

6689

DOCKET  
JUN 10

'88 JUL 11 A10:58

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

DOCKETING & SERVICE  
BRANCH

Before the Atomic Safety and Licensing Board

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

LILCO'S REPLY TO INTERVENORS' PROPOSED  
FINDINGS ON SCHOOL BUS DRIVERS AND HOSPITAL ETES

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

July 8, 1988

8807140023 880708  
PDR ADCK 05000322  
G PDR

DS03

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

LILCO'S REPLY TO INTERVENORS' PROPOSED  
FINDINGS ON SCHOOL BUS DRIVERS AND HOSPITAL ETES

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

July 8, 1988

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

**LILCO'S REPLY TO INTERVENORS' PROPOSED  
FINDINGS ON SCHOOL BUS DRIVERS AND HOSPITAL ETES**

Here, as prescribed by 10 CFR § 2.754(a)(3) (1987) and the schedule set out in the Board's Order of June 7, 1988, is LILCO's reply to the Intervenor's proposed findings of fact and conclusions of law on school bus driver role conflict and hospital evacuation time estimates (ETEs). Intervenor's findings (hereinafter "I.F.") are the "Suffolk County, State of New York, and Town of Southampton Proposed Findings of Fact and Conclusions of Law on the Remanded Issues of School Bus Driver Role Conflict and Hospital Evacuation Time Estimates," dated June 30, 1988. LILCO's proposed findings of June 22, 1988, are cited as "L.F."

Except for sections I.A and I.B below, the organization of this Reply matches the organization of the I.F.; for example, Section III.3 below responds to Section III.3 (on pages 33-53) of the Intervenor's June 30 proposed findings.

**I. Introduction**

The Intervenor's proposed findings suffer from many flaws. Two of them are pervasive. First, the findings repeatedly address issues that were ruled outside the scope of the remand. Second, they adopt an unprincipled approach to the weighing of evidence. We discuss these two flaws, respectively, in Sections I.A and I.B below.

A. Intervenors Reargue Issues that Are Outside the Scope

The Intervenors repeatedly propose findings on issues that are outside the scope of the remanded issues. In most cases these proposed findings amount to untimely and improper motions for reconsideration.

For example, in the hospital ETEs issue, the Intervenors invite the Board to reverse its earlier ruling that the 14 percent of capacity that receiving hospitals are assumed to have available would not be litigated. I.F. at 118 n.100.

Similarly, with respect to the school bus driver issue, the Intervenors reargue both issues that have recently been ruled outside the scope and issues that were litigated in 1983-84 and not remanded. For example, Intervenors persistently argue the availability of buses (not drivers), see I.F. at 12-14, even though this issue was ruled outside the scope of the hearing by the Board's Memorandum and Order of February 23, 1988. Likewise, the Intervenors submit findings on reception centers, I.F. at 96-100, another issue expressly declared out-of-bounds. See also I.F. at 12-14 (proposing reversal of rulings on "much" of the stricken testimony).

These requests that the Board reverse itself are untimely and improper. They are untimely because the time to move for reconsideration, if ever, was immediately after the Board's Memorandum and Order (Ruling on LILCO Motion in Limine and Motion to Set Schedule) (Feb. 23, 1988) and the Memoranda and Orders ruling on motions to strike dated May 9 and May 12, 1988. If the Board were to adopt the Intervenors' suggestion and reverse itself on evidentiary matters now, after the hearing, it would be unfair to the other parties and require a reopening of the record.

The belated requests for reconsideration are also improper, because the Intervenors have already requested reconsideration, been denied relief, and been warned that motions for reconsideration are not favored absent new information. Tr. 19,620 (Judge Gleason). Also, the tone of these particular findings, asking the Board to flip-flop

indecisively, are disrespectful and, in one instance (I.F. at 83 n.78<sup>1/</sup>), apparently designed to make the Board sound foolish.

B. Intervenors Misrepresent  
the Record

The second pervasive flaw in Intervenors' findings is that they do not fairly characterize the record or weigh the evidence. The Intervenors' findings are an exercise, not in assessing the merits of the evidence, but rather in explaining most of it away. This is the tactic of parties who are obviously struggling with a record that does not support them.

In the partial initial decision on the health-and-safety issues, the Board noted Suffolk County's "misrepresentation of the complete record":

Once again, the Board, in reaching its conclusions on these contentions, is faced with a massive record, . . . . The difficulty of our task, trying to be objective in consideration of each of the parties' submissions, is further compounded by the County's misrepresentation of the complete record -- by omission, selective citations and distortion of recorded testimony.

Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-83-57, 18 NRC 445, 579 (1983) (footnote omitted), aff'd in principal part, ALAB-788, 20 NRC 1102 (1984).

The Intervenors now continue this pattern. As noted in the passage above, the Board in LBP-83-57 noted "omissions," "selective citations," and "distortions" in the Intervenors' findings. Those sorts of things, particularly "distortions," appear also in the Intervenors' latest proposed findings. Some of them are documented below, though

---

<sup>1/</sup> "Initially, the Board believed that questions regarding LILCO's access to a sufficient number of buses . . . were within the scope of the remanded Contention 25.C issues. . . . Thereafter, however, we decided otherwise. . . . We now change our minds once again." I.F. at 83 n.78. This passage, LILCO submits, and particularly the sentence "[w]e now change our minds once again," is the written equivalent of what Suffolk County was criticized for doing orally at the hearing. See Tr. 20,422-23 (Judge Gleason).

LILCO has not tried in this Reply to address every misrepresentation in the I.F. We have tried instead to focus on what seem to be the Intervenors' major arguments.

## II. Role Conflict of School Bus Drivers

The Intervenors in their findings spend 50 pages discussing the record on "role conflict," but they cannot avoid the fact that they have no evidence that "role conflict" has ever been a problem.<sup>2/</sup> They must rely on opinion polls and on sheer opinion testimony, supported only by general theory and references to pre-1969 literature, all of which was discussed at length in the 1983 hearings before this Board.

Also, the Intervenors' findings obscure the fact that their own witnesses supported LILCO's case in three important respects. First, Suffolk County's school administrator witnesses testified eloquently about how responsible and reliable the regular bus drivers are. L.F. at 19. Since the issue here, in part, is whether the regular bus drivers can be counted on, this is significant. Indeed, because the regular drivers are of such high quality, and because there is no evidence that a bus driver anywhere has ever abandoned his job in an emergency, LILCO has asked the Board to find that LERO back-ups for the regular drivers are not necessary. L.F. at 58.

Second, the Intervenors support LILCO's assertion that role abandonment has not been a problem in past emergencies. Both from their answers to LILCO's discovery requests, L.F. at 40-41, and from their failure to cite specific cases in their testimony, it is clear that the Intervenors, like LILCO, have found no examples of true role abandonment.

---

<sup>2/</sup> LILCO inadvertently included in its proposed findings a passage that was stricken from its 1983 written testimony. The citation, to Cordaro et al., ff. Tr. 831, at 41-42, is at L.F. 16. The cited passage was stricken at Tr. 793 and should not have been included in the findings. LILCO apologizes for this oversight. However, the other citations for the proposition that role conflict is seen as a "non-problem" to emergency planning professionals, I.F. at 16-17 and 17 n.16, are correct.

Third, the Intervenor reinforced LILCO's 1983 analysis of the scientific literature by calling as witnesses only representatives of the "first generation" of literature on role conflict. LILCO testified at great length in 1983 about a "first generation" body of literature that did find, or appeared to find, evidence of role abandonment in real emergencies:

- A. [Dynes, Mileti] These works (Killian, 1952; Instituut Voor Sociaal, 1955; Moore, 1958; Fogleman, 1958; Form and Nosow, 1958; and Moore, 1963) and perhaps a few others provide the "evidence" that role conflict exists in emergencies and can result in role abandonment. The picture provided by them has been summarized in overviews of disaster books (for example, Allen H. Barton, Communities in Disaster: A Sociological Analysis of Collective Stress Situations, Garden City, New York: Doubleday and Co., Inc., 1969) and literature synthesis monographs (for example, Dennis S. Mileti, Thomas E. Drabek, and J. Eugene Haas, Human Systems in Extreme Environments: A Sociological Perspective (Boulder, Colorado: Institute of Behavioral Science 1975) and is referenced uncritically in most introductory textbooks on sociology.

If we were to base our judgment about role conflict only on these early empirical works that provide, seemingly, "accounts" of role abandonment or conflict or both, we would be left with the impression that (1) emergencies yield role conflict, (2) role conflict yields role abandonment, (3) role abandonment yields social disorganization, and (4) emergency planning that relies on "locals" cannot work because role abandonment can keep locals from doing their emergency work. This, indeed, is the conventional wisdom of people who speculate about human behavior based on lay impressions, or based on a selective reading of old literature, or based on the reading of a college freshman textbook.

Cordaro et al., ff. Tr. 831, at 58-59. LILCO's witnesses explained, however, that later work (the second and third generations) discovered that the postulated "problem" of role conflict was not a problem at all<sup>3/</sup> if the workers had "role clarity" -- a clear idea

---

<sup>3/</sup> Not a problem, that is, in terms of causing role abandonment. LILCO's witnesses have always acknowledged that role "conflict" -- meaning mental discomfort or anxiety about loved ones -- does occur in emergencies. See Tr. 19,627-28 (Mileti).

of what they are supposed to do. See Tr. 19,566 (Mileti).

Indeed, in a paper never to this day acknowledged by Intervenors' witnesses, in 1954 Lewis Killian wrote that "[t]he possession by the individual of a clear conception of a role which he can or should play seems to be conducive to organized adaptive behavior." Cordaro et al., ff. Tr. 831, at 62. However, LILCO's witnesses explained that some scholars have never gone beyond the "first generation":

- A. [Dynes, Mileti] Killian's second article was in a journal read by fewer scholars than his first; Fritz's work was in a sophomore text book; awareness of Bates et al.'s work was confined to "disaster specialists" who would have access to an Academy report, as was White's; and so these works were sought out by only the most committed scholars. It is little wonder, then, that only sociologists who had "disasters" as their area of prime interest and specialty thought role conflict was not a real problem in emergencies where roles were defined and workers properly trained.

Those whose experience with the concept was more limited continued to think of it as a major problem. To this day, an occasional sociologist, unfamiliar with the history, theory, and substance of disaster research, may do a piece of "disaster research" in which, after observing someone who he believes has or should have an emergency role (but who does not himself know that he has an emergency role), the sociologist concludes that role abandonment has occurred. This mistake can be made even by trained sociologists, and the risk of error is even greater when one takes the word of the uninformed and untrained person (for example, a medical administrator) as evidence of role abandonment.

Cordaro et al., ff. Tr. 831, at 67-68.

Upon remand the Intervenors underscored LILCO's point by failing to refute it. They obviously tried to rebut LILCO's 1983 analysis of the literature. See Cole et al., ff. Tr. 20,672, at 30-40. And yet all they were able to do was to cite "first-generation" literature and bring into the courtroom examples of "first-generation" scholars. Indeed, they brought in the very author that LILCO identified in 1983 as having summarized the "first generation" studies. That scholar, Professor Barton, has not published anything

on emergencies or emergency planning since. L.F. at 25. Moreover, the County's witnesses' 1988 testimony, like other County witnesses' 1983 testimony, simply relied upon the early (pre-1969) literature and ignored, or attempted to distinguish away,<sup>4/</sup> everything since. By contest, LILCO's witnesses reconciled the old and the new work. L.F. at 27; Tr. 19,634-35 (Mileti); see also Tr. 19,552-54 (Mileti).

The choice faced by the Board is, as LILCO said in its proposed findings, clear-cut. L.F. at 46. Either Professor Cole's opinion polls outweigh all of recorded history, or all of recorded history outweighs his opinion polls. If opinion polls outweigh history, then this Board had better do more than just decide the Shoreham case. It had better advise the Commission that there appears to be no reasonable assurance that any emergency plan in the country will work (except perhaps Shoreham and Limerick), and no basis for continuing to allow any nuclear plant to operate, until opinion polls have been taken of emergency workers everywhere. The Board should advise the Commission that the NRC rules should be amended to require all applicants to submit opinion polls.

And if the Commission should follow this misguided advice, it would receive many opinion polls showing, just as all opinion polls have showed so far, that emergency workers say their "families come first." But these polls would tell nothing about how emergency workers would behave in a real emergency.

Even if the Intervenors were dead right about polls and role conflict, LILCO still would be entitled to a license. LILCO has provided a back-up driver for each and every regular school bus driver. In this sense, the "role conflict" issue is moot. However, the Intervenors are not right, and because they are not, LILCO has asked the Board to hold that the LERO back-up drivers are not required. L.F. at 58.

---

<sup>4/</sup> The only post-first-generation works they refer to are Meda White's and Russell Dynes.' Cole *et al.*, ff. Tr. 20,672, at 32-36 and 37-39. And these they attempt to distinguish as inapplicable to emergencies at nuclear power plants.

A. History of the Role Conflict Issue (I.F. at 3)

I.F. at 9-10 ¶ 9. In I.F. ¶ 9 Intervenor's argue that LILCO's plan to provide LERO school bus drivers is an "entirely new proposal" and an "entirely new approach." This characterization is intended to bolster the Intervenor's argument that not just role conflict, but rather the entire LILCO plan for schools should have been at issue in this remand proceeding. See I.F. at 16 n.10, 12 ¶ 12 (issue stated as "analysis and review of LILCO's school evacuation proposal").

This argument is incorrect. The Appeal Board remanded the issue of whether there would be "a sufficient number of school bus drivers":

On the record now before us, we similarly cannot make a finding that a sufficient number of school bus drivers can be relied upon to perform their duties if an accident occurred at Shoreham. Therefore, we are remanding this matter to the Licensing Board for further exploration. All parties will be free to adduce additional evidence on the issue; at minimum, the Licensing Board is to accept the testimony related to the survey of volunteer firemen. Upon review of the evidence presented at the reopened hearing, the Licensing Board should reconsider its prior findings and conclusions regarding the potential for role conflict among school bus drivers.

ALAB-832, 23 NRC 135, 154 (1986) (footnote omitted; emphasis added).

The Board recognized this in its Memorandum and Order of December 30, 1987, denying LILCO's motion for summary disposition:

However, the submittal of the auxiliary bus driver arrangement does not require consideration of new contentions. The basic issue to be explored by the Board is whether, in light of the potential for role conflict, a sufficient number of school bus drivers can be relied upon to perform emergency evacuation duties. To assure an adequate number of drivers, LILCO has developed its new proposal for auxiliary drivers.

Memorandum and Order (Ruling on Applicant's Motion of October 22, 1987 for Summary Disposition of Contention 25.C Role Conflict of School Bus Drivers), slip op. at 5 (Dec. 30, 1987). The Board allowed the Intervenor's discovery on the new proposal. Id.

Had the Intervenor found, during this discovery, some reason why LILCO's proposal to supply additional drivers would not help to ensure "a sufficient number of school bus drivers," then that evidence would have been admissible. Had the Intervenor submitted and had accepted a new contention on some other issue, then again they would have been permitted to present evidence. But under the remanded Contention 25.C, which addresses "role conflict," they are not entitled to reopen the entire issue of LILCO's plans for schools.

