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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

LILCO'S TESTIMONY ON
CONTENTIONS 72.A AND E

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PURPOSE

The purposes of this testimony are to demonstrate that special facilities can be evacuated in a timely manner, that an ad hoc expansion of existing LERO transportation resources will provide adequate protection to hospital patients should an evacuation be ordered, and that the allegations of Suffolk County Contentions 72.A and E are without basis. The testimony describes the steps and assumptions used to calculate evacuation time estimates for special facilities. It presents evacuation time estimates, by vehicle type, for each special facility. These estimates indicate that with the exception of the Suffolk Infirmary, special facilities can be evacuated from the EPZ before the automobile-owning public has completed its evacuation.

The testimony also shows that an ad hoc expansion of existing LERO transportation resources during an evacuation is a rational

means of addressing the constantly changing transportation requirements of the three hospitals within the Shoreham EPZ. It indicates that such a philosophy is particularly appropriate where, as in the case of the Shoreham EPZ, the hospitals are located at the boundary of the EPZ, they each have favorable shielding characteristics, and they are the last of a list of "special facilities" to be evacuated.

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TESTIMONY

1. Q. Please state your name and business address.

A. [Cordaro] My name is Matthew C. Cordaro. My business address is Long Island Lighting Company, 175 Old Country Road, Hicksville, New York, 11801.

[Weismantle] My name is John A. Weismantle. My business address is Long Island Lighting Company, 100 Old Country Road, Hicksville, New York, 11801.

[Lieberman] My name is Edward B. Lieberman. My business address is KLD Associates, Incorporated, 300 Broadway, Huntington Station, New York, 11746.

2. Q. Please summarize your professional qualifications and your role in emergency planning for the Shoreham Nuclear Power Station.

A. [Cordaro] I am Vice President, Engineering, for LILCO.

My professional qualifications are being offered into evidence as part of the document entitled "Professional Qualifications of LILCO Witnesses." I am participating on this panel to provide the LILCO management perspective on Emergency Planning, and to answer any questions pertinent to management. My role in emergency planning for Shoreham is to ensure that the needs and requirements of emergency planning are being met, and that the technical direction and content of emergency planning are being conveyed to corporate management. I accomplish this by supervising the development and implementation of the offsite emergency response plan for Shoreham; the Manager of the Local Emergency Response Implementing Organization (LERIO) reports directly to me.

[Weismantle] I am Manager of the Local Emergency Response Implementing Organization for LILCO. My professional qualifications are being offered into evidence as part of the document entitled "Professional Qualifications of LILCO Witnesses." My familiarity with the issues surrounding this contention stems from work in developing and implementing the Local Emergency Response Plan for Shoreham.

[Lieberman] I am Vice President of KLD Associates, Incorporated. My professional qualifications are being offered into evidence as part of the document entitled "Professional Qualifications of LILCO Witnesses." My familiarity with this contention stems from work KLD Associates has performed for LILCO on evacuation time estimates for the Shoreham EPZ.

3. Q. Please summarize the issues raised by Contentions 72.A and E.

A. [Cordaro, Weismantle, Lieberman] Suffolk County Contention 72.A questions whether the evacuation of special facilities can be accomplished in a timely manner. Contention 72.E questions whether an ad hoc extension of transportation for the evacuation of hospitals is proper. Specifically, these two subparts of Contention 72 state:

Contention 72. The LILCO Plan proposes to evacuate all hospitals, nursing homes and other special health care facilities in the EPZ, using buses, ambulances, and ambulances. (Plan, Appendix A at II-28 to 29, IV-166 to 168; IV-172 to 178; OPIP 3.6.5). This aspect of the Plan cannot be implemented; accordingly, people in special facilities will not be adequately protected in the event of an emergency and the LILCO Plan fails to comply with 10 CFR Sections 50.47(a)(1), 50.47(b)(3), 50.47(b)(8), 50.47(b)(10) and NUREG 0654, Sections II.A.3, C and J for the following reasons:

Contention 72.A. Assuming the necessary vehicles were available to LILCO and were mobilized, the time necessary, following mobilization, to accomplish the proposed

evacuation of special facilities will be too long to provide adequate protection from health-threatening radiation doses. Evacuation will take too long as a result of: the large number of trips necessary to transport persons individually to relocation centers; the other mobilization and evacuation traffic congestion which the evacuation vehicles will encounter; and the time necessary to load and unload passengers from ambulances. Thus, the Plan fails to comply with 10 CFR Sections 50.47(a)(1) and 50.47(b)(10).

