

UNITED STATES NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:

DOCKET NO:

PUBLIC SERVICE COMPANY OF)	50-443-OL
)	50-444-OL
NEW HAMPSHIRE, et al.)	OFFSITE
)	EMERGENCY
(SEABROOK STATION, UNITS 1 AND 2))	PLANNING

EVIDENTIARY HEARING

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

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In the Matter of:)
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PUBLIC SERVICE COMPANY OF) Docket Nos.
NEW HAMPSHIRE, et al.,) 50-443-OL
) 50-444-OL
) OFF-SITE EMERGENCY
(SEABROOK STATION, UNITS 1 AND 2)) PLANNING
)
EVIDENTIARY HEARING

Tuesday
February 9, 1988

Bankruptcy Courtroom 2
Thomas P. O'Neill Federal Bldg.
2 Causeway Street
Boston, Massachusetts

The above-entitled matter came on for hearing,
pursuant to notice, at 9:00 a.m.

BEFORE: JUDGE IVAN W. SMITH, CHAIRMAN
JUDGE JERRY HARBOUR, MEMBER
JUDGE SUSTAVE A. LINENBERGER, JR., MEMBER
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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JUDGE SMITH: Good morning. Mr. Backus, yesterday afternoon some of the parties asked that we revisit the timing of the discussion of the schedule, referring to postponing it until the end of the testimony. But we weren't sure what-- we didn't exactly recall exactly what problems that caused for you in the trial life.

Is there any preliminary business before we begin?

MR. BACKUS: Yes, Your Honor. Your Honor, yesterday after the witnesses had taken the stand, the Commonwealth made a motion to this Board and made some representation to this Board, in particular, page 9157, which stated, "When the rebuttal testimony was received in our office, that was the first time the Massachusetts Attorney General's office was given any indication or notice that there would be expert testimony filed by Dr. Spencer or that expert testimony would be filed by Dr. Mileti covering this particular topic, the critique of these two surveys.

This was after a preliminary describing the testimony's critique of the surveys. And I do not want to reopen an argument here.

I do want to note for the Record that, on page 9031 on January 14, I stated to the Board in open hearing and during a discussion with Mr. Traficante and it's perhaps Mr. Fierce's problem was he was not there for that session. I just don't

1 know if he was or not.

2 I stated, "Your Honor, we may -- I am not sure yet --
3 we may have some rebuttal directed at aspects really mostly at
4 human behavior. As you know, we packaged our ETE and human
5 behavior together so it might not characterize it. But what it
6 will address certain aspects of human behavior by Dr. Mileti.
7 You can file it."

8 "And the other point we may do is file a piece of
9 rebuttal involving surveys. And that would be a piece directed
10 at survey techniques and so forth, and so on."

11 Now I didn't get into that yesterday simply because I
12 didn't have a transcript with me, but I had a fairly clear
13 recollection that I did my best in open hearing to warn people
14 as to what was coming.

15 I don't want to reopen the argument, but there was a
16 statement made yesterday, let us say, that I just think ought
17 to be put back into context. Thank you.

18 MR. FIERCE: Your Honor, I would just respond that I
19 was not at the hearings on January 14. I was working on other
20 issues in rebuttal testimony, in fact. And I was not apprised
21 of this announcement by Mr. Dignan.

22 And to that extent I would stand corrected. But I
23 would add that that form of notification does not arise to the
24 level that is required by Rule 2.740(e), and --

25 JUDGE SMITH: Well, I don't know if you want to be

1 held to that standard.

2 MR. FIERCE: I do.

3 JUDGE SMITH: I, well, you have not acted as though
4 you do.

5 MR. FIERCE: You have to keep in mind --

6 JUDGE SMITH: You're dwelling on the discovery bit,
7 right? The hearing has superseded a discovery. We are telling
8 the parties now that when they form the intention to put on any
9 witness of any sort at any time, to bring it to the attention
10 of the other parties as soon as it is practical to do so.

11 MR. FIERCE: And I agree with that 100 percent. I
12 would just add that, at least we would have the same
13 information that is required by the rule, which is the name of
14 the expert witness, the subject matter of his testimony and a
15 statement of its substance.

16 And this sort of announcing that maybe we will have a
17 witness who might talk about this, doesn't rise to that level.

18 JUDGE SMITH: What did you do with your testimony?

19 MR. FIERCE: I announced yesterday what I did with my
20 three pieces.

21 JUDGE SMITH: Well, just do me a favor will you and
22 tell me again? You know, indulge me.

23 MR. FIERCE: There are three pieces of rebuttal
24 testimony. One of them is from Thomas Adler. That witness,
25 with respect to that witness, as you all know, I made a motion

1 early on in these proceedings for leave to file rebuttal
2 testimony by him rebutting aspects of the testimony of Edward
3 Lieberman. So I can't believe that anybody would failed to
4 have notice that I would be filing that piece.

5 The second piece is a very short piece by Tom Moughan
6 which counts unobservable -- parking spaces unobservable from
7 the air, which we also made no secret that we would be
8 submitting. In fact, Beverly Hollingworth submitted testimony
9 to that effect with respect to the New Hampshire portion of the
10 EPZ.

11 And I would also submit that the Tom Moughan
12 testimony is not expert testimony. That is just a
13 straightforward count.

14 Well, the third piece I ---

15 JUDGE SMITH: Is there a distinction of that in the
16 Board's order? When did you announce your intention to present
17 the testimony of Thomas Moughan?

18 MR. FIERCE: When we -- specifically of Thomas
19 Moughan, I would have to say, when we filed it.

20 JUDGE SMITH: Now you're pushing the Board.

21 MR. FIERCE: I don't mean to be pushing the Board.

22 JUDGE SMITH: No. You're moving the Board, let's put
23 it this way, which is your right to do, to apply a very tight
24 standard, and I just want to know if you want to live with the
25 standard? Because you have a right to push it.

1 If you feel that you are being abused in this
2 proceeding because we have had what I regard as relatively
3 liberal standards, taking representations of the parties.

4 If you feel that you are being prejudiced by that,
5 then let's look at it. And we will put tight standards -- I
6 know how to put tight standards on a case.

7 MR. FIERCE: Your Honor --

8 JUDGE SMITH: If you want to live with it, we will.
9 At least we'll consider it.

10 MR. FIERCE: I am not the one --

11 JUDGE SMITH: Are you happy with the situation that
12 exists now or not? What do you want?

13 MR. FIERCE: I would like to have the name of the
14 expert witness identified in advance, giving the parties an
15 opportunity, if they so choose, to conduct some discovery,
16 either formal or informal, as the circumstances might require,
17 and to identify the subject matter.

18 JUDGE SMITH: Well, I think that's reasonable.

19 MR. FIERCE: That's all I'm asking for. And I do
20 think that the parties -- all of the parties, have had a
21 practice here of sort of sliding around that. They don't
22 really like that rule, but I think that's a rule that we should
23 have.

24 JUDGE SMITH: My impression is that the parties in
25 general have been rather responsible in informing the Board in

1 advance of their intentions in the litigation, the witnesses
2 that they hope to call, and the intentions -- Mr. Backus told
3 us yesterday he intends to rely upon older proposed findings,
4 and I think that I will leave it to the parties' professional
5 responsibility to do it when they feel that that it is required
6 to do his work well.

7 I will ask you to make a specific motion, if you are
8 unhappy with the way we've been tolerating the conduct of the
9 parties in that respect.

10 MR. FIERCE: Well, I'm going to let it go for now,
11 Your Honor. I'm not going to make that motion for now.

12 JUDGE SMITH: I'm happy with the way we've been
13 running the case. I'm happy with the conduct of the parties,
14 and we'll continue exactly as we have been absent a specific
15 motion.

16 Would the witnesses take the stand please?

17 WHEREUPON

18 DENNIS MILETI AND BRUCE SPENCER
19 having been previously been sworn, resume the stand.

20 JUDGE SMITH: Okay, Mr. Fierce?

21 MR. FIERCE: I'm going to be at point XI on the
22 outline this morning, Your Honor.

23 CROSS EXAMINATION - RESUMEL

24 BY MR. FIERCE:

25 Q Good morning, Dr. Mileti, Dr. Spencer.

1 A (Mileti) Good morning.

2 Q Doctors, do you have with you copies of the surveys,
3 the Cole survey and the Luloff survey? Because I'll be asking
4 you some questions about those surveys this morning.

5 A (Spencer) We have a copy we can share.

6 Q Okay.

7 Dr. Mileti, a number of the questions on the Cole
8 survey, the Social Data Analysts' survey, are not behavioral
9 intentions questions, are they not?

10 A (Mileti) Some of them are and some of them aren't.

11 Q Question 29 in the Cole survey is not a behavioral
12 intentions question, is it?

13 A (Mileti) That question reads, "Counting yourself, how
14 many people in your household will be evacuating?"

15 Q Yes.

16 A (Mileti) There's a sense in which I can see how
17 someone might not think that is a behavioral intentions
18 question.

19 Q What's that sense?

20 A (Mileti) In a sense in which I would think that one
21 could see it as a behavioral intentions question.

22 In the former sense, if somebody were using that
23 question to make a judgment about how many people lived in the
24 household on the presumption that all those people would be
25 there during the emergency and then evacuating from the

1 household during the emergency.

2 But in the general sense, I think it's likely a
3 behavioral intentions question.

4 Q Is it more like one than not?

5 A (Mileti) I would think so.

6 Q Doesn't that really fall into the category that you
7 described yesterday like the "when you would be leaving your
8 business and how long it takes you to lock up?"

9 A (Mileti) It has a dual sense to it, yes, and if one
10 presumes that the people who would be evacuating from the
11 household would be the people who lived in the household, then
12 I think it has a sense of not being a behavioral --

13 Q Well, how do you see it?

14 A (Mileti) I think what people are saying, how many
15 people are going to be evacuating in a yet-unexperienced
16 emergency, if you wanted to know how many people were living in
17 the household, I think a better question would have been, how
18 many people live in your household.

19 But this question makes some presumptions and that is
20 about how many people might be there in the household when the
21 emergency occurs. Some people may be at vacations. Some
22 people may be somewhere else. And to that degree it has an
23 element of the behavioral intentions question.

24 Q How about Question 30 right below that? Is that a
25 behavioral intentions question?

1 A (Mileti) Yes, to a certain degree, I think it is.
2 It's asking people how many vehicles they think they might use
3 in some future emergency to use for the process of evacuating.

4 Q How about Questions 340 and 341?

5 JUDGE SMITH: Well before you go into the other
6 questions, how could that question be rephrased to simply
7 extract the information as to the likely number of vehicles
8 that would be used in a radiological emergency in order to
9 evacuate? What deficiency does that question have?

10 THE WITNESS: (Mileti) I don't think one could use a
11 poll in this way to find out how many cars people would take.

12 JUDGE SMITH: You could use it in my house. I can
13 tell you right now: both of them.

14 THE WITNESS: (Mileti) And that would be your
15 intention about how many you might take.

16 JUDGE SMITH: No, it's a count: one, two. The Chevy
17 and the Colt.

18 THE WITNESS: (Mileti) Well, we know from looking at
19 how people evacuate that people tend to like to evacuate as
20 groups, and that there's also a strong sense, therefore, that
21 one might conclude that people might prefer driving out with
22 their wife and child next to them as opposed to having them in
23 a separate car.

24 And that's why the literal taking of how many cars
25 people own and transferring how many that might mean on the

1 road, there might be some question with.

2 It's a hypothesis that we could make. There is also
3 some data to suggest that in some evacuations people define
4 cars as valuable property and evacuate the car to save the car,
5 and then reunite after they're outside the zone of danger. So
6 there's a multitude of --

7 JUDGE SMITH: Can you give me an example, give an
8 example of a question which probes the likely conduct of people
9 in a radiological emergency evacuation that does not probe
10 their behavioral intentions? You gave the example of the
11 business, I think, "How long does it take you to leave work",
12 or that type of thing. Can you give any other examples?

13 THE WITNESS: (Mileti) Sure. If we were asking
14 people about things that I would call social facts, that is,
15 how many cars do you own, and then use that to define how many
16 cars there are in the EP2, and then use that to base a judgment
17 of how many might be on the road, or to ask people how long
18 does it take you to pack a suitcase, because people have
19 experience with that; and then make the inference that it
20 probably would -- that would characterize how long it might
21 take them to pack a suitcase, to ask them how many, if one
22 wanted to know this, how many people are living in your family,
23 how do you perceive the emergency brochure? There is a raft of
24 questions going to that.

25 JUDGE SMITH: Do you think that a question concerning

1 a number of cars a family might use in an evacuation being a
2 behavioral intention question as you see it, do you think that
3 the number of cars that they might mention on a survey would
4 markedly differ from the number of cars they would actually
5 use?

6 THE WITNESS: (Mileti) I think the number of cars
7 people would report in answering a question such as this would
8 tend to see more cars on the road if one took it literally than
9 might actually occur, that one could use this perhaps to define
10 an outer bound, it might be a good outer bound for planning
11 purposes, but I don't think that we should take it literally.

12 JUDGE SMITH: Mr. Fierce?

13 BY MR. FIERCE:

14 Q If planners were to assume that not all the cars that
15 people own would be on the road during an evacuation, how
16 should they go about gathering information about how many cars
17 to expect on the road, particularly as they are looking at what
18 number to plug into a computer model?

19 A (Mileti) There're probably many different ways that
20 one could go about gaining information that could be useful in
21 planning. This morning, what comes to my mind, would be to
22 devise a way to find out how many cars people own in an area
23 that might be asked to evacuate.

24 And I imagine there's any number of ways that that
25 could occur. One could be to ask people how many cars they

1 own. One could be to ask people how many cars they intend to
2 use in an evacuation. I would tend to think that would
3 overestimate the number of cars on the road.

4 One could also, I presume, use indirect methods, for
5 example, finding out through Motor Vehicles if there's a way to
6 do that, how many cars there are or people on the road in the
7 emergency planning zone, so there are a multitude of different
8 ways.

9 Q Do you know what method KLD Associates used in
10 assessing, estimating, how many cars they expected to be on the
11 road among the permanent population of the EB2?

12 A (Mileti) I can't say I remember this morning from
13 your questions. It sounds like it might have been a behavioral
14 intentions poll. I don't know.

15 Q Let me ask you about Question 340, and I've got
16 people over here who're asking me to read the question. So I
17 will, which is, "Is there anyone in your family who is
18 bedridden, handicapped, or who needs special evacuation
19 assistance?" Is that a behavioral intentions question?

20 A (Mileti) It's much less one than any of the others, I
21 think, that we've been talking about, because it's asking
22 people is anyone in your home bedridden; is anyone in your home
23 handicapped? And as a consequence, will they need special
24 evacuation assistance?

25 To the degree that people who might be bedridden the

1 day this question was asked might not be bedridden the day of
2 the emergency, and to the degree that different people would
3 define special evacuation assistance perhaps in different ways
4 when the question was read, and to the degree that what someone
5 anticipates as needing special evacuation assistance, might not
6 in fact, be necessary in the emergency. For example, if
7 someone lived alone and they were in a wheelchair, they may say
8 "Yes, I would imagine that I need special evacuation assistance
9 in a future emergency."

10 However, when that emergency occurs, a neighbor might
11 come and help evacuate them, in which case they don't need
12 special evacuation assistance.

13 So I would say that answers to this question might
14 tend to overestimate the number of people who, in fact, would
15 require special evacuation in an emergency.

16 But I don't have the sense that this is the same kind
17 of behavioral intentions question that I've objected to in the
18 ones that are more, go more to what people think they might do
19 in the future.

20 Q Have you assessed the similar question that was asked
21 by the State of New Hampshire in the poll they took, a mail-in
22 poll that they took of residents of the EPZ?

23 A (Mileti) No, I have not.

24 Q Well, how about Question 341, which reads, "How many
25 people in your household would need public transportation

1 assistance in order to evacuate?" Is that a behavioral
2 intentions question?

3 A (Mileti) No, not really. But it's characterized by
4 the same kinds of things I was talking about in reference to
5 Question 340; that is, somebody might answer this and say "Yes,
6 there are two of us in this house who would need transportation
7 in order to evacuate, because we don't own any vehicles," for
8 example. There could be other reasons.

9 But that in an actual emergency they may be offered a
10 ride by a neighbor, and in fact they wouldn't need
11 transportation. But again I wouldn't characterize this as much
12 as a behavioral intentions question as the other kind we were
13 talking about earlier.

14 Q Well, you know, I'm having difficulty with the
15 general tenor of your answers. Of course, it's too late to
16 take a poll right after the emergency begins, and when they
17 would know if a neighbor might give them a ride or not, so it
18 requires the best prediction that they can have. The best
19 prediction on the number of cars that they might use and
20 whatever.

21 Is it your testimony that predictive-type polls do
22 not have value in general?

23 A (Mileti) Some predictive-type polls and questions
24 have more value than others. If one were seeking to define an
25 outer limit of the number of people who might need

1 transportation assistance in order to evacuate, this could give
2 a reasonable estimate to that.

3 However, if we look at actual emergencies, where
4 actual numbers of people -- many people, have been evacuated,
5 we find that people tend to get rides from people they know.

6 And I would suspect that, in reference to this
7 question, for example, if we ended up saying that thousands of
8 people, or even hundreds of people need special transportation
9 assistance in an evacuation in the future, we would be
10 overplanning the number of people who actually would need that
11 sort of transportation, because many of them would end up
12 getting rides from people they know.

13 Q Doesn't that go into interpretation, rather than the
14 internal validity of the polls?

15 A (Mileti) I think it goes into how one would interpret
16 the answers to this question and translate it into planning
17 perhaps.

18 Q Dr. Mileti, you're not seriously suggesting that we
19 should gamble with respect to the number of buses that would be
20 available during an emergency to pick up people who are
21 bedridden, handicapped, or who needed special evacuation
22 assistance, are you?

23 JUDGE SMITH: Mr. Fierce, I think that you have, I
24 think, a valid line of cross-examination here, which I somewhat
25 adopted myself, because I think it's a good point, but I think

1 you're slipping off into a digression now, not warranted by the
2 direct testimony or any other event.

3 MR. FIERCE: I think it might be warranted by the
4 deposition that I took, Your Honor.

5 JUDGE SMITH: Well, I'm sure that you've taken
6 depositions that would generate a lot of interesting questions,
7 but point to the direct testimony, where that question might be
8 directed.

9 MR. FIERCE: Well, it is only responding to what he's
10 just said.

11 JUDGE SMITH: What happened was, you saw an
12 opportunity, a fortuitous opportunity on cross-examination and
13 decided to go off on it, and I am saying no. Stick to your
14 line of cross-examination.

15 MR. FIERCE: Can I ask one question?

16 JUDGE SMITH: On your cross-examination plan -- if
17 you want to represent to the Board that there are circumstances
18 under which you wish to be excused --

19 MR. FIERCE: There are.

20 JUDGE SMITH: -- from the standards, well, that's
21 one thing. But now I want you to follow the cross-examination
22 plan, which I think is a good point worthy of pursuit.

23 You just got lucky. You just got lucky and you want
24 to pursue it on cross-examination, and we don't want you to.

25 Well, we're also not happy with the pejorative tenor

1 of the question to Dr. Mileti.

2 BY MR. FIERCE:

3 Q Question 350, Dr. Mileti. Dr. Mileti, Question 350?

4 A (Mileti) Yes, I see it.

5 Q "At what time does the male head of household leave
6 his place of employment to return home for the evening?" Is
7 that a behavioral intentions question?

8 A (Mileti) No. That's asking what time the male head
9 of household typically leaves work.

10 Q And 355, "At what time does the female return?" You
11 would give the same response?

12 A (Mileti) Yes. And in general, people might have a
13 good idea about that.

14 Q In the survey conducted by Luloff Asc., Question
15 Number 1, do you have that survey in --

16 A (Mileti) I will in a minute. I have Form A for the
17 New Hampshire EPZ in front of me.

18 Q Let's use that one. Question Number 1: "First how
19 much have you heard about the Seabrook Nuclear Power Plant?"
20 Is that a behavioral intentions question?

21 A (Mileti) No, it's asking people how much they've
22 heard.

23 Q Number 2: "Counting yourself, how many people are
24 with you today?" Is that a behavioral intentions question?

25 A (Mileti) No. It's asking people to tell how many

1 people are with them.

2 Q "How did your party get to the beach today?" Giving
3 various options to select, is that a behavioral intentions
4 question?

5 A (Mileti) No. Again, that's asking about past
6 behavior.

7 Q "Where did you park?" Is that a behavioral
8 intentions question?

9 A (Mileti) No, it's not a behavioral intentions
10 question.

11 Q "About how long did it take to get from where you
12 parked your car to the beach?" How about that question?

13 A (Mileti) No. Again, that's asking about how long it
14 took them to walk, an actual past behavior.

15 Q Question No.4, "Are you here just for the day or are
16 you renting a cottage, camping, staying with friends or
17 relatives, or staying at a motel for the night?" Is that a
18 behavioral intentions question?

19 A (Mileti) No, in general it's not.

20 Q Question 5: "What town, state or Province do you
21 live."

22 A (Mileti) No, that's not a behavioral intentions
23 question.

24 Q "About how many days per year do you spend at New
25 Hampshire's seacoast beaches?"

1 JUDGE SMITH: Okay, will you stipulate that there are
2 a substantial number of non-behavioral questions?

3 MR. DIGNAN: Yes.

4 JUDGE SMITH: Okay.

5 BY MR. FIERCE:

6 Q With respect to the first six questions we've just
7 gone through on the Luloff survey, Form A, do you notice any
8 internal validity problems with those questions?

9 A (Mileti) If I did I would have discussed it in my
10 prefile rebuttal testimony, and since an answer to that
11 question needs to be well-thought through, I just want to check
12 that testimony.

13 JUDGE SMITH: Are we waiting for something?

14 MR. FIERCE: I'm waiting for Dr. Mileti to look
15 through his testimony and provide us with an answer.

16 THE WITNESS: (Mileti) Thank you for letting me do
17 that. Beginning on page 18 of my prefile testimony, "problems
18 regarding internal validity" in reference to what I called the
19 "factual data" on the survey, in reference to questions 2, 3-A,
20 3-B, 3-C, and 3-D.

21 BY MR. FIERCE:

22 Q I'm going to go to another topic with both Dr.
23 Spencer and Dr. Mileti at this point, and starting with Dr.
24 Spencer, I ask you whether the standards you're familiar with
25 as standards for telephone survey research in the Applied

1 Survey Research industry?

2 A (Spencer) The standard? Yes, to a certain extent.
3 The standards vary widely according to the purpose of the
4 survey.

5 Q And how are you familiar with these standards?

6 A (Spencer) I have worked with government surveys for
7 I'd say about the last five or six years. I provide advice to
8 the General Accounting Office; the National Academy of
9 Sciences; and similar agencies.

10 Q Have you ever worked with those who do surveys for
11 the industry, for example, New York Times polls, Roper,
12 Yankelovich, Boston Globe; I know the Chicago Tribune does
13 them?

14 A (Spencer) Yes, I've worked with those groups. Not
15 with media polls. I've done some consulting for Ray C.
16 Nielson, and for some companies that look at employee benefits.

17 Q Are you familiar with how surveys by those media
18 pollsters are done?

19 A (Spencer) In a general sense.

20 Q Do you know -

21 A (Spencer) I should add that I also work at National
22 Opinion Research Center. I direct their methodology research
23 center, and we also do some opinion surveys.

24 Q Well, in the industry, are you aware of what the
25 standards are for a typical sample size?

1 A (Spencer) Again, I believe that it varies according
2 to the purpose and the use of the data.

3 Q And what does it vary from? Is there a range within
4 which it does vary, depending on the purpose?

5 A (Spencer) What usually drives the size of the sample
6 is when you want to look at certain small subgroups of the
7 population, and you're just taking a broad brush sample. If a
8 subgroup comprises a small percentage of the whole population,
9 you will need a relatively larger sample to get enough of that
10 subgroup so that you have reliable estimates.

11 Q But I am still looking for a quantitative answer of
12 some sort from you on that question.

13 A (Spencer) Would you repeat the question, then?

14 Q Well, I understand you say there is a range depending
15 on purpose, but do you quantitatively what that range is within
16 which these industry polls are done?

17 MR. LEWALD: I'm going to object to that. I am a
18 little concerned that the use of the word, "industry," that Mr.
19 Fierce is using, undefined, is the same industry that the
20 witness is?

21 JUDGE SMITH: I think that's a good point. You were
22 talking there for a while about media polls, and it's not clear
23 to me whether you left that, and he doesn't seem to have any
24 knowledge on it. Would you define "industry" as you're talking
25 about it?

1 MR. FIERCE: Well, as opposed to government/academic
2 work, and I gave the examples of industry polls being the New
3 York Times, the Yankelovich, Roper, Boston Globe.

4 JUDGE SMITH: He called those "media polls," and he
5 said he did not have the figures.

6 MR. FIERCE: He said he had knowledge in a general
7 sense. I'm now just probing to find out how specific that
8 knowledge is.

9 JUDGE SMITH: What is the relevance of media polls,
10 anyway, to this?

11 MR. FIERCE: Industry polls is what we have here.

12 JUDGE SMITH: All right, but the examples you've
13 given are media polls.

14 MR. FIERCE: Yankelovich, Roper, those are members of
15 the industry. First Market Research would be another, and
16 Social Data Analysts falls within that category.

17 THE WITNESS: (Spencer) And you're asking do I know
18 what sizes the samples they use are?

19 BY MR. FIERCE:

20 Q Yes, what's the range?

21 A (Spencer) I don't know exactly. Would you like me to
22 speculate? I mean, we could check the record, but I don't know
23 what size samples they do.

24 Q No, I don't see any sense for you to speculate. How
25 about response rate for a typical industry poll? Do you have

1 any idea what the standard in the industry for an acceptable
2 response rate would be?

3 A (Spencer) No. Again, it depends on the purpose of
4 the survey. And I don't know what the typical standards are.
5 Usually what drives people to consider a response rate as
6 acceptable is cost. It costs more money to drive up response
7 rates, and to get better data.

8 Q How about the standard in the industry for sampling
9 error? Do you have any idea what the acceptable standards,
10 current standards, are in the industry for sampling error?

11 A (Spencer) Well, the sampling error varies with the
12 sample size. And in fact, that's how the sample size is
13 usually determined. You figure out what size sampling error
14 you can tolerate, and you work with some formulas and determine
15 what size sample you need to take.

16 Q ... asking now if you're familiar with what those
17 tolerances ... in the industry?

18 A (Spencer) It varies from survey to survey. I've
19 worked with industrial groups doing employee benefit surveys
20 and planning them, and we would start out with some levels of
21 precision and standard errors that we wanted, and then see what
22 it would cost; how big a sample would we need. And then we'd
23 modify them down when it looked too expensive; and it's an
24 iterative process; and it varies from survey to survey.

25 Q Are you familiar with the typical methodology for

1 generating the sample utilized in the industry?

2 JUDGE SMITH: Well, see, there's a thread to your
3 questions that I think should be resolved. And that is, each
4 question contains the premise that there is a typical -- that
5 there is an industry standard, and each time he has rejected
6 that premise.

7 Now, I think you're headed for the same problem
8 again. I think you ought to clean up your questions.

9 MR. FIERCE: I think I know what questions I'm
10 asking, Your Honor, and have a reason for doing that.

11 JUDGE SMITH: Sustained.

12 (continued on next page.)

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1 BY MR. FIERCE:

2 Q Dr. Spencer, when you were first contacted about
3 doing this work that resulted in this rebuttal testimony, who
4 contacted you?

5 A (Spencer) Karen Larson.

6 Q And did you know Karen Larson before that contact?

7 A (Spencer) No.

8 Q Do you know why she contacted you?

9 A (Spencer) Somebody gave her my name.

10 Q Do you know who that was?

11 A (Spencer) I don't remember the person's name.

12 Q It was someone you knew?

13 A (Spencer) No.

14 Q What did she say to you when she first contacted you?

15 A (Spencer) Something to the general effect that she
16 was working in connection with the Seabrook Powerplant and had
17 some surveys that she wanted me to look at, and would I be
18 willing to do that. I said, yes.

19 Q Did she more specifically define the task to you than
20 that?

21 A (Spencer) No.

22 Q And what happened next?

23 A (Spencer) I received some surveys in the mail. I
24 think it was Attachment 4 and Attachment 5 to the Luloff and
25 the Cole testimony. Maybe some -- probably some testimony.

1 also. And then I read through them, studied them, and drafted
2 a critique.

3 Q Did she send you the data tapes?

4 A (Spencer) Yes.

5 Q Did you look at those tapes and assess them?

6 A (Spencer) I had a graduate student do some analyses
7 that Dennis had requested. And first we ran some general
8 cross-tabs to make sure that we were reading the -- actually
9 they were magnetic disks -- but to make sure that we were
10 reading correctly. And having satisfied ourselves that that
11 was happening, Karen gave me some cross-tab specifications that
12 she wanted run at Dennis' request and we ran those and mailed
13 them to her.

14 Q How much time did you take on this assessment task
15 that you were asked to do?

16 A (Spencer) Oh, quite a bit of time. Let me think for
17 a second.

18 On the order of about a solid week, week and a half.

19 Q Was there any discussion with Karen Larson or anyone
20 else regarding how much time or what kind of an analysis you
21 should do with respect to these two surveys?

22 A (Spencer) Yes. I gave her an estimate at the
23 beginning of about how much time I thought it would take me to
24 critique them and write up my critiques.

25 Q Did you give them options on that estimate?

1 A (Spencer) No.

2 JUDGE LINENBERGER: Excuse me, Mr. Fierce, but I'd
3 like to ask Dr. Spencer for a bit of clarification to help me
4 here.

5 It seems to me that what I've heard you say is that,
6 as a result of this contact you discussed, you agreed to take
7 on an assessment of the surveys, but I haven't heard you say
8 anything that gives me a feeling that there was any kind of
9 mutual understanding about what your assessment was to
10 accomplish; what kinds of things were you to look at; and how
11 did you know what kinds of things you proposed to look at?

12 THE WITNESS: (Spencer) I told Karen Larson that I
13 would look at the surveys and I would critique them and I would
14 give it my best shot and call it as I saw it. And I wasn't
15 going to look for one side or the other, but I had to really
16 give it a professional unbiased assessment of the statistical
17 aspects of the surveys. I'm not an expert on questionnaires
18 and the design of questions, what Dennis Miletic has talked
19 about. And I have critiqued surveys before, and I think I knew
20 more than she did about what the statistical critique was.

21 JUDGE LINENBERGER: All right. So you were looking
22 for -- you were looking to undertake a statistical critique,
23 not a critique that might uncover bias and the orientation of
24 the questions or inadequacies in the process of implementing
25 the survey; is that correct?

1 THE WITNESS: (Spencer) Well, the presence of
2 implementing the survey has to do with statistical issues such
3 things as how much nonresponse to you have? And so I would, to
4 the extent that that was discussed in the evidence that was
5 given to me in the Attachments and the testimony, I would
6 comment on that.

7 But as far as the design of the questions, I have
8 some knowledge of that, but I don't call myself an expert in
9 that area. So to the extent that I noticed something that was
10 blatant, I would mention that.

11 JUDGE LINENBERGER: Thank you.

12 Sorry, Mr Fierce.

13 JUDGE SMITH: Who is Karen Larson?

14 Let the record show he's identified Karen Larson.

15 THE WITNESS: (Spencer) She's an employee or she's
16 working for New Hampshire Yankee.

17 BY MR. FIERCE:

18 Q Did at any time Karen Larson or anyone else explain
19 to you what the purposes of these two surveys -- purposes of
20 these two surveys were?

21 A (Spencer) No.

22 Q Given what you've just told me about the standards
23 that would be applied with respect to sample size, response
24 rate, sampling your -- the parameters that would vary depending
25 on the purpose of the survey, how could you then go about and

1 critique the survey?

2 A (Spencer) Well, I can answer that in several parts.
3 One part is that I used my imagination to think about the
4 purposes of the surveys. I'm aware that there are issues about
5 granting a license to Seabrook Powerplant and so I inferred
6 that these surveys were being used in connection with the
7 hearings. So I knew that there was some important decisions
8 riding on the results of these surveys. And that led me to
9 some conclusions about what kind of accuracy one would need in
10 the figures.

11 I good bit of my research has to do with the
12 importance of data quality for public decisions. So there's an
13 academic research interest that I carry in this.

14 And aside from that, given any -- whatever standard
15 of accuracy you choose there were certain flaws in the way the
16 surveys were designed and carried out, and one can discuss --
17 see those flaws and discuss them and criticize them under any
18 standard of accuracy that you would choose.

19 Q Your assumption was that because the surveys had to
20 do with a licensing of a nuclear powerplant that the accuracy
21 of these two surveys, the accuracy of the results needed to be
22 very high; isn't that true?

23 A (Spencer) Yes.

24 Q And you applied the highest standards that you know
25 of in critiquing these surveys; didn't you?

1 A (Spencer) Not the highest, but high.

2 Q Well, what would have been the highest standards that
3 you know of?

4 A (Spencer) Oh, the standards for the U.S. Census, the
5 decennial census.

6 Q Clearly this was not an effort to replicate a census
7 door-to-door information gathering process; correct?

8 A (Spencer) Correct.

9 Q So, something less precise in the outcome would be
10 understandable; isn't that correct?

11 A (Spencer) The standards -- something -- to answer
12 your question, something less precise than the census would be
13 appropriate for this survey; yes.

14 Q But in every other respect you applied the highest
15 standards that one would reasonably?

16 A (Spencer) I applied the kind of standards that I
17 applied to government surveys on which I work.

18 Q Now, I've seen government surveys and statistical
19 reports assessing government surveys, and typically had
20 difficulty reading those assessments because they're filled
21 with quantitative assessment, quantitative analysis, lots of
22 numbers and equations; and I don't see that in your testimony
23 here, can you tell me why that is?

24 A (Spencer) What's more important than the numbers is
25 typically the assumptions that go behind the numbers that you

1 don't see. And plus, I could have put lots of formulas and
2 numbers in this report, but I didn't assume that it was going
3 to be read by professional statisticians; whereas, the authors
4 of government statistical reports are writing more for their
5 peers.

6 And so I gave a very accurate critique, but I avoided
7 excessive use of numbers and formulas in developing the
8 critiques.

9 Q Did you run those numbers?

10 A (Spencer) Yes. And the numbers are reported in the
11 rebuttal.

12 Q The numbers that you ran are reported in the
13 rebuttal; is that correct?

14 A (Spencer) Correct.

15 Q Now, in your testimony regarding the Cole survey on
16 page three there is a long sentence that begins with the
17 paragraph under Point 1, "Analysis of External Validity," and
18 that sentence starts out this way: "The sample methodology
19 employed in the telephone survey conducted by Social Data
20 Analysts."

21 And then skipping down to the bottom line where the
22 sentence continues it says that that methodology cannot, quote,
23 "In our opinion ensure accurate descriptions and predictions
24 for the compilation that the survey purports to describe," end
25 quote.

1 This phrase, "Cannot ensure accurate descriptions,"
2 can you tell me what that means, Dr. Spencer?

3 A (Spencer) Yes. If a sample is designed
4 scientifically according to appropriate and proper use of
5 probability sampling, random sample, and the sample size is
6 large enough and the sample is carried out with small enough
7 levels of nonresponse, then the dominant component of error has
8 to do with the fact that you chose one probability sample
9 rather than another one that might have occurred.

10 And so you get error because you've chosen one sample
11 out of possible ones, had you chosen a different sample you
12 would have gotten a slightly different result.

13 And the amount of error that arises from choosing one
14 sample rather than another because you've introduced
15 randomization and you deliberately selected it
16 probabilistically, we can call this sampling error.

17 And statistical theory lets us calculate the amount
18 of sampling error that we'll get. And with this quantification
19 of the sampling error you know with high confidence how much
20 error there is in the results; and you know aside from a very
21 small chance what your error is bounded by. And if that bound
22 is small enough then you are essentially ensured accuracy.

23 And when I say that this -- the methodology as used
24 in this survey cannot ensure accuracy, I mean the conditions
25 that I've just described were not met and so you can't ensure

1 accuracy.