This was made clear, if it had not already been, in the Board's Memorandum and Order (Ruling on LILCO Motion In Limine and Motion to Set Schedule) (Feb. 23, 1988). It was made clear yet again in the Board's rulings on LILCO's motion to strike testimony. Board Memorandum and Order On Pending Motions to Strike (May 9, 1988); Supplemental Memorandum and Order (May 12, 1988). It was made clear again in the Board's rulings on the County's motions for reconsideration of those Memoranda and Orders. Tr. 19,616-20 (Judge Gleason). Finally, it was made clear in various rulings on objections to cross-examination during the course of the hearing. See, e.g., Tr. 19,646, 19,679-80, 19,713-14, 19,739-41, 19,745 (Judge Gleason).

I.F. at 9 n.4. Footnote 4 of the Intervenor's findings is the first of several places at which the Intervenor address three Appeal Board decisions that, they argue, stamp the Appeal Board's imprimatur on the use of opinion polls.<sup>5/</sup> These three cases are Cincinnati Gas & Electric Co. (William H. Zimmer Nuclear Power Station, Unit No. 1), ALAB-727, 17 NRC 760, 772 (1983); Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), ALAB-832, 23 NRC 135, 152-54 (1986); and Philadelphia Electric Co. (Limerick Generating Station, Units 1 and 2), ALAB-836, 23 NRC 479, 517 (1986). But

---

<sup>5/</sup> Other places in the I.F. where these Appeal Board decisions are discussed are I.F. at 7 ¶ 6, 7-8 ¶ 8, 44 ¶ 63 (Shoreham); I.F. at 9 n.4 (Zimmer); and I.F. at 24 ¶ 30, 25 ¶ 32, 32 n.21, 44-45 ¶ 64 (Limerick).

these Appeal Board decisions required more evidence to be presented; they did not decide the issue. LILCO has now presented the evidence, and this Board must weigh it and decide.

In each of these three cases the licensing board that heard the evidence first hand was persuaded that the historical record showing an absence of role abandonment outweighed statements by firemen or bus drivers that they would put their families first. That is part of what LILCO argues here, though with much better basis than has ever been argued before. In each of the three cases the Appeal Board ruled that the opinion evidence raised enough question that it had to be considered afresh. Never has the Appeal Board ruled that the opinion evidence carries the day; but it has ruled that survey results are sufficient to raise a question such that the applicant has the burden of producing affirmative evidence of an adequate number of available drivers. Philadelphia Electric Co. (Limerick Generating Station, Units 1 and 2), ALAB-836, 23 NRC 479, 518 (1986).<sup>6/</sup>

LILCO has produced the "affirmative evidence" that the Appeal Board has called for in these circumstances. LILCO has reviewed the literature on role conflict since the last hearings were held; has reviewed FEMA's reports (DRQ's) on real emergencies since November 1986; has searched, through discovery, the collective knowledge of Suffolk County and the State of New York; has reviewed the psychological literature on "bystander intervention"; and, over and above all this, has performed a specific study

---

<sup>6/</sup> The Limerick Appeal Board put it as follows:

In this instance, that means PECO was obliged to produce affirmative evidence of an adequate number of available drivers from some source, once the survey results substantially clouded that matter with doubt. See Consumers Power Co. (Midland Plant, Units 1 and 2), ALAB-123, 6 AEC 331, 345 (1973).

ALAB-836, 23 NRC at 518 (footnote omitted).

looking far and wide for evidence of actual role abandonment by evacuation bus drivers. Moreover, it has committed to provide back-up LERO bus drivers even though it does not believe that they are needed.

By contrast, in Zimmer the role conflict issue simply was not considered at the hearing stage. L.F. at 6. In Limerick, there was "little else" except the surveys in the record on which to base a reasonable assurance finding:

The Licensing Board did not give adequate weight to the largely negative results of these surveys, and there is little else in the record on which to base a reasonable assurance finding.

Limerick, at 519 (citations and footnotes omitted).<sup>7/</sup> In short, all the Appeal Board has held is that

Driver surveys raise a legitimate question whether there is reasonable assurance that an adequate number of drivers would respond in an emergency.

Limerick at 518-19 (footnote omitted). Surveys "raise a question." That question has now been put to rest by the evidence in this proceeding.

I.F. at 12-14 ¶¶ 13-14. At I.F. 12-14 the Intervenor's argue that the issue whether there are enough buses (as distinguished from bus drivers) is an issue that requires further hearings and that LILCO must move to reopen the record before it can satisfy NRC regulations.<sup>8/</sup>

---

<sup>7/</sup> The Appeal Board found in Limerick that "the planning deficiency is relatively limited" and, since parties and Licensing Board could address it over the summer months, there were "compelling reasons to permit continued plant operation, despite the demonstrated emergency planning deficiency . . ." Limerick at 520. As noted in LILCO's findings, in response to the Appeal Board's decision the licensee arranged to maintain a pool of 200 or more utility company bus drivers, and on remand the licensing board found this acceptable. L.F. at 13-14; LBP-86-32, 24 NRC 459, 472 (1986), aff'd, ALAB-857, 25 NRC 7 (1987).

<sup>8/</sup> The Intervenor's argue (I.F. at 13 ¶ 14) that LILCO should file a motion "with this Board" to reopen the record. This Board lacks jurisdiction over the number of school buses. Any such motion, were it necessary, would have to be filed with the Commission.

This issue was litigated in 1984. The Board found as follows in its Concluding Partial Initial Decision:

7. The Plan is deficient and must be corrected because LILCO's agreements for obtaining buses for use in an emergency are subordinated to preexisting contracts for normal daily use by schools outside of the EPZ. See Board Finding XII.22 (21 NRC at 872-74).

CPID, LBP-85-31, 22 NRC 410, 430 (1985). The availability of school buses was addressed in LILCO's motion for ruling in limine, and those arguments will not be repeated here. LILCO's Motion In Limine and Motion to Set a Hearing Schedule (Jan. 25, 1988). LILCO has committed to supply the necessary number of buses, and has testified that it will buy them if necessary. Tr. 19,794-96, 19,800 (Crocker). It would be foolish to have an evidentiary hearing so that the Licensing Board could count buses. This is a task that can and should be left to FEMA and the NRC Staff.<sup>9/</sup>

B. Witness Qualifications (I.F. at 14)

I.F. at 14-16 ¶¶ 15-18. Paragraphs 15-18 of the I.F. purport to address "witness qualifications" and should be compared to the corresponding part of LILCO's findings, L.F. at 25-26.

The Intervenors do not really argue about the "qualifications" of the academic (that is, sociological and psychological) witnesses at all. In behalf of their own expert witnesses, they simply argue that LILCO did not cross-examine them very long. I.F. at 15 ¶ 17. The Intervenors suggest (I.F. at 15 ¶ 17) that LILCO's brief cross-examination of the County's academic experts indicates that "LILCO considered their testimony to be strong and potentially damaging to LILCO's case." In truth, it indicates that LILCO considered their testimony to be weak and inconsequential. It is, however, fair to

---

<sup>9/</sup> Cf. Philadelphia Elec. Co. (Limerick Generating Station, Units 1 & 2), ALAB-857, 25 NRC 7, 11 (1987), finding that the number of buses (as distinguished from bus drivers) was not within the scope of the "narrowly circumscribed remand" in ALAB-836.

conclude that LILCO did not believe that cross-examination would cause them to change their opinions. Their opinions, founded on theory and not on empirical data, are largely proof against argument and cannot be shaken by confronting them with real-world facts. Cross-examination on pure opinion is not likely to be useful. And the fact that the opinions have no basis in actual experience with real emergencies is plain on the face of the written testimony.

Similarly, the Intervenors do not really address the "qualifications" of LILCO's academic witnesses. They simply say that they are biased, in particular because Dr. Mileti has testified for other utilities. I.F. at 16 ¶ 18. They do not note that Dr. Mileti has worked for the TMI Public Health Fund through Clark University, which is a group of intervenors. Tr. 19,475 (Mileti). Id. Whom he has worked for, however, is immaterial. Dr. Mileti believes in emergency planning. Tr. 19,572, 19,633 (Mileti). Utilities appear before the NRC to support emergency plans. It is not surprising that they have asked for his help.

The other remark the Intervenors make about LILCO witnesses' "qualifications" is that Mr. Kelly "did not appear to be experienced in or knowledgeable about the conduct of surveys." I.F. at 15 ¶ 18. Instead of citing the record for this proposition, the Intervenors refer the reader to their other findings on Mr. Kelly's phone survey. I.F. at 16 ¶ 18. Their remark about his "qualifications" really has to do not with "qualifications" but with the Intervenors' criticisms of the study itself.

A more balanced discussion of Mr. Kelly's "qualifications" would note that he is involved with another study of evacuations for another client, Tr. 19,434 (Kelly), and that he has read "numerous disaster research books," Tr. 19,435 (Kelly). Moreover, he represents a type of expert that is missing from the witness panels presented by Suffolk County: an emergency planning response professional. Mr. Kelly has worked both for the Massachusetts Civil Defense Agency and for FEMA. Crocker et al., ff. Tr. 19,431,

Attachment B, at 2. He has been involved both with responding to and planning for actual emergencies. Crocker et al., ff. Tr. 19,431, at 4, 7; Tr. 19,441-43 (Kelly).<sup>10/</sup>

Suffolk County also has people in its department of emergency preparedness. Tr. 9784 (Mayer). None of them was presented to testify. New York State has emergency planning experts, two of whom testified on role conflict in the Indian Point proceeding. L.F. at 11. None of them was called to testify on role conflict in this proceeding.

The only real discussion of "qualifications" in the section of I.F. called "Witness Qualifications" goes to the qualifications of the school administrators. In I.F. at 15 ¶ 16 the Intervenor says that the administrators were "the most qualified to testify about what the drivers who work for them would or would not do in a Shoreham accident."<sup>11/</sup> This is not so. The question of how people behave in an emergency is a subject for expert testimony, not lay opinions. The record in this case amply demonstrates that many of the things that ordinary people believe about emergencies (for example, panic, looting, and role abandonment) are simply not true in fact. The school administrators are expert in running schools; they are not expert in what would happen in an emergency, and their opinions on this psychological-sociological issue are entitled to no more weight than any other layman's.

C. The Issue (I.F. at 16)

I.F. at 17-20 ¶¶ 21-23. At I.F. 17-20 the Intervenor attempts to show that LILCO's witness Professor Lindell supports their case. They cite a passage from one of

---

<sup>10/</sup> Professors Milet and Lindell have also been involved in emergency planning. Crocker et al., ff. Tr. 19,431, at 5-7, 8.

<sup>11/</sup> It should be noted that not all school administrators share the opinions of Suffolk County's witnesses. The Superintendent of the Shoreham-Wading River School District, which is closest to the plant, testified for LILCO earlier in this proceeding. See Doremus, ff. Tr. 9491.

his papers saying that bus drivers "could not be assumed to have developed priority and avoidance mechanisms to the same degree as designated emergency workers." I.F. at 19 ¶ 22. See also Tr. 19,481-90, 19,497-502 (Lindell). The Intervenors do not cite the oral testimony, where Dr. Lindell said, among other things:

- A. (Lindell) Well, I would say that these kinds of procedures would be helpful. I don't know that they are necessary, but if they were provided, then the low probability of role abandonment would be further reduced. That may be from one in -- one in 100 to one in 500.

Tr. 19,498 (Lindell).

Also, the passage is talking about bus drivers who "may be needed to assist in evacuating residents of affected areas." I.F. at 19 ¶ 22. In other words, Dr. Lindell's observation applied to all bus drivers who might have to drive in an emergency, not specifically to school bus drivers. Regular transit bus drivers undoubtedly have less "normative overlap" than do school bus drivers. The regular school bus drivers are the very ones who took the children to school in the first place, and the ones who are expected to pick them up either at the regular dismissal time or in the event of an early dismissal. L.F. at 24. The Board has already found that regular school bus drivers are expected to drive school buses in an evacuation of school children. L.F. at 19; PID, 21 NRC at 859. Moreover, the protection of children would be one of the highest priorities in an emergency. L.F. at 24; Tr. 19,529, 19,567 (Mileti).

Nevertheless, LILCO's study of past emergencies involved ordinary transit bus drivers who were called upon to drive in evacuations, see Tr. 19,851 (Kelly), and they were found to have performed their emergency duties just as other emergency workers have always performed theirs. See L.F. at 27-40.

I.F. at 23-27 ¶¶ 28-34. In the section of the I.F. entitled "role clarity" the Intervenors argue in essence that school bus drivers will not know that they are expected to drive in a radiological emergency. They talk about LILCO's "unilateral" assignment of

the role. I.F. at 23 ¶ 30, 33 ¶ 45. They say that "There is no evidence that any of the regular bus drivers have agreed to accept the role that LILCO has assigned to them." I.F. at 24 ¶ 30. They say that many bus drivers have "either not agreed to assume their assigned role or have affirmatively rejected that role." And they say that the school districts "do not expect the bus drivers to drive in a Shoreham emergency." I.F. at 27 ¶ 34; see also I.F. at 33 ¶ 45. This is, of course, a collateral attack on the Board's finding that the regular school bus drivers are expected to drive school buses in an evacuation of school children. PID 21 NRC at 859.

LILCO testified, in essence, that in a radiological emergency there would be a unanimous community consensus that school bus drivers should do their jobs and help evacuate school children. Crocker et al., ff. Tr. 19,431, at 21. If one reads the Intervenor's findings uncritically he might think the Intervenor is saying that LILCO's testimony is wrong. But the Intervenor cannot possibly believe that the school districts would not care whether their drivers worked or not in an emergency.

Rather, the Intervenor's proposed finding that the school districts do not expect the bus drivers to drive appears to be a play on the word "expect." The evidence the Intervenor cite to support this collateral attack is "See generally, Brodsky et al., ff. Tr. 20,259, at 43-48." I.F. at 27 ¶ 34. The written testimony on those pages does offer the prediction that many school bus drivers will not drive. It says, in fact, that the school administrators "could not expect" the bus drivers to be committed to attending to the needs of their part-time employer rather than to the safety of their family members or loved ones during a Shoreham emergency. Brodsky et al., ff. Tr. 20,259, at 45. Here "expect" obviously means "anticipate" or "predict."

But what about "expect" meaning that the school districts would call upon the regular bus drivers and ask that they do their jobs in an emergency? Here the testimony gives a different story. The school administrators testified that it would be

"contrary to our settled transportation policies" to permit unapproved LERO personnel, as opposed to regular bus drivers, to transport children in an emergency. Brodsky et al., ff. Tr. 20,259, at 49. They say that "we could not release our buses or drivers, notwithstanding the many concerns previously stated, because we would need them for our children." Brodsky et al., ff. Tr. 20,259, at 66. They say that "the parents of schoolchildren attending our schools would expect us to get their children home or to attempt to evacuate them if a serious accident occurs." Id. In short, the school administrator witnesses are testifying that, while they would want and need the regular bus drivers to do their jobs in a real Shoreham emergency, their pre-emergency testimony that they cannot depend on those same drivers may confuse the drivers and perhaps become a self-fulfilling prophesy.

