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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)
)
(Shoreham Nuclear Power Station,)
Unit 1))

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

DIRECT TESTIMONY OF
DR. KAI T. ERIKSON AND DR. STEPHEN COLE
ON BEHALF OF SUFFOLK COUNTY
REGARDING CONTENTION EP 5A [ROLE CONFLICT]

OCTOBER 12, 1982

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Summary Outline of Direct Testimony of Dr. Kai T.
Erikson and Dr. Stephen Cole on Behalf of Suffolk County
Regarding Contention EP 5A

In Contention EP 5A, Suffolk County contends that LILCO has not addressed the question of whether offsite personnel (both LILCO employees and workers from offsite agencies) upon whom its Plan relies for emergency services in the event of a radiological emergency, would respond promptly. The County's concern is focused on the possibility that such personnel would decide to attend first to the safety of their families rather than immediately reporting for emergency duty. If significant numbers of emergency workers resolve the conflict between their family duties and emergency duties in this manner, LILCO cannot provide an adequate emergency response, thus failing to meet the requirements of 10 CFR §50. 47(b)(1), (2),(3),(8),(12) and (15) and 10 CFR Part 50, Appendix E.

Suffolk County has conducted surveys of volunteer firemen (including some from Mutual Aid fire districts upon which LILCO intends to rely in the event of a radiological emergency) and schoolbus drivers, to examine the extent of role conflict among those workers and the manner in which they intend to resolve that conflict in the event of a radiological emergency. A substantial number of both groups stated in response to survey questions that they would first take care of their families and would not be available for immediate emergency duty. The County contends that unless LILCO conducts similar studies for all personnel upon whom its Plan relies for

its emergency response and incorporates the results of such surveys into its plan, there can be no assurance that there will be an adequate response to an emergency.

EXHIBITS

ATTACHMENT 1

Resume of Dr. Kai T. Erikson

ATTACHMENT 2

Survey for Volunteer Firemen

ATTACHMENT 3

Survey for Schoolbus Drivers

ATTACHMENT 4

Responses of Emergency Personnel to a Possible Accident at the Shoreham Nuclear Power Plant (Draft)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

DIRECT TESTIMONY OF DR. KAI T. ERIKSON ON BEHALF
OF SUFFOLK COUNTY REGARDING CONTENTION EP 5A--ROLE CONFLICT

- Q. Please state your name.
- A. Dr. Kai T. Erikson.
- Q. Dr. Erikson, what is the purpose of this testimony?
- A. The purpose of this testimony is to address contention EP 5A, which states as follows:

EP 5: OFFSITE RESPONSE ORGANIZATION AND
ONSITE RESPONSE AUGMENTATION

Suffolk County contends that LILCO has failed to provide reasonable assurance that onsite assistance from offsite agencies will be forthcoming in the event of a radiological emergency at the Shoreham site (see, e.g., Plan at 5-8 and 6-15). LILCO has therefore not met the requirements of 10 CFR §§50.47 (b)(1), (2), (3), (8), (12) and (15), 10 CFR Part 50, Appendix E, Item A, and NUREG 0654. In addition, LILCO has not demonstrated adequately that it will be able to augment its onsite emergency response staff in a timely manner (see Plan, Ch. 5). LILCO has also, therefore, failed to meet the requirements of 10 CFR §50.47 (b)(1) and (2). Thus:

A. It does not appear that LILCO has addressed or analyzed the possibility that offsite personnel and/or onsite augmenting personnel expected to report to the Shoreham site for emergency duty, would fail to report (or report in a timely manner) because of conflicting family (or other) duties that would arise in the event of a radiological emergency.

In particular, I will discuss the failure of LILCO's Emergency Plan to take into account the possibility that off-site agency emergency workers and LILCO personnel, whose presence upon request is assumed in the LILCO Plan, will not in fact report for duty in the event of an emergency. My testimony will primarily focus on two matters: (1) the likely response of emergency personnel to the conflict that may arise between their emergency duties and their feelings of obligation to their own families' safety; and (2) the need for LILCO to analyze such response and account for it, in order to demonstrate adequately that it will be able to augment its onsite staff in a timely manner.

I: Background

Q. Please state your occupation.

A. I am a professor of sociology at Yale University and editor of the Yale Review. I have also had a joint appointment in the American Studies Program since 1968.

Q. In the field of sociology, do you have any particular areas in which you specialize?

A. For the first part of my professional career, I concentrated on the study of deviant behavior. In more recent years, I have focussed increasingly on human communities in general and on human reactions to moments of crisis in particular. I have provided consulting services on these subjects in the context of Nuclear Regulatory Commission hearings relating to the Three Mile Island, Diablo Canyon, and Indian Point Nuclear Power Plants. My professional qualifications and experience are set forth in more detail in the resume which is Attachment 1 hereto.

II. Role Conflict

Q. Dr. Erikson, have you reviewed LILCO's on-site emergency response plan?

A. Yes, I have.

Q. In your opinion, does the LILCO plan provide reasonable assurance that LILCO will be able to augment its on-site staff in a timely manner in the event of an emergency?

A. No it does not.

Q. What is the basis for your opinion?

A. Chapter 5 of the LILCO plan, particularly at section 5.2 and Table 5-1, discusses the augmentation of LILCO emergency personnel in the event of a radiological emergency. A number

of LILCO personnel who may be offsite at the time of an accident are expected, under the plan, to report to the Shoreham site within specific time periods. In addition, the plan at pages 5-8 and 6-16 indicates that LILCO intends to rely upon personnel from offsite agencies to provide onsite support in the event of an emergency. Specifically, the plan makes reference to volunteer fire departments, such as the Wading River Fire Department, which are expected to provide necessary fire protection, ambulance and rescue services on-site, and transportation from the site to off-site locations. My opinion is that those portions of the plan, and the plan in general for that matter, do not address the serious question of whether it is reasonable to assume that people who are off-site will move on-site to perform the duties that are described in the plan. The plan appears to assume, with no apparent basis in fact, that the necessary number of people will report for duty, that they will report within the necessary time period, and that they will properly perform the acts that the plan requires, all as a routine matter. The plan thus completely ignores the issue of role conflict, which has been identified as a potential problem among emergency response personnel. In my opinion, because those portions of the plan dealing with the augmentation of emergency personnel are premised on what may prove to be an unwarranted assumption, the plan fails to provide assurance that necessary augmentation would in fact occur.

Q. What do you mean by the term "role conflict"?

A. The word "role conflict" at its broadest describes situations where two or more parts of a person's life are in conflict: that is, situations in which two different things people are expected to do turn out to be contradictory. In the context of emergency planning, this usually takes the form of a conflict between the pressures people feel to report for various kinds of emergency duty and the pressures they feel to tend to their families.

Q. Has role conflict been identified as a problem in emergencies?

A. Yes. It has been discussed in the sociological literature for a number of years. The evidence that people only turn to rescue work after being assured that their families are safe was first reviewed in a 1952 article by Lewis Killian in the American Journal of Sociology and is discussed in some length by Allen H. Barton in a book called Communities in Disaster, (1969). Some investigators have questioned whether or not that tendency can be considered a general rule. However, in my study of the Buffalo Creek Flood of 1972, I know of no exceptions to the statement that the people living in the affected area took care of their families before engaging in any kind of rescue work. See, K. Erikson, Everything In Its Path, (1976). Furthermore, I have never seen a report describing a situation

in which people went about their emergency work in the absence of assurances about the safety of their families. In my opinion, most scholars knowledgeable about human response to disasters would agree with the conclusions of James Cornell in The Great International Disaster Book:

First, the basic unit of human life -- the family -- emerges as the single most important force influencing behavior. Survivors rapidly turn their own anxiety into concern for their kin. A person's first regard is for saving family members, often at the expense of other victims or themselves. Even officials charged with the safety of an entire community find their first allegiance is to their family. As Ralph Linton has written, "In the Gotterdammerung ... the last man will spend his last hours searching for his wife and child." (52-3)

Moreover, in my opinion, the kinds of role conflict that have been encountered in non-nuclear disasters are very different from the kinds of role conflict we are likely to encounter in a radiological emergency. I believe the conflict itself would be a great deal sharper in the event of such an accident, and I think the conflict is much more likely to be resolved in favor of family obligations.

Q. On what do you base that opinion?

A. These views are based primarily on the fact that nuclear accidents involve the risk of radiation exposure and the inherent uncertainties related to it. Nobody can see or smell radiation. Nobody can sense whether they are in its presence. This

lack of sensory identification leads people to be more afraid of radiation than they are of other potential perils. Because their uncertainty is so much greater, it is my opinion that they are more likely to feel that their families are endangered and in need of their help.

Q. How can one determine the likely resolution of role conflict with respect to a particular emergency?

A. There are only two ways to learn about such things. The first is to study what has happened on similar occasions in the past. This avenue is not particularly helpful with respect to radiological emergencies, however, because there never has been a nuclear accident of the sort we are talking about except TMI, and I am unaware of any formal role conflict studies arising from that event. Therefore, there are no historic models for us to rely upon.

The only other thing one can do is to survey the people who will be expected to perform services in the event of an emergency. From the responses to such surveys, we can obtain reasonably accurate estimates of how those people are likely to behave during an emergency.

Suffolk County recently undertook a survey of volunteer firemen and school bus drivers, both groups of which could be necessary to perform important emergency services during a radiological emergency. School bus drivers, for instance, could

be expected to drive school children or persons without transportation away from a potential area of danger. Likewise, volunteer firemen are likely to be assigned evacuation, ambulance, rescue or firefighting duties. Three of the five fire departments surveyed by Suffolk County (Ridge, Miller Place, and Rocky Point) provide mutual aid to the Wading River Fire Department. As noted, the LILCO plan relies upon such volunteer fire departments to provide onsite firefighting, as well as, ambulance and rescue support in the event of a radiological emergency.

Q. Who conducted the study for Suffolk County?

A. It was conducted by Dr. Stephen Cole, a professor of sociology at the State University of New York at Stony Brook and president of Social Data Analysts, in consultation with me.

Q. How was the study conducted?

A. The study consisted of two surveys. The first interviewed 291 volunteer firemen from the five departments mentioned above. The other interviewed 246 school bus drivers serving schools in the following districts surrounding the Shoreham site: the Rocky Point School District, the Eastport Union Free School District, the Middle Island Central School District, the Riverhead Central School District, the Shoreham-Wading River School District, and the South Manor Union Free School District of Brookhaven. For further details of how the surveys were

administered, see Dr. Cole's testimony on this contention.

(Attachment 2 is the survey administered to the volunteer firemen, and Attachment 3 is the survey administered to the school bus drivers.)

