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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION
HAROLD R. DENTON, DIRECTOR

In the Matter of	)	
	)	
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE	)	Docket Nos. 50-443
et al.	)	50-444
(Seabrook Station, Units 1 and 2)	)	(10 CFR 2.206)

DIRECTOR'S DECISION UNDER 10 CFR 2.206

By letter dated May 2, 1979, Mr. Robert A. Backus on behalf of the Seacoast Anti-Pollution League (SAPL) transmitted a request pursuant to 10 CFR 2.206 for an Order suspending or revoking Seabrook Construction Permit Nos. CPPR-135 and CPPR-136. On July 30, 1979, and November 16, 1979, the New England Coalition on Nuclear Pollution (NECNP) and the Commonwealth of Massachusetts, respectively, filed memoranda in support of SAPL's request. By letter dated October 12, 1979, the State of New Hampshire filed a Statement of Position with respect to the SAPL request. The relief requested is premised on contentions that NRC has failed to:

1. require development of an evacuation plan beyond the low population zone as part of the construction permit proceedings, and
2. evaluate the consequences of a Class 9 accident, in determining site suitability, including the necessity for evacuation beyond the low population zone.

STAFF RESPONSE TO CONTENTION 1

SAPL's first contention is that the Commission has effectively reversed the holding of ALAB-390[1/] by publishing for public comment in the Federal Register on August 23, 1978 (43 FR 37473) a proposed rule which, if adopted, would require the staff to determine if "emergency planning, which may include planning for evacuation measures, should extend to areas beyond the LPZ". On the basis of this proposed rule SAPL requests that the feasibility of evacuation beyond the LPZ be set down for determination at reopened construction permit proceedings.

In a letter dated November 21, 1979, the NRC Staff advised all licensees of plants under construction of additional staff requirements at the operating license stage in the area of emergency planning. These requirements, as presented in the joint EPA/NRC Task Force Report (NUREG-0396), were concurred in and endorsed in the Commission's policy statement issued on October 5, 1979, and published in the Federal Register on October 23, 1979 (44 FR 61123). The major recommendation of the report is that two Emergency Planning Zones (EPZ's) should be established around light water nuclear power plants. The EPZ for

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1/ The Appeal Board ruled in Public Service Company of New Hampshire (Seabrook Station, Units 1 and 2), ALAB-390, 5 NRC 733, 747 (1977), that "under the Commission's regulations in their present form, consideration is not to be given in a licensing proceeding to the feasibility of devising an emergency plan for the protection (in the event of an accident) of persons located outside the low population zone".

airborne exposure has a radius of about 10 miles; the EPZ for contaminated food has a radius of about 50 miles. These recommendations were based in part on Class 9 accident considerations.

On December 5, 1979, the Commission approved proposed rules, amending 10 CFR Part 50, for coping with emergencies at nuclear power reactors. 44 FR 75167 (December 19, 1979). The concept of dual EPZ's as defined in NUREG-0396 has been incorporated in the amendments, and will be required in the Emergency Plan of the licensee if the amendments are adopted as proposed. The publication of these proposed rules in the Federal Register supersedes the August 23, 1978 proposed rule change.

In its statement accompanying the publication of the proposed rules the Commission explicitly noted that it "is considering whether construction permits which have already been issued should be reconsidered because of the emergency planning considerations of the (proposed rules)."

By letter dated December 21, 1979, the NRC staff advised all power reactor licensees, and all construction permit holders and applicants of the proposed rule and of regional workshops to be convened to discuss the feasibility of the proposed rule, its impact, and the procedures for complying with its provisions.

In a letter dated December 26, 1979, the NRC staff requested that all licensees of plants under construction provide information regarding estimated evacuation times by March 31, 1980. This request did not change

the position stated in the letter of November 21, 1979, i.e., that compliance with the additional requirements need not be demonstrated until the operating license stage of review. These estimates were requested so that the NRC can identify those "instances" in which unusual evacuation constraints exist and special planning measures should be considered. In some cases of extreme difficulty where a large population is at risk, special facility modifications may also be appropriate.