* * *

Contention 72.E. Instead of planning to provide adequate protection to hospital patients in the event of such an evacuation, the LILCO Plan simply provides that "LERO will evacuate these facilities using an ad hoc expansion of transportation resources that are presently committed to other aspects of evacuation." (Appendix A at II-28, IV-172). Apparently, this ad hoc plan will not be developed until an emergency actually occurs. (See Appendix A at II-28; II-172, 173). The ad hoc plan will utilize the vehicles assigned to implement the evacuation of other segments of the population, but such vehicles will be supplied for the purpose of evacuating hospital patients only "on an as available basis," and only "as the rest of the affected population evacuation nears completion." (Appendix A at IV-173). Thus, there is no assurance that adequate protective measures could or would be taken for hospital patients and LILCO has thus failed to satisfy the requirements of 10 CFR Sections 50.47(a)(1) and 50.47(b)(10), and NUREG 0654, Section II.J.10.d.

4. Q. Could you please summarize the scope of this testimony?
- A. [Cordaro, Weismantle, Lieberman] This testimony will focus on the issues raised by Contentions 72.A and E:

namely, the evacuation time estimates for special facilities (Contention 72.A) and LILCO's decision to assign ambulances, ambulettes and buses to hospitals on an ad hoc basis should evacuation of those facilities be recommended (Contention 72.E). Both the evacuation time estimates for special facilities and the availability of transportation resources for the evacuation of hospitals are affected by the transportation requirements of handicapped persons living at home. Those requirements and the evacuation time estimates for that group have already been addressed in LILCO's testimony on Contention 73; those discussions will not be repeated here. The important assumption underlying LILCO's testimony on Contention 73 was that the first available ambulances, ambulettes and buses would be used to transport handicapped persons living at home from the EPZ. This assumption was recognized in preparing the evacuation time estimates for special facilities and in the discussion of evacuation of hospitals presented below.

Contention 72.A

5. Q. Has an estimate of the time required to evacuate special facilities been developed?
 - A. [Weismantle, Lieberman] Yes. Details of this analysis and evacuation time estimates on a facility-by-facility basis are presented on pages IV-172 to IV-178 of Appendix A to the LILCO Transition Plan.

Since the publication of Revision 3 to the LILCO Transition Plan, the evacuation time estimates for special facilities have been revised to reflect the latest information on ambulance, ambulette and bus availability, a change in assumed ambulette capacities from 4 passengers to 7 passengers,^{1/} and a reordering of the sequence in which special facilities will be evacuated to account for the sheltering characteristics of the Suffolk Infirmary. The revised evacuation time estimates, which have been broken down into evacuation time estimates for ambulances, ambulettes and buses, are presented in Attachment 2 to this testimony.

6. Q. Could you explain how these evacuation time estimates were developed?

A. [Lieberman] The calculation of evacuation time estimates for special facilities requires the summation of a series of discrete steps. These steps include:

1. the time at which equipment becomes available at staging areas to transport people in special facilities from the EPZ;
2. the time needed to travel from the staging area to the special facility;

^{1/} A survey of ambulette companies has revealed that the average ambulette capacity is seven passengers. Individual ambulette capacities vary based on seating configurations. A revised vehicle requirement table is attached as Attachment 1 to this testimony.

3. the time needed to load passengers at the facility; and
4. the time needed to travel from the facility to the EPZ boundary.

Additional steps also must be included in the evacuation time estimates to account for the fact that some ambulances and ambulettes must make two runs because of their limited availability. These additional steps include:

5. The time needed to travel from the EPZ boundary to the appropriate reception center;
6. the time needed to unload passengers at the reception center;
7. the time needed to travel from the reception center to the staging area;
8. the time needed for a driver to obtain his/her next assignment at the staging area;^{2/} and finally,
9. the time needed to complete a second pick-up and return trip to the EPZ boundary (see Steps 2 to 4 above).

The time required to complete each of these steps was calculated based on the following assumptions or data:

1. It was assumed that all ambulance and van companies would be alerted at the Site Area Emergency level. Based on information supplied by the ambulance and van companies, these vehicles were assumed to arrive at staging areas at various times ranging from 15 minutes to 5 hours after

^{2/} For ambulances and ambulettes equipped with radios, this stop at the staging area may not be required. Instead, routing instructions could be relayed to drivers by radio as they leave the reception center.

the initial alert to the ambulance and van companies. This information was obtained for both peak (6 a.m. to 6 p.m.) and off-peak hours. Since the arrival of ambulances and ambulettes was slightly slower for off-peak hours, this arrival distribution was used to compute evacuation time estimates. Buses were assumed to arrive at the edge of the EPZ within 2 hours of the declaration of a Site Area Emergency.

