UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING APPEAL BOARD

In the Matter of	)	
	)	
BOSTON EDISON COMPANY, et al.	)	Docket No. 50-471
	)	
(Pilgrim Nuclear Generating Station, Unit No. 2)	)	
	)	

BRIEF OF THE COMMONWEALTH OF MASSACHUSETTS IN SUPPORT OF ITS EXCEPTIONS NOS. 1, 2 AND 6 TO THE ATOMIC SAFETY AND LICENSING BOARD'S "PARTIAL INITIAL DECISION, FINDINGS OF FACT AND CONCLUSIONS OF LAW ON ALL MATTERS EXCEPT EMERGENCY PLANNING AND TMI-2 RELATED ISSUES"

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I. INTRODUCTION AND STATEMENT OF THE QUESTIONS PRESENTED

Pursuant to the provisions of 10 CFR §2.762, this action comes before the Atomic Safety and Licensing Appeal Board ["Appeal Board"] on exceptions of the Commonwealth of Massachusetts to the "Partial Initial Decision, Findings of Fact and Conclusions of Law on all Matters except Emergency Planning and TMI-2 Related Issues", issued by the Atomic Safety and Licensing Board ["Licensing Board"] on February 2, 1981. On February 18, 1981 the Commonwealth filed exceptions to the Licensing Board's decision, three of which are now being presented for review by the Appeal Board. The exceptions are as follows:

Exception No. 1

> The Licensing Board committed error in concluding that "from geographic and population viewpoints, the proposed Unit 2 site is suitable for the location of a nuclear plant of the general type and size proposed by the applicants."

Exception No. 2

> The Licensing Board committed error in concluding that "the population density estimated for the area contiguous to the site proposed for the Unit 2 nuclear generating station throughout its projected life is within guides established by the Commission and, accordingly, that the projected density is not cause, in itself, for selecting other sites."

Exception No. 6

> The Licensing Board committed error in striking the cost/benefit balance mandated by NEPA prior to evidentiary hearings on emergency planning and other TMI-2 issues relating to site suitability.

II. STATEMENT OF THE CASE

A. Procedural History

On June 7, 1973, an application was filed by Boston Edison Company ["BECo"], on behalf of itself and a number of other public utilities and municipal light departments, for authorization to construct an 1180 megawatt electric pressurized water reactor on the western shore of Cape Cod Bay, just south of Plymouth Bay at a site called Rocky Point. The plant, designated as Pilgrim Unit 2, is planned to be located adjacent to Pilgrim Unit 1, an operating 665 megawatt electric boiling water reactor. The original application was rejected by the Commission for lack of sufficient information, and after subsequent revisions it was resubmitted, accepted and docketed as No. 50-471 on December 21, 1973.[1/]

On May 30, 1974, the Licensing Board admitted the Commonwealth of Massachusetts, the Massachusetts Wildlife Federation, Alan and Marion Cleeton and Daniel F. Ford as intervenors to the proceeding.[2/] A non-timely petition to

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1/ At the same time it submitted its Pilgrim 2 application, BECo also applied for authorization to construct Pilgrim Unit 3, an application which was similarly docketed on December 21, 1973 as No. 50-472. In June of 1974, however, BECo requested that it be allowed to withdraw its Unit 3 application, a motion that was allowed by the Board on August 9, 1974.

2/ On February 26, 1975, the Licensing Board issued an order deeming Intervenor Ford in default for failure to participate in the evidentiary proceedings. All of Ford's contentions were dismissed except that concerning steam generator tube integrity, which was made the subject of independent Board inquiry.

intervene was filed by the Plymouth County Nuclear Information Committee and denied by the Licensing Board on August 30, 1974, a ruling that was subsequently affirmed by the Appeal Board on October 22, 1974. Boston Edison Company (Pilgrim Nuclear Generating Power Station, Unit 2), ALAB-238, 8 AEC 656. Various contentions of the intervenors were admitted by the Licensing Board on February 18, 1975.

On June 18, 1974 the Staff issued its Draft Environmental Statement for the proposed Pilgrim Units 2 and 3. Because of BECo's subsequent withdrawal of the Unit 3 application, the Licensing Board ordered that the changes in the proposed Final Environmental Statement ["FES"] necessitated by BECo's decision not to go forward with Unit 3 be published and recirculated to the appropriate agencies, and on October 4, 1974 the FES was issued. On June 25, 1975 the Staff issued its Safety Evaluation Report ["SER"], which has been supplemented four times since.

Evidentiary hearings commenced on October 20, 1975 and continued intermittently until July 1, 1977, when the environmental record was closed. Earlier, on October 13, 1976, BECo had requested a Limited Work Authorization ["LWA"] pursuant to the provisions of 10 CFR §50.10(e), and after the filing of proposed findings of fact and conclusions of law, the Licensing Board issued a partial initial decision on November 30, 1977, denying the LWA on the ground that the analysis of alternative sites offered by both BECo and the Staff pursuant

to the requirements of the National Environmental Policy Act ["NEPA"] was insufficient to satisfy the requirements of 10 CFR §§50.10(e) and 51.52(b). Boston Edison Company (Pilgrim Nuclear Power Station, Unit 2), 6 NRC 839; affirmed, Boston Edison Company (Pilgrim Nuclear Generating Station, Unit 2), ALAB-479, 7 NRC 774 (May 25, 1978). A draft supplement to the FES was subsequently prepared by the Staff, seeking to correct the deficiencies of the original alternative sites study. After circulation, it was issued as a Final Supplement to the Final Environmental Statement ["FSFES"].

Hearings resumed on March 6, 1978 and continued from time to time until August 28, 1979 when the record was closed on all issues except emergency planning,[3/] and those that may arise

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3/ On April 4, 1979 the Commonwealth requested the Licensing Board to accept the following two late-filed contentions:

> 1. Given the population densities, transportation network, land use and other unique characteristics of the area surrounding the proposed Pilgrim 2 site, no emergency plan can be developed that will adequately protect the public in the event of a major radiological accident.
>
> 2. The applicant's preliminary plans for protecting the public in the event of a major radiological accident at the Pilgrim site, as set forth in its Preliminary Safety Analysis Report, are inadequate under the guidelines established in Appendix E to 10 CFR Part 50 and the proposed amendment thereto.

The Commonwealth's motion was supported by the Staff, and on May 24, 1979 was granted by the Licensing Board. Although evidentiary hearings on these contentions were scheduled by the Board, on September 13, 1979 they were deferred indefinitely at the request of the Staff, which had not yet completed its review of emergency planning at the Pilgrim site. As of this date, hearings have not yet been rescheduled.

from the new safety requirements contained in NUREG-0718 and based on the lessons learned from the accident at Three Mile Island. Proposed findings of fact and conclusions of law were subsequently filed by BECo, the Commonwealth and the Staff, and on February 2, 1981 the Licensing Board issued the Partial Initial Decision that is the subject of this appeal.

B. The Decision Below

The pertinent portions of the Licensing Board's Partial Initial Decision with respect to the issues raised by this appeal are found at paragraphs 132-141, 397 and 418(5) of the decision. In exceptionally summary fashion, the Licensing Board held that the population densities surrounding the Rocky Point site both at the time of start up and at the time the Pilgrim Unit 2 is ultimately decommissioned are such that the "Staff concluded that no special consideration of demography was necessary in the review of alternate sites", Paragraph 133. Without any elaboration, and barely even expressing its own views on the subject, the Board also accepted the Staff's method of averaging population over land and water areas and its method of time-weighting seasonal residents and transients. Paragraphs 134-136. The Board briefly and inconclusively discussed the testimony of one early witness of the intervenors on population density at Paragraphs 137-38, but made no mention of the extensive critique of the Staff's demographic methodology offered by the Commonwealth through its

witness Phillip Herr, Tr. 11,612 et seq., or through cross examination of Staff witnesses at Tr. 1845-1922 and Tr. 11,452-11,600.

