response. I interpret that as
8 a declination.

9 Q. How many more are outstanding, did you
10 say?

11 A. (Crocker) We covered six out of seven
12 companies I mentioned. There is one more that is
13 outstanding.

14 Q. What bus company is that?

15 A. (Crocker) United Bus Company.

16 Q. You haven't heard anything one way or
17 the other from them?

18 A. (Crocker) Not in writing. I know my
19 staff talks to all these bus companies, but basic
20 conversations have been towards offering the
21 training, setting up the meeting to discuss it.

22 Q. Have they verbally accepted training,
23 talking about United?

24 A. (Crocker) My sense is they have
25 expressed an interest.

1 Q. But you can't say they have accepted?

2 A. (Crocker) I can't say they have
3 declined nor accepted. They want to talk to us
4 about it.

5 Q. Of the bus companies you have noted
6 here, what proportion of the student population
7 within the EPZ do they bus?

8 A. (Crocker) These--if I understood what
9 you asked me--these companies, in the aggregate,
10 transport a nominal hundred percent. There may be a
11 few outliers, but these are essentially the main bus
12 companies in the EPZ.

13 Q. You say you believe that Suburbia has
14 accepted or you are not sure?

15 A. (Crocker) My understanding from my
16 staff is that they will accept the training. The
17 notes here say that we have got a couple of
18 acceptances from individual drivers. We expect to
19 get more.

20 Understand, this is happening as we
21 speak, so the returns are still coming in.

22 Q. Well, have you been in touch with
23 individual bus drivers or with the bus companies?

24 A. (Crocker) The approach we take is we
25 go to the bus company management and we meet with

1 them and discuss what we propose to do. Typically,
2 at that point, we prepare flyers that either the
3 company management distributes for us or, you know,
4 we might have a representative there to do the
5 distributing for them.

6 So, we approach the management first
7 and with their consent, we make materials available
8 for the bus drivers and then either the bus company
9 will collect the material for us or--that is
10 generally what they all do.

11 Q. Does the flyer ask the individual bus
12 driver to send something back to you to say that he
13 or she is interested?

14 A. (Crocker) Yes. What it does is it
15 says--it describes the program and says, "If you are
16 interested," I recollect a check off box, "you
17 return it to your bus company management."

18 Q. How many of those fliers have you
19 received?

20 A. (Crocker) The fliers have a yes or no
21 check. Okay? I am not sure what the total is. At
22 Seaman--I can't tell from these numbers, Chris, how
23 many I have received back in terms of just sheer
24 paper.

25 Q. How many yes's and no's have you got?

1 A. (Crocker) That I can answer. At
2 Seaman we have got 18 yeses. I don't know how many
3 no's. I don't know if they all responded. But the
4 yeses are 18.

5 Q. Is it that you don't know whether there
6 are any no's or that you don't know how many there
7 are?

8 A. (Crocker) I don't know that there are
9 no's. I would be surprised if there were none. I
10 just don't know how many we got.

11 Q. What about for Suburbia? Have you
12 gotten any--

13 A. (Crocker) Suburbia, that is just
14 starting. We have got--two said yes so far, but the
15 forms are just begining to come in. It is like
16 predicting the results of an election from the first
17 hour.

18 Q. Do you have any no's yet?

19 A. (Crocker) There is no indication here
20 of any no's. I may have. I just don't know.

21 Q. Do you know how many bus drivers Seaman
22 Bus Company has that are school bus drivers for the
23 schools in the EPZ?

24 A. (Crocker) They have approximately 60.

25 Q. How many does Suburbia have?

1 A. (Crocker) Approximately 130.

2 Q. It seems you have some information with
3 you. Why don't we get the rest. How many do
4 Adelwerth, Riverhead, Harbor View and United have?

5 A. (Crocker) This is a different piece of
6 paper. Remember, we haven't been able to engage
7 these organizations in conversation.

8 Q. What about United? You had that in a
9 completely separate category.

10 A. (Crocker) United, I don't have a total
11 for bus drivers. I can probably give you the lower
12 threshold by figuring out how many buses they have.

13 Q. Let's not engage in that kind of
14 calculation. You don't know how many bus drivers
15 they have?

16 A. (Crocker) I don't have it right here.

17 Q. Can you tell me what proportion of the
18 school population Seaman and Suburbia transport?

19 A. (Crocker) You are asking me what
20 fraction of the EPZ school population each of these
21 bus companies carry?

22 Q. Seaman and Suburbia together, do you
23 know what proportion--

24 A. (Crocker) I have to do the
25 calculation.

1 Q. Do you have the information in front of
2 you that would get you to the calculation.

3 A. (Crocker) I have the information. In
4 about 10 minutes time I could do it. I would have
5 to rummage around a little bit.

6 MR. CHRISTMAN: Judge Gleason, may I
7 ask Mr. Crocker do the calculation?

8 JUDGE GLEASON: I would rather not. He
9 can supply it at a subsequent time period. All of
10 the questions in the last 10 minutes could have been
11 answered by a yes, he could supply it and it would
12 take a lot less time. I realize it is an important
13 area, but there are more expeditious--

14 MR. McMURRAY: It is only in the last
15 minute or two I realized he had all this information
16 written down.

17 Q. Let me get back to you, Dr. Lindell.

18 The last sentence of your excerpt says
19 that "procedures planned in advance of an emergency
20 would be expected to be particularly effective in
21 avoiding the types of role conflict that could
22 potentially result in role abandonment." Do you see
23 that.

24 A. (Lindell.) Yes.

25 Q. You did state, did you not, the words

1 "could potentially result in role abandonment,"
2 right.

3 A. (Lindell) Yes, I did say that.

4 Q. So that without some of these special
5 provisions, there is a greater likelihood, you would
6 agree, would you not, in role abandonment among
7 school bus drivers, wouldn't you?

8 A. (Lindell) Well, I would say that these
9 kinds of procedures would be helpful. I don't know
10 that they are necessary, but if they were provided,
11 then the low probability of role abandonment could
12 be further reduced. That may be from one in--one in
13 100 to one in 500.

14 Q. Where did you come up with those
15 fractions, Dr. Lindell?

16 A. (Lindell) I am giving those as
17 examples of they could be further reduced.

18 Q. You already stated that bus drivers
19 could not be assumed to have developed priority and
20 avoidance mechanisms to the same degree as
21 designated emergency workers. Right?

22 A. (Lindell) That is right. They cannot
23 be assumed to have developed them.

24 Q. So that without those mechanisms, you
25 cannot have assurance that those bus drivers will

1 not experience role abandonment. Correct?

2 A. (Lindell) Say that again, please?

3 Q. Without the existence of these special
4 provisions we have been discussing, you cannot have
5 assurance that the bus drivers will not experience
6 role conflict which could result in role
7 abandonment?

8 A. (Lindell) No, sir. It is without the
9 mechanisms, without the priority and avoidance
10 mechanisms, you can't and be assured. If you
11 undertake these training programs, then you increase
12 the probability that those mechanisms will act. But
13 they may not need to have the training programs in
14 order to develop the mechanisms.

15 As I said before, they may develop them
16 on the basis of past experience. So there are other
17 ways in which they can be developed other than by
18 simply the training programs.

19 Q. You are talking about training programs
20 as enhancing whatever priority and avoidance
21 mechanisms may already exist. Is that right?

22 A. (Lindell) That is correct.

23 Q. Let's talk about that, then. One of
24 the avoidance mechanisms that is noted in your
25 excerpt is choosing members of the emergency

1 organization from outside the affected area. Isn't
2 that correct?

3 A. (Lindell) That is correct.

4 Q. With respect to the bus drivers at
5 issue here today, do you know whether or not they
6 have been chosen from outside the Shoreham EPZ?

7 A. (Lindell) I don't know whether they
8 have been chosen from outside the Shoreham EPZ.

9 Q. Do you know what proportion of those
10 bus drivers live in the EPZ as opposed to those who
11 live outside the EPZ?

12 A. (Lindell) I don't know what proportion
13 live inside or outside the EPZ.

14 Q. Mr. Crocker, do you know how many of
15 the local bus drivers live within the EPZ?

16 A. (Crocker) These are the ones employed
17 by a normal school bus company?

18 Q. By a normal school bus company.

19 A. (Crocker) How many live--

20 Q. --within the EPZ.

21 A. (Crocker) I don't have a figure. I'd
22 say a large fraction of them do.

23 Q. But you don't have the figures?

24 A. (Crocker) No. It is not a question we
25 have pursued.

1 Q. Is there a reason why you haven't
2 pursued that?

3 A. (Crocker) I didn't think anybody would
4 ask me.

5 Q. Let's go to priority mechanisms, Dr.
6 Lindell.

7 One of the priority members is training
8 members of the emergency organization to give first
9 priority to their jobs. Isn't that right?

10 A. (Lindell) That is one.

11 Q. You don't know whether any of the local
12 bus drivers have been given that kind of training
13 with respect to emergencies, do you?

14 A. (Lindell) No, I don't.

15 Q. Another is the wearing of uniforms. Do
16 you know whether the local school bus drivers wear
17 uniforms?

18 A. (Lindell) They wear school buses. In
19 that sense, they are very distinctive.

20 Q. Do they themselves wear uniforms?

21 A. (Lindell) They don't wear articles of
22 clothing that are uniform across all members of the
23 organization, that I know of. The point there is--

24 Q. Have you ever heard of anybody except
25 Dr. Mileti, referring to a school bus as uniform?

1 A. (Lindell) I don't think he's ever
2 referred to a school bus as uniform that I know of.

3 Q. I seem to remember that answer before.
4 Maybe I am wrong.

5 A. (Mileti) I don't recollect it, I have
6 to admit.

7 Q. Let's go, also, to making prior
8 arrangements with families. Dr. Lindell, are you
9 aware of whether any of the local school bus drivers
10 have made prior arrangements with their families for
11 what they would do in the event of a radiologic
12 emergency at Shoreham.

13 A. (Lindell) No, I don't. But I wouldn't
14 be surprised if they have, since it is very common
15 experience for people in, for example, the area
16 around Mount St. Helens to have made arrangements,
17 and these aren't people that have any kind of
18 emergency responsibilities. They have made
19 arrangements within their own families to evacuate
20 separately in case they are separated.

21 Q. I am asking about your specific
22 knowledge about the school bus drivers here on Long
23 Island. Do you know whether they have--have you
24 made any contact with the local school bus drivers
25 or made any inquiries to determine whether or not

1 they have made prior arrangements?

2 A. (Lindell) No, I haven't contacted
3 school bus drivers within this area.

4 Q. Mr. Crocker, have you made any contact
5 with local school bus drivers, other than what we
6 have already discussed, to determine whether or not
7 they have made prior arrangements?

8 A. (Crocker) In terms of other than we
9 have discussed, the answer is no. But as part of
10 what we have discussed, the information we give
11 these drivers is, "We are going to train you in
12 this, that, this, and the other thing."

13 One of the things we do is talk about
14 the LERO family tracking system, which we make
15 available to them. We also make available the LERO
16 family reception center. In other words, how to
17 communicate with their families and where their
18 families can go in an emergency. So we, in
19 training, talk to them about the very issues. Has
20 it happened yet? No, it hasn't.

21 Q. That assumes the bus drivers take the
22 training. Correct?

23 A. (Crocker) Yes. If they are not there,
24 it is hard to tell them that.

25 Q. By the way, Mr. Crocker, it may not be

1 possible for you to do it in a break, but when you
2 have an opportunity, I would like you to find out
3 the number of bus drivers who said that they would
4 not accept training from LILCO, either from Seaman,
5 Suburbia or any other bus company, if you would
6 provide that information.

7 A. (Crocker) People who responded in the
8 negative? Is that the same thing you wanted me to
9 do before or--I just want to make sure I get this
10 right.

11 JUDGE GLEASON: It was the same
12 question he asked you about five minutes ago. Is
13 that right, Mr. McMurray?

14 MR. McMURRAY: No. This is a different
15 question. The percentage of the school population
16 within the EPZ that is transported by these two bus
17 companies who have agreed to accept training for
18 their drivers. I think that is what I asked before.
19 This is a totally different question.

20 A. (Crocker) I understand.

21 Q. How long have your fliers been out to
22 the Seaman Bus Company.

23 A. (Crocker) I would say three weeks to a
24 month.

25 Q. How about to Suburbia Bus Company?

1 I will cut this short. Were the fliers
2 sent out to all bus companies at the same time?

3 A. (Crocker) No, they were not. The way
4 the sequence went, we would set up an appointment
5 with the manager of each bus company, discuss the
6 issue and then the materials would follow. So it
7 depended when that first meeting was. It's been
8 scattered over the last six weeks, perhaps. Some of
9 it is ongoing now.

10 Q. Then let me ask you, for Suburbia, when
11 did the fliers go out?

12 A. I'd say roughly two or three weeks ago.

13 Q. And you have only received two yes's in
14 that time?

15 A. (Crocker) My staff says so far they
16 have met with one group of drivers, which was 12.
17 In this case, Suburbia wanted us to go talk to
18 assemblies of drivers at various convenient
19 locations. The person I have handling this, met
20 with a group of 12 drivers and this was roughly two
21 or three weeks ago. Of those 12, we have got 2
22 yes's back. And he indicates he hasn't received all
23 the forms back yet and says, "I expect all 12 to say
24 yes." But I don't have those forms yet.

25 Q. So, those sessions with those bus

1 drivers, that wasn't a training session, that was an
2 attempt to get them to accept the training?

3 A. (Crocker) It was an explanation of
4 what the flyer meant and to answer questions.

5 Q. Would you also suspect that a large
6 fraction of the bus drivers residing in the EPZ also
7 have families?

8 A. (Crocker) We haven't asked, but I
9 think it is a reasonable assumption.

10 Q. Let's turn back to page nine, of the
11 testimony. There, Dr. Mileti, you talk about the
12 essential point being that emergency workers who
13 have a clear perception of their emergency roles, do
14 those roles or those jobs in an emergency. Do you
15 see that? It is in the answer to question seven.

16 A. (Mileti) Yes, I see it.

17 Q. You have written in the past, haven't
18 you, that it is important that this clear perception
19 be prior, exist prior to the emergency. Isn't that
20 right?

21 A. (Mileti) I don't remember writing
22 that. However, I am willing to say that I believe
23 in emergency planning. One of the reasons I believe
24 in emergency planning is so that people have an idea
25 what they are supposed to do. So it doesn't sound

1 like something I would not have written.

2 Q. I will accept that.

3 I think in other places you discuss
4 "role clarity." Can you define "role clarity"?

5 A. (Mileti) In a general, broad stroke
6 definition, the notion is simple. Letting people
7 know ahead of time that they have a job to perform
8 in an emergency, as opposed to not telling them.
9 That is a very general, lay definition. And I
10 certainly am capable of making it more sophisticated
11 sociologically and subdividing it up until a lot of
12 little parts. But the bottom line is simply that.