2 Q Just to be clear, you are not -- what you are not
3 saying then is that this poll is necessarily inaccurate?

4 A (Spencer) If I could show that it was necessarily
5 inaccurate, because there are -- we can distinguish between
6 random errors that arise from sampling, and what Dennis Milet
7 has referred to as biases or systematic errors, sampling errors
8 can be assessed from the data that you collect in the sampling.
9 It's one of the, actually, marvelous things about random
10 sampling.

11 But biases cannot be assessed just from looking at
12 the data that you have. You may get -- if you have
13 inconsistencies in the data that you collect, that's evidence
14 that there are problems. If the data that you collect in your
15 survey differs from statistics that you've determined
16 externally, perhaps, from administrative data in which you have
17 high confidence, then you have evidence that there -- these
18 systematic errors are biases in your survey.

19 So, if you have external standards or benchmarks
20 against which you can compare your results you can see whether
21 you're accurate or not. But I didn't know of benchmarks
22 against which to compare the results from this survey, so I
23 couldn't see that the survey duplicated results that we knew to
24 be true.

25 So I have no evidence that the survey is accurate.

1 And I know that there is the potential for large amounts of
2 systematic error, very large amounts of systematic error. And
3 so without knowing actually how big those systematic errors
4 are, I can't conclude that this is an accurate survey.

5 Q I'm just trying to make this understandable for those
6 of us who didn't even make it through college statistics.

7 A (Spencer) I'm trying to.

8 Q But if I understand you correctly, is what
9 you're -- are you saying then that you potentially have data
10 results here which are not accurate with respect to the
11 population being sampled, but without knowing how large the
12 systematic error is for the various points you have raised, you
13 cannot say how wide of the mark the results are?

14 A (Spencer) I can only discuss how wide of the mark
15 the results might be. I can calculate ranges within it, which
16 the actual truth, if you could -- and by truth -- maybe truth
17 is too strong a word here. The results that you would get if
18 you didn't have the systematic errors that you did, if you
19 could actually have included even the whole population in the
20 study and applied the questionnaire to the whole population.

21 I can calculate the ranges of possibilities for those
22 results. Now, where in the range this survey falls, I do not
23 know.

24 Q You've raised four points with respect to the
25 external validity of the Cole survey. The first point, which I

1 guess you are calling a, one of the systematic errors is that
2 some unknown proportion of the EPZ households were excluded
3 because a certain number of telephone prefixes, if you will, on
4 the periphery of the EPZ were excluded; is that a fair
5 summation of that point?

6 A (Spencer) That's correct.

7 Q Now, do you have any idea how many people were in
8 those telephone prefixes that were excluded? How many people
9 who lived within the EPZ?

10 A (Spencer) Only what I stated in the rebuttal on the
11 top of page six, which I'll read it, if you like. "The
12 magnitude of the exclusion is not discussed in Attachment 5 or
13 in the testimony, but simply opined on cross-examination to be
14 a very small number."

15 So, Dr. Cole estimated that it was a very small
16 number. So that's the only knowledge I have about how many
17 people were actually excluded.

18 Q If it were a very small number, would this
19 potential -- would this systematic error, as you call it, have
20 any significant impact on the results?

21 A (Spencer) Many small systematic errors cumulate.
22 And you don't know that they'll cancel out, and that's why I
23 mentioned it, it's just one more systematic error. Maybe it
24 excluded -- I'm not sure what a very small number is, maybe it
25 excluded a few percent of the population. But a few percent

1 here and a few percent there add up, which is why I included it
2 in the rebuttal.

3 Q Let's assume it excluded less than five percent of
4 the population and a number of these are now geographic areas
5 that have telephone prefixes that are just on the periphery of
6 the EPZ?

7 A (Spencer) All right.

8 Q Would there be any expectation that you would have
9 that by excluding that five percent of the population with
10 respect to questions like this that the results would be
11 significantly different than they would be if that five percent
12 had been included?

13 A (Spencer) Yes.

14 Q And what's your basis for stating that?

15 A (Spencer) Well, if you're talking about people who
16 are living near the fringe of the evacuation zone, if I
17 understand correctly, so they might behave differently from
18 people who are at the center of the zone, because you're
19 talking about people who are very, very nearly not in the EPZ
20 at all. And you're saying, would you expect people in the EPZ
21 to behave differently from people not in the EPZ. So that's
22 why I think you could have differences.

23 Q Well, one of the issues that was -- one of the
24 questions that was being addressed in this survey would be the
25 extent of voluntary evacuation among people in the EPZ. And we

1 already know that Dr. Cole's data and Dr. Mileti's data are
2 essentially in agreement on this point, does that fact -- would
3 that fact influence your conclusions about the significance
4 of --

5 MR. LEWALD: I object --

6 BY MR. FIERCE:

7 Q -- this error?

8 MR. LEWALD: -- to the question. I don't think it's
9 understandable as to what fact the -- what the antecedent of
10 that fact is.

11 JUDGE SMITH: I thought I understood it, but if you
12 don't, you're entitled to understand it.

13 THE WITNESS: (Spencer) Would you repeat the
14 question?

15 JUDGE SMITH: Well, there's an objection.

16 THE WITNESS: (Spencer) Oh, I'm sorry.

17 MR. FIERCE: Well, why don't I put the question this
18 way.

19 BY MR. FIERCE:

20 Q In fact there were a variety of topics --

21 MR. FIERCE: I'll withdraw that last question.

22 BY MR. FIERCE:

23 Q There are a variety of topics that are being -- about
24 which data is being gathered in this survey, and isn't it fair
25 to assume, Dr. Spencer, that on some of these questions people

1 living on the periphery of the EPZ are likely to respond in
2 just the very same way that people in any other point of the
3 EPZ might respond?

4 A (Spencer) Is it fair to assume that?

5 I don't know, I'm not familiar enough with the
6 questions. I mean, we could look at question by question or we
7 could speculate whether they might be the same or different.
8 But, of course, if we knew they'd be the same we wouldn't have
9 to do a survey of the whole EPZ.

10 So you can try to make assumptions that excluding
11 people from your sample systematically is unimportant. And
12 indeed, sometimes it is unimportant. But you don't know when
13 it's going to be unimportant. You can speculate. Perhaps you
14 can gather data which will inform you more. But I don't have
15 this external data, so I can't say that it's fair to assume
16 that there would be no difference.

17 Q Well, let me give you one of those questions, and
18 it's one that we discussed with Dr. Miletic a few minutes ago,
19 which is a question regarding how many vehicles your family
20 would be using for evacuation; is that the kind of question
21 that would likely generate a different response if you lived on
22 the periphery of the EPZ?

23 MR. TURK: Objection. The questioning presumes now
24 on the part of the witness as to the characteristics of the
25 EPZ. And as I understand his testimony he's not evaluating the

1 characteristics of the EPZ and comparing it to the survey; he's
2 looking at the sampling methods.

3 MR. FIERCE: He's testified that there is -- "The
4 methodology used cannot ensure accurate descriptions." And all
5 I want to know is, how accurate are we talking about here.

6 JUDGE SMITH: Well, this flows from your cross-
7 examination to the effect that, you know, how can a five
8 percent or so at the periphery make a difference; his answer
9 was, there may be behavioral differences of people who live in
10 the center as compared to the periphery. Now you're pursuing
11 that; is that it?

12 MR. FIERCE: That's right.

13 JUDGE SMITH: As a point. Now -- and he is not here
14 as a behavioral person, but as a statistical person. Before we
15 would allow you to go into that very far, I guess we'd want a
16 good faith representation on your part that you, yourself,
17 don't see that there would be a difference in those who live in
18 the center of an EPZ and those that live at the periphery,
19 perhaps out of it. Otherwise what's your point?

20 MR. FIERCE: With respect to a question like this?

21 JUDGE SMITH: Yes.

22 MR. FIERCE: Yes.

23 JUDGE SMITH: No difference?

24 MR. FIERCE: That with respect to the accuracy of the
25 response that you will get to a question, how many vehicles

1 will your family use for evacuation. I cannot in good faith,
2 Your Honor, think of any reason why the people --

3 JUDGE SMITH: Okay.

4 MR. FIERCE: -- at the periphery of the EPZ would
5 answer that any differently or honestly or what have you than
6 the people who live in Seabrook.

7 JUDGE SMITH: Well, you did elicit in fair legitimate
8 cross-examination from him the opinion that the nonresponses to
9 periphery could be significant because they were on the
10 periphery. So we will allow a short amount of inquiry into it
11 with recognition that he was not offered as a behavioral person
12 and claims no expertise on it.

13 MR. TURK: Your Honor, I appreciate that you're
14 overruling my objection, but I want to note that Mr. Fierce has
15 not yet presented any testimony that would suggest that the 10
16 persons of the EPZ are identical. There may be economic
17 differences. There may be other demographic differences, which
18 I'm not aware of, which Mr. Fierce may not be aware of, which
19 this witness is not being offered to testify about. And I
20 don't want there to be a presumption on anyone's part here that
21 somehow the characteristics are identical throughout the EPZ.
22 And I don't know of any evidence on that at all.

23 JUDGE SMITH: That's right. That's what prompted my
24 inquiry of Mr. Fierce.

25 Proceed.

1 BY MR. FIERCE:

2 Q Well, I'd like an answer to that question that I've
3 put?

4 A (Spencer) May I ask you to repeat the question,
5 please. Yes, it was asked about five minutes ago, I know, I'm
6 not sure what it was.

7 Q I'm just asking if there could be any conceivable
8 basis that you, as a statistician, would have looking at
9 residential population spread over the towns of New Hampshire?

10 A (Spencer) I'm not familiar with the demographic
11 makeup of the EPZ. I don't know whether the town is under
12 periphery; whether they have the same demographic profiles;
13 whether they have the same family sizes, same household sizes.
14 So do they have the same number of vehicles? Are they
15 higher-income; are they lower-income? Do they tend to be home
16 during the day? I just don't know these things. So without
17 knowing them I can't tell you whether there would be a
18 difference or not.

19 JUDGE HARBOUR: If it were a purely factual question
20 such as how many cars do you own; can you imagine that there
21 would be any difference between whether it was at the center of
22 the EPZ or at the periphery of the EPZ?

23 THE WITNESS: (Spencer) Yes. I think people
24 would -- I'm not discussing whether people would tend to
25 respond erroneously or give dishonest answers. But without

1 knowing that people living around the periphery, maybe they
2 tend to have more cars because they're higher-income or they
3 have larger families, so there are more cars per household; I
4 don't know these things.

5 And these factors would affect whether the number of
6 cars per household was higher or lower or the same around the
7 fringe of the EPZ

8 JUDGE HARBOUR: Thank you.

9 BY MR. FIERCE:

10 Q Your second point, and I'm looking at page five of
11 your testimony, is that the survey did not seek a random sample
12 of heads of households; and as I understand the survey it did
13 not seek a random sample of the heads of households, it's sort
14 of random sample of households, and utilized a male or female
15 selected in a nonrandom way as the informant for that household
16 on what that household would do. And why is that -- strike
17 that. Is that difference, the fact that it's a sample of
18 households and not of heads of households, a large or does it
19 have large or small significance on the outcome of the results
20 here?

21 A (Spencer) It could have large significance on the
22 results, discussed in the rebuttal by -- in part one, the part
23 I wrote; and also, I believe in the part that Dennis Mileti
24 wrote.

25 Q And what do you mean by large? How much? What

1 percent?

2 A (Spencer) Let me say potentially very large. I'm
3 not an expert on differences in behavior; I'm not a
4 sociologist. And I don't know the extent to which a husband or
5 a wife would respond differently or have different attitudes
6 about evacuation or about nuclear power in general. But
7 differences do exist, based on Dr. Cole's testimony, and
8 they're discussed in the rebuttal. And I can only imagine how
9 large these differences might be. But I'm not expert enough to
10 tell you how big they probably are. All I'm saying is that,
11 they might be very large.

12 Q Let me ask you what it is that you would have
13 suggested be done when the telephone calls were made?

14 A (Spencer) Sure. The standard procedure that NORC,
15 National Opinion Research Center, uses in its surveys and
16 government agencies use when they do surveys is you get a
17 listing of the members of the household. You get a
18 knowledgeable informant, typically an adult, to tell you who is
19 in the household, and then you randomly select a member of the
20 household.

21 In this case we would find out, was there one or more
22 heads of the household, and then we would randomly choose one.
23 And that's what should have been done in this survey.

24 Q Well, if you find out you've got a husband and wife
25 and three children and you've got the wife on the phone, what

1 do you do specifically? What do you mean, you randomly choose
2 one?

3 A (Spencer) You find out from the wife that there's
4 also a husband in the household. And then you randomly select
5 one or the other, using a table of random numbers. And if it's
6 the wife you can ask her then or you can call her back. And if
7 it's the husband you can try to get the husband then or you can
8 call back and try to reach the husband then.

9 But you must, to have a properly carried out sample,
10 if your randomization tells you to interview the husband, you
11 must interview the husband.

12 Q And if he's not home, what do you do?

13 A (Spencer) If he's not home?

14 Q Yes?

15 A (Spencer) You call back when he is home.

16 Q You call back.

17 Is it standard practice at NORC to use a callback
18 technique?

19 A (Spencer) We usually use a callback technique; yes.

20 Q Now, in that randomization of the heads of household,
21 if you looked at that random sheet of numbers would there be
22 equal numbers of ones and twos or males and females?

23 A (Spencer) The randomization ensures that.

24 Q It would be equal --

25 A (Spencer) That's not the way the tables are set up,

1 but the net result is the same. You would have -- the tables
2 are set up so that you would have equal chance of picking
3 anybody from the household or anybody that you listed. You
4 wouldn't list the children, you wouldn't be interviewing them
5 in this case.

6 Q In this --

7 A (Spencer) But if there were a husband and a wife you
8 would have equal chance of interviewing the husband or the
9 wife.

10 Q The call survey utilized a system which sought to
11 ensure that the informant for each household, the informants,
12 would be roughly split 50/50 male and female; and I am still
13 struggling to understand as a lay person how that is
14 significantly different than a technique which randomly selects
15 males or female heads of household in the way you've just
16 described?

17 A (Spencer) May I take a minute to consult the
18 rebuttal, because I believe I've discussed this there.

19 JUDGE SMITH: Give him a mid-morning break, 15
20 minutes.

21 Off the record.

22 (Whereupon, a brief recess was taken.)

23 JUDGE SMITH: Proceed, please

24 BY MR. FIERCE:

25 Q Well, as we broke I had put a question to Dr.

1 Spencer, and I now would ask if he has an answer?

2 A (Spencer) Yes. To answer I'd just like to read from
3 the rebuttal on page six the first full -- I'm sorry, page
4 seven the first full paragraph; I'll read it if you like.

5 Q Is there a way you can summarize that or?

6 A (Spencer) I'd rather -- I'd rather just read it
7 directly, it's not very long.

8 JUDGE SMITH: Go ahead.

9 BY MR. FIERCE:

10 Q Go ahead.

11 A (Spencer) "The nonrandom selection of the respondent
12 within the selected households is critical and extremely
13 unfortunate because it means that of those households
14 containing more than one head the sample overrepresents those
15 heads who were home and willing to answer the phone. Beliefs,
16 knowledge and attitudes can vary markedly between different
17 heads of the same household; and thus, the typical attitudes of
18 the responding heads would not be the same as typical attitudes
19 within their households.

20 Indeed, recognition of this variation between two
21 heads of the same households appears to have led SDA to use sex
22 quotas. A sex quota," and I quote from Attachment 5 by Stephen
23 Cole, "A sex quota was used to ensure that the final sample
24 would represent the population in terms of sex. It was
25 important to make sure that women were not overrepresented as

1 it is well known from prior surveys that the attitudes of men
2 and women toward issues like nuclear power generally differ."

3 So, men and women can have different attitudes even
4 within the same household, and other characteristics of the
5 head of households, such as whether they're more often home or
6 whether they're willing to answer the phone or not can also --
7 you can also have variation in the attitudes between these
8 kinds of people.

9 So the answer to your question, how can it be
10 important to randomly select the head of the household, that
11 is, and the reason it's important to randomly select is so that
12 approximately half the time -- if you have households with two
13 heads of those households, about half the time you'd get one
14 head and half the other head.

15 And actually if you used this randomization you
16 wouldn't have had to use the sex quotas at all that SDA used,
17 because the randomization would have guaranteed through in a
18 small sampling error that you had a representative sample and
19 you wouldn't have had to do this ad hoc adjustment.

20 Q I hear a lot of "it could, it might, it's possible,"
21 but, Dr. Spencer, do you honestly believe that people who would
22 more likely be home and responding to the SDA call would have
23 different attitudes about nuclear power and what they would do
24 in an evacuation --

25 A (Spencer) I've not --

1 Q -- than a member of a household who was less likely
2 to be home?

3 A (Spencer) Do I really believe that they could differ
4 significantly?

5 Q That they do differ?

6 A (Spencer) That they do differ? They differ on some
7 characteristics. Do they differ on attitudes? I'd have to
8 say, I don't know enough to answer that.

9 The reason you want to take a random sample is, so
10 that you don't have to make these assumptions. And if the
11 sample would have been properly carried out I wouldn't have to
12 make suppositions, and none of us would have to make
13 suppositions about, did it make a difference that they didn't
14 randomly select the head of the household.

15 Q On your third point -- moving to your third point,
16 which is that all of the households in the EPZ did not have a
17 chance of participating in this survey. I, again, as a layman
18 want to make sure I understand your point here, because it
19 sounds to me like you would have preferred this to be a
20 census-type survey; is that what you're saying?

21 A (Spencer) No. Let me clarify that, if I could,
22 because this is a very important point. By say -- having a
23 chance, you could have a sample of just one person. But if the
24 person were selected at random from the whole EPZ, then
25 everybody would have a chance of being in the sample, even

1 though the sample only contained one person.

2 But what you've got is, you can think of dividing,
3 certainly not geographically primarily, but because of the low
4 response rate in the survey or people who weren't home when the
5 calls occurred, at least 40 percent, maybe more than 50 percent
6 of the population had no chance of being in the sample. That
7 means that we can think of splitting the EPZ population into
8 two groups: those that had a chance of being sampled, that is
9 those who are represented by the sample; and those who were not
10 sampled and had no chance of being sampled. We might as well
11 have totally ignored them for all practical purposes.

12 So what we've got is a survey of 60 percent or 50
13 percent of the population. And the other half of the
14 population we don't have any data on. And to apply this whole
15 survey to the group that had no chance of being sampled, people
16 who behave differently in terms of answering the phone and
17 certain obvious characteristics behave differently from those
18 who participated in the survey.

19 So, if you want to use this survey you've got to make
20 assumptions about how those people are similar to those who did
21 have a chance of being in the survey.

22 Now, the range of possibilities on this is very
23 broad. I mean, mathematically the range -- if you -- suppose
24 that the actual proportion who respond a certain way to your
25 survey is 30 percent. And being generous I would say, suppose

1 the survey covered 60 percent of the population. Then the
2 mathematical limits on what the actual proportion could be
3 range from 18 percent to 58 percent. Now these are limits on
4 possibilities; 18 percent to 58 percent, when the sample shows
5 30 percent. And they're extreme. And I don't really think
6 that it is either 18 percent or 58 percent, but mathematically
7 it could be; and the actual proportion could be anywhere in
8 there.

9 And without really knowing the population, you can't
10 know where in that range the actual proportion is. But because
11 you have this large proportion that are just not represented in
12 the survey. And by not represented I mean they had no chance
13 of being selected, you get this large range of possible results
14 and you can't be sure wherein that range the actual proportion
15 is.

16 Q And isn't it in recognition of that very point that
17 the survey research industry has set some standards with
18 respect to callback procedures?

19 A (Spencer) The standards that I'm familiar with apply
20 more to the response rate, which is to say, if people don't
21 respond the first time you can call them back or you can try
22 other means, you can actually do a personal visit in some
23 cases. Callbacks are widely used. But the purpose is to get
24 the ultimate response rate improved to reduce the proportion of
25 the population that really is not represented by the survey.

1 Q Well, the callback procedure is done for a variety
2 of reasons, but one of them is to make sure that people who
3 don't answer their phone the first time they're called,
4 because they might not be home at that hour of the day, are
5 given an opportunity to be reached at another time, in the
6 evening or on a week-end, which addresses part of the problem
7 you're suggesting here; doesn't it?

8 MR. LEWALD: I would object to the question, it's
9 standing off with a premise -- a foundation which no witness
10 has testified that I know of.

11 JUDGE SMITH: I thought he just testified to it.

12 MR. LEWALD: On the very foundation he -- the
13 question began with?

14 JUDGE SMITH: Well, I guess I'll have to have the
15 question back, I didn't hear it.

16 MR. LEWALD: I'm just suggesting there are a number
17 of questions into this one question, and I'm objecting to the
18 form of the question.

19 JUDGE SMITH: I'm -- I'll have to consult my
20 colleagues. I understood the question to be just a
21 recharacterization of his last several answers that, to assure
22 that people have a chance of being included in a survey, it's
23 necessary to call back because they weren't home. They might
24 be home later, a big effort has to be made to get them into the
25 survey, and that is one reason. Now, what he didn't do is go

1 into the other possible reasons. But I guess I'm lost here.

2 MR. LEWALD: Well, I think --

3 JUDGE SMITH: Let me consult.

4 (Board members conferring.)

5 JUDGE SMITH: So your objection is, there are many
6 reasons for a callback.

7 MR. LEWALD: He said that callbacks are had or are
8 done for various and many reasons.

9 JUDGE SMITH: It's the various --

10 MR. LEWALD: And I don't know that there's any
11 testimony in that respect.

12 JUDGE SMITH: All right.

13 MR. LEWALD: And certainly this witness didn't
14 testify to that.

15 JUDGE SMITH: Mr. Fierce.

16 MR. FIERCE: Let me approach it from a different
17 angle, Your Honor.

18 BY MR. FIERCE:

19 Q Dr. Spencer, in order to overcome the problem that
20 you have identified in Point 3, what would you recommend
21 telephone survey researchers in the industry do?

22 A (Spencer) Callbacks are one procedure. There are
23 various analytic strategies where you take -- called "double
24 sampling." What you do is take people who don't call -- who
25 don't respond to your phone, and then you say, "Okay, let's

1 think about this group separately from the population that does
2 answer the phone on the first call. And then let's take maybe,
3 not take all the people who don't answer the phone the first
4 time, but we'll take a subsample of them."

5 I'm afraid this may get technical, let me -- but it's
6 a standard technique for doing this. And you can do callbacks
7 to either this whole group who don't respond the first time or
8 to a randomly selected subsample of them, and then you follow
9 them. Follow them with repeated phone calls is what I mean.

10 Q Did you make any effort using the data tape to
11 compare the responses of the people who responded on the first
12 call to the responses of those who responded when called and
13 reached on the third time -- on the third call?

14 A (Spencer) No, I didn't. I don't believe that that
15 information was on the tape. On which call the results
16 occurred on. So it was not possible to do so.

17 Q But you did say that callbacks is one technique
18 utilized to reduce this potential source of error?

19 A (Spencer) Yes.

20 Q And when a callback technique is applied, aren't
21 there reasonable limits that the industry places on the number
22 of times a call should be attempted?

23 A (Spencer) Are they reasonable limits, whether
24 there -- there may be limits, and I've already responded that
25 I'm not -- I don't know what those standards are for the media

1 polls that you were talking about.

2 Whether they're reasonable depends on the importance
3 of the survey and how the results are going to be used, because
4 if you don't do enough callbacks or if you don't design them
5 properly, you still have a large proportion of the population
6 that's not represented by the survey. And if this results in a
7 large error in your results, then you're stuck with a large
8 error and you may come to the wrong decision, based on your
9 survey. And in that case the limits are not reasonable.

10 So, I'm uncomfortable with talking about reasonable
11 limits.

12 Q Well, let me put it this way, if you were advising a
13 client who would be interested in conducting a telephone survey
14 of this sort using a sample of roughly this size, 1400 or so
15 individuals, and you knew that the results that they wanted to
16 get didn't need to be as accurate as one could possibly
17 achieve, but they wanted to get a rough measure, a ballpark
18 measure of some likely possibilities for human behavior or
19 perhaps you're marketing a product and you want to know whether
20 the range of potential market share is 25 percent or 50
21 percent, not whether it's 48 or 49; wouldn't you advise that
22 client, in the interest of cost and effort, to limit the number
23 of callbacks utilized to a number much as Stephen Cole has
24 utilized here in the range of perhaps three?

25 A (Spencer) It has less to do with the number of

1 callbacks and more to do with how effective the callbacks are;
2 and whether you use various analytic strategies to reduce the
3 possible error from the nonresponse, from the fact that you
4 don't reach people even after three callbacks.

5 The number of callbacks per se is too simple a way to
6 look at it. So, if after three callbacks I said, "Look, the
7 plausible range of error in the statistic is 30 percent, and we
8 can't be -- we can't distinguish between 25 percent and 50
9 percent market share," I'd say, you know, we didn't do enough
10 callbacks. It looked like the right number, but there's still
11 too much nonresponse left in the survey.

12 Q So are you -- if this were the standard way to do
13 industry survey research using a callback procedure like was
14 done here, would you be criticizing that industry standard and
15 condemning the whole industry for this failure?

16 A (Spencer) I think I'd be rash to do so. I've told
17 you that I don't know what the standard is. And I've told you
18 that whether the standard is appropriate depends on the use of
19 the data. And I've told you that whether the standard meets
20 the needs of the client of the survey depends on what level of
21 nonresponse remains after the callbacks and whether you use
22 various statistical adjustment procedures for the nonresponse.

23 Q Your fourth point is that sampling errors appear to
24 have been calculated as if the sampling design were far less
25 complicated. There are in fact a variety of ways utilized to

1 calculate sampling error, aren't there, Dr. Spencer?

2 A (Spencer) There are a variety of ways. Some are
3 appropriate for some surveys and some are not appropriate for
4 some surveys. And often inappropriate techniques for
5 calculating sampling errors are used.

6 I don't want to run on but I'll read a quote from a
7 recent book that came out on estimating standard errors and it
8 says: "A common error of the survey practitioner or the
9 beginning student is the belief that simple random sampling
10 formula may be used to estimate variances regardless of the
11 design or estimator actually employed. This belief is false.
12 An estimator of variance must take account of both the
13 estimator and the sampling design." This is from a book by the
14 Chief of the Statistical Research Division at the Bureau of the
15 Census, Kirk Wolter; the book is "Introduction to Variance
16 Estimation."

17 And my fourth point is that, based on the way it
18 appears that the sample was drawn, and I'm making a little bit
19 of a supposition here because the record isn't entirely clear
20 on the exact manner in which the sample was drawn, but it
21 appears as if cluster sampling or multistage sampling was used;
22 and for this way of drawing a sample the formulas that were
23 used by Dr. Cole are incorrect, and tend to underestimate the
24 actual sampling error, that is the sampling error would be
25 bigger than calculated.

1 Q You've used a more complex method of calculating
2 sampling error?

3 A (Spencer) No, I didn't use a more complex method of
4 calculating sampling error. I didn't do calculate -- I don't
5 have enough data information to know or data to know the
6 appropriate way, you know, the right formula to use for
7 calculating this, because the details by which the sample were
8 drawn are not clear enough on the record.

9 Q So you're not sure what the sampling error is?

10 A (Spencer) It's my professional judgment that, if
11 multistage sampling was used, and I think it was used, that the
12 sampling errors calculated by Dr. Cole, and even the sampling
13 errors that I calculate in my rebuttal, understate the actual
14 sampling errors.

15 And the basis for my judgment that cluster
16 sampling -- if you use the simple formulas with the cluster
17 sample you will tend to underestimate the sampling error, one
18 can show it -- one can prove theorems, but I'll just give you a
19 quote from a textbook by Leslie Kish called "Survey Sampling."
20 Kish was a former President of the American Statistical
21 Association as well a Sociologist. "When comparing a cluster
22 sample with a sample of elements of the same size, and we can
23 expect a larger variance but a smaller cost for the cluster
24 sample." But the important thing is that you can expect a
25 larger variance. And variance here refers to the sampling

1 error.

2 Q Well, I'm just trying to get a sense from you whether
3 that increment would be a couple of percentage points or more
4 than that?

5 A (Spencer) It's typically a factor. So it could
6 increase the sampling errors. I've seen it have the effect of
7 doubling and more than doubling the sampling errors. I
8 wouldn't expect that the effect would be so severe for this
9 survey. Perhaps it would increase the sampling errors by 50
10 percent, but I -- I mean, I don't want to be specific on that
11 because I'm not sure.

12 I'm pretty sure that it understates them. I don't
13 want to say how much.

14 Q I want to turn to Dr. Mileti and ask you some
15 questions, Doctor, about the portion of the testimony you wrote
16 regarding the Social Data Analysts survey, at the Part 2,
17 analysis of internal validity.

18 You place a great deal of emphasis on the importance
19 of the first four questions to the survey with respect to the
20 bias that may be generated by those questions, and I'm going to
21 ask you some questions about those, but let me read them for
22 the rest of the people in the room.

23 Number -- well, it's labelled No. 14, it's the first
24 question asked on the survey and it is, "In general, how
25 dangerous do you think it would be to live near a nuclear

1 powerplant? Very dangerous; dangerous; or not dangerous at
2 all?"

3 The second question which is No. 15 on the survey, --
4 "Would you describe yourself as: (1) A supporter of nuclear
5 powerplants as a means of providing electricity; (2) An
6 opponent of nuclear powerplants; or, (3) You haven't made up
7 your mind yet on this issue?"

8 16: "Do you think that the Seabrook Nuclear
9 Powerplant should be allowed to operate to generate
10 electricity? (1) Yes. (2) No."

11 And the fourth question is: "Given where you live,
12 do you think it would -- strike that -- do you think you would
13 be affected by a release of radiation if a serious problem
14 develop at the Seabrook Nuclear Power Station after it
15 started operating? Yes or no?"

16 Those are those first four questions. And, Doctor,
17 keeping in mind that one of the interests that the Commonwealth
18 of Massachusetts had in asking Stephen Cole to do this survey
19 was to determine to some extent the level of pre-emergency fear
20 that people had about nuclear power.

21 How should that first question been worded in your
22 view?

23 JUDGE SMITH: Would you restate the first question?

24 BY MR. FIERCE:

25 Q "In general, how dangerous do you think it would be

1 to live near a nuclear powerplant? (1) Very dangerous. (2)
2 Dangerous. (3) Not dangerous at all."

3 A (Mileti) You've asked me to assume in my answer that
4 I was concerned with measuring fear?

5 Q Pre-emergency fear?

6 A (Mileti) And then you've required that I measure it
7 with the rewording of this question as opposed to an
8 alternative way, perhaps.

9 Q Give me an alternative way, perhaps then, how would
10 you have done it?

11 A (Mileti) If I were concerned with measuring
12 perceived pre-emergency fear in relation to a particular hazard
13 like nuclear power there are any number of ways of going about
14 doing it. And its been done in different ways for different
15 hazards.

16 One way is to present people with a range of
17 alternative hazardous events, for example, nuclear powerplant;
18 nuclear powerplant accident; radon; earthquakes; floods;
19 hurricanes, et cetera. And then ask them to rank those
20 different hazards relative one to another. And then based on
21 that ranking make a conclusion about their perceived level of
22 hazardousness or fear.

23 I should add that if I were actually doing this I
24 would give it much more thought than I'm able to do today in
25 responding to this question.

1 If I were concerned with coming up with a different
2 wording to this question that I thought might be less biasing
3 than the critique I've offered in this testimony, I would not
4 put the word "dangerous" in the question, and I would not state
5 it in each of the answers. But it might be something like,
6 although it would be more thought through. "In general, what
7 do you think about living near a nuclear powerplant?" And one
8 response could be, "I have no opinion about it." Another
9 response could be, "It seems dangerous." Another response to
10 me, and I would think through the range of alternative response
11 that persons could have. I might even do a pilot study to
12 determine what that is, and I'd come up with mutually exclusive
13 and exhaustive categories that didn't all focus in on the word
14 "dangerous" or for that matter on the word "safe" being used
15 consistently.

16 But I'd try to come up with a question that was free
17 of the answer in the question, and then a range of answers that
18 everyone would have to listen to that didn't restate one word
19 over and over again, but rather just gave it as one option as a
20 better way to go about having worded this question.

21 If I were laboring with intensity to measure pre-
22 emergency fear well in a population, I probably would opt for
23 something more like the former alternative that I talked about
24 were the use of a battery of questions to get as close an
25 accurate measure of that perceived variable as possible.

1 JUDGE SMITH: Well, let's shift the spectrum
2 somewhat. Let's assume that by other reliable means determine
3 that there is a perception of danger in living near a nuclear
4 powerplant. And the purpose of the survey is to measure the
5 perception of danger, would your answer be the same?

6 THE WITNESS: (Mileti) What came to mind as you
7 asked that question was trying to develop a way to scale
8 perceived risk or perceived danger such that I wouldn't be
9 lumping people into three general categories, so that someone
10 who thought it was very, very dangerous and someone who thought
11 it was very dangerous wouldn't be called the same, but rather
12 to develop a more continuous measure, so we would be getting
13 more precise estimates of perceived risk.

14 That's the only thing that came to mind in response
15 to that question.

16 BY MR. FIERCE:

17 Q Doctor, you've said that you would recommend that
18 emergency planners assume that there would be high levels of
19 fear in the public around the Seabrook Nuclear Plant; haven't
20 you?

21 A (Mileti) I, again, don't believe that that's the way
22 I've worded it. I think my -- as I said yesterday, my
23 recommendation has always been in reference to nuclear power as
24 well as other hazards that planners presume that the day an
25 emergency might occur that there would be people in that

1 population that were very fearful and people who were not
2 fearful at all as well as people in between, and that plans be
3 drafted on the basis of that presumed variance.

4 I think that better characterizes my point of view.

5 Q Do you deny that there are a very large number of
6 people around the Seabrook Nuclear Plant who have high levels
7 of fear about that plant?

8 MR. LEWALD: Objection, we're getting into testimony
9 now, and this witness isn't sworn.

10 JUDGE SMITH: Sustained.

11 BY MR. FIERCE:

12 Q Well, what I want to know here with respect to your
13 critique, Doctor, is again, how far wide of the mark do you
14 think the answers that were obtained in this survey are?

15 A (Mileti) Gee, that's a general question that goes to
16 all the answers in the whole survey.

17 Q Well, I'm talking about these first four right now,
18 with respect to an attempt to measure in the public through
19 these four questions some degree of pre-emergency fear, and
20 took collectively those four answers, four questions generated
21 some data which indicate that there's a significant level of
22 pre-emergency fear; and I'm asking you based on your critique
23 here how far wide of the mark do you think that data is?

24 JUDGE SMITH: Do you agree with the premise of the
25 question that the data did produce evidence of a significant

1 level of fear?

2 THE WITNESS: (Mileti) I'm not sure that I'd be
3 willing to say that a good measure that was internally valid of
4 fear was represented in the survey.

5 JUDGE SMITH: Despite your judgment of the questions,
6 the validity of the questions, do you agree with his premise,
7 valid or invalid, it produced a result that there was a
8 significant level of fear?

9 THE WITNESS: (Mileti) I would need to have a good
10 measure of fear in order to be able to say that it was produced
11 by this survey; and I don't think there's a good measure of
12 fear here. And I'm not saying that I don't think that some
13 people aren't fearful of nuclear power. I would just be
14 hard-pushed to be able to quantify it or to say that this --
15 the results of this survey have accurately quantified it. It's
16 not --

17 BY MR. FIERCE:

18 Q So it's your testimony that you're not sure how wide
19 of the mark the results are, but that there's no assurance that
20 the results obtained have hit the target, accurately measured
21 this pre-emergency fear?

22 A (Mileti) Absolutely not, I don't agree that that's
23 my testimony. That was what I was saying about being able to
24 say that any of these data would provide a reasonable
25 quantified estimate of how much fear existed when the survey

1 was performed in the Seabrook Nuclear Power- -- this EPZ.

