OBMED. UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the Matter of

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BOSTON EDISON COMPANY et al.

Docket No. 50-471

(Pilgrim N clear Generating Station, Unit 2)

J. Goldberg /Blune Chandler PRutberg Reply due Sept. 10, 1981

DETAILED STATEMENT OF THE COMMONWEALTH'S EMERGENCY PLANNING CONTENTIONS

The Applicants and Staff have failed to account properly Ι. for local emergency response needs and capabilities in establishing boundaries for the plume exposure pathway and ingestion pathway Emergency Planning Zones for Pilgrim II, as required by 10 C.F.R. §50.34(a) and 10 C.F.R. Part 50, Appendix E.1 / Specifically, Applicants and Staff have

<sup>1/</sup> Applicants have admitted, in their answers to interroyatories propounded by the Commonwealth, that the only local factor which affected their definition of the EP2's for Pilgrim was that of local jurisdictional boundaries. See Response of Boston Edison Company, et al. to Commonwealth of Massachusetts' First Set of Interrogatories to Boston Edison Company Relative to Emergency Planning, pp. 2-6. Applicants admit that, aside from this one factor, their selection of EP2 boundaries was based solely on the generic guidance contained in NUREG-0396: EPA 520/1-78-016, "Planning Bases for the Development of State and Local Government Radiological Emergency Response Plans in

failed to consider adequately or to account properly for the effect of the following factors specific to Pilgrim II on local emergency response needs and capabilities and, hence, on the appropriate size and configuration of the Pilgrim II EP2's:

- A. The large seasonal and transient populations on Cape Cod during summer months;
- B. The limited road network on Cape Cod;
- C. The limited access routes from Cape Cod to the mainland and the fact that those routes feed into the evacuation network for the population within 10 miles of Pilgrim II at points which are 11.5 and 14.5 miles, respectively, from the proposed plant site;
- D. The proximity of the proposed plant site to Cape Cod Bay and the groundwater conditions and soil

<sup>1/(</sup>cont.) Support of Light Water Nuclear Power Plants," December, 1978, and NUREG-0651: FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." Id. The Staff similarly states, in answer to interrogatories, that these documents serve as the bases for its agreement with the EP2 boundaries established by the Applicants. See NRC Staff's Response to the Commonwealth of Massachusetts' First Set of Interrogatories to the NRC Staff Relative to Emergency Planning, p. 2. The Commission's Emergency Planning Rule, 10 C.F.R. Part 50, Appendix E, Section II, specifically requires that the "size of the EP2s . . . be determined in relation to local emergency response needs and capabilities, as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries."

composition on said site, with their resulting implications for travel of radionuclides through a liquid pathway in the event of a reactor meltdown accident at Pilgrim II;2/

- E. The number, location, and capacity of local sheltering facilities and the degree of protection from radionuclides afforded thereby;
- F. The heightened sensitivity to radiation (over that of the average healthy adult male) of the large numbers of children and pregnant women who are present on Cape Cod during the summer months;
- G. Local meteorological conditions, including the distribution of wind directions and speeds and the frequency of hurricanes;
- H. Radionuclises which will be significant contributors to dominant exposure modes for prompt and latent effects in the event of a PWR-1 to PWR-7 accidental release as described in the NRC's Reactor Safety

2/ See NUREG/CR-1596, "The Consequences from Liquid Pathways of a Reactor Meltdown Accident," June, 1981.

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Study (WASH-1400), or its equivalent, at Pilgrim II.3/

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- I. The consequences of a PWR-1 to PWR-7 accidental release at Pilgrim II, or its equivalent, at harvest time.
- II. The Applicants' PSAR fails to comply with the requirement of 10 C.F.R. Part 50, Appendix E, and 10 C.F.R. §50.34(a) that it "contain sufficient information to ensure the compatibility of proposed emergency plans for both onsite areas and the EP2's, with facility design features, site layout, and site location . . . " because there is therein insufficient evidence of the feasibility of protective

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<sup>3/</sup> NUREG-0396 and NUREG-0654, in arriving at their generic guidance on the size of EF2's, rely on the potential consequences of a spectrum of accidents, including the PWR-1 to PWR-7 accidents described in WASH-1400. See NUREG-0396, pp. 4-6; NUREG-0654, pp. 5-7. The Pilgrim II fission product thermal reactor used as the model for WASH-1400's estimates of accident consequences. And the Pilgrim II average fuel burn-up exceeds the 17,600 megawatt-days (thermal) per metric ton assumed in WASH-1400. Thus, the generic guidance of NUREG-0396 and NUREG-0654 is based on estimates of accident consequences which fail to account for radionuclides which will be significant contributors to dominant exposure modes for prompt and latent effects in the event of a PWR-1 to PWR-7 release at Pilgrim II.