13 Q Well, it has to be more than telling
14 them, isn't it? First, they have to understand it,
15 don't they?

16 A. (Mileti) If we were discussing role
17 clarity in reference to what we are trying to
18 achieve, we would be suggesting a multitude of
19 things and, therefore, a multitude of more things.
20 For example, an initial subdivision would be to
21 distinction between having the person understand
22 what their job is and then addressing the skills
23 they might need to be able to perform that job. So,
24 one could then subdivide role clarity into parts
25 that tell people that they have a job, and then go

1 beyond that and address what you might want them to
2 understand about how to do that job.

3 Therefore, what one might address in
4 terms of this generic concept, role clarity could
5 vary from role to role.

6 Q. So, I am correct in saying it is not
7 just simply a matter of telling somebody, but they
8 also have to understand what their role is. Right?

9 A. (Mileti) Oh, one would hope that if
10 you had a training program, that is, in fact, what
11 it was accomplishing, yes, as well as giving them
12 the skills to be able to do it. Some roles you
13 might have the skills before you train them, because
14 they do that every day anyway. Other roles might be
15 something they don't do normally and then you have
16 to give specific training.

17 Q. And would you please tell us what
18 factors affect role clarity?

19 (Pause.)

20 Q. Let me backup a second. You said role
21 clarity is telling somebody that they have a role in
22 an emergency. Can you define it from the point of
23 view of what is in the emergency worker's mind, what
24 they have to go through to experience role clarity?

25 A. (Mileti) I am not sure I understand

1 the question, but let me try to provide an answer
2 anyway.

3 Q. Well, I want to make sure you
4 understand the question.

5 How do you know when a bus driver is
6 clear on his role, his emergency role?

7 A (Mileti) I was going to say I presume
8 you mean his emergency role.

9 If I were attempting to, as I would in
10 any training program, let all emergency workers
11 understand their role before the emergency, I would
12 provide them first with the information that they
13 are expected to perform that job and then the
14 details of how they might go about actually
15 performing that job, so that they understood, among
16 other things--this is in my '83 testimony, I am
17 sure--not only that they have a job, what is
18 expected of them, but in addition to that how their
19 job relates to overall emergency response. I have
20 always totally agreed with and supported emergency
21 planning.

22 But the specifics from role to role in
23 the emergency would vary. There are some roles,
24 emergency response roles, that are almost identical
25 to what people do on a normal basis. What you'd

1 need to do to impart role clarity in that case would
2 be a lot less than what you'd need to do to impart
3 role clarity were you asking people to engage in
4 emergency response activities that were much less
5 like what they do on a normal workday. Then the
6 mechanism you might use to implement that goal or
7 objective would certainly vary.

8 Q. We will get to that point later because
9 I think you do address it in your testimony.

10 Isn't it also important for purposes of
11 role clarity that there not be role confusion; that
12 is, that the emergency worker is receiving
13 conflicting signals about what he or she is expected
14 to do in an emergency?

15 A. (Mileti) That is an interesting
16 hypothesis. I don't know of anybody who has studied
17 it.

18 Q. Let me ask you this: If an emergency
19 worker is being told by one organization that he or
20 she is expected to respond in a radiologic
21 emergency, told by another organization, perhaps the
22 one he or she works for, that there is no such
23 expectation, then that could affect role clarity,
24 couldn't it?

25 MR. CHRISTMAN: Objection. Lacks a

1 foundation in the record.

2 MR. McMURRAY: Judge Gleason, I think
3 it is clear what the foundation is here. There is
4 testimony before the board right now by school
5 administrators that, in fact, they would not expect
6 their drivers to drive because of role conflict.
7 Now, that is public testimony and it demonstrates
8 that these bus drivers are receiving conflicting
9 signals which could affect their role clarity.

10 JUDGE GLEASON: I guess where I am
11 getting hung up, Mr. McMurray, is your question
12 about role conflict and role clarity. If somebody
13 has role clarity, then how does role conflict get
14 into it? Certainly it is almost the antithesis of
15 it, the opposite of it, the negation of it. I don't
16 even understand the answer that was given, that it
17 is an interesting thesis. I don't know where this
18 is driving at. Maybe you can enlighten me.

19 MR. McMURRAY: It is Dr. Mileti's
20 thesis that where there is role clarity, there will
21 be no role conflict. I am trying to establish under
22 what circumstances there will not be role clarity so
23 we can establish under what circumstances one could
24 expect role conflict.

25 JUDGE GLEASON: That is a much clearer

1 way you just put it than it was put before.

2 MR. McMURRAY: I am doing
3 cross-examination, Judge. It is easier for me to
4 tell you than it is to do it on cross-examination.
5 Now that everybody is clear on where we are going
6 maybe it will come out a lot clearer.

7 JUDGE GLEASON: Please proceed.

8 Q. Dr. Mileti, it is true, is it not, that
9 you would expect that where one's emergency role is
10 not clear, that there is a greater likelihood that a
11 clearer role--for instance, assisting one's
12 family--might be performed first?

13 A. (Mileti) In general--let me just say
14 three things--

15 Q. I would like a "yes" or "no" answer.

16 A. (Mileti) I am willing to say yes, but
17 I need to qualify it so it is clear. I apologize.
18 I typically qualify and then say "yes" or "no". But
19 yes, in general.

20 First I want to say it is not my thesis
21 that role clarity leads to know role conflict. I
22 think everybody that goes through an emergency is
23 going to have role conflict and that what is
24 relevant is whether that will manifest itself in
25 terms of role abandonment or not in terms of whether

1 they do their emergency or not.

2 Role conflict is something that
3 permeates all of social life, even as we sit here
4 many of us are, I am sure, experiencing role
5 conflict. In fact, the evidence is that, if
6 anything, emergencies reduce role conflict because
7 they reduce competing demands on the individual.
8 But that is another story.

9 Q. The point you are making, I think, is
10 that we are using the term "role conflict" loosely
11 and should be using the term role abandonment.

12 A. (Mileti) If we are talking about
13 behavior and talking about whether emergency workers
14 will do their job or do something else, for example,
15 be with intimates, then we need to talk about role
16 abandonment, a very different concept than the
17 psychological or sociology feeling of being pulled
18 in two directions at one time. Experiencing that
19 type of mental conflict that one does in emergency,
20 while doing their emergency job. I don't want to
21 split hairs, but I think that is a longstanding
22 distinction in this litigation, particularly at
23 Shoreham.

24 With that discourse, I have forgotten
25 the question I said I wanted to say yes to and then

1 qualify it.

2 Q. That is fine.

3 A. (Lindell) It may help if I explain the
4 opposite of role clarity is role ambiguity, where
5 you don't understand what the expectations are.
6 Role conflict is different from role ambiguity or
7 role clarity.

8 MR. McMURRAY: Thank you, Dr. Lindell.
9 That does help.

10 Q. Dr. Lindell, let me follow-up on that.
11 What sort of factors could lead to role ambiguity?

12 A. (Lindell) People could experience role
13 ambiguity if they have--if they find themselves in a
14 situation in which they have no--which is different
15 from one they ordinarily experience, so they have no
16 clear idea of what is expected of them in that kind
17 of a situation. That is a situation of role
18 ambiguity.

19 You have never been in the situation
20 before, you don't know what the expectations are for
21 you in that situation. It seems imperative to take
22 some action, but you don't know what is the
23 appropriate thing to do under the circumstances.

24 Q. Could role ambiguity come from the
25 circumstances I hypothesized before, where you are

1 getting conflicting signals as to whether you are or
2 are not expected to perform an emergency role?

3 A. (Lindell) No. If you are getting
4 conflicting signals, that is role conflict. What
5 happens is, role ambiguity would be if people are
6 not telling you what they expect of you.

7 Q. If you are getting the conflicting
8 signals--

9 A. (Lindell) People are communicating to
10 you that they want you to do different things. That
11 is role conflict.

12 Q. That is role conflict? You are talking
13 about--when you talk about that, you are talking
14 about between the family and the emergency role.
15 Correct?

16 A. (Lindell) That is one example.

17 Q. If you are in a situation where one
18 organization is telling you you are expected to
19 respond and another is telling you you are not
20 expected to respond, isn't it likely that there will
21 be less role clarity in such a case?

22 MR. CHRISTMAN: I object that. That
23 hypothetical has no foundation in the record.

24 MR. McMURRAY: I already established
25 the hypothetical.

1 JUDGE GLEASON: It is established.
2 Objection is denied. Proceed.

3 A. (Lindell) Could you repeat the
4 question now?

5 Q. In circumstances where someone is
6 receiving conflicting signals as to whether or not
7 he is expected to perform--that is, one organization
8 is telling him he is or should perform and another
9 is telling him he doesn't have to perform--couldn't
10 that lead to less role clarity?

11 A. (Lindell) No. That leads--if you are
12 talking about the present situation when you are
13 talking about before an emergency occurs, then that
14 is role conflict. If the person is motivated to
15 comply with the expectations of both parties and
16 those parties are giving mutually inconsistent or
17 mutually incompatible--communicating mutually
18 incompatible expectations, that is a situation of
19 role conflict.

20 Q. That's right. But couldn't it also
21 lead to less clarity about what one's role should
22 be?

23 A. (Lindell) It leads to uncertainty as
24 to which action should be taken. That is not the
25 same as role ambiguity or lack of role clarity, to

1 define it with the other pole of the continuum.

2 Q. Isn't it possible that in light of that
3 ambiguity--that is, the conflicting signals--at the
4 time of the emergency, the bus driver might not have
5 a clear idea of what his or her emergency role
6 should be?

7 A. (Lindell) The bus driver would have a
8 clear idea of what the alternative emergency roles
9 should be. The question is which role they will
10 follow through on.

11 Q. And, therefore, it is not as likely
12 that they would perform the emergency role as it
13 might be if the role was clear, if that ambiguity
14 didn't exist? Correct?

15 A. (Lindell) No, that is not correct.
16 Now you have shifted from talking about prior to an
17 emergency to performing an emergency role.

18 Q. I am talking about if, before the
19 emergency there are these conflicting signals, at
20 the time of the emergency we just established, you
21 said the question is which of those roles they would
22 perform. Correct?

23 A. (Lindell) At the time of the
24 emergency, the question is which of the actions they
25 would take.

1 Q. In this case, whether they would go to
2 their families or whether they would perform their
3 emergency roles. Right? Isn't that the whole issue
4 here, whether they would perform their emergency
5 roles, drive the bus, the school children, or
6 whether or not they would go to their families?

7 A. (Lindell) Yes. But you are talking
8 about two different things. You are talking about
9 prior to the emergency and then during the
10 emergency. There are different factors operating
11 during the emergency. As Dennis just said a few
12 minutes ago, during an emergency things become much
13 simpler because people are focused on real demands
14 of the incident and they experience less role
15 conflict because there is an emergency consensus.

16 Q. Wait a second. Dr. Lindell, didn't we
17 just establish with Dr. Miletic that it is important
18 that the roles be clear prior to the emergency?

19 A. (Lindell) It is desirable that the
20 roles be clear prior to an emergency, but in order
21 for a person to take action, to take effective
22 action, it only needs to be clear at the time that
23 the action is about to be taken what the appropriate
24 role is.

25 Q. Fine. Good.

1 Now let's assume that there is that
2 ambiguity at the time of the emergency, that the bus
3 driver has received conflicting signals and that
4 ambiguity has not been cleared up. Isn't it more
5 likely that the bus driver would respond to his
6 family than would otherwise be the case?

7 A. (Lindell) Well, if you are talking
8 about behavior in an emergency, I don't think that
9 that is the case because, as we have said earlier in
10 the testimony, people have a motivation to help in
11 emergencies.

12 Q. Wait a second, Dr. Lindell. You
13 already established that role clarity is important
14 for alleviating role abandonment. I have just
15 postulated a situation where that role clarity is
16 muddied up because of ambiguities.

17 A. (Lindell) No. You said it is role
18 clarity. Every time you described that as role
19 clarity I have corrected you and said that that was
20 role conflict. You keep on coming back and then
21 ignoring what I have said is the appropriate
22 interpretation.

23 Q. Let's not make this a semantic game.
24 Where there are those conflicting
25 signals at the time--they have existed prior to the

1 emergency and not been changed up to the time of the
2 emergency. Isn't it more likely that the bus driver
3 would opt for the family role than would be the case
4 if the ambiguities had been cleared up?

5 A. (Lindell) Mr. McMurray--

6 Q. The conflicting information had been
7 cleared up.

8 A. (Lindell) You are talking about two
9 entirely different situations, one prior to an
10 emergency and one during an emergency. What happens
11 in emergencies is that people choose to help.

12 JUDGE GLEASON: I believe his answer
13 is, Mr. McMurray, it isn't necessarily so.

14 MR. McMURRAY: Judge Gleason--

15 JUDGE GLEASON: Is that correct? Is
16 that your answer?

17 MR. McMURRAY: We have conflicting
18 testimony on the record. We have his testimony
19 about how it is important to have role clarity prior
20 to the emergency. Now Dr. Lindell is saying it
21 doesn't matter. I would like to clear that up.

22 JUDGE GLEASON: I don't think that is
23 what he said. Go ahead, Dr. Lindell.

24 WITNESS LINDELL: What I said is that
25 it is important--I say that it is important to have

1 role clarity--that is, that people need to know what
2 it is to do in those circumstances and how to do it
3 at the time the action is required. It is desirable
4 to establish that prior to an emergency. The reason
5 it is desirable to establish that prior to an
6 emergency is because people feel more comfortable
7 about knowing in advance that they have made
8 provisions that there is the assurance that people
9 will--that bus drivers, that Red Cross volunteers,
10 that police and fire will perform the roles they are
11 expected to perform--that is, to engage in the kinds
12 of behaviors they are expected to perform when the
13 emergency comes.

14 What happens is that in an emergency,
15 people tend to want to help. And the question is,
16 can they help effectively? That means that they do
17 the greatest good for the greatest number of people.
18 In order to insure that the greatest good is done
19 for the greatest number of people--that is, to have
20 an effective emergency organization, then it is
21 desirable to communicate people's expectations about
22 what it is that various members of the emergency
23 response organization are expected to do during an
24 emergency.

25 Q. Isn't it possible that where there is

1 not that clarity prior to the emergency, that you
2 may get a lower number of bus drivers responding to
3 the emergency to drive school children?

4 A. (Lindell) Okay. You have come to a
5 question that I can say yes. Yes, it is possible
6 that if you don't engage in a training program prior
7 to an emergency, that it is possible that there
8 might be fewer bus drivers or other emergency
9 auxiliaries or emergency personnel that engage in
10 the behaviors that are expected of them by other
11 members of the emergency response organization.

12 Q. And isn't it also true that you would
13 expect a lesser number if some of the other
14 avoidance mechanisms are not in place? For
15 instance, if the bus drivers are drawn largely from
16 the impacted area? Isn't it likely you would expect
17 a lesser number to be able to report?