2 Shall I answer your other question and then -- no, I
3 wasn't suppose to, I'm sorry.

4 Q Well, Doctor, on page 15 of the Social Data Analysis
5 survey report, which was contained in the Attachments to the
6 testimony presented by the panel on which Stephen Cole sat Don
7 Zeigler, Jim Johnson, Stephen Cole. Page 15, the results of
8 the survey for these questions are presented, and it indicates
9 that in response to the question, "How dangerous -- in general,
10 how dangerous do you think it would be to live near a nuclear
11 powerplant, in New Hampshire anyway, 39 percent responded very
12 dangerous; 33 percent responded dangerous; 23 percent responded
13 not dangerous at all; and four percent responded don't know."

14 Now, just with respect to that question, do you have
15 any sense of how wide of the mark that data is, given your
16 concerns about internal consistency?

17 MR. LEWALD: I'm going to object to that question,
18 wide of the mark undefined. Witnesses have testified that this
19 is not a random sample, so you can't project to the population.
20 So I -- and you can only look to the people that are
21 interviewed, and if this is the 39 percent that's referred to,
22 it's hard to find that out from the question.

23 And Dr. Mileti has questioned whether or not you can
24 even look to the people who are interviewed for any valid
25 answers because of the bias. And I don't know mark --

1 JUDGE SMITH: I'm sorry, continue.

2 MR. LEWALD: I don't know what mark he's referring
3 to. I mean, this is the -- he has set some sort of a mark and
4 he's asking the witness whether something is wide or short
5 or --

6 MR. FIERCE: What the actual --

7 JUDGE SMITH: Perception for fear is in --

8 MR. FIERCE: In the population in response to a
9 question like this.

10 JUDGE SMITH: Assuming that the survey was totally
11 illogical. The results were produced by the last of die,
12 nevertheless, given the results, are you able to testify how
13 close they approximate your view of reality?

14 THE WITNESS: (Mileti) I don't believe I can. I
15 just know that I don't trust these numbers in terms of what they
16 purport to represent. And I have a slug of reasons why I
17 should have used a more technical term, many reasons why,
18 sorry.

19 And I'd be happy to go into more. I was --
20 I thought --

21 BY MR. FIERCE:

22 Q Well, I'm really trying to get a general sense of
23 this significance of this criticism, whether you are claiming
24 it has a significant impact on the results or not. And I --
25 can you answer that question, does it have a significant impact

1 on the results?

2 MR. LEWALD: I'm going to object to that question,
3 it's an argumentative question, significant, undefined.
4 It -- what may be significant to Dr. Mileti may not be
5 significant to the questioner.

6 JUDGE SMITH: Would you restate the question.

7 MR. LEWALD: It's a word without values.

8 MR. FIERCE: Well, I think it's not a word without
9 values to a social scientist who is talking about a piece of
10 survey research here.

11 JUDGE SMITH: State the question again.

12 BY MR. FIERCE:

13 Q Is this particular criticism, that there is a problem
14 with the internal validity of this question, going to generate
15 a result which is significantly different than you would get if
16 the question were posed in a way that didn't have this problem?

17 A (Mileti) Yes. And let me put it in context and then
18 explain specifically why.

19 First, in reference to approach, and I don't enjoy
20 slinging mud at another sociologist, and there were some
21 criticisms I didn't include in my rebuttal but now I'm going to
22 have to address them.

23 This question asks the respondent to take the role of
24 being able to measure the concept the social scientist wants to
25 measure. It's a lazy social scientist. It's equivalent to you

1 being interviewed by a doctor when you go for an examine and
2 him saying, on a scale of one to three how much cancer do you
3 think you have? And that's the kind of measurement that's
4 going on here. The social scientist isn't performing
5 measurement.

6 A way should have been devised, much like the way I
7 first described this morning, to have the scientist who
8 supposedly knows how to measure these kinds of concepts do the
9 measure, not the respondent. At least the same measure would
10 have been used each time somebody was measured such that we're
11 asking people, whatever it is that they might imagine the word
12 "dangerous" means, how they might happen to be defining it that
13 day, to come up and measure our concept.

14 Second, I don't necessarily think that this goes --
15 the question goes to the concept of fear. Fear is a somewhat
16 established concept. It's multidimensional. It goes to more
17 things than the concept of danger, et cetera.

18 And so, in context I don't think this was a valid
19 approach to measure the concept of fear.

20 Now, in reference to this particular question,
21 presuming we wanted answers to this question that were as
22 accurate as Ph.D.'s in sociology are trained to measure things
23 and we were confined to this particular question, I think
24 that -- and I've spoken to the particular bias that I think
25 operates in this first question by use of the word "dangerous"

1 four times. I've called it in my rebuttal testimony something
2 that more resembles a lecture than it does a question. And I
3 think that would predispose people to picking something that's
4 dangerous.

5 And I think work -- but had it not been worded that
6 way, had we worded it better, I'm still not willing to say it
7 was a measure of fear. It's a measure of whatever it is this
8 question might be measuring. And I haven't even the slightest
9 idea that it might even measure danger well, perceived danger
10 well.

11 So now in comparing the numbers that have, in my
12 opinion, would have had to have been subject to some bias which
13 would have been easy to remove from this question; and
14 comparing it to what might actually exist in the EPZ, I only
15 know that I don't trust that this is an estimate of trying to
16 measure something that I know it's not even a good measure of.
17 So I just don't trust it.

18 It could be higher; it could be lower in reality.

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1 Q Dr. Mileti, further on in your testimony, on page
2 19, at the top of the page, you're talking about a question
3 which is the second question in that sequence, "Would you
4 describe yourself as a supporter of nuclear power plants as a
5 means of providing electricity; an opponent of nuclear power
6 plants; or you haven't made up your mind?"

7 And you say, "The answers given to this question
8 would contain bias, since respondents heretofore have been
9 instructed that nuclear power plants are dangerous due to bias
10 introduced in the first question."

11 You believe they actually have been instructed? That
12 nuclear power plants are dangerous by virtue of having been
13 asked that question?

14 A (Mileti) Yes. I believe I already said that I
15 thought Question 14 more resembled a lecture about that danger
16 than it did a question that tried to measure something in a way
17 free of bias. They've heard the word "dangerous" four times in
18 a very short period of time. It only takes a few seconds to
19 read that question, and all the answers. And they've heard the
20 word "dangerous, dangerous, dangerous, dangerous," and then are
21 asked, "What's your opinion," and they they're asked if they
22 support nuclear power or not.

23 Now, I know, and I have a strong hunch, without data,
24 that people in this neck of the woods don't support the
25 Seabrook Nuclear Power Plant, but if I wanted to try to measure

1 it, I'd try to measure it in a way free of bias.

2 Q You have no doubt that people living in that area
3 have read a great deal about the Seabrook Nuclear Power Plant
4 in the newspapers and heard about it on radio and television
5 through various media.

6 A (Mileti) I suspect that --

7 JUDGE SMITH: I think you're quibbling. We can all
8 read the question; we all know about the newspapers. I think
9 you've exhausted this. It's not even to the level of argument;
10 it's quibbling.

11 BY MR. FIERCE:

12 Q Further on in that paragraph, Doctor, with respect to
13 this Question No. 15, you say that "respondents are forced to
14 become a supporter or an opponent of nuclear power, or else
15 claim their minds haven't been made up, and that this
16 dichotomization is biasing.

17 Because, "Whichever position is chosen, Respondents
18 will remember their selection and be as consistent as possible
19 with their choice in answering all subsequent questions." Do
20 you believe that's true?

21 A (Mileti) Yes. That's why I said it.

22 Q Dr. Mileti, if I am an opponent of nuclear power
23 plants because I truly believe they are dangerous, how would
24 you expect that I would labor to answer Question 21?

25 And Question 21 reads, after being given a scenario

1 that was a beach closing message and I am living somewhere away
2 from the beach and I've indicated that I would leave, I'm
3 asked, "Where would you go? Where is the place you would
4 expect to spend the night, if I were evacuating from the
5 Seabrook area?"

6 How would I labor to answer that question in a way
7 that would be consistent with my answer to Question 15? And
8 14?

9 A (Mileti) Well, as I talked about in my rebuttal
10 testimony -- well, first let me say the interactive bias that
11 would occur between questions on the questionnaire would not
12 all be the same. There would be some subsequent questions on
13 which it might have a more profound effect, and others on which
14 it might have a lesser effect. And I suspect you've picked one
15 on which it might have a lesser effect, but the interactive
16 bias could still operate.

17 For example, that person would be looking at and
18 attempting to answer a question where -- Questions 21 through
19 25, which is, "Where would you go, after having, in the first
20 four questions in the questionnaire -- and this, again, I've
21 explained in my testimony, but I'll put it in different words,
22 there would be persons, for example, who in answering these
23 first four questions, and I'll just pick an extreme opponent,
24 who said nuclear power plants are very dangerous to live by;
25 that they're an opponent of nuclear power; that they don't

1 think the Seabrook Nuclear Power Plant should operate; and that
2 if there was an accident, that they would be affected by
3 radiation. Those were the first four questions.

4 Or, if you like, you can consider the alternative:
5 somebody who said they didn't think nuclear power plants were
6 dangerous at all, that they would describe themselves as a
7 supporter of nuclear power; that they think the Seabrook plant
8 should be allowed to operate and that, given where they live,
9 they didn't think that they would be affected by radiation if
10 an accident occurred.

11 Now, carrying forth those two different people who
12 have those two mind-sets now, after having given those four
13 responses, forward to Question 21 through 25, and that comes in
14 us in the context of Question 20. So we'll have to look at
15 that.

16 When you heard this message on the radio, which is
17 this shorthand version of one of the EBS messages, "Would you
18 and members of your family," and then they said, "go about
19 their normal business day inside their home," and then some
20 said they'd leave their home and go somewhere else.

21 Now, once they've said they'd leave their home and go
22 somewhere else, "Where would you go?"

23 Having the two mind-sets in mind, I would think some
24 persons, the persons committed to not thinking that they're
25 exposed to radiation, probably wouldn't pick Los Angeles.

1 However, persons who now are committed to think that
2 in this accident they're exposed to radiation; they're an
3 opponent of nuclear power, et cetera, as I have described,
4 would be more inclined to say that they might go further away.

5 Some bias would be interacting on that. And that's
6 just an example of perhaps one of the weakest ways that bias
7 could carry forward. It certainly would have a more profound
8 effect, as you know from reading my rebuttal, in answering
9 judgments about behavioral intentions in reference to Question
10 20.

11 Q Would interactive bias operate with respect to my
12 answer on Question No. 30: "How many of your vehicles would
13 you and your family use to evacuate?"

14 A (Mileti) Your question said in reference to your
15 answer. Do you mean in reference to answers the respondents
16 might have given?

17 Q Well, my question earlier to you posed a person who
18 was truly fearful that nuclear power plants were dangerous, and
19 I'm asking you now how I might labor because of that bias
20 generated in the first set of questions to answer Question No.
21 30. And it seems to me that that's perhaps -- let me ask you,
22 is that one of the questions as well that the interactive bias
23 would be less active on?

24 A (Mileti) Yes. In my judgment, I would think that it
25 would be. However, it could have a slight impact. For

1 example, after someone said that they're an opponent to nuclear
2 power and then they've made those kinds of commitments, it's
3 possible that if they caught on that this is a poll about the
4 Seabrook plant, by now I suspect they might have -- that they
5 might be more inclined to opt for higher numbers, thinking that
6 it might mess up the plan, or what-have-you, because there's
7 been a lot of political controversy.

8 Or in the opposite direction -- but I agree that I
9 think the interactive bias would be less here than on the
10 behavioral intention questions. But again, these are
11 behavioral intentions, about how many cars they think they
12 would intend to use in the future.

13 Q In your testimony you continue -- the next question,
14 No. 16, was, "Do you think that the Seabrook Nuclear Power
15 Plant should be allowed to operate to generate electricity?"

16 You say that this question doesn't show any major
17 internal sources of systematic error, but its position in the
18 questionnaire, being after Question 14 and 15, would bias the
19 results. Interactive bias would operate.

20 But isn't it true, Doctor, that interactive bias is
21 less prone to operate on questions about which the respondent
22 has already formed very strong views before the question has
23 been asked?

24 A (Mileti) If you mean formed strong views before the
25 question has been asked, but subsequent to being asked the

1 other questions on the questionnaire, that is the definition of
2 bias.

3 If, by your question -- I'm sorry, I guess I didn't
4 understand your question.

5 Q Well, again, you've got a question, "Do you think
6 that the Seabrook Nuclear Power Plant should be allowed to
7 operate to generate electricity," and the answers given for the
8 New Hampshire respondents were, 32 percent said yes; 62 percent
9 said no; and six percent didn't know.

10 And I'm asking you now about the notion, isn't it
11 true that interactive bias is less prone to operate on
12 questions about which the respondent would already have formed
13 very strong views before the questions were asked, before the
14 survey was conducted?

15 A (Mileti) Before the survey was conducted?

16 Q Yes.

17 A (Mileti) If somebody believed in their heart before
18 the survey was conducted that they didn't think the Seabrook
19 plant should be allowed to operate -- no, actually it would
20 have to be the converse, that they thought the Seabrook plant
21 should be allowed to operate.

22 Well, you see, the bias is going in the direction of
23 saying that it's dangerous.

24 Q You've told me about which way the bias is going, but
25 I'm now suggesting, and asking you, Doctor, isn't this the kind

1 of question that taps very strongly held views among the
2 residents of the EPZ, because it's an issue they have debated
3 long and hard, and there are many people out there who have
4 made up their minds.

5 JUDGE SMITH: All right, now this is, I think, a fair
6 line of questioning. You keep going back to the assumption
7 that the survey should be neutral, and he wishes now to explore
8 that if it is believed by the survey taker, regardless of the
9 reliability of it, that there already exists a substantial
10 perception of fear in the community, and the purpose is to
11 measure it, then would you answer the question along that line.
12 And just go back to your point about the doctor: true, walking
13 into a doctor's office, he should not ask you how much cancer
14 do you have.

15 But he may very well, you walk in and say, how bad is
16 your headache, when you're there for that purpose, he's trying
17 to measure something that is already known to exist, as
18 compared to determining whether it exists or not. And this is
19 a legitimate thrust of his questions.

20 Now you may quarrel with the premise that this
21 perception of fear has been established, and I don't know the
22 state of the record of that. But for the purpose of his cross-
23 examination, he should be allowed to pursue it.

24 MR. LEWALD: Could we have the question?

25 JUDGE SMITH: Please read it back?

1 (Whereupon, the previous question was read back by
2 the Reporter.)

3 JUDGE SMITH: You don't have to agree with the
4 assumption, just accept his.

5 THE WITNESS: (Mileti) In general, yes. However, I
6 think that people who already had their minds made up that they
7 are strong opponents to the Seabrook Nuclear Power Plant would
8 have answered this question, and probably would have answered
9 this question the same way whether it came first in the
10 questionnaire or last.

11 But the assumption that everybody is either a very
12 strong supporter of the Seabrook plant, versus a very strong
13 opponent to the Seabrook plant, I think, is an empirical
14 question that I find, or an assumption that I find, difficult
15 to swallow.

16 There have to be people in the middle, and those
17 people in the middle could be affected by bias, which leads me
18 to conclude that it's possible that, and probable, in fact,
19 given the wording of the first two questions, that bias would
20 have operated for those kinds of people, the people in the
21 middle.

22 In these settings, it's hard to believe there might
23 be people in the middle, because people are so clearly on one
24 side or the other.

25 And so for that reason I would say that I suspect the

1 number. Now if you -- but that's certainly something that
2 would be very easy to measure.

3 BY MR. FIERCE:

4 Q As a general proposition, Doctor, isn't it true that
5 the more strongly held the view is, the less likely it is to be
6 influenced or biased by questions preceding it, in a survey
7 that might have some bias?

8 A (Mileti) I think, to be fair, I'd have to say it
9 would depend upon what kind of view we're talking about. And
10 if it's a referendum-type opinion, such as this question, I
11 think I've already said, yes, it would be less subject to
12 interactive bias.

13 And then I thought I already explained how it still,
14 for some people could, could lead to bias, those that didn't
15 have as strong an opinion.

16 JUDGE SMITH: Now, Mr. Fierce, I did intercede in
17 this examination on your behalf, but it doesn't take away from
18 the fact that without something more which you have not
19 offered, the reasoning that I infer from your line of
20 questioning is circular. You have a survey, establishes, in
21 your view, a large perception of fear. Therefore, you take
22 that large perception of fear as being pre-existing, and the
23 bias of the questions does not have much impact.

24 I do think it's circular without you having some
25 external basis for establishing the pre-held conception of

1 perception of fear.

2 MR. FIERCE: Well, at this point, what I have -- what
3 I can get from the witness is his perception of whether there
4 is a dichotomization in the EPZ with respect to the Seabrook
5 issue.

6 JUDGE SMITH: Well, it's late in the day for that. I
7 mean, you're examining on the survey, and I think that you are
8 circular. I think that you should have been allowed to pursue
9 the idea, but without something more, I think you've exhausted
10 it.

11 BY MR. FIERCE:

12 Q On page 21 of your testimony, Dr. Mileti, you point
13 out that interviewees desperately try to be consistent during
14 interviews, and you say "How now, for example" -- How now,
15 meaning after the four questions had been presented to them,
16 "How now, for example, can a person already committed to the
17 above position select go about your normal business as an
18 answer to a question about emergency response after reading a
19 scenario in which a release of radiation were asked to be
20 assumed -- see, for example, Question and answers No. 274."

21 Now, have you carefully read Question 274, Doctor?

22 A (Mileti) I thought I did when I wrote my testimony.
23 I'm happy to have a look at it again.

24 Q Well, perhaps what I should do here as well is read
25 the question so the rest of those in attendance will know what

1 we're talking about.

2 And Question 274 is a question asking the respondent
3 to respond to an emergency message that is presented just above
4 that question. And it's a message that I will summarize by
5 saying, as a general emergency condition, and it says that "a
6 release of radiation has occurred at Seabrook, and that New
7 Hampshire Civil Defense and Public Health officials are
8 currently reviewing consequences of the release, local weather
9 conditions and other factors.

10 And then it advises people working or visiting the
11 beach areas in Hampton and Seabrook, to evacuate, and in the
12 final paragraph, also suggests -- says that Evacuation is also
13 recommended for the people in the Brentwood, East Kingston,
14 Exeter, Greenland, Hampton, Hampton Falls, Kensington,
15 Kingston, New Castle, Newfield, Newton, Northampton,
16 Portsmouth, Rye, Seabrook, South Hampton and Stratham."

17 And the question that is number 274 is, "when you
18 heard this message on the radio, when you and members of your
19 family go about your normal business, stay inside your home, or
20 leave your home and go somewhere else."

21 And you say, "How now can a person who has been
22 influenced by the interactive bias in the earlier questions in
23 the survey select 'go about your normal business' as an answer
24 to that question?"

25 Doctor, isn't it true that that scenario suggests

1 that everyone in the New Hampshire portion of the EPZ should be
2 evacuating?

3 A (Mileti) I don't know. I can't answer your
4 question.

5 Q You're not familiar with the towns in the EPZ?

6 A (Mileti) No, I know some of them. I'm not familiar
7 with all of them. And I don't know what a comprehensive list
8 of all of them would be.

9 Q Well, if that were the comprehensive list of the
10 towns in New Hampshire, wouldn't you have to agree that the
11 most important factor influencing the response to Question 274
12 is the fact that everyone here has been advised to evacuate,
13 rather than the interactive bias that might have been generated
14 by some earlier set of questions?

15 A (Mileti) It's possible that these words in the
16 question could have had more of an influence on people's
17 answers to the question than interactive bias, but that doesn't
18 say that interactive bias wouldn't have operated.

19 Q Doctor, what did you think the purpose of this
20 question was?

21 A (Mileti) To elicit people's best and honest judgment
22 about what they thought they might do in the context of this
23 interview.

24 Q What if I told you that the purpose of the question
25 was to put people in an evacuation mode, it was essentially

1 instructing everyone to evacuate, and that the purpose of the
2 question really was to gather data, which is done in the
3 following set of questions, about where they would go? Would
4 that change your view on your statement on page 21 of your
5 testimony?

6 A (Mileti) That bias wouldn't have operated? No.
7 It's the "would've"; it would've operated as people got psyched
8 up, as you just described, to answer what you were really
9 interested in later on.

10 Q So because people were influenced by the bias in the
11 first four questions towards fear of dangerous nuclear
12 radiation, when they were instructed in a simulated emergency
13 radio message to evacuate the entire EPZ, they would have been
14 more likely to have evacuated the entire EPZ, is that what
15 you're saying?

16 A (Mileti) No. I haven't made -- if you want me to
17 talk about the relationship between behavioral intentions and
18 behavior, I'm happy to. I was just talking about how in the
19 context of this questionnaire bias could have operated between
20 questions and the answers that people gave, even though they
21 were trying to be honest in giving their judgments.

22 Q Is the scenario set forth at Question 269 to 273, a
23 situation that people in the EPZ would likely have reacted to
24 by saying they would evacuate?

25 A (Mileti) I'm sorry, I don't think I understand your

1 question. We have data on that.

2 Q We've got a situation here where the questionnaire
3 basically told everybody, listen, here's a situation where
4 you're going to be evacuated. 274 wasn't the important point,
5 was it, of this series of questions? Obviously you're going to
6 get a very high response to a question like 274 that people
7 will be going -- will be leaving their home or going somewhere
8 else if they're told to imagine a situation where there's a
9 problem at Seabrook and radiation is released and they're told
10 to evacuate.

11 You're going to get a high response that people will
12 be leaving their home and going somewhere, isn't that likely to
13 be the case, Doctor?

14 A (Mileti) If what you just asked me is if you ask
15 people to presume that they had just been advised by officials
16 to evacuate, would I guess that more would be inclined to say
17 that they would evacuate versus say that they wouldn't, I would
18 agree, yes. I'm sorry I had to restate it. I just couldn't
19 get that from the question.

20 Q And there's a series of questions following this with
21 respect to where people would go, isn't there?

22 A (Mileti) There's one question asking them where
23 they'd go and another one about how many miles it is, and
24 another one about how many people in their household would be
25 going; how many cars they'd take, et cetera.

1 Q So now, understanding the question advised everybody
2 in the EPZ to evacuate, and looking at that next series of
3 questions, do you understand what the purpose was that the --
4 for asking these questions in this survey?

5 A (Mileti) I don't think I'll ever really understand
6 the purpose of asking these questions.

7 JUDGE HARBOUR: Mr. Fierce, I was hoping to interject
8 something here. In that question that you're talking about all
9 of the names of the -- the names of all of the towns in the EPZ
10 are there. You are assuming that a person reading that would
11 recognize that those are all the names, and would therefore
12 would respond in that way. Is that, I think, is what you're
13 surmising?

14 Is it not just as accurate to say that all the names
15 of the towns are there so that anybody who read it would
16 recognize the name of his town, and would respond because his
17 town was named?

18 MR. FIERCE: I think that's right.

19 JUDGE HARBOUR: Well, doesn't that change the premise
20 of the question that you were just asking?

21 MR. FIERCE: Well, I'm asking him if he understands
22 what the point was that the survey researchers were trying to
23 accomplish in engaging in this series of questions.

24 He thinks it was to measure what the response would
25 be in response to that.

1 In fact, this goes to the issue of how much
2 travelling around, and in which direction people would go after
3 being given an instruction to evacuate, and goes to the issue
4 in the ETE portion of the case whether people will travel on
5 their intended evacuation routes or be heading towards other
6 destinations, and how many vehicles they would be using to
7 evacuate. These are two other important points that are in
8 contention with respect to the evacuation time studies.

9 And if it is important to know what the purpose is
10 when conducting survey research in order to assess whether
11 you've got some usable results, I'm asking him now whether he
12 understood when he did that critique what the purpose was in
13 doing this?

14 JUDGE HARBOUR: Then why don't you ask him if he'd
15 think that'd accomplish the purpose?

16 MR. DIGNAN: You're asking this witness, as I
17 understand it, if he understands the purpose that was in the
18 mind of the survey makers, and we're being told by the unsworn
19 witness that this 274 really didn't make a whole hill of beans.

20 Well, if what they wanted to know is where people
21 would go, why didn't they just ask, well, assuming you were
22 told to evacuate, and assuming you went, where would you go/

23 Why do we have -- I mean, I could conjure up a lot of
24 these kind of questions, too, but I'm not sure it gets us
25 anywhere.

1 MR. FIERCE: Because we wanted to make it --

2 MR. DIGNAN: Why isn't the direct question asked of
3 the -- assuming you were told to leave and assuming you decided
4 to leave, where would you go, instead of leading in with this
5 thing?

6 Not that I think it's important one way or another,
7 but now we're told by the Commonwealth that this question had
8 no importance and he doesn't understand why our witness is
9 concerned about it. Where is it getting us?

10 If they want to admit 274 is a throwaway question,
11 fine. I'll stipulate and we'll go from there. I don't see
12 where the cross is taking us, Your Honor.

13 And the Board can disregard all data that came out of
14 274, and I'm for that. I really truly don't understand where
15 this line is taking us, Your Honor.

16 MR. FIERCE: I really believe the witness didn't
17 understand the purpose of the survey, and therefore is
18 incompetent to critique this portion of it. That's the point
19 here, Your Honor.

20 MR. DIGNAN: All right, if the questions are designed
21 to test Dr. Mileti's competence and credibility to critique a
22 survey, I guess I have no objection. Have at it.

23 JUDGE SMITH: Did you want to take a break? Do you
24 want to go to lunch?

25 MR. FIERCE: It's your pleasure.

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JUDGE SMITH: All right, return at 1:10.
(Whereupon, the noon recess was taken.)

1 A F T E R N O O N S E S S I O N

2 JUDGE SMITH: Proceed, Mr. Fierce.

3 MR. FIERCE: Thank you.

4 BY MR. FIERCE:

5 Q Good afternoon, Dr. Mileti, Dr. Spencer.

6 Dr. Mileti, on page 22 of your Testimony No. 3,
7 Rebuttal Testimony No. 3, you raise a concern about the answers
8 that were read to respondents after Questions Nos. 20, 31, 274
9 and 312, and those answers, the options the respondents were
10 given were (1) go about your normal business; (2) stay inside
11 your home; or (3) leave your home, place where you are and go
12 somewhere else.

13 And you indicate that you believe these categories
14 are not mutually exclusive nor exhaustive, and that it would be
15 possible for some people to be doing some of these things
16 simultaneously.

17 On this point, Doctor, you are aware, are you not,
18 that a pretest was performed by Social Data Analysts, and the
19 parties administering this survey for them, with respect to the
20 questions that were utilized on this survey, yes or no? Are
21 you aware?

22 A (Mileti) I have a vague recollection that a pretest
23 was talked about. I can't remember whether it was here on the
24 survey done on Long Island.

25 Q And you didn't perform any empirical tests? You

1 didn't perform any empirical tests with respect to the answers
2 to these four questions, did you?

3 MR. LEWALD: Are you talking about the pretest?

4 MR. FIERCE: I'm asking Dr. Miletì whether he
5 performed any empirical tests with respect to these four
6 questions.

7 THE WITNESS: (Miletì) Not directly with respect to
8 these four questions. However, I have done empirical work that
9 leads me to conclude that the, for example, in response to
10 Question 274, the choices (1), (2), and (3) are not
11 comprehensive nor mutually exclusive, list the categories about
12 what people do in response to getting emergency information.

13 BY MR. FIERCE:

14 Q Isn't one of the reasons for doing a pretest to
15 determine whether questions which might have some potential
16 confusion or ambiguity about them in fact lead to responses
17 which reflect that?

18 A (Miletì) There are many different reasons for doing
19 pretests. One of them certainly is, yes, to determine whether
20 or not the questions have -- if respondents can understand the
21 words, and to determine if face validity exists -- and there
22 are also many other reasons that pretests could be done to
23 determine more sophisticatedly whether or not face validity in
24 fact exists.

25 Q Isn't it true that those who did the pretest with

1 respect to these four questions and the answers given for them
2 are in a better position to judge whether respondents perceive
3 them to be ambiguous or confusing in any way?

4 A (Mileti) They sure would be in a better position to
5 judge whether or not the respondents thought they were
6 confusing in terms of being able to understand the words, yes.
7 That doesn't necessarily go to whether or not they'd be in a
8 better position to talk about other things, or whether they'd
9 have an advantage.

10 And I think actually have some -- a lot of a
11 disadvantage in terms of not coming up with a good set of
12 responses based on what people do in emergencies, versus their
13 perceptions of what people do in emergencies as well as in the
14 pretest, if they used a pretest to develop answer categories,
15 what persons thought they might do in an emergency even though
16 they might never have experienced it.

17 Q I want to move to the Rebuttal Testimony No. 4, which
18 pertains to the Luloff beach blanket survey, and ask Dr.
19 Spencer a couple of questions about his testimony in Part 1.

20 Again, I want to try to understand exactly what your
21 concern is here, Doctor, with respect to the randomness of the
22 sampling on the beaches, and can you briefly tell me whether
23 your concern is simply that the procedures utilized required
24 the people administering the survey to gather those respondents
25 from what essentially would be three lines down the beach,

1 about a third of the way to the beach, the mid-line, and a
2 third of the way to the seawall.

3 Is it that fact alone that generates the lack of
4 randomness in this survey?

5 A (Spencer) There was no randomness in this survey.

6 Q With respect to the sampling technique, what was your
7 concern about randomness?

8 A (Spencer) My concern is that we had a population of
9 people on the beach, and without going into issues of whether
10 you could generalize in any way from this population that was
11 on the beach on those days at those times to a larger
12 population, without going into those issues, we can talk about
13 surveying the people who were on the beach at the given times
14 that the survey was taken.

15 Now, a subset of those people were interviewed. But
16 that subset was not a random sample, because there was no
17 deliberate random selection of individuals from those on the
18 beach.

19 Q Why wasn't the method used essentially a random
20 methodology of picking beach blankets on the beach to
21 interview?

22 A (Spencer) Why was it not essentially a random
23 sample? For a sample to be a random sample in the accepted
24 sense of the word, there has to be a deliberate randomization
25 introduced, the equivalent of a coin toss, or a roll of a die,

1 or the draw of a number from a table of numbers that was
2 generated to be random numbers, but no such mechanism was used.

3 Q The mechanism that was used was to start at the
4 midline and walk halfway to the water's edge and pick a blanket
5 there. Then walk back to the midline, go a few paces forward,
6 turn toward the beach wall, the seawall, walk halfway to the
7 seawall, and walk half way to the seawall and pick the blanket
8 there. The blankets that were sampled were not preselected;
9 they were interviewed applying this particular technique.

10 A (Spencer) Okay, as I understood the description of
11 the sample, it wasn't clear whether the interviewer was to
12 stand at the position and pick one of the nearby blankets or
13 whether the person, the interviewer, was going to just pick the
14 blanket that exactly fell in the demarcated spot, and how
15 closely these rules were followed.

16 So it seemed to me that the beach was carved up, at
17 least conceptually, into strips, and each strip was divided
18 into subsections, and then the interviewer would pick a blanket
19 from each subsection, so that the interviews would be
20 guaranteed to be spread over at least the beaches that they
21 were trying to take interviews at on those days and those
22 times. But that the selection of the beach blanket was up to
23 the -- within the area -- was up to the discretion of the
24 interviewer.

25 A true random sample would have said, okay, here we

1 are in this area, we have five beach blankets here; let's draw
2 a number from one to five, and that will tell us which blanket
3 we should conduct the interview at.

4 Q The instructions were to pick the beach blanket that
5 was there or the closest beach blanket, were they not?

6 A (Spencer) I would have to read the exact
7 instructions. I tried to summarize the instructions in my
8 rebuttal to find the exact instructions as described in the
9 Attachment 4. Could I?

10 I read from page 2 on Attachment 4, "Groups of
11 interviewers ranging from two to three individuals per team
12 were assigned to each of the four areas. When they arrived at
13 these areas they were instructed to find the midline between
14 the water's edge and the seawall, or other equally defining end
15 of the beach area, and to establish a distance of the beach
16 area they were responsible for covering.

17 "Once this had been established, each individual was
18 told to divide the beach area into roughly equivalent pieces,
19 and to begin the sampling process by walking several paces
20 along the midline and then turn towards the water and walk a
21 distance halfway from the midline to the water's edge.

22 "Once this had been accomplished, the interviewer was
23 to target beach blankets as the sampling unit, and seek out the
24 driver of those among the individuals on the blanket."

25 And that is the extent of the detail on how the beach

1 blankets were selected.

2 Q You think it would have made a significant difference
3 in the results --

4 A (Spencer) Yes, I do.

5 Q -- if the beach blanket surveyors, having paced off
6 pathway to the water's edge or the beach wall, would have
7 interviewed the very closest beach blanket?

8 A (Spencer) Yes. That still would not have been a
9 random sample, or necessarily a representative sample, of the
10 beach blankets on the beach at that time.

11 However, so that meant that I would not have found
12 that method satisfactory, either.

13 Q And this is your basis for concluding that the sample
14 is not random?

15 A (Spencer) No. My basis for concluding the sample is
16 not random is that a random sample is something that's well-
17 defined in statistical books, in survey practice. And this
18 sample was not a random sample. The essential criteria --
19 there are many steps that have to be taken for a survey to be a
20 random sample. But the essential one is that deliberate
21 randomization has to be introduced.

22 And there was none of that here. This was not a
23 random sample.

24 Q You are aware that the population on the beaches is a
25 shifting population?

1 A (Spencer) I'm not sure what you mean by shifting
2 population.

3 Q That from one hour to the next, or one morning to the
4 afternoon, or one day to the next, or one week to the next, the
5 population varies.

6 A (Spencer) Meaning different people at the beach?

7 Q Different people; different amounts of people;
8 different proportions of people, from one beach to the next?

9 A (Spencer) Yes, I am aware of that.

10 Q When you have that sort of a situation, isn't it in
11 fact impossible to achieve the kind of random sample of a well-
12 defined group that you are talking about?

13 A (Spencer) No. No, it's not impossible.

14 JUDGE SMITH: Are you done with this line?

15 MR. FIERCE: Yes.

16 BY MR. FIERCE:

17 Q On page 6 of your testimony, Dr. Spencer, you in fact
18 make a comparison between the sampled proportions from four
19 beaches, Hampton, North Hampton to 101-C, 101-C to Odiorne
20 Point, Seabrook beaches, with the proportions of the people on
21 the beaches when observed by what I would call the Derman
22 photographs. Are those the photographs that you're talking
23 about here? The Derman photographs taken on July 18th in the
24 early afternoon?

25 A (Spencer) I don't know. I didn't see those

1 photographs. These proportions were provided to me by Karen
2 Larson.

3 Q In fact, that is a snapshot of the proportions of the
4 population on the beaches that existed at one moment in time,
5 isn't that true?

6 A (Spencer) I don't know if the snapshots were taken
7 at -- all at one time or not.

8 Q They were taken all at one point in time, Dr.
9 Spencer. And we know that the population on the beaches is a
10 shifting one, the proportions change from time to time. What -
11 - strike that.

12 This comparison is meaningless, isn't it?

13 A (Spencer) The reason I introduced this comparison
14 was because it wasn't clear to me how the sample sizes for the
15 different beaches were determined because there was no random
16 sampling. It's not as if all possible sites along the beach
17 fronts were chosen at random, which would have given you a
18 proportional sample, so that if you had done that, the -- to a
19 good approximation -- the proportion of beach blankets on the
20 beach in the sample would have been proportional to the number
21 of beach blankets that were actually on the beach.

22 But you didn't have a random sample, so in some way,
23 unknown to me, the target numbers of interviews for the beaches
24 were set. Or perhaps they weren't even set, perhaps they just
25 took as many interviews as interviewers could complete on the

1 beaches on those days.

2 So it's possible that some beaches had far -- had a
3 disproportionately large number of interviews occurring on
4 those beaches, and that suspicion occurred to me. And I think
5 it's very plausible that that happened, and so I took these
6 numbers as a point of comparison.

7 Q But in fact, that suspicion that they might not have
8 picked the appropriate proportions is neither confirmed nor
9 disaffirmed by looking at the proportions that would exist on
10 July 18, at roughly 12:00 midday, isn't that true?