Therefore, pending receipt and evaluation of this information, adoption of the proposed rule, and guidance from the Commission on reconsideration of construction permits, it would be premature to reopen the Seabrook construction permit proceedings at this time.

STAFF RESPONSE TO CONTENTION 2

SAPL's second major contention is that the extremely low probability of the Class 9 accident occurrence has been undercut by the Commission's repudiation of the assessment risk values in the Reactor Safety Study (WASH-1400) and that "(t)he Staff, in order to avoid the evaluation of the consequences of a Class 9 accident in the performance of its NEPA[2/] review, appears to have relied upon WASH-1400, the reactor safety study, more commonly known as the Rasmussen Report." Contrary to SAPL's contention, WASH-1400 was not the basis for evaluation of the consequences of accidents in the staff's NEPA reviews.

2/ National Environmental Policy Act of 1969 (Public Law 91-190, 83 Stat. 852).

Commission guidance on the consideration to be given to accidents in the environmental review, including Class 9 accidents, is found in the proposed Annex to 10 CFR Part 50, Appendix D, which was published in the Federal Register on December 1, 1971 (36 FR 22851).

This Annex divided the spectrum of accidents, ranging in severity from trivial to very serious, into nine categories or classes. It directed that "for each class, except Classes 1 and 9, the environmental consequences shall be evaluated as indicated". Class 1 events were not to be considered because of their trivial consequences, whereas in regard to Class 9 events the Annex states as follows:

> The occurrences in Class 9 involve sequences of postulated successive failures more severe than those postulated for establishing the design basis for protective systems and engineered safety features. Their consequences could be severe. However, the probability of their occurrence is so small that their environmental risk is extremely low. Defense-in-depth (multiple physical barriers), quality assurance for design, manufacture, and operation, continued surveillance and testing, and conservative design are all applied to provide and maintain the required high degree of assurance that potential accidents in this class are, and will remain, sufficiently remote in probability that the environmental risk is extremely low. For these reasons, it is not necessary to discuss such events in applicants' Environmental Reports.3/

A number of developments have occurred since the publishing of the Annex in December 1971 which have had significant bearing on accident consideration for both safety and environmental reviews. The following summary of developments reflects the evolutionary change in the NRC's policies in this area.

3/ A footnote in the annex states that such events also need not be discussed in the staff's Environmental Statements.

(1) WASH-1400: The publishing of the Reactor Safety Study (WASH-1400), first in draft form in August 1974 and in final form in October 1975 has had an effect upon accident considerations with regard to nuclear power reactors. Although this was not the first study that examined consequences of large radioactive releases, it was the first study to examine such events probabilistically and which attempted to arrive at an actual estimate of the probability of a core melt event. Staff practice, in environmental impact statements, has been to refer to the WASH-1400 study because it reflected a new methodology to assess the risks of severe accidents in a more quantitative fashion, but the staff has not relied on WASH-1400 findings in its environmental reviews.

(2) Risk Assessment Review Group: In July 1977, the NRC organized the above group primarily to clarify the achievements and limitations of the Reactor Safety Study (RSS). The results of this study, issued in September 1978, to the effect that the Review Group was unable to determine whether the overall probability of a core-melt given in the RSS was high or low, have also been included in recent environmental assessments issued by the staff. On January 18, 1979, the Commission issued an "NRC Statement on Risk Assessment and the Reactor Safety Study Report (WASH-1400) in light of the Risk Assessment Review Group Report [NUREG/CR-0400]" in which was stated:

"Accident Probabilities: The Commission accepts the Review Group Report's conclusion that absolute values of the risks presented by WASH-1400 should not be used uncritically either in the regulatory process or for public policy purposes and has taken and will continue to take steps to assure that any such use in the past will be corrected as appropriate. In particular, in light of the Review Group conclusions on accident probabilities, the Commission does not regard as reliable the Reactor Safety Study's numerical estimate of the overall risk of reactor accident."