18 A. (Lindell) That is possible if the
19 families are not capable of taking care of
20 themselves or if, more exactly, the bus drivers
21 believe that their families are not taking care of
22 themselves.

23 MR. McMURRAY: Judge Gleason, it has
24 been traditional in past proceedings--I don't know
25 how you want to run this, to have two brief breaks

1 in the afternoon, of 10 minutes.

2 JUDGE GLEASON: Let's take a 10-minute
3 break now.

4 (Brief recess.)

5 JUDGE GLEASON: You want to proceed,
6 Mr. McMurray?

7 BY MR. McMURRAY:

8 Q. Dr. Lindell, you haven't had any
9 contact with any of the bus drivers for the local
10 school districts, have you?

11 A. (Lindell) No, I haven't.

12 Q. Do you expect to have any?

13 A. (Lindell) No, I don't.

14 Q. Dr. Mileti, have you had any contact
15 with them at all?

16 A. (Mileti) Not since I went to school on
17 Long Island, but that was 30 years ago.

18 Q. Do you expect to have any?

19 A. (Mileti) No, I don't.

20 Q. Dr. Lindell, you can't say at this time
21 whether or not the school bus drivers are clear
22 about their roles in a Shoreham emergency, can you?

23 A. (Lindell) About all I can say at this
24 point is that it would seem to be that it is clear
25 to them that somebody doesn't want them to drive in

1 an emergency. And so I guess in that sense there
2 has been some role clarity that has been established
3 for them as to driving a bus in an emergency.

4 Q. Well, you don't really know whether or
5 not the bus drivers know that they have any role at
6 all, do you, in a Shoreham emergency?

7 A. (Lindell) Well, as I understand, I
8 can't remember whether this testimony is in or out
9 or the evidence is in or out, but it is my
10 understanding that a number of them were asked to
11 sign statements saying that they wouldn't. And I
12 think that pretty clearly conveys to them that
13 somebody thought that they should.

14 Q. Now, that number--let's put aside those
15 who signed that statement. With respect to the
16 remaining bus drivers, you don't know whether they
17 have any idea that they have a role in a Shoreham
18 emergency, do you?

19 A. (Lindell) No, I don't know.

20 Q. Now, is it also a factor in determining
21 whether or not there will be role abandonment
22 whether or not bus drivers have accepted their
23 emergency roles?

24 MR. McMURRAY: Let the record note Dr.
25 Miletic just conferred with Dr. Lindell.

1 A. (Lindell) Actually, Dr. Mileti is just
2 as qualified to answer the question as I am.

3 JUDGE GLEASON: There is nothing wrong
4 with members of the panel conversing with each
5 other. That is why we have the panel presentation.

6 MR. McMURRAY: I understand that. But
7 it is also important, I think, to let the record
8 reflect there was such a conference for whatever
9 value.

10 WITNESS LINDELL: I have forgotten--
11 (Record Read.)

12 A. (Lindell) Yes. It is important that
13 during the emergency that they would have accepted
14 the role of driving a school bus.

15 Q. Is there any indication that you know
16 of that the bus drivers may not accept that role?

17 A. (Lindell) No reliable indication.

18 Q. Any indication at all?

19 MR. CHRISTMAN: Objection. I think
20 counsel is trying to get Dr. Lindell to say
21 something about those statements that have been
22 stricken from the evidence.

23 MR. McMURRAY: He already--

24 JUDGE GLEASON: He already has. I
25 admonish the witness, as of now the statements

1 concerning those bus drivers is not in the record.
2 There will be some argument later that will attempt
3 to have it reconsidered. I suggest that you not
4 refer to that testimony at all.

5 WITNESS LINDELL: Yes, sir. I was
6 just--I had seen them before and I couldn't remember
7 whether that was something that was in the record or
8 not in the record. It was a little confusing.

9 Q. If there is not that acceptance at the
10 time of the emergency, though, you would agree that
11 there could be role abandonment. Is that correct?

12 A. (Lindell) Yes.

13 Q. Dr. Mileti, let me ask you, can you say
14 at this time whether or not there is role clarity
15 among the bus drivers with respect to their
16 emergency roles?

17 A. (Mileti) No, I can't. I have no
18 empirical evidence on which to base such a judgment.

19 Q. Let's go to the next page.

20 On page 10, I think there is an excerpt
21 from Drabek which then excerpts Dynes and
22 Quarantelli. I believe that is your testimony, Dr.
23 Mileti. In fact, this excerpt does discuss disaster
24 research center interviews conducted by Dynes and
25 Quarantelli?

1 A. (Mileti) It seems as it part of it
2 does and part of it doesn't.

3 Q. The paragraph that starts 1D 2.5, that
4 deals with Disaster Research Center interviews.
5 Isn't that correct?

6 A. (Mileti) Yes, it says it deals with
7 2,500 interviews of organizational officials. But
8 it also says "in our experience," so it may include
9 something beyond that. It definitely talks about
10 that many interviews.

11 Q. I am just trying to establish, these
12 are the Disaster Research Center interviews that we
13 have discussed in the past, right? That is the
14 basis for this excerpt?

15 A. (Mileti) It appears that way to me but
16 I can't say for sure. It sure looks that way.
17 Depending on what you mean by "our having discussed
18 before."

19 As I recollect the discussion of the
20 Disaster Research Center interviews that we engaged
21 in in 1983 and/or the beginning of '84--I
22 forget--when we were talking about that, was a
23 subset of their data base. And I am not sure if it
24 is identical to what Drabek is referencing when he
25 cites Quarantelli and Kelteer(ph.).

1 Q. I will just ask you follow-up
2 questions.

3 With respect to the interviews
4 referenced in this first paragraph, do you know
5 whether the interviews specifically included
6 questions designed to inquire into the existence of
7 role conflict?

8 A. (Mileti) I honestly don't remember.

9 Q. In the next paragraph, again quoting
10 Dynes and Quarantelli, there is an item in
11 brackets, number one--strike that.

12 There are three items set out
13 describing why role abandonment is not found
14 empirically. The first is that the total role
15 structure thus becomes more coherently organized
16 around a set of value priorities and at the same
17 time irrelevant roles which could produce strain are
18 eliminated until the emergency is over. Do you see
19 that?

20 A. (Mileti) Yes, I see that.

21 Q. It is not your testimony, is it, that
22 if one's family is perceived to be in danger, that
23 nevertheless that family role becomes irrelevant?

24 A. (Mileti) No. I don't think anyone,
25 even Dynes and Quarantelli, would say a role becomes

1 irrelevant. What they were discussing here was the
2 shifting of priorities amongst the various
3 activities a society is engaged in, and an emergency
4 comes along and reprioritizes them. Therefore, we
5 say things like the sale of durable goods fall off.
6 People close those kinds of shops. First priorities
7 are those roles that go toward helping people
8 preserve life and limb and the second priority is
9 the preservation of property, et cetera.

10 Q. Preservation of life and limb including
11 your own families?

12 A. (Mileti) Any other human beings, of
13 course including your own family. This is the basic
14 shift that is observed in emergencies, that, for
15 example, makes me feel confident that that is why we
16 have never seen, in all of the history of all the
17 emergencies I know of in this country, people ending
18 up abandoning a group of people--I call in my
19 testimony--third graders abandoned on the
20 curb--evacuating school children raises a very high
21 priority, with or without emergency planning.

22 Q. You say such role abandonment has never
23 been seen?

24 A. (Mileti) To the best of my knowledge,
25 I know of no case in the history of this country,

1 and I mean from 1776 forward, where anyone has left
2 school children on the curb whether or not there was
3 emergency planning.

4 Q. I am talking about role abandonment.
5 You are saying it has never occurred among emergency
6 workers?

7 A. (Mileti) I didn't say that. Role
8 abandonment has occurred amongst emergency workers.
9 I even have a case detailed in my testimony. It is
10 an outlying kind of event.

11 Q. I just wanted to make sure I was clear
12 on your testimony.

13 The second item deals with--because of
14 assurances that organizational members on duty will
15 remain, other organizational members not on duty
16 have the reassurance that they have time to check
17 personal and familial damage and also to engage in
18 limited amounts of nonoccupational role behavior
19 before reporting.

20 I would like to ask you how that factor
21 is at all applicable to the local bus drivers and to
22 the issue we have here.

23 (Pause.)

24 Q. Let me back up and state this another
25 way. My problem with this is, this seems to talk

1 about shift duty. That is, where there are people
2 on duty and other people off duty, that those people
3 off duty will have a sense that the people on duty
4 can handle it so, therefore, there will not be the
5 type of role conflict or role abandonment we are
6 discussing.

7 But the school bus drivers don't work
8 in shifts. They work at specific times. I am just
9 wondering whether this factor has any applicability
10 at all in this case, in this proceeding?

11 A. (Mileti) Let me reread it and I would
12 be happy to answer your question.

13 This factor is talking about
14 organizations that have multiple shifts. And it is
15 presuming and telling about an observation from
16 prior emergencies in which those shifts not at work
17 are assured that the organization for which they
18 work are able to--is able to accomplish its
19 emergency job without them, thereby freeing them up.
20 It is a role conflict abatement mechanism, if you
21 will.

22 Q. My question is, does this have any
23 applicability here where there is not such shift
24 work?

25 A. (Mileti) I don't know how bus drivers

1 drive buses on Long Island. I don't know if there
2 are shifts or not. I can only answer that it may
3 have applicability and it may not have applicability
4 depending upon the school bus driver organizations
5 as they are structured on Long Island.

6 Q. That is not something you are familiar
7 with, though?

8 A. (Mileti) No. I am not familiar with
9 it.

10 Q. The third item is that family units can
11 make internal allocative decisions, et cetera. Does
12 that have any applicability here?

13 A. (Mileti) Yes, I think it does. This
14 is talking about what actually goes on with actual
15 people in actual emergencies. What it is
16 suggesting, for example, is what we have always
17 observed or typically observed and how emergency
18 workers deal with opting between family roles and
19 emergency response roles.

20 And that is, the presumption is not,
21 empirically, what I think this contention has as its
22 premise, and that is that you pick one role versus
23 the other. But rather, if you are a male emergency
24 worker, for example, it turns out that you can
25 discover, and do in the context of an actual

1 emergency, that your wife remains a competent human
2 being and can engage in a protective action like
3 drive a car, or we could call it evacuation, even in
4 an emergency. And that can free the husband up to
5 go do his emergency job.

6 Or if the emergency worker is a woman,
7 to discover that the husband is competent.

8 Q. These school bus drivers work during
9 the day. Correct?

10 A. (Mileti) I presume they work whenever
11 school is open.

12 Q. During the day, right?

13 A. (Mileti) Most of the schools I know
14 are during the day.

15 Q. It is true, isn't it, that most of the
16 school bus drivers we are talking about within the
17 EPZ are women?

18 A. (Mileti) Yes. I have that impression
19 although I don't have the data in front of me.

20 Q. Let's assume that if you will.

21 It is also a likely assumption that if
22 they have families and they have husbands, that
23 those husbands work. Is that correct?

24 A. (Mileti) I think that is the norm in
25 this society, yes. There certainly could be an

1 exception.

2 Q. And it could be likely also that the
3 husbands may be at work at some distance from the
4 home? Isn't that right?

5 A. (Mileti) I think that is a
6 possibility. Yes.

7 Q. And it is also possible, is it not,
8 that these families have children who are at home?

9 A. (Mileti) I presume the children who
10 are sick or too young to be in school themselves.

11 Q. In other cases there would be children
12 in school?

13 A. (Mileti) One would presume most of the
14 time the children would be in school.

15 Q. Then it could be possible, couldn't it,
16 that it would be the bus driver, the woman in this
17 case, who would be the one closest to home and most
18 available to help in an evacuation, isn't that
19 right, of the family?

20 A. (Mileti) Well, in the typical sense
21 and for the typical family, no one would be at home.
22 The wife--the husband is away at work and the kids
23 are in school. So, no one is at home. But I
24 presume that there is a small subset of persons who
25 have a husband not at work or a husband at work who

1 may have children who aren't in school, who aren't
2 with a babysitter and are home alone. It just
3 doesn't seem--I don't believe what I just said.

4 Q. Let me try and clarify this.

5 Isn't it possible there are situations
6 where there are going to be people at home, people
7 who cannot necessarily take charge of the situation,
8 minor children, and therefore that the bus driver
9 would need to tend to the needs of the family first
10 rather than to her emergency role?

11 A. (Mileti) If what you are asking me is
12 do kids play hookey, I bet they still do.

13 Q. Or minor children who aren't in school?

14 A. (Mileti) I can't imagine a woman
15 leaving preschool-age children home alone. It
16 seems--or a man, for that matter, doing that.
17 Therefore, they would be with someone who occupies,
18 in a role relationship to that young preschool-aged
19 child, a role of not superiority but leadership--I
20 have forgotten the technical word. I'm sorry. And
21 that that person could tend to the safety of the
22 child or engage in a conversation with the mother if
23 she is at home, for example, as you hypothesized, or
24 the mother could, as is the case in many
25 emergencies, take the kid with her on the bus.

1 Q. Let me go back to the first thing you
2 said. Isn't it possible that even though there
3 might be somebody at home, a babysitter or whatnot,
4 that that person either is not capable to engage in
5 evacuation or that the bus driver nevertheless wants
6 to be the one who gets the family out of the EPZ?

7 A. (Mileti) Anything is possible. Given
8 all the parameters you have imposed on that
9 scenario, I would have to say the likely
10 representative, theoretically, very, very small
11 subportion of the population of bus drivers. But,
12 of course, it is possible that you can come up with
13 such a configuration in a human population.

14 Q. Has there been any sort of attempt, Mr.
15 Crocker, to determine, among the school bus drivers,
16 who might have circumstances at home that would
17 require them to respond home first?

18 A. (Crocker) None that I am aware of.

19 Q. Do you intend to make any attempt to
20 determine which bus drivers might face circumstances
21 that would increase the chances that they would
22 abandon their roles because they had family members
23 at home who needed to be taken care of?

24 A. (Crocker) No. I don't think we are
25 going to do that. We are going to train anyone who

1 is willing to accept the training.

2 Q. Don't you think it would be a prudent
3 inquiry to attempt to determine who might face such
4 circumstances so that there would be an avoidance
5 mechanism in place; those people would not be
6 expected to drive and you might have other drivers
7 fulfilling the role?

8 A. (Crocker) Because circumstances, as
9 Dr. Mileti said, change, I expect that some bus
10 drivers on occasion might find they have a child at
11 home that is not normally there. But perhaps most
12 of the time the child is healthy and they are in
13 school. I don't think I am going to go to each bus
14 driver and make detailed inquiries into their family
15 relationships.

16 Q. Why not? You apparently, at least at a
17 couple of these bus companies, have already made
18 contact with them. It would be an easy matter to
19 attempt to determine who might face circumstances
20 that would lead to role abandonment. Why not
21 attempt to determine who would face those
22 circumstances and alleviate the problem?