As evidence that many bus drivers either have not agreed to assume their assigned role or have affirmatively rejected it, I.F. at 24 ¶ 30, the Intervenors cite their proposed findings on opinion polls and Brodsky et al., ff. Tr. 20,259, at 46-48; Tr. 20,407-09 (Rossi, Doherty); and Tr. 20,143 (Crocker). All Mr. Crocker said at Tr. 20,143 was that no school district except Shoreham-Wading River had accepted LILCO's offer of training. Tr. 20,143 (Crocker). Mr. Rossi at Tr. 20,407 referred to a survey, the results of which he did not recall in much detail. Tr. 20,407 (Rossi). Mr. Doherty declined to refer to surveys because the ones done by his district were 8 to 10 years earlier, and his recollection of the results was "zilch." Tr. 20,407 (Doherty). His opinion was based on "discussions with drivers." Tr. 20,408 (Doherty). He had learned that their "primary concern was that their families had to be taken care of first." Tr. 20,408 (Doherty). Maybe 8 or 10 drivers indicated that once they were satisfied that their families were all right "they might consider returning to help out." Tr. 20,408 (Doherty). Brodsky et al., ff. Tr. 20,259, at 46-48 also relies on opinion surveys. In short, the evidence for the proposed finding that drivers have rejected their role is, like the rest of the Intervenors' evidence, opinion polls.

The Intervenors also attempt to show that LILCO does not know whether the bus drivers are clear about their roles and has yet done no training of the bus drivers. I.F. at 24 ¶ 31. The Intervenors say that "LILCO's witnesses admitted on cross-examination that they have had no contact with any school bus drivers," citing Tr. 19,651 (Lindell) and Tr. 19,526 (Mileti). Drs. Lindell and Mileti, of course, have not talked to any school bus drivers because they were called to the stand to testify about the theory and literature of role conflict. LILCO itself has had many contacts with school bus companies, school bus company management, and school bus drivers, as the record shows.

The Intervenors would have the Board find that "no such training [of school bus drivers] has yet taken place and that no training of substantial numbers of school bus drivers is likely to take place in the foreseeable future." They argue that "indeed, all but a handful of those bus drivers have either ignored or rejected LILCO's offer to receive training." They cite Tr. 19,694-95 (Crocker). I.F. at 25 ¶ 32.

The record, however, presents a different picture. For example:

- A. (Crocker) We have met with school bus drivers and their school bus company management, and we get a sense from discussions with them that a fair number of them will respond, they are interested in training. We haven't gone out and interviewed every single one of them, no. But we do have some indication that a significant number will respond.

Tr. 19,689-90 (Crocker); see also Tr. 19,491-96 (Crocker). LILCO has met with 60 drivers from one company, 21 from another, and 12 from another. LILCO had given letters and flyers to 129 of the drivers at one company, and at another company all the drivers had received letters. Tr. 19,691 (Crocker). LILCO has attempted to meet with the other three entities (two bus companies and a school district), but they refused to discuss planning with LILCO. Tr. 19,691 (Crocker). At the time of the hearing, 18 drivers from one company, 9 from another, and 2 from another had agreed to training. Tr. 19,693 (Crocker). LILCO was then in the middle of the process of offering training to

the regular bus drivers. Tr. 19,693 (Crocker). As Mr. Crocker said, "[your questioning] implies that the rest of those 93 do not want training. That is not true. We just haven't heard back from some of them yet." Tr. 19,693-94 (Crocker). Besides the roughly 10 percent who have responded affirmatively to LILCO's offer for training, conversations between LILCO and the drivers have indicated that more people are willing to drive. Tr. 19,694-95 (Crocker).

In short, the Intervenors' attempt to suggest, first, that the school districts would not "expect" the regular drivers to drive and, second, that LILCO has had no contact with the bus drivers is misleading.

D. The Parties' Opposing Views (I.F. at 20)

I.F. at 21 ¶ 25. In several places the Intervenors take the "strawman" approach, defining the issue so as to make it a problem. In particular, they suggest that the role conflict issue concerns a situation in which a bus driver cannot both drive a bus and take care of his family. This in turn allows them to characterize LILCO's case as requiring bus drivers to "overcome" their feelings for their family. For example, at I.F. 21 ¶ 25 they say that LILCO believes that various social forces and the urge to assist the community "will overcome the perceived need to join and assist the family in an emergency." I.F. at 25 ¶ 21. Similarly, they define role conflict as the experience of "incompatible" obligations arising from two or more of a person's societal roles. I.F. at 17 ¶ 20. Likewise, they argue that the bus drivers' obligations to their families "will remain dominant." I.F. at 23 n.14.

This misses the point. Role conflict is not an "either-or" proposition. a harsh choice between saving one's family and saving school children. It is rare that people are faced with truly "incompatible" demands. L.F. at 17. LILCO does not suggest that people will stop feeling concern for the families, or that other factors will "overcome" those feelings. Bus drivers will both drive and feel that their families are safe.

I.F. at 22 ¶ 26. One of the few references the Intervenors make to the historical record is to say that "role conflict has been documented, not only in theory, but in fact." I.F. at 22 ¶ 26. They cite their written testimony, Cole et al., ff. Tr. 20,672, at 30-31. Those pages refer to Killian's 1952 account of four disasters, including some involving volunteer firemen, and the firemen referenced by Form and Nosow.

As LILCO has pointed out above, the Intervenors' testimony relies on only the pre-1969 literature. All of this was addressed in the hearings in 1983, and a much more thorough job of it was done then than Intervenors attempt now:

<u>Paper</u>	<u>Discussed in 1988 Cole Testimony at pages</u>	<u>Discussed in LILCO's 1983 Written Testimony at pages</u>
Killian (1952)	28, 30- 31, 35	52-54
Instituut Voor Sociaal Orderzoek Van Het Nederlandse Volk (1955)	29	54-55
Moore (1958)	29	55-56
Fogelman (1958)	29	56-57
Form and Nosow (1958)	29	57
Meda White (1962)	32-37	66-67
Barton (1969)	29, 34	58

The Intervenors' reliance on Killian (1952) in I.F. ¶ 26 underscores the point.<sup>12/</sup>

---

<sup>12/</sup> These papers were explored at some length in 1983-84. Suffolk County cross-examined on them. See, e.g., Tr. 921, 922A, 928, 982-84, 996-1000, 1054 (Dynes, Mileti). Some of them were addressed by the Intervenors in their proposed findings. See Suffolk County and State of New York Proposed Findings at 71-72 (Oct. 26, 1984), where the Intervenors specifically cited Form and Nosow (1958) and Killian (1952). See also LILCO Reply Findings on Offsite Emergency Planning at 40-42 (Nov. 14, 1984), where LILCO addressed Moore (1958), Form and Nosow (1958), and Killian (1952). The Board addressed Killian's 1952 article in the PID, 21 NRC at 672, 673.

1. Role Clarity (I.F. at 22)

I.F. at 22 ¶ 28. The Intervenors represent LILCO's position as asserting that role clarity is achieved when people are informed and understand prior to the emergency that they have an emergency role. I.F. at 22 ¶ 28 (emphasis added). They cite Tr. 19,506-08 (Mileti) and LILCO's Findings at 23. But Dr. Mileti testified that role clarity could emerge during a disaster. Tr. 19,627 (Mileti). Indeed, people extend their normal roles over into emergency circumstances; that is what "emergent norm" theory is all about. Tr. 19,652 (Lindell).

I.F. at 23 ¶ 29. The Intervenors say that "LILCO concedes that without a clear understanding of the role that LILCO has assigned to them under its Plan, it is unlikely that many school bus drivers will respond as anticipated." I.F. at 23 ¶ 29. They cite Tr. 19,522 (Lindell) for this "concession." At that page Dr. Lindell was responding to the question whether without role clarity a "lower number" of bus drivers might respond to an emergency:

Yes, it is possible that if you don't engage in a training program prior to an emergency, that it is possible that there might be fewer bus drivers or other emergency auxiliaries or emergency personnel that engage in the behaviors that are expected of them by other members of the emergency response organization.

Tr. 19,522 (Lindell) (emphasis added). This is not at all the same as saying "it is unlikely that many school bus drivers will respond as anticipated."

The Intervenors do "not reach" the issue of whether role clarity will diminish role conflict or role abandonment. I.F. at 23 n.14. They rely entirely on their argument that LILCO has failed to demonstrate that role clarity will exist.

I.F. at 25 n.16. At I.F. 25 n.16 the Intervenors argue that even if the bus drivers took the training, they would not believe it because of LILCO's "low credibility." I.F. at 25 n.16. Cole et al., ff. Tr. 20,672, at 26, says that the bus drivers would not believe anything LILCO said about the dangers of radiation because of LILCO's low credibility.

But what is at issue here is "role clarity." It is hard to credit the suggestion that bus drivers would sign up for training, take it, and then still not know that they were expected to drive a bus in an emergency. The credibility argument has not to do with the issue at hand.

I.F. at 26 ¶ 33. At I.F. 26 ¶ 33 the Intervenor's argument is that the Frye Board decision found that LILCO's training program is "fundamentally flawed." I.F. at 26 ¶ 33. They reason from this that whatever training LILCO is providing the bus drivers will not produce role clarity.

As LILCO pointed out in its motion to strike, the Frye decision had nothing to say about training as a means of producing role certainty. The flaws in training found by the Frye Board were entirely different. See LBP-88-2, 27 NRC 85, 174-212 (1988). In particular, the problems identified involving school bus drivers had to do with training in dosimetry and use of potassium iodide, *id.* at 204-09, and had nothing to do with role certainty. Moreover, any "fundamental flaws" found by the Frye Board (and the lack of knowledge about personal radiation protection was not one, 27 NRC at 208-09) will have to be corrected before a full-power license can be issued.

I.F. at 26-27 ¶ 34. The Intervenor's argument is that the school administrators' testimony in this proceeding has itself created confusion in the minds of the school bus drivers. I.F. at 26-27 ¶ 34. It is hard to believe that this confusion, if it exists, would persist in a real emergency, when the emergency consensus would focus everyone's attention on evacuating threatened people. The Intervenor's argument is that the needs of families provide a role that is both dominant and clear. I.F. at 27 ¶ 34. But this assumes that the family is clearly threatened, helpless, and without other means of assistance. And would not the role of helping school children also be "clear"? As Dr. Mileti testified, even without emergency plans, "those bus drivers are going to have an idea -- it is going to occur to them because of the normative overlap between what they do every

day, taking kids back and forth to school, that if they hear that the EPZ is going to be evacuated, it will occur to them that they need to go to the school and get the kids. That is why I believe we have not ever seen kids abandoned in any emergency we have had." Tr. 19,565 (Mileti).

The Intervenors argue that "LILCO's witnesses have acknowledged that the school districts' regular school bus drivers could perceive that other drivers could fill their roles, and thus rationalize their failure to respond, even if they knew they had a role." I.F. at 28-29 ¶ 37. They cite Tr. 19,566-67 (Mileti). Dr. Mileti pointed out at Tr. 19,567-68, however, that in disasters in which there has been that kind of uncertainty, generally more people show up to do certain emergency tasks rather than too few. His belief was that more would show up, just to be on the safe side, in case LILCO didn't provide drivers. Tr. 19,568 (Mileti).

In a footnote, I.F. at 29 n.18, Intervenors claim to have found an inconsistency in LILCO's case. They say that LILCO argues that bus drivers would realize that they had an emergency role because of normative overlap, whereas doctors, hospital workers, and National Guardsmen at TMI did not perceive such a role. The difference between the two situations seems to LILCO obvious. At TMI there was no role for the doctors, only a vague potential role the Intervenors think should have been guessed at the time; in a Shoreham emergency there would be an actual, clear need for school bus drivers to drive buses.

## 2. Social Factors (I.F. at 30)

I.F. at 31 ¶ 41. The Intervenors argue that the "emergency consensus" would not work in a Shoreham emergency. They say that "LILCO has failed . . . to demonstrate that this concept would apply to the situation at hand." I.F. at 31 ¶ 41. The reason for this, they say, is that the concept is relevant "only where there is a clear community need overriding family concerns, and a clear course of action for individuals to follow."

I.F. at 32-33 ¶ 45. The basis for this is the unsupported testimony of Suffolk County's experts. Cole et al., ff. Tr. 20,672, at 23-24. These witnesses theorize that in a Shoreham emergency, people would blame LILCO and therefore, somehow, would not feel moved to try to evacuate school children. I.F. at 33 ¶ 45. This argument does not make much sense. Also, it is not evident that there is ever, in any kind of an emergency, a clear community need "overriding family concerns," and it is evident that in a Shoreham emergency there would be a "clear course of action for individuals to follow" insofar as school children were concerned. Nor is there any empirical evidence that the emergency consensus does not arise in technological, as opposed to natural, disasters.

Finally, the Intervenors attempt to attack Dr. Lindell's testimony about helping behavior because "leaving one's family exposed to a threat to perform an emergency role could be considered a 'cost' which could prevent the 'helping' behavior which LILCO advances." I.F. at 32 ¶ 43. The Intervenors find "equivocal and unconvincing" Dr. Lindell's testimony that cost figures "cut both ways." Tr. 19,640. I.F. at 32 n.20. They do not acknowledge his testimony at Tr. 19,642 (Lindell), where he explained further that cost "falls out" of the analysis, because either helping one's family or helping school children has a "cost" in the "conflict" situation postulated by Intervenors.

3. The Literature and Empirical Data (I.F. at 33)

a. Literature (I.F. at 33)

The Intervenors' discussion of the scientific literature is, as might be expected, brief, consisting of four paragraphs at I.F. 33-35. It makes three points.

I.F. at 34 ¶ 47. First, Intervenors argue that a passage in Dr. Lindell's published paper, already discussed above, weakens LILCO's case. I.F. at 34 ¶ 47. They argue that LILCO should "distinguish" the paper. The passage in question, of course, was put into evidence by LILCO. Dr. Lindell testified at length about his views of school bus drivers. There is no need to distinguish anything.

I.F. at 34 ¶ 48. Second, the Intervenor's argue that the Disaster Research Center studies "were not designed to inquire into role conflict." I.F. at 34 ¶ 48. They make the same argument later with respect to FEMA's Disaster Response Questionnaires (DRQ's), arguing that the questionnaires "do not ask any questions designed to elicit information regarding role conflict or role abandonment." I.F. at 53 n.38. This criticism misses the point. Both the DRC interviews (over 6,000 of them) and the FEMA DRQ's (about 300 of them) were designed to document what happened in real emergencies. The DRQ's, in particular, have a section devoted to "problems" that arose during real emergencies. In none of these 6,000 interviews or 300 FEMA DRQ's has role abandonment been documented as a problem. Obviously no one would design a study to look for "role conflict" except in connection with litigation, because no competent professional thinks that "role conflict" is a problem worth studying. L.F. at 16-17, 22.<sup>13/</sup>

---

<sup>13/</sup> Moreover, in case the Board is tempted to adopt such a finding, it should be aware that Professors Dynes and Quarantelli, in their Preliminary Paper 49 that was discussed in this proceeding in 1983, said this:

Our own research on disaster was initiated in 1963. Since it was focused on organizational involvement in disaster, we were aware, of course, of the common interpretations given to Killian's article. We had initially contemplated that the behavioral consequences of role conflict might be a major problem which might confront emergency organizations, so we were sensitive to indications of it.