At Paragraph 397, the Licensing Board concluded that "the population density estimated for the area contiguous to the site proposed for the Urit 2 nuclear generating station throughout its projected life is within guides established by the commission and, accordingly, the projected density is not cause, in itself, for selecting other sites," and that "from geographic and population viewpoints, the proposed Unit 2 site is suitable for the location of a nuclear plant of the general type and size proposed by the applicants." At Paragraph 413(5) the Board concluded that "the benefits to be derived from Unit 2 outweigh its costs."

III.SUMMARY OF ARGUMENT

The Commonwealth's first contention is that as part of its NEPA review the Staff should have performed a Class 9 accident consequence analysis for Rocky Point and its alternative sites. According to the Commission's June 9, 1980 Statement of Interim Policy, such analyses will henceforth be required in all Final Environmental Statements, but will not be required for those cases where an FES has already been prepared, "absent a showing of special circumstances." In support of its position, the Commonwealth will argue (1) that the Staff's treatment of demographic considerations at the Rocky Point site was so superficial and flawed as to constitute the special

circumstances that would warrant remand for consideration of the Class 9 issue, (2) the high population densities, irregular population distributions and other unique site characteristics of the area surrounding the Pilgrim 2 site indicate such a substantially increased threat to the public in the event of a major reactor accident that the special circumstances test has been satisfied, and (3) that where an FES has been prepared by the Staff but where the final cost/benefit balance has not yet been struck by the Licensing Board it is improper to preclude consideration of Class 9 accident consequences.

Second, it is the Commonwealth's contention that where the Licensing Board has yet to hold hearings on the Commonwealth's contention pertaining to emergency planning feasibility, it was premature and erroneous for the Board both to conclude that the Rocky Point site was suitable for the construction and operation of a nuclear reactor and to strike the cost/benefit balance mandated by NEPA.

IV. ARGUMENT

BECAUSE OF THE DENSELY POPULATED AREA SURROUNDING THE PROPOSED PILGRIM UNIT 2 REACTOR AND ITS UNIQUE SITE CHARACTERISTICS, A CLASS 9 ACCIDENT RISK ANALYSIS SHOULD HAVE BEEN UNDERTAKEN AS PART OF THE NEPA ALTERNATIVE SITES ANALYSIS (COMMONWEALTH EXCEPTION NO. 7)

A. <u>The Role of Class 9 Accident Analyses in Furthering the Commission's Remote Siting Policy</u>

The Commonwealth of Massachusetts is the third most densely populated state in the nation, and for this reason the issue of reactor siting is of paramount concern to its citizens.

Because some risk of a serious radiological accident will remain even after all reasonably attainable safety features are incorporated in the design of a proposed nuclear reactor, careful scrutiny of the size, distribution and evacuability of the population surrounding that reactor has emerged as the Commission's primary means of protecting the public against the consequences of such catastrophic accidents . See Reg Guide 4.7, pp. 9, 16; Statement of Considerations, 10 CFR Part 100, 27 FR 3509 (April 12, 1962); "Commission Action Paper", SECY 78-137 (March 7, 1978), introduced as Commonwealth Exhibit 112 at Tr. 11,539 ["SECY 78-137"]; 10 CFR §100.10.[4/]

To a considerable extent, the Commission's remote siting policy finds expression in the site suitability criteria of 10 CFR Part 100. In addition, although a Licensing Board is not

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4/ See, however, NUREG-0625, "Report of the Siting Policy Task Force" ["Siting Policy Report"], which concluded that the AEC's original commitment to remote siting as a key component in the defense against catastrophic reactor accidents had over the years become compromised by the NRC Staff's informal practice of allowing improvements in plant design to compensate for the protection that isolation of reactors from population concentrations would otherwise have afforded. As a result of this willingness on the part of the Staff to accept an increase in engineered safety features in the place of remote siting, a number of reactors can now be found in alarmingly close proximity to metropolitan areas.

Whatever the extent to which reactor design improvements decrease the probability of a major accidental release of fission products, they provide little or no protection in the event of such an accident, and for this reason the Task Force recommended that population density criteria be developed by the Commission and incorporated in 10 CFR Part 100, that section of the NRC's regulations pertaining to site suitability. In the interim, of course, it becomes all the more important that those provisions of the NRC's regulations intended to induce remote siting be fully complied with.

required to consider the details of a proposed emergency plan in reaching a decision on an application for a construction permit, it must at the very least determine whether surrounding population densities, transportation routes, land use and other unique site characteristics might combine to render any emergency plan ineffective. Southern California Edision Company, et al (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-248, 8 AEC 957, 962-63 (1974); Consumers Power Company (Midland Plant Units 1 and 2), ALAB-123, 6 AEC 331, 342-43 (1973).[5/]

The goal of remote siting is also effectuated, however, through the comparison of alternative sites mandated by NEPA. See SECY 78-137 at 2; Proposed Amendment to Appendix E, Supplementary Information, 43 FR 37474, Col. 1 (August 23, 1978); Public Service Company of New Hampshire (Seabrook Stations, Units 1 and 2), ALAB-471, 7 NRC 477, 93 (1978) ["Seabrook"]; Siting Policy Report, NUREG-0625 at 4,9. In the Newbold Island proceedings, for example, the Staff's FES concluded that a particular alternative site was more desireable than the proposed site from an environmental standpoint and that the "principal factor leading to this conclusion is the fact that the population density at the Newbold site is significantly larger than at the [alternative] location." SECY-137 at 2 and Enclosure A.

5/ As noted at footnote 3, the Licensing Board has accepted a Commonwealth contention related to emergency planning feasibility, the hearing on which has not yet been scheduled.

As part of its Pilgrim 2 alternative sites analysis, therefore, the Staff was obliged to carefully study the density, distribution and evacuability of the population surrounding Rocky Point and the other candidate sites. Indeed, because of the undeniable public health and safety implications of reactor siting, demography should not be treated as just one more undifferentiated factor in the NEPA balancing process; it is a paramount public safety consideration that must be accorded far more weight than most of the other environmental concerns addressed by the Staff in its NEPA review. As the Commission noted in Public Service Company of New Hampshire (Seabrook Station, Units 1 & 2), 5 NRC 507, 527 (1977), "NEPA does not require . . . an unbalanced weighting of environmental over other factors such as economic considerations or the possible health and safety advantages of particular locations."[6/] The need for differential weighting, of course, hardly needs justification: "public safety is the first, last, and a permanent consideration in any decision on the issuance of a construction permit or a license to operate a

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6/ In that same proceeding the Commission concluded it would be proper to include sunk costs in the cost-benefit analysis mandated by NEPA, at least to the extent that purely environmental impacts were being considered. Protection of the public, however, was decidedly a different matter: "Under the Atomic Energy Act, 42 U.S.C. 2011 et seq., our responsibility to protect the public health and safety is such that we may not consider to any extent any investment that an applicant has made in a facility when we are passing on the safety of the plant" 5 NRC at 535, fn. 36.

nuclear facility." Petition for Emergency and Remedial Action, CLI-78-6, 7 NRC 400, 404 (1978), citing Power Reactor Development Corp. v. International Union of Electrical Radio and Machine Workers, 367 U.S. 396, 404 (1961).