(3) SECY 78-137, "Assessments of Relative Differences in Class 9 Accident Risks in Evaluations of Alternatives to Sites With High Population Densities": The staff recommended to the Commission in SECY 78-137 on March 7, 1978 that:

"(a) Pending completion of the Commission's review of its reactor siting policy that the staff perform quantitative assessments of the relative differences in Class 9 accident consequences and risks in the review of alternative sites where the population density exceeds the values given in Regulatory Guide 4.7."

"(b) That the Commission consider the appropriateness of issuing some clarifying statement to the effect that the proposed Annex 10 CFR Part 50 Appendix D applies to land-based LWR's of the type licensed during the last decade or so, and that more detailed consideration of Class 9 accidents may be warranted for other types of sites or designs."

(4) Report of the Siting Policy Task Force (NUREG-0625): In August 1979, the Siting Policy Task Force recommended that siting policy changes be made "To take into consideration in siting the risk associated with accidents beyond the design basis (Class 9) by establishing population density and distribution criteria". This report

recommended that population criteria act as a surrogate for Class 9 risks, and that site-specific Class 9 accidents should not be analyzed and weighed in the decisional process.

(5) Commission Policy Statement: On October 5, 1979, the Commission issued a policy statement, published in the Federal Register on October 23, 1979(44 FR 61123), endorsing the guidance contained in a report issued in December 1978, ("Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Plants. A Report prepared by a U. S. Nuclear Regulatory Commission and U. S. Environmental Protection Agency Task Force on Emergency Planning") (NUREG-0396). In so doing the Commission said that "it is appropriate and prudent for emergency planning guidance to take into consideration the principal characteristics (such as nuclides released and distances likely to be involved) of a spectrum of design basis and core melt accidents."

(6) SECY 79-594, "Class 9 Accident Considerations": On October 31, 1979, in response to requests by the Commissioners in Offshore Power Systems (Floating Nuclear Plants), CLI-79-9, 10 NRC ____ (September 14,

1979),[4/] the staff submitted an information paper, SECY 79-594, entitled "Class 9 Accident Considerations". As stated in the paper, the staff is pursuing the following:

4/ In Offshore Power Systems, the Commission stated:

> "Our grant of review in this proceeding was limited to the narrow question certified to us by the Appeal Board and it is neither necessary nor appropriate for us to employ this particular adjudicatory proceeding to resolve the generic issue of consideration of Class 9 accidents at land-based reactors. Such a generic action is more properly and effectively done through rulemaking proceedings in which all interested persons may participate.
>
> Therefore, we are not today expressing any views on the question of environmental consideration of Class 9 accidents at land-based reactors which, as the Board noted, present risks different in kind and perhaps in magnitude from those risks presented by FNPs. However, we are concerned about this question and intend to complete the rulemaking begun by the Annex and to re-examine Commission policy in this area. To aid in that re-examination we ask our staff to:
>
> 1. Provide us with its recommendations on how the interim guidance of the Annex might be modified, on an interim basis and until the rulemaking on this subject is completed, to reflect developments since 1971 and to accord more fully with current staff policy in this area; and
>
> 2. In the interim, pending completion of the rulemaking on this subject, bring to our attention, any individual cases in which it believes the environmental consequences of Class 9 accidents should be considered."

" Preparation of an interim policy statement on accident risks under NEPA which include consideration of core melt events and which would withdraw the 1971 proposed Annex.

" Preparation of recommendations for design features for all plants associated with core melt accidents.

" Preparation of recommendations for rule making to revise 10 CFR Part 100, to encompass considerations of the risks associated with core melt events." (p. 5)

The Commission stated in Offshore Power Systems, supra, that it intends to handle the Class 9 issue by means of a generic rulemaking proceeding. Pending the outcome of the rulemaking, the staff is to bring to the Commission's attention individual cases in which the environmental consequences of Class 9 accidents should be considered. See, Public Service Company of Oklahoma (Black Fox Station, Units 1 and 2), ALAB-573, 10 NRC ___ (December 7, 1979).