23 MR. CHRISTMAN: Objection. That
24 question is excessively argumentative.

25 JUDGE GLEASON: Sustained. Let's move

1 on. You asked the question three different times.
2 He's answered.

3 Q. Dr. Miletì, let me ask you, do you
4 think that it would be prudent to attempt to inquire
5 which bus drivers might face circumstances that
6 would possibly lead to role conflict and role
7 abandonment?

8 A. (Miletì) Well, I think it would be--if
9 one did that, I'd call it prudent. I think it would
10 be, in the general scheme of things, quite a waste
11 of resources. I don't think it is necessary that it
12 is done. You well know that LILCO has, for its own
13 bus drivers, a large percentage of backup people. I
14 forget what percentage but it is perhaps as high as
15 50 percent. I can't conceive that that many people
16 would have kids at home, alone.

17 I think that addressing the notion of
18 role conflict as it would play out in real
19 emergencies among real people as the emergencies
20 were experienced is, in my opinion, and as I would
21 catalog it and have catalogued it before, down with
22 the list of myths that are problems, that are
23 nonproblems, that characterize real emergencies in
24 terms of being able to get an effective emergency
25 response.

1 It is possible for persons to have role
2 conflict; indeed, likely. It is unlikely you would
3 observe many people abandoning their roles. That is
4 what the historical record tells us. And it goes
5 down with the myths that people panic, et cetera. I
6 would rather see those resources if they are
7 available for emergency planning address something
8 that has in history shown to surface as a potential
9 problem in an emergency.

10 Q. But Dr. Lindell has cited in his
11 articie an important avoidance mechanism, which is
12 drawing workers from outside of the impact area. Do
13 you think that is not a worthwhile pursuit?

14 A. (Mileti) No. That wasn't Dr.
15 Lindell's words. Those were Russell Dyne's words.
16 Those words came from the end of an academic piece
17 that he wrote that he said, "Okay, now, if I were
18 sitting down and trying to think of all the things
19 planners could do if they wanted to address this,
20 this is what they should do."

21 And there have been some places--Long
22 Island, to be honest with you, is the only place I
23 know of where people have labored to try to address
24 those kinds of problems in putting emergency plans
25 together. From a practical point of view, it has

1 never occurred in the history of the country where
2 an emergency organization has not been able to do
3 its emergency job in a real emergency.

4 Q. Let me ask you this. Are you saying
5 that in no other emergency has there been an attempt
6 to draw emergency workers from outside the impacted
7 area so that there would not be role abandonment?

8 A. (Mileti) No. I didn't say that. What
9 I said was--

10 Q. I am asking you, do you believe that is
11 true? Have there been other instances where
12 emergency workers have been drawn from other areas
13 in order to avoid role abandonment?

14 A. (Mileti) It was done in the original
15 LERO plan put together here on Long Island, but only
16 in an attempt by the persons at LILCO in charge at
17 the time to do what it felt--they felt they needed
18 to do because of Suffolk County's concerns.

19 Q. You can't think of any other instances,
20 any other emergencies where role abandonment did not
21 occur specifically because the bus drivers or
22 whomever were pulled from areas outside of the
23 impact area?

24 A. (Mileti) I don't know of any
25 emergencies where that's--where that has occurred.

1 I know there have been some persons who have made
2 recomme.dations analogous to those lines in
3 reference to emergency planning for nuclear exchange
4 with the Soviet Union--you know, explosion. But
5 that is a category of emergencies apart from the
6 kind we are talking about here. And those were
7 recommendations.

8 Q. Do you know whether or not any of the
9 survey data compiled by Mr. Kelly indicate that in
10 certain circumstances, certain emergencies, bus
11 drivers were specifically pulled from areas outside
12 the impact area so that there wouldn't be role
13 abandonment?

14 A. (Mileti) No, I don't. You would
15 probably have better luck asking Mr. Kelly. He
16 compiled all that data. But if that does exist,
17 what I would say is that is possibly because
18 somebody who was managing that emergency perceived
19 that that was a potential problem. The police in
20 emergencies always, for example, brag that because
21 they cordoned off an area they prevented looting.
22 They think they were successful at that. But
23 looting tends not to occur in emergencies, either.

24 Q. But it means that to the extent it
25 occurred--we haven't gotten into that yet--an

1 emergency manager felt it was a prudent thing to do
2 to pull the emergency workers from outside the area
3 at risk?

4 A. (Mileti) That may well be. And there
5 are emergency managers across this land that to this
6 day emergency broadcast system messages say to their
7 public, "Don't panic." And there have been examples
8 of emergency where falling prey to these myths about
9 human behavior in emergencies have actually hurt
10 emergency response.

11 Q. You think it is a bad idea to pull
12 emergency workers from outside the impact area in
13 order to avoid role abandonment?

14 A. (Mileti) I don't think it is
15 necessary. I think if somebody wants to do it, make
16 a planner happy, let him do it. Would the emergency
17 response still get done if he didn't do that? My
18 best judgment and the judgment of anyone who
19 reviewed the empirical record of emergency response,
20 I think would have to say it is unnecessary.

21 Q. Doesn't that extend on the nature of
22 the impact or size of the impact area, the nature of
23 the disaster and how many of the emergency workers'
24 families are impacted by the disaster?

25 A. (Mileti) Given the list of hazard

1 characteristics you have given me, nature of the
2 impact was certainly one. If we were talking
3 about--the answer to your question is yes, however,
4 what happened in Hiroshima, for example, they blew
5 up all the emergency response organizations and
6 therefore emergency response would have had to have
7 come from outside.

8 Q. Mr. Crocker, I asked you earlier
9 whether you could get some data. Have you had a
10 chance to get those data yet?

11 A. (Crocker) I'm sorry. My understanding
12 was not during the break but overnight.

13 Q. I was just asking whether you have been
14 able to do it over the break.

15 A. (Crocker) In 10 minutes I didn't even
16 attempt it. I wrote it down to make sure I would do
17 it.

18 Q. Let's go to page 12--actually, on page
19 11 is another excerpt from Dynes, Marchi and
20 Penanda, Sociology of Disasters. Again, Dr. Miletì,
21 this excerpt discusses the Disaster Research Center
22 interviews. Isn't that correct?

23 A. (Miletì) As I recollect, the answer is
24 yes. And in fact, I think this perhaps is more
25 focused on what we discussed in '83 and '84. But

1 that is answering a question you asked 10 minutes
2 ago.

3 Q. In the middle of the indented paragraph
4 on page 12, it says, "In the first sample of 443
5 persons who held positions in emergency relevant
6 organizations"--do you see that?

7 A. (Mileti) Yes.

8 Q. Are you aware of whether any of those
9 443 persons were school bus drivers or bus company
10 officials?

11 A. (Mileti) To the best of my
12 recollection, although I can't say for sure, they
13 were not school bus drivers.

14 Q. How about bus company officials?

15 A. (Mileti) To the best of my
16 recollection, they were also not bus company
17 officials.

18 Q. They were things like fire chiefs,
19 mayors?

20 A. (Mileti) I'd have to look to say for
21 sure. I am sure they included the likes of, but
22 perhaps I can't say beyond a shadow of a doubt
23 whether they were limited to.

24 Q. Again, with respect to this paragraph,
25 you don't know whether the data that they were

1 compiling was the result of any questions
2 specifically designed to determine whether role
3 conflict occurred or not?

4 A. (Mileti) I think Russell--excuse
5 me--Russell Dynes described that in '83 and '84 to
6 you all and I would hate to have the record rest on
7 my recollection of what he said at that time.

8 But my recollection of what he said at
9 that time is that they had open-ended questions in
10 which they were asking the people "What happened?"
11 in a probing way. You might call it a focus group
12 except it wasn't a group. With persons--included in
13 that were "What were the problems you encountered?"
14 and so on and so forth. There was certainly the
15 potential for that to raise to the surface.

16 I can't say and it would be my best
17 guess that there were not explicit questions about
18 role conflict, which is a psychological phenomenon.
19 It is possible there were questions about role
20 abandonment but I can't say for sure.

21 Q. On the bottom of the page there is an
22 excerpt from an article by Sorensen of--V-o-g-t--

23 A. (Mileti) It is pronounced Vogt,
24 spelled V-o-g-t.

25 Q. --and Mileti, called "Evacuation and

1 Assessment of Planning and Research." And their
2 conclusion is stated. Part of the conclusion is
3 that in a nuclear power plant accident research
4 suggests that there may be an increased potential
5 for conflict and role strain.

6 Do you see that?

7 A. (Mileti) Yes, I do.

8 Q. Could you explain why there would be an
9 increased potential for conflict and role strain?

10 A. (Mileti) John and I--

11 Q. John Sorensen?

12 A. (Mileti) Yes. Excuse me. Doctor
13 Sorensen and I were pulling together findings. We
14 reviewed all the research record. There is not any
15 pointed research or specific piece of research that
16 would lead to this conclusion. In thinking about
17 what nuclear power plant emergency planning is--in
18 my judgment, the most sophisticated, the most
19 intricate, the most involved emergency planning that
20 I know of, that more persons are being involved in
21 it, that more jobs are being specified, et cetera.

22 It seemed clear to us that the
23 potential for role conflict to occur might indeed be
24 higher in a nuclear power plant emergency. But the
25 net effect of that is not that it would cause more

1 role abandonment, as we go on to say. But, rather,
2 that there is just so many more people involved and,
3 therefore, if you did nothing but count heads of
4 emergency responders you would have to say the
5 potential for it might increase.

6 Q. What are the factors of a radiologic
7 emergency that lead you to this conclusion?

8 A. (Mileti) I just told you what they
9 were.

10 Q. Is one the nature of the hazard?

11 A. (Mileti) No. The characteristics that
12 we thought of when we put this sentence together
13 were those that I just said.

14 Q. Could it also be because of the nature
15 of the hazard that there would be an increased
16 potential for conflict?

17 A. (Mileti) I'd have to say yes in answer
18 to that question. However, that is also true if it
19 were a fire or if it were a tornado or if it were a
20 hurricane or earthquake prediction. That is, it
21 would depend on whether or not the hazard was one in
22 which a person perceived during the emergency that
23 their family's life was threatened in a way that
24 death could occur. For example, a burning building
25 with the family still in it--and that the other

1 person, the person who has the potential for role
2 abandonment or who is experiencing role conflict,
3 perceives that they could go and help accomplish
4 something at the family unit that could not
5 otherwise occur.

6 Q. Is it because with respect to a nuclear
7 accident it is more likely that there might be the
8 perception that the family is endangered than, for
9 instance, in the case of a fire, which can be seen?

10 A. (Mileti) No. Again, I have already
11 said what the factors were that led us to make this
12 conclusion. There are many other hazards that are
13 also not visible.

14 Q. When you stated that you have given us
15 the factors--and frankly, maybe I didn't understand
16 it. Maybe you gave them and I didn't understand it.
17 All I think I heard were some generalities. I am
18 trying to figure out what specific factors there are
19 about a nuclear accident plan that would lead to
20 increased potential for conflict and role strain?

21 A. (Mileti) Specifically, the general
22 factor as you characterized it, that I answered was
23 emergency planning for nuclear power plants is more
24 intricate and more sophisticated than any kind of
25 emergency response that I know of. And as a

1 consequence of that, more people are involved and
2 more people are doing more things. Since more is
3 going on, there is a greater potential for conflict.

4 Q. Are more people involved because the
5 potential area of impact is greater than in many of
6 the disasters, for instance, that were looked at in
7 Mr. Kelly's survey?

8 A. (Mileti) In general, the potential for
9 impact is not larger for nuclear power plant
10 emergencies as they are planned for--that is, with
11 the 10 mile EPZ. Some natural events have huge
12 impact areas. No. I said it is because of the
13 infinite detail that goes into emergency planning
14 that just simply doesn't exist in emergency planning
15 for other hazards I know of.

16 Q. You know, the 19 emergencies that Mr.
17 Kelly looked at, isn't it true that the vast
18 majority of them have a smaller impact area than the
19 10 mile EPZ?

20 A. (Mileti) I honestly don't know.

21 Q. You haven't looked at that data?

22 A. (Mileti) I have looked at the list. I
23 have looked at both the organizational data on the
24 original questionnaires--the photocopies of the
25 original questionnaires--as well as the bus driver

1 interviews on the original questionnaires. But I
2 didn't have the perceived need to recollect how
3 large the impact zone was.

4 I did talk to him about how many people
5 were evacuated.

6 Q. Do you have anything more to say, Dr.
7 Mileti? I saw you conferring with Dr. Lindell. I
8 thought he was giving more you could answer.

9 A. (Mileti) He did tell me something. I
10 could say it now as more of an answer. But it was
11 providing more information about what Dr. Kelly did.
12 Dr. Kelly--Mr. Kelly is probably better qualified to
13 represent what he did than my interpretation of what
14 he did.

15 Q. Mr. Kelly, isn't it true that the vast
16 majority of the 19 emergencies that you looked at
17 had impact areas much smaller than the 10 mile EPZ
18 at Shoreham?

19 A. (Kelly) If I could refer you to
20 Appendix G, page two, this is a summary of the data.
21 We can look at each individual case. It says the
22 smallest area was .5 miles and the largest one being
23 280 square miles. I believe the 280 square miles
24 was due to a hurricane--Hurricane Elaine that in
25 Pinellas County, Florida. It does say the average

1 was between 2 and 20 square miles. We can go
2 through the cases and get exact figures if you'd
3 like.

4 Q. Well, you do have the data regarding
5 the impact area, the size of the impact area for
6 each. Emergencies you looked at. Right?

7 A. (Kelly) That's correct.

8 Q. Do you have it tabulated as to how
9 many--in how many of those evacuations the impact
10 area was smaller than 10 miles in radius?

11 A. (Kelly) I believe, a quick count, 14
12 who responded to that, three--two--sorry. Two were
13 larger than a 10 mile radius.

14 Q. That is the Marysville flood and the
15 Hurricane Elaine. Correct?

16 A. (Kelly) It is--Oh. In Pinellas County
17 it was--the response was 100 to 280. I think it was
18 the difference between two people answering the
19 question. In Woodburn there was 20 mile down-wind
20 radius. In Marysville I don't believe we had an
21 answer. No estimate was provided.

22 Q. I don't want to dwell on that. We are
23 going to address your surveys later.

24 Dr. Miletic, on page 13, you cited a
25 study by Barbara Friedman. She says, "In many

1 respects Mileti's argument is similar and agreeable
2 with the work done by Barton some 20 years earlier."
3 Do you see that?

4 A. (Mileti) I remember that statement. I
5 don't see it right now.

6 Q. Page 13, 4th line.

7 A. (Mileti) Yes. I see it. Thank you.

8 Q. What article was she talking about?

9 A. (Mileti) I think, in general, she was
10 talking about the current controversy regarding
11 whether or not role conflict exists in emergencies
12 and the fact that in the contemporary world,
13 particularly at nuclear power plants--although she
14 doesn't reference them--that it has been raised as
15 an issue.