It has been the position of the Commonwealth throughout these proceedings that in comparing the off-site consequences of accidental releases of radioactivity at the proposed site and its alternates, the Staff's inquiry must extend to the entire spectrum of reactor accidents, up to and including so-called Class 9 events. The Class 9 category of accident has been defined as involving "sequences of postulated successive failures more severe that those postulated for establishing the design basis for protective systems and engineered safety systems", Proposed Annex to Appendix D, 10 CFR Part 50, and a study of the consequences of such accidents, as part of the NEPA review process, would involve a detailed examination of a host of variables such as population density and distribution, meteorology, topology, reactor size and source term, and sheltering and evacuation capabilities. Tr. 11,530, 541.

The Staff's position, on the other hand, is that its assessment of the relative differences in accident consequences at the various sites did extend to consideration of Class 9 accidents, but only to the extent of employing a single factor - population density - as a "crude indication of residual risk", i.e. that risk to the surrounding population that remains even after all practicable steps have been taken to

design and construct the safest possible power reactor. FSFES, pp. 5-7, Appendix B; Tr. 11,456-59. With respect to the necessity of performing a more thorough and scientific analysis of comparative consequences of Class 9 accidents, the Staff was forced to take the contradictory positions that (1) there would have to be a far greater disparity in population density between Rocky Point and the alternative sites before such an analysis became warranted and (2) that it was prohibited from performing such analysis in any event. This contradiction was no aberration peculiar only to the Pilgrim Unit 2 proceedings, but at the very heart of what had been Commission policy up until quite recently, and before turning to a rebuttal of the Staff's conclusion that the disparities in population density were not significant enough to trigger a more thorough look at comparative accident consequences it is first necessary to briefly review this Commission policy and the torturous process leading up to its recent demise.

B. Class 9 Accident Risk Analysis Policy

Any review of the Commission's regulatory approach to Class 9 accidents must start with the Proposed Annex to Appendix D of 10 CFR Part 50 ["Proposed Annex"], which was issued by the AEC for public comment in 1971, and which up until its repudiation by the Commission in June of 1980 was treated as an "interim" statement of policy. The Proposed Annex divided all radiological accidents into nine classes, and with respect to Class 9 accidents - i.e., those beyond the design basis of the

plant and involving a substantial release of radioactivity through either core-melt or breach of containment - it held that the probability of their occurrence was "so small that their environmental risk is extremely low." Accordingly, the Proposed Annex concluded that the alternative sites analysis mandated by NEPA need not address the environmental consequences of such events.

Two years later, the Staff issued Regulatory Guide 4.7, which contained specific guidelines with respect to population density surrounding the sites of proposed nuclear reactors. Without explicitly referring to either the Proposed Annex or the AEC's earlier judgment concerning Class 9 accident probabilities, Reg. Guide 4.7 proposed that if projected population densities within a thirty-mile radius of a potential site exceeded 500 persons per square mile at the time of initial operation and 1,000 persons per square mile at its retirement, then "special attention should be given to the consideration of alternative sites with lower population densities."

What remained unclear, however, was just what was meant by "special consideration", and the extent to which this directive qualified the Proposed Annex's earlier proscription against consideration of Class 9 accidents. Clearly, if concern with population density signalled an intention to minimize the public safety and environmental hazards flowing from a serious reactor accident, then among other things "special

consideration" surely must have meant an in-depth analysis, under NEPA, of the consequences of such accidents, especially those extreme accidents denominated Class 9. Whatever the intent of Reg. Guide 4.7, however, on a number of occasions in the past the Staff has cited the Proposed Annex in refusing to look at Class 9 accident consequences, a position was routinely upheld by Appeal Boards and courts on the ground that "NEPA does not require consideration of environmental effects not shown to have some reasonable likelihood of occurring." Duke Power Company (Catawba Nuclear Station, Units 1 and 2), ALAB-355, 4 NRC 397, 416 (1976).

For a number of reasons, however, by June of 1980 the proscription against consideration of Class 9 accidents contained in the Proposed Annex has lost most of its force and effect. First, it is no longer possible to maintain that Class 9 events are so remote in likelihood that they need not be considered. To the contrary, in another proceeding relating to the Salem nuclear power plant[7/] the Staff acknowledged that the accident at Three Mile Island was a Class 9 event, and the Staff in the instant case so informed the Licensing Board. Tr. 11,436. See also Susquehanna Station Electric Station, Units 1 and 2, LBP-79-29, 10 NRC 586 (1979). To the extent that

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7/ Public Service Electric and Gas Co. (Salem Nuclear Generating Station, Unit 1), NRC Docket No. 50-272.

earlier case law upheld the Staff's refusal to undertake Class 9 consequence studies on the basis of the fact that such events could not happen, it clearly is no longer controlling.

Second, in the Perryman early site review the Staff concluded that the population surrounding the proposed site was sufficiently high to call for a Class 9 analysis, in spite of the explicit language of the Proposed Annex. SECY 78-137 at pg. 5-6. Based on the methodology developed in the 1972 Reactor Safety Study, the Staff concluded that Perryman would have to be rejected in favor of an alternative site that demonstrated a significantly reduced threat to the surrounding population in the event of a serious reactor accident. Id. at 6 and Enclosure D.

Furthermore, in SECY 78-137 the Staff shed some light on the "special consideration" language of Reg. Guide 4.7 by proposing that the Annex's ban on Class 9 accident assessments under NEPA be disregarded whenever the area surrounding a proposed site demonstrates a relatively high population density. Rather, "assessment of the relative differences in Class 9 accident risks should be included as one element of the site comparisons." SECY 78-137, pg. 1. As with the Perryman review, the Staff's concern was "not based on a uniquely high probability of accident but rather on unique circumstances which increase the potential consequences and thus the overall risk." Id., pg. 4. According to SECY 78-137, whatever prior case law has had to say about the necessity under NEPA to

perform such an evaluation in the face of the Staff's refusal to do so, "this does not preclude the Staff from going beyond the strict requirements of the law when it will assist in performing its NEPA review." Id., pg. 5.

Finally, consideration was given to Class 9 accidents in the Clinch River Breeder Reactor FES, NUREG-0139, and in Offshore Power Systems (Floating Nuclear Power Plants), CLI-79-9, 10 NRC 257 (1979) ["OPS"], the Commission itself upheld a Class 9 analysis performed by the Staff for floating nuclear plants. Although its reasoning holds little relevance for the instant proceedings, the Commission did decline "to express any views on the question of environmental consideration of Class 9 accidents at land-based reactors" and announced its intention to "complete the rulemaking begun by the Annex and to re-examine Commission policy in this area." OPS, 10 NRC at 262.

Re-examination of Class 9 accident policy finally culminated in a Statement of Interim Policy, issued by the Commission on June 9, 1981, 45 FR 40101. The Proposed Annex was withdrawn, the rulemaking proceeding that in theory had been ongoing since 1971 was suspended, and a new policy announced that would require environmental impact statements to contain "reasoned consideration of the environmental risks (impacts) attributable to accidents at the particular facility or facilities within the scope of each such statement," including detailed analysis of the relative consequences of

Class 9 accidents. With two commissioners dissenting, however, the Statement of Interim Policy directed that in cases such as Pilgrim 2, where an FES had already been issued, the change in policy should not be considered sufficient grounds for opening, reopening or expanding any previous or ongoing proceeding, "absent a showing of . . . special circumstances."

It is the position of the Commonwealth that (1) the Staff's treatment of demographic considerations at the Pilgrim 2 site was so superficial and flawed as to constitute the special circumstances that would warrant remand for consideration of the Class 9 issue, (2) the high population densities, irregular population distributions and other unique site characteristics of the area surrounding the Pilgrim 2 site indicate such a substantially increased threat to the public in the event of a major reactor accident that the special circumstances test has been satisfied, and (3) that where an FES has been prepared by the Staff but where the final cost/benefit balance has not yet been struck by the Licensing Board it is improper to preclude consideration of Class 9 accident consequences.