2. Vehicles were assumed to travel in a counterflow direction to evacuating traffic at a mean speed of 20 miles per hour from the staging areas to their pick-up location. The distance traveled on this leg varied depending on the location of the staging area and the special facility.
3. The time needed to load passengers at special facilities was assumed to be 10 minutes for ambulances; 15 minutes for ambulettes; and 10 minutes for buses. It was assumed that up to 6 vehicles could be loaded simultaneously at a given facility. Finally, it was assumed that given the period of time required for ambulances and ambulettes to reach special facilities, the residents of those facilities would be prepared to begin boarding those vehicles promptly upon their arrival.
4. Vehicles were assumed to travel at a mean speed of 6 miles per hour on their trip from the special facility to the EPZ boundary. This speed estimate was obtained from the results of Case 12, which is the base case evacuation of the entire EPZ.
5. Vehicles were assumed to travel at a mean speed of 8 miles per hour from the EPZ boundary to their assigned reception centers. Reception centers were assigned on the basis of information presented in LILCO's testimony on Contention 72.C.

6. The time assumed for unloading passengers at reception centers was the same as that assumed for loading them (see Item 3 above).
7. The mean speed for trips from reception centers to staging areas was assumed to be 20 miles per hour, since these trips will be in a counterflow direction to evacuating traffic.
8. All drivers were assumed to return to the staging areas to receive their next assignment. The time needed to obtain this assignment was assumed to be 15 minutes.
9. The assumptions used to calculate the time needed to complete a second pick-up and return to the EPZ boundary were the same as those presented in Items 2 to 4 above, except that the mean travel speed for both the inbound and outbound trips were assumed to be 35 miles per hour for ambulances and 30 miles per hour for ambulettes, if these trips occurred after the automobile-owning public had completed its evacuation.

Finally, in order to provide an evacuation time estimate in terms of the time following an order to evacuate, it was conservatively assumed that an order to evacuate would be given 25 minutes after the initial public notification. This is the same event sequence assumed for calculating the evacuation times for the general public needing bus transportation (see Appendix A, p. IV-74b).

7. Q. Do the evacuation time estimates for special facilities indicate that residents of those facilities will be exposed to "health-threatening radiation doses" as Contention 72.A suggests?"

A. [Cordaro, Weismantle, Lieberman] No. The evacuation time estimates for people in special facilities indicate that with the exception of persons living in the Suffolk Infirmary needing ambulance transportation, this portion of the population of the EPZ will be evacuated before the last car leaves the EPZ. Since the protective action recommendations of OPIP 3.6.1 are based on the principle of dose minimization and are keyed to the time needed to evacuate the automobile-owning public, it follows that people living in special facilities would also be protected. With regard to the Suffolk Infirmary, it has already been noted in LILCO's testimony on Contention 72.C that the Suffolk Infirmary is located near the boundary of the EPZ, that its masonry construction provides a high level of radiation shielding, and that a number of its patients would be exposed to the possibility of trauma should they be moved; accordingly, in most instances it would be advisable for the Suffolk Infirmary to shelter rather than evacuate its residents.

Contention 72.E

8. Q. Why does the LILCO Transition Plan specify that an "ad hoc expansion of transportation resources" will be used should an evacuation of John T. Mather Memorial, St. Charles and Central Suffolk Hospitals be recommended?

A. [Cordaro, Weismantle] As is explained in more detail in LILCO's testimony on Contention 72.D, it is expected that in a vast majority of accident scenarios it will be advisable for the three hospitals in question to shelter. It follows that an effort to preplan for their evacuation would be of marginal benefit.

This potential benefit is further reduced if one considers the realities of evacuating a hospital. A hospital, unlike a nursing home, does not have a reasonably stable population with relatively constant transportation needs. Instead, the number of patients needing to be transported by ambulance, ambulette or bus can be expected to vary on a frequent, perhaps daily, basis. Transportation requirements can also be altered by hospital admissions and releases, patients' recoveries and daily surgery. For some patients, the shock of transportation may simply be too great, and a decision may be made not to evacuate them. Finally, the population of radiosensitive patients (including babies), who would be the first group of patients to be evacuated (see OPIP 3.6.5 at 8-9), can change on almost a daily basis. Accordingly, planning for

hospital evacuations need be done only in the most general sense.

It is also important to note from a transportation perspective that in the case of the Shoreham EPZ each of the three hospitals in question is located at the boundary on the EPZ, more than 10 miles from the Shoreham plant. Since the order of evacuation of special facilities is premised on each facility's proximity to the Shoreham plant, it follows that the hospitals would be among the last facilities to be evacuated in any event. Thus, sufficient time will be available to allocate transportation resources for the evacuation of these hospitals should such an evacuation become necessary since the ambulances and ambulettes that evacuate the hospitals will have made one or two runs prior to arriving at the hospitals.

