

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

In the Matter of)

CONSOLIDATED EDISON COMPANY OF NEW YORK)
(Indian Point Unit 2))

Docket Nos. 50-247 SP
50-286 SP

POWER AUTHORITY OF THE STATE OF NEW YORK)
(Indian Point Unit 3))

May 19, 1982

UCS/NYPIRG ANSWER TO LICENSEES' INTERROGATORIES

The Union of Concerned Scientists and the New York Public Interest Research Group, Inc. answer the Licensees' interrogatories as follows:

1. Grounds for each defect or inadequacy of the Indian Point emergency plans which do not meet those standards set forth in 10 C.F.R. 50.47(b) or appendix E to 10 C.F.R. part 50 are described in detail in UCS/NYPIRG Contention I-A, found in UCS/NYPIRG Response to Objections to UCS/NYPIRG contentions, at pp. 10-14, and as amended on pp. 25, 26, 29, 31 and 32.

2. (a) and (b). The county emergency response organizations and the support organizations are listed in Table III-1 of the CEREPs. UCS/NYPIRG is in the process of attempting to obtain copies of the most recent Licensee and county plans; when such plans are obtained, UCS/NYPIRG will be in a better position to assess the extent the letters of agreement appropriately identify such organizations and determine the organizations for which letters of agreement are lacking. In the meantime, UCS/NYPIRG refers you to the most recent RAC review (December 1981).

2. (c). The relationships of each emergency response organization and the support organizations have not been clearly defined in the IPEP

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at this time, as pointed out in the December 1982 RAC Review, element A.1.b.

2. (d) and (e). The nature of the agreements and the ground for UCS/NYPIRG's claim that such agreements are required are found in NUREG 0654 Rev. 1 Nov. '80 - A.3.

3. UCS/NYPIRG's contention with respect to inadequate delineation of relationships among response organizations, (Contention I(a)) focuses on the inadequacy of the relationship between support organizations on the one hand and all other entities on the other hand. For further elaboration, see response to Interrogatory No. 2.

4. UCS/NYPIRG refers the licensees to the Dec. 1981 RAC Review A. 3 & C. 4.

4(a) The letters of agreement involved are included in the most recent plans. UCS/NYPIRG is in the process of obtaining copies of the most recent plans and will be in a position to specify which letters of agreement are involved upon reviewing these plans. Furthermore, Licensee's county plans must incorporate a procedure to assure that the letters of agreement are kept up-to-date and to ensure that such letters are maintained throughout the operating lifetime of the Indian Point reactors.

4(b) In the absence of a specification in the letters of agreement of the time periods for which the agreement remains in effect, UCS/NYPIRG believes that applicable criteria in this regard come from NUREG-0654, Rev. 1, November 1980 (also as referenced in Regulatory Guide 1.101, Revision 2, October 1981), Criterion P.4, which requires that each organization update its plans and agreements as needed and review and certify the plans to be current on an annual basis.

5. UCS/NYPIRG refers the licensees to the answer to Interrogatory #4.

6. UCS/NYPIRG awaits information from the Licensees as to the identity, training and qualifications, and professional experience of these individuals. Upon receipt and analysis of this information, UCS/NYPIRG will be in a better position to provide the information requested. The basis for the need for a demonstration by the Licensees that all persons in the line of succession for the "emergency coordinator" position are adequately trained is to be found in NUREG-0654, Rev. 1, November 1980, Criteria B.2, b.3, b.4, and B.5 (also Regulatory Guide 1.101, Revision 2, October 1981, and 10 CFR 50.47(b) (2)).

7. Refer to basis (4) of UCS/NYPIRG Contention 1(A).

8. It is the licensees who must prove that any and all operational, maintenance, supervisory, technical, and administrative personnel are capable, willing, and able to take part in any emergency effort of this type.

9. (a) and (b) There are no time frames given for any of the expected emergency response support resources in the IP off-site E.P.'s.

9. (c) Refer to the bases of UCS/NYPIRG Contention III (B) and to answer to Interrogatory 120.

10. See NUREG 0654 1 Rev. 1 Part II J9-11. The obvious criteria for determining the use of available services and resources are the preservation of human life and the prevention of disease.

11. (a) 10 CFR 50.47 (a)

11. (b) The criterion is generic and therefore irrelevant because the contentions are site-specific.

12. The provisions of the IPEP that must be addressed first are the immediate evacuation time estimates.

13. Commercial telephone lines have been overloaded. They have also gone dead even under non-emergency situations. Both situations have occurred. UCS/NYPIRG has no position on probability other than that it is greater than zero.

14. This Interrogatory is generic and therefore irrelevant because our contention is site-specific.

15. UCS/NYPIRG has not reviewed EALs for any nuclear plant in the U.S. besides Indian Point and Three Mile Island, neither of which have adequate EALs. The best available methodology to establish EALS is the following:

- A. Identify all accident scenarios which have the potential to cause releases of radioactivity to the environment.
- B. Identify the time to release for each such scenario.
- C. Identify the lead time necessary to implement protective responses for each such scenario.
- D. From the above, determine at what point in the scenario control room operators must be able to identify that such a sequence is in progress in order to permit the effectuation of the appropriate offsite protective response. In so doing, adequate conservatism must be added to account for delays in identifying the existence of an accident, delays in identifying the particular sequence, delays in communicating this information to offsite authorities, delays in offsite authorities making the determination that a protective response is necessary, delays in communicating this decision to the public,

and delays in the effectuation of particular protective response by the public and emergency response organizations.

- E. Establish what instruments in the control room these accident scenarios are manifested on and the particular value of the parameter measured by these instruments which corresponds to the time established in A-D above.
- F. Provide redundant means for annunciating to the operators that these values have been exceeded.
- G. To provide reasonable protection against the possibility that accident scenarios are not identified which could result in releases of radioactivity to the environment, generic EALs should be established for concentrations of radioactivity and/or dose rates and equipment availability or operability which are appropriately and redundantly annunciated to the control room operators which will trigger the declaration of an emergency and the effectuation of an appropriate protective response until the specific nature of the malfunction is determined and the potential for the degradation of the situation is also determined.

16. Not applicable.

17. UCS/NYPIRG does not have any analysis relating to the probability of loss of normal power, technical problems with commercial telephone service or adverse weather conditions at IP. NYPIRG/UCS is awaiting such information through the process of discovery. NYPIRG/UCS has no position on probability other than that it is greater than zero.

18. Timely as used by UCS/NYPIRG in this contention means that particular failures are identified, the characteristics of any releases or potential release to the environment of radioactive materials from the plant are identified, and that the potential for degradation of the situation is identified, and that all of the above are transmitted to offsite authorities in sufficient time for these authorities to evaluate such information, reach a judgment on the need for a protective response, notify the offsite emergency response organizations of this need, notify the public of this need, and permit the effectuation of the emergency protective response by the public before unacceptable adverse consequences occur.

19. See basis number 6 of UCS/NYPIRG Contention I(A). In addition, it is clear that simply responding to the lists of accidents contained in NUREG-0654, Rev. 1, November 1980, Appendix 1, does not assure that EALs for any given plant are complete. Indeed, the accidents so listed are repeatedly described as "example" initiating conditions. Thus, Licensees' EALs must have a rational basis which accounts for the complete spectrum of possible accidents at the Indian Point reactors in order to adequately protect the public health and safety.