C. The Staff's Treatment of Demographic Considerations at the Pilgrim 2 site was so Superficial and Flawed as to Constitute the Special Circumstances that would Warrant Remand for Consideration of the Class 9 Issue

As noted above, the Staff took the position in its FES that in performing the alternative sites analysis it did consider the impact of all classes of accidents, including Class 9 events. Rather than performing the detailed analysis now

recognized by the Commission as necessary under NEPA, however, the Staff merely used population density data as an indicator of residual risk. Tr. 11,456-59. Indeed, to the extent that the relative off-site consequences of a radiological accident were considered at all, it was only through analysis of population density:

> . . . an assessment of the Pilgrim site and the alternative sites has been made in the DS FES, which compared the relative differences in accident consequences, for accidents including Class 9 events. This review, based upon reconaissance-level information, has used the population and population density in the vicinity of a site as a measure of the relative magnitude of potential consequences, and the Staff has determined whether there are sites that have significantly lower accident consequences than the Rocky Point site.
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> FSFES at pp. 5-7.

"The litmus which the courts apply - and which we must perforce use - is whether the environmental consequences of each reasonable alternative have been accorded a 'hard look'", Boston Edison Company (Pilgrim Nuclear Generating Station, Unit 2), ALAB-479, 7 NRC 774, 779 (1978). It is questionable whether any "hard look" at accident consequences can be said to have occurred when only population density data was used, without regard to other critical and readily available threshold indicators such as road capacity, population distribution, local topography and rudimentary wind direction data, an issue that will be discussed in greater detail below. The first concern, however, lies with the Staff's misuse of the meager data that it did gather.

1. The Staff's Underestimation of Population Data at the Pilgrim 2 Site

Before granting a construction permit the Licensing Board had to satisfy itself that none of the alternative sites is "obviously superior" to the proposed site, and with such a demanding standard it becomes all the more critical that differences between the sites be sharply delineated. The Staff's demographic assumptions and methodology, however, have had just the opposite effect, that of understating population figures and the risk potential of the area surrounding the Rocky Point site, thus obscuring significant differences between Rocky Point and its alternative sites and making it impossible to conclude that some or all of the alternatives do not offer substantially reduced risks in the event of a radiological accident.

As a preliminary matter, the accuracy of the population data utilized by the Staff is open to serious and disquieting question. In preparing the FSFES, the Staff relied on the BECo's Environmental Report (ER), its Preliminary Safety Analysis Report (PSAR) and a 1974 siting study commissioned by BECo, as modified by a comprehensive update submitted by BECo in 1978. Tr. 11,465-66; FSFES at 3-4, 3-5. Just prior to the evidentiary hearing on demography, however, the Staff received an additional study from BECo ["ERT study"] which revealed that the company's earlier submissions understated certain categories of population. TR. 11,446. According to the ER,

for example, there were 452 seasonal residents living within one mile of the Rocky Point site, while the ERT study indicated that there were 1,361, or three times as many. Tr. 11,505-6. When asked if he could account for this discrepancy, the Staff witness acknowledged that the ERT study used different occupancy factors and was "a much more thorough and systematic review." Tr. 11,506-7.[8/]

The discrepancies between the Applicant's earlier submissions and the ERT study are troubling for two reasons. First, as the Staff has acknowledged, "differences in close-in

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8/ Although the accuracy of the population data employed by the Staff was both explored on cross-examination of Staff witnesses, see generally Tr. 11,452-11,600, and dealt with in the proposed findings of fact of all parties, the Licensing Board made no attempt to reconcile the discrepancies in numbers or to address the Commonwealth's challenge to the Staff's methodology in analyzing population data. In paragraphs 133 and 136 of its Partial Initial Decision, the Board recites certain population figures for the vicinity of the Rocky Point site, but these figures all came from testimony by Staff witnesses during hearings in 1975. By the time the issue was taken up again, in August of 1979, a number of additional studies - the 1978 update by BECo and the ERT Study referred to above - were available to and used by the Staff, which presented its final population data in Staff Exhibit 66, introduced on August 27, 1979 at Tr. 11,451. The Board makes no mention of the more recent figures, or of the discrepancies uncovered during cross-examination and detailed above.

Under the standard set forth in Public Service Company of New Hampshire (Seabrook Units 1 and 2), ALAB-422, 6 NRC 33, 40-42 (1977), the Licensing Board's cursory treatment of such evidence makes this an appropriate case for remand. Short of that, this Board must make its own factual findings on the basis of the record evidence, findings that are either different from those of the Licensing Board, Duke Power Co. (Catawba Nuclear Station, Units 1 and 2), ALAB-355, 4 NRC 397 (1976), or supplementary thereto, Wisconsin Electric Power Company (Point Beach Nuclear Plant, Unit 2), ALAB-78, 5 AEC 319, 323 n.14.(1972).

population should be given greater weight than corresponding differences in population density at greater distances." FSFES at B-2. Clearly, the population within one mile of the proposed reactor should have been of critical concern, and indeed is entirely within the confines of the LPZ. Its underestimation by a factor of three can't help but call into question the thoroughness with which the Staff undertook to investigate the entire matter of population density.

Second, the ERT study only looked at population within five miles of the Rocky Point site. Tr. 11,453. Within that area it revealed that seasonal population figures were three times greater than what the Staff had originally believed, and since the area of concern under Reg. Guide 4.7 extends out to thirty miles from the site, questions remain whether other critical discrepancies might not still remain undiscovered.

In addition, while the Staff concluded that there were no significant concentrations of tourists within two miles of the site, Tr. 11,502, the ERT study for that same area in 199[illegible] indicates a peak tourist figure of 2469. Tr. 11,480. According the Staff, such people are "negligible", for their length of stay in the area is small. Tr. 11,480-82. Such reasoning is open to serious question, however, for it ignores the fact that if an accident were to occur during the summer months these tourists will indeed be there and in fact will be well within the LPZ, people who already put a severe strain on Plymouth's traffic flow capacity and who will have had no prior

instruction in emergency measures or homes in which to shelter themselves.[9/] Commonwealth's witness Herr at 6, following Tr. 11,612.

Similarly, the Staff admitted that it did not bother to gather figures for daily transients between five and thirty miles from the site, Tr. 11,504-5, although that area includes Provincetown and most of Cape Cod, a prime tourist attraction every summer. Tr. 11,505. Since more than one million tourists visit the town of Plymouth alone every year, Tr. 11,471, it was clearly indefensible for the Staff to ignore transients between zero and two miles from the site, and again between five and thirty miles. Indeed, the Staff's practice of ignoring transients has already been condemned once before, in Public Service Company of New Hampshire (Seabrook Station, Units 1 and 2), ALAB-471, 7 NRC 477:

9/ In Southern California Edison Company, (San Onofre Nuclear Generating Station, Units 2 and 3) ALAB-248, 8 AEC 957, 62 (1974) the Appeal Board had little trouble concluding that daily visitors posed significant emergency planning problems within the LPZ, and would have to be taken into account in satisfying the siting criteria set forth in 10 CFR Part 100:

> To be sure, Part 100 refers expressly only to the need to protect "residents" within the low population zone. But we are aware of no basis for concluding that the Commission intended that term to be given a narrow, literal construction, which would exclude consideration of the safety of large numbers of transients regularly present within the low populaton zone. The need to protect such visitors is just as great as the need to protect permanent residents; if anything, greater steps will need to be taken to protect the visitors, who are likely to be relatively unfamiliar with the surrounding area and who will not have homes in which to take shelter. We thus decline to read the word "residents" as expressing a Commission intention to protect permanent residents but to ignore the safety of visitors. (emphasis added)

> To highlight the essential arbitrariness of the Staff's treatment of comparative population densitites, we note that the Staff ignored Seabrook's concentration of transients. The density figures it used on remand to compare the population at Seabrook with that at other sites include only permanent population. . . . By ignoring transients, it gave Seabrook (where transients are a major factor) an unfair advantage in comparison to sites where transients are of lesser significance.

