

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
CONSOLIDATED EDISON COMPANY OF NEW YORK)	Docket Nos. 50-247 SP
(Indian Point Unit 2))	50-286 SP
POWER AUTHORITY OF THE STATE OF NEW YORK)	
(Indian Point Unit 3))	March 14, 1983

OPPOSITION OF UCS/NYPIRG AND PARENTS
CONCERNED ABOUT INDIAN POINT TO
PASNY'S MOTION TO STRIKE TESTIMONY
OF DR. KAI T. ERIKSON

I. The Testimony is Relevant to Contentions 3.2 and 3.7

Dr. Erikson's supplemental testimony relating to the findings of studies commissioned by Suffolk County, Long Island and which became Volume III of the Suffolk County Radiological Emergency Response Plan represents the most probative of all available evidence regarding human response to an evacuation (contention 3.2) and the problems of evacuating children (contention 3.7). Whereas the Licensees' testimony submitted on that subject, the testimony of Drs. Lecker and Dynes, attempts to prove that human response to a radiological emergency will be the same as to any previous emergency, Dr. Erikson presents, in his testimony, the experience of Three Mile Island and that of the studies in Suffolk County the only available evidence about human response in a radiological emergency.

II. The Testimony is Based on Dr. Erikson's Personal Knowledge

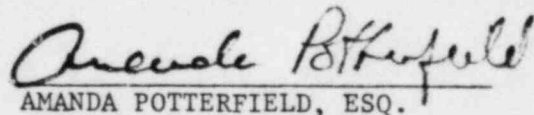
As Licensees concede, the Suffolk County study was accomplished with the help of Dr. Erikson, an accomplished sociologist whose testimony on

the survey was accepted by the Suffolk County Legislature in January, 1983. A copy of that testimony is annexed hereto. Dr. Erikson's primary role in the study is documented by pages 30 and 35 of the testimony of Suffolk County Executive Peter Cohalan, also presented to the Suffolk County Legislature. A copy of those relevant pages is also attached.

Licensees do not dispute the authenticity of the document entitled Volume III of the Suffolk County Radiological Emergency Plan, but rather challenge only Dr. Erikson's competence to identify it and comment on it. The correct procedure is for the Licensees' attorneys to voir dire Dr. Erikson about his involvement in the drafting and design of the study, in order that the Board can make its decision on the basis of the sworn testimony of Dr. Erikson, rather than on the allegations of the lawyers for the Licensees.

WHEREFORE, UCS/NYPIRG and Parents Concerned About Indian Point request that the Motion to Strike be denied; or, in the alternative, that a ruling on the Motion to Strike be postponed until after a voir dire of Dr. Erikson.

Dated: New York, New York
March 14, 1983



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On Behalf of Intervenors:
Union of Concerned Scientists
New York Public Interest
Research Group, Inc.
Parents Concerned About Indian
Point

TESTIMONY BEFORE THE
SUFFOLK COUNTY LEGISLATURE

REGARDING EMERGENCY PLANNING
FOR THE SHOREHAM NUCLEAR POWER STATION

BY

Kai Erikson, Ph.D.
Professor of Sociology
Yale University

January 24, 1983

TESTIMONY BY KAI ERIKSON, Ph.D.

I would like to speak today to a single concern that is crucial to any radiological emergency response plan - especially when evacuation may be called for.

The Draft Suffolk County plan -- and, indeed, every plan of its kind I am aware of -- relies upon personnel to respond promptly to perform various kinds of emergency work in the event of a radiological accident at the Shoreham Nuclear Power Plant.

There is a considerable body of evidence, however, to suggest that large numbers of people who are now counted on to aid in the evacuation of Suffolk County citizens in the areas surrounding the Shoreham plant will probably not be available in the initial stages of evacuation, if at all. And in their absence, we have no reason to suppose that the evacuation can be carried out successfully.

It is not a question as to whether these emergency personnel are brave or responsible or loyal. It is a question as to whether their sense of obligation to their families will outweigh their sense of obligation to the role assigned them in the emergency response plan. Neither choice can be considered "right" or "wrong": both halves of the dilemma involve the most noble of human feelings.

In my field, sociology, we generally call this "role conflict," using the term to refer to situations in which people are torn between two contrary feelings of responsibility and obligation -- in particular, the sense of duty

one feels as the member of a family and a parent, and the sense of duty one feels as the member of an emergency team.

Most emergency plans generally assume that virtually everyone called upon will resolve the conflict in favor of reporting to emergency duty. That assumption, it seems to me, flies in the teeth of common sense as well as what we know about human behavior in moments of crisis.