11 A (Spencer) Let me see when the surveys took place.

12 Q But the point is, Dr. Spencer, this is a shifting
13 population; there is no fixed percentage of people that visit
14 these beaches. The proportions vary from time of day, to day
15 to day.

16 A (Spencer) Well, I don't know how much shifting
17 occurs. I don't know comparing North Hampton -- 101-C to 101-C
18 -- Odiorne Point, the sample proportions are in the ratio of
19 roughly three to two; the proportions from the photographs are
20 in the ratio of one to two. So from the aerial photos, you're
21 getting twice as many people on one beach as the other; and in
22 the sample, you're getting one third. So that's quite a shift.
23 Maybe these shifts do occur.

24 Q Doctor, on the next page -- well, on the bottom of
25 that page is a sentence which begins, "In addition, it appears

1 that certain sections of the shorefront may not have been
2 represented at all in the survey," and you list a number of
3 beaches.

4 Q (Spencer) Yes.

5 Q How did you know that these beaches were not included
6 in the survey?

7 A (Spencer) I had the data, the data file that was
8 produced by Luloff, and on that there were some entries as to
9 where the interviews took place, what beach. And then I
10 compared those entries against a map of the beaches and noticed
11 that the beaches listed were not reflected in the answers to
12 the survey.

13 Q You had originally listed Rye Beach, but I see in
14 your errata, you've taken that off?

15 A (Spencer) Right.

16 Q That was a mistake?

17 A (Spencer) That was a mistake. That was in the data,
18 in the data file.

19 Q North Beach was in the data file, too, wasn't it?

20 A (Spencer) I don't believe so.

21 Q Little Boars Head was in the data file, too, wasn't
22 it?

23 A (Spencer) No. I looked at these. I did a
24 comparison just yesterday morning to check, and the only
25 overlap was Rye.

1 Q Did you see the words Boars Head listed on that data?

2 A I believe, if I recollect, there were several Boars
3 Head Beaches.

4 Q That is correct.

5 A (Spencer) And since I've only listed Little Boars
6 Head, some "Boars Head" must have been in the data file. But
7 not Little Boars Head.

8 Q But you saw the words Boars Head and saw that it had
9 been assigned to the beaches, there were four categories of
10 beaches: Hampton, Northampton to 101-C, 101-C to Odiorne
11 Point, and the Seabrook beaches, do you know in which of those
12 four categories Little Boars Head would go, and in which of
13 those categories Boars Head Beach would go?

14 A (Spencer) I would have to look at the file.

15 Q Conceivable you made a mistake there, isn't it?

16 MR. TURK: Objection. Anything is conceivable, Mr.
17 Fierce.

18 BY MR. FIERCE:

19 Q Where is Bass Beach, Dr. Spencer?

20 A (Spencer) I don't have the map in front of me, and i
21 don't remember where these beaches are.

22 Q Do you know whether any significant number of people
23 on a busy weekend would be at Bass Beach?

24 A (Spencer) No, I don't.

25 Q Do you know whether any significant number of people

1 on a given busy weekend would be at Foss Beach?

2 A (Spencer) No, I don't.

3 JUDGE SMITH: Is the thrust of your examination on
4 this point? Is it? I do not have the cross-examination plan
5 on this, do I?

6 MR. FIERCE: This is Item XVII on the bottom of page
7 3. And I'm moving now to Item XVIII.

8 JUDGE SMITH: Is the thrust that you disagree with
9 his conclusion that the sampling was not random, or that
10 sampling was not attainable nor was it -- I mean, randomness
11 was not attainable, nor was it necessary to reliable results?

12 MR. FIERCE: Perfect randomness of the sort I believe
13 Dr. Spencer is talking about is not obtainable, given the
14 shifting nature of the population, and, yes, as well, the
15 second point, that kind of randomness was not required, given
16 the purpose and nature of the survey.

17 MR. LEWALD: That was not the witness's testimony.

18 MR. FIERCE: He's asked me what my point is.

19 JUDGE SMITH: Well, all right. He's trying to
20 extract this on cross-examination, and I was, I think that
21 that's an area that you should be going into, but can't you go
22 into it a bit more directly?

23 MR. FIERCE: Well, Dr. Spencer --

24 JUDGE SMITH: Well, were you done? Were you finished
25 with it?

1 MR. FIERCE: I was going to move on to Number XVIII
2 on my cross-examination plan.

3 JUDGE SMITH: All right.

4 MR. FIERCE: Given what you've just said, I feel
5 encouraged to ask a few more questions, however.

6 JUDGE SMITH: All right, suit yourself.

7 BY MR. FIERCE:

8 Q Dr. Spencer, with respect to the -- well, with
9 respect to the purpose for which this survey was conducted, are
10 you aware of what that purpose was?

11 A (Spencer) It had to do with people's mode of
12 transportation to and from the beach.

13 Q Are you aware that one of the purposes of the survey
14 was to gather a data base with respect to people on the beaches
15 at various -- on various days, who are both male and female,
16 who are young, middle aged, and older folks, and using that
17 data base as a starting point, be able to at least make some
18 conclusions, general, perhaps, conclusions about assumptions
19 that have been made by planners with respect to Seabrook,
20 without necessarily looking to see whether 42 percent or 43
21 percent of a given population again answered a particular
22 question a given way.

23 A (Spencer) Am I aware that the intent -- let me see
24 if I can restate your question, to make sure I understand it
25 right. Am I aware that the intent of the survey, or one of the

1 intents --

2 Q One of the intents.

3 A (Spencer) -- was to create a data base, so that
4 statistics could be run, and analyses could be conducted. I
5 assume that. I mean, that's typically why people do surveys
6 and put the data into the machine-readable form, is to have a
7 data base to be able to analyze. It doesn't mean the data base
8 is going to give you accurate results.

9 Q Well, the question is what is accurate, given the
10 purpose of the survey?

11 Is there any doubt in your mind that questions about
12 how far people are from their cars would be any significantly
13 different if a more perfect randomized survey had been
14 conducted than the one that was done here?

15 A (Spencer) Yes.

16 Q And what degree of significance is there?

17 A (Spencer) I don't understand the question.

18 Q Well, certain information was gathered about how far
19 generally people are from their cars, a range of time and
20 distance.

21 Do you think there would be any significant
22 difference in the outcome of a poll which were conducted using
23 some more perfect randomized data collection system?

24 A (Spencer) Yes.

25 Q How much?

1 A (Spencer) How much difference? I don't know. You
2 have people missed at some beaches. You have, I think,
3 disproportionate numbers selected from some beaches. Do people
4 have to park? Can people park closer to the beach in some
5 beaches than other beaches? Do some beaches tend to attract
6 more bicycle riders, or walkers, or people coming on buses?
7 Who did the interviewers tend to select? Did they tend to
8 select smaller groupings or larger groupings, or friendlier
9 looking groupings? They apparently avoided people who were
10 very close to the seawall or close to the water's edge.

11 There are many ways that this doesn't represent the
12 population at the beach at the time the surveys were conducted.
13 So I don't even know what the -- I don't recall what the
14 statistics were that came out of the survey, but if you ask me
15 do I think that they would differ significantly from the actual
16 numbers, could we get, had we conducted a good survey? Yes, I
17 think the differences would be significant.

18 Q Because they didn't pick up people on the seawall,
19 enough people from buses, enough bicycle riders, and --

20 A (Spencer) Because there was no randomization used.
21 This is a survey -- I mean, random samples are so widely used
22 for good reason. This kind of a sample is just hardly ever
23 conducted, and not for -- not to my knowledge in industry, or
24 they're not called really samples, when they're done like this.
25 Certainly not in government work, because the conclusions just

1 can't be relied on.

2 MR. TURK: Your Honor, I was simply going to note, so
3 much for the phrase, "close enough for government work."

4 As a government lawyer, I've had --

5 MR. TRAFICANTE: Can we ask how long it's taken you
6 to get that line out?

7 JUDGE HARBOUR: Be careful, there's already been one
8 motion for recusal based on that statement.

9 MR. FIERCE: Your Honor, I have no further questions
10 for this particular panel on these two pieces.

11

12 (Massachusetts Attorney General's
13 Cross-examination Plan for
14 Applicant's Rebuttal Testimony
15 Nos.1, 2, 3, 4 and 5 follows:)

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ATTORNEY GENERAL JAMES M. SHANNON'S
CROSS EXAMINATION PLAN FOR
APPLICANTS' REBUTTAL TESTIMONY NOS. 2, 3, 4 AND 5
(Dennis Mileti and Bruce Spencer)

- I. Ascertain who wrote the various portions of No. 3 and No. 4.
- II. Establish that Dr. Mileti can not provide an objective critique of these surveys because of his own personal bias against all behavioral intention surveys, and Dr. Cole personally.
- III. Summarize the opposing views of Mileti and Cole and question whether the recent Shoreham decision weakens Dr. Mileti's claim that if EBS messages are drawn to his specifications they will be "good". In LPB 88-2, his EBS messages were found to have "fundamental flaws".
- IV. Question whether Dr. Mileti is competent to judge the validity or reliability of telephone surveys.
 - A. Dr. Mileti's effort to include in his own previous testimony telephone survey or poll -- a portion of his testimony the results of an unreliable survey or poll -- a portion of his testimony that was stricken as unreliable, unscientific hearsay -- indicate that Dr. Mileti is a poor judge of the reliability of such surveys.
- V. Ask Mileti and Spencer for their views on the First Market Research telephone survey, relied upon by Ed Lieberman in his preparation of the ETE study.
 - A. Explore their views on "call backs"
 - B. Are behavioral intention surveys okay if done for the applicants?
- VI. Do Mileti and Spencer agree with this statement on p. 88 of Applicants' Direct Testimony No. 7, sponsored by panel on which Mileti participated:

Another approach to assess whether the potential for bias is actually manifested as real, significant bias, is to compare the data obtained by the survey, with the same, or similar data obtained from other sources. If there is essential agreement between elements of the survey data set and those of other sources, then the prospect of systematic bias of significant extent can be dismissed.

VII. Get Mileti to acknowledge that, in his view, there is "essential agreement" between (1) the data generated by the Cole survey about the extent of voluntary (shadow) evacuation to be expected within the EPZ and (2) Mileti's own conclusion about the extent of "keyhole" shadow evacuation to be expected within the EPZ. Both Mileti himself and the Cole data suggest that it could be as high as 50 %.

VIII. Ask Mileti why, even with good public information, as many as 50% of the population might engage in voluntary keyhole evacuation? Is there something unique about this particular emergency response that leads him to believe that good public information won't be the key determinant of emergency response for up to 50% of the people?

-- If so, what is this difference?

-- If not, how can he be sure that good public information will be the key determinant with respect to such other emergency responses as:

-- where people will go (toward the official host community vs. other destinations)?

-- whether drivers will obey traffic guides or take the routes being "discouraged"?

-- whether drivers and occupants will abandon their vehicles after experiencing little or no movement for X hours?

-- whether role abandonment and delayed reporting to duty will occur?

On what rational basis do you assert that planners should assume that keyhole evacuation could be as high as 50% but that no one in the traffic streams will go anywhere except where they are told?

IX. What is the key determinant of emergency response for those whom Dr. Mileti believes will engage in voluntary keyhole evacuation? Isn't their situational risk perception shaped primarily by pre-emergency fear of radiation?

And isn't it possible for surveys of the type conducted by Drs. Cole and Luloff to measure, at least to some rough degree, the public's pre-emergency fears?

- X. If good public information cannot persuade as many as 50% of the population from evacuating sooner than they are told to do so, despite EBS messages specifically telling them there is no need to evacuate, then won't other kinds of emergency responses that are not addressed by good public information at all be even less subject to be influenced by good public information, e.g.

-- whether to stay with or abandon your car?

Wouldn't emergency planners be prudent to at least take a look at what the surveys suggest people might do after X hours of little or no movement?

- XI. Get the panel to acknowledge that the Cole and Luloff surveys do ask a number of questions which merely gather relevant information about the respondents and are not behavioral intention questions.

Ask Mileti: If you eliminate the questions in the Cole survey about Voluntary evacuation (on which there is substantial agreement between Mileti and Cole -- 50%), the survey is essentially an information gathering survey?

- XII. Establish that neither Dr. Spencer nor Dr. Mileti is aware of the current applied research industry standards for conducting telephone survey research (e.g., surveys done by N.Y. Times, Roper, Yankilovich, etc.) Neither is familiar with this part of the industry.

- XIII. Explore how Spencer got involved, what materials he reviewed, how much time he spent, how much he was paid etc.

- XIV. Get Spencer to acknowledge that it is possible for statisticians to compute the actual impact on the results of those factors he mentions which may affect the external validity, but he didn't do this. Without having done this he has no way of knowing whether the factors he mentions have any significant impact on the results.

- XV. Go through the discussion of external validity in No. 3, showing that Spencer's four points have no significant impact.

- XVI. Questions regarding internal validity No. 3.

- XVII. Questions regarding external validity of No.4.

- XVIII. Questions regarding internal validity of No. 4.
- XIX. Questions regarding No. 2 -- Traffic Guides.
- XX. Questions regarding No. 5 -- Panic.

1 JUDGE SMITH: Any other Intervenor?

2 MS. WEISS: Three lines of folly.

3 JUDGE SMITH: Three lines?

4 Is that your cross-examination plan?

5 MS. WEISS: Right here. I don't know where to put
6 this wretched thing.

7 CROSS-EXAMINATION

8 BY MS. WEISS:

9 Q Mr. Mileti and Mr. Spencer, my name is Ellyn Weiss.
10 I represent the New England Coalition on Nuclear Pollution.
11 Dr. Milenti, Dr. Spencer.

12 It's your opinion, Dr. Mileti, that behavioral
13 intentions, whether ascertained through whatever kind of
14 survey, are simply not good evidence about how people will
15 actually behave in an emergency, is that correct?

16 A (Mileti) In general, yes. Particularly in
17 emergencies that are rare events that people don't have much
18 experience with. I suspect that there could be a unique subset
19 of human beings that get evacuated for the flood hazard, for
20 example, along the Mississippi every year and have lived there
21 30 years, whose intentions would be based on enough experience
22 that it would be okay.

23 But not in reference to emergencies that are, by
24 definition, unique situations.

25 Q And that would presumably be true both for people who

1 have responded in this behavioral intention survey that they
2 would follow instructions, as it would be for people who
3 responded that they would not follow instructions, is that
4 correct?

5 A (Mileti) If we're talking about members of the
6 general public, and we're asking them what they might do in a
7 future emergency regarding advice about appropriate public
8 response, in general I would say yes.

9 Q And for emergency workers would it also be true that
10 a behavioral intention survey would not correlate well to their
11 actual behavior during an accident, or is there some
12 distinction that you were suggesting?

13 A (Mileti) It would depend on what kind of emergency
14 worker you're talking about. If we were talking about
15 emergency workers who have experience and are performing a role
16 a lot like their normal role, and that the role they'd be asked
17 to perform in a subsequent emergency is what we're considering,
18 then I would say their behavioral intentions might be more
19 reflective of what might actually occur.

20 However, I want to qualify that and say there are
21 some circumstances in which I might need to change my mind
22 about that or become more strong in my opinion about that. And
23 if we were talking about emergency workers who are being
24 trained to perform unique roles, I would not go with behavioral
25 intentions to convince me that they would perform their role.

1 I would rather look at what I know are the factors that affect
2 role performance in an emergency and cast an valuation on
3 those determinants, rather than self-reports.

4 But that's because I'm the sociologist I am.

5 Q And for nuclear -- when we're talking about an
6 accident at a nuclear power plant, we're talking about
7 something that hasn't occurred before, and at least some of
8 these people would be asked to perform functions which they
9 haven't ever performed before?

10 A (Mileti) Well, no. There have been accidents at
11 nuclear power plants before. I presume you meant to say here
12 at Seabrook?

13 Q Yes.

14 A (Mileti) And for some emergency workers, as I know
15 about them at Seabrook, some of them would be engaged in
16 behaviors they have done before, and I would imagine, although
17 I don't know anything about what's going on in Massachusetts, I
18 think there's a utility-sponsored response plan and I would
19 just bet, but I have no evidence on this, that that would
20 involve utility workers being trained to do emergency response.

21 Q And generally, the degree to which you could
22 correlate statements of behavioral intention with what you
23 would actually expect to happen during an accident would
24 depend, in the case of emergency workers, on a variety of
25 factors, one of which is whether they are asked to perform a

1 function which it is their normal duty to perform, and which
2 they have performed in the past?

3 A (Mileti) Indirectly, I would prefer saying what
4 evidence suggests is the clear reason why people do or don't
5 perform emergency work in an emergency, is whether or not they
6 have a clear understanding before the emergency of what their
7 emergency job is. And it is true that experience in performing
8 that role is one way they could learn that. Training is
9 another way that they could learn that.

10 So those are the sorts of things I would look at
11 rather than behavioral intentions.

12 Q You mentioned that there are other situational
13 factors during an emergency which would affect the response of
14 the various people to a greater or lesser extent, depending
15 upon how good the emergency information was, is that a correct
16 summary of your opinion?

17 A (Mileti) In general, but I had to qualify that when
18 that very such statement was made to me yesterday. I suppose I
19 should qualify it again, and that is that I would define
20 emergency information presuming that there would be conflicting
21 information in the future emergency, and talk about a subset of
22 that, the emergency information system, the formal emergency
23 information system, as one in which I would like to see good
24 information.

25 And if that exists, I would suspect that other

1 factors would play a lesser role.

2 Q Could you describe to me those other situational
3 factors?

4 A (Mileti) There, if we're talking about the behavior
5 of the public, are five categories of factors that prior
6 research has found to correlate with public behavior in prior
7 emergencies. I hope I can remember them all.

8 One of them is factors associated with a person's
9 position in a complex society, status factors, for example
10 whether someone's a man or a woman; whether they are employed
11 or unemployed; whether they have a religious orientation to
12 life or not, et cetera.

13 Second category of factors are psychological factors.
14 For example, locus of control, whether someone perceives in
15 general that they could control their own destiny versus give
16 control of their destiny to some externality, for example, God
17 or some other external force.

18 Their ability to process information; their ability
19 to process risk information, et cetera, are two categories.

20 The third category would be factors associated
21 -- I can't remember the other three categories, but they're in
22 my Shoreham testimony.

23 Q I'm probably the only one who hasn't read it.

24 A (Mileti) But the kind of baggage people as
25 individuals bring with them throughout life.

1 Oh, I remembered another category: their situation.
2 The situation they happen to be with at the time the emergency
3 begins, who they happen to be with, for example. Whether their
4 family is united or not united, for example; whether they're
5 shopping or not shopping; whether they're at home or not at
6 home. So, their situational context.

7 Q So these are a variety of factors, if I understand
8 it, which would affect the degree to which people follow the
9 instructions that they get, in addition to the goodness of the
10 emergency information, the quality of the emergency
11 information.

12 There are a variety of other factors. You have
13 mentioned three. There are a couple of others?

14 A (Mileti) No, I wouldn't agree with what you just
15 said. What I would say is these factors could operate to
16 determine what kind of judgments people make about what to do
17 in an emergency, and then what in fact they end up doing.

18 That, in the case when good emergency information
19 exists, the influence those factors would have would be
20 substantially less. And that, in a case where emergency
21 information was extremely poor, for example, like at the Three
22 Mile Island accident, it's these other sorts of factors that we
23 would need to resort to in order to explain variation and the
24 differences we observed in human behavior.

25 Q Now, you participated, as I understand it, in

1 preparing the prototype EBS messages, is that correct, in the
2 drafting of those?

3 A (Mileti) Here at Seabrook, I did critique them and
4 gave comments to people and re-critiqued them, and -- yes,
5 absolutely.

6 Q And it's your opinion that those good prototype
7 messages, correct?

8 A (Mileti) Well, it depends on which you mean when you
9 say those, because there have been so many different versions.

10 Q The ones that are attached to the direct testimony in
11 this case.

12 A (Mileti) I'm not sure I remember which ones are
13 attached to the direct testimony in the case. I remember that
14 the most recent version that I know of that the utility gave to
15 the Massachusetts Attorney General's office was the set we
16 talked about yesterday, and then in the last time I was cross-
17 examined, we even discovered an oversight, that needed to
18 suggest that something in those be changed.

19 Q We learned from your testimony yesterday that, if we
20 didn't already know it, that those exact messages would not in
21 fact necessarily be the message that goes out over the EBS
22 system during an actual emergency. You would expect, in fact,
23 for it to be altered depending on the circumstances that are
24 occurring at the time, correct?

25 A (Mileti) I would hope that it would be altered, such

1 that the EBS message would suit the character of the emergency
2 being experienced, yes.

3 Q And we know that that happened at Shoreham, and that
4 the alteration led to confusion, is that correct?

5 A (Mileti) No. What we know happened at Shoreham is
6 that somebody, and I said yesterday I don't know who they were,
7 adapted the prototype EBS messages, and as a consequence, if
8 you will, violated some of the basic rules that I would put
9 forth as standards by which to judge EBS messages, and didn't
10 violate others.

11 And that some of that came out in the litigation,
12 volunteered by me, in the typical way that things come out in
13 these sorts of things.

14 Q Well, I'll accept that characterization. I summed it
15 up as confusion, but I'll accept your characterization. It's
16 certainly more precise than mine.

17 Do you know who it is, what individual or
18 individuals, would have the authority to determine the content
19 of the EBS message at Seabrook should there be an accident?

20 A (Mileti) I have a vague impression, but I certainly
21 don't know for sure. I suspect the final word might lie with
22 the Governor of the State of New Hampshire, but I can't say. I
23 don't know for sure.

24 Q Do you know what training either the governor or the
25 person underneath him who would actually be drafting the

1 message has in the principles that you've discussed for clarity
2 and avoiding confusion?

3 MR. TURK: Objection. I think the prior answer
4 indicated that the witness was not aware who it would be, in
5 fact, who would be drafting the message. And I didn't hear any
6 reference to the person underneath the governor?

7 MS. WEISS: Well, there was a response that it's his
8 belief that the governor would be the person passing on the
9 matter.

10 JUDGE SMITH: Do you know whether the person, whoever
11 it may be, has the training to make an ad hoc adaptation of
12 the messages?

13 THE WITNESS: (Mileti) I haven't any idea.

14 MS. WEISS: I have no further questions.

15 MR. BACKUS: I have just basically one question for
16 Dr. Mileti.

17 CROSS-EXAMINATION

18 BY MR. BACKUS:

19 Q I'm Bob Backus, Dr. Mileti, representing the Seacoast
20 Anti-Pollution League. You've said, Dr. Mileti, in your
21 opinion about emergency workers responding that in the
22 emergencies you've studied, they do.

23 Is it your understanding that, in the event of a
24 radiological emergency, the emergency workers would have to use
25 personal dosimeters as part of their equipment?

1 A (Mileti) There certainly have been -- do you mean
2 here at Seabrook, or just in --

3 Q At Seabrook.

4 A (Mileti) It's my impression that some will be
5 provided with dosimeters. I don't recollect precisely what
6 categories of emergency workers will, and what categories
7 won't.

8 Q Okay, now let's just assume that basically the
9 emergency workers that are performing their duties within the
10 emergency planning zone, or where protective action has been
11 recommended, are wearing dosimeters. Then the intent of those
12 would be to give those emergency workers some indication of the
13 risk they were facing personally, would it not?

14 MR. TURK: Objection. I don't see the tie to the
15 testimony.

16 MR. BACKUS: I think Dr. Mileti just spoke about his
17 expectation of emergency worker response at the start of the
18 examination by Attorney Weiss. I'm just following up on that.

19 MR. TURK: I still have the objection, Your Honor.

20 (The Board confer.)

21 JUDGE SMITH: You're just building from her
22 examination and you're going to the area of dosimetry?

23 MR. BACKUS: Right, as a distinguishing thing between
24 the way emergency workers might respond in an event at Seabrook
25 as opposed to what Dr. Mileti's testified about in other

1 emergency situations.

2 JUDGE SMITH: Well, I think you've strayed too far
3 from the direct examination.

4 Ms. Weiss's examination should have been for another
5 purpose, and I assume that it is. And if it wasn't, then it
6 would have been out of order, and that was to test the
7 messages. And now you've gone beyond that.

8 MR. BACKUS: Well --

9 JUDGE SMITH: Sustained.

10 MR. BACKUS: Nothing further.

11 JUDGE SMITH: Mr. Turk?

12 MR. TURK: I have one limited line, Your Honor.

13 CROSS-EXAMINATION

14 BY MR. TURK:

15 Q And this is to Dr. Spencer.

16 Sir, I am attorney Turk with the NRC staff, and I
17 note I join Mr. Fierce in praise for our alma mater,
18 Northwestern.

19 This goes to your curriculum vitae.

20 A (Spencer) Yes, sir.

21 Q I notice among the different articles and books
22 you've listed is one, Article No.17, A-17, which is labelled as
23 "Uncertain Population Forecasting." Did that article involve
24 estimates, or projected estimates, of future populations?

25 A (Spencer) Yes. We looked at this. Alho wrote his

1 dissertation under me, and this is an article based on his
2 doctoral dissertation in statistics.

3 We looked at forecasts of population that the Census
4 Bureau produced, and tried to see how accurate they were. The
5 Census Bureau -- it's very tough to predict the future,
6 obviously, and the Census Bureau comes up with a high, medium,
7 and a low projection, but for planning purposes and for using
8 these, you need to decide, well, how probable is it that the
9 future population will lie between these values?

10 And Alhc and I tried to model the uncertainty and the
11 errors that get propagated through the forecasts to try to come
12 up with ranges so that you -- say, there would be a 70 percent
13 probability that the future population would lie between the
14 upper and lower bound. So that's what that article is about.

15 Q I wanted to ask you a question, hypothetically: if
16 you knew that an area was undergoing rapid growth in
17 populations, and you knew that you had a 15-year trend, let's
18 say from 1970 to 1985, and you had the more recent trend,
19 either the five-year trend, 1980 to 1985 or something along
20 that line, and you were trying to project the next year's
21 growth, what growth rate would you choose to come up with the
22 most reliable estimate of the next year's growth?

23 MR. FIERCE: Objection. This is beyond the scope of
24 the direct.

25 MR. TURK: Well, it's admittedly --

1 JUDGE SMITH: I will have to inquire --

2 MR. TURK: -- beyond the direct, Your Honor, but I
3 thought I could pick it up through the curriculum vitae.

4 JUDGE SMITH: The what?

5 MS. WEISS: Did you give him a test?

6 THE WITNESS: (Spencer) I'd be glad to send you the
7 article.

8 MR. DIGNAN: That's closer to the direct than some of
9 the stuff we've heard.

10 JUDGE SMITH: One of my board members thought that I
11 had sustained an objection which wasn't made earlier today.
12 And I thought I had heard a chorus of objections at that time.

13 But now, just to even things up, we just won't
14 sustain this objection. But we won't allow you to go any
15 further.

16 MR. TURK: May the question be answered?

17 JUDGE SMITH: No.

18 MR. TURK: I'm sorry, I didn't understand.

19 JUDGE SMITH: I can't possibly see why you're going
20 into this.

21 (continued on next page.)

22

23

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25

1 JUDGE SMITH: Are you seeking leave to cross-examine
2 this expert on that point with the representation that it is
3 necessary to develop the record or some other representation
4 because it simply is beyond the scope of the direct. It is
5 not -- you are not testing his credentials, that certainly
6 can't be, you're going into too much detail on that.

7 So, if you have a valid reason for opening --
8 reopening the record on this point and make that representation
9 we'll entertain it, otherwise you can't.

10 But if you do that you're inviting, and the Board
11 will take this into account, you're inviting a big problem that
12 we have here.

13 MR. TURK: Well, Your Honor, my purpose frankly was
14 to get back to a point which had been raised by one of the
15 Intervenor's witnesses.

16 JUDGE SMITH: Today?

17 MR. TURK: No. In testimony, I believe put forth by
18 Dr. Luloff, as I recall.

19 JUDGE SMITH: Boy, that sounds like testimony that
20 was stricken, too.

21 MR. TURK: The testimony that was stricken dealt with
22 a long range projected population growth. However, in the
23 supplemental piece of testimony proffered by Dr. Luloff, I
24 believe it was Dr. Luloff, he indicated in cross-examination
25 that he used the 1970 to 1985 growth rate for projecting the

1 one year growth in populations for the next year.

2 And in my cross-examination I sought to determine
3 whether or not that was the proper growth rate rather than the
4 more recent five or six year growth rate, which had been used
5 by Dr. -- by Mr. Lieberman in the ETEs, and that's the point to
6 this examination.

7 But if Your Honor is telling me that I'm opening the
8 door to --

9 JUDGE SMITH: Well, not only that, but you're making
10 him your own witness and it's all together improper.

11 MR. TURK: I subside.

12 JUDGE SMITH: Is that it?

13 MR. TURK: Yes.

14 JUDGE SMITH: Redirect.

15 MR. LEWALD: We have no redirect.

16 JUDGE SMITH: None.

17 (Board conferring.)

18 JUDGE LINENBERGER: One question. Dr. Spencer, this
19 morning in discussions with Mr. Fierce there came a point in
20 the discussion which I -- early on, which I cannot quite
21 recapture in its entirety, but conceptionally I didn't
22 understand it, in which you alluded to the lack, and these are
23 my words I don't think they were yours, the lack of a
24 comparative baseline that would allow you to cross-check for
25 validity in some form or other. And I d'd not understand that

1 statement in the following context: that if you had something
2 to compare against to critique a survey, something that you
3 considered acceptable to compare against to critique a survey,
4 why would there have been a need for the survey?

5 THE WITNESS: (Spencer) That's an excellent point.

6 JUDGE LINENBERGER: Sir?

7 THE WITNESS: (Spencer) That's an excellent point.

8 To respond to that, what you would compare it on -- sometimes
9 when you take a survey or -- and in these surveys we have
10 questions on a variety of different points. Now, maybe some of
11 these questions could be checked against census data, for
12 example, which would still have their own errors because the
13 census is out of date.

14 But you can try to check on some things where you can
15 check, and then you can try to see, well, if we don't check on
16 things that we know we should check on, then that makes us very
17 suspicious, that things that we can't check on also wouldn't
18 match up.

19 So it's by no means -- if you do check you could
20 still have discrepancies on the things that you can't check.
21 But if you don't match on things that you can check on, it
22 reinforces your suspicion about things that you can't check on.

23 JUDGE LINENBERGER: Thank you, sir.

24 JUDGE SMITH: That reminds me of the fact I did have
25 a question. Would you perhaps put questions in a survey which

1 weren't necessary to the survey, so that you can compare them
2 to a benchmark to test the validity of your sample, for
3 example?

4 THE WITNESS: (Spencer) Yes, you can do that. You
5 can also put questions in your survey that you're not
6 particularly interested in by themselves, but you can sometimes
7 get data about the nonrespondents on these items such as --
8 well, using geographical location, and try to do some
9 statistical corrections for nonresponse, is another way that
10 that gets -- it's very delicate to make it work right, but
11 things are used that way.

12 JUDGE SMITH: Anything further?

13 (No response.)

14 JUDGE SMITH: All right. Thank you, gentlemen.

15 (The witnesses were excused.)

16 MR. LEWALD: Your Honor, we would like to proceed to
17 introduce two other bits of testimony entitled Applicants'
18 Rebuttal Testimony No. 2, and also No. 5; and the panel would
19 consist of Dr. Mileti, who will be the sponsoring witness.
20 Whereupon,

21 DENNIS MILETI

22 having been previously duly sworn, was recalled as a witness
23 herein, and was examined and further testified as follows:

24

25

1 DIRECT EXAMINATION

2 BY MR. LEWALD:

3 Q Dr. Mileti, I show you a document in three pages
4 under the date of January 22, and the typo date 1987, the
5 document is entitled Applicants' Rebuttal Testimony No. 2 and I
6 ask you if you can recognize it?

7 JUDGE HARBOUR: Is that January 22nd or --

8 MR. LEWALD: January 22nd, 1987.

9 JUDGE SMITH: Correct that date, would you please
10 physically. Physically correct it.

11 MR. LEWALD: I will so physically. And I'll give the
12 Reporter -- do you want me to do it to all copies, Your Honor?

13 JUDGE SMITH: Well, just the one that gets bound.

14 BY MR. LEWALD:

15 Q I ask you, can you recognize that document, sir?

16 A (Mileti) Yes, I do recognize it, it's the rebuttal
17 testimony I prepared on this issue.

18 Q And is the information contained in that document
19 true to the best of your knowledge and belief?

20 A (Mileti) Yes, it is.

21 MR. LEWALD: I would like to offer it.

22 JUDGE SMITH: Are there objections?

23 (No response.)

24 JUDGE SMITH: All right. Applicants' Rebuttal
25 Testimony No. 2 is received into evidence and bound in the

1 transcript. And then following a transcript page will be
2 Applicants' Rebuttal Testimony No. 5, which is received.

3 MR. LEWALD: I haven't introduced No. 5.

4 JUDGE SMITH: Oh, excuse me. I thought you had them
5 both there.

6 (Applicants' Rebuttal Testimony
7 No. 2 was received in evidence
8 and bound in the transcript.)
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Dated: January 22, 1989

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

before the
ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)

PUBLIC SERVICE COMPANY)
OF NEW HAMPSHIRE, ET AL.)

(Seabrook Station, Units 1)
and 2))

Docket Nos. 50-443-OL
50-444-OL

(Offsite Emergency
Planning Issues)

APPLICANTS' REBUTTAL TESTIMONY NO. 2

(Rebuttal to the Corrected Testimony of
Dr. Avishai Ceder and Dr. Albert E. Luloff
on SAPL 31 and TOH III Regarding Drivers
Following the Advice of Traffic Guides)

Witness: Dennis S. Miletì

Community-wide emergencies, such as an evacuation following a nuclear power plant accident, are different from most other settings from a human behavior viewpoint; they are, behaviorally, a class by themselves. Aberrant, anti-social and individual-focused acts that sometimes occur in other settings dramatically fall off during community-wide emergencies. Fights, arguments and other manifestations of "putting-oneself-first" that can and do occur in the course of everyday social life all but disappear. The mechanism that fosters the decline of aggressive, aberrant, anti-social

acts and acts with individually-focused goals in community-wide emergencies does not prevail in most other social settings.

Communities in emergencies are transformed behaviorally at both the group and individual levels. Priorities shift, goals and objectives are transformed, and identifications change. The first priority becomes collective safety of people and the community. The prime goal and objective becomes serving the first priority. People shed racial, ethnic and other forms of personal identification and identify with the entire human collective or community that is at risk. This social psychological "shift" that characterizes emergencies results in the "falling-off" of acts and behavior that run counter to the good of the collective, which serve or stem from interests that are individual or personal. This "shift" would undoubtedly occur in an emergency at Seabrook or any other nuclear power plant for that matter. This phenomenon has been documented in every emergency studied by social scientists where it has been a topic of investigation; evidence of it can also be found in emergencies where it was not a formal topic of investigation. Perhaps because the popular image of the human behavior in such emergencies is so much the opposite of fact, most communities that experience an emergency come to boast of how "unique" are their local citizens and how they came together "when the chips were down."

Were an emergency to occur at Seabrook, the evacuating public would be affected by the "collective identification" which would typify all those persons experiencing the emergency. It is highly unlikely, therefore, that evacuees would behave in ways consistent with individual (seeking their own unique evacuation route) versus collective goals (following the recommended route of those directing traffic). It is, to go even further, equally unlikely that persons directing traffic would be harassed, verbally abused, physically assaulted or encounter other acts that would typify the behavior of people not affected by the "collective identification" which would occur among those experiencing the emergency. Traffic guides would not, therefore, be seen as targets for aggression or people "in the way". Rather, they would most likely be perceived as persons who are offering help and assistance that is useful to all those persons at risk.