To determine whether a particular case should be brought to the Commission's attention, the staff intends to apply the criteria set forth in the staff's

brief to the Commission in Offshore Power Systems.[5/] In that brief the staff stated that "there is no need for a detailed NEPA discussion of Class 9 accident risks in nuclear power reactor licensing proceedings unless the special circumstances of a particular case indicate that Class 9 accident risks may be unusually higher or of a different character than for the typical land based nuclear power reactor. To date only three types of special circumstances have been identified that would trigger a detailed Class 9 accident evaluation: a high population density for the proposed site (above the "trip points" in the Standard Review Plan[6/] and Regulatory Guide),[7/] a novel reactor design (a type of power reactor other than a

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5/ NRC STAFF'S BRIEF IN SUPPORT OF AFFIRMATIVE FINDING ON CERTIFIED QUESTION (January 12, 1979)

This brief was submitted to the Commission after the Atomic Safety and Licensing Appeal Board granted Offshore Power Systems' request to certify the "Class 9 question" to the Commission on September 29, 1978. ALAB-500, 8NRC 323 (1978).

The certified question was:
"Are Class 9 accidents a proper subject for consideration in the Staff's environmental statement on the floating nuclear power plant manufacturing license application?"

6/ "Standard Review Plan For The Review of Safety Analysis Reports For Nuclear Power Plants - LWR Edition" (NUREG-75-087) September, 1975.

7/ "General Site Suitability Criteria for Nuclear Power Stations" Regulatory Guide 4.7, Office of Standards Development, United States Nuclear Regulatory Commission, November 1975.

light water power reactor), or a combination of a unique design and a unique siting mode (a floating nuclear plant)." (Brief at p. 47)

I have reviewed the Seabrook facility to determine whether any of these special circumstanc exist. As noted in Section 1.2 of the Safety Evaluation Report,[8/] the nuclear steam supply system for each Seabrook unit will consist of a pressurized water reactor using a four-loop reactor coolant system based on the design described in the Reference Safety Analysis Report.[9/] Since this report is referenced for several other facilities and since the particular design is basically similar to several other reactor designs of the Westinghouse Electric Corporation licensed for construction and operation, the Seabrook facility is a typical light water reactor facility and therefore is not a novel reactor design.

In Offshore Power Systems, the unique design and unique siting mode consisted of a nuclear power plant mounted on a floating barge. There would be no soil structure to retard the release and dispersal of activity beneath the plant following a core melt accident as would be the case for land based plants. The staff concluded that the most likely population

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8/ "Safety Evaluation of the Seabrook Nuclear Power Station Units Nos. 1 and 2, Docket Nos. 50-443 and 50-444", U. S. Atomic Energy Commission, Directorate of Licensing, August 14, 1974.

9/ "Reference Safety Analysis Report (RESAR-3 Consolidated Version)", Westinghouse Nuclear Energy Systems, November 1973.

exposure from the liquid pathway for a floating nuclear plant is significantly greater than for a land based plant because of the inability to interdict releases in the vicinity of the floating nuclear plant.

The Seabrook site is bordered on three sides by marshland which is part of the Hampton Harbor estuary. Hampton Harbor, a shallow lagoon behind the barrier beaches of Hampton Beach and Seabrook Beach, is the nearest surface water body which could be affected by liquid releases from a Class 9 accident.

Groundwater in the site area is generally a reflection of surface topography and is usually within 10 feet of the ground surface. The groundwater moves generally toward the marsh areas at a rate of several tens of feet per year.

If a Class 9 accident were to occur, the groundwater in the plant area would be first affected. However, since the reactor building is located about 200 feet from the marsh at the closest point, it would likely require several years for groundwater to migrate to the estuary. Due to this slow rate of groundwater movement, the staff concludes that there are no unusual features or special circumstances with regard to the groundwater contamination interdiction characteristics of this site that would distinguish it from other land based light water reactor sites to the extent that, under the present Commission policy, warrant consideration of environmental consequences of Class 9 accidents.