Who are we talking about? Police officers at the local, county, and state levels will have extremely important roles to play in the event of an emergency, and we can take it more or less for granted that most of them will report. But the success of the emergency plan depends upon the active cooperation of many other people as well -- people to drive school buses and to accompany the children who ride them, people to staff the communications centers and the reception centers, people to monitor the spread of radiation and work with decontamination teams, people to drive ambulances and tow trucks and all the other vehicles that will have to be brought into play to transport the disabled and those without working vehicles of their own, people to repair roads and establish traffic control checkpoints and, in general, carry out the hundreds of other tasks that would, in a real emergency, be required. What will these people do if an emergency is declared at Shoreham and the neighborhoods in the vicinity of the plant are advised to evacuate?

Now it has been common experience in other types of disasters that emergency personnel report as asked, and there are those offering testimony to the Suffolk County Legislature who take great comfort from that finding. That comfort, however, is ill placed, for the situation we are discussing here in planning for a radiological emergency at Shoreham is quite different from the other kinds of human disasters.

In the first place, I know of no situations, anywhere, in which emergency personnel reported to duty without knowing that their families had been safely evacuated from the danger zone. The emergency plan that Suffolk County considers should not ask people to do that.

In the second place, as you heard a moment ago from Drs. Johnson and Zeigler, emergencies that involve widespread contamination in general and ionizing radiation in particular are different from the ordinary run of natural disasters and human accidents. The evidence shows clearly that people are more afraid of radiation than they are of other potential sources of danger, and it is not hard to understand why. Radiation cannot be seen, touched, heard, smelled, tasted, or sensed in any other direct way, so people have no way of knowing whether or not they are being exposed to it. And, to make matters a good deal worse, people who suspect that they have been in the presence of radiation cannot know for years -- for generations, even -- whether or not damage has been done, and, if so, to whom.

These uncertainties and apprehensions greatly increase the odds that emergency workers with children or other family members at home will resolve the role conflict by turning to them before reporting to emergency duty. The fear that one's family may be in danger has always been a compelling motive in human life, and that fear should be even greater when the potential danger is exposure to radiation. All the past experience from all the other emergencies of which we have information can provide no guide here -- for an emergency of this kind has never happened before in human history, except, as you have heard, at Three Mile Island.

Some people cite the evacuation of Mississauga, Ontario, in November 1979, as an indication that large-scale evacuation can be carried out in a successful manner. But it is almost impossible to take comfort from that precedent once one knows what actually happened there. First, the emergency at Mississauga was created by chlorine gas, which has an exceptionally sharp smell, rather than ionizing radiation, which has none at all. Being aware of that difference, both the Mayor of Mississauga and the Emergency Planning Coordinator of the Province of Ontario have publically and specifically warned that what happened there should not be used to predict what would happen in the event of a release of radiation from a nuclear power plant elsewhere. Second, the emergency at Mississauga began with an explosion in the middle of a Saturday night, and the evacuation began at 4:00 on a Sunday morning, when all schools and virtually all stores and

places of business were closed. Almost everyone was home. Almost every family was already assembled. And it would be foolish to assume that the outcome of that emergency would have been the same if most of the young children had been away at school and most of the employed adults had been away at work. Third, the Mississauga evacuation was phased over a relatively relaxed period of more than 20 hours, and that is a luxury we dare not assume in planning for a potential future accident involving radiation.

The Radiological Emergency Response Plan Steering Committee decided that studies of the people of Suffolk County themselves should be commissioned so that we do not need to speculate about or rely on the past behavior of people who live hundreds of miles away and have responded to circumstances wholly unlike the ones we must be prepared for here.

You have heard the results of one of those studies from Drs. Johnson and Zeigler. I would like to describe the results of two others, involving the attitudes of volunteer firemen and school bus drivers whose cooperation will be necessary for the success of any evacuation plan.

In the first study, 291 interviews were conducted by telephone with members of the five fire departments immediately surrounding the Shoreham plant, three of which have mutual aid arrangements with the Wading River Fire Department.

Roughly 60% of the members of those departments were interviewed. Ninety-eight percent of them were men. The firemen were asked the following question, among others:

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?

Sixty-eight percent of the firemen responded that they would first make sure that their families were safe, while 21% said they they would report first to the fire station. Many of the firemen who checked first with their families would then report to duty: 55% said they would do so relatively quickly -- assuming, of course, that they were able to reassure themselves of the safety of their families -- while 36% would not. More than two-thirds of the firemen, then, would not be available on an immediate basis, and more than a third would not be available at all because they felt drawn to a higher duty.