20. UCS/NYPIRG has not attempted to ascertain all possible accident sequences for the Indian Point reactors. Primary (and perhaps sole) responsibility for so doing resides with the Licensees who must demonstrate that their EALs have a rational basis and are complete. On information and belief, UCS/NYPIRG maintains that the accidents for which parameters are not currently provided in licensees' EALS are those which are principally, although not exclusively, outside the design basis for the Indian Point reactors, and it is such accidents

for which EALs are most urgently required.

21. (a) [redacted] (c) See answer to Interrogatory # 20. (d) See answer to [redacted] # 14.

22. [redacted] indication that any of licensees' EALs adequately account for [redacted] times necessary to implement protective actions, largely because licensees have not described the methodology by which the EALs were arrived at.

23. UCS/NYPIRG has not independently performed such calculations. In principle, such calculations could be performed once one has identified all accident sequences which result in release of radioactivity to the environment. In order to determine what represents an adequate lead time in each case, it would be necessary to determine what protective response(s) will be required for each.

24. UCS/NYPIRG refers the Licensees to basis (7) of UCS/NYPIRG Contention 1 (A) for the answer to this interrogatory. Additionally, when the sirens were tested during the March 3, 1982 Drill, some sirens could not be heard very well because they transmitted a weak signal, if any.

The sirens cannot be relied upon in the event of a power failure due to the lack of a backup power supply. Furthermore, no method of prompt verification of full operation of each siren during an emergency has been established. Finally, no studies or surveys have been undertaken to confirm that the population within the 10 mile EPZ, including transients, will know what to do when the sirens are sounded.

25. See Dec. 1981 RAC Review on element E.7. Furthermore, the content of the messages has not taken into account the existing expertise on eliciting appropriate human response.

26. The Emergency Broadcast Messages which are listed in the CRERPS and those used in the March drill are only in English.

27. (1) Families with no English-speaking members;

(a) Families in which no member speaks or understands the English language.

(b) and (c) Refer to UCS/NYPIRG interrogatories to Licensees # 25 - 27.

(d) The probability is greater than zero that some of these groups may overlap. The Licensees' consultants should have this information.

(e) The plans are deficient in that they do not account for how people who do not understand English will understand the magnitude of any radiological emergency or how to prepare for or act in such a situation.

(f) Since there is no reason to assume that the EPZ is free of these people, common sense would dictate that there must be at least some people from these groups there.

(g) UCS/NYPIRG does not have this information. Moreover, this information is irrelevant to the issue of what the situation is at Indian Point.

(h) Educate, alert, and instruct the people within the IP EPZ in a language they will understand.

(i) Not Applicable (N/A).

27. (2) Hearing impaired and deaf.

(a) People whose hearing loss is such that they would not be able to hear or understand sirens or radio broadcasts.

(b) and (c) Refer to UCS/NYPIRG interrogatories to Licensees #25 - 27.

(d) Refer to answer to Interrogatory (1)(d).

(e) The plans are deficient in that they do not account for people who cannot hear and will not understand the magnitude of any radiological emergency, or how these people are to prepare for or act in such a situation.

(f) Refer to answer to Interrogatory #27 (1)(f).

(g) Refer to answer to Interrogatory #27 (1)(g).

(h) Educate and instruct the people within the IP EPZ who are hearing impaired or deaf through a different sense. (i) N/A.

27. (3) Individuals with learning disabilities:

(a) Those individuals who, due to physical or mental impairment, have particular difficulties in learning.

(b) and (c) Refer to UCS/NYPIRG interrogatories to Licensees # 25 - 27.

(d) Refer to answer to Interrogatory 27(1)(d)

(e) The plans do not outline special compensatory procedures for alerting and informing this population of a radiological emergency.

(f) Refer to answer to Interrogatory # 27(1)(f).

(g) Refer to answer to Interrogatory #27(1)(g).

(h) Special compensatory procedures would be needed to adequately alert and inform this population of a radiological emergency

(i) N/A.

27. (4) Latch-Key Children:

(a) Children who go home to an empty house because both parents work or their single parent works.

(b) and (c) Refer to UCS/NYPIRG Interrogatories to Licensees # 25 - 27.

(d) Refer to answer to Interrogatory 27 (1)(d).

(e) The plans are deficient in that they do not make special provisions for this population.

(f) Refer to answer to Interrogatory 27(1)(f).

(g) Refer to answer to Interrogatory 27(1)(g).

(h) Since they are dependent upon others for their mobility, one has to make certain that they all have caretakers who are adequately informed, capable, and able to take responsibility for them.

(i) Refer to answer to Interrogatory 27(1)(i).

27. (5) Handicapped:

(a) Persons who because of their physical or mental disability are unable to have a necessary degree of mobility to take in and comprehend instructions about necessary protective actions.

(b) and (c) Refer to UCS/NYPIRG Interrogatories to Licensees #25 - 27.

(d) Refer to answer to Interrogatory 27(1)(d).

(e) The plans are deficient in that they do not account for people who, due to their handicap, may not be able to take any protective actions on their own behalf.

(f) Refer to answer to Interrogatory 27(1)(f).

(g) Refer to answer to Interrogatory 27(1)(g).

(h) Refer to answer to Interrogatory 27(4)(h).

(i) N/A.

(6) Invalids:

(a) Persons who are dependent upon others in matters of personal protection by virtue of their disease or illness.

(b) and (c) Refer to UCS/NYPIRG Interrogatories to Licensees #25 - 27.

(d) Refer to answer to Interrogatory 27(1)(d).

(e) The plans are deficient in that they do not account for the special provisions necessary for these individuals.

(f) Refer to answer to Interrogatory 27(1)(f).

(g) Refer to answer to Interrogatory 27(1)(g).

(h) Refer to answer to Interrogatory 27(4)(h).

(i) N/A.

27. (7) Other Special Populations:

(a) The aged persons who by virtue of their age are unable to fend for themselves.

(b) and (c) Refer to UCS/NYPIRG Interrogatories to Licensees #25 - 27.

(d) Refer to answer to Interrogatory 27(1)(d).

(e) Refer to answer to Interrogatory 27(6)(e).

(f) Refer to answer to Interrogatory 27(1)(f).

(g) Refer to answer to Interrogatory 27(1)(g).

(h) Refer to answer to Interrogatory 27(4)(h).

(i) N/A.

28.

(1) The number of persons receiving and comprehending the public information brochures has not been determined and therefore a strong possibility exists that a substantial number of people have not both read and comprehended the brochures.

(2) The number of persons who will retain and still comprehend the public information brochure in the future will not be determined since no plans exist to gather this information.

(3) No study has been carried out to determine if the actions recommended to the public, such as staying off the telephone and not picking up one's children are worded in such a way as to maximize the likelihood of people taking these actions.

(4) No methodology exists to ensure that the transient population will receive and comprehend these public information brochures or alternative information materials.

(5) The rumor control phones indicated in the brochures which are to be staffed by officials who have other emergency response duties will not serve the intended function.

(6) The public education sections "Radiation from nature and man" and "Facts about Indian Point" contain information that is debatable and self-serving to the Licensees' interest and does not contain responsible countervailing opinion.

(7) These inadequacies are in addition to those referred to in our response to Interrogatories # 29 - 30.