Q. Please explain how the survey obtained information on the problem of role conflict in the event of an emergency at Shoreham.

A. We were interested in gaining information on one overriding question: What would the respondents do in the event of an emergency? Would emergency workers report to their emergency posts first or tend to their families first?

In addition to that major question, we also wanted to know what kinds of people are most likely to report and which are least likely. From answers to such questions we can determine, for example, whether people with small children are apt to react differently than people with older children.

Q. What were the results of the volunteer fireman survey?

A. The results of the survey of volunteer firemen were only recently completed, and as of the time this testimony was prepared, I had not yet had an opportunity to review Dr. Cole's report of the survey results. I understand from Dr. Cole, however, that 55% indicated they would report for duty quickly in the event of an emergency and 36% indicated they would not report for duty until they had looked after their families'

safety. These results indicate that a significant number of volunteer firemen would not report for emergency duty until after they had taken care of their families' safety.

Q. What were the results of the school bus driver survey?

A. The results of the school bus driver survey, too, were only recently tabulated, and as of the time this testimony was prepared, I had not yet reviewed Dr. Cole's report of the survey results. However, I understand from Dr. Cole that 69% of the school bus drivers surveyed indicated that they would first make sure that their families were safely out of the area and 24% said they would first report to work to pick up school children and drive them to a shelter. These preliminary results not only confirm the existence of role conflict, they confirm that most drivers will resolve the conflict in favor of their family obligations.

Q. How do the survey results relate to the concerns raised in Contention EP 5A?

A. The results indicate that people who are likely to be counted upon for emergency services may not be available to perform those services in a radiological emergency. In addition, the studies have substantial implications with respect to LILCO's plan. Not only has the County shown that certain emergency workers may experience substantial role conflict problems during a radiological emergency, but, it has also

shown that many of those workers are volunteer firefighters whom LILCO may rely upon in the event of a radiological emergency. The results indicate that only a little over one half of the volunteer firemen, whom the LILCO plan relies upon for onsite support, would report for duty when called.

Accordingly, I believe that until such time as LILCO conducts studies like the ones I have described concerning all the emergency personnel LILCO plans to call upon in the event of an emergency, and accounts for the results and implications of those studies in its plan, there can be no confidence that the LILCO Plan is capable of implementation. The on-site plan relies upon cooperation of large numbers of people. So far as I can discern, LILCO has no information about the intentions or the feelings of the offsite personnel; nor does LILCO know whether they are likely to be available to implement the plan on a timely basis. Until such information is available and taken into account in the provisions of the plan that deal with augmentation of personnel, LILCO cannot reasonably rely on the availability of such personnel or demonstrate that the plan can be implemented.

Q. Does that conclude your testimony on contention EP 5A?

A. Yes.

NUCLEAR REGULATORY COMMISSION

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LONG ISLAND LIGHTING COMPANY)	Docket No. 50-322 (OL)
)	(Emergency Planning
(Shoreham Nuclear Power Station,)	Proceedings)
Unit 1))	
)	

Direct Testimony Of Dr. Stephen Cole
On Behalf of Suffolk County Regarding
Contention EP 5A - Role Conflict

Q. Please state your name.

A. Dr. Stephen Cole.

Q. Dr. Cole, what is your occupation?

A. I am a social scientist specializing in survey research.

My professional qualifications are set forth in more detail in my direct testimony on contentions EP 2B and 5B.

Q. Dr. Cole, what is the purpose of this testimony?

A. The purpose of this testimony is to address Suffolk County emergency planning contention EP 5A. That contention concerns the failure of LILCO's emergency plan to take into account the possibility that offsite agency emergency workers and LILCO augmenting personnel will not report for duty in the event of an emergency. Two surveys, conducted for Suffolk County by Social Data Analysts, have produced data as to how offsite personnel, including some upon whom the LILCO plan relies, are

likely to behave if there were an accident at Shoreham. The results suggest that large numbers of emergency personnel will experience role conflict which will make them unwilling to report for emergency duty until after they have attended to the safety of themselves and their families. In his testimony on contention 5A, Dr. Kai Erikson relies upon the survey results in assessing the adequacy of the LILCO plan with respect to offsite personnel. In this testimony I will provide the necessary foundation for Dr. Erikson's use of the survey data by describing how the surveys were conducted and discussing the results.

Q. Please briefly describe the surveys you have mentioned.

A. The first survey was one conducted among school bus drivers who currently work for school systems within a ten mile radius of the Shoreham plant. The purpose of that survey was to find out whether the bus drivers would actually report to work and drive their busses to help in the evacuation of school children in case of a nuclear emergency, or whether they would first go to look after their own families. The second survey was one of volunteer firemen. Its purpose was to find out, whether in the event of a nuclear accident at Shoreham, volunteer firemen would report to duty to assist in evacuation and firefighting, or whether they would first look after the health and safety of themselves and their own family members.

Q. How was the volunteer fire department survey conducted?

A. We surveyed firemen from the Miller Place, Ridge, Riverhead, Rocky Point, and Sound Beach fire departments. For this survey we conducted the interviews over the telephone in a manner similar to the way in which we conducted the general population survey described in my direct testimony on contentions EP 2B and EP 5B. Again, Drs. Johnson, Erikson and I collaborated on the construction of the questionnaire (Attachment 2).

For this survey, we attempted to interview every member of those fire departments listed above. Out of a total of 467 firemen, we were able to complete interviews with 291. Of the 323 we were able to contact, only 32 or 10% refused to participate. For a more detailed discussion of the reasons for not completing interviews in this survey see Appendix A of the attached report: "Reactions of Emergency Personnel to a Possible Nuclear Accident at the Shoreham Nuclear Power Plant" (Attachment 4).

Q. What were the results of the volunteer fireman survey?

A. The questionnaire asked, among others, the following questions:

Assuming that the Shoreham nuclear power plant is licensed and begins to operate, we are interested in knowing what you think you would do if there was an accident at the plant. Suppose that you were at work on a weekday morning and there was an accident at Shoreham. Everyone living within ten miles of the

plant was advised to evacuate. Volunteer firemen were expected to help with the evacuation. What do you think you would do first?

- 1 first, you would report to the fire station so that you could help with fire fighting and evacuation in the evacuation zone, or
- 2 first, you would make sure that your family was safely out of the evacuation zone, or
- 3 first, you would leave the evacuation zone to make sure that you were in a safe place, or
- 4 first, you would do something else
(SPECIFY).

How would you make sure that your family was safely out of the evacuation zone?

- 1 go home and drive your family to a safe place out of the evacuation zone
- 2 call home and tell your family to leave without you
- 3 some other way (SPECIFY).

We found that a significant percentage of firemen would first take their families out of the evacuation zone before attempting to report for duty. In the event of a radiological emergency requiring the evacuation of all people within a ten mile zone of the plant, 68% of the firemen said that they would first make sure that their families were safely out of the evacuation zone, whereas only 21% said that they would first report to the fire station to help with evacuation or

firefighting. Many of the firemen who said that they would first look after the safety of their families said that they would then quickly report to duty. An analysis of the survey data indicated that 55% would report for duty relatively quickly, 36% would not report for duty, and 8% were undecided as to what they would do. For a more detailed discussion of the results see Attachment 4.

Q. Please describe how the survey was conducted among school bus drivers.

A. We interviewed 246 school bus drivers who drive school buses in the Eastport Union Free School District, the Middle Island Central School District, the Riverhead Central School District, the Shoreham Wading River School District, and the South Manor Union Free School District of Brookhaven. Those districts are located within ten miles of the Shoreham plant.

This survey was conducted using a self-administered questionnaire which is Attachment 3 hereto. The surveys were all conducted on the morning of September 7 at orientation meetings held for those school bus drivers. At those meetings the school bus drivers read the questionnaire and checked off the appropriate answers. Then the data from the questionnaire were coded, keyed directly onto a computer, and analyzed using a computer program.

Q. Who constructed the questionnaire?

A. The survey was constructed by myself in collaboration with Professors Erikson and Johnson.

Q. Was the survey administered to a sample of school bus drivers?

A. No, we did not use a sample for this survey. We attempted to interview the entire population of school bus drivers who worked within ten miles of the plant. In fact, there were some working in that zone that we did not interview, but we did interview the great majority of school bus drivers that actually drive within ten miles of the Shoreham plant. In this particular study, therefore, the results are not based upon a sample, in which you draw generalizations from the sample to the population. Rather, the results of this survey are based on a population itself, although of course, we could not interview every member of that population.

Q. What were the results of your survey of school bus drivers?

A. The questionnaire asked, among others, the following question:

Assuming that the Shoreham nuclear power plant is licensed and begins to operate, we are interested in knowing what you think you would do if there was an accident at the plant. Suppose that you had completed your morning run and there was an accident at Shoreham. Everyone living within ten miles of the plant was advised to evacuate.

School bus drivers were expected to help evacuate school children. What do you think you would do first?

First, I would report to work so that I could pick up school children in the evacuation zone and drive them to a shelter.

First, I would make sure that my family was safely out of the evacuation zone.

First I would leave the evacuation zone to make sure that I was in a safe place.

First, I would do something else (SPECIFY).

The answers to this question indicate that in the event of a radiological emergency at the Shoreham plant a substantial majority of school bus drivers would first look after the health and safety of their families rather than report to drive a school bus. Of those interviewed, 69% said that if there was an accident requiring the evacuation of people within a ten mile zone of the plant they would first make sure that their families were safely out of the evacuation zone; an additional 4% volunteered that they would first check on their families and then go to drive the school bus; 24% said they would report to work so that they could pick up school children in the evacuation zone and drive them to a shelter; 3% said that they would immediately leave the evacuation zone. For a more

detailed discussion of the survey findings see the attached report: "Reaction of Emergency Personnel to a Possible Nuclear Accident at the Shoreham Nuclear Power Plant" (Attachment 4).

Q. Dr. Cole, the questionnaires used in both these studies asked people what they would do under certain circumstances. Are the answers to such questions a reliable indicator of what their actions are likely to be under those or similar circumstances?

A. Yes they are. I would not go so far as to say that you can definitely predict what a particular individual would do based upon his or her answers to these questions, but they do give a roughly accurate estimate of the numbers of volunteer firemen and school bus drivers who would report for emergency duty. For a more detailed discussion of the value of surveys as predictors of behavior, see my direct testimony on contentions EP 2B and EP 5B.