16 She is also talking about, I believe,
17 the controversy--not really controversy, but the
18 first generation of research on role conflict, as I
19 characterized it in my '83-'84 testimony, and the
20 subsequent research on role conflict or abandonment
21 in emergencies.

22 If one looks at the historical record,
23 the field of disaster research was originally called
24 social disorganization, because all the sociologists
25 thought things would be disorganized by emergencies.

1 They went out and, as you might guess, interpreted
2 what they saw in that way. And there are--and I
3 cited them in my testimony, as well as in
4 publications that I have referenced here--half a
5 dozen or so of the old original National Academy of
6 Science reports that document role abandonment or
7 conflict. In fact, one of them, Fred Bates, said
8 there was no role conflict; everyone opted for
9 family roles.

10 That, compared to compared to what
11 sociologists in the mainstream of disaster research
12 are saying today--and that is as characterized by
13 Dynes, Quarantelli, myself and others, Drabek, et
14 cetera, is that role abandonment is not a problem.
15 I think she is saying this controversy that appears
16 apparent in the field puts--and her effort was to
17 try to impose some consistency on it and say, "Okay
18 old boys, old salty dogs, here's what is really
19 going on. I, an insightful young person, have these
20 new things to say."

21 In the context of that, she is saying,
22 my point of view, in her view, as she interprets
23 Allan Barton's point of view, having read his book,
24 are identical. To be honest, tongue in cheek, she
25 is saying what Mileti published, which was really

1 from my testimony here in '83 and '84, is nothing
2 new. "He is just mouthing what I think Barton
3 says." That is how I would interpret that.

4 Q. Have you spoken to Friedman about what
5 she meant by this passage?

6 A. (Mileti) Yes. In fact, I got to know
7 her--in fact, there was awhile she was going to come
8 to Colorado State to work on her Ph.D. I was trying
9 to talk her into coming there to work with me. She
10 got her Master's Degree at Disaster Research Center
11 in Delaware and then decided to go, I think, to
12 Pennsylvania.

13 Q. Have you spoken to Professor Barton as
14 to whether or not he agrees that your views are
15 similar?

16 A. No, I absolutely have not. I would
17 suspect that he'd say they aren't, because that is
18 what he said in his deposition.

19 Q. What I am trying to get at, was she
20 pointing to a specific argument that you were making
21 in support of your views on role conflict, or was
22 she talking about your views in general being the
23 same as Barton's in general?

24 A. (Mileti) As I recollect it, I think
25 here she was talking about role clarity.

1 Q. What did she mean when she said your
2 argument was similar to Barton?

3 A. (Mileti) Well, let me get her article
4 and look at it before I answer the question. I can
5 tell you specifically rather than if I recollect.

6 MR. McMURRAY: So we don't waste time,
7 if you want to take the second break, Judge Gleason?

8 JUDGE GLEASON: All right. We will
9 take 10 minutes.

10 (Brief recess.)

11 JUDGE GLEASON: We will go for another
12 20 or 25 minutes and then we will suspend the
13 witnesses for the day and let you argue your motion
14 here. Then we will adjourn overnight and recess for
15 tomorrow.

16 Go ahead.

17 Q. Dr. Mileti, Friedman did make the
18 conclusion, didn't she, that more research would be
19 useful on role conflict and whether it results in
20 role abandonment?

21 A. (Mileti) It is possible. I don't
22 recollect. I do recollect that she made the
23 conclusion that future research should be directed
24 at how individuals resolve role conflict and
25 disasters, since many alternatives exist. And that

1 is calling for research that would address the
2 potentially many ways that people resolve it.

3 Q. Including, among others, role
4 abandonment?

5 A. (Mileti) Just a moment. I want to get
6 a clear reference to her conclusion.

7 (Pause.)

8 She makes many conclusions. One
9 conclusion, the fifth according to the way I counted
10 them, is that, "the point is that if we assume role
11 conflict exists during disasters at a significant
12 level, then we must turn research in the direction
13 of determining how individuals resolve it."

14 However, let me also reference what I
15 have called her fourth conclusion when I read her
16 document. It is as follows: "In other words, it
17 would seem more plausible that during disasters
18 individuals use other methods of resolving role
19 conflict besides role abandonment."

20 I think she was saying that as she read
21 the literature and looked around contemporary
22 society, that people are debating whether role
23 abandonment exists or not, and what sociologists
24 should really focus on, since role abandonment
25 occurs really very infrequently, is the mechanism

1 whereby role conflict, the psychological phenomenon
2 is resolved.

3 Q. She says it is more than plausible that
4 individuals use methods in resolving role conflict.
5 Other than role abandonment, she is not stating role
6 abandonment is not a possible resolution of role
7 conflict, is she?

8 A. (Mileti) Role abandonment
9 theoretically is a resolution of role conflict. I
10 don't know what she had in mind, but I would hope
11 that she would recognize role abandonment, which is
12 just opting for one role, as a mechanism that
13 theoretically can get you out of a conflict
14 situation.

15 Q. And she was not saying that role
16 abandonment would not occur, was she?

17 A. (Mileti) I would hope that she
18 wouldn't be saying that. We have never said that.
19 I have never said that role abandonment couldn't
20 occur.

21 By the way, I did find that passage you
22 asked me about.

23 Q. I was just going to ask you about that.

24 A. (Mileti) For your information, it is
25 on page 17 of her article, and is a very short

1 passage where she compares me to Allan Barton. I
2 think it probably would be best if I just read it.

3 "In role conflict and abandonment in
4 emergency workers, Mileti 1985, makes the strong
5 argument that although an individual may experience
6 psychological role strain, this does not result in
7 role abandonment in disasters if emergency workers
8 are provided before an emergency with a clear idea
9 of what would be their emergency role.

10 "In addition, Mileti argues that
11 Killian's earlier work specifically supported this
12 notion of role certainty results in the elimination
13 of role abandonment. In many respects Mileti's
14 argument is similar and agreeable with the work done
15 by Barton some 20 years earlier."

16 By the way, she is referencing my
17 reference to Killian's earlier work. His earlier
18 work that has been popular in these hearings is the
19 1952 article. And I am sure she is referencing my
20 reference to his 1954 article, although she doesn't
21 have his '54 article in her references.

22 Q. In your testimony on page 13, you also
23 mention work done by a graduate student, Barbara
24 Vogt, who stated that, in general, about twice as
25 many people show up to evacuate special facilities

1 as there are people who need to be evacuated from
2 them.

3 Do you see that?

4 A. (Mileti) Yes.

5 Q. Do you know what disaster she is
6 evaluating?

7 A. (Mileti) I did. I don't remember
8 which emergency she is evaluating today. I can say
9 that her data base was gathered according to the
10 following concepts: She wanted to investigate the
11 evacuation of special facilities from every major
12 evacuation in this nation in the course of the last
13 seven years, I believe, from 1980 or '81 forward.
14 And her data base was from that entire population.

15 She did develop a list of all of those
16 emergencies, and I can see that list. But I don't
17 remember any of them today.

18 Q. Do you know what kind of workers she
19 was studying.

20 A. (Mileti) She was studying the
21 evacuation of special facilities and, therefore,
22 would have studied anybody that helped work to
23 evacuate special facilities.

24 Q. Do you know whether school bus drivers
25 was among the population that she reviewed?

1 A. (Mileti) My best guess is that the
2 answer to that question is that she did not study
3 school bus drivers, because she was studying the
4 evacuation, as it says in my testimony, of nursing
5 homes and hospitals. I just don't think that school
6 bus drivers would end up evacuating or helping to
7 evacuate nursing homes and hospitals, although it is
8 not inconceivable. I wouldn't expect it in her data
9 set.

10 Q. Do you know whether any of the
11 disasters that she was looking at were radiological
12 emergencies?

13 A. (Mileti) Given the parameters of how
14 she defined her population, which was from--at the
15 earliest, 1980 forward, I don't know of any
16 large-scale evacuations in this country that
17 involved radiation as the hazard in that time
18 period. So I would be surprised if she turned one
19 up.

20 Q. Further down on that page, you discuss
21 an article by James Johnson, which apparently was a
22 survey regarding the intentions of teachers in
23 California with respect to a future as yet
24 unexperienced emergency.

25 Can you tell me what kind of emergency

1 Dr. Johnson was studying?

2 A. (Mileti) This was a hypothetical
3 emergency, one that did not occur but that was
4 speculating to occur in the future about, as I
5 recollect, an evacuation at the Diablo Canyon
6 Nuclear Power Plant.

7 Q. Hypothesizing an accident at Diablo
8 Canyon; is that correct?

9 A. (Mileti) As I recollect, hypothesizing
10 an accident there and asking teachers whether or not
11 they intended to participate in helping to evacuate
12 their school children.

13 Q. Other than Professor Johnson's article,
14 is it your testimony that there are no other
15 publications or research which support the county's
16 view on role conflict and role abandonment.

17 A. (Mileti) No. There are other
18 publications. And--

19 Q. Let me limit my question. I don't want
20 to go back to Killian and those. I am talking about
21 in, say, the last decade or so that supported the
22 county's view of role conflict.

23 A. (Mileti) Yes, there are and I have
24 them referenced in my testimony.

25 There are perhaps as many as a dozen

1 publications that James Johnson, Jr., for example,
2 presented at the hearings at Seabrook about the
3 behavior of hospital workers and the National Guard,
4 et cetera, that--well, the National Guard
5 publication doesn't, but other doctors have
6 published assessments of how they interpreted what
7 went on at hospitals during the accident at Three
8 Mile Island as what he chooses to label and I know
9 was in the county's evidence in this case, presented
10 as evidence of role abandonment by what he chose to
11 call emergency workers.

12 I think if you stretch the definitions,
13 which I don't agree with for reasons I am sure you
14 are familiar with, I would have to say that there
15 were those.

16 Q. Other than the other publications you
17 discussed further on with respect to hospital
18 workers at TMI, is it your testimony that there are
19 no other publications which support the county's
20 view on role conflict other than Professor Johnson's
21 here?

22 A. (Mileti) Not to the best of my
23 knowledge, except it is possible, although I don't
24 think that it is true. I think it is possible that
25 Dr. Johnson may have published another article or so

1 on the topic from the same data if not comparable
2 data. But I would have included it in this. I
3 presume the answer to your question is yes, although
4 it is possible that something existed that I don't
5 know about. I try to do comprehensive literature
6 reviews but you always miss one. I hope I didn't.

7 Q. On page 15, the answer to question 8,
8 Dr. Miletì, you note that the regular bus drivers
9 have not yet been trained. Dr. Miletì, you can't
10 state at this time, can you, that there is any
11 assurance that all the bus drivers ever will be
12 trained?

13 A. (Miletì) I sure can't, no. I have no
14 idea. That is way outside my area of influence.

15 Q. But you say that they have not been
16 exposed to all the factors that are known to enhance
17 role clarity and emergency role performance. Do you
18 see that?

19 A. (Miletì) Yes.

20 Q. Now, maybe this is the way I should
21 have approached this question before. What are the
22 factors known to enhance role clarity?

23 A. (Miletì) That people first know that
24 they have a job. I apologize for not remembering
25 the list. As I recollect, as you ask the question

1 now, it reminds me of three things I talked about in
2 '83 and '84. That is without a doubt the first one:
3 When to do it and how to do it.

4 Thank you, Mike. I will put on the
5 record that he helped me.

6 Q. I'm sorry. Can you restate that?

7 A. (Mileti) What to do--that they know
8 they have the job, when they are supposed to do it
9 and how to do it. On occasions, sociologists can
10 talk in simple English.

11 Q. You would agree, wouldn't you, that the
12 absence of training could have some effect on
13 whether or not people would abandon their roles?

14 A. (Mileti) I think that if in the
15 generic sense people weren't trained, didn't know
16 they had an emergency job, it wasn't apparent to
17 them in the emergency as a consequence of that, that
18 they had an emergency job, that without a doubt that
19 could result in their not doing that emergency job
20 in the emergency. However, I could not label that
21 role abandonment. How could you argue they
22 abandoned an emergency job they didn't know they
23 had.

24 Q. Well, if they had been given an
25 indication that they have a role, for instance,

1 through listening to testimony like this or
2 whatever, but they haven't been trained, they don't
3 know specifically what job they are supposed to do,
4 when to do it or how to do it, wouldn't that affect
5 whether or not they would abandon their roles?

6 A. (Mileti) It depends on what kind of
7 job we are talking about. If we are talking about,
8 as we are, bus drivers, it is my opinion, as stated
9 here, that their job--they drive buses. They drive
10 buses to and from school with children in them. And
11 that without an emergency plan--if you went back to
12 1976, before TMI, before NUREG 0654 and Department
13 for Emergency Plans, those bus drivers are going to
14 have an idea--it is going to occur to them because
15 of the normative overlap between what they do every
16 day, taking kids back and forth to school, that if
17 they hear that the EPZ is going to be evacuated, it
18 will occur to them that they need to go to the
19 school and get the kids. That is why I believe we
20 have not ever seen kids abandoned in any emergency
21 we have had.

22 That doesn't mean in my opinion that I
23 would say we should ignore role clarity. If we are
24 engaging in planning, we might as well do planning
25 right. The whole point of planning is to specify

1 what are the jobs that need to get done.

2 If we went back to the era of the 50's,
3 when the National Research Council was first doing
4 its disaster research, we'd find communities in
5 which people ended up doing something else in
6 response to an emergency, not because they were
7 worried about their family, but largely because they
8 didn't know they had an emergency job. And that
9 largely is the data base, by the way, on which
10 Barton's book rests.

11 Q. Are you saying the absence of training
12 had no effect on whether or not bus drivers will
13 abandon their roles?

14 A. (Mileti) I will think it could
15 potentially have an effect in the sense that they
16 may not know what others might think they should
17 know or how they should do their job. They
18 certainly know how to drive a bus. They certainly
19 would have a strong sense that they are the people
20 who have the bus, who could get the kids out of the
21 school. And I think that they would define in that
22 situation the need for them to get the kids out of
23 the school.

24 Q. How do you know they wouldn't think
25 that LILCO is supposed to get the kids out of the

1 school?

2 A. (Mileti) That is a possibility.

3 Q. You don't know whether or not they
4 think some other plans might have been made for the
5 children, do you?

6 A. (Mileti) That is also a possibility.
7 And it has been typically manifested in emergencies
8 that have that kind of uncertainty lent to it. That
9 is one of the main reasons why more people show up
10 to do certain emergency tasks rather than having no
11 people show up to do certain emergency tasks, and
12 tying this concept back to the notion that some
13 things in emergencies simply surface that no one can
14 keep from surfacing to the top of the social system
15 as high priority, and getting children evacuated
16 will do that.

17 I feel confident in saying that of all
18 the role conflict, role abandonment, roles we could
19 be arguing the one to be least concerned about in my
20 opinion is getting children out. If there were
21 species of humans who didn't care about children,
22 they would die out.

23 Q. But you already said that it is
24 possible that bus drivers could think that LILCO has
25 already made a plan for it.