1 BY MR. LEWALD:

2 Q Dr. Mileti, I show you another document in five pages
3 under the date of February 8, 1988 entitled Applicants'
4 Rebuttal Testimony --

5 JUDGE SMITH: We didn't get that corrected one.
6 I'm wrong.

7 BY MR. LEWALD:

8 Q -- Applicants' Rebuttal Testimony No. 5, and ask you
9 if you'd identify it, if you will?

10 A (Mileti) Yes. This is my rebuttal testimony on the
11 issue of panic.

12 Q And is the information contained in the document true
13 to the best of your knowledge and belief?

14 A (Mileti) Yes, it is.

15 MR. LEWALD: I would like to offer on behalf of the
16 Applicants and ask that it be bound in the transcript as if
17 read.

18 JUDGE SMITH: Are there objections?

19 (No response.)

20 JUDGE SMITH: The testimony is received.

21 (Applicants' Rebuttal Testimony
22 No. 5 was received in evidence
23 and bound in the transcript.)
24
25

Dated: February 8, 1988

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

before the

ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)

PUBLIC SERVICE COMPANY)
OF NEW HAMPSHIRE, ET AL.)

(Seabrook Station, Units 1)
and 2))

Docket Nos. 50-443-OL
50-444-OL

(Offsite Emergency
Planning Issues)

APPLICANTS' REBUTTAL TESTIMONY NO. 5

(Rebuttal to the Testimony of Dr. Avishai Ceder
and Dr. Albert E. Luloff Regarding Panic)

Witness: Dennis S. Miletì

It is a widespread myth that panic occurs in mass emergencies. Members of the public do not panic in emergencies of the type considered in this hearing; that is, emergencies that involve community or neighborhood. However, it is true that most people believe that panic occurs in all sorts of emergencies. This myth is perpetuated by, for example, Hollywood movies that have "panic" in their scripts. Hollywood and most people, however, are simply wrong. Panic in mass emergencies is a characteristic of science fiction and not scientific fact.

Those scholars who were pioneers in the research of

emergencies and disasters began their work expecting to discover public panic; they were surprised at not finding panic in the disasters which they investigated. These researchers, for example, include Robert Kutak, "The Sociology of Crisis; Lewisville Flood of 1937," Social Forces 17: 66-72, 1938; Enrico Quarantelli, "The Nature and Conditions of Panic", American Journal of Sociology 60: 26-27, 1954; Charles Fritz and Eli Marks, "The NORC Studies of Human Behavior and Disaster," Journal of Social Issues X(3): 26-41, 1954; William Form and Sigmund Nosow, Community in Disaster. New York: Harper, 1958 and Samuel Prince, who in 1920 completed his doctoral dissertation, "Catastrophe and Social Change, Based Upon a Sociological Study of the Halifax Disaster", at Columbia University on a human-made disaster.

Subsequent investigations of more contemporary emergencies and disasters have provided additional evidence on panic. Enrico Quarantelli has performed an elaborate analysis of panic. His now classic work on the topic was published as "The Nature and Conditions of Panic", American Journal of Sociology 60: 267-275, 1954 and "The Behavior of Panic Participants" Sociology and Human Research 41: 187-194, 1957. In 1964 he wrote a chapter titled "The Behavior of Panic Participants," pages 69-81 in D. P. Schultz (Ed.), Panic Behavior, New York: Random House, in which he offers several conclusions about panic. The panic participant: (1) "acts in a nonsocial manner in his flight behavior" (page

78), (2) "perceive a specific threat to physical survival" (page 73), (3) "is future-threat rather than post-danger orientated" (page 74), (4) "is nonrational in his flight behavior" (page 76), (5) is relatively aware of his activities" (page 75), and (6) is acutely self-conscious and fearful" (page 75). In addition, in 1975, Dennis Mileti, Thomas Drabek and J. Eugene Haas wrote a monograph titled Human Systems in Extreme Environment. Boulder, Colorado: Institute of Behavioral Science. That text (page 58) attempted to define the conditions or determinants of panic in emergencies, concluding that three conditions were critical for panic to occur: (1) a person perceives that a specific threat to his "physical survival" is imminent and, as a result of this situational perception, that person becomes fearful of his physical survival; (2) there are escape routes that, if traversed, are perceived as being able to offer "safety"; and (3) those escape routes are seen to be blocked or closing off such that they cannot be traversed.

The determinants of panic need not result in panic. History provides examples of when these conditions have existed, but panic did not occur; for example, these conditions have prevailed on sinking ships, yet stories by survivors indicate panic did not occur. However, these determinants must exist for panic to arise. These determinants would not exist in an evacuation from the areas around a nuclear power plant such as Seabrook, because people

would be leaving an open geographic area (rather than, for example a closed building) and their escape would not be blocked. The prototypical case in which the determinants (necessary but not sufficient) of panic occur is, for example, a major fire in a crowded theater or nightclub. These conditions do not prevail as potential characteristics in a vehicle evacuation. As a widely-cited study of evacuation prepared by Joseph Hans and Thomas Sells for the Environmental Protection Agency summed it up (see Joseph Hans and Thomas Sells. 1974. Evacuation Risk an Evaluation Washington, D.C.: Environmental Protection Agency, pages 43, 45, and 54): (1) many studies in the United States and in other countries of public reaction in emergencies have essentially dispelled the myth of panic, (2) the idea that people panic in emergencies and disasters is widespread; however, it is not borne out in reality; and (3) neither panic nor hysteria has been observed during evacuations.

An additional point about panic is worth making. Even people who over-perceive the risk or hazard present in an emergency, and who evacuate unnecessarily as a result, act in quite controlled and adaptive ways that are rationally consistent with their situational perceptions of risk. The notion that overreaction is not panic, hysteria, or aberrant behavior is borne out by studies of how people respond in actual emergencies. For example, Dennis Mileti, Donald Hartsough and Patti Madson wrote a report entitled The Three

Mile Island Incident; A Study of Behavioral Indicators of Human Stress in 1982. In this work they examined the frequency of automobile accident rates before, during, and after the Three Mile Island accident. They concluded that there was not evidence to suggest that accidents increased during the evacuation despite the fact automobile travel in the area was likely up because of evacuation. If the 141,500 "overresponders" at TMI were panic-stricken, hysterical or the like, surely traffic accidents during evacuation would have shown some decisive increase. In fact, the rate of traffic accidents were for all practical purposes the same as if no emergency were occurring. Additionally, the research of Drs. Johnson and Zeigler on evacuation of The Three Mile Island Accident concludes that the evacuation was characterized by a calm and orderly movement of people rather than hysterical flight.

1 MR. LEWALD: We have no other questions of Dr.
2 Mileti on these -- on Rebuttal 2 and 5.

3 JUDGE SMITH: Mr. Fierce?

4 MR. LEWALD: Dr. Mileti is available for cross-
5 examination.

6 MR. FIERCE: Thank you, Mr. Lewald.

7 CROSS-EXAMINATION

8 BY MR. FIERCE:

9 Q Dr. Mileti, I want to -- turning first to the
10 testimony No. 5 regarding panic in which you list three
11 conditions which are critical for panic to occur. And after
12 listing them you make a statement at the bottom of page three
13 that these determinants would not exist in an evacuation from
14 the areas around a nuclear plant such as Seabrook because
15 people would be leaving in open geographic area rather than,
16 for example, a closed building, and their escape would not be
17 blocked.

18 Doctor, it's not your testimony that panics have not
19 and do not occur in the out-of-doors, is it?

20 A (Mileti) No, I wouldn't say that it makes a
21 difference. Although the circumstances that lead to panic are
22 more likely found inside buildings. Certainly I could imagine,
23 for example, a ship sinking and somebody could be standing
24 outside. I wouldn't say that it's an indoor-outdoor
25 phenomenon, that's not a sociological variable.

1 Q But you are aware that --

2 JUDGE SMITH: Let me interrupt here a second. Do you
3 have a cross-examination plan for --

4 MR. FIERCE: I just have a few short questions on
5 this piece.

6 JUDGE SMITH: Okay. Now, did you give the Reporter a
7 copy of your cross-examination plan for the previous panel?

8 MR. FIERCE: I have not yet. I have it right here.

9 JUDGE SMITH: Remember to do that.

10 BY MR. FIERCE:

11 Q Dr. Mileti, there have been panic situations which
12 have occurred in open geographic areas; isn't that true?

13 A (Mileti) It depends on how you mean open geographic
14 areas. I certainly don't know of any.

15 JUDGE SMITH: Did you study the Buffalo Creek
16 disaster?

17 THE WITNESS: (Mileti) No, I didn't. I read Kai
18 Erikson's work on it, and it's my understanding that most of
19 the people that went through that disaster died in it.

20 BY MR. FIERCE:

21 Q Maybe I need to ask you how you would define the word
22 "panic" in an outdoor open situation?

23 A (Mileti) Panic is people engaging in -- and I tried
24 to define it in my testimony, so I'd like to refer you to the
25 definition which is Henry Quarantelli's, "people acting in a

1 nonsocial manner, engaging in flight behavior, perceiving a
2 threat to their physical survival," and then there's a further
3 description. But basically what that means in English is
4 persons so concerned about themselves that they step on the
5 persons' next to them's face and not notice it in an attempt to
6 flee what they consider to be a life and death situation; and
7 that if they don't act immediately death will come to pass.

8 But the bottom line is, being that aberrant towards
9 others, and there have been circumstances in the past and
10 likely will be in the future where those events materialize.

11 JUDGE LINENBERGER: Question, Doctor. Are you saying
12 the equivalent of terminology I will use to the effect that
13 they ignore any cooperation or withhold assistance to people
14 around them and look out only for themselves, is that the
15 equivalent of what you are getting at when you say, stepping on
16 the face?

17 THE WITNESS: (Mileti) No, I don't think so. I
18 think they might --

19 JUDGE LINENBERGER: Well, perhaps you can help me
20 here then, because I'd like to understand the distinction.

21 THE WITNESS: (Mileti) We're actually now talking
22 about three kinds of behavior. The kind you've just described
23 is one in which individuals are operating basically with an
24 individual motive. They may be doing what is in their own
25 self-interest.

1 In a panic situation people are doing that in the
2 absolute extreme. And what we find as communities experience
3 emergencies where entire communities are at risk is that,
4 that's not what occurs at all; that, in fact, people do help
5 one another in emergencies.

6 JUDGE LINENBERGER: That helps me. Thank you.

7 BY MR. FIERCE:

8 Q One of the points I'm unclear on with respect to your
9 testimony is whether panic behavior is a collective response by
10 a group of people or whether in fact you could have a given
11 individual or a few individuals in a larger group who could be
12 engaging in panic behavior; does that question make sense?

13 A (Mileti) It certainly isn't the way I'd ask it, but
14 I think I understand what you mean, so I'll attempt to answer
15 it. I think what you asked me, is it possible that a few
16 persons could panic and others don't? It's not generally been
17 experienced. What's generally experienced is that when panic
18 occurs it's a collective behavior, mass behavior, group
19 behavior, and it goes into crowd psychology perhaps even, as
20 well as there probably and behind your question, and I'm
21 assuming this, have been cases where people didn't panic but
22 might be seen to engage in individual selfish acts that may
23 have been incorrectly labeled as panic, but it certainly is not
24 panic behavior where they're behaving in ways inconsistent with
25 the good of the collective.

1 I'm not sure I understood your question. I tried my
2 best. If you'd like to try again, I'd be happy to again.

3 Q But I take it, it's your view that a panic situation
4 can occur at the beginning, anyway, with just a few
5 individuals?

6 A (Mileti) I'd be willing to hypothesize that in the
7 world of all human possibilities, but I don't know of any
8 empirical evidence. And that may only be because sociologists
9 haven't been there at the beginning to observe it. So, I don't
10 know, I can't say for sure. I do know that panic has occurred,
11 and I know the circumstances that exist, when it has occurred.
12 And I do know that there is no other issue I could be
13 questioned on that's more important than this one, in my mind.
14 Panic is not a way to characterize how human beings behave in
15 emergencies of the sort we're talking about here.

16 And that people ascribe to that myth so deeply in
17 this culture as in emergencies that have been experienced,
18 stood as a major constraint to making good decisions about
19 emergency management.

20 Q Are you familiar with the Bhopal disaster?

21 A (Mileti) Not as familiar as I'd like to be. I would
22 have liked nothing better than to go there and to study it.

23 Q Did you see the Frontline show the other -- I think
24 it was about a month ago, two months ago?

25 A (Mileti) No, I missed that one. It must have been

1 on in the evening instead of the daytime. I am familiar with
2 newspaper headlines and stories. I tried to collect all of
3 them that I could, the New York Times, for example, regarding
4 Bhopal and other reports that came out.

5 Q You're aware that at Bhopal people woke up in the
6 middle of the night experienced coughing spasms, realized there
7 was a problem at the chemical plant and then began fleeing; you
8 would agree with at least that much of the situation at Bhopal?

9 A (Mileti) No. Actually, I think the story was a
10 little bit different than that. The siren sounded, the people
11 who did wake up -- most people didn't wake up, the people who
12 did wake up were not given protective action guidance. Some
13 people went to the -- and I have this information secondhand
14 from physicists who happen to have been in that neck of the
15 woods and went, and a fellow from NYU.

16 I'm not -- I've been told stories that people went to
17 look and observe the fire. That the sun came up and pulled the
18 cloud back over people. That there were accounts in newspaper
19 articles that described near-panic at the Kiev train station,
20 but near-panic is what news reporters describe what they
21 observed when they expect to observe panic and don't see it;
22 that's what they call near-panic.

23 The myth of panic permeates society and secondhand
24 information in reference to many emergencies characterizes
25 panic, including legal accounts which is all Kai Erikson and

1 Effer based his study of Buffalo Creek on legal accounts,
2 depositions and that sort of thing, that survivors were suing
3 the company.

4 Panic is a myth that permeates our society. But it's
5 not something that happens in community-wide emergencies.

6 Q You don't believe that at Bhopal people were fleeing,
7 running over individuals, leaping over them, doing everything
8 possible to get out of that gas cloud?

9 A (Mileti) I certainly haven't seen any evidence that
10 would lead me to conclude that.

11 Q Are you denying that a panic situation can occur in
12 an open geographic area?

13 A (Mileti) I could conceive of a hypothetical
14 emergency where panic could occur in an open geographical area
15 that would conform to the principles when we know it's
16 happened. I've already said I didn't think whether it was
17 outside or inside was a sociological factor.

18 Q Now, the first condition that needs to arise, in your
19 opinion, is that a person perceives that a specific threat to
20 his physical survival is imminent, and as a result of this
21 situational perception that person becomes fearful of his
22 physical survival. There will be people who are on the beaches
23 in that Hampton-Seabrook area who will perceive their situation
24 to be this fearful for their physical survival, won't there?

25 A (Mileti) Well, let me just clear something up.

1 You're reading from my quoting one list of panic determinants,
2 and I've provided more than one list. That is what I wrote a
3 long time -- quoting myself. But I'm happy to talk about that.

4 No, the kind of physical survival that I'm talking
5 about is if this room caught on fire, if we were outside and
6 the walls caught on fire and people became convinced that death
7 was certain. And it's not easy to convince people that death
8 is certain. People do not become convinced on the basis of
9 hearing words that death is certain or on the basis of pre-
10 emergency fear of a hazard that death is certain when an
11 emergency occurs.

12 I'm talking about if there were a killer cloud of gas
13 and it were coming across a football field and we were standing
14 at the end and we saw people falling over as the cloud moved
15 towards us.

16 Q As at Bhopal?

17 A (Mileti) I -- I'm happy to stop my answer to that
18 question.

19 JUDGE SMITH: Well, we're not going to litigate
20 Bhopal. So just let him use his own --

21 MR. FIERCE: Well, Your Honor, I'm going to move to
22 strike that answer entirely as being totally unresponsive to my
23 question.

24 JUDGE SMITH: Well, your question --

25 MR. FIERCE: My question was, did he -- could he

1 conceive -- did he believe that there wouldn't be any people on
2 the beaches at Seabrook or Hampton who in the course of an
3 emergency at the Seabrook Nuclear Plant wouldn't believe that
4 their physical survival was at risk and become fearful of their
5 physical survival.

6 JUDGE SMITH: All right.

7 MR. FIERCE: And then he gave me an answer --

8 JUDGE SMITH: That's right.

9 MR. FIERCE: -- that went off on gas clouds rolling
10 down the field.

11 JUDGE SMITH: Exactly. The difficulty with your
12 objection is that you waited until you found out you didn't
13 like the answer until you objected. Now, if you want to object
14 for nonresponsiveness, object as soon as you're aware that it's
15 nonresponsive. But you take your chances when you wait too
16 long.

17 Now, we're not real happy with the way the litigation
18 is going anyway, because its relevance, certainly, too much
19 into Bhopal is not apparent to us.

20 So we're not going to strike the answer. But we'll
21 be aware that you want responsive answers to your questions,
22 and you have a right to insist upon them.

23 (Continued on next page.)

24

25

1 BY MR. FIERCE:

2 Q Are you denying, Doctor, that if there is an
3 emergency at Seabrook that there won't be some people on the
4 beaches in Hampton and Seabrook who will be fearful for their
5 lives, their physical survival?

6 A (Mileti) No, I'm not. I would imagine that most
7 persons who came to believe that an emergency was going on, who
8 were motivated enough to, for example, evacuate would perceive
9 that there was a need to engage in that behavior.

10 Q Now, if --

11 A (Mileti) However, that's not the kind of physical
12 survival perception that leads to panic.

13 Q There will be people on the beaches who are fearful
14 of their physical survival because of radiation from a leak at
15 Seabrook, won't there?

16 A (Mileti) One would hope in an emergency that most
17 people would be given that motivation; yes.

18 Q Now, if those people were also in a traffic jam on
19 Seabrook beach or on Hamp'on beach which slowed the traffic
20 stream that they were in, in their automobile, to so slow or in
21 fact they were in a parking lot and unable to get their car
22 out, wouldn't they also be, perhaps, perceive that those escape
23 routes, which offered safety, were blocked?

24 A (Mileti) I'm sure persons in a traffic jam would
25 understand that they're in a traffic jam. Persons in a parking

1 lot would understand that they're in a parking lot and that
2 they can't get out. That's not what I mean in my testimony
3 when I talk about the kind of being blocked that is one of the
4 requisites for panic to occur.

5 I cannot as a professional, because it's in someone's
6 political interest, allow this myth about panic in emergencies
7 to perpetuate itself.

8 MR. FIERCE: Strike -- move to strike as
9 unresponsive.

10 JUDGE SMITH: Strike it.

11 BY MR. FIERCE:

12 Q Will there not be people in that traffic jam who will
13 perceive their escape routes as being blocked?

14 A (Mileti) Not in this sense as presented in my
15 testimony, no. They could open the door to their car and take
16 a step out. The block that needs to occur is that you're
17 physically contained and have no other option but to traverse
18 that one escape route. They're not confined in that way, they
19 can open their car door and they can walk. I'm not
20 recommending that that's what they do. But I'm saying, that's
21 the kind of blockage that needs to occur in order for it to be
22 a determinant of panic.

23 Q So they would perceive an escape route that offers
24 safety to them, and that is out of their car and on to their
25 feet; is that your testimony?

1 A (Mileti) That's a reason why it wouldn't be blocked
2 in the sense that blockage of an escape route is imminent and
3 that only a few people are going to survive and then that panic
4 would occur.

5 JUDGE SMITH: All right. He's changing -- I want to
6 intercede here for a moment. Upon reflection -- I don't think
7 the record is clear as to what your motion to strike covered
8 and what the ruling covered. And it's my understanding that
9 his testimony to the effect that he is not going to perpetuate
10 a myth, which for political purposes has generated that there
11 will be widespread panic; that's the part that I intended to
12 strike. And that's what I understand you to move.

13 MR. FIERCE: That's right.

14 JUDGE SMITH: The rest of the answer remains.
15 Go ahead.

16 BY MR. FIERCE:

17 Q If people in the beach area are -- there are people
18 in the beach area who are fearful for their physical survival,
19 they are in their automobiles along one of the small number of
20 roadways that lead to safety, and they perceive those routes to
21 be so jammed with traffic that they are effectively blocking
22 any immediate escape; is it, in your opinion, likely that
23 rather than engaging in panic behavior those people will step
24 out of their cars and pursue those escape routes on foot?

25 A (Mileti) It's possible, I wouldn't say that it's

1 probable, and it would depend on factors you haven't contained
2 in your question.

3 Q Now, I want to talk for a minute about near-panic
4 behavior. Can you define that for me, Dr. Mileti?

5 A (Mileti) I'd like the definition I've already
6 offered and that is, near-panic is what journalists use to
7 describe what they observe when they expect to see panic but
8 don't see it.

9 Q Aren't there in fact certain responses which are not
10 so antisocial that you would call them panic behavior, but yet,
11 are still somewhat antisocial?

12 JUDGE SMITH: I need that question back. Do you
13 think you -- I think you folded back on yourself on that one.
14 Do you want to ask it or do you want -- just read it back, see
15 if this is what you want.

16 (Whereupon, the previous question was read back by
17 the Reporter.)

18 JUDGE SMITH: I don't understand the question.

19 BY MR. FIERCE:

20 Q Let me give you an example. Let me give you an
21 example, Dr. Mileti. Aren't there perhaps behaviors that we
22 might be concerned about at Seabrook like, for example,
23 automobiles in traffic streams who decide to drive up the
24 right-hand shoulder, behavior they would not engage in, in
25 normal circumstances, but because they're not running over

1 other bodies or crashing into other cars, you might not call
2 that panic behavior. But would you describe that as near-panic
3 behavior?

4 A (Mileti) It would depend on the circumstances. If
5 someone drove their car to the shoulder of the road, I could
6 think of a context in which it might make good sense that
7 that's what they do. And then I could think of other context
8 in which I would judge their behavior to be silly or not good
9 behavior. I wouldn't call it near-panic, they're parking their
10 car.

11 JUDGE SMITH: Well, we seem to be just casting around
12 a fortuitous example of near-panic behavior. And part of the
13 problem stems from your definition of it, which is not a very
14 good definition as far as I'm concerned. But can you describe
15 it better? I mean, can you give a better description of it,
16 you know, the behavior that journalists see when they expect to
17 see panic but don't, doesn't tell us much. But if that's the
18 best you can do, fine.

19 THE WITNESS: (Mileti) No, I certainly could
20 elaborate on that.

21 JUDGE LINENBERGER: Near-panic?

22 JUDGE SMITH: Near-panic, yes.

23 THE WITNESS: (Mileti) If people are asked to, in an
24 emergency, evacuate by cars and they're in their cars and
25 they're driving, and they're driving with vigilance and paying

1 attention to driving and not appearing as if they're relaxed,
2 because it's not a relaxed situation, it's an emergency. And
3 that stream of cars is proceeding with vigor out of the town, a
4 journalist could describe that as near-panic, if the journalist
5 described persons that he or she might have observed at a train
6 station where people were in another culture not prone to stand
7 in lines, the way we are in this culture, and rather anxious to
8 get tickets for a train at a window, much like getting on a
9 train in New York City, they could describe that as near-panic
10 behavior. That's not necessarily antisocial behavior. That's
11 not necessarily behavior that goes against the collective or
12 against collective safety in the emergency.

13 And from an objective point of view and a value free
14 point of view might actually make good sense from those who are
15 experiencing the emergency.

16 And those behaviors on occasion have and could help
17 perpetuate the notion of near-panic, but it's not near-panic.
18 It's not panic behavior.

19 BY MR. FIERCE:

20 Q So, behavior such as evacuating drivers driving up
21 the right-hand shoulder; evacuating drivers who cross a double
22 yellow center line and proceed up the left lane; evacuating
23 drivers who abandon their vehicles and leave them in a traffic
24 stream, you would not characterize as panic behavior; correct?

25 A (Mileti) I've characterized panic behavior as it's

1 defined in my discipline. What you've just described are
2 behaviors that may not be -- I certainly wouldn't call panic
3 behavior.

4 Q Now, Dr. Mileti, with respect to your other piece of
5 testimony, No. 2, you make the statement on page three, quote,
6 "It is highly unlikely therefore that evacuees would behave
7 in ways consistent with the individual versus collective,"
8 excuse me, "individuals", parentheses, "(seeking their own
9 unique evacuation route)", end of parentheses, "versus
10 collective goals," parentheses, "(following the recommended
11 route of those directing traffic)", end of parentheses.

12 Now, I understand -- I think I understand this
13 phenomenon of the shift that characterizes emergencies in
14 general, Doctor, but isn't it true that, that shift -- the
15 degree to which that shift occurs in any given population
16 varies depending on the nature of that population?

17 A (Mileti) No, I don't know of any evidence that would
18 lead me to that conclusion. Now, the general conclusion is
19 that, it occurs in community-wide emergencies where the entire
20 community is at risk.

21 Q So, it occurs; it's full-blown, boom, it's there, you
22 have the therapeutic community, it doesn't occur in stages, it
23 doesn't occur to a greater or lesser degree, given the nature
24 of the emergency, it's there full-blown?

25 A (Mileti) No, that's not what I said. There are

1 different mechanisms whereby it can come into play. It would
2 vary depending upon whether or not we're talking about the
3 warning period, that is when people are being warned, or if
4 we're talking about after impact has occurred.

5 There's been some research to document alternative
6 ways that it occurs, that people go from the way they are
7 normally to this emergency response mode. But I just don't
8 know to what degree anyone has documented that it occurs in
9 varying degrees.

10 It's been the case that in the emergencies that have
11 been studied that it's been observed. People haven't tried to
12 quantify it, to the best of my knowledge, and say more of it
13 was in this town than was in that town, is the conclusion that
14 it seems to always be there.

15 Q Now, isn't that the point that almost all of the
16 prior emergencies that you've observed have been with respect
17 to population groups that can be called towns, and in towns
18 where you have close-knit interpersonal relationships, you have
19 a kind of community that is, in fact, what we would all think
20 of in terms of a paradigm, that a community like that would
21 pull together in the case of an emergency. But there are other
22 population groups that we have here at Seabrook, Doctor, and I
23 wonder whether you can ascribe 100 percent, the same
24 conclusions about this shift that you draw from these other
25 towns, these paradigm communities, and apply them to a traffic

1 jam?

2 A (Mileti) Well, first let me say that, what I'm
3 basing my conclusions on aren't just my personal observations,
4 but those made by other sociologists in my field.

5 And second, that your suggestion that the empirical
6 record regarding this conclusion is only based on emergencies
7 that have been studied in self-contained small communities is
8 incorrect.

9 Indeed, a good deal of disaster research has gone on
10 in small little communities, but some of it has gone on in
11 urban centers as well -- as well as in communities that have
12 beaches that get evacuated, for example, with transients on the
13 beach. The evacuation of the Texas beaches or what have you in
14 hurricanes.

15 But I would say that the kind of mood that
16 characterizes a very small town where everybody knows everybody
17 else and feels like them as if they're a whole human being
18 is the kind of mood that characterizes this emergency response.
19 And that that emerges because of the emergency. And certainly
20 one could say, might it have a higher probability of occurring
21 a few seconds sooner in a small town versus an urban center,
22 it's an interesting hypothesis of no one has ever tested it, to
23 the best of my knowledge. But I don't think that that matters.

24 The community is the human community. It's not a
25 political boundary. Although it's possible for me to conceive

1 of an emergency large enough that's uneven enough where threat
2 would be hit-and-miss, not like at a nuclear powerplant, but,
3 for example, let's say a great earthquake in a large urban
4 center like Southern California that would cause hit-and-miss
5 damage over hundreds and hundreds of miles, where there may be
6 pockets of this kind of response after impact, that we may not
7 observe this. But that's very uncomparable to an emergency at
8 a nuclear powerplant.

9 Q Can you point to other examples, Doctor, where
10 individualized behavior typified the vehicles and drivers in a
11 traffic jam that lasted as long as 10 hours?

12 A (Mileti) I'm sorry, I don't think I understand your
13 question. May I see if I do?

14 Q Wait a second. Let me strike that question and
15 restate it, because I think I did misstate it.

16 Give me an example of a situation where collective
17 behavior, I think I said individualized, collective behavior
18 typified a situation where you had vehicles and drivers in a
19 traffic jam that lasted for as long as 10 hours?

20 A (Mileti) Did you mean to say by collective behavior,
21 the kind of emergency response I talk about in my testimony?

22 Q Any kind of collective behavior. I frankly have
23 trouble understanding the notion of collective behavior among a
24 group of automobiles in a traffic jam.

25 A (Mileti) Well, automobiles don't experience it,

1 people do. And it's their response to -- I do know it's hard
2 to understand. But when human beings in towns and areas are
3 experiencing the threat of major and pending catastrophe or
4 after those catastrophes have occurred, people do provide help
5 to one another in a way that they'd never think of doing.
6 They're more helpful towards one another. I could go on and
7 describe this at length. People have written books about it.

8 I can think of major evacuations, for example, the
9 evacuation of Hurricane Carla, I have no idea why that comes to
10 mind, but over half a million cars were evacuated.

11 Q How long was the traffic jam there, Doctor?

12 A (Mileti) I don't remember.

13 Q It wasn't anywhere near this long, was it?

14 A (Mileti) I honestly don't remember, so I can't say
15 if it was near this long or not.

16 Q Isn't it true that never in the annals of emergency
17 studies has there been a situation where a traffic jam with
18 level of service F traffic, congested flow traffic, existed for
19 that period of time?

20 A (Mileti) I don't know what level of F flow of
21 traffic is. I certainly know what traffic is, stop and go,
22 maybe that's F. Shall I --

23 Q Stop-and-go, moving in waves?

24 A (Mileti) I have to say, I honestly don't know. It's
25 inconceivable to me that there haven't been people in traffic

1 jams knowing that there have been some very large evacuations
2 involving over half a million people.

3 Q I'm not disputing that. Clearly, you've had large
4 evacuations, but you never had one where the escape routes were
5 so few and the population trying to get through them was so
6 large that you would have this kind of traffic jam?

7 MR. LEWALD: I would object to that.

8 BY MR. FIERCE:

9 Q Isn't that true, Dr. Mileti?

10 JUDGE SMITH: What's the basis?

11 MR. LEWALD: There's no foundation for the question.
12 I don't know of any such evidence that this is an isolated
13 event that Mr. Fierce is testifying to in his question. He's
14 not putting it as a hypothetical to a witness, assuming -- he's
15 just stating it as a fact.

16 MR. FIERCE: I'm asking a question.

17 MR. LEWALD: It doesn't sound like a question to me.

18 JUDGE SMITH: Well, your question does have a
19 hypothetical in it.

20 MR. FIERCE: I said, there's never been this kind of
21 a situation, has there, Dr. Mileti.

22 JUDGE SMITH: This kind of situation.

23 MR. FIERCE: Where you've got traffic that is in
24 congested flow conditions, as Dr. Mileti said in his words,
25 stop-and-go, I added moving in waves, moving very slowly, for

1 as long as, all of the experts agree will be the case here at
2 Seabrook. And I said, you've never seen that, have you, in any
3 situation.

4 MR. LEWALD: I don't know what the agreement all the
5 experts are with.

6 JUDGE SMITH: Are you talking about -- are you
7 specifically talking about Mrs. Fallon's film?

8 MR. FIERCE: No, I'm talking about the evacuation
9 time estimates and the studies that have been done both by Mr.
10 Lieberman and Dr. Adler. The Lieberman testimony, I believe,
11 is now that on certain rainy days, on crowded beach -- with
12 crowded beach situations where sudden rain storms occur, the
13 ETE will be over 10 hours long; and that means that the last
14 line of congested flow traffic to leave the area will not get
15 out before 10 hours.

16 Dr. Adler believes those times to be longer than
17 that.

18 JUDGE SMITH: Are you satisfied?

19 MR. LEWALD: Am I satisfied? If this is the basis
20 for his question, but he's testifying as though certain things
21 were facts. And this is the only -- at least as I understood
22 the question, he was comparing facts here with everywhere else
23 in the world and saying that there didn't exist any situation.

24 JUDGE SMITH: Well, he's asking -- that's a part of
25 his question. That's not the hypothesis of the question,

1 that's the part of the question.

2 MR. LEWALD: If he was posing it as a hypothetical,
3 then I wouldn't have objected, but I didn't hear him so doing.

4 MR. FIERCE: I don't think I need to given the facts
5 that have been testified by the experts on both sides in this
6 case.

7 JUDGE SMITH: You may answer.

8 THE WITNESS: (Mileti) Were you asking me if I knew
9 of an evacuation that took 10 hours?

10 BY MR. FIERCE:

11 Q No, I was not.

12 A (Mileti) I'm sorry, I honestly don't remember the
13 question.

14 Q I'm asking you if ever in history you are aware of a
15 situation where an evacuation occurred after an emergency in
16 which the traffic was in congested flow conditions, stop-and-go
17 conditions for as long as 10 hours?

18 A (Mileti) No, I don't, and the reason is, I'm not an
19 expert on traffic and I've not examined the behavior of
20 traffic. So I don't know on what emergencies that I have
21 information on there was stop-and-go traffic; I just know how
22 people behaved. And in some of those events we know how long
23 it took for people to evacuate. And I don't even remember the
24 times involved in most of those events. There have been some
25 in which it's taken longer than others.

1 And certainly in the whole human experience there
2 would have to have been evacuations. I can't conceive if we
3 didn't look where evacuations went on that took long times.

4 Q I'm not talking about long times, because we clearly
5 have long times. I'm talking about in a jam. That's the
6 difference between everywhere else and Seabrook, isn't it,
7 Doctor?

8 JUDGE SMITH: The fact is, his answer is he doesn't
9 know.

10 BY MR. FIERCE:

11 Q Doctor, isn't it likely that there will be at least
12 some individuals, let's say after three, four, five, six hours
13 who will begin to engage in individual oriented behavior that
14 includes such things as seeking their own evacuation routes?

15 A (Mileti) Of course it's possible. I think of my
16 father, in fact, when you describe this person. But it's not
17 going to be probable and wouldn't characterize the behavior of
18 most people.

19 I've always said, if you can think it up it's
20 possible that somebody might engage in it.

21 Q I said, isn't it likely that some individuals after
22 four, five or six or more hours will begin to engage in
23 individualized behavior of the type we are talking about here,
24 seeking their own unique evacuation routes?

25 A (Mileti) I'm sure it's likely, yes, that some person

1 or two or three or some number might in fact do that. That --
2 the image that the evacuation would be a helter-skelter where
3 there's large numbers of people doing that, not following the
4 advice of those who are providing information, I don't think is
5 a prudent hypothesis about the future at all.

6 Could it happen? Yes. Would it likely characterize
7 the behavior of most people? I don't think so. Is it likely?
8 What's the difference, I don't know, really between likely and
9 possible. Of course. I don't think it would be a major
10 problem.

11 Q Do you know how many people it would take if they
12 were engaging in that type of behavior to cause the kind of
13 problem that lengthens the ETE significantly?

14 A (Mileti) No, I'm not an expert on ETE, I wouldn't
15 know how to calculate it.

16 MR. FIERUE: I have no further questions.

17 JUDGE SMITH: We'll take a 10 minute break.

18 Off the record.

19 (Whereupon, a short recess was taken.)

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1 JUDGE SMITH: Ms. Weiss?

2 FURTHER CROSS-EXAMINATION

3 BY MS. WEISS:

4 Q Dr. Mileti, if I understand your testimony it's
5 really quite narrow. You define panic as aggressive antisocial
6 behavior and it's your opinion that such behavior simply cannot
7 occur in a vehicular evacuation because the conditions it would
8 cause it to occur don't exist; is that correct?

9 A (Mileti) I've defined panic as I defined it. I
10 don't know if I characterized it in there.

11 Q Depressive aberrant and antisocial?

12 A (Mileti) It's inconceivable to me that panic, as
13 I've defined it, could occur in a community-wide emergency.

14 Q But that's not the same thing as saying that people
15 would always follow the instructions given to them; is that
16 correct?

17 A (Mileti) I think that is correct, following
18 instructions versus panic are two different things.

19 MS. WEISS: That's all I have.

20 JUDGE SMITH: Mr. Backus?

21 MR. BACKUS: Your Honor, I have some.

22 FURTHER CROSS-EXAMINATION

23 BY MR. BACKUS:

24 Q Dr. Mileti, just so I'm clear on your last answer to
25 Ms. Weiss' question. And you're saying one need not follow

1 instructions -- well, strike that. Someone who is not
2 following instructions would not necessarily be engaging in
3 panic behavior?