Q. Does this conclude your testimony on contention EP 5A?

A. Yes.

Attachments To The Direct Testimony of
Dr. Kai T. Erikson and Dr. Stephen Cole
On Behalf Of Suffolk County
Regarding Contention EP 5A (Role Conflict)

ATTACHMENT 1

Resume of Dr. Kai T. Erikson

ATTACHMENT 2

Survey for Volunteer Firemen

ATTACHMENT 3

Survey for Schoolbus Drivers

ATTACHMENT 4

Responses of Emergency Personnel to a Possible Accident
at the Shoreham Nuclear Power Plant. (Draft)

October 12, 1982

ATTACHMENT 1

Kai T. Erikson
 Department of Sociology
 Yale University
 New Haven, Connecticut

Born in Vienna, Austria, 1931
 U.S. citizen (derivative, 1937)
 Married, two children

EDUCATION

1949-1950 University of California, Berkeley
 1950-1953 Reed College (B.A.)
 1953-1955 University of Chicago (M.A.)
 1955-1963 University of Chicago (Ph.D.)

POSITIONS

1954-1955 Research Fellow, Family Study Center, University of Chicago
 1955-1957 Social Science Technician, Walter Reed Army Institute of Research, Walter Reed Army Medical Center (while on active duty, U.S. Army)
 1959-1963 Instructor to Assistant Professor, Departments of Psychiatry and Sociology, University of Pittsburgh
 1963-1966 Associate Professor, Departments of Psychiatry and Sociology, Emory University
 1966- Associate Professor to Professor, Department of Sociology and American Studies Program, Yale University
 1968-1969 Fellow, Center for Advanced Study in the Behavioral Sciences, Stanford, California
 1969-1973 Professor, Trumbull College, Yale University (Chair, Council of Masters, 1970-1973)
 1974-1977 Chair, American Studies Program, Yale University
 1979- Editor, The Yale Review

SELECTED PUBLICATIONS

Books

Wayward Puritans: A Study in the Sociology of Deviance (New York: John Wiley, 1966)

Everything in Its Path: Destruction of Community in the Buffalo Creek Flood (New York: Simon & Schuster, 1976)

Articles

"The Confirmation of the Delinquent," Chicago Review, Winter, 1957 (with Erik H. Erikson)

"Patient Role and Social Uncertainty: A Dilemma of the Mentally Ill," Psychiatry, 20:263-274, 1957

"The Functions of Deviance in Groups," Social Problems, 7:98-107, 1959 (with Robert A. Dentler)

"Impressions of Soviet Psychiatry: Some Travel Notes," Psychiatric Communications, 5:1-12, 1962

"Notes on the Sociology of Deviance," Social Problems, 9:307-314, 1962

"A Return to Zero," American Scholar, 36:134-146, 1966

"A Comment on Disguised Observation in Sociology," Social Problems, 14:366-373, 1967

"Sociology and the Historical Perspective," American Sociologist, 5:331-338, 1970

"Introduction," In Search of Common Ground: Conversations with Erik H. Erikson and Huey P. Newton (New York: Norton, 1973)

"Loss of Communitality on Buffalo Creek," American Journal of Psychiatry, 133:302-306, 1976

"On Teaching Sociology," New England Sociologist, 1:35-40, 1979

"A Report to the People of Grassy Narrows," in Christopher Vecsey and Robert W. Venables, editors, American Indian Environments: Ecological Issues in Native American History (Syracuse, N.Y.: Syracuse University Press, 1980) (with Christopher Vecsey)

SELECTED PUBLICATIONS (continued)

Book Reviews

American Journal of Sociology
American Scholar
American Sociological Review
Contemporary Sociology
New York Times Book Review
Transaction
Yale Law Journal

HONORS

McIver Award, American Sociological Association, 1967

Sorokin Award, American Sociological Association, 1977

Nominee, National Book Awards, 1977

PROFESSIONAL MEMBERSHIPS

American Sociological Association (Chair, Committee on Professional Ethics, 1971-1973; Council, 1974-1977; Committee on Executive Office and Budget, 1978-1981)

Society for the Study of Social Problems (President, 1970-1971)

Eastern Sociological Society (President, 1980-1981)

ATTACHMENT 2

Volunteer Firemen

September, 1982

Hello, my name is _____ and I am calling for
Suffolk County. We are doing a survey of volunteer firemen to
obtain information that will be useful to the County in making
plans to deal with a possible nuclear emergency at the Shoreham
nuclear power plant. The _____ fire depart-
ment is cooperating with this research. They have given us a
list of members. Do you still work with the _____
fire department?

123

4. For how many years have you worked with this fire
district?

0=less than one

1=one

2=two to three

3=four to five

4=six to ten

5=more than ten

DON'T READ [9=Refuse

4

5-9 What is the zip code of your home address?

56789

In general, how dangerous do you think it would be to live
near each of the following:

(Categories for Q. 10 to Q. 13)

1=very dangerous

2=dangerous

3=not too dangerous

DON'T READ

[4=Don't Know

[9=Refuse

10. an airport

10

11. a mental hospital

11

12. a coal fired power plant

12

13. a nuclear power plant

13

14. Would you describe yourself as:

1=a supporter of nuclear power plants as
a means of providing electricity.

2=an opponent of nuclear power plants, or

3=you haven't made up your mind yet on this issue?

DON'T READ

[9=Refuse

14

15. Do you think that LILCO should complete and operate the
Shoreham nuclear power plant?

1=yes

2=no

DON'T READ

[4=Don't Know

[9=Refuse

15

16. During normal operation, which type of electricity plant pollutes the air the least:

- 1=an oil-fired plant
- 2=a coal-fired plant
- 3=a nuclear-fired plant
- 4=you're not sure

DON'T READ [5=all about the same
[9=Refuse

16

17. During normal operation does a nuclear power plant give off a dangerous level of radiation?

- 1=yes
- 2=no

DON'T READ [3=Don't Know [9=Refuse

17

18. Assuming that the Shoreham nuclear power plant is licensed and begins to operate, we are interested in knowing what you think you would do if there was an accident at the plant. Suppose that you were at work on a weekday morning and there was an accident at Shoreham. Everyone living within ten miles of the plant was advised to evacuate. Volunteer firemen were expected to help with the evacuation. What do you think you would do first?

1=first, you would report to the fire station so that you could help with fire fighting and evacuation in the evacuation zone, or [SKIP to Q. 23]

2=first, you would make sure that your family was safely out of the evacuation zone, or [ASK Q. 19 to 22]

3=first, you would leave the evacuation zone to make sure that you were in a safe place, or [SKIP to Q. 23]

4=first, you would do something else _____
[SKIP to Q. 23] Specify

DON'T READ [5=Don't Know [SKIP to Q. 23
[9=Refuse [SKIP to Q. 23]

18

19. How would you make sure that your family was safely out of the evacuation zone?

1=go home and drive your family to a safe place out of the evacuation zone

2=call home and tell your family to leave without you

3=some other way _____

(Specify)

DON'T READ [4=Don't Know
[9=Refuse

19

20. Where would you go?

- 1=someplace in Suffolk County
- 2=someplace in Nassau County
- 3=someplace in New York City
- 4=some other place _____

(Specify)

5=you don't know [SKIP to Q. 22]

DON'T READ [9=Refuse [SKIP to Q. 22]

21. In terms of miles, about how far away is this place from your home?

- 1=10 miles or less
- 2=11 to 20 miles
- 3=21 to 30 miles
- 4=31 to 40 miles
- 5=41 to 50 miles
- 6=more than 50 miles

DON'T READ [7=Don't Know
[9=Refuse

21

22. After your family was in a safe place would you return to the fire house to help with evacuation?

- 1=yes
- 2=no

DON'T [3=I would try
[4=Don't Know
READ [9=Refuse

22

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

- 1=much more dangerous than normal fire fighting work
- 2=somewhat more dangerous than normal fire fighting work
- 3=about equally dangerous
- 4=less dangerous
- 5=not dangerous at all

DON'T READ [5=Don't Know [9=Refuse

23

Do you agree or disagree with each of the following statements.

(Categories for Q. 24 to Q. 27)

1=agree 2=disagree DON'T READ [3=Don't Know
[9=Refuse

24. Helping with the evacuation of people from the emergency zone during a nuclear emergency should be the job of specially trained personnel rather than the job of volunteer firemen.

24

25. In the event of a nuclear emergency, at Shoreham it would be the obligation of everyone to first look after the health and safety of their family.

25

26. Only firemen who have specifically volunteered should be expected to help with off site evacuation during a nuclear emergency.

26

27. In the event of a nuclear emergency at Shoreham, a volunteer fireman must place duty to the fire department over duty to family.

27

28. Do you currently have any children living at home with you?

- 1=yes
- 2=no [SKIP to Q. 32]

DON'T READ [9=Refuse

28

29. How old is the youngest child living at home with you?

- 1=under 5
- 2=5 to 12
- 3=13 to 18
- 4=over 18

DON'T READ [9=Refuse

29

30-31 In what district do your children attend school?

30

 (school district
 [99=no children attending school]

31

32. What is your current marital status?

- 1=married
- 2=single [SKIP to Q. 34]
- 3=widowed [SKIP to Q. 34]
- 4=divorced or separated [SKIP to Q. 34]

DON'T READ [9=Refuse

32

33. Does your spouse currently work full time (30 hours a week or more)?

- 1=yes
- 2=no

DON'T READ [9=Refuse

33

34. What is the last grade of school that you completed?

- 1=some high school or less
- 2=high school graduate
- 3=some college
- 4=college graduate

DON'T READ [9=Refuse

34

35. What is your age category?

- 1=under 25
- 2=25-35
- 3=36-50
- 4=51-65
- 5=over 65

DON'T READ [9=Refuse

35

36. What is your sex?

- 1=male
- 2=female

36

THANK YOU FOR YOUR COOPERATION

ATTACHMENT 3

SUFFOLK COUNTY SURVEY

Schoolbus Drivers

September, 1982

As you probably know, the Long Island Lighting Company has applied for a license that will enable it to operate its nuclear power plant at Shoreham. If this plant goes into operation it is essential to have an adequate emergency evacuation plan in case there is a nuclear accident at the plant. Suffolk County is trying to develop such a plan and needs some information from you. This questionnaire is completely anonymous and confidential. Results of this survey will only be presented in statistical tables.

Please check the appropriate box.

1) For what school district do you drive?

- Rocky Point School District
- Eastport Union Free School District
- Middle Island Central School District
- Riverhead Central School District
- Shoreham-Wading River School District
- South Manor Union Free School District of Brookhaven

2) For how many years have you driven for this district?

- | | |
|--|--|
| <input type="checkbox"/> less than one | <input type="checkbox"/> four to five |
| <input type="checkbox"/> one | <input type="checkbox"/> six to ten |
| <input type="checkbox"/> two to three | <input type="checkbox"/> more than ten |

3) What is the Zip Code of your home address?