29. No study has been carried out or is to our knowledge contemplated to confirm^{that} the special needs of the categories of people referred to here are adequately addressed by the public information brochure. Specifically, it is not known how many sight and hearing-impaired people have not sent in their "tear-off card," or their special needs. The problems of children and non English speaking persons are obvious and the burden of resolving those problems clearly falls on those responsible for drawing up and carrying out the emergency plans.

30. It is the impression of UCS/NYPIRG that substantial numbers of Spanish and French speaking people live within the plume EPZ and it is clearly the responsibility of those who draw up and carry out the plans to determine the numbers and locations of those persons, to publish the brochures in the appropriate languages, and to provide special educational assistance to those for whom it would not be practicable to publish a translated pamphlet.

31. UCS/NYPIRG refers the licensees to our answer to Interrogatory #24.

32. (a) - (e) To the extent that this information is not covered by Basis 9 of UCS/NYPIRG Contention 1(A), UCS/NYPIRG awaits further information on the answers to these questions from Discovery.

33. UCS/NYPIRG refers the licensees to basis 10 of UCS/NYPIRG Contention I(A).

34. UCS/NYPIRG awaits response to descriptive and design documents from the Licensees for these facilities.

35. We maintain that emergency monitoring capabilities of the Disaster & Emergency Services and Dept. of Health for Rockland and Westchester Counties are inadequate. Interrogatories have been served on these counties in support of our claim. Also, we maintain that ambulance corps in the 4-county region are inadequately prepared for radiological monitoring. Support for this claim will come from the results of our Ambulance Corps survey which is available on request.

36. ARAC and MIDAS do not have the capability to accurately predict the concentrations of radioactivity and/or the resultant dose rates in accidents which involve a heated release. Furthermore, neither system adequately accounts for doses due to deposited radioactivity, such deposition caused either by gravity or precipitation scavenging or washout phenomena. In addition, these systems have limited accuracy at large distances.

37. The topography of the Indian Point area is such that low level wind is channeled in a North-South direction. This has possible implications for emergency planning measures. See attached list of Other References -- Wind.

Also, see "Evaluation of Potential Radiation Hazard Resulting from Assumed Release of Radioactive Wastes to Atmosphere from Proposed Buchanan Nuclear Power Plant", Technical Report No. 372.3, New York University College of Engineering, prepared for Consolidated Edison Company, April 1957; and "Safety Evaluation Report by the Directorate of Licensing," U.S. Atomic Energy Commission in the matter of Indian Point Unit No. 3, September 21, 1973, pp. 2-6 through 2-15.

38. As used by UCS/NYPIRG in this context, "rapid assessment" means an assessment that provides an identification of the magnitude and location of radiological hazards (actual or potential) in sufficient time to permit a protective response by the members of the public in the affected or potentially affected areas such that the hazard can be avoided. Capabilities lacking in this regard are sufficient numbers of required instrumentation (such as survey meters), sufficient numbers of trained technicians capable of utilizing such instrumentation, and the capability to perform rapid assessments during periods of adverse weather conditions or degraded roadway conditions.

39. A specification of this problem is not possible due to the pervasive lack of such criteria in the plans. Not only are specific criteria missing from the plans but the factors needed to be considered are also missing. An example of a situation for which such criteria would be necessary is:

The need for criteria to determine when greater protection is provided by sheltering rather than evacuation. Here, criteria would be needed covering roadway network conditions, percentage of population already evacuated, time to plume arrival, spatial location of population and plume, dose rates in the plume, expected reductions in dose due to sheltering in a variety of structures, and the potential for additional releases and the cumulative impact that such releases will have.

40. The evacuation time estimates could be utilized in a determination of whether sufficient time is available to evacuate the EPZ or a portion thereof before plume arrival. To the extent that these studies incor-

porate faulty assumptions (including but not limited to assumptions regarding human response, availability of transportation resources, effective evacuation speed, warning time delays, the effectiveness of the prompt notification system, limitations on multiple or extra trips before evacuating, the evacuation-shadow phenomenon, the condition of the roadway network, and adverse weather or meteorological conditions such as snow, fog, flooding, icy roadways, and storms), their results may be misleading and form inaccurate bases for choices among protective actions. This is particularly true if optimistic estimates are used to predict the feasibility of an evacuation that when actually attempted would increase the exposure of evacuees delayed in transit during plume passage.

41. Among the protective actions which should have been developed in the plans but which were not are predistribution of potassium iodide pills for the general population and instructions and training in the use of ad hoc respiratory protection to reduce inhalation and thyroid exposures. In addition, notification of locations of excess and adequate sheltering space should be provided to the extent to which it is available (and should be developed to the extent necessary). There are also design changes that should be made at the Indian Point plants to increase the likelihood that protective responses, either singly or in combination, can be effectuated in timely fashion. These design changes include the installation of a filtered vented containment system (which will essentially eliminate or substantially reduce releases of particulates and radioiodines), installation of a core catcher (which will delay containment failure or produce additional lead time to effectuate protective actions), and installation of an additional containment structure (which can be used

to relieve overpressure to delay or eliminate containment failure). In addition, operation should be prohibited during time periods when roadway conditions become degraded to such an extent that evacuation is greatly diminished or eliminated as a choice for protective actions.

42. In general these protective actions would be useful in the event of accidents which exceed the design basis for the Indian Point reactors, although ad hoc respiratory protection, adequate sheltering, potassium iodide predistribution, and prohibition of operation during degraded roadway conditions could provide additional necessary protection for certain events within the design basis. At the present time, UCS/NYPIRG has made no calculation of the probability of such events, but asserts that the probability of these events is greater than zero.

43. and 44. The variability in materials used in constructing buildings in the EPA leads to varying degrees of dose reduction due to the sheltering afforded by these structures. In addition, some structures lack basements. Also, the structures vary in the degree to which they are leak tight, causing variations in doses due to inhalation and thyroid exposure from radioiodines.

45. UCS/NYPIRG refers the licensees to basis 14, as amended, of the UCS/NYPIRG Contention 1(A). and Dec. 31, 1981 RAC review k. 3.a.

46. We claim that the 4-county region surrounding IP reactors has not the facilities, equipment, supplies or trained personnel to adequately respond to a radiological accident. We assert that emergency departments of the region's hospitals, the ambulance services, and county health agencies, are inadequate to the task of providing for the health and safety of the population of the area in the event of a serious accident at Indian Point. We base this contention on data to be received from the Surveys (available on request) and Interrogatories served on the Counties

of Rockland and Westchester. As of the date of this submission, we are awaiting the return of both survey and responses to the interrogatories.

47. We feel that response to this contention is adequately addressed in answer to Interrogatory #46.

48. (a) See #47

(b) See #47

(c) We do contend that such equipment would not be available in an acceptable period of time, in the absence of evidence to the contrary.

49. We have served interrogatories on the Counties of Rockland and Westchester to determine the inventory of radiation survey instruments.

50. Our grounds are explained in #46. The number of irradiated and contaminated people whom we claim will not be capable of being cared for will be derived from the demand established in the NYC Audubon Testimony (Beyea) minus the capability determined by the enclosed surveys and the interrogatories served on the counties of Rockland and Westchester.