1 A. (Mileti) That is likely. To be on the
2 safe side, I would suspect more just show up, just
3 in case LILCO didn't.

4 Q. You haven't discussed this with any of
5 the local bus drivers, have you?

6 A. (Mileti) No. I am basing my judgments
7 solely on the empirical record of human behavior in
8 actual emergencies.

9 Q. You are speculating as to what they
10 might do even if they were untrained. Correct?

11 A. (Mileti) You can call it speculating.
12 I prefer to make--to characterize it as making a
13 prudent judgment based on the scientific technique.

14 Q. What scientific technique are you
15 referring to?

16 A. (Mileti) Well, the scientific method
17 is, you have a hypothesis, in a sense, and then you
18 look at data. And you either accept or reject your
19 hypothesis. The hypothesis in reference to how
20 people behave in emergencies, we can hypothesize a
21 role like bus drivers won't drive evacuation buses
22 to get children out of a hazardous area and then
23 look at the empirical record of actual data and see
24 if there are any scraps of evidence for that, and I
25 think that there isn't.

1 Q. It is possible also that the local bus
2 drivers, especially those with children, might go to
3 the schools to pick up their own children, their own
4 family?

5 MR. CHRISTMAN: Objection.

6 JUDGE GLEASON: Let him answer it.

7 A. (Mileti) You know you can always get
8 out of me--when you ask is it a possible question,
9 about human behavior, yes. If you can think it up
10 in reference to human behavior, it is possible that
11 sometime, someplace, somebody is going to engage in
12 that behavior. But the question really becomes in
13 sociology one of is it probable or is it likely.
14 What would you guess the model or normative response
15 might be? So, yes, I agree. It is possible. I
16 don't think it is probable.

17 Q. Is it your testimony that even if bus
18 drivers were untrained, they didn't know where they
19 were supposed to take the children, didn't know what
20 routes they were supposed to take, they didn't even
21 know if they were supposed to take the children,
22 that nevertheless all of them would show up at the
23 schools with their buses?

24 A. (Mileti) There are so many parameters
25 to that question, I could almost make it a question

1 in reference to each of them. My testimony is that
2 of all the groups of--

3 Q. I would like an answer to that question
4 that I asked, Dr. Mileti.

5 A. (Mileti) Can I have it read back, then
6 because I think it did contain many questions

7 JUDGE GLEASON: Read the question.

8 (Record read.)

9 A. (Mileti) And the answer to your
10 question, I wouldn't expect that all of them would
11 show up. I would hypothesize that given the
12 parameters of that question, that there is a
13 probability that less than all of them would show
14 up. However, I would also hypothesize that enough
15 of them would show up to get the school children
16 evacuated.

17 Q. Do you know how many it would take to
18 get the children evacuated?

19 A. (Mileti) No, I don't. I am resting
20 that on the basis of my judgment or interpretation
21 or reading of the historical record of emergencies
22 in this nation that we have experienced with and
23 without emergency plans, that there has never in the
24 history of the country been an organization that has
25 been unable to do what it was supposed to do in an

1 emergency because of role abandonment or role
2 conflict or role stress, whatever label we want to
3 use.

4 Q. And there never has been a radiological
5 emergency in this country, has there, where school
6 children have had to be evacuated by school buses,
7 has there?

8 A. (Mileti) Not in the sense that you
9 phrased your question. But there was the
10 evacuation--the closing of schools at Three Mile
11 Island.

12 Q. Which you haven't studied.

13 A. (Mileti) No, I did spend a couple of
14 hours interviewing one school principal. What I
15 didn't ask in that interview years ago, was whether
16 or not school buses were used. I am just presuming
17 that they were.

18 And you're right. I am happy to say
19 there hasn't been a radiological emergency in this
20 nation for us to study. I hope I never get the data
21 and we never get to test the hypothesis. But I am
22 willing to make the judgment, the only prudent one a
23 scientist could make on the basis of the empirical
24 record.

25 By the way, none of this means that I

1 think emergency planning should not go on. I do
2 support emergency planning efforts.

3 Q. Let's go to page--well, this is an okay
4 place to stop, Judge.

5 JUDGE GLEASON: All right. Gentlemen,
6 we appreciate your testimony today. You are excused
7 as witnesses.

8 Mr. Miller, are you going to speak on
9 the motion, or who is?

10 We have before us the motion by Suffolk
11 County asking the board to reconsider its decision
12 with respect to motions to strike testimony of the
13 Brodsky, et al., witnesses, filed by the applicant.

14 MR. McMURRAY: Judge Gleason, Mr.
15 Miller and I have this whole bus driver issue
16 divided between us. I am going to address those
17 that deal with the role conflict testimony of
18 Professor Cole and the others.

19 JUDGE GLEASON: All right.

20 MR. McMURRAY: There are just two items
21 we want to address. The first one deals with the
22 testimony that was stricken regarding the Friday
23 board's decision. That is number one on page two.

24 JUDGE GLEASON: One and two. All
25 right.

1 MR. McMURRAY: On page two. In your
2 decision it was Item A--sorry. B1A6.

3 JUDGE GLEASON: Did that refer to both
4 of them?

5 MR. McMURRAY: No, sir. The other one
6 we want to address with respect to Cole, the Cole
7 testimony, is the striking of the testimony about
8 the signed statements by the bus drivers.

9 Let me first address the Exercise
10 Board's findings.

11 JUDGE GLEASON: The Friday board
12 decision is referenced in Brodsky testimony and also
13 in Cole testimony. Are you going to cover both?

14 MR. McMURRAY: Yes. I will cover both.
15 It is the same argument.

16 JUDGE GLEASON: Can you give me the
17 reference in our decision to the Cole testimony if
18 you have it?

19 MR. McMURRAY: Yes. In the Cole
20 testimony it is page 25--

21 JUDGE GLEASON: I don't mean that. I
22 mean our decision.

23 MR. McMURRAY: What page in your
24 decision?

25 JUDGE GLEASON: Yes.

1 MR. McMURRAY: It is on page two of
2 your order of May 9th. Item B1A6.

3 JUDGE GLEASON: What was the one on the
4 first one, Brodsky? I have that as B1A6.

5 MR. MILLER: I am not as organized as
6 Mr. McMurray. I have not made the correlation to
7 your order.

8 JUDGE GLEASON: Okay. Go ahead Mr.
9 McMurray. I will find it somewhere.

10 MR. McMURRAY: Both my arguments on
11 these matters will be brief. With respect to the
12 Exercise Board findings, the board has ruled that
13 those findings are irrelevant. I would first like
14 to ask the board for clarification as to why it--

15 JUDGE GLEASON: I am not going to
16 clarify any more at this point. I am going to
17 listen to arguments and come back tomorrow. You
18 make the argument. You made the motion to strike.
19 I will let the other parties respond to it and then
20 I will respond to it in the morning.

21 MR. McMURRAY: My only point, Judge
22 Gleason, is it is difficult to try to impress the
23 board why the evidence is relevant when we have
24 nothing more than the board's ruling that it is
25 relevant. I am trying to tell the board why we

1 believe this is relevant.

2 As you heard today, there has been a
3 lot of discussion about training and whether
4 training can be given to bus drivers and whether
5 training will alleviate role conflict. LILCO makes
6 much of the fact that training will alleviate role
7 conflict and is an important factor in reducing role
8 abandonment.

9 Now, the Friday board decision casts
10 serious doubt upon LILCO's ability to provide that
11 training. The Friday board decision found LILCO's
12 training program to be fundamentally flawed. That
13 cast doubt on LILCO's ability to provide the
14 training to the bus drivers which would eliminate
15 role abandonment. Therefore, the Friday board's
16 decision is very relevant to whether or not, in a
17 radiological emergency at Shoreham, there would be
18 role abandonment.

19 These witnesses are perfectly capable
20 of reading a decision and drawing conclusions based
21 on their expertise from that decision. The decision
22 tells them that the training program raises
23 questions about whether or not LILCO is capable of
24 alleviating role conflict and role abandonment.
25 That is the point which we make with respect to the

1 Exercise Board findings and why it is so relevant to
2 the issue before the board at this time.

3 I have nothing further to say on that
4 but I will respond to questions if the board has
5 any.

6 JUDGE GLEASON: Do you care to respond?

7 MS. LEUGERS: Yes. The Friday decision
8 is mentioned twice; once in the Brodsky and once in
9 the Cole testimony, where they give their
10 conclusions, their conclusions about what the
11 significance of the Friday decision is. It is a
12 legal decision. It requires expertise, legal
13 expertise to interpret what this decision means,
14 especially when you are generalizing it from one
15 situation to another.

16 It broadly talks about LILCO's training
17 but it does not talk about training of regular
18 school bus drivers, which is what the testimony went
19 towards this morning in response to the questioning
20 by Mr. McMurray, nor does it go to the training, any
21 unique aspects of the training, that LILCO school
22 bus drivers would be receiving. Any legal
23 interpretation is best left to the lawyers to argue
24 in their findings at some other point.

25 That is basically what we have to say

1 about that.

2 JUDGE GLEASON: Mr. Bachmann?

3 MR. BACHMANN: The staff agrees with
4 counsel for LILCO primarily on the idea that this is
5 essentially legal argument. It really has no place
6 for witnesses of this sort to be making that sort of
7 testimony.

8 MR. ZAHNLEUTER: May I state, on behalf
9 of the State, that the State supports the County and
10 also, I note that there have been numerous
11 references in testimony to the PID, which itself is
12 a legal decision from a board.

13 JUDGE GLEASON: To what? I'm sorry.

14 MR. ZAHNLEUTER: The PID, the Partial
15 Initial Decision, PID. It is referenced PID in the
16 testimony quite often. That runs contrary to the
17 position LILCO is taking now that legal decisions
18 require legal expertise to interpret. There are
19 numerous places where LILCO's nonlegal witnesses
20 rely on the Partial Initial Decision.

21 MR. McMURRAY: We have already had
22 reference today, Judge Gleason, to NUREG 0654 by one
23 of the witnesses. That is basically a legal
24 document--

25 JUDGE GLEASON: I thought you were

1 through, Mr. McMurray?

2 MR. McMURRAY: I'm sorry. May I please
3 speak, Judge Gleason?

4 JUDGE GLEASON: Yes.

5 MR. McMURRAY: Thank you.

6 We had reference to NUREG 0654 by more
7 than one witness. That is a legal document of
8 sorts. We did not object, because it is the kind of
9 document that one would expect an expert to be able
10 to draw conclusions from. The same with a Partial
11 Initial Decision by a board. An expert should be
12 able to read it and draw conclusions from the facts
13 that are stated in that decision.

14 The Friday board is not pure legal
15 argument. It states many facts. And the
16 fundamental fact there is that LILCO's training
17 program, not just training for any particular group,
18 but training program, is fundamentally flawed.

19 Thank you.

20 MR. BACHMAN: Judge Gleason, may I have
21 a brief word?

22 JUDGE GLEASON: Go ahead.

23 MR. BACHMAN: I object to Mr.
24 McMurray's characterization of NUREG 0654 as a legal
25 document. That is a document used as guidance in

1 emergency planning. It is not designed to be used
2 essentially by lawyers. It is designed to be used
3 by professional emergency planners. So I really
4 object to his characterization of that as a legal
5 document.

6 JUDGE GLEASON: Let's hear Mr. Miller
7 on number two.

8 MR. McMURRAY: I'm sorry. I still have
9 the signed statements by the bus drivers to address.
10 That is number--

11 JUDGE GLEASON: You have number two?

12 MR. McMURRAY: I will also address
13 number two.

14 Here the issue is whether or not
15 testimony regarding signed statements by 225 bus
16 drivers that they will not drive buses in a
17 radiological emergency at Shoreham should be
18 admitted. This is probably the most probative
19 evidence that we can have in this proceeding. It
20 comes directly from the emergency workers--I should
21 say auxiliary emergency workers, that LILCO has
22 unilaterally designated to drive buses in an
23 emergency without asking them.

24 Those who are aware that LILCO has
25 designated them, or some of these who are aware,

1 have stated that they will not drive. They have not
2 accepted that role. That is extremely important for
3 this board to weigh in assessing the issue of
4 whether or not there will be sufficient bus drivers
5 in the event of an emergency at Shoreham.

6 Now, there are issues as to whether or
7 not these statements constitute hearsay. Hearsay is
8 admissible in these NRC proceedings. As we have
9 stated, some of the school administrators can
10 provide information regarding the bases for these
11 statements and their reliability. And it seems to
12 me at a minimum that this board should hear what
13 they have to say before ruling to strike the
14 testimony regarding those statements.

15 LILCO, remember, took the opportunity
16 to address these statements. LILCO wasn't
17 blind-sided by these statements. It addressed them
18 in its testimony and was able to deal with them.
19 Now, the board should now be able to weigh the
20 testimony provided by LILCO rather than ignoring
21 what is the truth, which is that 225 bus drivers
22 have said they will not drive.

23 JUDGE GLEASON: Ms. Leugers?

24 MS. LEUGERS: Your Honor, LILCO still
25 believes that any reference to the bus drivers'

1 statement should be stricken from the
2 testimony--should remain not part of the testimony
3 for several reasons. There is a lack of foundation.
4 The witnesses are not qualified to support this
5 testimony. And it is not just that it is hearsay.
6 It is unreliable hearsay.

7 We laid this out well in our motion to
8 strike, but I will touch on each of the three
9 reasons very briefly. The lack of foundation
10 problem is due to the fact that LILCO has not been
11 made privy to who these drivers are or to who talked
12 to these drivers to get them to sign these
13 statements, how it was done, under what conditions
14 these individuals were asked or even coerced to sign
15 these statements.

16 Also, we don't know if people refused
17 to sign these statements and since they refused
18 their statements were thrown away or there was no
19 tabulation upon keeping these statements.

20 The witnesses are not qualified to
21 support these statements not only because there is a
22 lack of foundation, but they are not aware, from
23 what we have discovered in depositions of several of
24 the witnesses, they aren't aware of these bus driver
25 statements or where they came from.

1 In answers to interrogatories we
2 proposed, we put to Suffolk County and New York
3 State, they gave very vague answers about where
4 these statements came from and who the members of
5 the public were that provided these statements. And
6 I believe that their answers to interrogatories were
7 part of our motion to strike.

8 Because of these factors, it falls into
9 the category of unreliable hearsay. Hearsay is
10 admissible, but not in conditions such as these.

11 The one last point that Mr. McMurray
12 said was that we could cross-examine their witnesses
13 to find out about the reliability of the statements.
14 Specifically in their response to our motion to
15 strike, they mentioned that Suffolk County witness
16 Rossi could be asked and he could give his knowledge
17 on it. Well, we asked him that during his
18 deposition and we had never seen those statements.