4) In general, how dangerous do you think it would be to live near each of the following:

	Very Dangerous	Dangerous	Not too Dangerous
an airport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a mental hospital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a coal fired power plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a nuclear power plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5) Would you describe yourself as:

a supporter of nuclear power plants as a means of providing electricity.

an opponent of nuclear power plants.

I haven't made up my mind yet on this issue.

6) Do you think that LILCO should complete and operate the Shoreham nuclear power plant?

yes

no

I don't know.

7) During normal operation, which type of electricity plant pollutes the air the least?

an oil-fired plant

a coal-fired plant

a nuclear-fired plant

I am not sure.

8) During normal operation does a nuclear power plant give off a dangerous level of radiation?

yes

no

I am not sure.

9) Assuming that the Shoreham nuclear power plant is licensed and begins to operate, we are interested in knowing what you think you would do if there was an accident at the plant. Suppose that you had completed your morning run and there was an accident at Shoreham. Everyone living within ten miles of the plant was advised to evacuate. Schoolbus drivers were expected to help evacuate school children. What do you think you would do first?

First, I would report to work so that I could pick up school children in the evacuation zone and drive them to a shelter.

First, I would make sure that my family was safely out of the evacuation zone.

First, I would leave the evacuation zone to make sure that I was in a safe place.

First, I would do something else. _____

(Please specify)

10) If there was a nuclear accident at Shoreham requiring the evacuation of people within a ten mile zone, how dangerous do you think it would be for you to spend several hours driving school children out of the evacuation zone?

- so dangerous that it would be life threatening
- very dangerous
- somewhat dangerous
- not dangerous
- I don't know.

11) Do you agree or disagree with the following statements

<u>Agree</u>	<u>Disagree</u>	<u>Don't Know</u>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Evacuation of school children during a nuclear emergency should be done by specially trained personnel, not by school bus drivers.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In the event of a nuclear emergency at Shoreham it would be the obligation of everyone to first look after the health and safety of their family.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The best way to evacuate school children from an unsafe area is to have their parents pick them up at school.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In the event of a nuclear emergency at Shoreham, a schoolbus driver must place duty to drive the school bus over duty to family.

12) Do you currently have any children who live at home with you?

- yes
- no

13) If you have children living at home with you, how old is the youngest?

- under 5
- 5 to 12
- 13 to 18
- over 18

14) If you have children living at home with you, in what district do they attend school?

(School District)

15) What is your current marital status?

- married widowed
 single divorced or separated

16) If married, does your spouse currently work full time (30 hours a week or more)?

- yes
 no

17) What is the last grade of school that you completed?

- some high school or less
 high school graduate
 some college
 college graduate

18) What is your age category?

- under 25
 25-35
 36-50
 51-65
 over 65

19) What is your sex?

- male female

THANK YOU FOR YOUR COOPERATION

ATTACHMENT 4

D R A F T

RESPONSES OF EMERGENCY PERSONNEL TO A POSSIBLE ACCIDENT
AT THE SHOREHAM NUCLEAR POWER PLANT

October, 1982

Prepared for Suffolk County

by

Social Data Analysts, Inc.

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ABOUT SOCIAL DATA ANALYSTS, INC.

Social Data Analysts, Inc. is a Long Island based research and polling company that has conducted more than 100 social surveys in the last ten years. Clients have included Newsday, The Boston Globe, The Baltimore Sun, Gannett-News Service, Brookhaven National Laboratories, Columbia University, the National Bureau of Economic Research, and the Long Island Lighting Company. Social Data Analysts is a member of the National Council on Public Opinion Polls and the American Association of Public Opinion Researchers. (Dr. Stephen Cole is President of Social Data Analysts. Dr. Cole, who received his Ph.D. in sociology from Columbia University in 1967, is also a professor of sociology at the State University of New York at Stony Brook. He is the author of seven books, including a popular research methods text and more than 25 articles published in journals such as Science, Scientific American, and Public Opinion Quarterly. Ann Harriet Cole is Director of Field Research. She received an M.A. degree in sociology from Stony Brook in 1975 and has more than 10 years of experience conducting social surveys.

EXECUTIVE SUMMARY

In order for the Long Island Lighting Company Shoreham nuclear power plant to receive an operating license from the Nuclear Regulatory Commission a satisfactory evacuation plan providing for the safety of community residents must be filed. In order to help the County and its consultants prepare such an evacuation plan, Social Data Analysts, Inc. conducted two surveys among two groups of emergency personnel workers.

In the event of a radiological emergency at Shoreham several groups of people will play a crucial role in helping with the evacuation of citizens in the area of the plant. Although no plan has yet been adopted, school bus drivers and volunteer firemen are typically expected to play important roles in any evacuation. School bus drivers are needed to drive school children from schools within the evacuation zone to shelters outside of the evacuation zone. Volunteer firemen are needed to fight any fires within the evacuation zone and to help with other evacuation tasks.

If a nuclear accident requiring evacuation did occur at Shoreham it is possible that both school bus drivers, volunteer firemen and other emergency personnel would face a difficult role conflict. On the one hand they would have their designated responsibilities under the evacuation plan and on the other they would have their responsibility to their own family. We cannot simply assume that all or most emergency personnel will place their duty to help with evacuation over their duty to look after the health and safety of their families. The two surveys we conducted had as their primary goal to estimate what proportion

of both school bus drivers and volunteer firemen could be counted upon to report quickly for their evacuation assignments.

We conducted a total of 246 interviews with school bus drivers driving for the following school districts (all within a ten mile radius of the Shoreham plant): Eastport Union Free School District, Middle Island Central School District, Riverhead Central School District, Shoreham-Wading River School District, South Manor Union Free School District of Brookhaven. These 246 interviews represent close to the total population of drivers for these districts and a substantial majority of all drivers for school districts within a ten mile zone of the plant.

All data were collected through a self-administered questionnaire which was distributed to bus drivers at three different orientation meetings on the morning of September 7, 1982. For more information about how this survey was conducted see Appendix A.

Responses given by school bus drivers to all questions asked in the survey are presented in Table 1. The most significant question in the survey was number 16 in which we asked the drivers what they would do if there was a nuclear accident at Shoreham. (For the exact wording of this question see Table 1 or the questionnaire in Appendix B.) We posited a scenario in which a nuclear accident at Shoreham required the evacuation of all people within a ten mile zone of the plant. We asked the drivers to think what they would do if this happened just after they had completed their morning run. Fully 69% said that they would first make sure that their family was safely out of the eva-

evacuation zone; 24% said that they would first report to work to help with the evacuation of school children; 3% said that they would immediately leave the evacuation zone; and 4% volunteered that they would first check on their families and then go to drive the school bus.

These data lead us to conclude that a substantial majority of bus drivers would handle the role conflict they face by first looking after the health and safety of their families. The evacuation of school children is a task which must be performed very quickly. Successful evacuation of school children would require that bus drivers report to work immediately once the evacuation advisory was made. Even if some of the bus drivers would attempt to return to work after looking after the safety of their family, it might be too late for them to accomplish the evacuation in a timely manner.

In evaluating the extent to which the survey we conducted accurately predicts the behavior of school bus drivers in a real emergency, we must consider that the questionnaire was filled out in a work setting at which the bus drivers' supervisors were present and in a relatively calm non-emergency situation. Interviews with some bus drivers indicated that some of them may have been afraid to say that they would not report to drive the bus; fearing that they would lose their jobs. Also, under the actual conditions of an accident, it is possible that some bus drivers who said that they would report to drive might become frightened and attempt to leave the evacuation area. The data suggest that it would not be safe to count on a majority of school bus drivers helping with the evacuation of school

children.

Fully 86% of the school bus drivers agreed with the statement: "In the event of a nuclear emergency at Shoreham it would be the obligation of everyone to first look after the health and safety of their own family." Only 8% disagreed with this and 6% had no opinion. Only 12% agreed with the statement: "In the event of a nuclear emergency at Shoreham, a school bus driver must place duty to drive the school bus over duty to family." Seventy-four percent disagreed with this statement and 14% had no opinion.

Another goal of this survey was to find out what characteristics of school bus drivers would be correlated with the likelihood of them reporting for evacuation duty in case of a nuclear accident. Data on this question are presented in Table 2. Here we show what proportion of drivers say they would first report to work and what proportion say that duty to drive the school bus must be placed over duty to family broken down by the answers to other questions and demographic characteristics.

Among the main findings were the following:

- 1) The drivers least likely to say that they would immediately report to work were those who drove for the Shoreham-Wading River school district- the district which is closest to the plant and for which a quick evacuation might be the most important.

- 2) Those drivers who are the most afraid of nuclear power plants are less likely to say they will report to work quickly than are those who are less afraid. Level of knowledge about nuclear power was not correlated with the likelihood of

reporting to work quickly.

3) Attitudes towards nuclear power is very strongly correlated with likelihood of reporting to work immediately. Fully 51% of those who describe themselves as supporters of nuclear power say they would report to work immediately as opposed to only 16% who describe themselves as opponents and 22% who say they haven't made up their minds yet. Forty-nine percent of those favoring the completion of the Shoreham plant as opposed to 17% opposing its completion and 22% with no opinion on this issue say that they would report to work first. As the data in Table 1 indicate, however, fully 60% of the school bus drivers oppose the completion of Shoreham while only 20% favor its completion.

4) Drivers who believe that it would be very dangerous for them to work in the evacuation zone are significantly less likely to say that they would report to work first than are those who are less concerned with the personal danger.

5) Drivers with children living at home with them were less likely to say that they would report to work first; but even a significant majority of those who did not have children living at home with them said that they would first look after the health and safety of their family.

6) Drivers who had children of their own attending school within the ten mile zone were less likely to say that they would report to work than those who had children attending school outside of the ten mile zone.

The survey of volunteer firemen was conducted on the

telephone among 291 members of the following departments: Miller Place, Ridge, Riverhead, Rocky Point, and Sound Beach. There were a total of 467 firemen in these departments. Only 32 or 10% of the firemen that we contacted refused to participate in the survey. Most of the firemen whom we did not interview could not be reached on the telephone. For a more detailed discussion of the methods used in conducting this survey see Appendix A.

The answers given by the firemen to all questions contained in the survey are presented in Table 3. Pretests conducted with firemen indicated that although a significant number of firemen felt that it was their obligation to first look after the health and safety of their family in case of a nuclear accident, some of them would attempt to check in on their family and then report quickly for evacuation duty. We asked a series of questions aimed at estimating what proportion of firemen would report for duty within a relatively short time after the evacuation advisory was issued.