4 A (Mileti) No. Panic is not the same thing as not
5 following instructions. Panic is what panic is.

6 Q Okay.

7 A (Mileti) Not following instructions I think is
8 better addressed in my testimony No. 2 rather than testimony
9 No. 5.

10 Q Thank you, Doctor.

11 Let me ask you this, would the fear which is
12 referenced on page three of your testimony No. 5, "A person
13 perceiving a specific threat to his physical survival," could
14 that same fear be generated through a specific threat to
15 another family or to a family member?

16 A (Mileti) And we're talking about panic now?

17 Q That is correct.

18 A (Mileti) I don't know of any evidence to suggest
19 that that would be the case. And the kind of fear we're
20 talking about here is full knowledge that death is imminent as
21 convinced by observing, it occurred to others like I was
22 describing on the football field.

23 Q Well, I'm not sure if that's completely responsive to
24 my question. What I'd like to know is, can an individual
25 become panicked by being fearful for the well being of a family

1 member?

2 A (Mileti) I have no evidence of that in a community-
3 wide emergency that I know of.

4 Q You have no evidence one way or another on that?

5 A (Mileti) I don't know of the cases of panic that
6 have been observed, and particularly the lack of panic in
7 community-wide emergencies that would suggest that that kind of
8 transference from concern over an intimate versus oneself could
9 be catalogued as a determinant then of panic.

10 Q I'm not sure I completely follow that answer. Is it
11 your testimony then that you don't know whether or not panic
12 can arise based on the fear for a family member, you don't
13 know?

14 A (Mileti) In the cases where panic has occurred its
15 occurred as an individual perceives threat. I don't know of
16 cases where its occurred because of fear over a family member.

17 Q It may have occurred, you're not sure?

18 A (Mileti) I don't -- that's quite possible. I would
19 be surprised if I didn't know about it though.

20 Q Well, let me just follow that point a little bit.
21 Assume a situation where you have an individual at -- on
22 Hampton Beach and has a family member located elsewhere within
23 the emergency planning zone. The individual on the beach is
24 not -- cannot communicate with the family member; doesn't know
25 what the safety or the threat to the family member is. In that

1 kind of situation could you expect a panic reaction?

2 A (Mileti) No, I would say absolutely not. In fact,
3 the intimate who aren't in physical proximity are able to
4 communicate with one other happens in all emergencies; and I
5 don't know where that's of evidence that suggests that panic
6 has occurred in those circumstances.

7 Q I'm sorry, I'm assuming that there can't be
8 communication between the two?

9 A (Mileti) Yes.

10 Q So you're dealing with the situation of an unknown
11 threat to the family member, in that situation could you expect
12 panic to occur? Is that a reasonable -- strike that. Would
13 you expect that that reaction could occur with any significant
14 number of people?

15 A (Mileti) I thought my answer was, no. That in fact
16 having people separate who are intimate with one another. For
17 example, being members of the same family happens in a lot of
18 emergencies. And I don't know in those emergencies of any
19 event where panic has occurred because of being separated from
20 those intimate -- not being able to communicate with them. Not
21 knowing whether they were -- to what degree they might be at
22 risk or what have you. I don't know of cases in emergencies
23 where that's led to panic.

24 Q Fine.

25 MR. BACKUS: Nothing further, thank you.

1 JUDGE SMITH: Mr. Turk?

2 MR. TURK: Nothing, Your Honor.

3 JUDGE SMITH: Mr. Huntington?

4 MR. HUNTINGTON: Nothing, Your Honor.

5 JUDGE HARBOUR: Dr. Mileti, are there any studies
6 that you know of in the literature related to your subject area
7 that deal with battlefield situations where individual or in
8 parts of groups have panicked?

9 THE WITNESS: (Mileti) Yes. And I want to say that
10 battlefield situations are not comparable events. That war is
11 the antithesis of coming together that can occur in community-
12 wide emergencies.

13 So, there are some categories of emergencies that
14 aren't applicable or aren't the same as the kind of an
15 emergency we're discussing here.

16 Certainly, there have been studies of people turning
17 and running under attack on battlefields. And there have even
18 been sociologists, believe it or not, who have worked for the
19 Army to try to address that problem. Somewhat successfully, I
20 might add. But I would have to say that war is not a
21 comparable sort of situation, and I don't think provides good
22 analogy or evidence to bear weight on the kind of emergency
23 we're discussing here.

24 JUDGE HARBOUR: Why is a group of soldiers in the
25 battlefield who have been living and fighting together for a

1 long time different from any other community?

2 THE WITNESS: Well, I have to answer that question in
3 two parts. First, most of the observed behavior that one could
4 characterize as turning and running or perhaps panicking in a
5 war setting occurred in situations in which fighting groups
6 were conscripted into the Army and sent to the battlefield not
7 knowing other persons that they were engaged in battle with.

8 And during World War II I believe the sociological
9 recommendation was to conscript to the battlefield people out
10 of basic training, so that you were fighting with a few good
11 friends rather than total strangers to reduce that problem; and
12 it worked successfully to some extent.

13 However, the -- and my expertise in regard to what
14 goes on in war groups is severely limited. But I do know that
15 the kind of mechanism that would trigger the community response
16 or surge of altruism that typifies community-wide emergencies
17 may not come into play there, and I'm not sure why.

18 JUDGE HARBOUR: Thank you.

19 JUDGE SMITH: Mr. Lewald, do you have redirect?

20 MR. LEWALD: No redirect. No further questions.

21 JUDGE SMITH: All right. Dr. Milet, thank you.

22 (The witness was excused.)

23 MR. FIERCE: Your Honor, I believe at this point we
24 have rebuttal witnesses that the Mass. AG's office is prepared
25 to put on.

1 JUDGE SMITH: Three.

2 MR. FIERCE: Three. I have Chief Edwin OLivera, the
3 Police Chief from Salisbury who has been waiting since this
4 morning, I'd like to put him on next.

5 JUDGE SMITH: All right.

6 MR. FIERCE: Chief.

7 JUDGE SMITH: You may stand and be sworn.

8 Whereupon,

9 EDWIN J. OLIVERA

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

12 DIRECT EXAMINATION

13 BY MR. FIERCE:

14 Q Good afternoon, Chief, would you please state your
15 full name and position for the record?

16 A (Olivera) Good afternoon, Your Honor. My name is
17 Edwin J. Olivera, Police Chief of the town of Salisbury.

18 Q Chief, I'm going to put before you a document which
19 is entitled Rebuttal Testimony of Edwin J. Olivera on behalf of
20 the Attorney General for the Commonwealth of Massachusetts
21 regarding traffic disorders expects during an evacuation of the
22 beach area because of an accident at the Seabrook Nuclear
23 Plant, and ask you if you recognize that document?

24 A (Olivera) Yes, I do, it is my rebuttal.

25 Q This is the rebuttal testimony that you --

1 A (Olivera) Yes.

2 Q -- have prepared for this proceeding?

3 A (Olivera) That's correct. They are --

4 Q Let me ask you if you've reviewed this document
5 recently and have noted any additions or corrections that you
6 would like to make?

7 A (Olivera) Yes, sir. On page three in the example of
8 the beach road sketch where it says Noven Boulevard Route 1-A
9 and Cable Avenue there is a little island, that is not in that
10 direct spot, it should be further back a little bit, sir.

11 And where it has a large island --

12 JUDGE SMITH: Yes. What we're going to have to do
13 now is put some kind of indicator on the drawing to capture
14 your description. Which way would you move it?

15 THE WITNESS: (Olivera) It should be moved further
16 back. Actually, there are three islands in that one long one
17 there. And that one should be actually taken out of that
18 drawing.

19 JUDGE SMITH: Taken out all together?

20 THE WITNESS: (Olivera) Yes, sir.

21 JUDGE SMITH: Okay.

22 JUDGE HARBOUR: And the long one should be divided
23 into three small ones?

24 THE WITNESS: (Olivera) Three, yes. They are two
25 actual areas that you can go into the parking lot. One comes

1 into the entrance and one comes out from the exit.

2 JUDGE SMITH: Okay. Let's -- let me try here and see
3 if this agrees with you.

4 JUDGE LINENBERGER: Is there automobile passage?

5 THE WITNESS: (Olivera) Yes. Coming from the exit,
6 yes, there is, going straight across and also for the entrance.

7 JUDGE SMITH: Is that it? Do you have that right
8 there?

9 THE WITNESS: (Olivera) Yes.

10 JUDGE SMITH: So there, all right, three islands in
11 the middle and none in the middle of the street.

12 THE WITNESS: (Olivera) Correct.

13 JUDGE SMITH: Three islands in the middle of the
14 block.

15 THE WITNESS: (Olivera) Right.

16 JUDGE SMITH: So that comes in; and that addition of
17 one island.

18 THE WITNESS: (Olivera) Yes.

19 JUDGE LINENBERGER: I just don't see the parking lot
20 you were talking about.

21 THE WITNESS: (Olivera) It's -- if I could show it
22 to you, sir. This area right here is what we call the
23 Salisbury Municipal parking lot. And there is an entrance
24 right in this direction here. I can draw it for you and give
25 you a better idea.

1 JUDGE SMITH: Okay. Now, be careful because that's
2 going to go into the transcript.

3 THE WITNESS: (Olivera) Okay. Right about here is
4 where the entrance sits. And right about here is where the
5 exit is.

6 JUDGE SMITH: Okay.

7 THE WITNESS: (Olivera) So you have an entrance in
8 this area here. You can either enter coming this way or going
9 across.

10 JUDGE SMITH: Okay, this is the parking lot.

11 THE WITNESS: (Olivera) This is the parking lot
12 here.

13 JUDGE SMITH: All right. Let's mark it parking --
14 wait a minute.

15 MR. FIERCE: Is this your copy, Chief, do you have
16 other notations?

17 THE WITNESS: (Olivera) Yes, I do, on that one.

18 MR. FIERCE: Maybe we want to make it on a fresh
19 copy.

20 JUDGE SMITH: All right. I'll tell you --

21 THE WITNESS: (Olivera) I can do that for you.

22 JUDGE SMITH: Is that blue?

23 THE WITNESS: (Olivera) Yes.

24 JUDGE SMITH: Let's do it -- I'm still going to give
25 you a hard time today, let's do it in black.

- 1 THE WITNESS: (Olivera) Quite all right.
- 2 JUDGE SMITH: It copies -- photocopies better.
- 3 Okay. Now, write in parking lot there.
- 4 THE WITNESS: (Olivera) Shall I cross this out here?
- 5 JUDGE SMITH: Yes, cross that out.
- 6 Exit and entrance.
- 7 JUDGE LINENBERGER: This is an entrance, right?
- 8 THE WITNESS: (Olivera) Yes, sir. That's the only
- 9 entrance into the lot and this is the only exit.
- 10 JUDGE SMITH: All right. Then I'm going to do one
- 11 final thing here and I'm going to cross out these connectors
- 12 and you show this to the other parties briefly.
- 13 MR. FIERCE: Well, let me ask if --
- 14 BY MR. FIERCE:
- 15 Q -- Chief, are there any other additions and
- 16 corrections that you would like -- wish to make?
- 17 A (Olivera) On the last page --
- 18 Q The other map?
- 19 A (Olivera) -- the Attachment A, the other map, shows
- 20 Elm Street at Route 1-A, that should be Route 110.
- 21 It would have been the -- it's called North End
- 22 Boulevard, Route 1-A rather than North Boulevard.
- 23 JUDGE SMITH: North End Boulevard?
- 24 THE WITNESS: (Olivera) Yes, sir; North End.
- 25 JUDGE SMITH: You marking that on your map?

1 Oh, is that North End?

2 THE WITNESS: (Olivera) E-N-D.

3 JUDGE HARBOUR: Mr. Olivera, before we go on --

4 THE WITNESS: (Olivera) Yes, sir.

5 JUDGE HARBOUR: -- on the diagram on page three is
6 north to the left -- is north to the left?

7 THE WITNESS: (Olivera) Yes, sir.

8 BY MR. FIERCE:

9 Q Chief, with these additions and corrections, let me
10 ask you if this is the testimony that you would like to offer
11 into evidence at this time?

12 A (Olivera) Yes, sir, it is.

13 MR. FIERCE: I would offer this evidence -- offer
14 this testimony into evidence at this time, Your Honor.

15 JUDGE SMITH: Are there objections?

16 MR. LEWALD: No objection.

17 MR. TURK: Your Honor, I have an objection to part of
18 the testimony. At the beginning of -- a large question
19 beginning on page 5 at the end of the testimony.

20 It seems to me that the question which begins,
21 "Chief, would you please assume for a minute that it's a Sunday
22 in the summer of 1988, et cetera." It's a very long question,
23 it goes on for more than a complete page. It includes a lot of
24 assumptions which, to my knowledge, have not yet been tied into
25 anything in the record.

1 For instance, it assumes that the plant is operating
2 at full power; this fact is well known to those in the area
3 including the beach goers.

4 It further assumes that the beaches -- I'm sorry,
5 that there's an announcement made that the beaches have been
6 closed, and that evacuation of the area is recommended.

7 As the Board may recall, these are a potentially
8 alternative EBS messages, either the beaches are closed or
9 there's going to be an evacuation, but it's not beach closing
10 and an evacuation.

11 It further assumes that all the people on the beach
12 area including Salisbury, Seabrook and Hampton Beach get the
13 announcement at the same time. It further assumes that the
14 entire population, the day trippers, the seasonal residents,
15 the workers, everyone seek to leave the beach area at roughly
16 the same time. And it goes on with other assumptions about
17 traffic control point manning and traffic conditions, speeds.

18 The next question after that says, "Chief, assume the
19 same facts as in my last question," that's on page seven.

20 And then the final question on page eight does not
21 seem comfortable by itself, but the answer indicates that
22 under the conditions posed earlier, the answer is given in that
23 context.

24 It seems to me that the whole -- this whole piece of
25 testimony is not connected to anything that's part of the

1 record which should be relied upon by the Board in making a
2 decision as to conditions that may face traffic in the area in
3 an emergency.

4 MR. FIERCE: Your Honor, I don't know where Mr. Turk
5 has been for the last three months, this is exactly the
6 situation that we have all been talking about with respect to
7 the evacuation time estimates, at the beach areas on a crowded
8 weekday -- crowded week-end.

9 We have testimony --

10 JUDGE SMITH: Well, no problem. I don't see any
11 problem with crowded week-end, that's not your problem. The
12 other assumptions are --

13 MR. FIERCE: The traffic guides are placed exactly as
14 they have been.

15 JUDGE SMITH: You leaped over an awful lot here
16 before you got to the traffic guides. Take it in order.

17 I think that the assumption that the powerplant is
18 licensed, although there's no evidentiary support for that is
19 what this thing is all about, and that is a necessary
20 assumption for his question; and we'll forgive you on that one,
21 I don't know how else you could do this.

22 The beaches have been closed and evacuation of the
23 area is recommended. It is true that closed and evacuation
24 have different meanings, but they're not mutually exclusive,
25 one precedes the other.

1 Well, we understand two sequence being here, that
2 the beaches have first been closed then evacuation ordered.

3 MR. FIERCE: That's one possibility here, Your Honor.
4 It's also conceivable that they could occur simultaneously.

5 JUDGE SMITH: No, they're different. They're --
6 well, is it necessary to your hypothesis to the testimony that
7 you make that distinction, because the distinction I recall and
8 I think everybody will agree with is that, closing is a
9 situation that would precede in an evacuation, but in time.

10 MR. FIERCE: In slow moving events. But I believe
11 the Intervenors would take the very strong position, Your
12 Honor, that in a fast moving accident sequence the beach
13 closing will not be the first move, it will be an evacuation.

14 JUDGE SMITH: Wouldn't an evacuation subsume a
15 closing?

16 MR. FIERCE: Oh, absolutely.

17 JUDGE SMITH: If there were no closing --

18 MS. WEISS: We've got the closing of the beach and
19 evacuation of the prudent population.

20 JUDGE SMITH: Well, I don't think that these two in
21 the same sentence present a hypothesis that does violence to
22 the record, the idea is captured. He wants the most severe
23 situation and that is evacuation. You could either strike
24 closing and it would not hurt your assumption.

25 MR. FIERCE: That's right.

1 JUDGE SMITH: Okay.

2 All right. Go ahead.

3 All the people area are given the announcement at
4 roughly the same time. Does anybody quarrel with that
5 assumption, that hypothesis?

6 (No response)

7 JUDGE SMITH: All right. Nobody does.

8 Now, the day trippers. Merchants and their employers
9 all seek to leave the beach area roughly the same time. That
10 is just a restatement of the earlier sentence, isn't it.

11 Nobody quarrels with that.

12 Now we -- the next one is --

13 (Board conferring.)

14 JUDGE SMITH: All right. Now, what's this one here,
15 we're up to the traffic guides.

16 MR. FIERCE: Those are taken exactly from volume 6,
17 Your Honor.

18 JUDGE SMITH: Does anybody quarrel with the statement
19 concerning traffic guides?

20 MR. DIGNAN: Your Honor, you're asking that question
21 generally to the room, Mr. Turk has an objection on the floor
22 which I understand you're deciding.

23 JUDGE SMITH: Right.

24 MR. DIGNAN: I don't want my silence to indicate that
25 I'm agreeing to anything. I'm not making an objection, but I

1 don't want my silence to indicate agreement with anything.
2 That's all I'm pointing out for the record. It's, I have no
3 dog in the fight, is my only thing.

4 MR. TURK: I'm not objecting to the traffic guide
5 portion, Your Honor. My objection start -- end on the second
6 line where it says that all these people seek to leave the
7 beach area at roughly the same time.

8 JUDGE SMITH: Well, then you did object to that
9 assumption. Is it the cumulative effect of the assumptions
10 or --

11 MR. TURK: No, it's the individual portions of the
12 assumption. Let me back up for a second. Let me indicate item
13 by item where I'm objecting.

14 MR. DIGNAN: Your Honor, let me help the Board out
15 because I don't want -- I had the feeling of the reaction of
16 the Board that somebody thought I may being cute here. I'm not
17 being cute, because I don't care about the objection that goes
18 in, I can deal with them in proposed findings. I just don't
19 want my silence to indicate that I've agreed with these
20 hypothesis are backed up in the record, because I don't think
21 they are, frankly.

22 But as far as I'm concerned it's Mr. Turk's argument
23 on the objection, and I'm not -- we're not objecting; we'll
24 deal with it another way. And I just didn't want somebody to
25 come back later and say, well, if Dignan didn't think they

1 could all leave at the same time, why didn't he say something
2 that day. Because I don't think the evidence is that they're
3 going to all leave at the same time; I don't think it's even
4 close to that.

5 JUDGE SMITH: Is that your -- where do you begin
6 objecting to the scenario that's laid out here?

7 MR. TURK: Number one, that the plant is operating at
8 full power and that fact is well known to people in the area.
9 The status of the plant's power level, I don't think is
10 something that's going to be known, and there has been no
11 testimony what people may know about the power levels in the
12 plant. Now, maybe that's something that can be stricken from
13 the question and save it.

14 JUDGE SMITH: Well, would it be all right that the
15 plant is authorized to operate at full power?

16 MR. TURK: Fine.

17 JUDGE SMITH: Is that all right you?

18 MR. TURK: Maybe, Your Honor, that I can just drop
19 the objection.

20 MR. FIERCE: I'm astounded, I think that the NRC
21 would doubt that when this nuclear plant gets licensed that
22 fact wouldn't be well known.

23 MR. TURK: That's not what your question says, Mr.
24 Fierce.

25 JUDGE SMITH: I don't know if they'd know it or not,

1 really. It's not that easy to know.

2 MR. DIGNAN: I'll bet you nobody knows whether
3 Vermont Yankee is at full power right now, 50 percent power or
4 anything else except the people in the plant --

5 MR. FIERCE: I'm talking Seabrook.

6 MR. DIGNAN: -- three or four people who work there.

7 MR. FIERCE: I'm talking Seabrook here. I think it's
8 really beyond the realm of credibility to doubt that the people
9 in the Seabrook EPZ won't know it the minute that plant gets
10 licensed with headlines in almost every newspaper.

11 JUDGE SMITH: All right. Licensed, all right, that's
12 fine, then we don't have any trouble. Is authorized to
13 operate; is that all right? See, they just don't turn it on
14 and let it run.

15 JUDGE HARBOUR: Week-end by week-end the populous is
16 not likely to know what power level they're working at that
17 day.

18 MR. FIERCE: If that's the concern I'll agree with
19 that, and we can certainly correct it.

20 JUDGE SMITH: So we just say authorize to operate.

21 MR. FIERCE: Is authorized to operate at full power.

22 JUDGE SMITH: Yes.

23 MR. TURK: That was the first. And the second line I
24 guess we've taken care already if we're striking that the
25 beaches have been closed; we're saying evacuation has been

1 recommended.

2 MR. FIERCE: Well, I didn't know we were striking
3 that the beaches had been closed.

4 JUDGE SMITH: Well, so that the Chief understands
5 that, you know the evacuation of the beach would be, you know,
6 get off the beach: right? Certainly don't go on it and get
7 off?

8 THE WITNESS: (Olivera) That's right.

9 MR. TURK: The point, Your Honor, is that the beach
10 closing message is a pre-evacuation message.

11 JUDGE SMITH: Right.

12 MR. TURK: The area is not being evacuated, it's
13 simply closing off access to beaches.

14 JUDGE SMITH: He says it's evacuation.

15 MR. TURK: Mr. Fierce is not willing to admit that
16 the beaches haven't closed is out.

17 MS. WEISS: He's just hypothesized two separate
18 things; both that it's closed and the area has been evacuated.

19 JUDGE SMITH: He agreed that evacuation is adequate.
20 And so let's just -- if you don't mind we'll strike close and
21 make everybody happy there, because it does have a special term
22 in this proceeding.

23 MR. TURK: The third one, Your Honor, is that --

24 MR. FIERCE: Excuse me, I'm going to hand you the
25 copy that Chief Olivera made his corrections on, if you

1 are --

2 JUDGE SMITH: I'll just do it on my rough copy.

3 MR. FIERCE: Well, we need to have it on the copy
4 we're going to give to the Court Reporter.

5 JUDGE SMITH: All right. Well, when we get them all
6 worked out.

7 MR. FIERCE: All right.

8 MR. TURK: The third one, Your Honor, was that,
9 assume that all people on the beach area including Salisbury,
10 Seabrook and Hampton Beach -- we haven't addressed Salisbury,
11 that's in Massachusetts. What we've been address so far are
12 the New Hampshire beaches. There's nothing in the record about
13 what will happen on Salisbury.

14 MR. FIERCE: There is in the ETE study, Your Honor,
15 that's what we are litigating here, the ETE study assumes that
16 this is the scenario. And that's why this is phrased the way
17 it is.

18 MS. WEISS: If any of these premises are not
19 supported by evidence in the record later on, then, you know,
20 Mr. Turk is free to argue in his findings --

21 JUDGE SMITH: The trouble is I don't want argument to
22 be made that the Chief's testimony fails because one of his
23 assumptions failed. And I think there should be general
24 agreement as to what the assumptions are.

25 MR. FIERCE: I am positing simply the assumptions

1 that were made by KLD Associates in conducting the ETE study,
2 and that is certainly one of the assumptions. If you took a
3 look at volume 6 and looked at the evacuation routes that he
4 has shown clogged with congested flow of traffic, very quickly
5 into the evacuation scenario you will see Route 1-A; and the
6 assumption is that the Salisbury beaches are going out as well
7 as the others.

8 MR. TURK: Your Honor, there's an answer to it all.
9 I can waive my objections -- I can simply waive my objection
10 and let Mr. Fierce have his question and answer the way they
11 are and I'll deal with it in the findings as Mr. Dignan says
12 that he's prepared to do. If Mr. Fierce wants to stand on the
13 question I'll yield to him.

14 There are other problems. I mean, this assumption
15 that the day trippers and the permanent residents leave at the
16 same time, there's nothing in the record on that. The fact is
17 that the day trippers are there with their cars, they have no
18 preparation time necessary, they get into their cars, they
19 enter the roads. And the permanent residents have to close up
20 their houses --

21 JUDGE SMITH: I would still worry, you're about to
22 lose on Salisbury, Seabrook and Hampton beach. Wouldn't you
23 lose on that and then go to the next one or do you want to just
24 withdraw your objection?

25 MR. DIGNAN: We want to know who's going to close

1 Salisbury, Hampton -- Salisbury Beach, that's in Massachusetts.
2 I understand the position of the Commonwealth is they won't do
3 anything.

4 MS. WEISS: It was an evidentiary presumption.

5 MR. TURK: I believe the question --

6 MR. DIGNAN: I'll take that as a stipulation.

7 MR. TURK: The question here says that, "Assume that
8 the Salisbury, Seabrook and Hampton beach area are given the
9 announcement at roughly the same time." There's nothing before
10 us in terms of what -- when the announcement will be given to
11 Salisbury Beach regardless of what's in the KLD ETE in terms of
12 evacuation times.

13 JUDGE SMITH: Chief, are you sorry you came?

14 (Laughter)

15 THE WITNESS: (Olivera) It's interesting.

16 JUDGE SMITH: Well, what's the status of your
17 objection?

18 MR. TURK: I ask Mr. Fierce, does he want to stand on
19 those questions --

20 MR. FIERCE: Yes.

21 MR. TURK: -- as framed?

22 MR. FIERCE: I have no objection to the other
23 corrections that we've made. But with respect to Salisbury,
24 certainly.

25 MR. DIGNAN: Well, can we nail down on the exact

1 question that's being put to the Chief.

2 MR. FIERCE: Well, I'd like to see what the Judge has
3 on his -- because I haven't got it exactly.

4 JUDGE SMITH: Well, there's two things; we struck
5 have been closed as unnecessary. And we inserted authorized to
6 operate at full power.

7 MR. FIERCE: Beaches have been closed was struck?

8 MR. DIGNAN: Yes.

9 MR. FIERCE: Those two changes? Anything else?

10 JUDGE SMITH: See the thing is, we're going to
11 proceed through the assumptions and rule whether they can
12 remain or not remain. But Mr. Turk has offered to withdraw his
13 objection, and I don't know, it's up to him, he's calling it.

14 MR. FIERCE: Well, I'm not objecting to the
15 authorized to operate insertion.

16 JUDGE SMITH: Yes.

17 MR. FIERCE: Or the striking of the beaches have been
18 closed.

19 JUDGE SMITH: We were about ready to allow to remain
20 over Mr. Turk's objection, that the three communities,
21 Salisbury, Seabrook and Hampton Beach were included in the
22 announcement.

23 MR. DIGNAN: Well, no, Your Honor, the question
24 doesn't say included. It says, "Given the announcement at
25 roughly the same time."

1 Again, and I got no dog in the fight, I just don't
2 want my silence to be perceived as agreement.

3 MR. TURK: Your Honor, I'll withdraw the objection to
4 the whole darn thing and the best thing is, if Mr. Fierce
5 intends to use this question and answer to establish something,
6 I think we'll just all understand what all the assumptions are
7 and be able to deal with them.

8 JUDGE SMITH: All right.

9 MR. DIGNAN: And as long as the Board, because the
10 Board has indicated that, let people know up front that
11 question as phrased, in my judgment, I will ask for a finding
12 for the Board to disregard the Chief's testimony simply because
13 he was given a question that is a hypothesis that is not backed
14 up by the record. Just the thing that Your Honor feared would
15 be requested. So everybody knows, if he continues the question
16 in the form it's in, that's what I will be asking.

17 MR. FIERCE: Well, I'd like Mr. Dignan to make the
18 objection now. I'm here with the witness --

19 MR. DIGNAN: No. Oh, no. No, no, no. Mr. Dignan is
20 just going to sit back here like an old puppy dog.

21 MR. FIERCE: And sandbag us as he usually does in
22 situations like this.

23 MR. DIGNAN: I object to that.

24 JUDGE SMITH: All right. Come on, just stop.

25 MR. FIERCE: Here's the numbers for the testimony to

1 be objected to, and I believe that every one of these
2 assumptions is exactly the way --

3 JUDGE SMITH: That's his tactic. He's allowed to do
4 it. It's -- you should not take the Board's comment that we
5 would necessarily find one failure in your assumptions as
6 something that destroys, you know, like a house of cards, one
7 card out and zap, everything falls down. I just said that as
8 something, that argument if it could be avoided should be
9 avoided.

10 MR. FIERCE: That's my point as well.

11 JUDGE SMITH: The Board, I guess, is capable of
12 determining upon proposed findings, how close to reality the
13 assumptions are.

14 MR. FIERCE: Well, I want to say just one other thing
15 in response to the concerns that have been raised, which is
16 that if one takes a look at volume 6 and particularly takes a
17 look at page 10-21 one can see a map of the roadways in the EP2
18 which are at congested flow levels after 10 minutes after the
19 order to evacuate.

20 And that, that is a substantial foundation for the
21 way the question has been drawn.

22 JUDGE SMITH: Mr. Fierce, you know, the Board has a
23 basic sympathy to your situation here, but there's not much we
24 can do. I mean, we can't go through all this and then trace
25 back to the record where it's supported and where it isn't.

1 You'll have to take your chances.

2 Do you want to -- well, the Chief has been waiting
3 all day, I was wondering if you'd like --

4 MR. FIERCE: No.

5 JUDGE SMITH: -- no, you didn't know these objections
6 were coming up, if you'd like to look at your testimony.

7 MR. FIERCE: I'm prepared to go forward now, Your
8 Honor.

9 JUDGE SMITH: All right.

10 MR. DIGNAN: Your Honor, my last one, again, so that,
11 you know, nobody accuses me later of -- I would remind --

12 JUDGE SMITH: Mr. Dignan, there's one thing you can
13 count on.

14 MR. DIGNAN: What?

15 JUDGE SMITH: That this Board member is not going to
16 accuse you later.

17 MR. DIGNAN: It's not you I'm worried about, Your
18 Honor. It's not you I'm worried about, Your Honor. About 10
19 minutes later he's got everything congested; that is not 10
20 minutes from beach closing; that's 10 minutes from order to
21 evacuate. And the assumption is the beach closing is taking
22 place 25 minutes earlier. Bingo.

23 JUDGE SMITH: We struck closing.

24 MR. DIGNAN: No, no. But my point is, he's right
25 there and he's going with 10 minutes on that chart as the basis

1 for this big mess. And that's the reason Mr. Turk brought up
2 the beach closing, and that's why I'm concerned about this.
3 This question is a pretty convoluted question with a lot of
4 assumptions, and in my personal judgment, 30 or 40 percent of
5 which aren't in the record and aren't backed up. And I just,
6 you know, I don't want to hear anything from anybody when the
7 finding comes in; and with that I subside.

8 Now, he's on notice. And you offered him an
9 opportunity to reflect on the question.

10 MR. FIERCE: I like the question the way I had it
11 original.

12 JUDGE SMITH: That'll stand or fall on the proposed
13 findings in the record.

14 MR. FIERCE: Well, in terms of the beaches have been
15 closed, the assumption in the ETE study was that the beaches
16 have been closed, and that approximately 25 minutes later an
17 order to evacuate would be given.

18 MR. DIGNAN: That's not in the question. And I --

19 MR. FIERCE: I am stating --

20 MR. DIGNAN: -- it wouldn't change the Chief's
21 answer, and that's my problem.

22 MR. FIERCE: The question was originally designed to
23 parallel exactly what the situation was assumed in the ETE
24 study, which was that the beaches had been closed and you have
25 an evacuation order. Following shortly thereafter --

1 JUDGE SMITH: The difficulty is, the Chief is here,
2 he is probably the best person you could bring to explain
3 what's going to happen, in his view, in Salisbury. And I think
4 it is important to you to have assumptions here that are
5 supported by the record, so that the Board will get the maximum
6 benefit from the advice that he wants to give us. Because I
7 can just see, you know, you're going to have problems here, and
8 then we're going to have to try to weigh --

9 MR. FIERCE: Your Honor, I would like to include the
10 beach closing and to make it perfectly clear that I am
11 following the ETE analysis 100 percent. We can insert in that
12 question the beaches have been closed and that within 25
13 minutes evacuation of the area is recommended.

14 MS. WEISS: Thereafter -- 25 minutes thereafter.

15 MR. FIERCE: And that within 25 minutes thereafter.

16 MR. DIGNAN: 25 minutes later.

17 MS. WEISS: Thereafter.

18 JUDGE SMITH: All right. Are you using within or 25
19 thereafter.

20 MR. FIERCE: Why don't we say that, 25 minutes later
21 evacuation of the area is recommended.

22 MR. DIGNAN: But you're going to continue on and when
23 all the day trippers as well as the permanent residents and
24 seasonal residents and all the merchants and their employees
25 all seek to leave the beach at roughly the same time despite

1 the fact that the warning went out 25 minutes earlier; is that
2 right?

3 MR. FIERCE: That's what the ETE study assumes.

4 MR. DIGNAN: If the Chief wants to adopt his answers
5 on that basis, it's okay with me.

6 JUDGE SMITH: Is it possible for you to cast this
7 question in such a way that it's going to not fail because
8 you've exceeded the ETE and the record. I mean, can't you --
9 will his testimony really change --

10 MR. FIERCE: No.

11 JUDGE SMITH: -- if you are, let's say, more -- not
12 conservative, because I don't know which direction conservatism
13 lies here, and if you were more -- you describe it more in the
14 direction of the objections which are being made.

15 MR. FIERCE: His testimony won't change --

16 JUDGE SMITH: Well, that's what I mean.

17 MR. FIERCE: -- or this at all. I'm certainly trying
18 to present a question, however, which is as closely patterned
19 to what the ETE study assumed as I can.

20 JUDGE SMITH: All right. Well, then we'll just leave
21 it -- we'll leave it to the Board. We'll leave it to the Board
22 to look at the proposed findings, compare with the record and
23 see what weight we can give to the Chief's testimony if it does
24 depart from the record and which direction; I don't know, if
25 necessary. We'll look at the proposed findings on it.

1 The objection has been withdrawn. However, you have
2 in light of the observations made, you have offered some
3 corrections to the or some modifications to the question.

4 MR. FIERCE: Yes.

5 JUDGE SMITH: All right. Let's make sure that we
6 understand those.

7 MR. FIERCE: The first --

8 JUDGE SMITH: The authorized --

9 MR. FIERCE: -- is the authorized to operate.

10 JUDGE SMITH: All right.

11 MR. FIERCE: Assume that Seabrook Nuclear Plant is
12 licensed and it's authorized to operate at full power.

13 JUDGE SMITH: And then would you carefully read into
14 the record the adjustment as to the beaches being closed and 25
15 minutes thereafter evacuation has been ordered.

16 MR. FIERCE: Now, assume that a sudden unexpected
17 announcement is made that due to the problems at the Seabrook
18 Nuclear Plant the beaches have been closed, and that 25 minutes
19 later evacuation of the area is recommended.

20 The only changes --

21 JUDGE SMITH: You think you might be willing to -- am
22 I helping him too much?

23 MR. DIGNAN: No, Your Honor, you're not, but I want
24 to point out something to the Board, because the Board has
25 indicated a concern. Now, look at the next sentence, "And

1 further assume that all the people in the beach area including
2 Salisbury, Seabrook and Hampton Beach are given the
3 announcement," and I don't know whether that's the announcement
4 of the closing or the order to evacuate at roughly the same
5 time. What is the announcement now refer back to with that
6 change?

7 MR. FIERCE: I'm more than happy to insert the beach
8 closing announcement there.

9 JUDGE SMITH: Well, you want to have the
10 announcements, the beach closing evacuation announcements?

11 JUDGE HARBOUR: Insert beach closing after, but
12 before announcement; is that your suggestion?

13 MR. FIERCE: Yes.

14 MR. DIGNAN: And we have no hypothesis as to whether
15 or not the OTE is given to these populations at the same time;
16 is that right?

17 JUDGE SMITH: You know, you can be grateful that Mr.
18 Dignan is cleaning up your testimony, and it's going to be hard
19 to challenge it.