19 For the reasons I have stated, LILCO
20 believes that those statements should remain not a
21 part of the record.

22 MR. BACHMANN: I will defer to Mr.
23 Zahnleuter at this time and go last.

24 JUDGE GLEASON: Mr. Zahnleuter? Sorry.
25 I should have asked you.

1 MR. ZAHNLEUTER: The State supports the
2 County on this motion, too. I would like to add
3 that LILCO's complaints about unreliability of these
4 statements can also be applied to some of the
5 testimony we heard today from Mr. Crocker, where he
6 talked about the bus drivers who had agreed with
7 LILCO to conduct--to participate in training. We
8 don't know much about the circumstances that
9 surrounded the inquiries that LILCO made about the
10 willingness of bus drivers to accept training.

11 JUDGE GLEASON: Was that not on
12 cross-examination?

13 MR. ZAHNLEUTER: It arose this morning
14 in response to questions by Mr. McMurray and without
15 objection from counsel for LILCO.

16 JUDGE GLEASON: Proceed.

17 MR. ZAHNLEUTER: We know very little
18 about the circumstances that the drivers were
19 questioned about. As Ms. Leugers said, whether they
20 were asked or coerced, the testimony seems to be in
21 the same category. It is just that it comes out in
22 LILCO's favor, whereas these signed statements from
23 bus drivers come out against LILCO's favor. The
24 reliability is equal in both instances and I think
25 that the Government would be prejudiced by allowing

1 testimony favorable to LILCO to be allowed into the
2 record but not testimony favorable to the
3 Government.

4 JUDGE GLEASON: Mr. Bachmann?

5 MR. BACHMANN: In answer to a comment
6 made by Mr. Zahnleuter, I would certainly suggest
7 that if a witness responds on cross-examination you
8 sort of have to take him as you get him. I don't
9 think that analogy is at all apt.

10 Going to the heart of the objection to
11 this testimony, that it is unreliable hearsay, while
12 it is true that these administrative hearings, a
13 certain amount of hearsay by necessity must come in,
14 especially under expert testimony, I think this is
15 pushing it way beyond the bounds of what would be
16 acceptable hearsay evidence. We are not dealing
17 with experts here. We are dealing--at least that
18 part of their testimony they are not testifying as
19 experts. I believe and the staff believes that this
20 is, was, continues to be unacceptable hearsay
21 evidence.

22 JUDGE GLEASON: Number two?

23 MR. MILLER: Judge Gleason, I will try
24 and keep this very brief. The easy one, whj i
25 unfortunately is not listed on the two-page document

1 that we prepared during the course of the day and
2 gave to the parties and the board, appears on page
3 13 of the County's testimony, where I believe--and I
4 assume inadvertently the board struck roughly two
5 lines of the County's testimony which was not moved
6 to be stricken by LILCO or the NRC staff. Those
7 lines would be lines 16 through 18 on page 13 of the
8 County's testimony, the sentence, "Our remaining
9 three public schools are all located close to the
10 ten-mile EPZ boundary line." Those lines I believe
11 should not fall in the scope of the passage that was
12 stricken--

13 JUDGE GLEASON: I think in the--

14 MR. MILLER: It didn't catch that one.

15 JUDGE GLEASON: Was there reference to
16 it?

17 MR. MILLER: No.

18 JUDGE GLEASON: I just made a mistake
19 and I figured it wasn't worth striking it or leaving
20 it in, so I ignored it. Do you agree with that
21 conclusion?

22 MR. MILLER: No, sir. I would like to
23 get the sentence back in.

24 There was another one you did catch,
25 Judge Gleason.

1 JUDGE GLEASON: This I didn't make a
2 reference to, I know.

3 MR. MILLER: It is page 13, lines 16
4 through 18, the sentence right before the passage
5 that was stricken pursuant to motion.

6 JUDGE GLEASON: Unfortunately, I don't
7 have the Cole testimony here.

8 MR. MILLER: This is the Brodsky.

9 JUDGE GLEASON: What page was it?

10 MR. MILLER: 13. Next-to-last sentence
11 of the first full paragraph.

12 JUDGE GLEASON: "We feel it is
13 unrealistic to assume."

14 MR. MILLER: That was stricken pursuant
15 to LILCO motion to strike. "Our remaining three
16 public schools," LILCO did not move to strike that
17 nor did the staff and I believe it should be back in
18 the testimony.

19 JUDGE GLEASON: If that is the case,
20 then it would be.

21 Do you agree, Ms. Leugers?

22 MS. LEUGERS: Yes, your Honor. From my
23 reading of the sentence it appears to be merely a
24 description of the school district, the makeup of
25 the school district, and we would have no objections

1 to that.

2 JUDGE GLEASON: That sentence would be
3 reinserted into the testimony.

4 MR. MILLER: Thank you.

5 The remainder of those were matters
6 stricken pursuant to motions to strike.

7 JUDGE GLEASON: Proceed.

8 MR. MILLER: The next matter I will
9 lump together as what I will call opinion statements
10 by the County school official witnesses regarding
11 whether or not LILCO's plan to evacuate the schools
12 would, in fact, be implemented by the schools
13 themselves. Those are the five items listed on the
14 first page of the document we prepared today, items
15 2A through 2E. Specified on that page are the
16 particular page numbers and the lines of those pages
17 where the testimony was stricken.

18 JUDGE GLEASON: I can state very
19 simply, Mr. Miller, that those are stricken because
20 they are really outside the scope of the issue
21 before us and, therefore, they are irrelevant to our
22 proceeding.

23 MR. MILLER: Judge Gleason, let me just
24 see if I can understand. Maybe we can reach an
25 understanding on this one. Your ruling did indicate

1 that the matters, those five passages were stricken
2 because the board considered them to be irrelevant
3 evidence. I guess I can only say that what we have
4 before the board as far as I am aware is a plan by
5 LILCO to evacuate the schools in part relying upon
6 resources available to the schools--that is, school
7 buses--and in part relying on school bus drivers
8 normally under contract or employed by the schools.
9 And, in any event, relying upon the schools
10 themselves to say they would in fact implement
11 LILCO's plan.

12 The testimony presented by the County
13 in many ways and for many reasons sets forth the
14 reasons why LILCO's plan, as far as the school
15 administrators are concerned, is an unworkable plan
16 and could not be implemented in a way to adequately
17 protect the safety of the children that attend EPZ
18 schools. The school administrators give the
19 reasons, ample reasons as to why they would not
20 implement LILCO's plan and then state in a very
21 precise fashion in these five passages stricken by
22 the board that they would not implement LILCO's plan
23 or permit LILCO to implement that plan by putting
24 their school children on buses driven by LILCO
25 employees.

1 It seemed to me, Judge Gleason, that
2 that is the heart of the issue before the board.
3 LILCO has a plan but that plan is completely
4 dependent upon the school officials within the EPZ
5 saying they would permit LILCO to implement that
6 plan. The school officials have stated to the
7 contrary. They will do so next week when they
8 appear before the board under oath, that they would
9 not implement LILCO's plan. And I have to believe
10 that that is relevant evidence and squarely inside
11 the scope of the issues before this board and should
12 therefore be admitted into evidence.

13 JUDGE GLEASON: Go on to number
14 three--excuse me. I'm sorry. Mr. Zahnleuter?

15 MR. ZAHNLEUTER: I will simply state
16 that the State supports the County's position.

17 JUDGE GLEASON: Mr. Christman?
18 I'm sorry.

19 MS. LEUGERS: That's okay.

20 In addition to the board's reasons that
21 were given in the errata sheet, LILCO feels these
22 five statements should be out because they challenge
23 NRC's NU Regulation discussing the best efforts of
24 local governmental entities and state entities. And
25 as Suffolk County has repeatedly told LILCO, school

1 districts are separate political entities and they
2 have no control over them whatsoever. As such, they
3 also are bound by the NRC NU Regulation that
4 requires that they use their best efforts. Also,
5 there is a presumption that they will use the
6 utility plan to help respond in an emergency at
7 Shoreham.

8 As such, these five statements
9 challenge that by saying they, as counsel
10 characterized themselves, the statements say they
11 refuse to implement LILCO's school plan. That goes
12 directly contrary to the new NRC regulations.

13 MR. BACHMAN: Staff would support
14 keeping these things stricken. We believe that
15 these statements are just so far out of the scope of
16 the proceeding defined by the Appeal Board in
17 ALAB-832 and by this board, that it really doesn't
18 bear much discussion.

19 JUDGE GLEASON: Number three.

20 MR. MILLER: Number three is what we
21 call the witnesses' statement regarding the
22 protective action they would in fact take. In
23 arguing this, Judge Gleason, it does tie back into
24 the one previously argued, the statements regarding
25 the school's refusal to implement LILCO's plan. I

1 think it is important, Judge, to address some of the
2 comments made by Ms. Leugers regarding the new rule.
3 I will do so in the context also of this affirmative
4 response made by the witnesses that the board had
5 stricken.

6 The board's ruling on the motion to
7 strike indicated the board considered the evidence
8 irrelevant. It did not tie that ruling into the new
9 Commission rule. I am not sure that is the basis
10 the board used to strike the evidence. But assuming
11 for the moment that it was, the board first must
12 recognize that the new rule applies to actions by
13 state and local governments.

14 Under the argument just made by Ms.
15 Leugers, the sewer districts of New York State would
16 be governmental entities that would have to follow a
17 utility plan because they are independent political
18 entities under New York State law. That was not the
19 purpose of the new rule and there is no way to read
20 that rule to reach that reason or rationale offered
21 by Ms. Leugers.

22 Secondly, I must point out, Judge
23 Gleason, that these school witnesses have provided
24 ample reasons as to why they would not follow and
25 implement LILCO's school plan for evacuating the

1 school children. This is not a case where the
2 schools are simply saying "we would never do it,"
3 without offering reasons and justification and
4 rationale to the board to consider. Many of the
5 reasons that have been offered have been stricken by
6 the board but the reasons have been offered, ample
7 reasons still remain in the testimony. And in
8 addition, this ties into this fourth point about the
9 affirmative statement and the response that would be
10 taken by the schools that was stricken.

11 The school officials have also offered
12 in their testimony on pages 70 and 71 very
13 particular, very precise statements as to how they
14 would, in fact, deal with the Shoreham emergency
15 given the situation they believe they would face
16 with role conflict among the known bus drivers. We
17 believe that that affirmative statement made by the
18 witnesses offered by the County should also be
19 reviewed by the board. That statement states what
20 the school districts believe they would do and how
21 they would attempt to do it.

22 JUDGE GLEASON: In other words, they
23 are expressing their best efforts in that statement?

24 MR. MILLER: That is their best
25 efforts, Judge Gleason. That is right.

1 JUDGE GLEASON: Mr. Zahnleuter, are you
2 up?

3 MR. ZAHNLEUTER: We support the County.

4 JUDGE GLEASON: Ms. Leugers?

5 MS. LEUGERS: Judge Gleason, first I
6 must confess that I hadn't come totally prepared to
7 re-argue our motions to strike so what I have
8 prepared has been since lunchtime, in between. I
9 did have some time hunting down all the reasons for
10 some of the arguments that were made. It appears
11 from looking at this one again, in particular, the
12 emphasis here in this litigation is the adequacy of
13 LILCO's plan to use its own school bus drivers to
14 evacuate the schools. It does not go to responding
15 to school districts' absolute refusal to use LILCO's
16 plan and to work with LILCO and then to do something
17 totally different that isn't adequate. In that
18 sense, it is out of the scope of this proceeding.

19 JUDGE GLEASON: Anything to add, Mr.
20 Bachmann?

21 MR. BACHMANN: Just the fact that this
22 is a very narrow issue on remand and I think this
23 is--this type of testimony is impermissibly broad in
24 the scope of what we are supposed to be trying.

25 JUDGE GLEASON: Number four?

1 MR. MILLER: Yes, sir. Number four,
2 Judge Gleason, very briefly, ties into the last two
3 arguments I have made. Number four refers to a Mt.
4 Sinai School District resolution that was passed in
5 1988 specifically in response to LILCO's new school
6 proposal. That resolution, of course, was not one
7 of the resolutions that was in issue back in the
8 1983-84 planning litigation. Again, it is specific
9 to this proposal before the board. Therefore, I
10 assume it must be relevant to the issues before the
11 board and we believe, therefore, should be admitted
12 or readmitted back into evidence. That is also
13 Attachment 11 to the County's testimony. I am not
14 sure the arguments really differ, if the board wants
15 to go around the horn here.

16 JUDGE GLEASON: Is what you are saying
17 it must be relevant because the board has already
18 considered it previously?

19 MR. MILLER: Just the opposite, sir. I
20 am saying this resolution was enacted this year,
21 1988, by the school district. It goes specifically
22 to LILCO's new school proposal for evacuating school
23 children. I guess what I am saying, Judge Gleason,
24 is that if the board agrees with my arguments that
25 statements by the schools regarding the fact that

1 they would not implement LILCO's plan, if the board
2 agrees that is relevant and that the affirmative
3 statements of the schools should come in, this
4 should come in as well.

5 JUDGE GLEASON: It is really the same
6 issue?

7 MR. MILLER: I believe so.

8 JUDGE GLEASON: I believe the answers
9 are the same.

10 MS. LEUGERS: All I would add is the
11 resolution does not go to evaluating LILCO's school
12 bus driver procedure. That is all I would add to
13 that.

14 JUDGE GLEASON: Mr. Zahnleuter?

15 MR. ZAHNLEUTER: Are you asking me to
16 discuss Dr. Harkin's testimony at this point?

17 JUDGE GLEASON: No. I am just asking
18 what your comment is with respect to the Mt. Sinai
19 resolution in the 1988 testimony.

20 MR. ZAHNLEUTER: On the apt of the
21 State, again, we support the County.

22 Also, I would like to add that if a
23 school district is not willing to accept help in any
24 form from LILCO, then the LILCO plan's adequacy has
25 to be viewed in that light. It is a relevant

1 inquiry to know whether or not the recipient of
2 LILCO's planned help will, in fact, accept it. It
3 is a situation somewhat different from a state and
4 county entity in this case because LILCO's plan does
5 not thrust help on top of the state and county as
6 LILCO does intend to send bus drivers to the schools
7 in the county.

8 JUDGE GLEASON: I am not so sure it is
9 not part of the same argument, but let's not argue
10 that.

11 Mr. Bachmann?

12 Thank you for your comments.

13 MR. BACHMAN: The staff has
14 essentially the same statement made before. It is
15 far beyond the scope of the remand issue.

16 MR. MILLER: Judge Gleason, the fifth
17 issue, the Port Jefferson students, which is page
18 39, lines one through four, I am assuming there must
19 be some misunderstanding here and I will try to
20 clarify.

21 All this testimony states by the board
22 member from the Mt. Sinai School District is that
23 school district, which is within the EPZ, has a
24 number of students, approximately 500 or so, that
25 attend the Port Jefferson School District's high

1 school, which is also within the EPZ. Now, LILCO
2 moved to strike this on the basis that we were
3 trying to relitigate the EPZ boundaries. That just
4 makes no sense. Both districts are within the EPZ.
5 It is a mere factual statement by the witness, Mr.
6 Petrilak, that some students attend another school
7 district. But both districts are within the EPZ and
8 therefore those school children are at risk and must
9 be planned for.