7 J. Quarantelli, Structural Factors in the Minimization of Role Conflict: A Re-examination of the Significance of Multiple Group Membership in Disasters (Preliminary Paper 49, Ohio State University Disaster Research Center), at 3 (emphasis added). The same point was made in Professor Dynes' 1987 publication:

When DRC began its studies of emergency organizations in 1963, it was anticipated that, in spite of the contradictory evidence provided by White, role conflict still might be a significant problem and the field work was intended to be sensitive to any indication of the consequences of role conflict.

R. Dynes, "The Concept of Role in Disaster Research," in R. Dynes et al. (eds.), Sociology of Disasters at 81 (1987) (emphasis added).

Third, the Intervenors argue that LILCO has made a "major concession" by conceding that an emergency worker might abandon his job if he perceived that his family was threatened in a "direct, drastic, way similar to that of a person seeing his own house on fire." I.F. at 35 ¶ 49. This observation by LILCO's witnesses refers to the Texas City ship explosion and fire, as the Intervenors note.

Suffolk County's witness Professor Barton compared the Texas City disaster to nuclear war:

In the case of an atomic attack, the visible extent of fires or the detectable extent of radiation might create a certainty of family danger over a wide area, similar to the Texas City situation.

A. Barton, Communities in Disaster (New York: Doubleday, 1969) at 120, cited in Crocker et al., ff. Tr. 19,431, at 22-23 (emphasis in original book by Barton). Thus Professor Barton at one time thought that even nuclear war only "might" be similar to the Texas City situation; he now has decided that a Shoreham emergency would be. Moreover, the Intervenors now claim that the invisibility of radiation, not the detectable extent of it, might make the workers react as they would to their house being on fire.

The truth is, as LILCO's witnesses testified, that a radioactive plume is nothing like seeing one's own house on fire with his family inside. Dr. Mileti characterized the situation as one in which "physical harm was about to befall in a dramatic way jeopardizing life and limb as fire would if a family didn't evacuate from the house." Tr. 19,661 (Mileti). Such a threat is inconsistent with what would happen in radiological emergencies, as we know from the results of reactor accident consequence analyses. Crocker et al., ff. Tr. 19,431, at 23. The LILCO witnesses' testimony was based "upon a more accurate understanding of the nature of the radiological emergency -- as portrayed by reactor accident consequence analyses." Id. at 24. LILCO's point is not, as the Intervenors think, that the bus drivers would know about reactor consequence analyses. I.F. at 35 n.22. The point is that they would not perceive anything nearly so drastic as their own homes being on fire with their families inside.

Moreover, to abandon his role, not only must the bus driver perceive this drastic sort of harm, he must think that he could help in a way that might make a difference. Tr. 19,653-54 (Mileti). In a radiological emergency it is likely that the bus driver's family could take protective actions by themselves. Crocker et al., ff. Tr. 19,431, at 24.

b. Other Emergencies (I.F. at 35)

I.F. at 35-39. The Intervenors' discussion of "other emergencies" is, once again, brief. I.F. at 35-39. They address three radiological emergencies: Hiroshima, Chernobyl, and Three Mile Island. The Intervenors claim that LILCO's evidence with respect to Hiroshima and Chernobyl was "vague and inconclusive." I.F. at 36 ¶ 51.

I.F. at 36 n.23. With respect to Hiroshima, the Intervenors claim that Dr. Mileti's testimony is "largely anecdotal." I.F. at 36 n.23. Apparently they have looked only at his oral testimony on cross-examination in this latest hearing, not at his 1983 testimony. LILCO did not address Hiroshima and Nagasaki in its 1988 written testimony because LILCO had already addressed it in 1983. Cordaro et al., ff. Tr. 831, at 46-51, describes the evidence of Hiroshima and Nagasaki in considerable detail. It cites several published books and papers on the Japanese and precise statistics (93% of the nurses and 90% of the doctors were either killed or injured, id. at 49.)

What the Intervenors apparently refer to as "anecdotal" is Dr. Mileti's own investigation. Dr. Mileti went to Japan, Tr. 19,459-60 (Mileti), and spoke to a friend of his named Professor Nakano who is "familiar with most of the people who survived in Hiroshima." Tr. 19,460 (Mileti). Professor Nakano and a few other social scientists there helped arrange for Dr. Mileti to talk to some of the survivors (half a dozen or so). Tr. 19,461 (Mileti). Suffolk County, of course, presented no evidence about the Japanese disasters at all, either in 1983 or more recently.

As for Chernobyl, Suffolk County argues that the Soviet bus drivers had "no reason to fear" for the safety of their families in Kiev, because the residents of Kiev had

not been advised to take protective actions. I.F. at 36 n.23. In the Intervenor's view, then, the irrational instinct that causes Americans to flee their homes and abandon their jobs at the slightest mention of radiation does not exist in the Soviet Union. In any event, no one argues that the Chernobyl experience is conclusive. But it is one additional example of a radiological emergency in which bus drivers (large number of them) were used to evacuate many people and in which there is no record of any bus driver having abandoned his role.

I.F. at 36 ¶¶51-52. Finally, the Intervenor's argue that LILCO has "misrepresented" the case at Three Mile Island. I.F. at 36 ¶ 51. And they argue that LILCO's "logic" is "uncompelling." I.F. at 36 ¶ 52. Their main complaint seems to be that Dr. Mileti did not speak to "medical personnel at TMI." *Id.* This proposed finding, however, does not take into account the 1983 record. LILCO did not discuss TMI at any length in its 1988 written testimony, because it had already addressed it in 1983. At the time, LILCO was aware of two papers that had been published describing shortages of personnel at TMI area hospitals. Dr. Mileti had a research assistant call the authors of both papers, a Dr. Smith and a Mr. Maxwell, to explore further. Cordaro *et al.*, ff. Tr. 831, at 83. What he found out was the following:

These hospitals were not in the 0-5 mile TMI planning zone. For that reason, none of them had a radiological emergency plan that clearly specified emergency roles for workers. At the same time, the public information at the time suggested that "risk" did exist at the location of the hospitals. Dr. Smith reported that about 50 percent of the staff left who were specialists and not in a role of responsibility for activities that would include, for example, patient evacuation. Others stayed and eventually got involved in patient evacuation. Also, division chiefs and other higher authorities stayed to oversee evacuation work that was likewise clearly part of their job. Put simply, the people who left did so because they had no emergency role. In addition, week-end staffing is only one-third of regular staffing anyway. Dr. Smith reported that the evacuation weekend coincided with a national physicians meeting in another state, and many people were away attending the meeting. Mr. Maxwell reported that his hospital had no radiological emergency plan, that few workers knew if they had a role or not, and that the normal reduction in

staffing for weekends largely affected how many people were at work in these hospitals.

Cordaro et al., ff. Tr. 831, at 83-84.

The Intervenors claim that Dr. Mileti admitted that the Hershey Medical Center established a large facility to receive people requiring medical attention. I.F. at 37 n.24, citing Tr. 19,968 (Mileti). LILCO testified in 1983 that the Red Cross had activated two relocation centers, one at Hershey and one in York County. Cordaro et al., ff. Tr. 831, at 38. These reception centers were also discussed during the hearing on LILCO's reception centers last summer. But, as Dr. Mileti testified, he recalled that this was set up not in anticipation of potentially 5,000 victims but, rather, as a place where people could spend the night. Tr. 19,968 (Mileti). Dr. Mileti did believe that part of the reason for setting up the facility was to provide potential medical services, and he noted that the provision for decontaminating people was a rolled up garden hose. Tr. 19,969 (Mileti). LILCO does not believe there is any evidence that the TMI reception centers were understaffed. Rather, the inference from the evidence of last summer is that they were probably overstaffed, since few members of the public used them.

There is no dispute that no actual medical emergency occurred at Three Mile Island. L.F. at 43. There were not a large number of people who sought medical attention. Tr. 20,675 (Cole). The doctors and nurses were never called in to respond to a medical emergency, and, as Mr. Kelly testified, ordinarily hospital emergency plans call for the personnel to wait and respond to a page. Tr. 20,179-80 (Kelly).

The Intervenors also argue that Dr. Mileti has misinterpreted a report by the Pennsylvania National Guard finding that "difficulty was encountered in assembling local National Guardsmen to respond to the TMI incident." I.F. at 38 ¶ 53. Once again, the Intervenors argue that the National Guardsmen at TMI should have responded to an emergency in some undefined way (it is not clear even now what role these National

Guardsmen would have played in a radiological emergency) but that school bus drivers would not have any clear idea that they expected to pick up the same school children that they pick up if school dismisses for a snowstorm or other emergency.

Also, in 1983 Dr. Mileti had phone calls made to a "variety of organizations that would have had emergency responsibilities of some sort during the Three Mile Island accident." Cordaro et al., ff. Tr. 831, at 74. The caller (a graduate student) questioned about a dozen organizations. Id. at 75. He reported that "Not one case of role abandonment was reported by any organizational respondent in reference to teachers, bus drivers, the police, civil defense, the State Troopers, the National Guard, or the Pennsylvania Emergency Management Agency." Id. at 75. (There was a 12-13 percent absentee rate on the Friday and Monday of the "TMI weekend" among state employees generally, but a 10 percent absentee rate is normal before and after any weekend. Id. at 75. Also a spokesperson for a volunteer fire department reported that "a few who wanted to leave the area did." Id. at 76. However, there was no reason to believe that these few evacuating volunteer firemen were called upon to fight fires or that their presence was crucial to the functioning of local fire units. Id. at 76.)

The Intervenors have presented no evidence of their own on Three Mile Island. Their only response to the record is to attempt to interpret away LILCO's evidence. They have not succeeded.

I.F. at 39 ¶ 55. Finally, the Intervenors would have the Board find that "LILCO's experts have studiously avoided any serious inquiry into the matter" of Three Mile Island. I.F. at 39 ¶ 55. Nothing could be further from the truth. It was LILCO's witness that phoned TMI organizations to see if they reported any role conflict, not Suffolk County. It was LILCO's experts who were familiar with the literature on Three Mile Island. Tr. 20,181 (Mileti, Lindell). It is LILCO's experts who have studied the TMI accident, not Suffolk County's, and LILCO's witness who had talked to a school principal

there. It was LILCO who presented in 1983 the head of the Kemeny Commission's Task Force on Emergency Response and Preparedness to explain that role conflict had not been a significant matter to the Commission. Cordaro et al., ff. Tr. 831, at 3, 71-72.

c. The County's Surveys (I.F. at 39)

I.F. at 39-44. In their discussion of Dr. Cole's opinion polls, the Intervenor's answer LILCO's evidence that polls do not predict emergency behavior by arguing that they do not predict the "exact proportion" of drivers who will abandon their jobs, but rather "estimate the extent to which role conflict will present a problem." I.F. at 43 ¶ 62. They would have the Board find that this "limited use" of survey data is appropriate. Id.

Their observation may be correct for polls of voter or consumer behavior. It is not true for polls about emergency behavior. LILCO's point is not simply that polls are imprecise; it is that they are inherently unable to predict behavior in a future, undetermined emergency. L.F. at 29. The plain fact is that all polls of this sort predict large amounts of role conflict; the plain fact is that real emergencies show an excess of personnel, not a shortage. This is not a matter of whether the shortage of personnel will be 50% or 60%; the polls show the opposite from what happens in a real emergency. L.F. at 30-31.

LILCO offered the alternative explanation that the surveys measure either hostility to the utility or people's fondness for their families. L.F. at 34. The Intervenor's take issue with the first of these interpretations, saying that it is mere "speculation." I.F. at 43 n.31. But it is not mere speculation. A large amount of evidence in this proceeding shows that polls about nuclear energy inevitably reveal large amounts of anti-nuclear feeling.<sup>14/</sup>

---

<sup>14/</sup> In 1984 one of LILCO's witnesses on the "credibility" contention, a cultural anthropologist, testified that people generally are suspicious of communications (espe-

The alternative interpretation that the polls reflect people's affection for their families is also well-founded. Indeed, in the Intervenor's own findings they note that respondents were asked to agree or disagree with the statement that "In the event of a nuclear emergency at Shoreham, a volunteer fireman must place duty to the fire department over duty to family." I.F. at 41 ¶ 59. What can this possibly be measuring except generalized devotion to family? If you ask someone "which do you love more, your family or your job?," what answer can you expect except what the Intervenor's got?

The very best that can be said about Suffolk County's opinion polls is that experts on both sides disagree about their significance. Suffolk County's experts say that the polls measure future behavior; LILCO's experts say that they measure attitude towards family or attitudes toward nuclear plants or attitudes toward the utility. On this record there can be no finding that the Intervenor's have prevailed.

I.F. at 44-45 ¶¶ 63-64. The Intervenor's argue that ALAB-832 "found that behavioral opinion polls are of probative value to the issues here confronting us." I.F. at 44 ¶ 63. They cite Limerick as well. Id. at 44-45 ¶ 64. They reason from these cases that "it is plain that where surveys indicate that the emergency workers relied upon to respond to an emergency indicate that they will not respond, there can be no reasonable assurance that they will do so." I.F. at 45 ¶ 64. The Appeal Board, of course, found no

---

(footnote continued)

cially from utilities) about nuclear power. Barnett et al., ff. Tr. 9689, at 18-19. Attitudes toward a utility's credibility are strongly correlated with overall opinions of nuclear energy. Id. at 21. Most utilities with nuclear plants suffer from low credibility. Tr. 9699-700 (Barnett). Dr. Barnett concluded that the surveys he had seen were "tapping a basic feeling or series of basic mind-sets about nuclear energy that, by inference, will result in pretty similar percentages no matter what the [precise] question is." Tr. 9705 (Barnett). People around the country are skeptical of statements by utilities about "the entire gamut of nuclear activity, be it specific construction data, data about costs, future reliability, safety, waste disposal, what you will." Tr. 9711-12 (Barnett). Generally speaking, a utility's credibility declines as a nuclear power plant comes closer to going on line. Tr. 9719 (Barnett). And negative attitudes toward a utility are increased by large rate increases. Tr. 9722 (Barnett).

such thing. It found that opinion polls are admissible and that, absent weightier evidence, they raise a question about the adequacy of the number of bus drivers. That is all.

d. LILCO's Surveys (I.F. at 45)

Unlike any other party in this proceeding, and apparently unlike any party in any other NRC proceeding that has considered role conflict, LILCO actually went out and looked for cases of role abandonment by school bus drivers. LILCO phoned both organizational respondents and individual bus drivers to try to find evidence of role abandonment from emergencies in the past. I.F. at 37-40. LILCO was no more successful than the Intervenor in uncovering true cases of role abandonment.