20 MR. DIGNAN: Let me tell you why I'm cleaning it up,
21 Your Honor, if I'm cleaning it up, what's bothering me here.
22 Mr. Turk started this thing off, I thought it was kind of
23 convoluted. We have a Police Chief of the Commonwealth sitting
24 up there. And when we're all through cleaning this up I hope
25 the Board will put the question to the Chief that he's sure

1 that none of his answers change in light of the change in the
2 question.

3 But to me as a layman, there's a hell of a difference
4 between dealing with a situation where, bang, an announcement
5 is given and it's going to start people understanding there's a
6 problem and we'll all be leaving here. And then another
7 announcement 25 minutes later. I may be wrong. Maybe that
8 makes no difference to the Chief's answers at all.

9 But to a layman, at least like myself, those are two
10 different situations. And what's going on here is a big
11 rewrite of a question, and then the Chief is going to be asked,
12 presumably, to adopt it. And I want to be sure we go right
13 through that so that under oath he gets a chance to adopt these
14 same answers to that same question if he chooses to do so.

15 JUDGE SMITH: The Chief has indicated that he's
16 following the modifications with interest and we'll see what
17 his opinion is.

18 Now, let's move on to --

19 MR. DIGNAN: So we have no hypothesis now on whether
20 the OTE was given to these same people at roughly the same
21 time.

22 JUDGE SMITH: What's OTE? Order to evacuate.

23 MR. DIGNAN: Order to evacuate. Or do we?

24 JUDGE SMITH: That's the one that the Board was more
25 willing to go along with the AG that a scenario in which

1 Salisbury, Seabrook and Hampton Beach being contiguous
2 communities. It's not an unreasonable scenario that he's
3 proffering there, that they might be given an OTE at roughly
4 the same time. Even though we recognize we've not had any
5 record on Massachusetts communities yet.

6 MR. DIGNAN: Oh, yes, but keep in mind another thing,
7 an OTE may be a keyhole evacuation; it may be a number of
8 things. I don't think it's at all a given.

9 JUDGE SMITH: We just didn't see a keyhole being
10 quite as precise as to include Salisbury and nothing else.

11 MR. DIGNAN: No, I'm thinking more of including say,
12 Seabrook and not Salisbury, if the wind is blowing the right
13 way.

14 JUDGE SMITH: Well, that's an area -- leave it up to
15 counsel, whatever he wants. But we would have overruled you on
16 it.

17 But let's go --

18 MR. DIGNAN: I have no objection.

19 JUDGE SMITH: That's right.

20 MR. DIGNAN: You're overruling Turk.

21 JUDGE SMITH: Let's go down to the next one. Let's
22 have -- let's have where everybody -- everybody seeks to leave
23 the beach at roughly the same time. I think that's where you
24 might have a little bit of trouble. Can you define roughly a
25 little bit better to assure that you're going to capture a

1 scenario --

2 MR. FIERCE: Well, my intent would be to try to
3 define it in the same way that it was intended in volume 6 in
4 the ETE study. And as I understand the situation from Mr.
5 Lieberman's testimony, it would be expected that at the beach
6 closing announcement, at least within the first five or 10
7 minutes after the beach closing announcement the evacuation
8 routes would be fully congested.

9 JUDGE SMITH: Well --

10 MR. FIERCE: And that the people on the beaches and
11 in the homes and in the stores would begin to leave -- and when
12 I say, roughly the same time, that may be over the next 15
13 minutes to 45 minutes or so, but it makes really no difference,
14 he would say, because the roads are all congested anyway, they
15 couldn't get out any quicker.

16 The roughly the same time is that period of time
17 after the order to evacuate -- from the time the order to
18 evacuate is given until the last person seeks to try to leave
19 and it may be a period that could be as long as an hour, but
20 that's within roughly the same time is what I mean by that.

21 JUDGE SMITH: Okay. Roughly, come, as much as an
22 hour --

23 MR. FIERCE: After the beach closing announcement.

24 Well, we've mentioned the first two changes. I just
25 want to sum up, if I can.

1 JUDGE SMITH: Now, you're cleaning up a copy to put
2 in the transcript.

3 MR. FIERCE: I am. I think -- and I want to go over
4 this right now with you, Judge. So I have a sentence that
5 reads now, "Assume that a sudden unexpected announcement is
6 made that due to problems at the Seabrook Nuclear Plant" --

7 JUDGE SMITH: Wait a minute. Start at the beginning
8 and I'll get all these changes, and make sure that they're
9 all --

10 MR. FIERCE: The first change is, "Now assume that
11 the Seabrook Nuclear Plant is licensed and is authorized to
12 operate at full power."

13 JUDGE SMITH: Right.

14 MR. FIERCE: "Now assume that a sudden unexpected
15 announcement is made that due to problems at the Seabrook
16 Nuclear Plant the beaches have been closed, and that 25 minutes
17 later evacuation of the area is recommended."

18 And the next sentence I would like to change and have
19 read as follows: "And further assume that all the people in
20 the beach area, coma, including Salisbury, Seabrook and Hampton
21 Beach, coma, are given the beach closing and evacuation
22 announcements at roughly the same time."

23 Next page, "All seek to leave the beach area at
24 roughly the same time, coma, i.e., within an hour of the beach
25 closing announcement."

1 JUDGE SMITH: I think that was it.

2 MR. FIERCE: Okay. With these changes I would offer
3 this testimony as corrected.

4 JUDGE SMITH: Any other objections?

5 MR. LEWALD: I'm objecting to offering the testimony,
6 offering the question to his testimony, Your Honor.

7 JUDGE SMITH: You object to what?

8 MR. DIGNAN: I think we want to find out if the Chief
9 is changing any answers in light of the questions.

10 MR. LEWALD: He's offering --

11 MR. FIERCE: I think that's right, I need to ask the
12 Chief now.

13 BY MR. FIERCE:

14 Q In light of the changes that we've made, Chief, would
15 your answer given to this question be any different?

16 A (Olivera) Well, assuming that not everybody left at
17 the same time, it wouldn't really stop the situation of how,
18 once they get into a congested traffic jam how they would
19 react, in my opinion anyway.

20 JUDGE SMITH: What effect would the change -- well,
21 we had them leaving roughly the same time, described now, as
22 leaving within an hour after the beach closed?

23 THE WITNESS: (Olivera) What I meant, Your Honor, is
24 if they all left at the same time, naturally you would have a
25 bigger congestion of traffic. But how people react to waiting

1 time, as far as traffic is concerned is what I'm leading up to.

2 It doesn't have to be per se an evacuation. This
3 happens almost every Sunday during regular normal novel times
4 where people get tied up in traffic and they get frustrated and
5 they take any means they can to get around it, if it's
6 possible. Riding up on sidewalks, going down the left-hand
7 side of the road. If there's no police officer there, they'll
8 do it. I've seen them do it because I've been in traffic
9 myself sometimes and I know.

10 JUDGE SMITH: So is it your testimony that the speed
11 with which -- I mean, the promptness with which that phenomenon
12 would take place might change, but it would happen
13 nevertheless.

14 THE WITNESS: (Olivera) Right.

15 JUDGE SMITH: It wouldn't change the fact that it
16 would happen?

17 THE WITNESS: (Olivera) Right. That's my opinion.

18 MR. DIGNAN: Your Honor, I understand the opinion,
19 but I want to be sure very carefully on the record here,
20 whether the Chief wishes to change any of the answers to any of
21 the questions. I remind the Board, as Mr. Turk pointed out,
22 that two or three questions after that come off the same
23 hypothetical. Perhaps the Chief's answers don't change. I
24 don't know whether that opinion changed the answer or didn't at
25 this juncture. And I just want to be sure he gets a chance to

1 affirm whether or not he's prepared to stand on this testimony
2 after the question is now phrased.

3 JUDGE SMITH: Mr. Dignan, the Chief is here to tell
4 us -- to give us his valuable opinion as to what he expects is
5 going to happen in Salisbury. And I don't want him to testify
6 with the fear that if he overlooks the significance of a change
7 later on, he's going to be driven out of the hearing room in
8 disgrace. I'm convinced that he's going to tell us, as well as
9 he can, what he knows about his expectations in the event of an
10 evacuation under this scenario.

11 And it will be all of our functions here to help him
12 do that.

13 MR. DIGNAN: Your Honor, I don't think that's going
14 to happen either. As a matter of fact, at least I'm not going
15 to cross-examine him, my partner is, so that's not the point.

16 What I'm getting at is, we have a record now where
17 all the witness' has done is adopt a set of testimony as was
18 originally handed; that's where the record sits.

19 The question has now been changed. The Chief has not
20 yet been asked, and affirmatively answered a question that
21 says, Chief, do you stand on the answers given in light of the
22 change that has been worked in the question. That question
23 simply has not yet been answered.

24 I assume his answer is going to be, yes, because it
25 was represented it is going to be, yes. But I think that

1 should be done for record purposes. As it now stands, nothing
2 is admitted, when you admit it, because the Chief has not
3 affirmed these answers to this question as its been rewritten.

4 Now, that's where the record stands, Your Honor, I
5 respectfully suggest. It's not a question of driving the Chief
6 out of here or anything else. But the point is, the question
7 got some substantial rewrite, I think for good reason, and I
8 don't know what the witness says.

9 JUDGE SMITH: All right. The Chief followed -- the
10 witness followed over an extended period of time, carefully
11 arrived at changes to the question. He was asked, what effect
12 it would have on the balance of his testimony; he told us
13 narratively. Now you think that there may be a void in the
14 record in which he has not stated that the testimony as changed
15 is his belief.

16 MR. DIGNAN: I do believe there's a void, Your Honor.
17 If, Your Honor, does I subside.

18 JUDGE SMITH: That's fine. Now, except that he sworn
19 to tell the truth all over. But, Chief,--

20 MR. DIGNAN: No, no, no. It's not a question of
21 whether he told the truth; it's a question whether there's just
22 a void in the record. Your Honor put it perfectly. There's
23 nothing to do with the Chief's credibility.

24 I think there is now a void in the record. I may be
25 wrong, and if I am and the Board thinks I am, I subside.

1 JUDGE SMITH: I don't see it. But, Chief, is this
2 testimony as changed, as the question is changed -- see, don't
3 forget, your answers, your typed answers have not been changed,
4 but the question has been changed. And you've explained to me
5 narratively the effect that the change might have. But there
6 still is the problem that there are words written here that
7 intended to be answered to another question.

8 THE WITNESS: (Olivera) Right.

9 JUDGE SMITH: And I think what we better do is to
10 take a break for about five minutes and let you read the rest
11 of the testimony and see if it still makes sense to you in view
12 of the change of questions.

13 THE WITNESS: (Olivera) Okay, sir. Thank you.
14 Off the record.

15 (Whereupon, a short recess was taken.)

16 (Continued on next page.)
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1 JUDGE SMITH: Is your witness ready for cross-
2 examination now?

3 MR. FIERCE: Yes.

4 BY MR. FIERCE:

5 Q At this point, I think the question is to the Chief,
6 whether in light of the changes that we have made to the
7 question which begins on page 5 and carries over onto page 6,
8 would there be any changes on the written answer provided in
9 your testimony on page 6 as it carries over to page 7?

10 A (Olivera) Yes, where it says, "the evacuating
11 drivers would not refrain from using the incoming opposite lane
12 on Beach Road," I would like to cross out "would" -- or rather,
13 "not," and leave it stand as "evacuating drivers would
14 refrain."

15 Q Chief, is that the correction of a typographical
16 mistake --

17 A (Olivera) I would say so, yes.

18 Q -- or a change in your answer in response to the
19 question changes?

20 A (Olivera) No, I would say it's typographical.

21 MR. DIGNAN: I'm sorry. I lost where the change is. I
22 apologize.

23 JUDGE HARBOUR: Is it the answer on page 6 about six
24 lines from the bottom?

25 MR. FIERCE: Yes.

1 THE WITNESS: (Olivera) Yes, sir.

2 JUDGE HARBOUR: Change "would not refrain" to "would
3 refrain."

4 THE WITNESS: (Olivera) Would refrain.

5 BY MR. FIERCE:

6 Q Chief, there is a question that is on page 7 which
7 asks you to assume the same facts as in that prior question,
8 and you have provided a written answer on page 7 that carries
9 over onto page 8. In light of those changes, in the earlier
10 question, would your answer to this question change at all?

11 A (Olivera) No, sir.

12 MR. FIERCE: At this time I'd like to offer this
13 corrected testimony into evidence.

14 JUDGE SMITH: Are there objections?

15 The testimony is received. Are you -- you're making
16 all these corrections?

17 MR. FIERCE: I want to show you these corrections,
18 Your Honor and note that they will be provided to the Court
19 Reporter.

20 JUDGE SMITH: You showed it to your other parties?

21 MR. FIERCE: I did not. I should show it to Mr.
22 Dignan first.

23 JUDGE SMITH: Do we have a clean -- do you have --

24 MR. FIERCE: I have a clean copy, if you wish one.

25 JUDGE HARBOUR: This one has something that was taken

1 out and put back in.

2 JUDGE SMITH: Put back in. I think if we can avoid
3 that, that would be in the mean time, pass around what is going
4 to look like and clean it up.

5 MR. FIERCE: I do, Your Honor. Here's a clean copy.

6 JUDGE SMITH: You want me to make those changes after
7 the proceeding --

8 JUDGE SMITH: I'll tell you, somebody, let me
9 volunteer somebody with nice writing to do that while -- so we
10 can get on with it.

11 MR. BACKUS: Yes, Ms. Doughty has very good writing.
12 It is highly legible, I can guarantee it.

13 MR. TURK: Your Honor, you're not going to like this,
14 I have a feeling, but I want to just ask for the record, what
15 what is this a rebuttal of?

16 MR. FIERCE: What is this a rebuttal of?

17 MR. TURK: The reason I ask, Your Honor, is I recall
18 that Mass. AG did have testimony in their direct case about
19 driver behavior, and I'm wondering -- I'm asking it -- maybe
20 this is a general question I should have asked before we got
21 into all the details of the last question.

22 JUDGE SMITH: Well, among other witnesses, Mr. Turk,
23 I believe it's in rebuttal to your own.

24 MR. TURK: Yes, and I also believe that the Mass. AG
25 did put on some testimony earlier about driver behavior, or at

1 least about the way persons may be expected to behave in a
2 long, backed-up traffic situation. It seems to be more of the
3 same.

4 Granted, it does address things that our witness said
5 as well, but I query whether it's truly rebuttal.

6 JUDGE SMITH: However, you have no objection?

7 You're just doing it to annoy His Honor?

8 MR. BACKUS: Your Honor, you know I have not made an
9 objection.

10 MR. TURK: I tremble to make the objection, but I,
11 for the record, I make it.

12 JUDGE SMITH: This is something that we -- the
13 objection is traditionally made at the time it's offered. I
14 understand that. But the parties have been very helpful in
15 making objections in limine, as a good-faith effort to avoid
16 inconvenience, expense.

17 Nevertheless, if you persist in your objection, we
18 will take it on its merits, and evaluate it.

19 MR. TURK: I'd note one thing, Your Honor, in regard
20 to the question of motions in limine. Mass. AG attempted to
21 serve this on NRC staff at the same time it served other
22 parties, and was unable to. And the first time I received this
23 was upon a second service attempt late last week on Thursday.
24 Upon discussing it with Mass. AG, I indicated that it would be
25 fine to serve it on me then and I would take a look at it.

1 So I didn't have it until the end of last week.

2 MR. FIERCE: The U.S. Post Office was unable to
3 locate Mr. Turk, or his office. In fact, they said it was not
4 habited.

5 MR. DIGNAN: That's often the case.

6 MR. TURK: I'm not complaining about service, Your
7 Honor, but I don't want you to feel that I've raised the
8 objection so late in the game.

9 JUDGE SMITH: What do you say?

10 MR. FIERCE: Well, in response to that, since the
11 issue has been raised, there are serious questions regarding
12 whether traffic disorders will exist in an evacuation from the
13 Seabrook plant during an emergency on busy weekends, and it's a
14 very important issue in the case. And both Dr. Urbanik and Mr.
15 Lieberman have testified that to the extent that there will be
16 such incidents, they will have no effect on the evacuation time
17 estimates. And we believe, to the contrary, that there will be
18 incidents -- this is among them -- that will certainly have
19 some bearing on how the evacuation times need to be calculated
20 at Seabrook, and clearly in rebuttal to Mr. Lieberman's
21 testimony and Dr. Urbanik's testimony.

22 JUDGE SMITH: All right, is -- I guess your point is
23 he had a case-in-chief, which included testimony of this
24 nature, but faced with the testimony of Dr. Urbanik and Mr.
25 Lieberman, he re-evaluates and decided he wishes to offer

1 rebuttal. He's not prohibited from offering rebuttal, because
2 he felt that after he presented his case-in-chief, it would be
3 prudent to rebut testimonies put in against him, that I can
4 see.

5 MR. DIGNAN: The only problem I have with the
6 argument I've just heard, Your Honor, is as far as I know, and
7 I just checked with him, Mr. Lieberman has never testified that
8 the type of things the Chief is talking about is going to have
9 no effect on ETEs. He just hasn't testified to that.

10 Indeed, he put an 85 percent factor on urban roads
11 just to account for things like this. And in addition he
12 testified to sensitivity runs for accidents and a whole lot of
13 other things. And the statement is made by the Commonwealth
14 that Mr. Lieberman's coming here and testified that what the
15 Chief is concerned about is something that we're saying
16 couldn't affect an ETE, and we've never said that.

17 JUDGE SMITH: How about if we make all of the
18 responses to the argument that he's making before I come up
19 with a reason for allowing it in that -- a reason --

20 MR. DIGNAN: I think he's got a good reason, because
21 he had two reasons. But I just wanted it known that the
22 representation that we have testified that the things that are
23 of concern to the Chief can't affect an ETE. It just ain't so.

24 We haven't so testified. Well, Mr. Lieberman has not
25 so testified by we.

1 JUDGE SMITH: He is not bound to put his case-in-
2 chief in all at once -- I mean, he's not precluded from
3 offering rebuttal testimony solely because he covered the same
4 subject matter in case-in-chief.

5 If, in his judgment, he decided that rebuttal would
6 be appropriate to meet somebody else's case-in-chief, I see no
7 reason why he should not be allowed to do it.

8 I don't recall -- I'll accept Mr. Dignan, I don't
9 recall whether this is necessary to rebut Mr. Lieberman or not.

10 MR. FIERCE: I perhaps should clarify, when I say,
11 Mr. Lieberman, I am referring to Applicant's direct testimony
12 No.7 and the panel on which Mr. Lieberman sat, could well have
13 been that it was Dr. Mileti who was speaking to these issues
14 directly, but this question about traffic disorders, and
15 traffic disorderliness, has been discussed repeatedly.

16 JUDGE SMITH: All right, let's call it -- what do you
17 say we call it surrebuttal. You put on a case in chief that
18 there would be problems. That other witnesses said, well,
19 that's not going to be any big deal.

20 And now you're putting in surrebuttal to that
21 testimony.

22 MR. FIERCE: I don't care what it's called, Your
23 Honor.

24 JUDGE SMITH: Just so it's in.

25 MR. FIERCE: But there is another point. It's beyond

1 traffic disorderliness. There is a contention with respect to
2 whether evacuation buses and other emergency vehicles are going
3 to be able to travel inbound during an emergency.

4 JUDGE SMITH: You know, this is supposed to be
5 rebuttal, or some resemblance of it.

6 MR. FIERCE: And Dr. Urbanik testified in his
7 examination, his written testimony, that there would not be a
8 problem with emergency buses travelling inbound, so this is
9 also rebuttal to that.

10 JUDGE SMITH: Do you agree that this would be
11 rebuttal to Dr. Urbanik's testimony? Mr. Turk?

12 MR. TURK: I'm thinking, Your Honor. I'm trying to
13 recollect the portions of Dr. Urbanik's testimony that might be
14 affected.

15 JUDGE SMITH: Well?

16 MR. TURK: I honestly don't recall, Your Honor.
17 There was testimony with Dr. Urbanik that bus travel times into
18 the EPZ should be reduced down to something like 30 miles an
19 hour instead of the 40 that was assumed by KLD.

20 There was also testimony that driver behavior,
21 aberrant driver behavior, was not expected to become the
22 problem in the evacuation and that in Dr. Urbanik's opinion,
23 people would stay in traffic, and would not impede the flow.

24 JUDGE SMITH: I think so. Right. Objection
25 overruled. The testimony is received unless there's another

1 objection. The testimony is received.

2 (Rebuttal testimony of
3 Edwin J. Olivera on behalf of
4 the Commonwealth of Massachusetts
5 regarding traffic disorders
6 because of a Seabrook accident
7 follows:)

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:
Ivan W. Smith, Chairperson
Gustave A. Linenberger, Jr.
Dr. Jerry Harbour

In the Matter of)	Docket No.
)	50-443-444-OL
PUBLIC SERVICE COMPANY OF NEW)	(Off-site EP)
HAMPSHIRE, ET AL.)	
(Seabrook Station, Units 1 and 2))	January 22, 1988
)	
)	

REBUTTAL TESTIMONY OF EDWIN J. OLIVERA
ON BEHALF OF THE ATTORNEY GENERAL FOR
THE COMMONWEALTH OF MASSACHUSETTS
REGARDING TRAFFIC DISORDERS EXPECTED DURING
AN EVACUATION OF THE BEACH AREA
BECAUSE OF AN ACCIDENT AT THE SEABROOK NUCLEAR PLANT

Q. Would you please state your name and current occupation?

A. My name is Edwin J. Olivera, and I am the Chief of Police for the town of Salisbury, Massachusetts.

Q. How long have you been the Chief of Police in Salisbury, and what did you do prior to becoming the chief?

A. I have been the chief since 1979. Prior to that time I was a police officer in Salisbury. Altogether, I have been a Salisbury police officer for 25 years.

Q. Where is the police station located in Salisbury?

A. It is in the beach area, near the amusement park.

Q. Are you familiar with the traffic conditions in the beach area of Salisbury during the summertime?

A. Yes, certainly. My staff and I see and respond to the traffic in the beach area on a daily basis.

Q. Chief, a number of witnesses in this proceeding have testified that in their opinion there will be no traffic disorderliness of any significance during an evacuation of the beach areas near the Seabrook nuclear plant if there were ever to be an accident at the plant, and I want to ask you a few questions on this topic.

A. Okay, go ahead.

Q. Have you ever seen situations in which most of the people who come to the beaches for the day all try to leave at once?

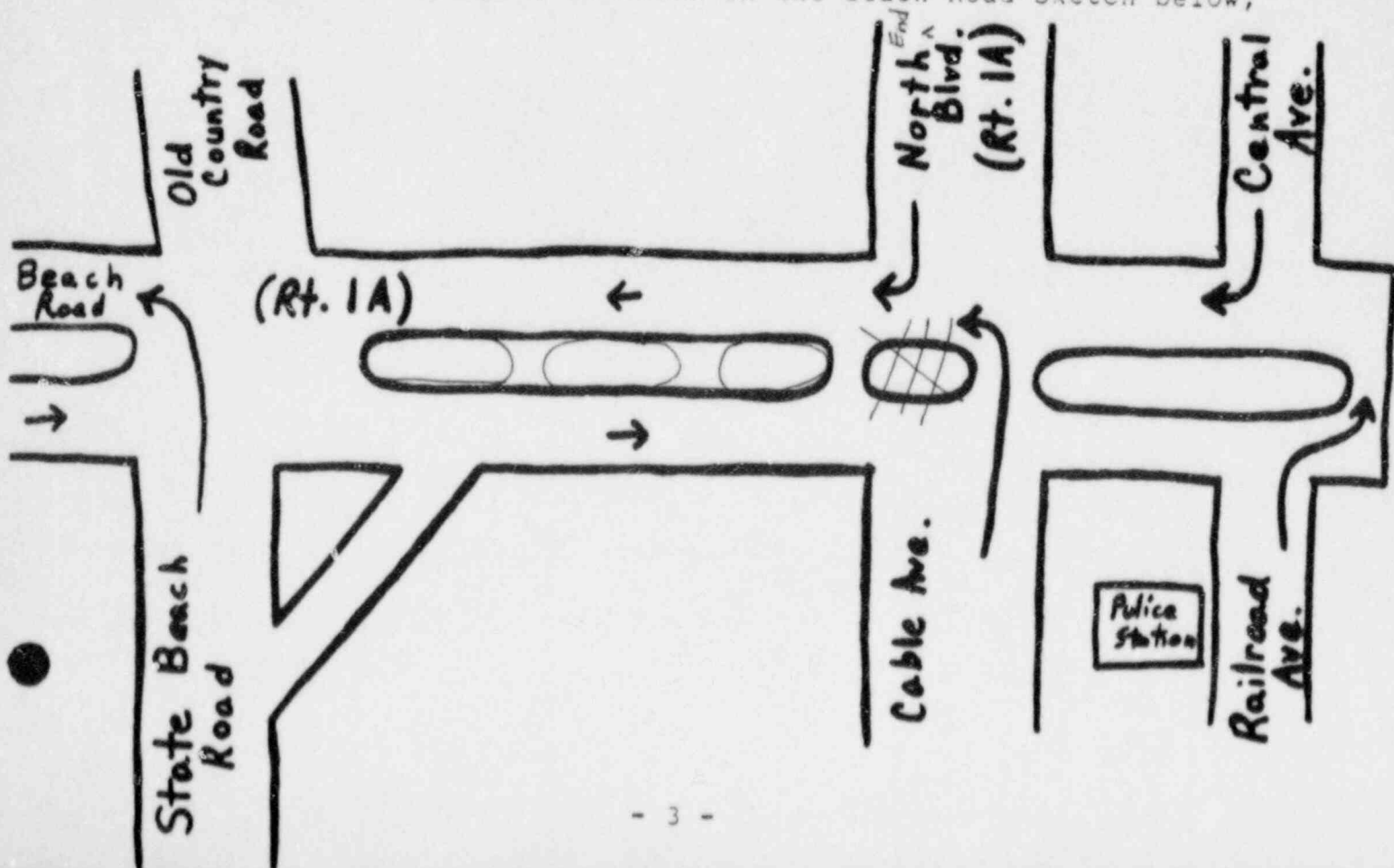
A. Well, we have had sudden rainstorms on days when the beaches have been crowded. When that happens there are an awful lot of people who do try to leave the beach areas within a short period of time, and it creates quite a traffic jam. Traffic is a real mess when that happens.

Q. What are the traffic conditions like in the beach area when a sudden rainstorm occurs on a busy beach day?

A. First, Route 1A heading west out of the beach area becomes a very congested line of very slow moving traffic. This happens late in the afternoon on busy beach days even without a rainstorm. The rain just makes the situation

worse. All the drivers who came to the beach that day want to move out at once, and they just can't do it. Cars are backed up everywhere. Many of the cars in the big parking lots can't even get out onto the road for hours. The chief problem is that, apart from heading north on Rt. 1A up the beach into Seabrook, there are only two roads out of the Salisbury beach area: Rt. 1A (Beach Road) in the south and Rt. 286 in the north (See the map attached hereto as Attachment A). Each of these roads is a two lane, east-west road with one lane in each direction. Bottleneck traffic jams occur where each of these roads leaves the main north-south beach area road (Route 1A). This happens because vehicles from many lanes of north-south traffic flow are trying to merge onto the one westbound lane of either Beach Road or Rt. 286.

For example, as shown in the Beach Road sketch below,



five lanes of exiting north-south traffic must merge into a single lane, westbound on Rt. 1A (Beach Road). During a sudden rainstorm, this area is terribly snarled.

Q. Do you or your officers ever see disorderly traffic behavior when this kind of congested condition occurs?

A. Oh, sure. We see all kinds of things. People get frustrated by the long traffic back-ups, and they try all kinds of things to get out of or to avoid the traffic jams. For example, we have seen drivers who try to pass the traffic by driving on the right shoulder, to the right of the fog line. We have seen other drivers who cross the double yellow center line into the eastbound lane on Beach Road in order to pass as many cars in the westbound lane as they can, despite the fact that passing is prohibited. We have also seen them try to avoid the lengthy lines of slow-moving traffic on Beach Road (Route 1A) and Route 286 by taking secondary roads. On Beach Road they often take Old County Road just to bypass about a half mile of backed-up traffic on Beach Road. Some of those backed up on Route 286 divert onto South Main Street, which appears to them to be a way to "beat the traffic" on Rt. 286. In fact, it just leads them into a worse snarl in Salisbury center, making traffic flow through the intersection there (Rt. 1A, Rt. 1, Rt. 110) even more congested and difficult.

Of course, because we are the police, and people tend to drive more orderly around us, I know that what we see is

only a small fraction of the disorderly traffic behavior that goes on under these circumstances.

Q. Chief Olivera, do you have an opinion regarding what kind of drivers are the most disorderly under these conditions.

A. As you probably know, a large percentage, probably half or more, of our beach area population in the summer is comprised of young people in the 17-25 age range. I would say that these drivers, more so than others, are the ones who are the disorderly drivers.

Q. Chief, would you please assume for a minute that it is a Sunday in the summer of 1988 when the skies are sunny and the temperature is 85 - 90 degrees and further assume that it is between 1 and 2 p.m. and that the beaches are as crowded as they ever get. Now assume that the Seabrook nuclear plant is licensed and is ^{authorized to operate} ~~operating~~ at full power and that this fact is well known to those in the area, including the beachgoers. Now assume that a sudden, unexpected announcement is made that due to problems at the Seabrook nuclear plant the beaches have been closed and that ^{25 minutes later} evacuation of the area is recommended. And further assume that all the people in the beach area, including Salisbury, Seabrook, and Hampton Beach, are given the ^{beach closing and evacuation} announcements at roughly the same time and that, with little or no exception, the entire population of the beach area -- all the day-trippers as well as all permanent residents, seasonal residents, those renting cottages and rooms, and all the

merchants and their employees -- all seek to leave the beach area at roughly the same time, ^{i.e. within an hour of the beach closing announcement.} Now further assume that there are two traffic guides assisting the evacuation at the eastern end of Beach Road (Rt. 1A) and that there is an additional traffic guide at the intersection of the State Beach Road and Beach Road. Assume that from that spot -- the State Beach Road -- there are no traffic guides stationed anywhere along the two mile stretch of Beach Road (1A) before it intersects with Route 1 in Salisbury Center. And further assume that the one, westbound lane of Beach Road (Rt. 1A) quickly backs up and slows to a very slow speed. In your professional opinion and experience, after the evacuating traffic passes the traffic guide stationed on Beach Road at its intersection with the State Beach Road, will the evacuating traffic remain in the one westbound lane?

A. No. I think that under those conditions, evacuating traffic would quickly begin using the eastbound lane as well. Without having a series of troops or police officers stationed at regular intervals along the mid-line of the road, I cannot believe that during an evacuation because of an accident at the nuclear plant the evacuating drivers would ~~not~~ refrain from using the (incoming) opposite lane on Beach Road. At that time of day and under those conditions, there would be few vehicles coming into the beach area on Route 1A; so that inbound lane would just be too tempting for snarled traffic to resist using, especially without any police or traffic guides stationed along

the center line. The traffic jam under those conditions will be more than twice as bad -- and last more than twice as long -- as anything we have ever seen in a sudden rainstorm, because everybody would be leaving, not just the day-trippers. I can't imagine how long it would take for that kind of a traffic jam to clear, but it will be far longer than people with normal frustration levels could tolerate. Plus there is the radiation threat! Drivers will be trying everything possible to get away from the nuclear plant quickly, and they are not going to worry about getting cited by the police for a traffic violation. I am confident that, under the conditions you have had me assume, both lanes of Beach Road (the eastbound lane as well as the westbound lane) would be used by evacuating vehicles.

Q. Chief, assume the same facts as in my last question except that I want this time to focus on Route 286. And, further assume that there are two traffic guides at the eastern end of Route 286, where it intersects with Route 1A. And assume that there are no other traffic guides anywhere along Route 286 until you reach its intersection, about two miles to the west, with Washington Street. Again Chief, in your professional opinion and experience, would the evacuating traffic remain in the single, westbound lane on Route 286 in that two-mile stretch?

A. No, it would not. It's the same situation as in the prior question about Beach Road except that here the evacuating drivers are even closer to the nuclear plant and, to make drivers even more anxious, they are actually within view of the

nuclear plant for a good portion of that two-mile stretch. No reasonable person who is familiar with the beach traffic would believe that vehicles evacuating out Route 286 would stay in just the westbound lane during an emergency at the nuclear plant unless, again, a series of troops or police officers were stationed at regular intervals along the mid-line to prevent it. In addition to filling both lanes, many of the vehicles evacuating out Route 286 will undoubtedly take South Main Street, which leads south and west and will appear to many drivers to take them away from the nuclear plant faster than Route 286 does. Route 286 at this point appears to parallel or almost circle the nuclear plant somewhat.

Q. If the westbound evacuating vehicles do fill up the eastbound lane as well, and this happens on both Beach Road (Route 1A) and on Route 286, will returning homeowners, emergency vehicles, buses, and others be able to travel westbound on these roads at all?

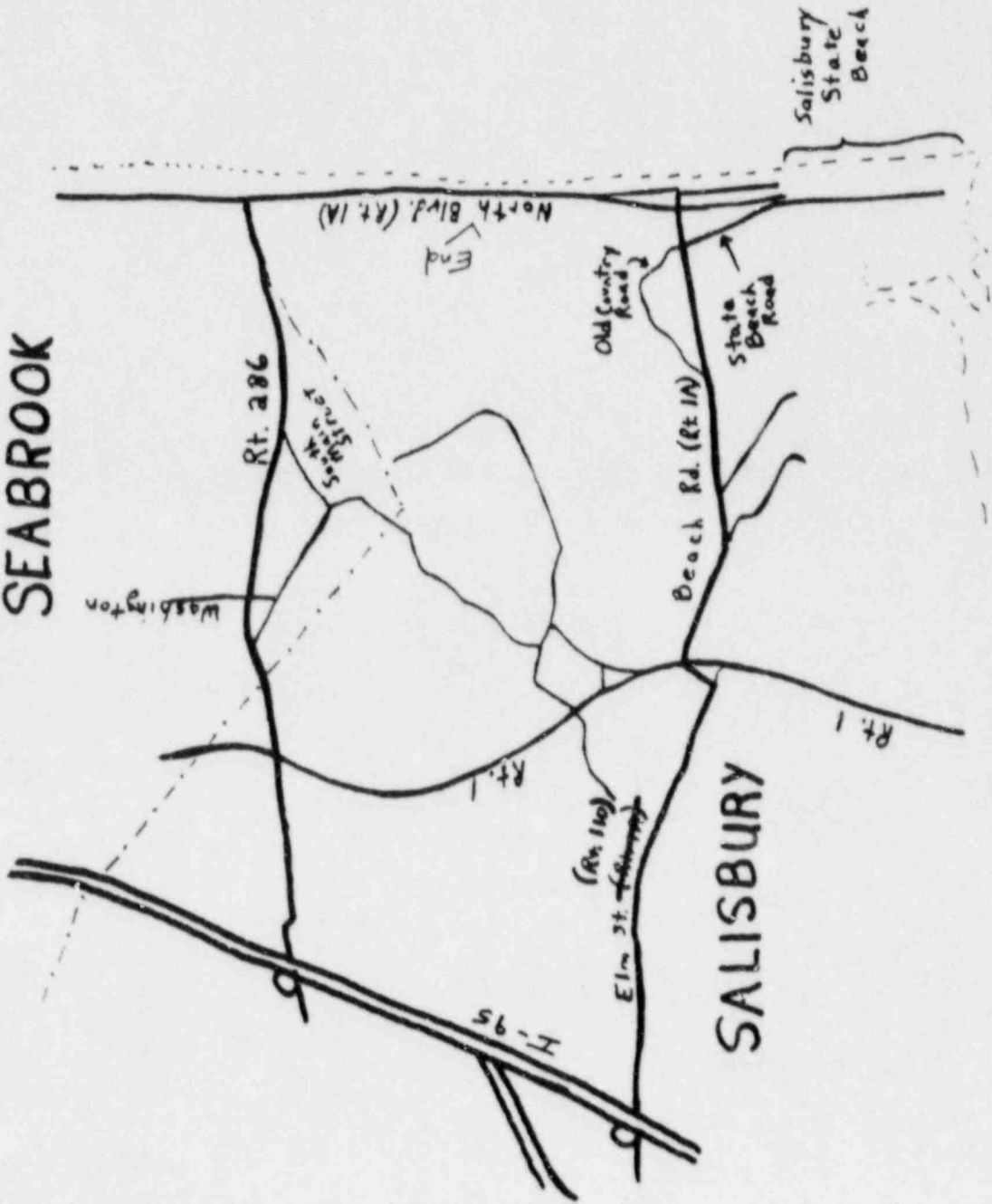
A. It will be extremely difficult if not impossible -- and it will be dangerous, given the risk of collisions. Emergency planners should not assume, under the conditions you posed to me earlier, that two-way traffic flow will be possible on these roads during an evacuation because of an accident at the nuclear plant.