In the second study, 246 school bus drivers who work in the five school districts within ten miles of the Shoreham plant were also interviewed, this time by a self-administered questionnaire. Virtually all of the school bus drivers in that population were contacted. Seventy-seven percent of them were women. The drivers were asked essentially the same question that had been posed to the firemen: what

would you do first in the event of an advisory to evacuate? Sixty-nine percent of the school bus drivers replied that they would not report to duty until they were sure that their families were safely out of the evacuation zone, while 24% replied that they would report immediately to the tasks assigned to them.

To put the matter in perspective, volunteer firemen were asked whether they agreed or disagreed with the following statement: "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 of the firemen disagreed, and 17% agreed.

And a similar question was asked of the school bus drivers. In response to 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," 74% disagreed, and 12% agreed.

These are striking and important findings. They indicate in the sharpest way that it is reckless to assume that emergency personnel can be counted on to report to duty in a Shoreham emergency without assurances that their families are safe. Nor should we be surprised, for, if social and behavioral scientists know anything, it is that people instinctively turn first to the needs of their own offspring. James Cornell put it well:

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 oneself. Ralph Linton has written, "In Gotterdammerung . . . the last man will spend his last hours searching for his wife and child."

One thing more. Some may say that surveys of the kind I have been describing here can be wrong; can fail to predict what people will do at some time in the future. That argument has to be granted up to a point. Dr. Cole will address that point.

But it is extremely important to remember two things, especially when one is charged with the safety of hundreds of thousands of people.

In the first place: the results of the two surveys I have reported to you constitute the only relevant information available to us on the subject of role conflict in Suffolk County. To say that those findings are unreliable is to say that people who live in this community cannot be trusted to know their own minds.

In the second place: even if the figures I have reported to you turn out in the long run to be inexact, the problem they address is nonetheless critical. If those figures are only half true, or even a quarter true, it is still difficult to imagine under present circumstances that an evacuation plan can be successful.

In sum, any evacuation plan that takes for granted the readiness of local emergency workers to report for duty, regardless of family obligations, runs a high -- and, in my opinion, unacceptable -- risk of failure. Our research indicates that this risk is a real one in Suffolk County, and it must be dealt with before one can have a workable radiological emergency response plan.

REPORT OF
SUFFOLK COUNTY EXECUTIVE
PETER F. COHALAN
CONCERNING
RADIOLOGICAL EMERGENCY PREPAREDNESS
IN SUFFOLK COUNTY

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February 16, 1983

behavior both at Three Mile Island on Long Island. At Three Mile Island, the Governor of Pennsylvania issued an advisory that pregnant women and pre-school aged children within 5 miles of the plant should evacuate. An estimated 2,500 persons within the five mile area around TMI fit that category; however, the studies of Drs. Johnson and Zeigler, as well as two other studies (Tr. 1100), revealed that over 144,000 persons living as far as 15 miles from the plant in fact evacuated. Tr. 1037, 1099; see also testimony of Dr. Stanislav Kasl, Tr. 1399. This tendency for persons in a radiological emergency to evacuate in great numbers, though not advised to do so, has been labeled the "evacuation shadow phenomenon."

Mindful of this occurrence at TMI, the Steering Committee commissioned a study to investigate whether such behavior might occur on Long Island in the event of an accident at Shoreham. The study, conducted primarily by Drs. Johnson, Erikson, Zeigler, and Cole, consisted of a random sample telephone survey of more than 2,500 Long Island residents. Dr. Cole's research firm, Social Data Analysts, administered the survey, the results of which are contained in Documents 4 and 5 of Volume III of the County's RERP. The focus of the study was upon three nuclear accident scenarios posed to each interviewee. In Scenario One, each interviewee was asked what he or she would do if there was an official advisory that persons within a 5 mile radius of the plant should stay

Drs. Erikson and Cole performed two surveys to determine to what extent, if any, the problem of role conflict might hamper the County's response to a radiological emergency. The first survey studied the attitudes of school bus drivers in Suffolk County, who would have a major role in evacuating school children and others from the EPZ. The second survey studied role conflict among volunteer firemen serving fire districts close to the Shoreham plant. During a radiological emergency, volunteer firemen would also be expected to perform various evacuation duties.

The details of the role conflict studies are contained in Volume III, Document 6 ("Responses of Emergency Personnel To A Possible Accident At The Shoreham Plant"). They reveal that 68 percent of the firemen surveyed indicated they would first care for the safety of their families and therefore would not be available for immediate emergency duty. About 36 percent indicated they would not be available at all. Tr., Jan. 24, 1983, Attachment C at 6. With respect to school bus drivers, 69 percent indicated that they would not report to duty until they were certain that their families were safe. Tr., Jan. 24, 1983, Attachment C at 7.

Highlighting the implications of these results for radiological emergency planning, Dr. Erikson concluded:

These are striking and important findings. They indicate in the sharpest way that it is reckless to assume that emergency personnel can be counted on to