Nevertheless, the Intervenor find a number of things to criticize about LILCO's phone surveys. Ignoring the beam in their own eye, they attempt to exploit what they see as a mote in LILCO's.

Their first argument is that each and every past emergency can be distinguished from a hypothetical future Shoreham emergency on one ground or another, especially since one can define the future emergency as he likes. For example, they distinguish a Shoreham emergency on the basis of size of impact area (I.F. at 46 ¶ 65) (hypothesizing a Shoreham emergency that envelopes the entire 10-mile EPZ), radiological versus nonradiological (*id.*), and number of bus evacuees (I.F. at 46 n.32).

It is true that the evidence is not perfect, in the sense that there is no perfect correlation between any past emergency and a future Shoreham one. There has never been a (1) radiological emergency (2) requiring bus evacuation (3) from a ten-mile zone. And if there had been, the Intervenor would still argue that a future Shoreham emergency would be different because the fear of radiation would have increased.

The Intervenor also argue that there might be some cases of role abandonment that LILCO has missed. I.F. at 46 ¶ 65, 46 n.33, 47 ¶ 67. Of course there might, by

definition, be cases of role abandonment that no one knows about, just as there might be unicorns. But LILCO has searched scholarly literature, after-action and police reports, newspaper accounts, popular literature including antinuclear books,<sup>15/</sup> the Disaster Research Center data, and FEMA DRQ's. Its witnesses have spoken with disaster response professionals, and they have gone so far as to interview veterans of actual evacuations. LILCO's effort has by any fair standard been thorough.

The Intervenors argue that LILCO's organizational survey was not "methodologically sound." I.F. at 47 ¶ 67. But they cannot support this claim. The survey instrument was developed by Drs. Lindell and Mileti and tested by Mr. Kelly. Tr. 19,859-61 (Kelly). The people who asked the questions had done telephone interviews before. Tr. 19,860-61 (Kelly). They practiced using the instrument first, Tr. 19,861, 19,909 (Kelly), then got together a few days later to go over any needed corrections, Tr. 19,861 (Kelly). Mr. Kelly went over each questionnaire a day or two after it was completed. Tr. 19,861 (Kelly). Interviewers talked to people who said they were involved in or aware of the facts of the various emergencies. Tr. 19,866 (Kelly).

The Intervenors say that there were "instances in which those employees reportedly recorded incorrect information," I.F. at 47 ¶ 67, citing Tr. 19,902-20 (Kelly). The first case was S.C. Bus Driver Ex. 6, involving the Marysville flood. The interviewer apparently wrote down, under the question about what percentage refused to drive evacuation buses, the notation "2 drivers one mechanic?". When Mr. Kelly called the respondent back for further information, however, she said that the three people were not actually called because they were in the risk area. Tr. 19,902, 19,903, 19,908 (Kelly).

---

<sup>15/</sup> As Dr. Mileti explained, he attempted "to review the scraps of information that do exist for evidence of role abandonment of any sort, not just in terms of bus drivers." Tr. 19,988-89 (Mileti). Some of these sources were even "anti-nuke books." Tr. 19,989 (Mileti).

The second case is S.C. Ex. 7, involving a chemical tank explosion at Taft, Louisiana. For the same question as to how many bus drivers refused to drive, the interviewer had written down "2 or 3 bus drivers." Tr. 19,910 (Kelly). LILCO duly reported this "discrepancy" in an attachment to its prefiled written testimony:

In the Taft case, a discrepancy exists because there was a report of testimony about the role abandonment of two or three drivers. The emergency coordinator, his assistant, and the transportation officer do not recall any instance of bus driver abandonment.

Crocker et al., ff. Tr. 19,431, Att. G, at 4 ¶ 16. Again, Mr. Kelly made follow-up calls and talked to the Emergency Coordinator, his assistant, and the bus company's transportation officer. None of them knew anything about bus drivers refusing to drive. Tr. 19,911-12, 20,183 (Kelly). It appears that one of the respondents passed on some information from a newspaper or other report, but the Emergency Coordinator was not aware of it and didn't believe it was true. Tr. 20,183 (Kelly).

Obviously, these two cases do not invalidate LILCO's survey, as the Intervenors argue. For one thing, there is an internal check in that more than one respondent was contacted for all but one of the emergencies. See Crocker et al., ff. Tr. 19,431, Att. G at 1. It is not even clear that the interviewers wrote down wrong information. In the case of S.C. Ex. 6, the information simply was incomplete; three people did fail to drive, but they were not asked to. In the case of the second, it appears that one of the respondents was passing along hearsay information about testimony or a newspaper article or some such.

But the Intervenors argue that the study is biased because, in the few cases where role abandonment was indicated, Mr. Kelly made follow-up calls. Mr. Kelly explained full well why he made the calls. He was trying to find cases of role abandonment. As is evident from the entire record in this proceeding, role abandonment is very rare. When he found (apparent) cases of it, Mr. Kelly wanted to investigate

further and "get the details" and "additional information." Tr. 19,902, 19,903-04, 19,907, 19,919, 19,920-21 (Kelly). The notable thing is that, even with all its effort, LILCO was still not able to find a true case of role abandonment. LILCO has conceded that role abandonment can occur. But it is so rare that no one in this proceeding has yet been able to find a true example of it.

I.F. at 49 ¶ 71. The Intervenor then note "other failures to report data." I.F. at 49 ¶ 71. These two "failures" are that one bus company official reported that 75% of its drivers reported late so that they could "secure family possessions," S.C. Bus Driver Ex. 9 at 8, and that another respondent reported that 10% of the bus drivers were late because they were "taking care of their families," S.C. Bus Driver Ex. 10 at 7. This 10% was reported in an attachment to LILCO's written testimony:

During the Pinellas evacuation, about 10% of one bus company's drivers showed up late because they first helped "take care of family."

Crocker et al., ff. Tr. 19,431, Att. G, at 5 ¶ 22. LILCO also reported that in the Pinellas case the delay caused by drivers reporting to work late ranged from 20 minutes to three hours, with an average delay of only one hour. Crocker et al., ff. Tr. 19,431, Att. G, at 5 ¶ 25.

Mr. Kelly also explained the 75% who secured family possessions. Tr. 19,884-85 (Kelly). The same respondent who reported the 75% noted that no one showed up late in response to LILCO's Question 22. S.C. Bus Driver Ex. 9 at 7 ¶ 22. Hence Mr. Kelly reasoned that the drivers who couldn't be reached were those who were either out of town for the weekend or helping to secure their family possessions. Tr. 19,884-85 (Kelly).

I.F. at 50-53 ¶¶ 72-78. The Intervenor argue that LILCO's second survey, that of individual bus drivers who had been involved in actual evacuations, is entitled to no weight at all because it is "unreliable." I.F. at 50 ¶ 72. They argue that LILCO's

request to speak to drivers who had participated in the evacuations would by definition exclude any drivers who had refused to drive. I.F. at 51 ¶ 73. But Mr. Kelly pointed out that in the cases studied there were no bus drivers who refused to participate. Tr. 19,941 (Kelly).

I.F. at 51-52 ¶¶ 74-75. The Intervenors argue that the survey instrument was worded in such a way that it provided "ambiguous data," attaching significance to the difference between the word "household" and the word "home." They argue that some of the bus drivers had evacuated their families out of the impact zone and thus had no role conflict.

The facts are as follows. As LILCO testified, it interviewed 27 bus drivers. Of these, 19 had family members at home when the bus driver received the activation message. Ten of these 19 answered the question whether their home (LILCO said home in its survey question, "household" in its testimony) would be threatened. Seven of the 10 said that the danger to their homes was extremely likely or very likely or even odds. Six of the seven nevertheless proceeded immediately with their bus driving duties; the other one of the seven took 20 minutes to evacuate her children before reporting to drive an evacuation bus. Crocker et al., ff. Tr. 19,431 at 30.

Suffolk County argues that "in a number of those instances, the bus drivers reported that they had evacuated their families out of the impact zone." The Intervenors cite S.C. Bus Driver Ex. 11 and 12 and Tr. 19,943-49 and 19,954 (Kelly). This proposed finding, and the cross-examination that underlies it, are misleading. As LILCO explained on redirect, Ex. 11 was not included in the 19 addressed in LILCO's testimony. Tr. 20,184 (Kelly). S.C. Bus Driver Ex. 12 was included in the 19. This respondent, Ms. Laird, saw a car speeding by and talked to a passer-by and thus found out about the emergency. She went in, helped her family prepare to evacuate, and then reported directly to the bus yard; this took only 15 minutes. Tr. 20,185 (Kelly).

I.F. at 52 ¶ 75. The Intervenors claim that there are "other instances where LILCO's witnesses were unable to interpret the answers they received from the bus drivers." They cite Tr. 19,950-51 (Kelly, Lindell). I.F. at 52 ¶ 75. The "other instances" they are talking about is S.C. Bus Driver Ex. 11, not included in the 19 who had family members at home when they received the activation message. In that emergency (the Marysville flood) there had been rain for about a week, during which some people apparently prepared to evacuate. Tr. 19,950 (Kelly). Finally a levee broke, precipitating the emergency, and there was only five minutes' warning. Tr. 19,945-46, 19,950-51 (Kelly).

I.F. at 52 ¶ 77. Finally, the Intervenors argue that the fact that one of the bus driver respondents apparently told LILCO "family comes first" is significant. As noted in LILCO's own proposed findings, L.F. at 34-35, what this meant in practice was that the driver was delayed about 15 minutes while she helped her family evacuate before reporting for duty. L.F. at 34-35.

I.F. at 53 n.38. The Intervenors argue that LILCO's review of the FEMA DRQ's was "cursory" and that the reports in any event are "irrelevant" because they do not ask questions designed to elicit information regarding role conflict or role abandonment. This proposed finding apparently comes from looking at LILCO's written testimony and not the oral. In fact, LILCO not only asked the FEMA person in charge to look through the DRQ's. Crocker et al., ff. Tr. 19,431, at 33. In addition, Mr. Kelly testified that his associate went through all 300 of them and that he himself went through the first 20 or 25. Tr. 19,964-65 (Kelly). They found nothing that appeared to be role abandonment. Tr. 19,965 (Kelly).

4. Role Conflict Conclusion (I.F. at 53)

E. LILCO's School Evacuation Proposal (I.F. at 54)

1. Overview (I.F. at 54)

I.F. at 54-55 ¶ 80. The Intervenor's argue that the original multiple-wave plan for evacuation of school children would have lengthened the time required to implement the protective action of evacuation "well beyond the time required in LILCO's view, to evacuate the general public." They cite Tr. 19,686 (Crocker) and OPIP 3.6.5 at 10a. What Mr. Crocker said at Tr. 19,686 was that LILCO went to a single-wave evacuation plan because it wanted to evacuate the children in a time frame comparable to the evacuation of the general public and it wanted to have each bus make one trip. He also said that clearly evacuation times go up if each bus has to make more than one trip. Tr. 19,686 (Crocker). In fact, the evidence from the 1984 hearings showed that a multiple-wave evacuation of school children could take place within the same time as evacuation of the general public. Tr. 9460-62 (Lieberman). But the analysis relied on assumptions about where the reception centers for the children would be, and on this ground the Board found the record inadequate.

I.F. at 57 n.41. In footnote 41 the Intervenor's would have the Board find that an issue of whether there would be a sufficient number of regular school bus drivers to carry out an early dismissal precludes an operating license for Shoreham. They argue that this issue, as well as the issue of bus drivers for evacuation, was remanded by the Appeal Board. This is incorrect. The "early dismissal" option under the LILCO plan works exactly as the early dismissal option for snowstorms or any other emergencies that require closing the schools, under emergency plans that the schools are required to have by State law. Early dismissal would take place only if the general public had not been advised to evacuate, and indeed it is designed to get the children home so that, if necessary, they can evacuate later with their families. All of this was litigated in 1983-84 and not reopened by the Appeal Board's remand.

If the issue were open now, the same evidence showing that bus drivers have not abandoned their roles in the past and showing that the regular bus drivers on Long Island are highly reliable people would a fortiori demand a ruling in LILCO's favor on early dismissal.

2. Summary of LILCO's School Evacuation Proposal (I.F. at 57)

I.F. at 59 ¶ 86. The Intervenors say that it would be "necessary for at least two teachers to board each bus to supervise the evacuated schoolchildren." They cite Tr. 19,731, 19,716, 19,714 (Crocker). None of those pages says that it is necessary for at least two teachers to board each bus. Indeed, LILCO testified that it would ask "at least one" school person to accompany the children. Crocker et al., ff. Tr. 19,431, at 56, Att. P at 3. In the first place, one teacher should be enough. In the second place, it can be expected that school children could be driven to safety even if no teacher were aboard. Apparently the support for the proposition that school teachers are "necessary" is LILCO's testimony that teachers would provide necessary care and supervision. See Tr. 20,092 (Crocker). That does not mean that school children cannot be driven to safety unless there is a teacher on board.

The last 13 lines of ¶ 86 discuss reception centers, monitoring, and sheltering and are outside the scope of the remanded issue.

3. Witness Qualifications (I.F. at 61)

I.F. at 61-63 ¶ 89. In ¶ 89 the Intervenors again praise the qualifications of their school administrator witnesses. The experience of these witnesses in running schools would indeed be relevant if the issue were, as the Intervenors put it (I.F. at 62 ¶ 89) "the practical implications involved in attempting to implement LILCO's school evacuation plan." But the issue here is not all of the practical problems that may come up in a disaster. The issue is whether there are an adequate number of drivers. Mr. Crocker was called by LILCO to testify about LILCO's plan for providing LERO drivers. The

school administrators, for all their expertise in school administration, did not present any reason why LERO cannot provide an adequate number of drivers, nor were they expert in predicting how people would behave in an emergency.

The Intervenors argue that these witnesses "have no vested interest or inherent bias in the outcome of LILCO's license application." I.F. at 62 ¶ 89. That is not quite true, since it is clear from both their 1984 and their 1988 testimony that these witnesses will be saved time, trouble, and money if they do not have to plan for a Shoreham emergency. But the Intervenors are correct that there is little reason to doubt that the witnesses testified because they are concerned about the safety and welfare of the school children. So is LILCO. The difference is that the school administrators want to protect safety by keeping Shoreham closed; LILCO is trying to protect safety by providing an adequate emergency plan. This issue of motive has little to do with which witnesses should be accorded more weight.