ATTACHMENT A

Nuclear Plant
★

SEABROOK

OCEAN



MERRIMAC RIVER

SALISBURY

1 MR. FIERCE: I return the witness over for cross-
2 examination at this point.

3 JUDGE SMITH: We're going to finish the Chief
4 tonight, I hope if possible.

5 MR. LEWALD: I'm not going to stand in the way of
6 that, Your Honor. I have a very short examination, but I did
7 record a few things I was going to ask.

8 JUDGE SMITH: Thank you.

9 CROSS - EXAMINATION

10 BY MR. LEWALD:

11 Q Chief Olivera, my name is George Lewald, and I am one
12 of the lawyers with the Applicants, and I find I have the
13 privilege to conduct this cross-examination of you.

14 I take it that none of the questions in your
15 testimony were drafted by you, that they were given to you by
16 somebody else?

17 A (Olivera) Yes, sir.

18 Q Were some answers drafted for you for your inspection
19 and acceptance and approval?

20 A (Olivera) Well, let's say they were cleaned up a
21 little bit to that effect.

22 Q Did you get bare questions and then you filled in the
23 blanks and then somebody looked at them for cleaning up, as you
24 say?

25 A (Olivera) Yes.

1 Q How many drafts did these go through?

2 A (Olivera) Just two.

3 Q Just two? Just the initial draft and what we have
4 here, except for the changes we've made here?

5 A (Olivera) Yes, sir.

6 Q And from whom did you get the questions? This
7 counsel?

8 A (Olivera) Mr. Fierce.

9 Q From Mr. Fierce?

10 A (Olivera) Mr. Fierce, yes.

11 Q And what was the occasion of him asking you these
12 questions?

13 A (Olivera) Well, I received a call from Mr. Fierce
14 with regard to how I felt about the evacuation of the beaches
15 in just this situation, where everyone had to leave at
16 approximately the same time. And I gave him my opinion.

17 Then he asked me if I was willing to put that down as
18 an affidavit.

19 Q And was that the form of the first testimony was an
20 affidavit to that effect?

21 A (Olivera) Yes.

22 Q And this affidavit was later changed into the form
23 that we now have in the question and answer?

24 A (Olivera) Yes. Well, this was done over the phone
25 and then Mr. Fierce came up to interview me in person, and he

1 then told me there would be a rebuttal to testimony of someone
2 else.

3 Q Now what were and what were not traffic
4 disorderliness of any significance defined for you?

5 A (Olivera) Could you rephrase that question, sir?

6 Q Yes. Well, let's look at page 2 of your testimony,
7 and the question is, "Chief a number of witnesses in this
8 proceeding have testified that in their opinion there would be
9 no traffic disorderliness of any significance during an
10 evacuation."

11 Then were the traffic disorderliness of significance
12 explained to you?

13 A (Olivera) Not really.

14 Q So what you have here is your own concept of what
15 traffic disorderliness consists of?

16 A (Olivera) While in situations, yes, that I've seen.

17 Q But you don't know whether you're reading testimony
18 that was presented in this proceeding before?

19 A (Olivera) Not at that time, no.

20 Q Have you since learned that?

21 A (Olivera) Yes.

22 Q Sitting here today?

23 A (Olivera) No, I have copies of testimony from Mr.
24 Mileti -- well, both from Mr. Mileti on testimony on No.2 and
25 No.5. I had received all this.

1 Q And is this what you're responding to today? Two and
2 5 is the testimony you were heard today, if you heard all the
3 cross-examination that took place.

4 A (Olivera) Yes, but I had copies -- right, right.

5 Q Now, will you turn to page 3 of your testimony in the
6 chart, or the sketch? Did Dr. Mileti make any reference to
7 this situation at Salisbury in his rebuttal testimony 2 and 5?

8 A (Olivera) Not that I heard.

9 Q In fact, you drew this before you ever received Dr.
10 Mileti's rebuttal testimony 2 and 5, didn't you?

11 A No. This was sent to me. I believe it came off of
12 one of the evacuation plans that was in the plan.

13 Q Well then, this isn't your sketch?

14 A (Olivera) No, this is not my sketch. That's why I
15 made the changes.

16 Q Now is the testimony with respect to the sketch, your
17 testimony or someone else's?

18 A (Olivera) No. It's roughly -- it's mine, because
19 that's the area that gets most congested when traffic starts to
20 come off the beach.

21 Q Well, as we look at the sketch from the bottom of
22 page 3 up toward the top, the traffic area shown on Route 1-A,
23 and I guess proceeding westerly after making the turn as the
24 road comes from the north, that's represented in the testimony
25 to be a single lane. That's not so, is it? Isn't that a

1 double lane, there?

2 A (Olivera) No. It's a single lane coming from North
3 End Boulevard. When it gets to Route 1-A it's two lanes.

4 Q So that, but your testimony talks about five lanes
5 merging into one, does it not?

6 MS. WEISS: Could you identify the part of the
7 testimony you're talking about?

8 THE WITNESS: (Olivera) I believe I said that many
9 vehicles from many lanes trying to merge onto one would either
10 be south of Route 286. I don't believe I said five.

11 MR. FIERCE: It's on the -- the line is on the -- the
12 last line on page 3 that carries over onto page 4.

13 THE WITNESS: (Olivera) Okay, what that consists of
14 is, if you look at the -- it's a map -- you would have traffic
15 coming out of the parking lot, which is the southern part here,
16 which merges out and then around going west. The traffic
17 coming down from the north end, traffic from Cable Avenue, and
18 there's traffic from Railroad Avenue coming around, and also
19 from Central Avenue. You have five lanes that can merge into
20 that one area, which causes a big congestion in that one --

21 BY MR. LEWALD:

22 Q But that one area is a double-lane road. But the
23 testimony says it is all one lane.

24 A (Olivera) Yes. It's two lanes up to the Reservation
25 Road, where it becomes a one-lane road.

1 Q Now, are Railroad Avenue and Central Avenue dead
2 ends? Are they through streets?

3 A (Olivera) Central Avenue and Railroad Avenue?

4 Q Yes.

5 A (Olivera) Well, they're not so-called dead ends,
6 because there is another road at the end of it called Murray
7 Street. Now, if you went down Cable Avenue, and you go around
8 Murray Street, and come back up either Atlantic Avenue or
9 Railroad Avenue, and vice versa. They're not one-way. They're
10 both two-lane traffic, so you can go around.

11 Q So you have really one lane coming from Railroad
12 Avenue?

13 A (Olivera) Yes. Only because it has to go to the
14 right and around the island.

15 Q And the same would be true for Central Avenue, is
16 that a dead end?

17 A (Olivera) No, that's not a dead end. That leads on
18 to North End Boulevard.

19 Q So I could take Central Avenue and get on to Route
20 1-A going north?

21 A (Olivera) Yes.

22 Q What's the width of 1-A at this point in the sketch?

23 A (Olivera) At this point it's roughly around fifty
24 feet.

25 Q Now, where is Route 236 located?

1 A (Olivera) 286 is roughly about a mile and a half
2 north of this intersection here.

3 Q Is that still Salisbury?

4 A (Olivera) No, that's Seabrook. But 286 does run
5 into Salisbury.

6 Q But has 286 -- or is it another -- does the route
7 number or the street number or the street name change when it
8 comes into Salisbury?

9 A (Olivera) Well, when it comes into Salisbury it then
10 becomes Collins Street, and Forest Street, and comes on to Main
11 Street and onto 95.

12 Q Is Forest Street in the area where you say that, in
13 your opinion, that it will not be possible to maintain two-way
14 traffic, except with traffic guides or police attendants?

15 A (Olivera) Well, 286 is roughly --

16 Q No, can you answer that question? Is this the area
17 you are talking about of the traffic disorderliness? 286

18 A (Olivera) Forest Street?

19 Q Yes.

20 A (Olivera) No. The area I'm talking about is South
21 Main Street in Seabrook.

22 Q You're talking about Seabrook area, not rather
23 Salisbury area?

24 A (Olivera) Right

25 Q Do you have any jurisdiction over that road, 286?

1 A (Olivera) No, not on 286.

2 Q Now, isn't the gist of your testimony that simply
3 that you say that in the event of the condition as previously
4 described, in your judgment, you can't maintain two-way traffic
5 on Route 1-A or on Route 286 without either police officers or
6 traffic guides, is that -- have I summed up your testimony
7 correctly?

8 A (Olivera) Generally, yes. I would say that.

9 (continued on next page)

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1 Q Are you aware of studies that have been made with
2 respect to traffic, easterly traffic on Route 1-A and on 286?

3 A No, I am not aware of it.

4 Q Now the condition that you described that you say,
5 because of this disorderliness of the drivers it would be
6 impossible to maintain two-way traffic on these roads, is one
7 that exists, or has existed from time-to-time on Sundays,
8 pretty much?

9 A (Olivera) Saturdays and Sundays, yes.

10 One of the problems with 1-A is you have a two-lane
11 traffic area at the beach which becomes a one-lane area because
12 the road is not a 50-foot road all the way. You have areas
13 where it's 50 foot, areas where it's 44 feet, areas where it's
14 36 feet wide. And there's where the problems lie.

15 Q Would you be surprised to learn that these studies
16 through counters show no discontinuance of two-way traffic on
17 Route 1-A for an entire summer?

18 A (Olivera) Would I be surprised?

19 Q Yes.

20 A (Olivera) No.

21 MR. FIERCE: Objection, unless we can identify these
22 studies.

23 BY MR. LEWALD:

24 Q Chief, the very last --

25 JUDGE SMITH: You understand the question's already

1 been answered.

2 MR. FIERCE: I understand.

3 BY MR. LEWALD:

4 Q When you examined your testimony after some of the
5 questions were changed, including the additions, did you also
6 look at the very last answer in your testimony? Where you make
7 reference to the conditions that you posed to me earlier?

8 A (Olivera) In my opinion it would be extremely
9 difficult for any traffic to be going easterly on that road.
10 Only because of the fact that you do have areas that are not
11 wide enough in traffic that is going to continue to try to go
12 off that road two lanes, and that's when it becomes dangerous.

13 Q Traffic doesn't move very fast in these conditions,
14 does it?

15 A (Olivera) No, it doesn't.

16 MR. LEWALD: I don't have any more questions.

17 JUDGE SMITH: Mr. Turk?

18 MR. TURK: I have nothing, Your Honor.

19 JUDGE SMITH: Does any Intervenor have questions?

20 MR. FIERCE: I would just want to ask a couple to
21 clear up an ambiguity.

22 REDIRECT EXAMINATION

23 BY MR. FIERCE:

24 Q Chief, in response to one of the questions, you made
25 a response that indicated that this area becomes one lane at

1 Reservation Road. Is Reservation Road what is labelled on the
2 sketch as State Beach Road?

3 A (Olivera) That's correct.

4 Q And it is just west of that point where the road
5 becomes one lane eastbound?

6 A (Olivera) One lane.

7 Q And you're also asked whether you had jurisdiction
8 over Route 286, and you said no. But how familiar are you with
9 the traffic on heavy beach weekends on Route 286?

10 A (Olivera) Very familiar because of the fact that
11 East Main Street in Seabrook also runs onto Seabrook Road into
12 Salisbury. And we get many complaints from the neighbors
13 because of the traffic coming down there. They can't get out
14 of their driveways and it becomes horrendous at times.

15 MR. FIERCE: I have no further questions.

16 JUDGE SMITH: Anything further?

17 All right, thank you.

18 THE WITNESS: (Olivera) Thank you, sir.

19 (Whereupon the witness was excused.)

20 JUDGE SMITH: Do you want to continue with Mr.
21 Moughan tonight?

22 MR. FIERCE: I'm willing to continue if the Board
23 wishes us to. He's been here, but I am not sure we'll be able
24 to finish with him.

25 JUDGE SMITH: Is there any chance we could finish?

5.
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:
Ivan W. Smith, Chairperson
Gustave A. Linenberger, Jr.
Dr. Jerry Harbour

_____)
In the Matter of)
PUBLIC SERVICE COMPANY OF) Docket Nos. 50-443-OL
NEW HAMPSHIRE, et al.) 50-444-OL
(Seabrook Station, Units 1 and 2)) Off-site Emergency Planning
January 22, 1988
_____)

REBUTTAL TESTIMONY OF THOMAS F. MOUGHAN
ON BEHALF OF THE ATTORNEY GENERAL FOR
THE COMMONWEALTH OF MASSACHUSETTS
REGARDING THE PRESENCE OF HIDDEN PARKING SPACES
IN SALISBURY BEACH AND ON PLUM ISLAND

Q. Would you please state your name and current address?

A. My name is Thomas F. Moughan, and I reside at 91 Lake Attitash in Amesbury, Massachusetts.

Q. Mr. Moughan, a prior witness in these proceedings, Mr. Gordon Derman, has stated that there are not many garages, carports, or under-building parking spaces in the beach areas of the Seabrook EPZ. Would you agree that this is true for Salisbury Beach and Plum Island?

A. No, I would not. I have recently conducted a field survey to determine the number of garages, carports, and other under-building parking spaces in Salisbury Beach and on Plum

Island, and I have also counted the parking spaces which exist in these structures. A summary of my findings is as follows:

Parking Spaces Observed In Garages
Carports, and Under-Buildings

Salisbury Beach	295
Plum Island	<u>253</u>
TOTAL	548

Q. When did you conduct your field survey, and how was it conducted?

A. The Salisbury Beach survey was conducted on Sunday, January 10, 1988. I was assisted by Mr. William Lord. We drove along each street in Salisbury Beach and recorded on paper the street address of each building which contained a garage, carport, or other under-building parking spaces. Next to the address we noted the total number of parking spaces by category of structure (garage, carport, or under-building). In cases where a street number was not visible, an estimate was made from the nearest property having a visible number. Garages included both detached structures and those built in or beneath dwellings. Carports included both the typical carport structure as well as clearly-used parking spaces beneath decks and porches. The area surveyed included all streets from the New Hampshire line on the north to the Salisbury Beach State Park on the south. The western boundary was the marsh except that in counting west along Route 1A (Beach Road) coming out of the Salisbury amusement park area, we stopped at the entrance road to the State Beach.

The Plum Island survey was conducted the next day, Monday, January 11, 1988. The same procedure was followed, however, I was unassisted. I recorded the count by street, rather than building by building using street addresses, because very few of the structures on Plum Island have street addresses which are visible.

Q. Have you kept your records of these counts?

Yes. I would be happy to make them available to anyone who is interested.

1 MR. LEWALD: I don't know, Your Honor. It depends
2 on how quickly the answers are forthcoming to the questions
3 that are asked.

4 JUDGE SMITH: How much do you want to go home
5 tonight, Mr. Moughan?

6 MR. LEWALD: I have no desire to press forward if --

7 MR. FIERCE: The witness indicates he's ready to go
8 ahead.

9 JUDGE SMITH: Okay, let's give it a shot.

10 MR. FIERCE: Would you state your name for the record
11 and your current address?

12 THE WITNESS: (Moughan) My name is Thomas Moughan,
13 my current address is 91 Lake Attitash, Amesbury, Mass.

14 MR. FIERCE: I place before you a document which --

15 JUDGE SMITH: Has the witness been sworn? Has he
16 testified before? Okay.

17 WHEREUF ON

18 THOMAS MOUGHAN

19 having first been duly sworn, was examined as a witness herein
20 and testified as to the following:

21 DIRECT EXAMINATION

22 BY MR. FIERCE:

23 Q Mr. Moughan, I've placed before you a document which
24 is entitled Rebuttal Testimony of Thomas F. Moughan, on Behalf
25 of the Attorney General of the Commonwealth of Massachusetts

1 regarding the Presence of Hidden Parking Spaces in Salisbury
2 Beach and On Plum Island.

3 I ask you if you recognize that document?

4 A (Moughan) I do.

5 Q Can you identify it?

6 A (Moughan) I can. It is my rebuttal testimony.

7 Q And have you reviewed this testimony for any
8 additions or corrections that you might wish to make on this?

9 A (Moughan) I have.

10 Q And are there any additions or corrections?

11 A (Moughan) No, there are none.

12 Q At this time would you like this testimony to be
13 offered into evidence and bound into the record of these
14 proceedings?

15 A (Moughan) I would.

16 MR. FIERCE: I would offer this testimony into
17 evidence, Your Honor, and ask that it be bound into the record.

18 MR. LEWALD: No objections.

19 JUDGE SMITH: No objections? The testimony is
20 received.

21 (Rebuttal testimony of
22 Thomas F. Moughan on behalf of
23 the Attorney General of the
24 Commonwealth of Massachusetts
25 Regarding Hidden Parking Spaces

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in Salisbury Beach and on Plum
Island follows:)

1 MR. FIERCE: The witness is available for cross-
2 examination, Your Honor.

3 CROSS-EXAMINATION

4 BY MR. LEWALD:

5 Q Mr. Moughan, my name is George Lewald and I am one of
6 the lawyers representing the Applicants.

7 Have you given testimony in this proceeding?

8 A (Moughan) I have not given sworn testimony.

9 Q You haven't?

10 A (Moughan) I have not given sworn testimony. I've
11 given limited appearance testimony.

12 Q And this was some time ago?

13 A (Moughan) Correct.

14 Q And have you been in attendance from time to time at
15 these hearings?

16 A (Moughan) I would say perhaps three. This may be
17 the third session.

18 Q Were you by any chance here at the time that the
19 prior witness in this proceeding, as represented on the first
20 page of your testimony, allegedly stated certain things which
21 appear on the first page of your testimony?

22 A (Moughan) I don't believe so. I don't put the name
23 to any of the people that I observed when I was here.

24 Q Were you ever shown any testimony to this effect?

25 A (Moughan) No, I was not.

1 Q But whatever the case, you would not agree this is
2 true for Salisbury Beach and Plum Island, as I take it is your
3 testimony?

4 A (Moughan) That's correct.

5 Q Now, were you solicited or hired or somehow contacted
6 to perform the task that's related in your testimony?

7 A (Moughan) Yes, that is correct.

8 Q And who requested that you do this?

9 A (Moughan) I was requested to participate through
10 William Lord who represents the town of Amesbury and the
11 Attorney General's office, he explained to me, was looking for
12 someone familiar with the Plum Island - Salisbury Beach area to
13 do this count and I offered to do it for the Attorney General's
14 office and subsequently spoke with Mr. Fierce.

15 Q And what did Mr. Fierce ask you to do?

16 A (Moughan) He indicated that they were seeking a
17 count of what was termed hidden parking spaces along the
18 beaches, that being garages, parking spaces beneath buildings
19 and carports.

20 Q Along the beaches?

21 A (Moughan) Correct. At Salisbury Beach and Plum
22 Island.

23 Q What areas did you cover in Salisbury in particular?

24 A (Moughan) I actually covered each street from the
25 New Hampshire state line to the north, southerly all the way to

1 the Massachusetts State Park, Salisbury Beach State Park. We
2 included in those streets --

3 Q And all the way down the peninsula?

4 A (Moughan) Correct, along the barrier beach.

5 Q Barrier beach?

6 A (Moughan) Right. Westerly to the marsh.

7 And Plum Island, by the way, we did the entire
8 island.

9 Q You did the entire island?

10 A (Moughan) With the exception, I would say, of the
11 National Wildlife Refuge.

12 Q Do you have a house count of -- on Salisbury Beach?

13 A (Moughan) I do not.

14 Q You do not?

15 A (Moughan) Have a house count?

16 Q Yes.

17 A (Moughan) No, I do not.

18 Q How many buildings that are there?

19 A (Moughan) No, I do not.

20 Q Would you be able to estimate it?

21 A (Moughan) I would say that it would perhaps --
22 buildings being duplexes, motels, et cetera, I would
23 guesstimate perhaps 1000, 800 to a thousand.

24 Q Eight hundred to a thousand?

25 A (Moughan) Yes.

1 Q How many streets did you count?

2 A (Moughan) We canvassed every street in Salisbury.

3 Q How many does that entail?

4 A (Moughan) I would have to count them on the --

5 Q Would you do that?

6 A (Moughan) Sure.

7 Well, on the other hand, the streets I have listed
8 are only those that show garages or parking spaces that we were
9 inventorying, so I may not have all the streets here.

10 Eighteen streets that had hidden parking spaces on
11 them. There may have been, I'm sure there were additional
12 streets that did not show a hidden parking space, so I would
13 not be able to give you an accurate estimate of the number of
14 streets.

15 Q What was the time spent in your inspection in
16 Salisbury?

17 A (Moughan) In Salisbury there were two of us. Mr.
18 Lord assisted me and we spent perhaps four and a half hours in
19 a vehicle canvassing each street.

20 Q You spent four and a half hours writing down 18
21 streets?

22 A (Moughan) Yes.

23 Q Or there were more streets, but you don't have --

24 A (Moughan) Whatever the number of streets that exist
25 in Salisbury Beach, in that case, we spent all that time

1 travelling each street on the beach observing from the street.

2 Q And did you and Mr. Lord split up the work? Did he
3 look on one side of the street, while you looked the other? How
4 did you do it?

5 A (Moughan) We did that. I observed one side, he
6 observed the other, and we concurred with each other's findings
7 so that we were travelling quite slow, stopping almost at each
8 property that showed a garage.

9 Q Did you make any distinctions between commercial or
10 residential buildings for your inspection?

11 A (Moughan) The only distinction I think was on the
12 underneath parking spaces which in Salisbury, I indicated, was
13 one building that had -- maybe it was two, I'd have to look --
14 that had spaces beneath a motel, which would be a commercial.
15 The others were just about all residential. There are a couple
16 commercial establishments in the center of Salisbury Beach that
17 showed parking garage doors, that would indicate a parking
18 garage perhaps.

19 Q Gas stations?

20 A (Moughan) We did not do gas stations.

21 Q Are there gas stations in the area?

22 A (Moughan) There are.

23 Q You didn't count those?

24 A (Moughan) We did not. Any place there was a sliding
25 garage doors -- many of the businesses at the beach that have

1 garage doors that close an establishment for the evening of the
2 off-season. We did not include those either.

3 Q Now this is January?

4 A (Moughan) January 10th.

5 Q January of this year, you did that?

6 A (Moughan) Correct.

7 Q Now, the one residential underneath -- excuse me, the
8 one commercial underneath parking area, that you've told us
9 about, you said that's a motel?

10 A (Moughan) Actually there were two, now that I
11 recall. There were two, yes. Motels.

12 Q Two motels?

13 A (Moughan) Right.

14 Q And it'd be fair to say that that's the only two
15 motels in Salisbury Beach that have underneath parking?

16 A (Moughan) Yes.

17 Q How many parking spaces did these hotels or motels
18 have?

19 A (Moughan) We didn't count the parking spaces in the
20 lots. We were only counting underneath spaces. But the one on
21 Central Avenue, I believe had eight.

22 There was one on Central Avenue, No.50 Central
23 Avenue, had eight underneath spaces.

24 I thought there was -- I recall there being one on
25 Ocean Boulevard North -- North End Boulevard and scanning, I

1 don't see it, but it had about six spaces.

2 Q Now, were these enclosed parking areas?

3 A (Moughan) They were not enclosed. They were the
4 typical type that you might see along a barrier beach where the
5 building was raised for perhaps flood plain zoning and you just
6 drive in beneath the building and park.

7 Q And was the area paved?

8 A (Moughan) The area was paved.

9 Q And marked out lines?

10 A (Moughan) Marked out with bumpers at the end.

11 Q And these you counted?

12 A (Moughan) This is correct.

13 Q And this went into your total of spaces?

14 A (Moughan) Yes, it did.

15 Q So we have what, how many?

16 A (Moughan) I would say of those two, 12 or 14. I'd
17 have to find the other figure, but eight at one and I believe
18 it was six at the other, so let's call it 14.

19 (Continued on next page.)

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1 Q Now how many other underneath building spaces did
2 you find?

3 A (Moughan) I'd have to do an itemized count. Are you
4 willing to wait for an itemized count of the underneath?

5 Q Do you have it? This is solely in Salisbury.

6 A (Moughan) When you say -- I'm not sure I know what
7 you mean by underneath. When I think of underneath, I'm
8 thinking in terms of a garage that goes underneath a split
9 level home, or one that declines down into the basement area.
10 Because everything was underneath, either a carport or a deck,
11 so when I'm saying underneath, I'm thinking in terms of a
12 garage that goes under a building.

13 Because what we did with those, we indicated those as
14 garages -- only underneath a home.

15 Q Can we stop for a moment and refer back to your
16 testimony? And I am referring to underneath as under-building
17 parking spaces.

18 A (Moughan) Yes?

19 Q And would this include garages?

20 A (Moughan) That would include garages beneath them,
21 yes.

22 Q It would include garages?

23 A (Moughan) Yes, it would. A garage beneath a
24 residential home.

25 Q And did you inspect each of these to determine

1 whether or no there were parking space areas?

2 A (Moughan) Well, we visually inspected them from the
3 street, all right?

4 Q You didn't --

5 A (Moughan) We did not go under people's properties as
6 such.

7 Q And see whether the garage was filled with furniture
8 or whatever?

9 A (Moughan) We made no determination as to whether the
10 garage was being used for an automobile on January 10th or not.
11 We counted basically potential spaces indicated by doors, or
12 open doors, into a building.

13 Q Well, you were counting places that could be --

14 A (Moughan) Correct.

15 Q -- garages if people wanted it?

16 A (Moughan) These were all garages or garage doors,
17 what was behind the doors where they were closed, we did not
18 open doors to find out what was in there.

19 Q And you had no idea as to the footing in any of these
20 buildings?

21 A (Moughan) No. We did it basically by the door
22 configuration.

23 Q In looking at your testimony on page 2 with the
24 Salisbury Beach, the total count of 295 is simply spaces and
25 you don't have a breakdown as to how many of these spaces were

1 in garages, or underneath parking areas, or carports?

2 A (Moughan) There is a breakdown by carports, by
3 garages, which includes underneath garages, where there is a
4 detached garage, and underneath spaces, as I explained,
5 underneath a motel. The only underneath spaces would be those
6 under a motel, or a hotel.

7 Q How many residential garages did you tally in
8 Salisbury?

9 A (Moughan) I will make a count if you will wait.
10 We estimated 241 on a quick count.

11 Q 241 garages? In Salisbury Beach?

12 A (Moughan) Correct.

13 Q And for the sake of your total of 295 parking spaces?

14 A (Moughan) That's right.

15 Q And these would include enclosures? I understand the
16 garages are enclosed areas, either under houses --

17 A (Moughan) Either a detached building or a part of.

18 Q Or detached buildings.

19 A (Moughan) Yes.

20 Q And the garages aren't necessarily garages in which
21 there are parked cars in which you have determined there is a
22 space to park the car?

23 A (Moughan) I was not intending to count cars, but
24 spaces, so it would be spaces.

25 Q And you did your counting from the street, as I

1 understand it, and not physically on the property?

2 A (Moughan) That's right.

3 Q Did you see any cars at any of the garages?

4 A (Moughan) In many of them.

5 Q In many of them?

6 A (Moughan) Sure.

7 Q Did you make a count of that?

8 A (Moughan) No, we did not.

9 Q How did you determine that the spaces that you
10 observed on Salisbury Beach were hidden parking spaces?

11 A (Moughan) The definition to work from would be
12 something that would -- that could not have been photographed
13 from an aerial photo; that where a vehicle could be parked from
14 beneath inside, and not detected by that type of accounting
15 methodology.

16 Q It could not be detectable from an aerial photo? Did
17 you overfly the area?

18 A (Moughan) No, I did not.

19 Q But in your judgment, it couldn't be, from any angle?

20 A (Moughan) I would say it was explained that there
21 was some angle to the photography that would allow some spaces
22 to be, for example, a vehicle partially within an enclosed area
23 so we did not do, for example, a deck, where a vehicle could be
24 block-parked, you know, partially beneath that deck or carport.

25 Q How long did it take you to survey Plum Island?

1 A (Moughan) I did Plum Island by myself. It took
2 about four hours.

3 Q How many houses on Plum Island?

4 A (Moughan) Again, it would be a guess.

5 Q Twice as many as Salisbury Beach?

6 A (Moughan) I don't believe so.

7 Q Half again as many?

8 A (Moughan) I don't know. Quite honestly I don't know
9 it to be more or less. I wouldn't even hazard a guess.

10 Q You didn't make a count of houses that did not?

11 A (Moughan) No, I did not.

12 Q And again, you made just a count of spaces and sort
13 of indiscriminate as to whether or not they're in garages,
14 carports, or under building areas?

15 A (Moughan) It was the same category, the three
16 categories, and it was spaces where a vehicle could be under
17 cover. So in that same method.

18 Q Were there any motels or hotels on Plum Island with
19 underground garages?

20 A (Moughan) Not that I found.

21 Q Were there any multiple car garages or the like?

22 A (Moughan) Yes, that had a maximum of a two car
23 garage, and there may have been --

24 Q And again, you have no idea whether or not these were
25 filled with things other than cars?

1 A (Moughan) That's correct.

2 MR. LEWALD: I have no further questions.

3 JUDGE SMITH: Mr. Turk?

4 MR. TURK: I'd like to follow up a line just
5 explored by Mr. Lewald.

6 CROSS EXAMINATION

7 BY MR. TURK:

8 Q Mr. Moughan, my name is Sherwin Turk. I am with the
9 NRC staff. I want to ask you a little bit more about the
10 numbers that appear on page 2 of your testimony.

11 You indicated that, in your testimony, and this comes
12 around eight lines from the bottom, where it says, "Carports
13 included both the typical carport structure as well as clearly-
14 used parking spaces beneath decks and porches."

15 A (Moughan) Yes.

16 Q What was your criterion for counting spaces beneath
17 decks?

18 A (Moughan) It was to differentiate a carport being
19 that traditional covering over a garage -- over a driveway, and
20 the deck was an instance where a vehicle could be parked
21 beneath the deck, there was space enough and indicators that --
22 seeing tire tracks that went beneath the decks that people had
23 been and could well, park beneath those decks.

24 Q Did you go out and measure the space under each deck?

25 A (Moughan) I did not.

1 Q Would you agree that the decks are maybe something
2 like eight feet in width from the structure out?

3 A (Moughan) They would vary if they were eight feet,
4 it would not have been included, because that would have
5 indicated that the rear or the front of the vehicle could be
6 photographed from above.

7 So we looked at the larger decks and at the beaches
8 the decks are probably larger than your larger deck, in some
9 cases cover the entire back of a house or front of the house.

10 Q Of the number for Salisbury Beach, you have 295 total
11 parking spaces that you've counted as potentially hiding a car.

12 How many of those 295 were in this carport category
13 generally? Including typical carport structures and these
14 other parking spaces?

15 A (Moughan) That fall in the carport category, I
16 would, going by my rough, quick count a minute ago, 241
17 garages, and we had 214 underneath spaces, so the differences
18 of that, which would be about 27.

19 Q Now, what about for Plum Island? You counted a total
20 of 253, can you break that out?

21 A (Moughan) I can't break that out because I didn't do
22 it. There were virtually few carports on Plum Island, and
23 there were a few decks, but basically all of it was either a
24 detached building or underneath garages.

25 MR. TURK: I have nothing further.

1 JUDGE LINENBERGER: Mr. Moughan, I gather that
2 between you and Mr. Lord, somehow, some judgment was exercised
3 with respect to whether you or he or both of you thought that
4 these spaces could have or could not have been detected from
5 the air, is that correct? Did you look at a space and then
6 tried to decide whether you thought it could be photographed
7 from the air?

8 THE WITNESS: (Moughan) There was some arbitrary
9 decisions made with some of them.

10 JUDGE LINENBERGER: Say again, please?

11 THE WITNESS: (Moughan) There was some arbitrary
12 decision made, but primarily on the carport or deck situation.
13 Garages or detached buildings didn't seem to pose any problem
14 that way.

15 JUDGE LINENBERGER: Would you say that you and Mr.
16 Lord both made these judgments, or did you solely make them, or
17 do you make a distinction here?

18 THE WITNESS: (Moughan) We've made sort of a joint
19 decision with regard to Salisbury, because that's the area we
20 both travelled in. Plum Island I made them myself.

21 JUDGE LINENBERGER: What I'm concerned about is, the
22 extent, pardon me, of your awareness of aerial photography
23 surveillance sufficient to allow you to make a judgment that
24 structures or parking spaces that you counted could not have
25 been detected by aerial photography. Are you able to shed any

1 light on that? Do you think there is a possibility?

2 Let me rephrase that question. Do you think there is
3 a possibility -- a likelihood that a significant number of the
4 spaces you counted might have been detected by aerial
5 photography?

6 THE WITNESS: (Moughan) I think there is a
7 possibility some may have been. But if we're talking just a
8 carport or deck situation the numbers there were fairly small,
9 so of those spaces, we first eliminated any that we felt could
10 be detected from above, or could not completely cover a vehicle
11 at the outset. So those remaining were the larger coverings or
12 decks, and what have you. Out of that, there was a relatively
13 small number, and it's possible that a few of those may have
14 been detected from the air. I'd say half a dozen or eight
15 probably at a guess.

16 MR. LINENBERGER: But of the numbers that appear in
17 your tally on page 2 of your rebuttal testimony, I gather
18 you're saying that that total of 548 is probably not an error
19 by more than, say, at most 20 structures or less, or of parking
20 spaces, or less?

21 THE WITNESS: (Moughan) I'd say that's fair, and I'd
22 say that could possibly be offset by those parking spaces we
23 were not able to visually see from the street. I'm sure we
24 missed some. And that's another category.

25 JUDGE LINENBERGER: Yes.

1 THE WITNESS: (Moughan) The streets are quite
2 narrow; the lots are close to the roads in most cases, so it's
3 not too difficult to size up the space or -- we could have
4 missed a few, but --

5 JUDGE LINENBERGER: Do I understand correctly this
6 was a voluntary effort on the part of you and Mr. Lord?

7 THE WITNESS: (Moughan) That is correct.

8 JUDGE LINENBERGER: And were you compensated for it?

9 THE WITNESS: (Moughan) Absolutely not, sir.

10 JUDGE LINENBERGER: Thank you. That's all I have.

11 JUDGE HARBOUR: Did I understand that you said that
12 there were approximately 34 carports in Salisbury Beach?

13 THE WITNESS: (Moughan) I think 27 is what I, with
14 my quick count I did --

15 JUDGE HARBOUR: For carports?

16 THE WITNESS: (Moughan) Right.

17 JUDGE SMITH: Any intervenors? Any redirect?

18 You're excused. Thank you.

19 We'll come back tomorrow at 9:00. Anything further
20 tonight on the record?

21 We're adjourned until 9:00 a.m. tomorrow.

22 (Whereupon, at 5:13 p.m. the hearing was concluded.)

23

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25

CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

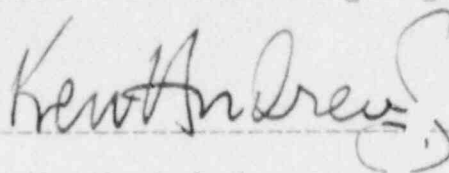
Name: PUBLIC SERVICE COMPANY OF
NEW HAMPSHIRE, et al.

Docket Number: 5-443-OL, 5-444-OL

Place: Boston, Massachusetts

Date: February 9, 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 electronically by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company and that the recording is a true and accurate record of the foregoing proceedings.



Signature typed: Kent Andrews

Official Reporter

Heritage Reporting Corporation