action in the event of a PWR-1 to PWR-7 accidental release, or its equivalent, at Pilgrim II. This is true for the following reasons:

- A. The PSAR contains no evidence of plant-specific probabilities of PWR-1 to PWR-7 releases.
- B. The PSAR contains no evidence of site-specific consequences in the event of PWR-1 to PWR-7 releases.
- C. WASH-1400's estimates of accident probabilities and consequences are not sufficient evidence of the probabilities and consequences in the case of Pilgrim

II because:

- WASH-1400 provides insufficient evidence of accident consequences where evacuation is restricted, as may be the case under the current emergency plans for Pilgrim II, to a ten-mile radius.
- 2. WASH-1400 provides insufficient evidence of the consequences resulting from releases through liquid pathways in the event of a reactor meltdown accident, which omission is particularly critical in the case of Pilgrim II given the proximity of the proposed plant site to Cape Cod Bay and the groundwater conditions and soil composition on the site.
- The PSAR contains no evidence that WASH-1400's assumptions regarding medical treatment are applicable to Pilgrim II.
- There is a large degree of uncertainty associated with WASH-1400's estimates of accident probabilities.

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The assumptions upon which WASH-1400's estimates of accident probabilities and consequences are based are not conservative for Pilgrim II and are inconsistent with the following factors specific to Pilgrim II:

- A. Pilgrim II fission product inventory;
- B. Pilgrim II fuel burn-up;
- c. The heightened sensitivity to radiation (over that of the average healthy adult male) of the large number of children and pregnant women who are in the Town of Flymouth and on Cape Cod during the summer months;
- d. The population density pattern in the area of the Pilgrim site, as reflected by the Applicants' own filings in this proceeding;
- e. Meteorological conditions specific to the Pilgrim site, including the distribution of wind directions and speeds and the frequency of hurricanes.
- 6. The PSAR contains insufficient information to assure that the assumptions upon which WASH-1400's estimates of accident probabilities and consequences are based are consistent with the following factors specific to Pilgrim II:
  - a. The degree of protection afforded by the protective action of sheltering in the event of an accident at Pilgrim II.
  - b. The latent consequences of a PWR-1 to PWR-7 accidental

release at Pilgrim II, or its equivalent, at harvest time.

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- D. Decause of the large degree of uncertainty associated with WASH-1400's estimates of accident probabilities, the probabilities of exposures exceeding Protective Action Guides (PAG's) set forth in NURES-0396 may be seriously understated for Pilgrim II.
- E. The evacuation time estimates contained in the PSAR have been limited to a geographical area determined without reference to local emergency response needs and capabilities. (See Section I. above).
- F. The evacuation time estimates contained in the PSAR have not been properly calculated so as to estimate accurately the time required to evacuate the population within the plume exposure pathway EP2 proposed by the Applicants. Specifically, those evacuation time estimates fail to:
  - Account for the full public transportation-dependent population;
  - Account for the effect on evacuation times of the bottlenecks at the Sagamore Rotary and along the Cape Cod Canal;
  - Account properly for population growth prior to the commencement of operation and over the life of the plant;
  - Account for the time required to evacuate special institutions;
  - Account properly for preparation/mobilization time;

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 Account properly for the effect on evacuation times of adverse weather conditions;

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- Account for other than home-based evacuation traffic;
- Account for the possibility that multiple-car families will evacuate in more than one car;

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- Use realistic assumptions with respect to the information available to evacuees when choosing evacuation routes.
- G. The evacuation time estimates prepared by

Battelle Pacific Northwest Laboratories for the NRC Staff have not been properly calculated so as to confirm that the evacuation time estimates contained in the PSAR are realistic.

