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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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Before the Atomic Safety and Licensing Board

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In the Matter of)

LONG ISLAND LIGHTING COMPANY)

(Shoreham Nuclear Power Station,
Unit 1))

Docket No. 50-322-OL-3
(Emergency Planning)

DIRECT TESTIMONY OF JAMES H. JOHNSON, JR.
ON BEHALF OF SUFFOLK COUNTY REGARDING
LILCO'S PROFFERED EVIDENCE OF JANUARY 11, 1985

Q. Please state your name and qualifications.

A. My name is James H. Johnson, Jr. I am an Assistant Professor of Geography at UCLA, and I specialize in the field of social geography. My professional qualifications are detailed in the curriculum vitae which is attached to my testimony regarding Contention 23.^{1/} Briefly, I hold degrees in geography from North Carolina Central University (B.S., 1975), University of Wisconsin at Madison (M.S., 1977), and Michigan State University (Ph.D., 1980). My current research concerns human responses to hazards of technological origin, especially nuclear power plant accidents, and I have authored or co-authored a number of articles and reports on actual and intended evacuation behavior in a radiological emergency.

^{1/} Direct Testimony of Donald J. Zeigler and James H. Johnson, Jr. on Behalf of Suffolk County Concerning Contention 23 (Evacuation Shadow Phenomenon), ff. Tr. 2789 (hereinafter, testimony regarding Contention 23).

Q. What is the purpose of this testimony?

A. LILCO has recently proposed using the Nassau Coliseum as a monitoring and decontamination center in the event of a radiological emergency at Shoreham. The purpose of this testimony is to assess the appropriateness of LILCO's proposal on the basis of what is known about the behavior of people in nuclear reactor emergencies.

Q. Are you familiar with the evidence proffered by LILCO?

A. Yes. I have reviewed LILCO's evidence, including the January 10, 1985 Affidavit of Elaine D. Robinson; the letter dated September 25, 1984 from William J. Catacosinos, Chairman and Chief Executive Officer, Long Island Lighting Company, to E.B. Sumerlin, Jr., General Manager, Nassau Veterans Memorial Coliseum; the letter dated October 23, 1984 from Matthew C. Cordaro, Vice President, Long Island Lighting Company, to Frank M. Rasbury, Executive Director of the Nassau County Chapter of the American Red Cross; and the map that is Attachment 4 to the Robinson Affidavit. Among other things, the evidence proffered by LILCO reveals that: (1) the Nassau Coliseum is located in south-central Nassau County, approximately 43 miles from the Shoreham plant and 33 miles from the 10-mile EPZ's westernmost boundary (Robinson Affidavit, ¶ 5 and Attachment 4); (2) LILCO's use of the Coliseum will include "[p]erforming radiological monitoring and decontamination, if necessary, in the Coliseum and/or surrounding property in the event of a radiological emergency at

Shoreham. . . ." (September 25 letter, at 1); and (3) "all [Shoreham] evacuees will be directed to go to the Coliseum" (October 23 letter, at 2).

Q. In your opinion, is the Nassau Coliseum an appropriate location for LILCO's monitoring and decontamination center?

A. No. As set forth in my testimony regarding Contention 23, a number of social surveys have been conducted on Long Island to determine how residents would respond to a Shoreham accident. The results of these studies, conducted on behalf of LILCO, Suffolk County and Newsday, are explained in detail in my testimony regarding Contention 23. All the surveys indicate that in the event of a radiological emergency at Shoreham, large numbers of people from both inside and outside the Shoreham EPZ would seek to evacuate, even though not advised to do so. The survey conducted for Suffolk County revealed, for example, that, depending on the perceived severity of the accident, between 25% (215,000 families) and 50% (430,000 families) of the households on Long Island would be likely to evacuate spontaneously, casting an "evacuation shadow" extending more than 25 miles beyond the plant. See testimony regarding Contention 23, ff. Tr. 2789, at 15-21.

In my opinion, LILCO's proposal to use the Nassau Coliseum as a relocation/decontamination center in the event of an emergency at Shoreham is likely to increase both the magnitude and geographic extent of the evacuation shadow phenomenon.

Evacuees escaping any disaster attempt to find a place of refuge, be it a public shelter or a relative's home, that is "safe;" i.e., that puts a reasonable amount of distance between them and the disaster agent. NUREG 0654 recommends that such shelters be located about ten miles beyond the boundary of the EPZ. NUREG 0654, Section II.J.10.h. Indeed, some of the monitoring and decontamination centers which LILCO originally proposed were located less than five miles from the EPZ.

Now LILCO proposes to direct all evacuees to a location some 33 miles from the edge of the EPZ. October 23 letter, at 2. Establishing the place of safe refuge so far from the origin of the danger -- the Shoreham plant -- is likely to increase in the minds of the public the degree of the perceived danger. For example, because people will be told to seek refuge at a location more than 40 miles from the source of the emergency, there will be a perception among many people in the area between the plant and the refuge (i.e., the 0-40 mile region) that that area (or much of it) is unsafe, because the safe refuge center (the Nassau Coliseum) is still further from the source of the emergency. As was amply demonstrated by all of the Shoreham surveys, the greater the public's perception of danger, the greater the extent of the evacuation shadow. Thus, it is very likely that LILCO's proposal to locate its monitoring and decontamination center so far from the EPZ will increase the number of voluntary evacuees expected in the event of a Shoreham accident. The resulting

increase in evacuees attempting to use the limited east-west roadway capacity available on Long Island will lead to even greater congestion than discussed in my testimony regarding Contention 23. Increased congestion will likely result in greater evacuation times (making the LILCO estimates which were the focus of Contention 65 even more inaccurate than previously was urged) and long delays in reaching the Nassau Coliseum, thus delaying the monitoring and decontamination process for evacuees. See the testimony of Edward P. Radford regarding this issue for the potential health effects resulting from such delays.