We first asked the firemen a question similar to that asked of the school bus drivers. (For the exact wording of this question see Table 3 or Appendix C.) Sixty-eight percent of the firemen said that they would first make sure that their family was safely out of the evacuation zone, 21% said that they would first report to the fire station to help with evacuation, 1% said that they would leave the evacuation zone, 7% said that they would do something else (generally involving an activity which would delay their reporting to duty) and 4% said that they did not know what they would do.

For those firemen who said that they would first make sure

that their family was safely out of the evacuation zone we asked them how they would do this. Fifty-one percent said that they would call home and tell their family to leave without them; 32% said that they would drive their family to a safe place outside of the evacuation zone; 12% said that they would seek to protect their family in some other way (generally involving an activity such as taking a boat to Connecticut which would delay their reporting to work); and 5% said that they did not know what they would do.

Combining the answers to these two questions we constructed an index which suggests that 55% would attempt to report to work relatively quickly, 36% would look after the safety of themselves and their family in a way which would prevent them from reporting quickly to duty, and 8% did not know what they would do.

From both the pretests and the actual interviews with the firemen it was evident that the situation we posed for them did provide them with a significant amount of role conflict. Most of the firemen would want to help in an emergency such as would be created in the event of a nuclear accident; but they also feel a strong sense of obligation to their families. The data lead to the conclusion that at least a significant minority of firemen would resolve this role conflict by looking after the needs of their family rather than report to duty.

This conclusion was supported by answers given to the agree-disagree questions in which 92% of the firemen agreed that: "In the event of a nuclear emergency at Shoreham it would be the obligation of everyone to first look after the health and

safety of their family." Only 5% disagreed with this and 3% had no opinion. On the other hand only 17% agreed 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." Seventy-seven percent disagreed with this and 6% had no opinion.

In Table 4 we present data which show the likelihood of a fireman reporting to work quickly and the percent saying that a fireman must place duty to the fire department over duty to family broken down by the other questions asked in the survey.

Among the most important findings were the following:

1) Firemen who believe that it is dangerous to live near a nuclear power plant are significantly less likely to indicate that they will report for duty quickly than those who are less concerned about living near a nuclear power plant.

2) Supporters of nuclear energy in general and those who believe that LILCO should complete the Shoreham plant are more likely to say that they will report to work quickly than are those who oppose nuclear energy and oppose the completion of the Shoreham plant. Unlike the school bus drivers, however, a majority of 57% favor the completion of Shoreham whereas 33% oppose its completion. Level of information about nuclear energy was not significantly correlated with likelihood of quickly reporting to duty.

3) Firemen who believed that it was very dangerous for them to serve in the evacuation zone during a radiological emergency were significantly less likely to say that they would report for work than those who are less worried about the personal danger.

However, fully 50% of the firemen believe that it would be "much more dangerous than normal fire fighting work" for them to spend a day working within the evacuation zone.

4) Firemen who have children living at home with them are less likely to indicate that they will quickly report for duty than those who do not have children living at home with them.

TABLE 1

ANSWERS GIVEN TO QUESTIONS ON SCHOOL BUS DRIVERS QUESTIONNAIRE

5. For what school district do you drive?	
Eastport Union Free School District	8%
Middle Island Central School District	45
Riverhead Central School District	25
Shoreham-Wading River School District	12
South Manor Union Free School District of Brookhaven	5
Other or combination	<u>4</u>
Total	99%
6. For how many years have you driven for this district?	
less than one	18%
one	15
two to three	18
four to five	18
six to ten	20
more than ten	<u>1</u>
Total	100%
7. What is the Zip Code of your home address?	
within 10 mile zone	42%
outside of 10 mile zone	<u>58</u>
Total	100%
8. In general, how dangerous do you think it would be to live near an airport?	
very dangerous	7%
dangerous	32
not too dangerous	<u>61</u>
Total	100%
9. In general, how dangerous do you think it would be to live near a mental hospital?	
very dangerous	6%
dangerous	17
not too dangerous	<u>76</u>
Total	99%

Table 1 Continued

10. In general, how dangerous do you think it would be to live near a coal fired power plant?	
very dangerous	12%
dangerous	29
not too dangerous	<u>59</u>
Total	100%
11. In general, how dangerous do you think it would be to live near a nuclear power plant?	
very dangerous	64%
dangerous	23
not too dangerous	<u>13</u>
Total	100%
12. Would you describe yourself as:	
a supporter of nuclear power plants as a means of providing electricity	16%
an opponent of nuclear power plants	48
I haven't made up my mind yet on this issue	<u>36</u>
Total	100%
13. Do you think that LILCO should complete and operate the Shoreham nuclear power plant?	
yes	20%
no	60
I don't know	<u>20</u>
Total	100%
14. During normal operation, which type of electricity plant pollutes the air the least?	
an oil-fired plant	10%
a coal-fired plant	13
a nuclear-fired plant	33
I am not sure	<u>45</u>
Total	101%

Table 1 Continued

15.	During <u>normal operation</u> does a nuclear power plant give off a dangerous level of radiation?	
	yes	14%
	no	38
	I am not sure	48
	Total	100%
16.	Assuming that the Shoreham nuclear power plant is licensed and begins to operate, we are interested in knowing what you think you would do if there was an accident at the plant. Suppose that you had completed your morning run and there was an accident at Shoreham. Everyone living within ten miles of the plant was advised to evacuate. School bus drivers were expected to help evacuate school children. What do you think you would do <u>first</u> ?	
	First, I would report to work so that I could pick up school children in the evacuation zone and drive them to a shelter.	24%
	First, I would make sure that my family was safely out of the evacuation zone.	69
	First, I would leave the evacuation zone to make sure that I was in a safe place.	3
	First, I would do something else _____.	-
	First, check on family and then go to drive the bus.	4
	Total	100%
17.	If there was a nuclear accident at Shoreham requiring the evacuation of people within a ten mile zone, how dangerous do you think it would be for you to spend several hours driving school children out of the evacuation zone?	
	so dangerous that it would be life threatening	32%
	very dangerous	34
	somewhat dangerous	25
	not dangerous	1
	I don't know	8
	Total	100%

Table 1 Continued

18. Do you agree or disagree that evacuation of school children during a nuclear emergency should be done by specially trained personnel, not by school bus drivers.	
agree	51%
disagree	35
don't know	<u>14</u>
Total	100%
19. Do you agree or disagree that in the event of a nuclear emergency at Shoreham it would be the obligation of everyone to first look after the health and safety of their family.	
agree	86%
disagree	8
don't know	<u>6</u>
Total	100%
20. Do you agree or disagree that the best way to evacuate school children from an unsafe area is to have their parents pick them up at school.	
agree	14%
disagree	74
don't know	<u>12</u>
Total	100%
21. Do you agree or disagree that in the event of a nuclear emergency at Shoreham, a schoolbus driver must place duty to drive the school bus over duty to family.	
agree	12%
disagree	74
don't know	<u>14</u>
Total	100%
22. Do you currently have any children who live at home with you?	
yes	78%
no	<u>22</u>
Total	100%

Table 1 Continued

23. If you have children living at home with you, how old is the youngest?	
under 5	22%
5 to 12	39
13 to 18	24
over 18	<u>15</u>
Total	100%
24. If you have children living at home with you, in what district do they attend school?	
within 10 mile zone	88%
outside 10 mile zone	<u>12</u>
Total	100%
25. What is your current marital status?	
married	78%
single	6
widowed	2
divorced or separated	<u>14</u>
Total	100%
26. If married, does your spouse currently work full time (30 hours a week or more)?	
yes	77%
no	<u>23</u>
Total	100%
27. What is the last grade of school that you completed?	
some high school or less	14%
high school graduate	60
some college	21
college graduate	<u>5</u>
Total	100%

Table 1 Continued

28. What is your age category?

under 25	4%
25-35	31
36-50	44
51-65	20
over 65	<u>1</u>
Total	100%

29. What is your sex?

male	23%
female	<u>77</u>
Total	100%

TABLE 2

CORRELATES OF ATTITUDES TOWARDS EMERGENCY SERVICE

	<u>% Saying they would first report to work</u>	<u>% Saying duty to drive school bus must be placed over duty to family</u>
5. For what school district do you drive?		
Eastport Union Free School District	29	10
Middle Island Central School District	23	9
Riverhead Central School District	29	17
Shoreham-Wading River School District	10	7
South Manor Union Free School District of Brookhaven	20	23
Other or combination	38	12
6. For how many years have you driven for this district?		
less than one	28	7
one	20	11
two to three	15	18
four to five	23	15
six to ten	26	4
more than ten	35	17
7. What is the Zip Code of your home address?		
within 10 mile zone	21	11
outside of 10 mile zone	26	12
8. In general, how dangerous do you think it would be to live near an airport?		
very dangerous	25	0
dangerous	22	15
not too dangerous	23	10

Table 2 Continued

	<u>% Saying they would first report to work</u>	<u>% Saying duty to drive school bus must be placed over duty to family</u>
9. In general, how dangerous do you think it would be to live near a mental hospital?		
very dangerous	20	8
dangerous	19	13
not too dangerous	25	11
10. In general, how dangerous do you think it would be to live near a coal fired power plant?		
very dangerous	27	12
dangerous	24	9
not too dangerous	22	12
11. In general, how dangerous do you think it would be to live near a nuclear power plant?		
very dangerous	17	10
dangerous	33	14
not too dangerous	33	15
12. Would you describe yourself as:		
a supporter of nuclear power plants as a means of providing electricity	51	18
an opponent of nuclear power plants	16	11
I haven't made up my mind yet on this issue	22	9
13. Do you think that LILCO should complete and operate the Shoreham nuclear power plant?		
yes	49	16
no	17	9
I don't know	22	13

Table 2 Continued

	% Saying they would first report to work	% Saying duty to drive school bus must be placed over duty to family
14. During normal operation, which type of electricity plant pollutes the air the least?		
an oil-fired plant	22	20
a coal-fired plant	38	28
a nuclear-fired plant	16	7
I am not sure	25	7
15. During <u>normal operation</u> does a nuclear power plant give off a dangerous level of radiation?		
yes	22	20
no	23	12
I am not sure	25	8
17. If there was a nuclear accident at Shoreham requiring the evacuation of people within a ten mile zone, how dangerous do you think it would be for you to spend several hours driving school children out of the evacuation zone?		
so dangerous that it would be life threatening	16	12
very dangerous	26	10
somewhat dangerous	36	15
not dangerous	*	*
I don't know	18	5
18. Do you agree or disagree that evacuation of school children during a nuclear emergency should be done by specially trained personnel, not by school bus drivers.		
agree	16	7
disagree	38	20
don't know	20	3