Id. at 510, fn. 63. (emphasis supplied)

There is no reason why the Appeal Board's criticism of the Staff in Seabrook is not equally applicable here; if anything, the Staff's action is all the more reprehensible in this case, where it had already been put on notice that transients were not to be ignored.

2. The Staff's Weighting Methods and Use of Reg. Guide 4.7's "Trip Levels"

The Staff has acknowledged that population density, by itself, is at best a "crude indicator of risk", and that an accurate assessment of the consequences of a radiological accident can only be obtained by investigating a host of other variables. Tr. 11,520; 11,572-74. As noted above, such an in-depth study has come to be called a Class 9 analysis, and prior to the Commission's June, 1980 Statement of Interim Policy the trigger for looking in some unspecified way beyond mere population density it was found in Reg. Guide 4.7: if projected population density within a thirty-mile radius of a potential site exceeds 500 persons per square mile at the time of initial operation or 1,000 persons per square mile at its retirement, then "special attention should be given to the

consideration of alternative sites with lower population densities." FSFES, B-1. In SECY 78-137, the Staff proposed that among other things, "special attention" would include performing a Class 9 analysis for each of the candidate sites, but at the time the Pilgrim Unit 2 FSFES was prepared, the Staff's public posture was still to remain vague about what "special attention" meant and to insist that the Proposed Annex proscribed any consideration of Class 9 accidents.

While the Commonwealth's position has been that other unique site characteristics might also serve as a triggering device, the Staff was cleary warranted in its position that the population density surrounding a proposed site might in some circumstances be so high as to require a close look at all sites to determine how each would fare in the event of a Class 9 accident. See, generally, SECY 78-137. If population density is to be used as an indicator of risk and the Staff's exclusive triggering device for determining whether a Class 9 analysis is warranted as part of the NEPA review process, however, the work done by the Staff on the Pilgrim 2 application contained certain assumptions and omissions that could not help but compromise the reliability of this factor.

a. <u>The Temporal Weighting of Population</u>

In arriving at average population densities for the area surrounding the Rocky Point site, the Staff employed weighting factors of 1.0 for permanent residents and 0.25 for seasonal residents. Tr. 11,469-71. As noted above, the Staff testified

that transients between zero and two miles and five and thirty miles were not considered at all, because the Staff concluded that when weighted these figures would be negligible.[10/] Tr. 11,480-82.

Perhaps such weighting assumptions would hold true for a region experiencing moderate seasonal fluctuations in population, but when an area is as profoundly effected by tourists and summer residents as is that surrounding the Rock Point site, the use of weighted population density as an exclusive threshold indicator of residual risk is highly questionable. Commonwealth witness Herr at 6, following Tr. 11,612; Tr. 11,660-62. To the extent that the licensing process is concerned with the consequences of serious reactor accidents, it is illusory to obscure the crowded conditions that occur every summer in the Plymouth area by ignoring

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10/ For reasons that the Staff did not explain, tourists and daytrippers were considered for that area between 2 and 5 miles from the site, where they were weighted by a factor of 0.0033. Tr. 11,470; FSFES at 5-9.

transients or averaging their inflow over the course of an entire year. Id.[11/]

According to extrapolations made by a Staff witness from the ERT study, for example, within two miles of the site the maximum daily population in 1985 will be 10,700 persons. Tr. 11,513-14. The Staff's weighting technique reduces this figure to 3,943, Tr. 11,515, but if a major accident at the Rocky Point site during the summer were to necessitate emergency measures for that two mile zone, all of which is well within the LPZ, there would be 10,700 individuals requiring information, evacuation and/or sheltering, not 3,943.

Similarly, in 1990 the maximum daily population within two miles of the plant is projected to be 12,121 persons. Tr. 11,479. This includes 4,393 permanent residents, 5,259 summer

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11/ As with the question of the accuracy of the Staff's population data, the Licensing Board made no attempt to address the questions raised by the Commonwealth with respect to the Staff's methodology in analyzing that data. In dealing with the non-uniform distribution of population surrounding Rocky Point, the Board said only that the Staff's method "provides a suitable averaging process", Partial Initial Decision, paragraph 135; as to the vast seasonal fluctuations in population, the Board merely noted that the Staff used a weighted average, Partial Initial Decision, paragraph 136. Given the extensive critique of the Staff's methodology offered by the Commonwealth in its comments to the FSFES (See FSFES, Appendix A, A-20-A-30), the testimony of Commonwealth witness Herr (introduced at Tr. 11, 612) and its cross-examination of Staff witnesses on this subject (Tr. 11,454-11,600), the Licensing Board can hardly be said to have discharged its duty "not only to resolve contested issues but to articulate in reasonable detail the basis for the course of action chosen" Public Service of New Hampshire (Seabrook Station, Units 1 and 2), ALAB-422, 6 NRC 33,37 (1977).

residents and 2,469 daily transients. Tr. 11,479-82. Under the Staff's weighting system, the 5,259 summer residents were reduced to 1,315, and the daily visitors were not counted at all because they were deemed to be "negligible." Tr. 11,480-82. In comparing Pilgrim 2 to the other sites, therefore, a peak population of 12,121 was reduced to 5,708, once again grossly understating the magnitude of risk should an accident occur in the summertime. Tr. 11,655-57.

The Staff's weighting system becomes all the more incomprehensible when one considers that it was not uniformly applied. Only at Pilgrim and the coastal sites (Nos. 18-20, Seabrook and Millstone) did the Staff differentiate between population categories and weight seasonal residents, Tr. 11,516; for all of the inland sites, no such calculations were performed. In addition, there is certainly no dispute that the area surrounding the Rocky Point site experiences far greater than normal incursions of seasonal residents and tourists, but since the Staff's weighting method has the effect of concealing the magnitude of such population fluctuations, this critical aspect of the Rocky Point situation was totally factored out of the Staff's analysis of comparative populations. Tr. 11,658-59.

b. The Dilution of Average Population Density Figures by Inclusion of Water Areas

The Staff's review of population at Rocky Point and its alternative sites is further compromised by its insistence that water area be included when calculating average population

densities. The 53 municipalities which are within 30 miles of the Rocky Point site have a projected 1985 population of 981,000 persons in the winter, 1,395,000 in the summer and a land area of 1,256 square miles. Commonwealth witness Herr at 7, following Tr. 11,612. This means a winter density of 780 persons per square mile of land area, a summer density (with summer-only population "discounted" at 100/365) of 870 persons per square mile, and an actual summertime population (seasonal plus year-round) of 1,110 persons per square mile. Id. at 7.

These figures, which were derived by Commonwealth witness Herr by focusing exclusively on land area surrounding the site, are far more revealing than the Staff's in reflecting the actual population density of the area in question and in providing insight into how Rocky Point would fare in comparison with the other sites in the event of a major radiological accident. As with its treatment of seasonal residents and tourists, the Staff's inclusion of water area when calculating population density had the effect of vastly deflating Rocky Point's figures and making it appear far more desirable in comparison to the inland sites than is actually the case. It may very well be that a coastal site is to be preferred in that specific instance where it can be demonstrated that prevailing winds are offshore and hence will transport accidentally released radioactive material away from population centers. The Staff's inclusion of water area in calculating average population density is a gross oversimplification of this principle, however, and should not be tolerated.