Q. Do you have any other concerns about LILCO's proposal to use the Nassau Coliseum as a monitoring and decontamination center?

A. Yes. LILCO's proposal is likely to cause a great deal of congestion around the Nassau Coliseum which would further delay the arrival of evacuees at that location. As depicted in Figure 1 to this testimony, data previously collected during the survey conducted on Suffolk County's behalf show that even before LILCO proposed to use the Coliseum as a monitoring and decontamination center, between 25% and 50% of the population in the communities surrounding the facility indicated that they would evacuate in the event of a general emergency at Shoreham requiring evacuation of the full 10-mile EPZ. With the Nassau Coliseum now designated to host people who may be contaminated by radioactive materials, and with decontamination taking place both

inside and outside the structure,^{2/} the number of people in the surrounding communities perceiving a threat to their health (and that of their families) is likely to increase, thus increasing the number who will attempt to evacuate. Likewise, the area immediately surrounding the Coliseum is characterized by substantial commercial development, including a number of private and government office buildings. Workers in these buildings are also likely to sense that the area is not safe and will attempt to leave the area -- in many cases using roads and crossing intersections over which evacuees attempting to reach the Coliseum will travel.

The outflow of Nassau County residents and workers and the influx of evacuees from Suffolk County, processes which could very well occur simultaneously, could create major traffic problems within the vicinity of the Coliseum. This would make it even more difficult for evacuees to reach the Coliseum, thus making it less likely that LILCO could provide radiation monitoring and decontamination in a timely manner. See NUREG 0654, Section II.J.12.

Q. Will you please summarize your conclusions?

A. In my opinion, LILCO's proposal to locate its monitoring and decontamination center at the Nassau Coliseum will result in a much greater evacuation shadow than contemplated in my testimony regarding Contention 23, and will result also in the

^{2/} It is my understanding that contaminated automobiles will need to be parked and washed down outside of the Coliseum.

evacuation of large numbers of residents and workers in the communities surrounding the Coliseum. Both consequences will lead to increased traffic congestion which, in turn, will delay the arrival of evacuees at the Coliseum to commence the monitoring and, if necessary, decontamination process.

Q. Does that conclude your testimony?

A. Yes.

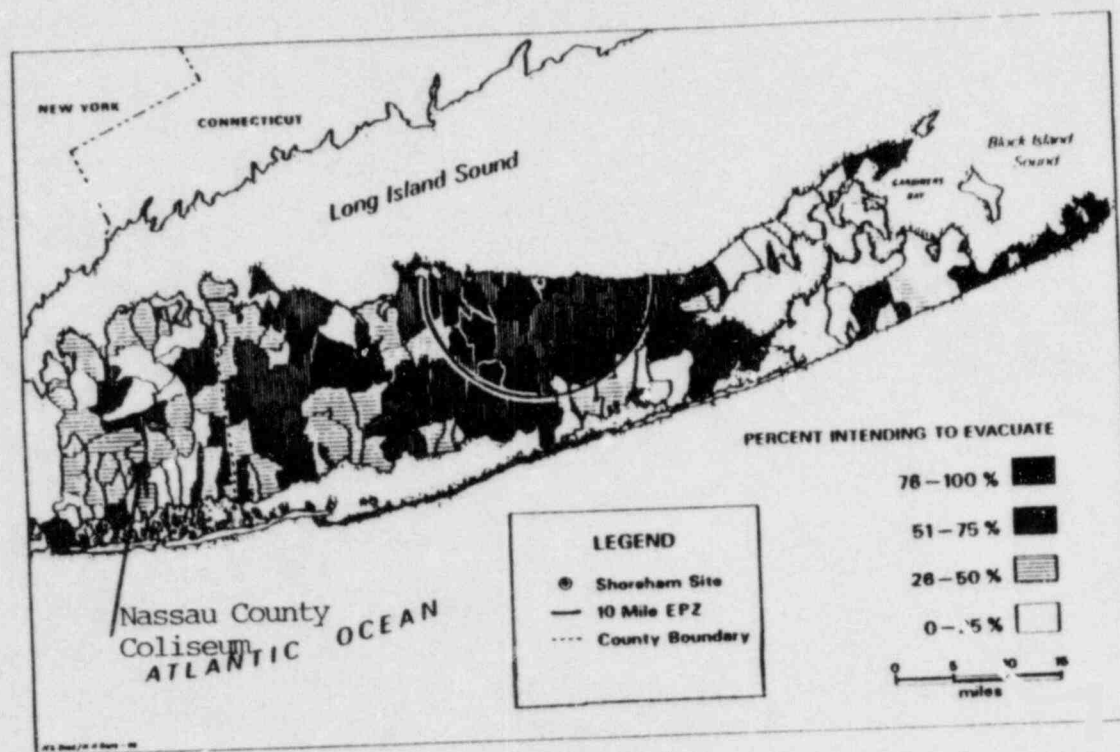


Figure 1: Percent Intending to Evacuate