4. LILCO Has Failed to Provide Reasonable Assurance that an Adequate Number of Trained and Qualified School Bus Drivers Would Be Available in the Event of a Shoreham Emergency (I.F. at 63)

I.F. at 63 ¶ 91. The Intervenors argue that LILCO has not been able to recruit the number of LERO school bus drivers it needs. I.F. at 63 ¶ 91. In footnote 49 they claim that the slowing of LILCO's recruiting efforts has resulted in "pressure" on LILCO management to fill school bus driver positions. I.F. at 63 n.49, citing Tr. 19,820-21, 19,818 (Crocker) and S.C. Bus Driver Exs. 5-A and 5-B. Mr. Crocker explained that "pressure" is probably too strong a term. Tr. 19,820-21, 19,818 (Crocker). He testified that LERO had noticed that some LILCO departments had great recruiting for LERO and others had "minimal." Tr. 19,819 (Crocker). The managers of the departments that had produced few recruits were approached again, because here "is a potential source of people that may not have gotten the word, maybe misunderstood the circumstances or whatever." Tr. 19,819 (Crocker). He did say that "there was pressure, if you will,

applied among vice-presidents." The pressure was to "get the word down to the troops." Tr. 19,821 (Crocker). Mr. Crocker testified that LILCO is committed to find within LILCO, or even to hire, if necessary, sufficient bus drivers. Tr. 19,822-23 (Crocker).

Also in footnote 49 the Intervenors claim that "LILCO did not yet have any employees licensed to drive buses." I.F. at 63-64 n.49 (emphasis in original). They cite Tr. 19,704 and 19,815 (Crocker). This finding is worse than an "omission," "selective citation," or "distortion." It is simply wrong. At Tr. 19,815 Mr. Crocker testified that 558 drivers had been trained and passed their road tests. He said there were a "few extra" that hadn't started the training program yet. Tr. 19,815 (Crocker). At Tr. 19,705 Mr. Crocker testified that he had 558 drivers who had passed the road test, and that 486 of them had actually had the paperwork completed "and can show you today a class two license in their possession." Tr. 19,705 (Crocker). In other words, at the time of the hearing there were 486 LERO drivers with Class 2 licenses, not zero as the Intervenors allege. There were 72 LERO drivers who had passed the road test and were simply waiting for the paperwork to be finished before getting their licenses. LILCO had 28 more drivers recruited but not yet trained, Tr. 19,815 (Crocker), making a total of 586 recruited drivers. LILCO needed to recruit only 27 more. Tr. 19,815 (Crocker).

Of course, the precise number of bus drivers who had been trained on a particular day is exactly the type of detail that licensing boards are not supposed to concern themselves with in light of the Waterford decision. Louisiana Power and Light Co. (Waterford Steam Electric Station, Unit 3), ALAB-732, 17 NRC 1076, 1106-07 (1983); see also Pacific Gas & Elec. Co. (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-781, 20 NRC 819, 834 (1984). The only importance of this particular dispute is that it reveals that the Intervenors' proposed findings are unreliable.

I.F. at 65 ¶ 93. In ¶ 93 the Intervenors argue that LILCO's figures for the population of the EPZ schools are inaccurate. But the Intervenors presented no comprehensive population figures in evidence of their own. LILCO's numbers were obtained from two phone surveys, Tr. 20,168-69 (Crocker), and in addition were consistent with information received from New York State, Tr. 19,748, 19,750-51, 20,170-71 (Crocker). The information received from Suffolk County was incomplete and difficult to use. Tr. 19,805, 20,169-70 (Crocker).

The Intervenors argue that "LILCO concluded that the Mount Sinai School District has a student population of 1,830 students, when it actually has 2,232 students." I.F. at 65 ¶ 93. As Mr. Crocker explained, the Mount Sinai Senior High School students attend school in a different district, Port Jefferson, Tr. 20,176 (Crocker), and so those students are accounted for in the Port Jefferson tabulations, *id.* See also Tr. 20,293-94 (Petrilak).

The Intervenors' continuing attempt to persuade the Board that LILCO is not accounting for all the Mt. Sinai students is misleading. At the end of the first day of the hearing, Suffolk County's counsel, arguing that the Board should admit some of the County's stricken testimony, told the Board that the Mt. Sinai School District has 500 or so students who attend the Port Jefferson District's high school. Tr. 19,596-97 (Suffolk County counsel).

The next day, however, the same counsel attempted for some nine pages of the transcript (Tr. 19,805-14) to establish a discrepancy in LILCO's figures because some 572 high school students from the Mt. Sinai District were not included in the Mt. Sinai population figures. Counsel for Suffolk County told the Board that he was trying to establish the "pertinent, relevant information" that here was a school population "considerably higher than LILCO is planning for." Tr. 19,809 (counsel). He represented that the evidence "contradicts data proffered in LILCO's testimony." Tr. 19,811 (counsel).

After counsel for LILCO explained that the 572 students were the Mt. Sinai students who attend Port Jefferson High, Tr. 19,813 (LILCO counsel), counsel for Suffolk County said that this "could be a possibility." Tr. 19,813 (Suffolk County counsel). Yet now the Intervenors make the argument again in their proposed findings.

In footnote 50 to I.F. ¶ 93 the Intervenors compare the population figures of LILCO's two telephone surveys and conclude that the "surveys came up with a difference of some 650 students, once the population numbers for each individual school were totaled. See LILCO Br. at 48. We do not find this to be an insignificant difference, as LILCO would have us believe." The Intervenors fail to explain, however, that the difference is on the conservative side; that is, LILCO used the highest population figures in determining the number of buses needed to evacuate schools. The difference is insignificant in part because LILCO has overestimated the number of buses it need..

Everyone agrees that enrollment figures go up and down as the school year progresses. The Intervenors' complaints about the data are mere quibbles, beneath the purview of the Board as defined in Waterford. The important thing is that LILCO has committed to revise its figures each fall, when school starts anew, Tr. 19,804, 19,814, 19,821 (Crocker), and that its plan is flexible enough to accommodate day-to-day variations in attendance. Tr. 19,759-60 (Crocker).

The Intervenors argue that LILCO's surveys did not attempt to obtain population figures for either the parochial or the nursery schools within the EPZ. I.F. at 65 n.50. This is another misrepresentation of the record. LILCO did get enrollment figures from parochial and nursery schools; it is just that they are not listed on LILCO Bus Driver Ex. 1:

Q. Mr. Crocker, I assume you had your staff telephone all the EPZ schools, public schools, private parochial schools and nursery schools?

A. (Crocker) Certainly, they telephoned as part of this the public schools. We had--we have more regular discussions with the parochial and nursery schools. So, my data for

those comes from an intermediate point. This last survey, to the best of my recollection, went solely to public schools.

Tr. 19,749 (Crocker) (emphasis added). See also Tr. 19,763-64 (Crocker) (LILCO asked for peak attendance figures from nursery schools), 19,767 (Crocker), and Crocker et al., ff. Tr. 19,431, Att. K at 4-5.

I.F. at 66-68 ¶¶ 94-96. In ¶¶ 94-96 the Intervenors find fault with LILCO's reduction of the enrollment figures by 5% to account for daily absences and (for high schools) by an additional 20% to account for students who drive to school or ride to school with other students.

The Intervenors quarrel with LILCO's 5% absenteeism rate, citing two cases in which attendance rates may be "upwards of 97%." I.F. at 67 n.51. This was litigated in 1983-84. Tr. 19,755 (Crocker). Moreover, the evidence taken as a whole clearly shows that LILCO's 5% is reasonable. See Tr. 20,309 (Suprina).

More important, as Mr. Crocker explained, any good plan or set of procedures has built-in flexibility that allows you to accommodate deviations. Tr. 19,759 (Crocker). The LILCO plan has that built-in flexibility. For example, the school coordinator at the EOC called each school district, and among the other things they discussed is, "Do you have any problems?" Tr. 19,759 (Crocker).

The Intervenors also quarrel with LILCO's 20% of high school students who would use their own vehicles to evacuate. This figure was already litigated in 1983-84, as Mr. Crocker pointed out. Tr. 19,755 (Crocker). LILCO's figure was derived from a conversation with a school superintendent before the original hearings and confirmed with another superintendent later on. Tr. 19,755-56, 19,757 (Crocker). As another example of a "distortion," the Intervenors say that LILCO's figure came originally from the "spouse of one of the witnesses who testified on LILCO's behalf" without mentioning that the "spouse" was a school superintendent. I.F. at 68 n.52.

The Intervenors argue that all high school students should be evacuated by bus, the ones with cars leaving them at the school. I.F. at 68 ¶ 96. They suggest it is cal-  
lous to allow 18-year-olds to drive in an emergency.<sup>16/</sup> Of course, there is nothing to  
prevent the same 18-year-olds from driving their cars out of the EPZ on Saturdays,  
should an evacuation occur then. The Intervenors' complaint has no basis in NRC regu-  
lations.

The Intervenors argue that the 20% figure is unreliable "in light of the fact that  
the legal age to obtain a license to drive a vehicle to high school during the day in  
Suffolk County has risen from 16 years to 18 years of age since 1983." They cite Title  
15 of the Official Compilation of Codes, Rules and Regulations of the State of New  
York, Section 1.3, and Section 501(3) of the New York State Vehicle and Traffic Law.  
I.F. at 68 n.52.

In the first place, LILCO's testimony based on the 20 percent assumption was  
presented in 1984 and confirmed with another school superintendent for the purposes of  
Mr. Crocker's testimony sometime later. So even if the Board accepts as evidence In-  
tervenors' counsel's statement that the driving age has changed "since 1983" (the regu-  
lation cited by Intervenors suggests the change became effective January 1, 1984), it  
would not outweigh LILCO's testimony.

In the second place, the way the Intervenors chose to raise this point was un-  
timely and inappropriate. Intervenors cannot come in after a hearing and ask the  
Board to infer, without proper foundation, that a law has a practical effect that invali-  
dates the evidence already presented. They knew about the driving age before the  
hearing but presented no evidence on it. It is pure speculation to argue now that the  
cited law has changed the facts.

---

<sup>16/</sup> As noted in LILCO's proposed findings, L.F. at 14, the Shearon Harris plan called  
for evacuation buses to be driven by high school students as young as sixteen-and-a-half  
years old. Carolina Power & Light Co. (Shearon Harris Nuclear Power Plant), LBP-85-  
27A, 22 NRC 207, 227-29 (1985), aff'd, CLI-87-1, 25 NRC 1 (1987).

The Intervenors also argue that LILCO overloads the buses. But the evidence does not show that LILCO's loading factors are unreasonable. LILCO uses the capacity figure stenciled on the side of the bus, which the bus company owners say is the bus's capacity. Tr. 19,776 (Crocker). These are the capacities "as rated by the State and standardly used by the bus companies." Tr. 19,777 (Crocker).

The Intervenors argue that loading three students per seat, which is proposed only for elementary and junior high students, would be contrary to school district policy and State law and also "patently unsafe," citing Tr. 20,415 (Rossi) and Brodsky et al., ff. Tr. 20,259, at 11, 14, 41. Of these four citations, only the first, Tr. 20,415, says that three students per seat would be "unsafe." It does not say why, though one can speculate that the concern is that a passenger might fall into the aisle. Brodsky et al. at 41 says 60 students per bus is not "appropriate" and adds that a "crowded bus leads to extra noise and confusion, which is very distracting to the driver and poses a potential safety hazard." Brodsky et al. at 11 and 14 do not mention safety but merely state school district policy (at 14) and what the witnesses "would not" do (at 11).

It is clear from this that the witnesses disagree with LILCO's loading factors. But it is not clear that LILCO's plan is "patently unsafe," and the Intervenors' concern does not have to do with radiological health and safety or rise to a level at which this Board should be concerned.

The Intervenors also argue that it would "most often be physically impossible" to squeeze three junior high students onto one bus seat, citing Brodsky et al., ff. Tr. 20,259, at 41 and Tr. 20,320 (Suprina). Actually at Tr. 20,320 Mr. Suprina said "There is no way that we believe that three middle school children can fit in a seat on any of those buses." Tr. 20,320 (Suprina). Brodsky et al. at 41 says that 60 junior high students per bus would be "too many even for a short trip" and that junior high students "would not be able to fit three per seat."

Apparently the State Department of Transportation allows 13 inches per child. Tr. 20,321 (Rossi); see Brodsky et al., ff. Tr. 20,259, at 41. The County witnesses regard this as inadequate but, again, it does not appear to be either a physical impossibility or a matter of health and safety.

The short of the matter is that LILCO plans to load the bus according to the rated capacity. This may not be as comfortable for the students as the school district's policy for everyday transportation. But it is not a matter affecting the public health and safety.

I.F. at 69 ¶ 98. In ¶ 98 the Intervenors repeat their claim that LILCO assumes that "at least two teachers or other school personnel" would accompany the students on each bus. As noted above, this is incorrect. One teacher should be adequate, and even none would not necessarily interfere with an evacuation. As LILCO noted, L.F. at 49-50, there is some flexibility in the actual number of students who would be loaded on a bus, because the student populations at each school are not evenly divisible by 40 or 60. Crocker et al., ff. Tr. 19,431 at Att. K.

The Intervenors argue, here and later, that teachers will not agree to ride the buses in an emergency. But role conflict of teachers has already been litigated. See ALAB-832, 23 NRC 135, 150-52 (1986). This is another collateral attack on the earlier NRC decisions.

I.F. at 70 ¶ 99. The Intervenors argue that LILCO's figures for the number of bus drivers employed by the bus companies are not accurate. I.F. at 70-71 ¶ 99. However, as the Intervenors note in footnote 57, the number of regular drivers is based on bus counts and information from bus companies. L.F. at 50, Tr. 19,790-91 (Crocker). Indeed, for the two companies and one district that would not give LILCO the information, LILCO sent its staff out to count the number of bus drivers. Tr. 20,166-67 (Crocker). The Intervenors, who were in a position to present evidence on this issue, did not. The Board will note that I.F. ¶ 99 cites no Suffolk County evidence at all.

The Intervenors, in footnote 59, say that there is no "evidentiary foundation" for the proposition that bus companies have extra drivers. This is incorrect. See Tr. 20,174 (Crocker), cited in n.61 at L.F. at 50. Suffolk County's witnesses also testified about the number of substitute bus drivers they have. Brodsky et al., ff. Tr. 20,259, at 14, 21. Indeed, the Intervenors do not deny that bus companies have extra drivers; they merely claim that LILCO has not proven it. Surely they do not deny that substitutes are available, when their own witness testified that he had a list of substitutes. Tr. 20,342-43 (Doherty), cited at L.F. 53 n.63.

More fundamentally, the Intervenors argue that the Board should ignore the earlier record in this proceeding. That suggestion is uncalled for. The information in the old record is still good. No authority LILCO knows of suggests that on remand the court must abandon the earlier record. Even if the Board did, however, the weight of just the 1988 evidence would still support LILCO.

I.F. at 71 ¶ 100. Paragraph 100 of the I.F. is a hodgepodge of arguments made elsewhere. The Intervenors argue that opinion polls support their position, that few of the regular bus drivers have been trained, that bus drivers are not expected to perform their role, and that LILCO has no agreements with the regular school bus drivers. As to this last point, agreements with individual school bus drivers are not required by the NRC and never have been. The other arguments have been addressed elsewhere, either in LILCO's proposed findings or above.

I.F. at 73 ¶ 102. In ¶ 102 the Intervenors argue that it would be difficult to notify regular bus drivers. The reason, they assume, is that there would be little or no advance warning of a radiological emergency. The Intervenors also attempt to raise the issue of telephone circuitry overload, which was stricken from their direct testimony. The issue of notification of bus drivers was already litigated in 1983-84, and the Intervenors' findings now are collateral attack on the Board's PID. The issue of telephone circuitry overload has been expressly excluded from this proceeding several times.