51. The grounds for this claim are cited in basis 16 of Contention 1(A).

52. UCS/NYPIRG agrees with the Dec. 1981 RAC review comment on M.I., which stated that "insufficient information is furnished regarding assignment of responsibility, criteria for re-entry and details on the longterm radiation and medical monitoring programs." Additionally, no planning has been made for an area which may not be re-inhabitable for many years.

53. UCS/NYPIRG refers the licensees to the answer to Interrogatory #52.

54. C.f. December 31, 1981 FEMA RAC Review; comments on elements N.I. 6; N. 5 0.5; p.3; 0.1

55. In the March 3rd exercise

1) participants in the exercise were aware of approximate time and duration of the exercise.

2) Exercise was to determine essentially only communications and administrative capabilities which are only a part of the logistical tasks in an emergency response.

3) Exercise took place approximately at start of a normal business day and ended at end of a normal business day. It therefore did not test assembly time of officials at night or during a time when they would be called in from other work duties. It also did not test the sustained effort that would be required during a severe emergency.

4) Participants in the exercise were only a fraction of the personnel that would be called on in such an accident.

5) The exercise did not test responses of participants or the public to genuinely stressful circumstances.

6) With respect to Board Question 4, the exercise did not involve any active public participation. UCS/NYPIRG recognizes problems and dangers associated with public participation but feels that soliciting as limited voluntary participation as was done March 3rd is counterproductive to maximizing the possibility of public cooperation during a real emergency.

56. UCS/NYPIRG refers the Licensees to the Dec. 1981 RAC Review comments on Element D.

57. UCS/NYPIRG refers the Licensees to the answer to Interrogatory #56.

58. UCS/NYPIRG refers the Licensees to the answer to Interrogatory #56.

59. If UCS/NYPIRG, which has been conscientiously monitoring the development and revisions of the emergency plans, has trouble being adequately informed of revisions to the EP, common sense would dictate then that the public, not necessarily always on the lookout for revisions, could easily miss it. See Basis 19 of UCS/NYPIRG Cont. 1A.

60. There are no provisions updating the public information programs for at least the following items: when roads used for the evacuations are closed for a period of time due to construction; when new people move into the area; when any new school within the EPZ is opened; or when any school designated as a Reception or Congregate Care Center closes. Basis 19 of UCS/NYPIRG Cont. 1A.

61. (a) All the emergency response organizations responsible for making decisions relating to protective actions and their implementation.

(b) and (c) These organizations lack the expertise to extrapolate from the assumptions of the models developed by the Licensees' consultants to the actual conditions when an accident occurs.

These organizations also lack the capability to promptly obtain the data necessary to account for variances between the time estimate assumptions and real conditions at the time of an accident. To the best of our knowledge, they have been given no training, no criteria, and no listing even of the factors which must be considered in making such decisions.

62. N Refer to 59 and 60.

63. Refer to Answers to Interrog. #44, 55, and 56. In addition, these persons have not been adequately informed either by the Licensees, the NRC or their respective consultants about what to expect in the event of a serious nuclear accident at Indian Point. This is significant

since the NRC Special Inquiry Group concluded that this factor was an important contributor to the lack of preparedness for the TMI-2 accident (See, NUREG/CR-1250, Vol II, Part 3, pp. 104601047, "Three Mile Island: A Report to the Commissioners and to the Public.")

64. UCS/NYPIRG knows of only 2 other groups besides us who have a copy of their county plan. Donald Davidoff has stated to an employee of NYPIRG that the office did not have enough funds to make copies for all interested citizens.

65. Does not relate to UCS/NYPIRG contention.

66. The Red Cross does not have radiological equipment -- such as that for monitoring their workers, helping with possible decontamination, and protective gear for the Red Cross workers.

67. Yes. Other emergencies do not include the need to respond in an environment which is subject to contamination by radioactive materials and/or an environment which contains radioactivity in the air. Unlike other natural hazards, radioactivity is silent and invisible, and otherwise undetectable by human senses without instrumentation. The particular fear and uncertainty attendant to exposure to radiation thus creates societal difficulties not present in other types of emergencies.

68. Bus service is not adequate for handling mass school evacuations as well as for carrying all persons without personal automobiles because there are not enough buses to carry out an evacuation and there is no guarantee that a sufficient number of busdrivers would be willing to make one trip into the EPZ, notwithstanding the possible necessity of multiple trips into the EPZ.

69. (a) The estimate will be determined by NYPIRG's surveys, which are available on request.

(b) See above.

(c) The basis will be determined by the demand established in the NYC Audubon Testimony minus the capability determined by the above-mentioned surveys.

70. This Interrogatory is not directed to a UCS/NYPIRG contention.

71. One way in which the emergency plans and the evacuation time estimates failed to adequately account for the density of traffic is that they fail to consider possible self-evacuations beyond the evacuation EPZ that would impact the density of traffic within the EPZ.

In addition, the time estimates fail to accurately account for the roadway network loading pattern caused by adverse weather situations, accidents, highway repairs, and the choice by evacuees of routes other than those intended for their use in the plans and time estimates. Regarding the last factor, it has been established that during the TMI-2 accident, evacuees preferentially chose destinations upwind and in mountainous areas as opposed to densely populated urban areas (see "Evacuation from a Nuclear Technological Disaster," Geographical Review, by Donald J. Ziegler, Stanley D. Brunn, and James H. Johnson, Jr., Vol. 71, No. 1, January 1981, p. 9; see also Prefiled written testimony of James H. Johnson, Jr., In the Matter of Diablo Canyon Nuclear Plsny, Docket No. 50-275, January 19, 1982, p.5). In addition, the plan and time estimates assume the availability of adequate traffic control and adequate accident removal capabilities for which no adequate assurance has been provided that these services will be available.

72. UCS/NYPIRG does not have responsibility for ascertaining this information. It is the Licensees which must demonstrate that sufficient numbers of policemen, firemen, school bus drivers, teachers, snow plow drivers, road crew members, and all others upon whom the emergency plans depend will be both capable and willing to respond to a serious radiological emergency at Indian Point in a timely fashion.

73. This is not directed to a UCS/NYPIRG contention.

74. A drain on telephone service will be intolerable when people in the EPZ are unable to communicate with other family members or relatives or any other relevant persons or people, in their efforts to coordinate the individual response to a radio emergency.

Relatives who hear of the evacuation warnings will attempt to contact residents of the affected area (page 52). In addition, "Virtually all research on warning systems reports that almost without regard to the mode and source of a disaster warning, people attempt to confirm the warning message." (page 68), and the consequences of this confirmation process can include "jammed communications lines" (Id.). Even if instructions are given not to use the phone, "It is well known that such rules are systematically violated; people call into an area to check on relatives and residents call out to issue reassurance to friends and relatives as well as to call for official confirmation warnings." (pages 69-70) All references are to "The Implications of Natural Hazard Evacuation Warning Studies for Crisis Relocation Planning." RS 2-8-35, June 1980, prepared for FEMA by Ronald W. Perry, Michael K. Lindell, and Marjorie R. Greene.

75. UCS/NYPIRG would be delighted to participate in substantive dialogue with all appropriate officials to improve exercises of the Indian Point emergency plans. The question is too impossibly broad to answer here. However, the Licensee might extrapolate from our answer to # 55 to understand our general area of concern.

