

December 21, 1998

Mr. Theodore A. Sullivan
Vice President Nuclear and Station Director
Boston Edison Company
Pilgrim Nuclear Power Station
RFD #1 Rocky Hill Road
Plymouth, MA 02360

SUBJECT: ISSUANCE OF AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE
NO. DPR-35, PILGRIM NUCLEAR POWER STATION (TAC NO. MA0882)

Dear Mr. Sullivan:

The Commission has issued the enclosed Amendment No. 180 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station. This amendment is in response to your application dated February 11, 1998.

The UFSAR describes the response of the salt service water (SSW) system to a complete loss of AC power by assuming that the system would be divided by the closure of one of the two division isolation valves. Boston Edison Company (BECo) has discovered single failures involving a partial loss of AC power could place the SSW system in a configuration of one pump supplying both trains of heat exchangers for the first 10 minutes of the worst case design basis accident. BECo has determined that these single failures are an unreviewed safety question. The amendment authorizes BECo to change the Updated Final Analysis Report (UFSAR) Section 10.7, "Salt Service Water System," to address this single failure vulnerability.

A copy of the related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:

Alan B. Wang, Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosures: 1. Amendment No. 180 to License No. DPR-35
2. Safety Evaluation

cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

December 21, 1998

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Sincerely,

A handwritten signature in cursive script that reads "Alan Wang".

Alan B. Wang, Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosures: 1. Amendment No. 180 to License No. DPR-35
2. Safety Evaluation

cc w/encls: See next page

DATED: December 21, 1998

AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE NO. DPR-35-PILGRIM
NUCLEAR POWER STATION

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

BOSTON EDISON COMPANY

DOCKET NO. 50-293

PILGRIM NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 180
License No. DPR-35

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
 - A. The application for amendment filed by the Boston Edison Company (the licensee) dated February 11, 1998, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, changes to the Updated Final Analysis Report (UFSAR) to reflect a change in the description of the facility as set forth in the application for amendment by Boston Edison Company dated February 11, 1998, is authorized.
3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Cecil O. Thomas, Director
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Date of Issuance: December 21, 1998



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 180 TO FACILITY OPERATING LICENSE NO. DPR-35

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

1.0 INTRODUCTION

By letter dated February 11, 1998, Boston Edison Company (BECo/the licensee) requested an amendment to their Operating License No. DPR-35, for the Pilgrim Nuclear Power Station (PNPS) to change the Updated Final Safety Analysis Report (UFSAR) Section 10.7, "Salt Service Water System." The UFSAR describes the response of the salt service water (SSW) system to a complete loss of AC power by assuming that the system would be divided by the closure of one of the two division isolation valves. BECo has determined that single failures involving a partial loss of AC power could place the SSW system in a configuration of one pump supplying both trains of heat exchangers for the first 10 minutes of the worst case design basis accident. BECo has determined that these single failures are an unreviewed safety question. The amendment will authorize BECo to change UFSAR Section 10.7, "Salt Service Water System," to address this single failure vulnerability.

2.0 EVALUATION

The SSW system consists of five service water pumps located in the intake structure, which discharge to a common header from which independent piping supplies each of two cooling water loops. Each loop consists of one reactor building closed cooling water heat exchanger (RBCCW) and one turbine building closed cooling water (TBCCW) heat exchanger. The RBCCW heat exchangers provide cooling to the core standby cooling system components and provide a heat sink for the residual heat removal heat exchangers. The TBCCW heat exchangers provide cooling to equipment located in the turbine building and station air conditioning systems. Two division valves are included in the common discharge header to permit the SSW system to be operated as two independent loops.

Section 10.7 of Pilgrim's UFSAR states that the safety objective of the SSW system is to provide a heat sink for the RBCCW system under transient and accident conditions. This objective consists of supplying cooling to the equipment area coolers and to the core standby cooling systems which would be required to operate under transient and accident conditions and supplying cooling to the residual heat removal system for containment heat removal. The current licensing basis credits operator actions to initiate containment cooling 10 minutes after the event has initiated.

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The licensee performed a single failure analysis of the SSW system, which revealed that certain low probability single active failures exist that can cause the loss of the automatic closing feature of the SSW motor-operated division valves MO-3808 and MO-3813 that are located in the common header and the loss of SSW pumps in one train. The single active failures could leave the SSW system in a configuration with one SSW pump supplying both SSW trains through open cross connect header isolation valves.

PNPS performed a calculation M500, "Range of Salt Service Water System Header Pressure and Pump Flows," to determine whether the SSW system could operate with one pump supplying both trains of SSW. The calculation demonstrated that continuous operation of a single SSW pump with an open header and minimum system resistance is acceptable. Under the worst case design conditions, the licensee stated that the expected pump flow rate was within the tested performance of the pump, and the net positive suction head (NPSH) requirements are met at the low astronomical tide. According to the current pump curves, the licensee determined that the SSW pumps could operate under the full range of conditions and times required with no significant adverse effects including conditions in which one pump would be operating until operator action is taken without degradation or damage to the pump. The staff has reviewed the results of this calculation and found it to be acceptable.

To provide further assurance that the actual SSW pump conditions agree with the design conditions of the pumps, the licensee performed a SSW pump runout test, using a similar pump, that showed that the SSW pumps could operate under conditions of severe cavitation for 30 minutes without any degradation of performance or any noticeable material degradation of pump internals.

The licensee recognized that for approximately 10 minutes after an accident, the SSW system would be operating at a diminished capacity. However, the current licensing basis does not require SSW for core cooling and the containment heat removal function of the RHR system is not assumed to be initiated until 10 minutes after an accident. After 10 minutes, operators are expected to align the SSW systems to achieve containment cooling by isolating the SSW loops or start additional SSW pumps as necessary depending on the existing plant conditions. The licensee performed a calculation M771, "RBCCW Heatup Following a DBA LOCA," to determine the ability of the SSW system to supply adequate cooling to the RBCCW system. The calculation revealed that even with no cooling to the RBCCW system from SSW during the first 10 minutes of the worst case design basis accident LOCA, the temperatures within the RBCCW system would remain within acceptable design limits. The staff has reviewed this calculation and found it to be acceptable.

Based on its review, the staff agrees with the licensee that the ability of the SSW system to perform its safety objective is not diminished by operating with one SSW pump supplying two loops until operators can restore another SSW pump within 10 minutes. This is based on the staff's determination that the results of the licensee's calculations M500 and M771 are acceptable, and the SSW system meets the guidance described in Standard Review Plan (SRP) 9.2.1, "Station Service Water System," and SRP 9.2.5, "Ultimate Heat Sink."

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Massachusetts State Official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment (which changes the description of the facility in the UFSAR) changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (63 FR 17220). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: V. Ordaz

Date: December 21, 1998