Finally, it should be noted that in comparing population densities the Staff chose to ignore sectoral information, Tr. 11,581, information that would otherwise indicate where significant concentrations of population exist within each radial ring. Tr. 11,655-56, 11,662-63. This is particularly troubling in light of the fact that the population surrounding the Rocky Point site is extraordinarily uneven by radial sector. Commonwealth witness Herr at 12, following Tr. 11,612. Nearly one half of the cumulative permanent population within thirty miles of the site is concentrated in the northwest and west-northwest sectors. Id. at 14; PSAR, Table 2.1-8. Even without consideration of seasonal residents, the northwest sector alone is projected to have a 1990 cumulative population of 330,000 persons living within thirty miles of the site, PSAR, Table 2.1-8, and thus a density of 1,858 persons per square mile. Id.

By 2020, there will be nearly 700,000 persons living in this sector, at an average density of 3,737 persons per square mile. Id. at 17. In other words, in the event of a major radioactive release under wind conditions blowing to the northwest, emergency measures will have to be taken to protect an area with a population density of 1,858 persons per square mile in the year 1990 and 3,737 in the year 2020. In comparing Rocky Point with the other candidate sites, however, population density at thirty miles was found by the Staff to be only 438 in 1985 and 908 in 2020. FSFES, Table 1.

Similarly, the peculiar configuration of the Rocky Point site is such that a southeasterly plume trajectory would carry an accidental release along a coastal corridor densely populated in the summertime. Commonwealth witness Herr at 28, following Tr. 11,612. In 1975, the south-southeast sector alone contained a summertime population of nearly 9,000 persons within five miles of the Rocky Point site, a density of 1,800 persons per square. Id.; PSAR Tables 2.1-2a and 2.1-8. In addition, Priscilla Beach, Whitehorse Beach and Manomet Heights have a summer residence of some 7,000 persons, all of whom are within a narrow arc and less than two miles from the Rocky Point site. Commonwealth witness Herr at 7 and 28, following Tr. 11,612. The fact that this high density is "balanced" by lower densities at other seasons and in other sectors does nothing to diminish the magnitude of the problem of exposure if a major accident occurs at an unfavorable season under unfavorable wind conditions.

In answer to the above arguments, the Staff has taken the position that its temporal weighting of seasonal and daily transients, its inclusion of the waters off Rocky Point in calculating average population densitites and its refusal to consider the vast disparties in population densities between one sector and another are all permitted, either explicitly or implicitly, by the provisions of Reg. Guide 4.7. The Reg. Guide itself, however, is no more than a Staff position paper, never having been promulgated by the Commission as a

regulation, Tr. 11, 528, and hence has no binding force. See Seabrook , 7 NRC at 509-10 and cases cited. Ultimately, the Staff's use of population density is a necessary first step in assessing the relative impact of major reactor accidents at each of the candidate sites, but its failure to refine its analysis to include the above-mentioned variables amounts to an impermissible gamble that a serious radiological accident will not occur at a time when wind direction is favorable and the area surrounding Rocky Point is not inundated with summer residents and tourists. As Commonwealth witness Herr observed, average population density figures are clearly relevant and necessary in comparing alternative sites, but so too are extremes in population fluctuation. Tr. 11,660-62. This is especially true in an area such as that surrounding the Pilgrim 2 site, where the town of Plymouth alone attracts over a million tourists a year, Tr. 11,471, and which by 1975 was already experiencing an inflow of 25,000 seasonal residents every summer, all within five miles of the site. PSAR Table 2.1-2a

c. The "Factor of Two"

Given the Staff's inattention to the unique demographic characteristics of the Rocky Point site, its use of the so-called Factor of Two becomes all the more indefensible. As noted above, the Staff has admitted with commendable candor that "the population density of a site is a relatively crude measure of the residual risk associated with the accidental

release of radioactivity" FSFES at B-1; as the Staff acknowledged, the actual consequences of a major accident will depend on many factors, including population density and distribution, meteorogical and topological conditions, the rate at which persons can be evacuated from the area of impact, access to travel routes, the shielding factor to be found in the area's residences and other site-specific characteristics. Tr. 11,572-4; FSFES at B-1. Under such circumstance, and given the Staff's obligation to analyse the residual risk to the public posed by major radiological accidents, one would expect the Staff to have undertaken a refinement of its analysis, perhaps by incorporating the population fluctuations and distributions noted above, perhaps by utilitizing reconnaissance-level data with respect to meteorology, transportation networks, etc. In short, there is clearly much more that can be done to sharpen the Class 9 triggering device without coming even close to the complexities of the Class 9 analysis itself.

The Staff, however, apparently did just the opposite. It further diluted whatever accuracy its "crude indicator of risk" could be said to have by requiring that in order for the difference in population densities between two sites to be considered "significant", the alternative site must have a population density which is at least a factor of two lower than the primary site at distances out to 30 miles. Tr. 11,559-60; FSFES at B-2.

The Staff, in effect, has first adopted an admittedly imprecise measure of residual risk, and then depriving it of all significance by refusing to respond to that indicator unless extreme differences in population density are present. If there are differences between the sites such that one or more of the alternatives may provide greater protection to the public in the event of a reactor accident, desensitizing the "crude indicator" by the factor of two ensures that these differences will never receive the attention they truly warrant. Such an approach is neither authorized by Reg. Guide 4.7 nor the "hard look" required by NEPA; under both, the Staff's mandate is not to mask critical differences between sites, but to uncover them. If population density is too crude an indicator of risk, then the solution is not to make it all the more so by use of the Factor of Two test. Rather, the indicator itself should have been upgraded.

An examination of the Montague population figures as compared to those of Rocky Point provides graphic proof of all the infirmities in the Staff's methodology. First, Montague does not have a significant seasonal or transient population, Tr. 11,517, so that its population density figures accurately reflect population density throughout the year. The Rocky Point figures, on the other hand, are weighted averages, and effectively conceal the fact that during the summer much higher concentrations of people can be found throughout the area around the site. Second, Montague is an inland site, so that

its population figures reflect actual land-mass living density. In contrast, for Rocky Point the population density figures have been cut roughly in half by the Staff's inclusion of water area in its averaging calculations.

Having thus obscured the true situation with respect to population density at Rocky Point vis-a-vis Montague, the Staff then further undermined whatever comparison could have been made by concluding that differences between the sites were not to be considered significant unless Montague were found to be twice as populous as Rocky Point. Indeed, comparison of the Montague figures (found at FSFES, pg. 4-48) and the Rocky Point figures (found at FSFES, pg. 4-4, as modified by Staff Exhibit 56) indicate that the Staff apparently concluded that before an alternative site could be considered more preferable than the proposed site it had to have a population density that is a factor of two lower at each and every radial distance out to thirty miles.

In the year 2020, for example, the Montague site will have lower population densitites at every distance out to thirty miles except for the 3-4 mile radial ring. FSFES at 4-4, 4-48. Between zero and one mile from the sites, Rocky Point's population density is five times that of Montague's (320 people/mi^2 vs. 61 people/mi^2),[12/] while it is four

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12/ These figures are all the more troubling in light of the Staff's own position that "differences in close-in population density should be given greater weight than corresponding differences in population at greater distances" FSFES at B-2.

times greater at zero to ten miles (735 vs. 169), zero to twenty miles (761 vs. 183) and zero to thirty miles (908 vs. 234). Id. Finally, Rocky Point's density figures are greater than Montague's for the zero to two, zero to three and zero to five mile ring, although concededly not by the factor of two required by the Staff. Id.