76. This is not our contention; however, we feel that this is a very crucial question that must be studied much more thoroughly by appropriate state and federal agencies, and that it is in fact irresponsible to consider that emergency plans are "implemented" before this study is completed and all shortcomings are remedied.

77. This question is too broad to elicit a response.

78. People will respond to a radiological threat in a manner different from the way in which people respond to hazards such as fires and floods because floods and fires can be felt by all of the senses. A radiological threat does not smell; no smoke can be seen; and it cannot be felt in any way -- it's an invisible threat. Therefore, people are much more dependent upon information from authority than in the case of the other kinds of hazards for information about the extent of the danger, when thresholds requiring evacuation or protective action have been reached; when a person has reached^d a place of adequate safety and when an emergency situation ends. Furthermore, radiation is known by members of the public to be capable of inflicting damage which cannot be assessed until it shows up in the form of illness or genetic damage, which may be many years later. Studies of people's reaction to various hazards indicate that radiological threats are dreaded more than any other.

79. Some people outside the EPZ who may want to self-evacuate but who are prohibited from entering roads in or near their neighborhoods could easily feel threatened, which could provoke panic and disorganization. Empirical studies of panic show that panic is most reliably provoked in situations of dangers with blocked egress.

80. Panic could easily ensue if parents and children could not communicate in the event of a radiological emergency because people would have a strong urge to be reunited with their family members which could be easily frustrated with lack of communications.

81. All individuals do not behave cooperatively all of the time. Therefore, common sense would dictate that at least some of the individuals waiting in cars in traffic will not behave cooperatively.

82. UCS/NYPIRG refers the Licensees to basis (3) of UCS/NYPIRG Contention 1 (B)(2) for the answer to this interrogatory.

83. UCS/NYPIRG refers Licensees to NUREG-0396 and the basis for UCS/NYPIRG Contention I(B)(2) for the answer to this interrogatory. Additional information can also be found in NUREG/CR-1131, "Examination of Offsite Radiological Emergency Measures for Nuclear Reactor Accidents Involving Core Melt." June 1978, D.C. Aldrich, et. al., Sandia Laboratories. Regarding part "e" to this interrogatory, UCS/NYPIRG has not calculated such a probability and disputes the accuracy of any such probability estimates appearing in NUREG/CR-1131 and/or NUREG-0396.

84. This does not relate to a UCS/NYPIRG Contention.

85. The interrogatory is not directed at UCS/NYPIRG.

86. UCS/NYPIRG refers the Licensees to the answer to Interrogatory #85.

87. UCS/NYPIRG refers the Licensees to the answer to Interrogatory #85.

88. This interrogatory is not directed at UCS/NYPIRG.

89. UCS/NYPIRG has been attempting to obtain information about the evacuation time estimate from the Licensees and will answer this interrogatory when the information is supplied.

90. UCS/NYPIRG has made no such calculations of its own. Our concern is with the accuracy and reliability of the estimates calculated by CONSAD and Parsons Brinckerhoff. In view of the uses to which such evacuation time estimates may be put, it is essential that the estimates be accurate and reliable and that those persons and organizations using them understand precisely how the results are to be interpreted together with information on how the actual situation at the time of an accident differs from the assumptions of the studies. If the time estimates are not accurate and reliable, their use may be worse than having no estimates at all in that optimistic predictions or evacuation time could result in exposures to the public which are greater than would be necessary (e.g., if evacuation was assumed possible but turned out not to be prior to plume arrival, and the attempt resulted in large numbers of evacuees being exposed while in cars during plume passage.)

91. Interrogatory relates to Contention 3.4 and is thus assumed to be directed at RCSE and WESPAC.

92. The grounds for making this claim are the testimony of Margaret A. Reilly, Dept, of Environmental Resources, Commonwealth of Pennsylvania, under cross-examination, transcript page 18,539. In the Matter of METROPOLITAN EDISON COMPANY/Three Mile Island Nuclear Station, Unit No. 1) RESTART, available through the Nuclear Regulatory Commission Public Document Room.

93. UCS/NYPIRG has no statement to make on the issue of probability other than that the probability is greater than zero.

94. Precipitation during plume passage will cause higher deposition and thus higher doses to the population. The emergency plans do not adequately protect against these higher doses. In addition, the emergency plans may not adequately incorporate increased evacuation times during precipitation.

95. UCS/NYPIRG has not calculated this risk and does not have the information to do so. Licensee should have the necessary data to perform such a calculation.

96. See Other References. Doses may be higher than expected on elevated terrain due to lower effective plume rise. The emergency plans do not adequately protect against these higher doses. Emergency plans may also not adequately consider wind channelling or increased evacuation times in hilly terrain.

97. Doses may be higher than expected under inversion or other adverse meteorology. The emergency plans do not adequately protect against these higher doses. See also 94.

98. The CONSAD Time Estimate Study does not appear to have used extreme weather conditions such as snow and icing in its assumptions. Under conditions of icing and snow, evacuation time would be increased significantly, limiting the efficacy of evacuation as a protective action and increasing the dependence on other protective actions, regardless of their adequacy or appropriateness given certain accident release scenarios.

99. Interrogatory relates to Contention 3.7 and is thus assumed to be directed at PARENTS.

100. UCS/NYPIRG does not have access to the numbers referred to in a-c. UCS/NYPIRG does contend that buses would not necessarily be available from other private or public sources in the event of a radiological emergency. There are no written agreements concerning such availability and therefore there is no basis for assuming that such availability exists.

101. UCS/NYPIRG does not recall making such a claim.

102. Interrogatory relates to Contention 3.9 and is thus assumed to be directed at WESPAC and WBCA.

103. Same response as #102.

104. Same response as #102.

105. Same response as #102.

106. Same response as #102.

107. It is assumed that this interrogatory is directed at a WBCA contention.

108. Same response as #107.

109. Same response as #107.

110. Same response as #107.

111. Same response as #107.

112. UCS/NYPIRG has not at present calculated the area for which the Plume Exposure Pathway EPZ should be expanded to provide adequate protection for the public health and safety. In general, a satisfactory methodology for doing so is set forth in "Emergency Planning Zones for Serious Nuclear Power Plant Accidents", State of California Office of Emergency Services, Alex R. Cunningham, Director, November 1980. That methodology can be successfully applied with the proviso that the probabilities calculated for different types of accidents and releases are unreliable. The report methodology does not limit the determination of the Plume EPZ primarily to prompt fatality limits, but also includes latent fatalities, early radiation injuries, and impacts on the thyroid as bases for establishing the Plume EPZ boundary. The methodology also includes specific and explicit consideration of local and site-specific factors such as meteorology (including dominant trajectories, wind direction and persistence, precipitation, inversion frequency and persistence, and seasonal and diurnal variations in these parameters), population distribution, and characteristics of the local roadway network. This methodology is also based upon an explicit consideration of accidents which exceed the design basis.

113. 1) A ten mile EPZ is not a fixed regulatory standard but a guideline.
- 2) At Indian Point, the public safety requires some expansion of the EPZ due to especially dense population patterns, longer than usual evacuation times, and the public's perception of excessive risk. Also, see response to Interrogatory #112.

114. The expansion of the plume EPZ would most likely increase evacuation time for all sectors of the population listed. It is self-evident that expansion of the plume EPZ would increase the number of transients who are located in the plume EPZ.