However, the task action plans contained in Draft NUREG-0660 (TMI Lessons Learned) as proposed to the Commission, identify Task Action Plan III.E.1.4 as an in-depth study of liquid pathway interdiction, which is one of the special factors identified in Offshore Power Systems which might trigger further consideration of Class 9 events. Assuming Commission approval, Seabrook and all other plants would be analyzed as part of Task Action Plan III.E.1.4. If that should result in the liquid pathway being identified as a unique consideration at Seabrook, and the Commission's interim policy on Class 9 accident consideration has not yet clarified the situation in this regard, methods of interdiction and mitigation will be identified. Based upon the liquid pathway study[10/] and preliminary discussions with Argonne National Laboratory on liquid pathway mitigation methods, the staff believes it is possible to interdict within the time period identified above and reduce or prevent the migration of contaminated groundwater to the marsh.

Several methods of mitigation, including pumping and construction of slurry walls to prevent migration are available. However, site specific techniques, if required, will be identified as a part of the liquid pathway interdiction review.

10/ "Liquid Pathway Generic Study - Impacts of Accidental Radioactive Releases to the Hydrosphere from Floating and Land Based Nuclear Power Plants," (NUREG-0440) February 1978.

In discussing the high population special circumstance, the staff's brief in Offshore Power Systems notes that the "special attention" called for by the Standard Review Plan and Regulatory Guide 4.7[11/] in the case of sites exceeding the population level "trip points" entails a consideration of comparative population exposures for Class 9 accidents at the proposed site and alternative sites. The "trip points" apply to proposed new sites at the construction permit stage and were not evaluated nor proposed for plants beyond the construction permit stage. The consideration of population exposures for Class 9 accidents has been utilized by the staff in assessing the relative differences between the proposed site and the candidate alternative sites. The consideration of population exposure for Class 9 accidents is not used as an absolute site-specific criterion for evaluating the suitability of a proposed site and sites are not necessarily found unsuitable if they exceed the population density guidelines given in the Standard Review Plan and Regulatory Guide 4.7. As indicated by the staff

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11/ Section C.3 of Regulatory Guide states:

> "If the population density, including weighted transient population, projected at the time of initial operation of a nuclear power station exceeds 500 persons per square mile averaged over any radial distance out to 30 miles (cumulative population at a distance divided by the area at that distance), or the projected population density over the lifetime of the facility exceeds 1,000 persons per square miles averaged over any radial distance out to 30 miles, special attention should be given to the consideration of alternative sites with lower population densities."

criteria in Regulatory Guide 4.7 and described in the Pilgrim final environmental statement,[12/] a site that exceeds the population density guidelines can nevertheless be selected and approved if, on balance, it offers advantages compared with available alternative sites when all of the environmental, safety, and economic aspects of the proposed site and the alternative sites are considered.

It is current staff practice to assess the relative differences in population exposures for Class 9 accidents between a proposed new site and the alternative sites through the use of population distribution and population density as a surrogate for accident consequences. The consequences of radiological accidents, from minor or trivial releases up to and including severe events, is directly related to the number of people surrounding a particular site and to the distance of the population from the reactor location. The staff recognizes that the population distribution of a site is a relatively crude measure of the risk associated with the accidental releases of radioactivity. The risk from any accidental releases would depend not only upon the population distribution of a site but also upon many other factors that would enter into the determination of the actual consequences of accident. However, insight gained in the evaluation of the relative consequences of accidents in the Perryman alternative site study (SECY-78-137, Enclosure D) led the staff to conclude that

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12/ "Final Supplement to the Final Environmental Statement related to construction of Pilgrim Nuclear Power Station, Unit No. 2", (NUREG--549) May 1979.