Table 2 Continued

	<u>% Saying they would first report to work</u>	<u>% Saying duty to drive school bus must be placed over duty to family</u>
19. Do you agree or disagree that in the event of a nuclear emergency at Shoreham it would be the obligation of everyone to first look after the health and safety of their family.		
agree	21	8
disagree	47	50
don't know	31	14
20. Do you agree or disagree that the best way to evacuate school children from an unsafe area is to have their parents pick them up at school.		
agree	23	10
disagree	27	13
don't know	4	4
21. Do you agree or disagree that in the event of a nuclear emergency at Shoreham, a school bus driver must place duty to drive the school bus over duty to family.		
agree	75	
disagree	15	
don't know	25	
22. Do you currently have any children who live at home with you?		
yes	21	10
no	37	17
23. If you have children living at home with you, how old is the youngest?		
under 5	12	5
5 to 12	22	7
13 to 18	14	7
over 18	41	32

Table 2 Continued

	<u>% Saying they would first report to work</u>	<u>% Saying duty to drive school bus must be placed over duty to family</u>
24. If you have children living at home with you, in what district do they attend school?		
within 10 mile zone	17	7
outside 10 mile zone	31	7
25. What is your current marital status?		
married	23	11
single	15	7
widowed	*	*
divorced or separated	30	16
26. If married, does your spouse currently work full time (30 hours a week or more)?		
yes	23	8
no	23	19
27. What is the last grade of school that you completed?		
some high school or less	41	14
high school graduate	21	10
some college	24	13
college graduate	18	8
28. What is your age category?		
under 25	11	0
25-35	15	10
36-50	23	8
51-65	43	23
over 65	*	*
29. What is your sex?		
male	26	17
female	23	9

TABLE 3

ANSWERS GIVEN TO QUESTIONS ON VOLUNTEER FIREMEN QUESTIONNAIRE

4. For how many years have you worked with this fire district?

one or less	11%
two to three	10
four to five	17
six to ten	21
more than ten	<u>41</u>
TOTAL	100%

5. What is the Zip Code of your home address?

within 10 mile zone	59%
outside of 10 mile zone	<u>41</u>
TOTAL	100%

10. In general, how dangerous do you think it would be to live near an airport?

very dangerous	3%
dangerous	19
not too dangerous	75
Don't know	<u>3</u>
TOTAL	100%

11. In general, how dangerous so you think it would be to live near a mental hospital?

very dangerous	1%
dangerous	16
not too dangerous	79
Don't know	<u>4</u>
TOTAL	100%

Table 3 Continued

12. In general, how dangerous do you think it would be to live near a coal fired power plant?	
very dangerous	2%
dangerous	19
not too dangerous	76
	<u>3</u>
TOTAL	100%
13. In general, how dangerous do you think it would be to live near a nuclear power plant?	
very dangerous	20%
dangerous	29
not too dangerous	46
Don't know	<u>6</u>
TOTAL	101%
14. Would you describe yourself as:	
a supporter of nuclear power plants as a means of providing electricity	35%
an opponent of nuclear power plants	19
I haven't made up my mind yet on this issue	<u>46</u>
TOTAL	100%
15. Do you think that LILCO should complete and operate the Shoreham nuclear power plant?	
yes	57%
no	33
Don't know	<u>10</u>
TOTAL	100%
16. During <u>normal operation</u> , which type of electricity plant pollutes the air the least?	
an oil-fired plant	9%
a coal-fired plant	8
a nuclear-fired plant	59
I am not sure	<u>24</u>
TOTAL	100%

Table 3 Continued

17. During normal operation does a nuclear power plant give off a dangerous level of radiation?

yes	9%
no	63
you're not sure	<u>28</u>
TOTAL	100%

18. Assuming that the Shoreham nuclear power plant is licensed and begins to operate, we are interested in knowing what you think you would do if there was an accident at the plant. Suppose that you were at work on a weekday morning and there was an accident at Shoreham. Everyone living within ten miles of the plant was advised to evacuate. Volunteer firemen were expected to help with the evacuation. What do you think you would do first?

first, you would report to the fire station so that you could help with fire fighting and evacuation in the evacuation zone, or	21%
first, you would make sure that your family was safely out of the evacuation zone, or	68
first, you would leave the evacuation zone to make sure that you were in a safe place, or	1
first, you would do something else	7
Don't know	<u>4</u>
TOTAL	100%

19. How would you make sure that your family was safely out of the evacuation zone?

go home and drive your family to a safe place out of the evacuation zone	32%
call home and tell your family to leave without you	51
some other way _____	12
Don't know	<u>5</u>
TOTAL	100%

Table 3 Continued

20. Where would you go?	
someplace in Suffolk County	16%
someplace in Nassau County	15
someplace in New York City	11
some other place _____	41
you don't know	<u>17</u>
TOTAL	100%
21. In terms of miles, about how far away is this place from your home?	
10 miles or less	9%
11 to 20 miles	8
21 to 30 miles	16
31 to 40 miles	10
41 to 50 miles	7
more than 50 miles	46
Don't know	<u>5</u>
TOTAL	101%
22. After your family was in a safe place would you return to the fire house to help with evacuation?	
yes	58%
no	20
I would try	11
Don't know	<u>10</u>
TOTAL	99%
23. If there was a nuclear accident at Shoreham requiring the evacuation of people within a ten mile zone, how dangerous do you think it would be for you to spend a day working within the evacuation zone?	
much more dangerous than normal fire fighting work	50%
somewhat more dangerous than normal fire fighting work	17
about equally dangerous	20
less dangerous	4
not dangerous at all	5
Don't know	<u>4</u>
TOTAL	100%

Table 3 Continued

24. Do you agree or disagree that helping with the evacuation of people from the emergency zone during a nuclear emergency should be the job of specially trained personnel rather than the job of volunteer firemen.

agree	70%
disagree	27
Don't know	<u>3</u>
TOTAL	100%

25. Do you agree or disagree that in the event of a nuclear emergency at Shoreham it would be the obligation of everyone to first look after the health and safety of their family.

agree	92%
disagree	5
Don't know	<u>3</u>
TOTAL	100%

26. Do you agree or disagree that only firemen who have specifically volunteered should be expected to help with off site evacuation during a nuclear emergency.

agree	66%
disagree	30
Don't know	<u>4</u>
TOTAL	100%

27. Do you agree or disagree that in the event of a nuclear emergency at Shoreham, a volunteer fireman must place duty to the fire department over duty to family.

agree	17%
disagree	77
Don't know	<u>6</u>
TOTAL	100%

Table 3 Continued

28. Do you currently have any children living at home with you?	
yes	65%
no	<u>35</u>
TOTAL	100%
29. How old is the youngest child living at home with you?	
under 5	40%
5 to 12	36
13 to 18	15
over 18	<u>10</u>
TOTAL	100%
32. What is your current marital status?	
married	81%
single	16
widowed	1
divorced or separated	<u>2</u>
TOTAL	100%
33. If married, does your spouse currently work full time (30 hours a week or more)?	
yes	39%
no	<u>61</u>
TOTAL	100%
34. What is the last grade of school that you completed?	
some high school or less	7%
high school graduate	44
some college	30
college graduate	<u>19</u>
TOTAL	100%

Table 3 Continued

35. What is your age category?

under 25	13%
25-35	36
36-50	36
51-65	11
over 65	<u>5</u>
TOTAL	101%

36. What is your sex?

male	98%
female	<u>2</u>
TOTAL	100%

TABLE 4

CORRELATES OF ATTITUDES TOWARDS EMERGENCY SERVICE

	<u>% Saying they would report to duty quickly</u>	<u>% Saying a fireman must place duty to the fire department over duty to family</u>
1. For what fire district do you work?		
Miller Place	71	18
Ridge	65	14
Riverhead	57	26
Rocky Point	53	14
Sound Beach	32	4
4. For how many years have you worked with this fire district?		
one year or less	58	23
two to three	69	17
four to five	47	12
six to ten	53	10
more than ten	56	22
5. What is the Zip Code of your home address?		
within 10 mile zone	51	14
outside of 10 mile zone	62	23
10. In general, how dangerous do you think it would be to live near an airport?		
very dangerous	62	12
dangerous	52	13
not too dangerous	57	19

Table 4 Continued

	% Saying they would report to <u>duty quickly</u>	% Saying a fireman must place duty to the fire department over duty <u>to family</u>
11. In general, how dangerous do you think it would be to live near a mental hospital?		
very dangerous	25	0
dangerous	54	20
not too dangerous	55	18
12. In general, how dangerous do you think it would be to live near a coal fired power plant?		
very dangerous	67	0
dangerous	62	18
not too dangerous	53	17
13. In general, how dangerous do you think it would be to live near a nuclear power plant?		
very dangerous	43	9
dangerous	58	13
not too dangerous	60	22
14. Would you describe yourself as:		
a supporter of nuclear power plants as a means of providing electricity	63	12
an opponent of nuclear power plants	42	14
I haven't made up my mind yet on this issue	56	23
15. Do you think that LILCO should complete and operate the Shoreham nuclear power plant?		
yes	62	20
no	46	14
I don't know	50	13

Table 4 Continued

	% Saying they would report to duty quickly	% Saying a fireman must place duty to the fire department over duty to family
16. During <u>normal operation</u> , which type of electricity plant pollutes the air the least?		
an oil-fired plant	56	22
a coal-fired plant	47	21
a nuclear-fired plant	57	15
I am not sure	55	20
17. During <u>normal operation</u> does a nuclear power plant give off a dangerous level of radiation?		
yes	58	27
no	60	18
I am not sure	42	14
19. How would you make sure that your family was safely out of the evacuation zone?		
go home and drive your family to a safe place out of the evacuation zone		11
call home and tell your family to leave without you		9
some other way _____		17
20. Where would you go?		
someplace in Suffolk County	50	16
someplace in Nassau County	76	7
someplace in New York City	62	10
some other place _____	44	9
you don't know	36	12

Table 4 Continued

	<u>% Saying they would report to duty quickly</u>	<u>% Saying a fireman must place duty to the fire department over duty to family</u>
21. In terms of miles, about how far away is this place from your home?		
10 miles or less	69	6
11 to 20 miles	77	8
21 to 30 miles	73	8
31 to 40 miles	56	6
41 to 50 miles	50	0
more than 50 miles	42	2
22. After your family was in a safe place would you return to the fire house to help with evacuation?		
yes	62	14
no	17	5
I would try	48	9
Don't know	43	0
23. If there was a nuclear accident at Shoreham requiring the evacuation of people within a ten mile zone, how dangerous do you think it would be for you to spend a day working within the evacuation zone?		
much more dangerous than normal fire fighting work	47	14
somewhat more dangerous than normal fire fighting work	54	13
about equally dangerous	63	26
less dangerous	77	23
not dangerous at all	73	13
24. Do you agree or disagree that helping with the evacuation of people from the emergency zone during a nuclear emergency should be the job of specially trained personnel rather than the job of volunteer firemen.		
agree	51	14
disagree	67	24