115. UCS/NYPIRG makes such an allegation. All the grounds for considering emergency planning within the EPZ inadequate are grounds for the inadequacy of ad hoc expansion as well. Given the lack of supporting evidence, there is no reason to believe that ad hoc measures outside the EPZ could be even as minimally successful as those inside. The greatly increasing population density in the areas approaching NYC will increase the difficulty in carrying out ad hoc protection measures. Therefore, in answer to (b) and (c), comprehensive emergency plans are what is needed to protect all individuals who could be adversely affected by any possible accident scenario at Indian Point.

116. It is assumed that this interrogatory is directed at PARENTS.

117. Special institutions will have special problems in dealing with a radiological emergency directly in relation to the nature of their specialness. For example, patients residing in an institution for the blind would have problems evacuating which could be different from those of the rest of the population and directly related to the reason for their being in that institution -- blindness. In the same manner, individuals in other special institutions -- such as those for the physically handicapped, the mentally impaired, the aged, and the deaf -- would have problems unique to their particular handicap.

118. UCS/NYPIRG believes it would be impossible to implement timely appropriate protective measures in the New York City Metropolitan area due to the extremely high population density and the poor road system in this area.

(a) The NYC Metropolitan area includes Manhattan, Brooklyn, the Bronx, Queens, and Yonkers.

(b) The protective measures appropriate for this area are comprehensive, effective, realistic emergency plans.

(c) The plans should be drawn up immediately. Such measures could not now be timely implemented.

(d) Emergency planning is appropriate for an area that could be affected by an emergency and NYPIRG contends that the NYC Metropolitan area could be affected by a radiological emergency at Indian Point.

In the event of large exposure brought about by unfavorable weather conditions, the only protective response that would be even remotely conceivable would be sheltering, and this presumes that the public could be promptly notified of the need to do so and taught how to shelter prior to plume arrival. Even then, this response would have limited use since sheltering is only useful to avoid inhalation doses for a period of about 2 hours. Regarding doses caused by ground deposition, evacuation of New York City within a period of one week to two weeks is conceivable, although not necessarily feasible.

119. Measures for control of agricultural products and drinking water supplies beyond the plume EPZ would not be sufficient to protect the public beyond the plume EPZ, in the event of such accidents as described in the bases of UCS/NYPIRG Contention II A because in those circumstances significant portions of the population would be exposed to dangerously

high levels of radiation from sources other than agricultural products and drinking water, and therefore the monitoring of such materials would not constitute adequate protection.

120. Massive damage could include some early deaths. In addition, preliminary calculations suggest between 78 and 20580 latent cancer deaths would occur in the case of a 24 hour exposure for persons beyond 10 miles. Thyroid cancers have not yet been calculated. Land contamination would be severe and would pose a continual threat to public health due to resuspension, water contamination, etc. These results have been calculated for a severe release such as PWR2 (in the Reactor Safety Study notation.) Probability estimates for the accidents that can lead to a PWR2 release have not yet been prepared.

121. The grounds for the allegation that the direction of evacuation would be limited is that the roadway network in the area likely to be affected is strongly oriented in a roughly North/South direction. It is assumed that most evacuees would choose or have chosen for them a means of transport which would necessitate use of the existing roadway network. Thus, they would largely be limited to egress in the directions offered by the existing roadway network. This could be further limited by the actual direction of plume travel.

122. Licensees' wind rose data as presented in its Final Safety Analysis Report (FSAR) combined with population distribution data therein show this relationship quite readily. Additional data may be found in the CRERP's and Licensees' emergency plans.

123. See response to Interrogatory 122. UCS/NYPIRG is unaware of any other published study. UCS/NYPIRG awaits receipt of Licensees' so-called "Probabilistic Safety Study" to determine if any useful information is contained therein on wind direction and wind persistence at

the site and in nearby areas.

124. See Other References -- Wind. Also computer printout of hour by hour meteorology for Indian Point, provided for International Benchmark Consequence Exercise by Sandia Laboratories. Available for inspection at National Audubon Society Headquarters, 950 Third Ave., 19th Floor, New York City.

125. 1)PWR1-5 type releases, not "accidents."

2) Probability estimates for these releases have not yet been prepared. Consequence calculations are based on previous efforts (see enclosed publications and publications list of Jan Beyea) and on recent modelling efforts using a modified version of a program prepared for the New Jersey Department of Environmental Protection.

126. Such an influx could evoke a quarantine response from governments and residents outside the immediate Indian Point area.

UCS/NYPIRG's allegation^{is} that there is no basis for assuming that the New York City metropolitan area would permit the influx of large numbers of potentially or actually irradiated and/or contaminated persons evacuating from Indian Point. If the Licensee has evidence to the contrary, it is their duty to provide it to the Board and parties.

127. The topography of Indian Point can cause higher doses than expected in the current emergency plans. The emergency plans do not adequately protect against these higher doses. See also answer to Interrogatory # 96.

128. a) UCS/NYPIRG is not addressing the issue of probability.

b) Population data from the N.Y. State Emergency Preparedness Plans.

c) Populations beyond ten miles are not guaranteed to be protected from early death or other serious consequences.

129. With regard to potassium iodide see answers to Interrogatories 131 and 135. UCS/NYPIRG is in the process of gathering information about sheltering and roadways and will supplement its answers at a later date.

130. Because UCS/NYPIRG is not in a decision-making capacity with regard to emergency planning, it is in no position to state what can and cannot be expected in the way of emergency planning improvements in the future.

131. (1) National Council on Radiation Protection and Measurements (NCRP) Report #55 "Protection of the Thyroid Gland in the Event of Release of Radioiodine" Aug. 1, 1977.

(2) FDA "Potassium Iodide as Thyroid Blocking Agent in a Radioactive Emergency" Federal Register 43:242 Dec. 15, 1978 p. 58798.

132. The appropriate form is a tablet containing at least 130 mg of KI salts.

133. The 1980 Physicians Desk Reference makes reference to the occurrence of small bowel lesions with extended KI use. Hypersensitivity to iodides has been demonstrated in some individuals.

Adverse reactions of thyroid adenoma, goiter, and myxedema are possible.

Most side effects would not occur with a dosage of 130 mg/day for a 7 day period, the minimum dosage that we recommend.

134. To provide a "ball-park" figure:

Estimated population w/n EPZ - 10	285,000
1 - 130 mg. tablet/day for 7 days	<u>X 7 tablets</u>
	1,995,000 tablets

There should be at least 2 million doses of 130 mg KI tablets. This amount would allow protection of the population for one week, a

safe estimate for the evacuation time for the last occupants of the region. The 130 mg tablet can be broken in half, a suitable dose for children less than 1 year old.

Additional tablets may be needed for those outside the 10-mile EPZ but within the 50-mile ingestion pathway.

135. Potassium iodide should be stockpiled at all facilities catering to the overnight accomodation of transients, such as parks, hotels, and YMCAs. County health department officials should be available for on-the-spot distribution of KI to transients at these and other locations. There is no evidence indicating the availability of KI for such circumstances.

136. Adequate sheltering capability would be sheltering capable of reducing radiation exposure during and following plume passage to an extent such that significant adverse health consequences do not occur. Such sheltering should be available for all residents of the areas at risk plus all transients in the area at risk at the time of the accident.