All of the above-cited figures would appear to indicate that Montague is a more preferable site than Rocky Point, at least from the standpoint of residual risk.[13/] The Staff concluded otherwise, FSFES at 4-51, apparently because the Rocky Point population densities do not exceed those of Montague by a factor of two at every radial distance. See, generally, Tr. 11,563-70. Because of fortuitous differences in population density at a handful of the radial rings, therefore, the Factor of Two is not totally met, and the population density differences between the two sites are deemed by the Staff to be insignificant. Such reasoning, based on population density averages that obscure far more than they reveal and a Factor of Two that finds no support in either logic or precedent, typifies the contortions the Staff has been forced to go through in defense of a ten year old "interim" policy that had long since been overtaken by events and indeed by the Staff's own internal deliberations.

13/ A similar demonstration can be made for the year 1985, although the Montague figures are higher at more of the radial rings than they are for the year 2020. FSFES at 4-4, 4-48.

D. The Unique Terrestrial and Demographic Characteristics of the Rocky Point Site Constitute the "Special Circumstances" warranting Remand for a Class 9 Accident Analysis as Part of the Pilgrim II NEPA Review Process

In its FSFES, the Staff relied exclusively on the trip levels contained in Reg. Guide 4.7 as a threshold indicator of Class 9 accident risk, thus avoiding any consideration of the unique population distribution and land use characteristics found within a thirty-mile radius of the Rocky Point site, special circumstances which by themselves should serve under the Commission's June 1980 Statement of Policy to trigger a thorough study of the consequences of a Class 9 accident at Rocky Point and its alternative sites.

a. Unique Population Distribution Characteristics

As noted above, because of its beaches and historical sites the area immediately surrounding the Rocky Point site experiences a tremendous influx of bathers, tourists and seasonal residents during the summer months. According to BECo's ER, each year more than 1.25 million people visit Plymouth and its historical sites alone, and the town triples in size from June through Labor Day. ER, 2-32. As one example of this influx, it has already been noted the Priscilla Beach - Whitehorse Beach - Manomet Heights area has a summer residence of some 7,000 persons, all of whom reside in a narrow arc and less than two miles from the proposed reactor site. Other examples abound, many of which have been discussed in the preceding section.

In addition, the Cape Cod canal is located just over ten miles from the Rocky Point Site, and most of the Cape lies within 30 miles. See Figure 2.1 of the SER. Provincetown itself, lying just across Cape Cod Bay, is only 20 miles away. By 1990, according to the ER, there will be 155,000 seasonal residents on the Cape during the summer months, in addition to the 232,000 persons already living there year round. ER, Figure 2-15. Unfortunately, because neither BECo nor the Staff bothered to gather such data, it is impossible to say how many tourists, extended visitors and daytrippers will also be present during those months. Suffice to say, the entire area from Plymouth to Provincetown experiences vast incursions of summer residents, weekly and daily visitors that should serve to satisfy the special circumstances test of the Commission's Statement of Interim Policy.

b. Transportation Characteristics and Evacuability

According to the ER, "most of the local and seasonal residents rely on State Highway 3A for inter-neighborhood travel. Consequently, the road is sometimes congested during the summer months." ER, 2-48. In addition, Cape Cod is linked to the mainland by two bridges which, under normal summer weekend conditions, are sorely inadequate to handle the normal flow of vehicles going to and from the Cape. On the mainland side, the two bridges empty into two highways. One highway (Rte. 25) runs west toward Wareham, while the other (Rt. 3) runs in a northerly direction directly toward Plymouth. ER, Figure 2-16.

In the event of a serious accident during the summer, if a plume were to travel in a southeasterly direction toward the Sandwich-Barnstable area, persons wishing to flee the Cape would be forced to travel in closer to the plant in order to reach the bridges to the mainland.[14/] Once over a bridge, all traffic would have to be routed onto Rte 25, since Rte. 3 would only funnel traffic toward the site. Given the Cape's perennial traffic problems, it is unrealistic to expect that a single state highway will suffice to handle a panicky mass exodus in the event of a reactor accident.

Both the congested road system within close proximity to Rocky Point and the potential of having vast numbers of Cape residents and visitors bottlenecked within ten to thirty miles of the site constitutes a unique site characteristic. That characteristic should have been considered by the Staff, but was avoided as a result of the Staff's exclusive reliance on the population density criteria found in Reg. Guide 4.7. Now, under the Commission's Interim Statement of Policy it clearly qualifies as a special circumstance warranting remand for detailed consideration of Class 9 accident consequences.

E. Where an FES has been Prepared by the Staff but where the Final Cost/Benefit Balance has not yet Been Struck by the Licensing Board, it is Improper to Preclude Consideration of Class 9 Accident Consequences.

14/ Although the Cape is presently beyond the emergency planning zone established for Pilgrim 2, the probability of sponataneous evacuation cannot be discounted, especially in the summertime.

As noted above, on June 9, 1980, the Commission formally repudiated the Proposed Annex on the grounds that it (1) prevented consideration of those accidents that dominate accident risk, (2) did not sufficiently define such accidents, (3) did not contribute to objective consideration of the environmental consequences of reactor accidents and (4) did not give adequate consideration to accident prevention and mitigation measures. In the future, the Commission concluded, NEPA environmental reviews should include analysis of the consequences of all possible radiological accidents, including the those Class 9 events that were heretofore deemed to be so improbable as to not warrant consideration. With two commissioners dissenting, however, the Commission took the further position that this extremely significant shift in regulatory policy need apply only to those NEPA reviews for which final environmental impact statements have not yet been issued. According to the Statement of Interim Policy, all other reactors - those in operation, those under construction and those for which the Staff's NEPA review has been completed but which are still in the midst of construction permit proceedings before Licensing Boards - should continue to be treated under the assumptions contained in the now discredited Proposed Annex.

Whatever the propriety of the Commission's position with respect to those plants currently in operation or even those now under construction, it is indefensible not to extend its

new policy to include those six proposed plants, including Pilgrim 2, for which impact statements have been prepared by the Staff but for which the Licensing Boards have yet to approve the issuance of construction permits. In these cases, at least, no investment in construction has been made that might arguably tip the balance toward declining to reopen the record. Indeed, the record in each case is still open, and the Licensing Board in each has yet to strike the final cost-benefit balance required by NEPA.

It is unnecessary to recount once again the troubled history of the Proposed Annex; suffice to say that its cursory dismissal of Class 9 accidents came under intense criticism from the very start, and indeed was ignored by the Staff wherever it felt that the consequences of a Class 9 accident at a particular facility, however improbable, were potentially too catastrophic to be ignored. What is significant is that in the wake of the accident at Three Mile Island the Commission has directed the Staff to turn from what the Council on Environmental Quality has recently characterized as "boilerplate" consideration of accident consequences[15/] to a hard look at all possibilities, including core melts and containment failures. NEPA, of course, requires no less; as the Commission itself observed in the very case that triggered

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15/ See letter of March 20, 1980 from Gus Speth, Chairman of the Council on Environmental Quality to Chairman Ahearn, and the accompanying report, "NRC's Environmental Analysis of Nuclear Accidents: Is It Adequate?"

reconsideration of the Staff's practice in dealing with Class 9 accidents,

> NEPA is based on the philosophy that the federal government should consider all available information about the reasonably likely environmental consequences of its proposed actions and should take appropriate measures to mitigate or eliminate the adverse impacts of those actions when practical. OPS, 10 NRC at 261.