Table 4 Continued

	% Saying they would report to duty quickly	% Saying a fireman must place duty to the fire department over duty to family
25. Do you agree or disagree that in the event of a nuclear emergency at Shoreham it would be the obligation of everyone to first look after the health and safety of their family.		
agree	54	14
disagree	93	60
26. Do you agree or disagree that only firemen who have <u>specifically</u> volunteered should be expected to help with off site evacuation during a nuclear emergency.		
agree	64	16
disagree	52	20
27. Do you agree or disagree that in the event of a nuclear emergency at Shoreham, a volunteer fireman must place duty to the fire department over duty to family.		
agree	64	
disagree	52	
28. Do you currently have any children living at home with you?		
yes	51	12
no	63	28
29. How old is the youngest child living at home with you?		
under 5	51	13
5 to 12	49	10
13 to 18	57	4
over 18	56	29

Table 4 Continued

	<u>% Saying they would report to duty quickly</u>	<u>% Saying a fireman must place duty to the fire department over duty to family</u>
32. What is your current marital status?		
married	55	16
single	59	24
widowed	100	100
divorced or separated	29	14
33. If married, does your spouse currently work full time (30 hours a week or more)?		
yes	60	15
no	51	16
34. What is the last grade of school that you completed?		
some high school or less	57	19
high school graduate	57	23
some college	52	11
college graduate	54	15
35. What is your age category?		
under 25	62	8
25-35	52	16
36-50	55	18
51-65	58	13
over 65	64	57
36. What is your sex?		
male	56	17
female	40	20

APPENDIX A
METHODS AND PROCEDURES

In the case of a nuclear accident at the Shoreham nuclear power plant it is possible that some of the personnel who would be expected to play a role in an evacuation plan might face significant role conflict. In the case of an accident, those people who are supposed to play a role in an evacuation plan would be torn between two conflicting roles. On the one hand, every individual has an obligation to his/her family during an emergency. On the other hand, emergency personnel would have an obligation to perform their specified duties during an emergency. We cannot simply assume that all people who are supposed to play a role in an emergency plan will actually show up for duty when the emergency occurs. In order to investigate this topic we were asked by Suffolk County to conduct studies to determine the probability that various emergency personnel would report to duty to perform their emergency role, or would first seek to protect themselves and/or their family from any perceived danger.

Since no evacuation plan currently exist for Shoreham, there was no precise way to designate those groups who would be expected to play a role in an evacuation. Most evacuation plans, however, do expect the police, volunteer firemen, and school bus drivers to play crucial roles. Other groups such as ambulance drivers and field sanitarians might also play crucial roles. However, these latter groups are relatively small in size.

In order to help prepare an adequate emergency eva-

cuation plan, Suffolk County wanted to collect data which would indicate how crucial emergency personnel might react in an accident situation. The County attempted to obtain the cooperation of the Suffolk County police, volunteer fire departments within a ten mile area of the Shoreham plant, and school districts within a ten mile area of the Shoreham plant. The aim was to interview policemen, volunteer firemen, and school bus drivers. The Suffolk County police refused to provide the County Executive's Office with a list of policemen with their home phone numbers because the release of this information was prohibited in their contract. Because there was no way to obtain the names and phone numbers of Suffolk County police we were unable to interview this crucial group. We did, however, obtain the cooperation of the school bus companies and school districts and volunteer fire departments, and were able to complete surveys with both school bus drivers and volunteer firemen.

School Bus Drivers

Since some of the school districts were hesitant to release the names and telephone numbers of school bus drivers who drove for their district, but were willing to allow us to interview the school bus drivers at a pre-school orientation meeting, data from this group were collected by a self administered questionnaire.

We obtained the cooperation of the Riverhead Central School District, which operates its own bus system and also serves several other school systems in the area, the Seaman Bus Company which serves the Shoreham Wading-River School District,

and the Suburbia Bus Company. These three companies serve the following school districts: The Eastport Union Free School District, the Middle Island Central School District, the Riverhead Central School District, the Shoreham Wading-River School District, and the South Manor Union Free School District of Brookhaven. An attempt was made to obtain the cooperation of the Coram Bus Company which provides drivers for the Rocky Point School District. This bus company, however, did not provide us with a setting in which we could administer the questionnaire to their bus drivers. Thus, we were unable to obtain data from the approximately 25 drivers who drive for the Rocky Point school system.

All the data were obtained on September 7, 1982. On that morning the Riverhead School District and the two bus companies which cooperated with the study held pre school orientation meetings for their bus drivers. One of our representatives attended each of these three sessions and administered the questionnaire to all those bus drivers who were in attendance.

Although some school bus drivers may have been absent from this orientation meeting and a small number may have not filled out the questionnaire, the survey data we have represent the opinions of virtually all of the bus drivers for the five school districts covered in this survey. The statistics we compiled on how many bus drivers completed the questionnaire in each of the three locations corresponded closely with the number of bus drivers we were told by the managers of the bus company would be in attendance at the meetings. Since virtually all of the bus drivers completed the questionnaire, we have a population of bus dri-

vers for these five school districts rather than a sample. We, therefore, do not have to be concerned with whether or not the statistics generated by this study of school bus drivers are representative of the population of school bus drivers. We completed interviews with 21 drivers for the Eastport Union Free School District, 111 drivers for the Middle Island Central School District, 62 drivers for the Riverhead Central School District, 30 drivers for the Shoreham Wading-River School District, 13 drivers for the South Manor Union Free School District of Brookhaven, and 9 drivers who drove either for other districts or for a combination of the above mentioned districts. A total of 246 interviews were completed with school bus drivers. The questionnaire used in conducting this survey is reproduced in Appendix B.

Design of the Questionnaire

The questionnaire used in this study was prepared by Dr. Stephen Cole, President of Social Data Analysts, Inc. in consultation with Dr. Kai Erikson, Professor of Sociology at Yale University. Dr. James Johnson, Jr., Assistant Professor of Geography at UCLA, also provided comments on the first draft of the questionnaire. A preliminary meeting was held on August 3rd between Drs. Erikson and Cole to discuss the purposes of the study and to work on the questionnaire. After this meeting Dr. Cole constructed a first draft of the questionnaire which was then sent to Drs. Erikson and Johnson. After Drs. Erikson and Johnson commented on the questionnaire an additional draft was prepared. We then pretested the questionnaire with nine school

bus drivers who worked for either the Seaman Bus Company or the Riverhead Central School District. The pretest was administered by Ann Harriet Cole, Director of Field Research for Social Data Analysts, Inc. After the drivers filled out the questionnaire in the pretest, Mrs. Cole discussed with them the questionnaire and their reactions to it. On the basis of this pretest several changes were made in the questionnaire to make it more intelligible to typical school bus drivers. In addition, it became evident from the pretest that school bus drivers felt apprehensive about saying that in the case of an emergency they might first go home rather than report to work to drive the school bus. Several of the drivers who were interviewed in the pretest expressed fear that if it became known that they would not report to work during an emergency they might be fired from their jobs.

Although all the questionnaires were anonymous, it should be remembered that the questionnaires were administered in a work setting and in the presence of the supervisors of the school bus drivers. Given this setting which emphasized the importance of work and the possible fear that some of the drivers may have felt about saying that they would not report for work during a nuclear emergency, it is possible that the results obtained from this survey underestimate the proportion of bus drivers who would look after the needs of their family rather than report to drive a school bus during a nuclear emergency.

After the questionnaires were filled out by the school bus drivers they were checked over by a research assistant to make sure that they had been filled out correctly. The data were

then entered onto the computer and after being checked for errors the data were analyzed using the SPSS statistical program.

Volunteer Firemen

Through the efforts of the Suffolk County Executive's Office the cooperation of the Ridge Volunteer Fire Department, the Miller Place Volunteer Fire Department, and the Sound Beach Volunteer Fire Department were obtained. These fire departments provided the County Executive's Office with an up-to-date list of their current members. The Ridge list and the Miller Place list contained phone numbers. The Sound Beach list did not. We independently contacted the Sound Beach Fire Department and obtained the phone numbers for all the firemen from that department.

The Commissioners of the Rocky Point Fire Department had expressed some hesitancy to participate in the study. After a meeting, however, with Ann Harriet Cole, Director of Field Research for Social Data Analysts, Inc., the Commissioners of the Rocky Point Fire Department agreed to cooperate and provided us with a complete list of all the members of their department. We also decided to include members of the Riverhead Volunteer Fire Department in this survey. Mrs. Cole met with the commissioners of that department and obtained their cooperation. A significant part of the area served by the Riverhead Fire Department is within a ten mile zone of the Shoreham nuclear power plant and part of the area served by this fire department is outside the ten mile zone. We nonetheless believed it important to obtain information from members of this department.

An attempt was made to interview all members of the five

fire departments included in the study. There were 83 members of the Ridge Department, 144 members of the Riverhead Department, 60 members of the Sound Beach Department, 110 members of the Rocky Point Department, and 70 members of the Miller Place Fire Department. The interviewing for this study was conducted on the telephone. Given the available time and resources to conduct this study it was not possible for us to reach all of the 467 members of the five fire departments. We were able to complete interviews with 291 firemen, or a total of 62% of all firemen. Since the procedure used in this survey is not based upon sampling, but represents an attempt to interview an entire population, sampling statistics estimating the sampling error would not be appropriate. We should point out, however, that it is possible although there is no evident reason why it should be so, for those firemen whom we were not able to contact on the telephone to have somewhat different attitudes than those firemen whom we were able to contact on the telephone.

Table A-1 presents data showing the outcome of all the interviewing done for the firemen survey. Of the 322 firemen we were able to contact on the telephone, only 32 or 10% refused to participate in the survey. The majority of the firemen for whom we did not complete interviews with we were unable to reach, receiving a no answer or busy signal on the four or more attempts we made to reach them.