137-138. UCS/NYPIRG is not aware of the existence of any study which demonstrates the adequacy of present sheltering capability, either in terms of numbers of shelter spaces available or the dose reduction offered by the available shelter space. Until and unless the adequacy of sheltering is established for the population at risk (including resident and transients) there is no reasonable assurance that sheltering represents a feasible and effective protective response option.

139. As used in the contention, "degraded" means that either or both the carrying capacity and the traffic speed are less than normal. Degraded roadway conditions would include the following:

- A. Accidents blocking or partially blocking one or more lanes of an evacuation route.
- B. Highway construction or repairs blocking or partially blocking one or more lanes of an evacuation route.
- C. Weather-related conditions blocking or partially blocking one or more lanes of an evacuation route, or limiting visibility or traffic speed on an evacuation route.
Such weather-related conditions include snow, icing, fog, flooding, rainfall, storms, haze (whether or not due to natural or man-made causes.)
- D. Heavier than normal traffic volume sufficient to reduce traffic speed on an evacuation route.
- E. Any combination of the above.

140. It is not the responsibility of UCS/NYPIRG to devise strategy for upgrading the roadway network so that it will be sufficient for a rapid evacuation in the event of an accident at Indian Point.

141. "Arrival time" as referred to in UCS/NYPIRG contentions is calculated as the average wind velocity divided by the distance under consideration plus one half hour for the completion of plume passage. Arrival time will thus depend on average wind speed at time of release. This "arrival time" definition is used because the computer programs used in our study refer to dose as a function of time after plume passage.

142. Rain, snow, ice, extreme temperatures, fog, flooding, wind storms, and air pollution with an inversion would impair the ability of the public to promptly evacuate the plume EPZ. The nature of such impairments would be reduced visibility, worsened road conditions, engine trouble, and resulting traffic jams and accidents. UCS/NYPIRG has not calculated the probabilities of such occurrences.

143. Those particular "license conditions" proposed are just what is stated -- prohibition of power operation of Indian Point Units 2 and 3 when the roadway network becomes degraded to the point at which evacuation becomes infeasible.

144. This information is currently being assembled by WESPAC, RCSE, and other citizens intervenor groups in Rockland and Westchester counties. UCS/NYPIRG will be able to provide a more complete answer after consultation with these groups. With regard to parts (a) and (b), calculations are being carried out based upon a hypothesized PWR2 release category accident. UCS/NYPIRG lacks the capacity at the present time to determine what are the "most limiting accidents." The number and locations of persons at risk (item (c)) depends upon the specific accident and release scenarios that are hypothesized; in general, the persons at risk will be those persons within the plume exposure pathway EPZ once that area is properly established in accordance with the methodology proposed in our answer to Licensees interrogatory # 112.

145. UCS/NYPIRG expects to receive such engineering studies through Discovery.

146. See answer to Interrogatory #117 for answer to first part of Interrogatory #146. UCS/NYPIRG is not responsible for the identifications requested in 146 a - d. It is UCS/NYPIRG's allegation that such infor-

mation should have gone into the preparation of the RERPs. (e) is irrelevant.

147. See responses to Interrogatories # 117 and 146. Common sense and personal experience dictate the grounds for the allegation referred to in part C. UCS/NYPIRG does not have the data requested in part D.

148. The grounds for this allegation can be found in UCS/NYPIRG's Bases for Contention 1(B)7. Such specific steps would most likely **include** a stepped-up public education program including material which would promote such an awareness.

149. NRC continues to rely on paper reviews of paper plans. NRC has failed to require demonstrations of feasibility of evacuation and/or other protective response options; in addition, NRC has failed to specify acceptable limits for the maximum time required to effectuate protective response options. Thus, although the particulars have changed, the general practice remains quite similar. To make matters worse, NRC has shifted the burden of determining acceptability to FEMA, which has an insufficient staff and almost no criteria for performing the job, and which is generally inaccessible to the public. See also Basis for Contention I(B)(7).

150. UCS/NYPIRG has not extensively analyzed emergency planning hardware to ascertain all of the appropriate safety-grade standards for such hardware. Nonetheless, several criteria are applicable:

- (a) Single failure criteria
- (b) Failure annunciation criteria
- (c) Environmental qualification criteria
- (d) Criteria of availability of backup power sources
- (e) Redundancy of safety systems criteria

151. See bases to UCS/NYPIRG Contention I(B)(6).

- (a). UCS/NYPIRG is seeking expert opinion on this issue, and would hope to take advantage of FEMA and NRC in-house dose levels, if any.
- (b). Changes in the Evacuation Time Estimates.
- (c). The interrogatory is not applicable, since it is generic. UCS/NYPIRG contentions are site-specific to Indian Point.
- (d). A maximum acceptable dose level. See UCS/NYPIRG response to Objections to UCS/NYPIRG Contentions, at pp. 58-59.
- (e). See basis 3 to UCS/NYPIRG Contention I(B)(6).

152. It is our understanding that the present means of alerting and informing the population of an emergency consists of 88 outdoor sirens, numerous plectron tone-alerts, the public broadcasting system, and ad hoc measures such as roving policemen equipped with megaphones.

153. Not directed at a NYPIRG contention

154. Not a UCS/NYPIRG contention. Note reference to RCRERP (Rockland County Plan.)

155. Not a UCS/NYPIRG contention.

156. The two major types of protective action are sheltering and evacuation. Ad hoc respiratory measures and thyroid prophylaxis can be of some value used in conjunction with sheltering or evacuation. The adequacy of various protective measures in major releases of radioactivity is dependent upon the level of exposure and the time period in which the protective measures can be implemented. There is a limit to the effectiveness of sheltering in terms of the dose reduction provided.

157. Not directed at UCS/NYPIRG.

158. Not directed at UCS/NYPIRG.

159. A protective measure is any step or combination of steps which will reduce the dose to the public from exposure to or contamination by radioactivity.

(a) Technologically possible.

(b) Available in sufficient numbers for use by all affected persons.

(c) Results, either singly or in combination with other measures, in a sufficient reduction in dose to prevent significant adverse health effects.

(d) Available in sufficient time to afford the necessary protection to people at risk.

(e) And has costs that are acceptable.

160. Not relevant to a NYPIRG contention.

161. Not relevant to NYPIRG contentions.

162. To the extent to which persons in social groups are within the area at risk from serious accidents at Indian Point, these persons must be able to participate successfully in all protective response options which are relied upon to protect the public health and safety.

Such special groups would include the blind, the deaf or hearing impaired, the mentally handicapped, the physically handicapped, non-English speaking persons, small children, the elderly, the infirm, those easily subject to panic, the claustrophobic, and any other person who would have particular difficulties with evacuation sheltering or any other protective action which might be recommended.

163. The same provisions must be made as for those who are not dependent on others for their mobility. Additionally, there must be assurance that sufficient numbers of appropriately trained persons are available to assist those persons dependent on others for their mobility.

164. The burden of such identification is on those responsible for adequate emergency planning.

165. Answer same as for interrogatory #164.

166. This information should have been gathered by those responsible for emergency planning before the emergency plans were drawn up. UCS/NYPIRG is presently attempting to get this information through Discovery.

167. Interrogatory is directed at WESPAC contention.

168. Interrogatory is directed at WESPAC and WESTBRANCH contention.

169. This allegation is a WESPAC contention.

170. This is not directed at a NYPIRG/UCS contention.

171. UCS/NYPIRG has no figures on this. It is presumed, for the most part, that patients in intensive care and on life-support systems could not be evacuated.