Indeed, an agency's detailed consideration of all reasonable alternatives is the crux of NEPA's procedural requirements, and when the First Circuit Court of Appeals undertook to catalogue the purposes served by 42 USC §4332(2)(C) its observations could not have been more pertinent to this case:

> The 'detailed statement' required by §4332(2)(C) serves at least three purposes. First, it permits the court to ascertain whether the agency has made a good faith effort to take into account the values NEPA seeks to safeguard. To that end it must 'explicate fully its course of inquiry, its analysis and its reasoning'. [citations omitted] Second, it serves as an environmental full disclosure law, providing information which Congress thought the public should have concerning the particular environmental costs involved in a project. To that end, it 'must be written in language that is understandable to nontechnical minds and yet contain enough scientific reasoning to alert specialists to particular problems within the field of their expertise'. [citations omitted] Finally, and perhaps most substantively, the requirement of a detailed statement helps insure the integrity of a process of decision by precluding stubborn problems or serious criticism from being swept under the rug. A conclusory statement 'unsupported by empirical or experimental data, scientific authorities, or explanatory information of any kind' not only fails to crystallize issues, . . . but 'affords no basis for a comparison of the problems involved in the alternatives'. [citations omitted] Silva v. Lynn, 482 F.2d 1282, 84-85 (1973).

With respect to Class 9 accidents, the Commission has now concluded that their likelihood, however remote, is such that they must be considered under NEPA. Furthermore, to the extent that there is a significant risk to the public in the event of reactor accident, it is precisely from the Class 9 type of accident, i.e., that accident that is beyond the ability of engineered safety features to prevent or mitigate. Having concluded that the Staff's NEPA review process needs upgrading in this respect, it is impermissible to preclude similar consideration in those impact statements which have been prepared by the Staff but which have not yet been ruled upon in the adjudicatory process; such an approach clearly is violative of all three of the purposes articulated by the court in Silva v. Lynn.

In this respect, Calvert Cliffs Coordinating Committee v. AEC, 449 F.2d 1109 (D.C. Cir. 1971) ["Calvert Cliffs"] is instructive. In that case, the AEC had provided by rule that, as to all plants already granted a construction permit, no "backfitting" for environmental purposes would be considered. Calvert Cliffs at 1127. Although the agency maintained that the rule was justified because of the delay which would be caused by such backfitting and because of the "energy crisis", the court reiterated that the procedural duty to consider alternatives "to the fullest extent possible" is strict and that it continues even after construction. "[N]o action which might minimize environmental damage may be dismissed out of

hand." Id. at 1128. The Interim Statement of Policy echoes the backfitting rule rejected in Calvert Cliffs, in that it precludes full and fair consideration of what is now to be treated as a necessary matter under NEPA merely because the Staff has completed its work on the subject, work that the Commission admits was based on a earlier policy position that can no longer be justified.

Turning to the procedural ramifications of the Commission's position, it is indisputable that the NEPA review process does not come to a halt with issuance of the Staff's FES. However significant that document may be in organizing the technical data and setting forth the Staff's conclusions, under the Commission's own regulations and decisions it is the Licensing Board itself that must strike the ultimate cost-benefit balance. See 10 CFR §§51.52(b)(3), 51.52(c)(1-3); Texas Utilities Generating Company (Comanche Peak Steam Electric Station, Units 1 and 2), ALAB-260, 1 NRC 51, 55 (1975).[16/]

16/ Specifically, under 10 CFR §51.52(c)(2) the Licensing Board is required to "independently consider the final balance among conflicting factors . . ."

Under the regulations of the Council on Environmental Quality, it would also appear that it is improper to preclude analysis of Class 9 accidents under the circumstances of this case. Pursuant to 40 CFR §1502.9(c), agencies

> (1) Shall prepare supplements to either draft or final environmental impact statements if:
>
> > (i) the agency makes substantial changes in the proposed actions that are relevant to environmental concerns; or
> >
> > (ii) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

In the Pilgrim Unit 2 proceedings, this final balancing has not yet been undertaken, and cannot be allowed to occur in the absence of data the Commission has now concluded is necessary in NEPA reviews. As the Court noted in Calvert Cliffs at 1113:

> . . . NEPA requires that agencies consider the environmental impact of their actions "to the fullest extent possible." The Act is addressed to agencies as a whole, not only to their professional staffs. Compliance to the "fullest" possible extent would seem to demand that environmental issues be considered at every important stage in the decision making process concerning a particular action -- at every stage where an overall balancing of environmental and nonenvironmental factors is appropriate and where alterations might be made in the proposed action to minimize environmental costs.

The question to be answered, it must be emphasized, is not whether the record in this proceeding should be reopened. To the contrary, further hearings must be held by the Licensing Board, and all that can be decided is whether that study the Commission has now concluded is necessary under NEPA can be neglected, especially in light of NEPA's mandate that environmental impacts be considered "to the fullest extent possible" and the Commission's own regulations, which place the ultimate responsibility for striking the cost-benefit balance on the Licensing Boards. In debating this question, one might ask whether there is any appreciable difference between the attitude shown in declining to consider Class 9 accident consequences at Pilgrim 2 and the other five plants in a similar procedural posture and the attitude underlying the proposed Annex of ten years ago. In both instances the

position taken by the Commission is arbitrary, technically unsupported and laden with potential for unending controversy.

BECAUSE THE LICENSING BOARD HAS YET TO CONDUCT HEARINGS ON EMERGENCY PLANNING, ITS CONCLUSIONS WITH RESPECT TO SITE SUITABILITY AND THE COST/BENEFIT BALANCE UNDER NEPA ARE PREMATURE AND ERRONEOUS (COMMONWEALTH EXCEPTION NOS. 1 AND 6)

As noted above at fn. 3, on May 24, 1979 the Licensing Board accepted two late-filed contentions by the Commonwealth relating to emergency planning, one of which questioned whether any emergency plan could be developed to protect the permanent, seasonal and transient population surrounding the Rocky Point Site. Although hearings have not yet been held on the issue of emergency planning feasibility, the Board concluded in its Partial Initial Decision that (A) "from geographic and population viewpoints, the proposed Unit 2 site is suitable for the location of a nuclear plant of the general type and size proposed by the applicants" (Decision, paragraph 397), and (B) that "the benefits to be derived from Unit 2 outweigh its costs" (Decision, paragraph 418[5]). Given the Commonwealth's outstanding emergency planning contention, both conclusions are premature and erroneous as a matter of law.

On at least two occasions the Appeal Board has treated the question of emergency planning feasibility as subsumed within the general issue of site suitability. Southern California Edison Company (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-248, 8 AEC 957, 962-63 (1974); Consumers Power

Company (Midland Plant Units 1 and 2), ALAB-123, 6 AEC 331, 342-43 (1973). Similarly, the Commission has acknowledged that "emergency planning advantages or disadvantages of particular sites [are] part of the NEPA cost/benefit analysis of alternate sites." Proposed Amendment to Appendix E, Supplementary Information, 43 FR 37474, Col. 1 (August 23, 1978).

The Commonwealth has already submitted a portion of its testimony on the impediments to effective emergency measures at the Pilgrim 2 site, see testimony of Commonwealth witness Herr at 20-31, following Tr. 11,612, but the Licensing Board decided to defer cross-examination thereon until the Staff had prepared its case. Tr. 11,609-612. Under such circumstances, no conclusions should have been reached by the Board on either the issue of site suitability or the cost/benefit balancing required by NEPA and 10 CFR §51.52(c).

V. CONCLUSION

For the reasons set forth above, the Commonwealth of Massachusetts submits that the Partial Initial Decision of February 2, 1981 should be reversed and the matter remanded for further consideration of the impact of Class 9 accidents at Pilgrim 2 and its alternate sites and for evidentiary hearings on emergency planning prior to a decision on site suitability and the cost/benefit balance.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING APPEAL BOARD

In the Matter of BOSTON EDISON COMPANY et al. (Pilgrim Nuclear Generating Station, Unit 2)	Docket No. 50-471

CERTIFICATE OF SERVICE

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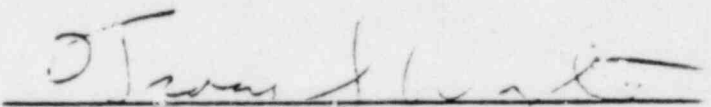

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