TABLE A-1

OUTCOME FOR FIREMEN SURVEY

	<u>Ridge</u>	<u>River- head</u>	<u>Sound Beach</u>	<u>Rocky Point</u>	<u>Miller Place</u>	<u>Total</u>
Number completed	51	107	44	55	34	291
Number not completed	32	37	16	55	36	176
no answer	10	7	3	14	11	45
busy (person not at home - call back - make appointment)	8	10	5	12	13	48
wrong phone number, phone disconnected	8	3	2	13	6	32
no longer a fireman	1	2	4	5	1	13
refusal	5	12	1	9	5	32
other	-	3	1	2	-	6
Total	83	144	60	110	70	467

All the interviewing was conducted from a rented telephone facility in Melville, New York. Interviewing was done on the evenings of September 28, September 30, and during the day on Saturday, October 2. Evening calls were made between the hours of 6:00 and 10:00 p.m. and Saturday calls were made between the hours of 10:00 a.m. and 3:00 p.m. All the interviewers were experienced and trained people who had previously worked for Social Data Analysts, Inc. Before the survey was begun the interviewers participated in a one hour training session in which the questionnaire was gone over several times and explained to the interviewers. During the interviewing, there was always at least one trained supervisor present on the floor to check the questionnaires for accuracy and to listen in on interviews to make sure that the interviewers were in fact following the designated interview schedule.

Design of the Questionnaire

The questionnaire used in this study was prepared by Dr. Stephen Cole, President of Social Data Analysts, Inc. in consultation with Dr. Kai Erikson, Professor of Sociology at Yale University. Dr. James H. Johnson, Jr., Assistant Professor of Geography at UCLA, also provided comments on the first draft of the questionnaire. After this meeting Dr. Cole constructed a first draft of the questionnaire which was sent to Drs. Erikson and Johnson. After Drs. Erikson and Johnson commented on the questionnaire an additional draft was prepared.

First, we conducted an informal pretest with the Riverhead fire commissioners. Mrs. Cole went over the questionnaire with

them. Then a telephone pretest was conducted by Dr. Stephen Cole who personally interviewed six firemen. (These six were not called to respond to the final questionnaire.) Based upon this pretest a final draft was prepared after consultation with Dr. Erikson.

After the interviews were completed the supervisor checked the survey instrument to make sure that it had been filled out properly. The data were then entered directly onto the computer and verified for entry errors. Analysis for the data was conducted using the SPSS statistical program.

APPENDIX B

SUFFOLK COUNTY SURVEY

Schoolbus Drivers

September, 1982

As you probably know, the Long Island Lighting Company has applied for a license that will enable it to operate its nuclear power plant at Shoreham. If this plant goes into operation it is essential to have an adequate emergency evacuation plan in case there is a nuclear accident at the plant. Suffolk County is trying to develop such a plan and needs some information from you. This questionnaire is completely anonymous and confidential. Results of this survey will only be presented in statistical tables.

Please check the appropriate box.

1) For what school district do you drive?

- Eastport Union Free School District
- Middle Island Central School District
- Riverhead Central School District
- Shoreham-Wading River School District
- South Manor Union Free School District of Brookhaven

2) For how many years have you driven for this district?

- | | |
|--|--|
| <input type="checkbox"/> less than one | <input type="checkbox"/> four to five |
| <input type="checkbox"/> one | <input type="checkbox"/> six to ten |
| <input type="checkbox"/> two to three | <input type="checkbox"/> more than ten |

3) What is the Zip Code of your home address?

4) In general, how dangerous do you think it would be to live near each of the following:

	Very Dangerous	Dangerous	Not too Dangerous
an airport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a mental hospital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a coal fired power plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a nuclear power plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5) Would you describe yourself as:

- a supporter of nuclear power plants as a means of providing electricity.
- an opponent of nuclear power plants.
- I haven't made up my mind yet on this issue.

6) Do you think that LILCO should complete and operate the Shoreham nuclear power plant?

- yes
- no
- I don't know.

7) During normal operation, which type of electricity plant pollutes the air the least?

- an oil-fired plant
- a coal-fired plant
- a nuclear-fired plant
- I am not sure.

8) During normal operation does a nuclear power plant give off a dangerous level of radiation?

- yes
- no
- I am not sure.

9) Assuming that the Shoreham nuclear power plant is licensed and begins to operate, we are interested in knowing what you think you would do if there was an accident at the plant. Suppose that you had completed your morning run and there was an accident at Shoreham. Everyone living within ten miles of the plant was advised to evacuate. Schoolbus drivers were expected to help evacuate school children. What do you think you would do first?

- First, I would report to work so that I could pick up school children in the evacuation zone and drive them to a shelter.
- First, I would make sure that my family was safely out of the evacuation zone.
- First, I would leave the evacuation zone to make sure that I was in a safe place.
- First, I would do something else. _____

(Please specify)

10) If there was a nuclear accident at Shoreham requiring the evacuation of people within a ten mile zone, how dangerous do you think it would be for you to spend several hours driving school children out of the evacuation zone?

- so dangerous that it would be life threatening
- very dangerous
- somewhat dangerous
- not dangerous
- I don't know.

11) Do you agree or disagree with the following statements

Agree Disagree Don't Know

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Evacuation of school children during a nuclear emergency should be done by specially trained personnel, not by school bus drivers. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | In the event of a nuclear emergency at Shoreham it would be the obligation of everyone to first look after the health and safety of their family. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The best way to evacuate school children from an unsafe area is to have their parents pick them up at school. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | In the event of a nuclear emergency at Shoreham, a schoolbus driver must place duty to drive the school bus over duty to family. |

12) Do you currently have any children who live at home with you?

yes

no

13) If you have children living at home with you, how old is the youngest?

under 5

13 to 18

5 to 12

over 18

14) If you have children living at home with you, in what district do they attend school?

(School District)

15) What is your current marital status?

married

widowed

single

divorced or separated

16) If married, does your spouse currently work full time (30 hours a week or more)?

yes

no

17) What is the last grade of school that you completed?

some high school or less

high school graduate

some college

college graduate

18) What is your age category?

under 25

25-35

36-50

51-65

over 65

19) What is your sex?

male

female

THANK YOU FOR YOUR COOPERATION

APPENDIX C

SUFFOLK COUNTY SURVEY

Volunteer Firemen

September, 1982

Hello, my name is _____ and I am calling for _____ 1
 Suffolk County. We are doing a survey of volunteer firemen to
 obtain information that will be useful to the County in making
 plans to deal with a possible nuclear emergency at the Shoreham
 nuclear power plant. The _____ fire depart- 2
 ment is cooperating with this research. They have given us a
 list of members. Do you still work with the _____ 3
 fire department?

4. For how many years have you worked with this fire district?

- 0=less than one
- 1=one
- 2=two to three
- 3=four to five
- 4=six to ten
- 5=more than ten
- DON'T READ [9=Refuse

_____ 4

5-9 What is the zip code of your home address?

_____ 5 _____ 6 _____ 7 _____ 8 _____ 9

In general, how dangerous do you think it would be to live near each of the following:

(Categories for Q. 10 to Q. 13)

- 1=very dangerous
- 2=dangerous
- 3=not too dangerous

DON'T READ [4=Don't Know
[9=Refuse

10. an airport _____
10

11. a mental hospital _____
11

12. a coal fired power plant _____
12

13. a nuclear power plant _____
13

14. Would you describe yourself as:

- 1=a supporter of nuclear power plants as a means of providing electricity.
- 2=an opponent of nuclear power plants, or
- 3=you haven't made up your mind yet on this issue?

DON'T READ [9=Refuse _____
14

15. Do you think that LILCO should complete and operate the Shoreham nuclear power plant?

- 1=yes
- 2=no

DON'T READ [3=Don't Know
[9=Refuse _____
15

16. During normal operation, which type of electricity plant pollutes the air the least:

- 1=an oil-fired plant
- 2=a coal-fired plant
- 3=a nuclear-fired plant
- 4=you're not sure

DON'T READ [5=all about the same
[9=Refuse _____
16

17. During normal operation does a nuclear power plant give off a dangerous level of radiation?

- 1=yes
- 2=no

DON'T READ [3=Don't Know [9=Refuse

18. Assuming that the Shoreham nuclear power plant is licensed and begins to operate, we are interested in knowing what you think you would do if there was an accident at the plant. Suppose that you were at work on a weekday morning and there was an accident at Shoreham. Everyone living within ten miles of the plant was advised to evacuate. Volunteer firemen were expected to help with the evacuation. What do you think you would do first?

1=first, you would report to the fire station so that you could help with fire fighting and evacuation in the evacuation zone, or [SKIP to Q. 23]

2=first, you would make sure that your family was safely out of the evacuation zone, or [ASK Q. 19 to 22]

3=first, you would leave the evacuation zone to make sure that you were in a safe place, or [SKIP to Q. 23]

4=first, you would do something else _____
[SKIP to Q. 23] Specify

DON'T READ [5=Don't Know [SKIP to Q. 23
[9=Refuse [SKIP to Q. 23]

19. How would you make sure that your family was safely out of the evacuation zone?

1=go home and drive your family to a safe place out of the evacuation zone

2=call home and tell your family to leave without you

3=some other way _____

(Specify)

DON'T READ [4=Don't Know
[9=Refuse

20. Where would you go?

- 1=someplace in Suffolk County
- 2=someplace in Nassau County
- 3=someplace In New York City
- 4=some other place _____

(Specify)

5=you don't know [SKIP to Q. 22]

DON'T READ [9=Refuse [SKIP to Q. 22]

20

21. In terms of miles, about how far away is this place from your home?

- 1=10 miles or less
- 2=11 to 20 miles
- 3=21 to 30 miles
- 4=31 to 40 miles
- 5=41 to 50 miles
- 6=more than 50 miles

DON'T READ [7=Don't Know
[9=Refuse

21

22. After your family was in a safe place would you return to the fire house to help with evacuation?

- 1=yes
- 2=no

DON'T [3=I would try
[4=Don't Know
READ [9=Refuse

22

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

- 1=much more dangerous than normal fire fighting work
- 2=somewhat more dangerous than normal fire fighting work
- 3=about equally dangerous
- 4=less dangerous
- 5=not dangerous at all

DON'T READ [5=Don't Know [9=Refuse

23

32. What is your current marital status?

- 1=married
- 2=single [SKIP to Q. 34]
- 3=widowed [SKIP to Q. 34]
- 4=divorced or separated [SKIP to Q. 34]

DON'T READ [9=Refuse

32

33. Does your spouse currently work full time (30 hours a week or more)?

- 1=yes
- 2=no

DON'T READ [9=Refuse

33

34. What is the last grade of school that you completed?

- 1=some high school or less
- 2=high school graduate
- 3=some college
- 4=college graduate

DON'T READ [9=Refuse

34

35. What is your age category?

- 1=under 25
- 2=25-35
- 3=36-50
- 4=51-65
- 5=over 65

DON'T READ [9=Refuse

35

36. What is your sex?

- 1=male
- 2=female

36

THANK YOU FOR YOUR COOPERATION