172. It is not the responsibility of UCS/NYPIRG to make such identifications. It is clearly the responsibility of emergency planners to do so.

173. See answer to interrogatory #172.

174. This interrogatory would be best directed at the county departments of parks and recreation. UCS/NYPIRG does not possess such information. In addition, average numbers are not as important as maximum numbers.

175. It is UCS/NYPIRG's understanding that there is no intention to equip congregate care centers with emergency supplies.

(a) Emergency supplies should include food, medicine, clothing, bedding, medical goods, water, sanitation facilities, and radiation monitoring equipment.

(b) It is possible that some such centers could be equipped with supplies subsequent to their activation. It is not difficult to envision situations where it would be extremely difficult and maybe impossible to acquire such necessary supplies after an accident had occurred.

176. Interrogatory directed at PARENTS contention.

177. Interrogatory directed at PARENTS contention.

178. Not directed at a UCS/NYPIRG contention.

179. UCS/NYPIRG does not have the data requested in this interrogatory. The fact that a certain number of residents of the plume EPZ are employed outside the plume EPZ would affect emergency planning and the evacuation time estimates in that many of these people could be expected to return to the EPZ to pick up children, other family members, or personal possessions before evacuating the area for good. Such an influx would increase evacuation time. Common sense dictates such a response and such an effect.

180. (a)-(d), (f). Jan Beyea and Brian Palenik: Board Contentions 3.6, 4.1, and 4.3 and intervenor contentions referenced thereunder. Biographical information and list of documents attached as Appendix A. Pages of previous testimony unknown

Kai Erikson: Board Contentions 3.2 and 3.7 and intervenor contentions referenced thereunder. Biographical information and list of documents attached as Appendix B. Pages following page 12407 of testimony at San Luis Obispo, California, to be found in the NRC Public Document Room. Pages of other previous testimony unknown.

(e) No relationship.

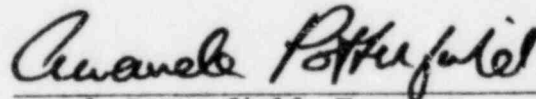
181. See interrogatory responses #1-180.

182. See interrogatory responses #1-180.

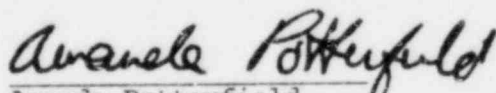
183. Such items, when appropriate, are referred to in the response to individual interrogatories.

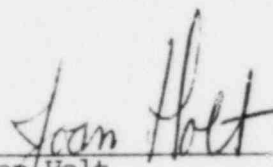
184. We are awaiting the publication of FEMA's assessment and the delivery of documents requested in discovery. However, it is evident that communications failures occurred between emergency officials (see, e.g., the press release from Orange County referring to hot line failure, in your possession); EBS messages contained information that contradicts the public information brochure on the question of bringing pets when evacuating; and widespread, though yet undetermined, failures occurred in the siren systems.

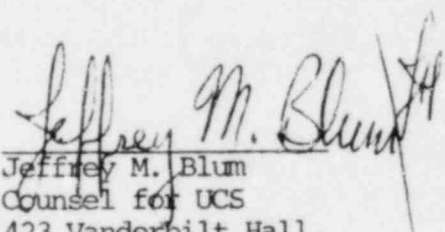
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1970 to 1976, Assistant Professor of Physics, Holy Cross College.
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Consultant on nuclear energy to the New Jersey Department of Environmental Protection; the Offices of the Attorney General in New York State and the Commonwealth of Massachusetts; the state of lower Saxony in West Germany; the Swedish Energy Commission; and various citizens' groups in the United States.

PUBLICATIONS CONCERNING ENERGY CONSERVATION AND ENERGY POLICY:

"Comments on Energy Forecasting," material submitted for the record at the Hearings before the Subcommittee on Investigations and Oversight of the Committee on Science and Technology, U. S. House of Representatives; Committee Print, June 1, 2, 1981 / No. 14 _/.

* "The Audubon Energy Plan Technical Report," Peterson, Beyea, Paulson and Cutler, National Audubon Society, April 1981.

"Locating and Eliminating Obscure but Major Energy Losses in Residential Housing," Harrje, Dutt and Beyea, ASHRAE Transactions, 85, Part II (1979). Winner of ASHRAE outstanding paper award.

"Attic Heat Loss and Conservation Policy," Dutt, Beyea, Sinden. ASME Technology and Society Division paper 78-TS-5, Houston, Texas, 1978.

"Comments on the proposed FTC trade regulation rule on labeling and advertising of thermal insulation," Jan Beyea and Gautam Dutt, testimony before the Federal Trade Commission, January 1978.

"Critical Significance of Attics and Basements in the Energy Balance of Twin Rivers Townhouses," Beyea, Dutt Woteki, Energy and Buildings, Volume I (1977), Page 261. Also Chapter 3 of Saving Energy in the Home, Ballinger, 1978.

"The Two-Resistance Model for Attic Heat Flow: Implications for Conservation Policy," Woteki, Dutt, Beyea, Energy--the International Journal, 3, 657, (1978).

"Energy Conservation in an Old 3-Story Apartment Complex," Beyea, Harrje, Sinden, Energy Use Management, Fazzolare and Smith, Pergamon 1977, Volume I, Page 373.

"Load Shifting Techniques Using Home Appliances," Jan Beyea, Robert Weatherwax, Energy Use Management, Fazzolare and Smith, Pergamon 1978, Volume III/IV, Page 121.

PUBLICATIONS CONCERNING ENERGY RISKS (PREDOMINANTLY NUCLEAR POWER):

Articles

* "Containing a Nuclear Reactor Melt-Down," (with Frank von Hippel), Bulletin of the Atomic Scientists, to be published.

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Documents are available for inspection at NYPIRG (5 Beekman St. N.Y., N.Y.) by appointment. In addition to the documents on Dr. Beyea's resume the following documents are available as these may be used to support his testimony:

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Brian Palenik received his Bachelor of Science in Civil Engineering degree from Princeton University. While an undergraduate at Princeton, he worked with Dr. Beyea on the consequence calculations for "Some Long-Term Consequences of Hypothetical Major Releases of Radioactivity to the Atmosphere from Three Mile Island"--Dr. Beyea's report of the President's Council on Environmental Quality. After graduation, Mr. Palenik joined the staff of National Audubon Society's Policy Research Department to continue working on nuclear accident consequence modelling, as well as other energy policy issues.

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EDUCATION

1949-1950	University of California, Berkeley
1950-1953	Reed College (B.A.)
1953-1955	University of Chicago (M.A.)
1957-1963	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, Washington, D.C. (while on active duty with 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	Master, Trumbull College, Yale University (Chair, Council of Masters, 1970-1973)
1973-1974	Visiting Professor, Department of Sociology, University of New Mexico
1974-1977	Chair, American Studies Program, Yale University
1979-	Editor, <u>The Yale Review</u>

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)

English edition entitled In the Wake of the Flood (London: George Allen & Unwin, 1979)

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HONORS

McIver Award, American Sociological Association, 1967

Sorokin Award, American Sociological Association, 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)

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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