ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 14, 1975

Honorable William A. Anders
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: INTERIM REPORT ON PILGRIM NUCLEAR GENERATING STATION, UNIT NO. 2

Dear Mr. Anders:

At its 187th meeting, November 6-8, 1975, the Advisory Committee on Reactor Safeguards completed a partial review of the application of Boston Edison Company and joint applicants (Applicants) for a permit to construct the Pilgrim Nuclear Generating Station, Unit No. 2. The site was visited on February 20, 1975, and the project was considered at a Subcommittee meeting at Plymouth, Massachusetts on November 4, 1975. During its review, the Committee had the benefit of discussions with representatives and consultants of the Applicants, Combustion Engineering, Inc., Bechtel Corporation, and the Nuclear Regulatory Commission (NRC) Staff. The Committee also had the benefit of the documents listed.

The plant will be located in Plymouth County, Massachusetts approximately 38 miles southeast of Boston. The NRC Staff has designated a group of contiguous communities consisting of Plymouth Center, West and North Plymouth, and Kingston Center, some located as near as 2.2 miles from the site, to be the nearest population center (1970 population of 20,000 and the projected 1990 population of 25,000). The minimum exclusion distance is 441 meters and the low population zone radius is 1.5 miles. Major land uses in the vicinity of the plant site are for residential and recreational activities.

The Nuclear Steam Supply System (NSSS) for Pilgrim Unit 2 will be furnished by Combustion Engineering, Inc. It will consist of a pressurized water reactor with a two-loop reactor coolant system and will be rated at a thermal power output of 3473 megawatts. The design of the NSSS is similar to that of San Onofre Units 2 and 3 which was reported on in the Committee's report of July 21, 1972.

The Committee has not completed its review of the seismicity of the site region, the proposed seismic design basis, and the foundation engineering for Category I structures. These matters will be reviewed by the Committee following completion of the NRC Staff review. The Committee will complete its review of LOCA-ECCS at the same time.

The source of normal and emergency cooling water will be Cape Cod Bay. The intake structure and the intake channel will be protected by existing breakwaters constructed for Pilgrim Unit 1.

Pilgrim Unit 2 will employ a containment consisting of a steel-lined, pre-stressed, post-tensioned concrete cylinder and hemispherical dome roof with a total free volume of 2.48×10^6 cu. ft. The design pressure and temperature are 60 psig and 300°F., respectively. The Committee believes that this containment design, with its auxiliary systems, is satisfactory for this plant.

The NRC Staff has identified other outstanding issues which will require resolution before the issuance of a construction permit. The Committee recommends that these matters be resolved in a manner satisfactory to the Staff.

The Committee recommends that the NRC Staff and the Applicants review further the design features that are intended to prevent the occurrence of fires and to minimize the consequences to safety-related equipment should a fire occur. This matter should be resolved to the satisfaction of the NRC Staff. The Committee wishes to be kept informed.

The ACRS considered the problem of turbine missiles in its report of April 18, 1973, where recommendations were made concerning overspeed protection systems, optimum turbine orientation, and projectile penetration. The Committee recommends that the NRC Staff continue to review the combination of overspeed protection systems and low angle missile barriers to determine if changes would enhance the safety of Pilgrim Unit 2, recognizing that design of this plant, which utilizes a non-optimum turbine orientation was well advanced prior to 1973. For future plants, the ACRS reiterates its recommendation that a peninsular arrangement, optimized to be non-interactive with critical components in both single and multi-unit stations, is preferred.

The Committee believes that the Applicants and the NRC Staff should continue to review the Pilgrim Unit 2 design for features that could reduce the possibility and consequences of sabotage. The Committee recommends that adequate attention be given by the Applicants and the NRC Staff to ensure that satisfactory measures are developed and implemented to assure the protection of Pilgrim Unit 1 during the construction of Unit 2.

Generic problems relating to large water reactors are discussed in the Committee's report dated March 12, 1975. These problems should be dealt with appropriately by the NRC Staff and the Applicants.

With satisfactory conclusions on LOCA-ECCS, the seismic-related items, and the foundation engineering of Category I structures, identified above as matters requiring further Committee review, and with due consideration to the other items mentioned above, the Committee believes that Pilgrim Nuclear Generating Station, Unit No. 2 can be constructed with reasonable assurance that it can be operated without undue risk to the health and safety of the public.

Sincerely,

W. Kerr
Chairman

References

1. Boston Edison Company and joint applicants, "Pilgrim Nuclear Generating Station, Unit No. 2 Preliminary Safety Analysis Report," (PSAR), Vols. I-XI.
2. Amendments 1-21 to PSAR.
3. U.S.N.R.C., Safety Evaluation Report for the Pilgrim Nuclear Generating Station, Unit No. 2, June 1975.
4. Letter, dated January 3, 1975, Boston Edison Company to DRL, concerning Anticipated Transients Without Scram.