Specifically, the Battelle estimates fail to:

- Account for the public transportation-dependent population;
- Account properly for population growth prior to the commencement of operation and over the life of the plant;
- Account for the time required to evacuate special institutions;
- Demonstrate any basis for the distribution of preparation times assumed or percentages of the population assigned to each time;
- Account for adverse weather conditions;
- Account for other than home-based evacuation traffic;
- Account for the possibility that multiple-car families will evacuate in more than one car;

 Use realistic pre-planned evacuation routes or routes consistent with those which local officials will recommend;

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 Use realistic free flow rate assumptions;

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- Employ a methodology sufficiently refined to produce results which are useful for purposes of confirming the estimates contained in the PSAR.
- H. There are significant discrepancies between the evacuation time estimates contained in the PSAR and those calculated by Battelle Pacific Northwest Laboratories for the NRC Staff.
- I. The evacuation time estimates contained in the PSAR and those calculated by Battelle Pacific Northwest Laboratories for the NRC Staff underestimate actual evacuation times because they fail to account for any of the following possibilities:
  - vehicles breaking down or running out of fuel;
  - traffic accidents;
  - abandoned vehicles;
  - 4. disregard of traffic control devices; and
  - evacuees using inbound traffic lanes for outbound travel.

J. The evacuation time estimates contained in the PSAR and those calculated by Battelle Pacific Northwest Laboratories for the NRC Staff are sufficiently high to warrant the conduct of a full plant-specific accident probabilities and site-specific accident consequences analysis and consideration of design modifications and other preventive and mitigative measures.

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- K. The PSAR contains insufficient evidence to assure the feasibility of evacuation as a protective action given the fact that reception centers for evacuees have been located within twenty miles of the site.
- L. The PSAR contains insufficient evidence of the availability and adequacy of local sheltering facilities to assure the feasibility of sheltering as a protective action in the event of a PWR-1 to PWR-7 release at Pilgrim II.
- M. The PSAR contains insufficient assurance of prompt protective action decision-making.
  - 1. The PSAR does not provide for direct lines of communication, with appropriate back-up, with the Governor of Massachusetts and the Secretary of the Massachusetts Department of Public Health during that period of time before those officials arrive at the Civil Defense Agency Headquarters Emergency Operations Center.

- 2. The PSAR, through its provisions for "First-line" and "Second-line" notification, does not assure that all offsite authorities responsible for implementing protective actions will be notified within fifteen minutes of the occurrence of an emergency, as required by NUREG-0654.
- 3. The PSAR contains no letters of agreement providing for prompt (15 minute) protective action decision-making on a 24-hour basis by off-site agencies.
- N. There are no established quantitative or qualitative standarc; by which one can assess the feasibility of protective action in the event of a PWR-1 to PWR-7 release at Pilgrim II.
- III. Because the Applicants' PSAR contains insufficient evidence of the feasibility of protective action in the event of a PWR-1 to PWR-7 accidental release, or its equivalent, at Pilgrim II, there is insufficient basis for the Board to strike the cost/benefit balance required by the National Environmental Policy Act of 1969, 42 U.S.C. §4332 et seq.4/

4/ The Board expressly notes, in its Partial Initial Decision in this matter (at p. 191), that the costs and benefits of emergency planning have not yet been factored into its cost-benefit analysis and that the cost-benefit balance which it has tentatively struck must be reassessed in the light thereof.

- IV. The PSAR fails to set forth adequate preliminary plans for coping with emergencies as required by 10 C.F.R. 50, Appendix E, and 10 C.F.R. §50.34(a).
  - A. The PSAR fails to describe the means by which the public is to be notified and instructed of the need to evacuate or to take other protective action as required by 10 C.F.R. 50, App. E, Section II, Items C and G.
  - B. The PSAR fails to provide for timely and adequate notification of off-site authorities.
    - The PSAR fails to provide, as required by NUREG-0654, for notification of off-site authorities within 15 minutes of the occurrence of an Unusual Event.
    - The PSAR does not call for provision of sufficient information to off-site authorities upon the occurrence of an Unusual Event to assure that the purposes of such notification, as set forth in NUREG-0654, will be satisfied.
    - 3. The PSAR, through its provisions for "First-line" and "Second-line" notification, does not assure that all offsite authorities responsible for implementing protective measures within the plume exposure pathway EP2 will be notified within 15 minutes of the occurence of an emergency, as required by NUREG-0654.
  - C. The evacuation time estimates contained in the PSAR have been limited to a geographical area determined without reference to local emergency response needs and capabilities. (See Section I. above).
  - D. The PSAR contains insufficient evidence that there will exist the capability for

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dose projection using real-time meteorological information, as required by 10 C.F.R. Part 50, Appendix E, Item H, since PSAR Amendments 41 and 43 are inconsistent in their commitments with respect to provision of radiation monitors in accordance with Reg. Guide 1.97, Rev. 2.

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## CERTIFICATE OF SERVICE

I hereby certify that the within Statement has been served on the following by deposit of copies thereof in the United States Mail, first class mail, postage prepaid this 21st day of August, 1981:

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