10 JUDGE GLEASON: Mr. Zahnleuter?

11 MR. ZAHNLEUTER: Again, Mr. Miller's
12 argument makes sense and we support the County.

13 JUDGE GLEASON: Ms. Leugers?

14 MS. LEUGERS: Judge Gleason, I must
15 confess, at the time we moved to strike these four
16 lines of the testimony it wasn't clear to me that
17 the students they were talking about were being
18 transported to a school inside the EPZ. I thought
19 they were being transferred to a school outside the
20 EPZ.

21 JUDGE GLEASON: That is the way I
22 interpreted it myself.

23 MS. LEUGERS: With the understanding
24 they are students being transferred to another
25 school inside the EPZ, we have no problem leaving it

1 in. That situation is covered by LILCO's plan
2 anyhow, so it is taken care of.

3 JUDGE GLEASON: Do you have any problem
4 with that, Mr. Bachman?

5 MR. BACHMANN: To the extent the Port
6 Jefferson High School is actually inside the EPZ, we
7 have no objection--

8 JUDGE GLEASON: That is what Mr. Miller
9 said. I assume it is factual.

10 The board's ruling on that part of the
11 motion **pertaining to lines one through four, page
12 39, will be reversed and that testimony will be
13 introduced into the record.

14 MR. MILLER: Thank you.

15 The sixth item on our document we
16 prepared, I believe, again, this may be a point of
17 clarification by the board. That refers to, on page
18 28, lines five to seven, a reference to role
19 conflict that could be experienced by school
20 personnel, including bus drivers. In ruling on
21 other motions to strike made by LILCO, the board
22 denied motions to strike relating to statements by
23 our witnesses that there would likely be role
24 conflict among school personnel, including bus
25 drivers. This one, for some reason, was stricken

1 and I am assuming it was inadvertent by the board.

2 JUDGE GLEASON: I believe it was in
3 reference to just that part that refers to role
4 conflict affecting school personnel. That was
5 supposed to be stricken. Is that correct, Ms.
6 Leugers?

7 MS. LEUGERS: Just to the school
8 personnel and not the bus drivers.

9 JUDGE GLEASON: Does that clarify, Mr.
10 Miller? Even though I presume the ruling carried
11 the whole sentence out, it just was referring to the
12 reference to the school personnel.

13 MR. MILLER: I understand the board's
14 ruling. With that clarification, then, there is
15 really nothing to pursue on that one. You can't
16 really just put the bus drivers back in and make it
17 make any sense, so I will drop that. But I will
18 carry right into item seven because that does still
19 **recourse of the ruling regarding role conflict
20 issues applying to school personnel other than bus
21 drivers.

22 I think, Judge Gleason, the best way to
23 try to handle seven in a shorthand fashion is to say
24 I listed four items, A through D, which I would like
25 reconsideration on. These items all go to, in my

1 opinion, reasons provided by our school officials as
2 to why they would not implement LILCO's plan. Now,
3 there are other reasons, some of which were stricken
4 by the board. I am not going to reargue all those.
5 I will not argue anything not listed on the page.

6 The four particular reasons that
7 parents would want and would attempt to reunite with
8 their children: That there would be role conflict
9 among school personnel, in particular school
10 teachers; that LILCO's proposed reception centers
11 for school children are not available to those
12 school children under matters made clear by the
13 Nassau County Government; and for other reasons
14 reception centers pose problems for our school
15 officials; and no provision for monitoring or
16 decontaminating school children.

17 Those are four particular reasons
18 offered by the witnesses as to why they would not
19 implement LILCO's plan to evacuate school children.

20 It must be understood, I believe, that
21 what the witnesses are attempting to do in this
22 testimony is not in any way to relitigate issues
23 previously litigated before licensing boards on the
24 Shoreham proceeding. We are not trying to revisit
25 issues regarding accuracy of reception centers, to

1 revisit issues as to whether or not teachers will
2 experience role conflict. What we are stating is
3 the opinion of school administrators within the EPZ
4 that there are particular reasons why LILCO's plan
5 would not work.

6 I think, viewed in that light, it is
7 not fair to cast attempting to relitigate or res
8 judicata as LILCO is attempting to say. It is more
9 fair to say the opinions are being offered by our
10 witnesses to support their expert opinion and back
11 up the factual conclusions they have reached that
12 LILCO's plan for evacuating school children could
13 not be implemented.

14 JUDGE GLEASON: Fundamentally, you are
15 saying you are not trying to litigate the reasons
16 but you are simply citing the reasons or the
17 witnesses are citing the reasons why they won't
18 implement LILCO's plan.

19 MR. MILLER: That is exactly right.
20 Just to clarify--

21 JUDGE GLEASON: I don't think we
22 mentioned res judicata.

23 MR. MILLER: No. Your order striking
24 these passages was based upon them being outside the
25 scope. LILCO's motion mentioned res judicata.

1 To clarify, because, again, I am afraid
2 the job I did on this piece of paper is not as
3 thorough as it could have been, perhaps I should
4 give to you the particular lines referenced as well
5 as pages for some of these matters.

6 JUDGE GLEASON: All right.

7 MR. MILLER: 7-A, the parents' desires
8 to reunite with their children, page 28, lines 10
9 through 12. Page 54, line 18 through page 55, line
10 2. And page 64, line 19 through page 65, line 2.

11 7-B, likelihood of role conflict
12 amongst school teachers would be those passages
13 stricken at page 52, line 15 through page 53, line
14 4. And page 54, lines 3 through 4. LILCO's
15 proposed reception centers for school children,
16 passages were stricken at page 53, lines 5 through
17 20, page 55, lines 3 through 8, page 56, and
18 attachments 13 and 14.

19 JUDGE GLEASON: Excuse me. 13 and 14?

20 MR. MILLER: Attachment 13 and 14.

21 JUDGE GLEASON: 55, lines 3 through 8
22 and then--

23 MR. MILLER: Attachments 13 and
24 14--sorry. And page 56.

25 JUDGE GLEASON: All of page 56?

1 MR. MILLER: Yes, sir, essentially.

2 Item D, provision for monitoring
3 decontaminating school children, is page 54, lines 8
4 through 17.

5 JUDGE GLEASON: You have one to
6 go--wait. Mr. Zahnleuter?

7 MR. ZAHNLEUTER: Given the
8 qualification that this is the rationale of the
9 witnesses' testimony and consistent with what the
10 Government has argued already here today, the State
11 supports the motion.

12 JUDGE GLEASON: Ms. Leugers?

13 MS. LEUGERS: I have several comments
14 on what Mr. Miller has said. First, 7-A, which is
15 parents' desire to unite with children has already
16 been litigated and found in LILCO's favor that it
17 would not be a problem. Likelihood of role conflict
18 among teachers also was found in LILCO's favor not
19 to be a problem. Reception centers has been
20 litigated and specifically excluded from this
21 hearing because this is a narrow remand issue we are
22 hearing strictly going to the procedure to use
23 school bus drivers, LERO school bus drivers to
24 evaluate. Monitoring and decontamination of school
25 children is a reception center issue, something that

1 happens after you pick up the children and go
2 through--what you have to go through to evacuate the
3 children.

4 Mr. Miller says even though they are
5 not trying to relitigate the issue, they do bring
6 them all up. I think of prime importance is the
7 first two, reuniting with children and role conflict
8 of school teachers. What Suffolk County wants the
9 board to do here is to allow their witnesses to come
10 forward and argue based upon these facts that they
11 claim are facts, which this board has found are not
12 to be assumed as facts and has found contrary that
13 we are not to assume that these types of situations
14 exist. In essence, Mr. Miller would like his
15 witnesses to get up here and testify about facts
16 that we have already litigated and found do not
17 exist. Therefore, they should not be allowed to use
18 that as a basis for evaluating LILCO's plan. It is
19 a faulty basis and not reliable as such.

20 JUDGE GLEASON: Because why?

21 MS. LEUGERS: Because they are relying
22 on facts, specifically, saying that reunite--parents
23 wanting to reunite with their children, and that
24 there will be role conflict of school teachers, they
25 are arguing that those are facts to be contended

1 with when this board has already decided these are
2 not problems, we don't have to be concerned about
3 this.

4 JUDGE GLEASON: That is your res
5 judicata argument.

6 MS. LEUGERS: That is because it
7 already has been litigated. Mr. Miller is claiming
8 that they are not trying to relitigate it. I am
9 saying what they are trying to do is sneak it in the
10 back door by saying we are not litigating it but we
11 are going to assume facts contrary to what this
12 board has found, and that is improper.

13 JUDGE GLEASON: Mr. Bachmann?

14 MR. BACHMANN: Whatever assertion
15 counsel for intervenors may make as to the use of
16 this particular testimony, once it has been
17 accepted, if it becomes unstricken and is accepted
18 in, it then becomes part of the record, which is
19 cluttered up enough, I think, at this point. These
20 things are definitely beyond the scope of the narrow
21 remand issue and simply should not be on the record.

22 JUDGE GLEASON: One to go, Mr. Miller.

23 MR. MILLER: I would like to say in
24 very, very brief response that I have full
25 confidence in this board's ability to make judgments

1 about reasons offered by witnesses and I would rely
2 on the board to do so. I think these matters that
3 we just argued, if anything, go to the weight of the
4 evidence to be attributed by the board. And I think
5 the board can make those judgments.

6 On the last item, Judge Gleason, the
7 conclusion which essentially was stricken in its
8 entirety, pages 78 and 79. My reading of the
9 board's May 9th ruling is that this testimony was
10 stricken because it was considered irrelevant and
11 outside the scope of the issue before the board and
12 also because it appeared to be unacceptable hearsay.
13 I don't understand how the testimony could be
14 outside the scope of the issues or irrelevant,
15 because essentially what the question asked and what
16 the witnesses testified to concerns their
17 understanding of what other EPZ school district's
18 have said and indicated what action they would take
19 in response to LILCO's proposal to evacuate school
20 children.

21 It must be recognized by the board that
22 they will be seeing next week eight very high-level
23 school official witnesses on behalf of Suffolk
24 County. Superintendents, directors of
25 transportation, school board members. Those people

1 routinely meet with one another, they talk with one
2 another, they discuss matters with one another,
3 including LILCO's plan for evacuating the school
4 children. We could have brought in, Judge Gleason,
5 26 witnesses covering all the districts and all the
6 boards of education and all the school
7 superintendents. That is something we could have
8 done, I think. But we recognize there is a limit to
9 the number of witnesses to throw before the board.
10 We chose those witnesses that we believe would be
11 representatives of not only their school districts
12 but also other districts and state the views of
13 other districts within the EPZ.

14 I do not believe that is unacceptable
15 hearsay. Surely through board questioning and
16 cross-examination the parties can determine the
17 weight to be attributed to the testimony. So I
18 believe that testimony should come in, including the
19 references to the resolutions of other school
20 districts, resolutions which are in the evidentiary
21 record and make clear that the EPZ school districts
22 do not support LILCO's plan, much less its plan for
23 evacuating the school children within the EPZ.

24 MR. ZAHNLEUTER: For the reasons
25 stated, the State agrees with the County.

1 JUDGE GLEASON: Ms. Leugers?

2 MS. LEUGERS: Judge Gleason, as I am
3 reviewing the conclusion that runs two pages, it is
4 really a mishmash of all different types of issues
5 the board has excluded for a variety of reasons. It
6 is hard to respond to them as one. For example, it
7 talks not only about what other school districts
8 will do, it talks about early dismissal, talks about
9 the bus driver statements, it talks about role
10 conflict of teachers. There is a whole lot of
11 different issues here that we have already
12 discussed.

13 As to the issues Mr. Miller has raised
14 already, first he argues I believe that the school
15 district representative should be allowed to talk
16 about what they think the other school districts
17 would do. It is clear from looking at these two
18 pages that they are talking about what they think
19 they would do because they just have a general
20 feeling about what they would do. It doesn't say
21 they have sat down and talked to everyone, asked
22 their opinions of LILCO school bus driver procedure
23 specifically. Again, this is a narrow issue going
24 to the adequacy of LILCO school bus driver
25 procedure, not whether you can evacuate schools and

1 not whether reception centers or any other issue you
2 wanted to pull in. It is a very specific issue
3 here.

4 Also, we asked not all the witnesses
5 but many of the witnesses in their depositions who
6 they represented and a couple of them--I can't
7 represent how many, but a couple said they represent
8 their school district. We also asked every single
9 one of them, I believe, if they had talked to any
10 other school district and asked them their opinion
11 of LILCO's procedure and all of them, as far I
12 remember at this point, all of them said no.

13 Also, we repeatedly tried through
14 discovery to get some information about the other
15 school districts through Suffolk County, and Suffolk
16 County has repeatedly said these are separate
17 political entities and we have no control over them.
18 Even when we tried to get information through their
19 own witnesses that made those same claims. Now it
20 is hard to understand how they are coming forward
21 and saying they speak for all of them when earlier
22 they couldn't even get any information from them.

23 Again, the resolutions go to just broad
24 statements that they will not work with LILCO. They
25 do not focus on the school bus driver procedure that

1 we are here litigating. Not only does it go to my
2 argument earlier about challenging the rule, but not
3 specific to the issue in this remand. For those
4 reasons I think these two pages should remain
5 stricken.

6 JUDGE GLEASON: Mr. Bachmann?

7 MR. BACHMANN: The staff agrees with
8 the board's characterization of the testimony in the
9 May 12, 1988 order where the board stated that the
10 testimony was irrelevant evidence, unacceptable
11 hearsay and outside the scope of the issue and the
12 staff agrees with that characterization.

13 MR. MILLER: Judge Gleason, a point of
14 clarification. I think it may be obvious but just
15 to make sure, the depositions of these school
16 witnesses took place last January and early
17 February, and I think it is rather obvious that
18 school officials that were deposed at that time
19 certainly could have talked with other school
20 officials from other school districts since that
21 time. Again, I think it goes to the weight to be
22 offered the testimony. The board and, of course,
23 LILCO can make inquiry of these witnesses as to
24 discussions they have had and what has been said to
25 them. The board can attribute the weight they think

1 is appropriate to the testimony.

2 JUDGE GLEASON: Gentlemen, thank you--

3 MR. CHRISTMAN: I have a letter for you

4 on EBS.

5 JUDGE GLEASON: You can pass that out

6 to us.

7 That will conclude the session for

8 today. We will recess until tomorrow morning at

9 nine o'clock.

10 (Time noted: 5:30 p.m.)

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CERTIFICATE

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This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name: LONG ISLAND LIGHTING COMPANY
(Shoreham Nuclear Power Station, Unit 1)

Docket Number: 50-322-OL-3

Place: Hauppauge, New York

Date: May 16, 1988

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken stenographically by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

IS/ Debra Stevens

(Signature typed): Debra Stevens

Official Reporter

Heritage Reporting Corporation