(1) the relative differences in the population distribution between sites is a reasonable measure of the relative magnitude of potential consequences, (2) relatively large differences in the population densities between two sites are required to exist before significant differences in accident risks would be expected to be discernible, and (3) the risk is not uniform for all members of the population regardless of distance from the site but is higher for those persons relatively close to the site and generally decreases with distance away from the site.

The staff's findings in the Seabrook case were published in NUREG-0501, "Seabrook Alternative Site Study," in December 1978 and presented as direct testimony before the Appeal Board at a hearing in January 1979. In this evaluation, the population distribution out to 30 miles for the Seabrook site was compared to the population distribution for each of the candidate alternative sites. The staff found that with respect to population, three of the alternative sites had significantly lower population densities than the Seabrook site, i.e., Moore Pond, Shelburne and Phillips Cove. This factor was brought forward for consideration in the overall balancing of all of the environmental and economic factors which entered into the comparison of each alternative site to the Seabrook site. The staff's conclusion was that upon consideration of an overall balancing of all of the factors, none of the alternative sites were "obviously superior" in comparison to the Seabrook site.[13/] See, Public Service Company of New Hampshire, CLI-77-8, 5NRC 503 (1977).

13/ (on next page)

13/ The conclusions reached by the staff are as follows:

Moore Pond
"The socioeconomic factors and in particular the long transmission corridors through wilderness landscape are factors which weigh to the disadvantage of Moore Pond relative to Seabrook. Environmental factors which weigh in favor of Moore Pond relative to Seabrook include low population density and lack of salt drift effects. The staff concludes that the adverse factors are of greater magnitude than those which favor the site and that Moore Pond is clearly and substantially disadvantaged relative to Seabrook for the siting of a nuclear power station." NUREG-0501, p. D-72.

Shelburne
"Possible impacts on fish restoration programs, socioeconomic impacts, and in particular the need for long transmission corridors are all factors which weigh to the substantial disadvantage of Shelburne relative to Seabrook. Environmental factors which weigh in favor of Shelburne relative to Seabrook are lesser effects of drift and lower population densities. The Staff concludes that the comparative adverse impacts at Shelburne are of greater magnitude than the comparative advantages and that this site is therefore clearly and substantially inferior to Seabrook for the siting of a nuclear power station." Id., pp. E-69, 70.

Phillips Cove
"The residual environmental comparison at the two sites finally reduces to aesthetic, biological and low population advantages at Phillips Cove due to the probable absence of cooling towers and advantages at Seabrook due to shorter transmission corridors and less socioeconomic impact (other than aesthetic). Because these factors are incommensurate and, therefore, cannot be contrasted directly, and because there are some important countervailing factors, the staff concludes that Phillips Cove is not clearly and substantially preferable to Seabrook.

However, the overall weight of evidence does tend to favor Phillips Cove because of the absence of aesthetic effect and drift problems and the staff concludes that Phillips Cove is marginally superior to Seabrook." Id. pp. F-69, 70.

In summary, although Seabrook exceeded the "trip points" of Regulatory Guide 4.7, as proposed in SECY 78-137, supra, the staff has already performed the assessments of relative differences in Class 9 accident consequences in the Seabrook alternative site review.

I have determined for the reasons set forth above that there exists no adequate basis for instituting a proceeding to suspend or revoke the the Seabrook construction permits because of (1) failure of NRC to require development of an evacuation plan beyond the low population zone as part of the construction permit proceeding, and (2) failure of NRC to evaluate the consequences of a Class 9 accident including the necessity for evacuation beyond the low population zone. Accordingly, the request of SAPL is denied.

A copy of this decision will be placed in the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555 and the local Public Document Room for the Seabrook Station located at the Exeter Public Library, Front Street, Exeter, New Hampshire. A copy of this document will also be filed with the Secretary of the Commission for its review in accordance with 10 CFR 2.206(c) of the Commission's regulations.

In accordance with 10 CFR 2.206(c) of the Commission's Rules of Practice, this decision will constitute the final action of the Commission 20 days after the date of issuance, unless the Commission on its own motion institutes the review of this decision within that time.

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland,
this 11th day of February 1980.