I.F. at 74 ¶ 103. The Intervenor's cite a number of polls conducted in the past. Most of these were considered in 1983-84. The results and the details of the polls are not in the record. Even one of the County's witnesses dismissed their importance because they are so dated.

I.F. at 75 ¶ 104. The Intervenor's argue that the regular bus drivers are "part-time employees of the school districts, not trained emergency workers." I.F. at 75 ¶ 104. It is doubtful that drivers of evacuation buses in any emergency are "trained emergency workers" in the sense that policemen, firemen, and Red Cross personnel are.

5. LILCO's Training Program (I.F.at 75)

I.F. at 75 ¶ 105. In ¶ 105 the Intervenor's say that "even LILCO appears to concede that the school districts' regular drivers would refuse, at least for the most part, to drive in the event of a Shoreham emergency." I.F. at 75 ¶ 105. LILCO does not know what concession the Intervenor's are talking about. LILCO has made none.<sup>17/</sup> As a matter of fact, when Suffolk County asked whether "LILCO itself had and has some concerns about whether regular school bus drivers would in fact show up," Tr. 19,687-88, LILCO's witness answered "No." Tr. 19,688 (Crocker).

I.F. at 75-78 ¶¶ 105-07. The Intervenor's argue that LERO school bus drivers should be required by the NRC to undergo, apparently, the precise same training program that regular school bus drivers do. For example, apparently the Intervenor's want the LERO drivers to have training in "child discipline or supervisory techniques." I.F. at 77 n.67.

Apparently the Intervenor's argue that the NRC should impose this requirement as a matter of NRC policy, not State law, because they do not argue very strenuously

---

<sup>17/</sup> LILCO has consistently stated that the LERO back-up drivers are "additional assurance, over and above what is necessary to meet NRC requirements." LILCO's Motion In Limine and Motion to Set a Hearing Schedule at 4 (Jan. 25, 1988).

that LILCO is required to comply with State law. They say that LILCO's argument that LERO drivers are exempted from State requirements is "unsupported," I.F. at 77 ¶ 107, and then reply with a totally unsupported claim that LERO bus drivers are not "volunteers" because they are given overtime pay and training bonuses. I.F. at 78 n.69.

LILCO is not aware of any New York State caselaw that would help interpret "volunteer" in Article 19-A. Nor does LILCO think the Board is required to decide this issue of State law definitively. Ordinary dictionary definitions of "volunteer" seem to focus on one who does something of his own free will rather than being compelled to do so by law. See Webster's New World Dictionary (2d Coll. Ed. 1970). The word apparently comes from the Latin voluntarius (voluntary), which comes from voluntas (free will), which comes from volo (I wish). Id. Mr. Crocker testified that "LERO always has been and still is a volunteer organization." Tr. 19,818 (Crocker). It is very hard to believe that the unsupported interpretation of "volunteer" now offered in a footnote in Intervenors' proposed findings would prevent children from being evacuated in a radiological emergency.

In yet another distortion of the record, the Intervenors say that, in addition to learning to drive a bus, LILCO intends to provide its drivers with a "broad-brush" explanation of Shoreham's operation, LERO, and general radiological emergency training in the use of dosimetry and personnel monitoring. I.F. at 76 ¶ 106. Of course, as Mr. Crocker testified, this "broad-brush" training is only the general training, the background. Tr. 20,095 (Crocker). The training on the individual procedure is more focused and narrow. Id.

Of course, the training program is not at issue in this remand proceeding. LILCO's training program was litigated in 1983-84, and it is not open to review now.

6. Other Problems with the LILCO Plan  
That Render It Unworkable (I.F. at 79)

I.F. at 79-100. The Intervenors argue that "other problems" make the LILCO plan unworkable. For the most part these "problems" are outside the scope of the remanded issue, and indeed the Intervenors propose several times that the Board reverse its evidentiary rulings. Much of this section of the I.F., then, should be disregarded.

I.F. at 80 ¶ 110. Paragraph 110 raises the issue of whether the LERO bus drivers will be able to find the schools. This is an issue outside the scope of the remanded proceeding. In any event, maps and instructions are provided, and the LERO drivers will have driven to all of the schools beforehand in road rallies:

We run what we call road rallies, and we make every one of our bus drivers drive to every school that he could potentially service based on whatever bus yard he is assigned to. In fact, we have conducted those drills already.

Tr. 20,067 (Crocker).

I.F. at 80-81 ¶ 111. In I.F. ¶ 111 the Intervenors raise the argument that the schools would not permit LERO drivers to drive their children. This issue was ruled outside the scope of the proceeding. Tr. 20,107 (Judge Gleason), and in any event has been answered by LILCO's findings. L.F. at 56-57.

I.F. at 81-82 ¶ 112. I.F. ¶ 112 raises the argument that the school districts are not cooperating in emergency planning. But LILCO's plan does not require the pre-emergency cooperation of the schools. Nothing about their noncooperation with LILCO, in and of itself, proves that there will not be an adequate number of bus drivers in an emergency. See, e.g., Tr. 19,729-30, 20,097-102 (Crocker).

I.F. at 82-86 ¶¶ 113-18. At I.F. 82-86 the Intervenors argue that there will be an inadequate number of buses. This was expressly ruled outside the scope of the remanded proceeding in the Board's ruling in limine. The Intervenors acknowledge this, I.F. at 82-83, but ask the Board to reverse itself. It would be improper to do so.

I.F. at 84-86 ¶¶ 115-18. Here, the intervenors argue that LILCO will not have a sufficient number of buses to evacuate schools in the EPZ because (1) LILCO overestimated the number of full size buses used by the Riverhead central school district and the Longwood school district, and (2) LILCO used "unrealistically low estimated enrollment figures and inappropriately high loading procedures." I.F. at 85 ¶ 116. The intervenors' proposed findings fail to recognize that LILCO has committed to obtain as many buses as are needed to evacuate school children in the EPZ, Tr. 19,794-95, 19,796 (Crocker), and they ignore the fact that LILCO's bus numbers for the other bus companies were not challenged at the hearing. Also, Mr. Crocker corrected his written testimony about the number of full-size buses for the Riverhead School District upon further review of his staff's bus counts. Tr. 20,015-16 (Crocker).

Also, the intervenors' proposed findings incorrectly characterize LILCO's enrollment figures as being "estimated." It is clear from the record that LILCO obtained these figures from the schools themselves and even compared them with enrollment figures supplied by New York State in response to LILCO's interrogatories. It is clear from LILCO Bus Driver Exhibit 1 that LILCO's numbers are similar to numbers provided by the school districts to the State. The intervenors also ignore the fact that none of their witnesses knew the enrollment figures for any of the schools not represented by them. Suffolk County's witnesses represented only three of the ten school districts that have schools within the Shoreham 10-mile EPZ, and none of them represented any of the parochial or nursery schools. Intervenors' enrollment figures and bus numbers are unreliable to a great extent because they do not contain figures for any schools except their own. It is also clear that the school officials representing the three school districts in the EPZ mostly agreed with LILCO's enrollment figures. All witnesses acknowledged that the enrollment figures fluctuate throughout the year, and so it is reasonable to expect that there will be some deviation from one month to the next.

I.F. at 86-87 ¶ 119. The Intervenors distort the record about the number of drivers who take their buses home during the day and at night and the evidence about whether bus drivers would bring the buses back to the bus yards during a Shoreham emergency. Intervenors argue that both LILCO's and the County's witnesses testified that most drivers keep their buses with them during the day. Mr. Crocker, however, testified at Tr. 20,149-51 that it is not possible to say "some or most or often." Rather, he testified that the percentage of drivers that would take their buses home during the day varied from bus company to bus company, ranging from 100% at one bus company to zero at another. Suffolk County witnesses testified that only "many," not most, keep their buses all day. See Brodsky et al., ff. Tr. 20,259, at 58. The Intervenors are also wrong in their claim that Mr. Crocker testified that some drivers keep their buses overnight. At Tr. 20,149 Mr. Crocker said he did not know if drivers took buses home at night.

The Intervenors urge the Board to reject LILCO's testimony that bus drivers will bring their buses back to the bus yard during a Shoreham emergency and, instead, to accept the County witnesses' testimony to the contrary. However, they cite only one witness to support their position. At Tr. 20,368 County witness Smith gives his opinion that bus drivers will not return the buses. This evidence does not "thoroughly rebut [LILCO's] presumption."

I.F. at 87-88 ¶ 120. The Intervenors incorrectly claim that handicapped students will be evacuated substantially later than the rest of the school population. When asked if "handicapped students would be essentially fifth in line" for evacuation by ambulettes, Mr. Crocker responded: "No, Sir. The intent is to have sufficient ambulettes, in addition to those dedicated to other purposes." Tr. 20,154 (Crocker). Here "ambulette" was also used by Mr. Crocker to mean specially equipped vans. Id. Further questioning on this matter was denied as outside the scope. Tr. 20,156 (Judge Gleason).

I.F. at 88-89 ¶ 121. The Intervenors reargue the issue of notification and mobilization of LERO workers, which has already been litigated and decided in LILCO's favor. LILCO uses the same method of calling its LERO bus drivers as it uses to call out all other LERO workers. Crocker et al., ff. Tr. 19,431, at 53. The Intervenors' findings address issues outside the scope of this proceeding and should be disregarded.

Also, in footnote 83 to I.F. ¶ 121, the Intervenors reargue telephone circuitry overload, another issue that has been ruled outside the scope. Here they argue that LILCO's call-out system will not work. The Intervenors cite testimony of two of the County's witnesses. Neither of these witnesses, however, testified about LERO's call-out system, and they were not qualified to testify about telephone overload. This proposed finding should be disregarded as well.

I.F. at 89-90 ¶ 122-23. The Intervenors argue that LILCO's school bus driver procedure will not work because LILCO does not have agreements with bus dispatchers to perform their functions at the bus yard during a Shoreham emergency and because "LILCO has yet to train a single dispatcher . . ." I.F. at 90 ¶ 123. Intervenors' arguments misrepresent NRC caselaw and the record in this case. First, LILCO is not required to have agreements with individual bus dispatchers. Second, the Intervenors' claim that LILCO has not trained a single dispatcher is misleading. Mr. Crocker testified that training of bus dispatchers was beginning that week or the following week. Tr. 20,040 (Crocker).

The Intervenors' statement that "LILCO has not yet even spoken with many of the bus dispatchers" also misrepresents the record. At Tr. 20,076, Mr. Crocker states only that LILCO has not talked to some of the bus dispatchers.

I.F. at 90-91 ¶ 124. Here the Intervenors argue that "chaos and confusion would prevail" at the bus yards because "twice the number of people who normally report to the yards could be present." I.F. at 91 ¶ 124. Intervenors' argument contradicts

themselves. Intervenors' argument is true only if their other arguments, that LERO bus drivers and regular bus drivers will not drive because of role conflict, are without merit.

LILCO does believe that regular and LERO drivers will show up. LILCO does not believe, however, that confusion will follow, because LERO drivers have been trained to stay out of the way and only to drive if they are asked to drive by the bus dispatcher. Tr. 20,041-42 (Crocker). Thus, regular school bus drivers will be able to proceed with their normal functions without interference from LERO drivers.

I.F. at 91-92 ¶ 125. Intervenors improperly attempt to reargue the issue of role conflict of LERO workers. In the Licensing Board's 1984 Partial Initial Decision, the Board decided the issue of role conflict of LERO workers in LILCO's favor. This issue was not remanded by ALAB-832. I.F. ¶ 125 should be disregarded.

I.F. at 93 ¶ 127. Intervenors' argument is outside the scope of the issue and in total disregard of the Board's ruling granting LILCO's motion in limine. The Board's ruling prohibited testimony on school evacuation time estimates. Therefore, Intervenors' findings on this issue should be disregarded.

I.F. at 93-94 ¶ 128. Intervenors' proposed finding is contrary to the Board's ruling on the Intervenors' motion to strike LILCO's testimony about the school evacuation plans at other nuclear power plants. The Board's ruling specifically found that such testimony is relevant. The Intervenors' proposed findings on this matter, in essence, is a motion for reconsideration of the Board's denial of the Intervenors' motion to strike and, as such, is improper.

I.F. at 95-100 ¶¶ 130-137. Intervenors' proposed findings should be disregarded here because they are contrary to this Board's ruling on LILCO's motion to strike and seek reconsideration of the Board's orders. The issues the Intervenors ask the Board to reconsider concern (1) matters involving school relocation centers, including

monitoring and decontamination of school children; (2) role conflict of teachers and other school personnel; (3) whether parents will seek to reunite with their children at the schools; and (4) how other EPZ school districts would respond in the event of a Shoreham emergency. The Board was correct to strike Intervenors' testimony and should not reconsider, because there is nothing new that warrants reconsideration.

7. Conclusion of Discussion Regarding LILCO's School Evacuation Proposal (I.F. at 100)

### III. Hospital Evacuation Time Estimates

#### C. Background (I.F. at 103)

I.F. at 106-08 ¶¶ 152-53. At I.F. 106-08 the Intervenors argue that LILCO's Rebuttal Testimony<sup>18/</sup> and Corrections to Rebuttal Testimony<sup>19/</sup> were untimely and obviously prejudicial to the Governments. However, these arguments were considered and resolved against Intervenors at the time the Board admitted the testimony. See Tr. 20,204-225, 20,233-236 (Zahnleuter, McMurray). In allowing LILCO to file the Rebuttal Testimony, the Board authorized additional discovery and modified the hearing schedule to allow the Governments additional time to review the Rebuttal Testimony. Tr. 20,236-238 (Judge Gleason). Furthermore, the Board permitted the State of New York's witness Dr. David T. Hartgen to file Surrebuttal Testimony<sup>20/</sup> in response to LILCO's Rebuttal Testimony, Tr. 20,692 (Judge Gleason), and to comment on LILCO's Corrections prior to cross-examination. Tr. 20,693-698 (Hartgen).

---

<sup>18/</sup> Rebuttal Testimony of Edward B. Lieberman and Diane P. Dreikorn on the Remanded Issue of the Bases and Accuracy of LILCO's Hospital Evacuation Time Estimates (May 18, 1988), ff. Tr. 20,586 [hereinafter LILCO Rebuttal].

<sup>19/</sup> Corrections to the Rebuttal Testimony of Edward B. Lieberman and Diane P. Dreikorn on the Remanded Issue of the Bases and Accuracy of LILCO's Hospital Evacuation Time Estimates (May 31, 1988), ff. Tr. 20,586 [hereinafter LILCO Corrections].

<sup>20/</sup> Surrebuttal Testimony of David T. Hartgen, Ph.D., P.E., on Behalf of the State of New York Regarding Hospital Evacuation Time Estimates (May 26, 1988), ff. Tr. 20,692 [hereinafter Hartgen Surrebuttal].