9. Q. Does the use of an ad hoc expansion of transportation resources for the evacuation of hospitals provide, as Contention 72.E suggests, "no assurance that adequate protective measures could or would be taken for hospital patients"?

A. [Cordaro, Weismantle] Absolutely not. The fact that the LILCO Transition Plan specifies that an ad hoc expansion of transportation resources will be used for an evacuation of hospitals does not suggest that should an evacuation be recommended it could not be carried out. As we noted in our previous answer, the development of a detailed

transportation plan for hospital evacuations would be of marginal benefit: the transportation requirements of hospitals change rapidly and the hospitals in the Shoreham EPZ would be the last "special facilities" to be evacuated given their location and building shielding factors.

An evacuation of a hospital would require, first, a call to the hospital to ascertain its transportation requirements. This information would then be used to match available vehicles with each hospital's needs. As configured, the LILCO Transition Plan could easily be adapted to permit the evacuation of hospitals. On page IV-173 of Appendix A, it is explained that if an evacuation is recommended the Health Facilities Coordinator will contact each hospital and determine its transportation needs. This information will be relayed to the Transportation Support Coordinators and Ambulance Coordinator who will assure that the appropriate vehicles arrive at each hospital. Thus, adequate protective measures can be taken to protect hospital patients should their evacuation be recommended.

Attachment 1

HOSPITAL/NURSING HOME EVACUATION

FACILITY	PATIENTS			VEHICLES REQUIRED		
	Ambulatory	Non-Ambulatory		Buses	Ambulettes	Ambulances
		Buses	Ambulettes			
Crest Hall Health Related Facility	50	70	0	2	10	6
Oak Hollow Nursing Center	3	141	20	0	21	10
Millcrest Adult Home	16	0	0	1	1	0
Our Lady of Perpetual Help Convent	15	4	1	1	1	1
Ridge Rest Home	53	1	0	2	17	0
Riverhead Nursing Home and Health Related Facility	60	119	2	2	9	1
Suffolk Infirmary	27	58	130	1	24	65
Sunrest Health Facilities, Inc.	27	162*	18*	1	18	9
Woodhaven Nursing Home	10	125*	13*	1	12	7
Woodhaven Home for Adults	100	80	0	3	0	0
General EPZ Population **	246	59	40	11	9	20
TOTALS				26	122	113

* Assume 10% require ambulance (2 stretchers)
90% require ambulettes/wheelchair vans (7 wheelchairs)

** Based upon a survey mailed to all residences in the EPZ, August, 1983.

Attachment 2

EVACUATION TIME ESTIMATES FOR SPECIAL FACILITIES

FACILITY	DISTANCE FROM PLANT	REQUIRED TRANSPORT TYPE*	TIME AFTER ORDER TO EVACUATE (HOURS:MINUTES) LAST VEHICLE							
			AMBULANCE		AMBULETTE		BUS		LEAVE FACILITY	LEAVE EPZ
			LEAVE FACILITY	LEAVE EPZ	LEAVE FACILITY	LEAVE EPZ	LEAVE FACILITY	LEAVE EPZ		
Crest Hall HRF	Zone K/7 miles	18 A/V, 2 B	----	----	1:45	2:25	2:15	3:15		
Oak Hollow Nursing Center	Zone K/7 miles	10 A, 36 A/V	2:30	3:10	2:40	3:20	----	----		
Millcrest Adult Home	Zone L/8 miles	1 B	----	----	----	----	2:20	2:30		
Our Lady of Perpetual Help Convent	Zone F/6 miles	1 A, 1 A/V, 1 B	1:40	2:30	0:45	1:35	2:25	3:15		
Ridge Rest home	Zone G/4 miles	1 A/V, 2 B	----	----	0:45	2:05	2:35	3:55		
Riverhead Nursing Home and HRF	Zone P/10 miles	1 A, 30 A/V, 2 B	1:50	2:30	4:00	4:10	3:20	3:30		
Suffolk Infirmary	Zone L/10 miles	65 A, 15 A/V, 1 B	8:50	8:55	4:40	4:45	2:20	2:30		
Sunrise Health Facilities Inc.	Zone Q/10 miles	9A, 41 A/V, 1 B	2:10	2:20	2:35	2:45	2:15	2:25		
Woodhaven Nursing Home	Zone K/10 miles	7 A, 32 A/V, 1 B	----	----	3:50	4:00	2:15	2:25		
Woodhaven Home for Adults	Zone K/10 miles	20 A/V, 3 B	2:55	3:05	3:30	3:40	2:15	2:25		

Note: For purposes of this Table, an order to evacuate is assumed to be given 25 minutes after the initial notification of ambulance/ambulette companies.

* A - Ambulance, A/V - Ambulette/Van, B - Bus