I.F. at 107-09 ¶¶ 153-56. Intervenors argue extensively that errors or "bugs" in the KLD computer model render the hospital ETES inaccurate, but then conclude that the model is "close enough," and that such errors do not provide a basis for rejecting LILCO's hospital ETES. I.F. at 109 ¶ 156. At I.F. 108 ¶ 154 the Intervenors argue that the KLD model has not been "debugged" sufficiently to be reliable, and state that "Mr. Lieberman conceded on cross-examination that the process of de-bugging his computerized model would have to continue . . . ." This is a misleading use of the testimony. Mr. Lieberman testified that "What we have here is a recent history of finding bugs. Certainly we are moving very close to the truth, we have found that even before these bugs were located the differences in the results are miniscule. But I think it is prudent to continue to look." Tr. 20,602 (Lieberman).

It is uncontroverted that it is nearly impossible to completely debug any computer program. Tr. 20,596, 20,603 (Lieberman); 20,732 (Hartgen).<sup>21/</sup> The testimony of the NRC Staff's expert Dr. Thomas Urbanik and LILCO's expert Mr. Lieberman, made it clear that the errors discovered in the KLD computer model were minor and insignificant,<sup>22/</sup> and do not render LILCO's hospital ETES inaccurate. LILCO Rebuttal, ff. Tr. 20,586 at 8; LILCO Corrections, ff. Tr. 20,586 at 2-9; Tr. 20,471-473, 20,518-519 (Urbanik); Tr. 20,602 (Lieberman). The ETES calculated using the model, before and after

---

<sup>21/</sup> The "simple analytical tool," I.F. at 112 ¶ 160, used by Dr. Hartgen also had a "bug," Tr. 20,767-769 (Hartgen), and its implementation exhibited other problems as well. LILCO Rebuttal, ff. Tr. 20,586 at 1-3; Tr. 20,624-626 (Lieberman).

<sup>22/</sup> In arguing the "significance" of errors in LILCO's computer model, the Intervenors once again have selectively cited and mischaracterized the record. See I.F. at 108 n.96. The error referred to in footnote 96 involved the application by the model of a speed of 40 mph rather than 15 mph to less than five percent of the total runs. Tr. 20,585 (Lieberman). This error involved only those vehicles on one route, I-495, traveling westbound from the EPZ directly to a reception hospital over a particular 30 minute period. *Id.* Mr. Lieberman testified that "the magnitude of that effect ranged anywhere from zero to I think about 18 minutes, the average value about 10 minutes for that small sample of vehicles." *Id.* Intervenors fail to note that such a small number of vehicle trip segments were affected by the error.

correction of the minor errors, are essentially the same. LILCO Rebuttal, ff. Tr. 20,586 at 8; LILCO Corrections, ff. Tr. 20,586 at 2-9.

D. The Sensitivity of the Hospital ETEs (I.F. at 110)

I.F. at 110-11 ¶ 157. Intervenors argue that if the conditions during an accident are not the same as the conditions assumed in calculating the ETEs, "the ETEs will be substantially inaccurate". They further argue that LILCO's hospital ETEs are useful only if the LILCO personnel charged with implementing the evacuation strategy are able to duplicate the scheme developed by the consultants. I.F. at 110 n.97. The Board should reject this argument. The ETE analysis methodology reflected the procedures which would be used during an actual evacuation. Testimony of Diane P. Dreikorn and Edward B. Lieberman on the Remanded Issue of the Bases and Accuracy of LILCO's Hospital Evacuation Time Estimates (April 13, 1988), ff. Tr. 20,586 at 4-10 [hereinafter LILCO Testimony]. As the Board noted in its first Partial Initial Decision, "[i]t is reasonable to plan to implement these strategies and recommendations in an evacuation, even though it is likely that full compliance by evacuees will not be achieved." Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-85-12, 21 NRC 644, 794 (1985). The unavoidable existence of some uncertainty in estimates did not then (and should not now) detract from the Board's findings. Id. at 809.

The testimony clearly indicates that pronounced changes in the estimates of speed, which are extreme in magnitude but deserving of consideration within the context of sensitivity studies, produced modest changes in ETE. I.F. at 66; LILCO Rebuttal, ff. Tr. 20,586 at 10-17. The following two examples indicate the relationship between changes in speed and changes in ETE, LILCO Rebuttal, ff. Tr. 20,586 at 10, according to the KLD/model:

<u>Sensitivity Test</u>	<u>Route/ Direction</u>	<u>Change In</u>		<u>Change In ETE, Percent</u>
		<u>Speed</u>	<u>Percent</u>	
2	Outbound LIE:	-5 mph	-33%	+ 6.6 to
	Inbound LIE:	-5 mph	-25%	+11.8
	Inbound "Other" Roads:	-5 mph	-25%	
	Within EPZ:	0	0	
5	Outbound LIE:	+5 mph	+33%	- 1.4 to
	Inbound LIE:	+5 mph	+25%	- 2.5

Clearly it is not correct to argue that ETEs will be "substantially incorrect", since the ETEs are relatively insensitive to large percentage changes in speed estimates.

I.F. at 113-15 ¶ 161-62. Furthermore, as discussed in the Board's Partial Initial Decision on Suitability of Reception Centers, the estimated speeds for KLD's base run (Table XIII B) are reasonable and acceptable representations of congested conditions. Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-88-13, 27 NRC \_\_\_\_\_ (1988), slip op. at 45-48; L.F. at 70-71. Thus, Dr. Hartgen's use of a speed of 6 mph on the LIE, particularly for a full 18-20 hours, is simply unrealistic and unreasonable. LILCO Rebuttal ff. Tr. 20,586 at 12. There is no basis to expect speeds on an access-controlled expressway to be comparable to that on the at-grade roadways within the EPZ during the evacuation. Tr. 20,629-630 (Lieberman). The NRC Staff witness concurs saying that expressway speeds of 20 mph are a conservative expectation. Tr. 20,486-488 (Urbanik); L.F. at 71. Furthermore, Dr. Hartgen applied this unsupportable low speed of 6 mph on the LIE even after the evacuation was completed. LILCO Rebuttal, ff. Tr. 20,586 at 13. Such sensitivity studies do not reflect reasonably anticipated real-world conditions; therefore, the Board should reject the Intervenor's proposed findings that a 66 percent increase in ETE could result.

I.F. at 115-16 ¶ 164. The Governments argue that there is a need for monitoring speeds during the evacuation but do not offer any feasible means for doing so, nor do they indicate what would be done with this information even if it were available. Tr. 20,706-708, 20,710-712 (Hartgen). The purpose of ETEs is to provide guidance for developing a protective action decision. L.F. at 62. Such a decision, by definition, is made before an evacuation is ordered. Consequently, information as to actual speeds during an evacuation, even if obtainable, could not inform a decision that was already made. The insensitivity of ETEs relative to changes in speed, as described above, also shows that there is no urgent need for additional data during the evacuation. Furthermore, the average speeds used in the KLD model are reasonable, and perhaps on the low side. Tr. 20,515 (Urbanik).

Intervenors argue that LILCO should be required to insert in the Plan the results of speed sensitivity analyses, as the Board required for sensitivity analyses of variables other than speeds in the context of ETEs for the general population. I.F. at 110-11, ¶¶ 157-58; 117-18 ¶¶ 167-68. There is no value in doing so. Speed estimates made in the field prior to the order to evacuate or, say, two hours into an evacuation, offer no predictive value as to what the average speed would be over the 12 hours or so encompassing the hospital evacuation. Consequently, we see no particular benefit for the decisionmaker to include sensitivity analyses for assumptions other than speeds.

Even though the Board required LILCO to add sensitivity analyses to the information contained in the Plan regarding general population ETEs, the Board stated that "the existence of uncertainty . . . does not detract from our findings. . . . We delegate to the NRC Staff responsibility for review and approval of these changes, since they involve only incremental improvements and do not involve any ultimate issue of adequacy of LILCO's Plan." LBP-85-12, 21 NRC at 809. Thus, the Board should conclude that the Intervenors' argument for including the results of sensitivity tests in the LILCO Plan

does not offer any substantive value since the information needed to select among these ETE estimates is not available for such purpose.

I.F. at 118 ¶ 168 n.100. The Intervenors argue that the assumption that 14% of the reception hospitals' capacity would be available, should be included as a factor in developing additional sensitivity studies. We disagree. The KLD analysis prudently assumed that the evacuating hospitals within or near the EPZ would be at 100% capacity and that 14 percent of the reception hospitals' capacity was available. Tr. 20,647-648 (Lieberman). Twice previously, the Board has considered Intervenors' argument that LILCO's assumption of 14% capacity in reception hospitals is flawed. Memorandum and Order (Ruling on LILCO's Motion for Summary Disposition of the Hospital Evacuation Issue) (Feb. 24, 1988), ASLBP No. 86-529-02-OLR, 27 NRC \_\_\_\_\_, slip op. at 11; Memorandum and Order (Ruling on Intervenors' Motion for Reconsideration of Board Order on Summary Disposition of Hospital Evacuation Issue) (April 14, 1988), ASLBP No. 86-529-02-OLR, 27 NRC \_\_\_\_\_, slip op. at 3. Twice the Board has rejected the Intervenors' argument. Id. Now, in the Intervenors' Findings, they attempt yet another motion for reconsideration of this issue. Once again their argument should be rejected.

E. Conclusion on Hospital ETEs (I.F. at 117)

I.F. at 117-18 ¶¶ 167-68. The Intervenors' findings on hospital ETEs conclude that the KLD computer model "is close enough to provide adequate hospital ETEs." I.F. at 117 ¶ 167. Then, however, Intervenors argue that LILCO should be required to "conduct a range of sensitivity analyses covering the numerous assumptions on which its hospital ETEs are based, and to include the results in its Plan" before LILCO's hospital ETEs can be considered adequate. I.F. at 118 ¶ 168. The Intervenors cite no requirement in the regulations to support their argument.<sup>23/</sup> LILCO has shown that the

---

<sup>23/</sup> Of course, the LILCO Plan already includes the results of one sensitivity analysis (as required by NUREG-0654)--the ETEs under normal, summer adverse, and winter adverse weather conditions. LILCO Plan, Appendix A.

results of such sensitivity studies provide no additional guidance to the decisionmaker.

Given the presence of sensitivity analyses regarding general population ETES in the LILCO Plan, and the testimony in this proceeding that hospital ETES are relatively insensitive to reasonable variations in speeds, there is little, if anything, to be gained by requiring that sensitivity analyses for hospital ETES be included in the LILCO Plan. The Intervenor's have not shown that LILCO's hospital ETES fail to satisfy the NRC emergency planning regulations in 10 CFR § 50.47 and NUREG-0654. Furthermore, they have not shown any significant flaws in the bases and accuracy of LILCO's hospital ETES.

Respectfully submitted,



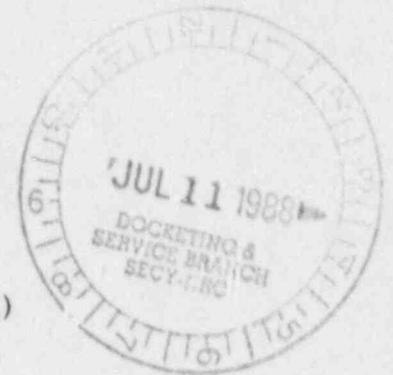
James N. Christman  
K. Dennis Sisk  
Mary Jo Leugers  
Rita A. Sheffey  
Counsel for Long Island Lighting Company

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

DATED: July 8, 1988

CERTIFICATE OF SERVICE

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



I hereby certify that copies of LILCO'S REPLY TO INTERVENORS' PROPOSED FINDINGS ON SCHOOL BUS DRIVERS AND HOSPITAL ETES were served this date upon the following by Federal Express as indicated by one asterisk, or by first-class mail, postage prepaid.

James P. Gleason, Chairman \*  
Atomic Safety and Licensing Board  
513 Gilmoure Drive  
Silver Spring, Maryland 20901

Dr. Jerry R. Kline \*  
Atomic Safety and Licensing  
Board  
U.S. Nuclear Regulatory Commission  
East-West Towers, Rm. 427  
4350 East-West Hwy.  
Bethesda, MD 20814

Mr. Frederick J. Shon \*  
Atomic Safety and Licensing  
Board  
U.S. Nuclear Regulatory Commission  
East-West Towers, Rm. 430  
4350 East-West Hwy.  
Bethesda, MD 20814

Secretary of the Commission  
Attention Docketing and Service  
Section  
U.S. Nuclear Regulatory Commission  
1717 H Street, N.W.  
Washington, D.C. 20555

Atomic Safety and Licensing  
Appeal Board Panel  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Adjudicatory File  
Atomic Safety and Licensing  
Board Panel Docket  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Richard G. Bachmann, Esq. \*  
U.S. Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852

Herbert H. Brown, Esq. \*  
Lawrence Coe Lanpher, Esq.  
Karla J. Letsche, Esq.  
Kirkpatrick & Lockhart  
South Lobby - 9th Floor  
1800 M Street, N.W.  
Washington, D.C. 20036-5891

Fabian G. Palomino, Esq. \*  
Richard J. Zahnleuter, Esq.  
Special Counsel to the Governor  
Executive Chamber  
Room 229  
State Capitol  
Albany, New York 12224

Alfred L. Nardelli, Esq.  
Assistant Attorney General  
120 Broadway  
Room 3-118  
New York, New York 10271

George W. Watson, Esq. \*  
William R. Cumming, Esq.  
Federal Emergency Management  
Agency  
500 C Street, S.W., Room 840  
Washington, D.C. 20472

Mr. Jay Dunkleberger  
New York State Energy Office  
Agency Building 2  
Empire State Plaza  
Albany, New York 12223

Stephen B. Latham, Esq. \*  
Twomey, Latham & Shea  
33 West Second Street  
P.O. Box 298  
Riverhead, New York 11901

Mr. Philip McIntire  
Federal Emergency Management  
Agency  
26 Federal Plaza  
New York, New York 10278

Jonathan D. Feinberg, Esq.  
New York State Department of  
Public Service, Staff Counsel  
Three Rockefeller Plaza  
Albany, New York 12223

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

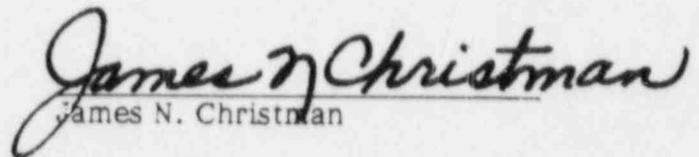
DATED: July 8, 1988

Ms. Nora Bredes  
Executive Coordinator  
Shoreham Opponents' Coalition  
195 East Main Street  
Smithtown, New York 11787

Evan A. Davis, Esq.  
Counsel to the Governor  
Executive Chamber  
State Capitol  
Albany, New York 12224

E. Thomas Boyle, Esq.  
Suffolk County Attorney  
Building 158 North County Complex  
Veterans Memorial Highway  
Hauppauge, New York 11788

Dr. Monroe Schneider  
North Shore Committee  
P.O. Box 231  
Wading River, NY 11792

  
James N. Christman