

October 22, 1990

Mr. Ralph G. Bird  
Senior Vice President - Nuclear  
Boston Edison Company  
Pilgrim Nuclear Power Station  
RFD #1 Rocky Hill Road  
Plymouth, Massachusetts 02360

Dear Mr. Bird:

SUBJECT: ISSUANCE OF AMENDMENT NO. 131 TO FACILITY OPERATING LICENSE NO.  
DPR-35 - PILGRIM NUCLEAR POWER STATION (TAC NO. 75533)

The Commission has issued the enclosed Amendment No. 131 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station. This amendment is in response to your application dated December 11, 1989.

This amendment changes the minimum acceptable core spray pump flow rate for each pump from the current technical specification limit of 3600 gpm to 3300 gpm. The bases section of the technical specifications are also updated to reflect the change.

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

Sincerely,

*RS*

Ronald Eaton, Senior Project Manager  
Project Directorate I-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 131 to License No. DPR-35
- 2. Safety Evaluation

cc w/enclosures:  
See next page

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

October 22, 1990

Docket No. 50-293

Mr. Ralph G. Bird  
Senior Vice President - Nuclear  
Boston Edison Company  
Pilgrim Nuclear Power Station  
RFD #1 Rocky Hill Road  
Plymouth, Massachusetts 02360

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Sincerely,

A handwritten signature in black ink, appearing to read "Ronald Eaton".

Ronald Eaton, Senior Project Manager  
Project Directorate I-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 131 to License No. DPR-35
2. Safety Evaluation

cc w/enclosures:  
See next page

Mr. Ralph G. Bird

Pilgrim Nuclear Power Station

cc:

Mr. R. A. Anderson  
Vice President of Operations  
and Station  
Pilgrim Nuclear Power Station  
RFD #1 Rocky Hill Road  
Plymouth, Massachusetts 02360

Mr. Richard N. Swanson  
Manager, Nuclear Engineering Department  
Boston Edison Company  
25 Braintree Hill Park  
Braintree, Massachusetts 02184

Resident Inspector  
U. S. Nuclear Regulatory Commission  
Pilgrim Nuclear Power Station  
Post Office Box 867  
Plymouth, Massachusetts 02360

Ms. Elaine D. Robinson  
Nuclear Information Manager  
Pilgrim Nuclear Power Station  
RFD #1, Rocky Hill Road  
Plymouth, Massachusetts 02360

Chairman, Board of Selectmen  
11 Lincoln Street  
Plymouth, Massachusetts 02360

Mr. Charles V. Barry  
Secretary of Public Safety  
Executive Office of Public Safety  
One Ashburton Place  
Boston, Massachusetts 02108

Office of the Commissioner  
Massachusetts Department of  
Environmental Quality Engineering  
One Winter Street  
Boston, Massachusetts 02108

Office of the Attorney General  
One Ashburton Place  
20th Floor  
Boston, Massachusetts 02108

Mr. Robert M. Hallisey, Director  
Radiation Control Program  
Massachusetts Department of  
Public Health  
150 Tremont Street, 2nd Floor  
Boston, Massachusetts 02111

Regional Administrator, Region I  
U. S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, Pennsylvania 19406

Mr. John Dietrich  
Licensing Division Manager  
Boston Edison Company  
25 Braintree Hill Park  
Braintree, Massachusetts 02184

AMENDMENT NO. 131 TO DPR-35 PILGRIM NUCLEAR POWER STATION DATED October 22, 1990

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

BOSTON EDISON COMPANY

DOCKET NO. 50-293

PILGRIM NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 131  
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 December 11, 1989 complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - 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 set forth in 10 CFR Chapter I;
  - 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.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-35 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 131, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard Wessman, Director  
Project Directorate I-3  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance:     October 22, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 131

FACILITY OPERATING LICENSE NO. DPR-35

DOCKET NO. 50-293

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove  
103

113

Insert  
103

113

LIMITING CONDITION FOR OPERATION

SURVEILLANCE REQUIREMENT

3.5 CORE AND CONTAINMENT COOLING SYSTEMS

Applicability

Applies to the operational status of the core and suppression pool cooling subsystems.

Objective

To assure the operability of the core and suppression pool cooling subsystems under all conditions for which this cooling capability is an essential response to station abnormalities.

Specification

A. Core Spray and LPCI Subsystems

1. Both core spray subsystems shall be operable whenever irradiated fuel is in the vessel and prior to reactor startup from a Cold Condition, except as specified in 3.5.A.2 below.

4.5 CORE AND CONTAINMENT COOLING SYSTEMS

Applicability

Applies to the Surveillance Requirements of the core and suppression pool cooling subsystems which are required when the corresponding Limiting Condition for Operation is in effect.

Objective

To verify the operability of the core and suppression pool cooling subsystems under all conditions for which this cooling capability is an essential response to station abnormalities.

Specification

A. Core Spray and LPCI Subsystem

1. Core Spray Subsystem Testing.

<u>Item</u>	<u>Frequency</u>
a. Simulated Automatic Actuation test.	Once/Operating Cycle
b. Pump Operability	Once/month
c. Motor Operated Valve Operability	Once/month
d. Pump flow rate Each pump shall deliver at least 3300 gpm against a system head corresponding to a reactor vessel pressure of 104 psig.	
e. Core Spray Header $\Delta p$ Instrumentation	

BASES:

3.5.A Core Spray and LPCI Subsystem

This specification assures that adequate emergency cooling capability is available whenever irradiated fuel is in the reactor vessel.

Based on the loss of coolant analysis performed by General Electric in accordance with Section 50.46 and Appendix K of 10CFR50, the Pilgrim I Emergency Core Cooling Systems are adequate to provide sufficient cooling to the core to dissipate the energy associated with the loss of coolant accident, to limit calculated fuel clad temperature to less than 2200°F, to limit calculated local metal water reaction to less than or equal to 17%, and to limit calculated core wide metal water reaction to less than or equal to 1%.

General Electric Company Proprietary Report EAS-65-0989, "Safety Evaluation for Interim Operation of Pilgrim Nuclear Power Station with Reduced Core Spray System Flow Rate" (September 1989) calculates a peak fuel clad temperature of less than 2200°F with a Core Spray pump flow of 3240 gallons per minute (gpm). A flow rate of 3300 gpm ensures adequate flow for events involving degraded voltage.

The limiting conditions of operation in Specifications 3.5.A.1 through 3.5.A.6 specify the combinations of operable subsystems to assure the availability of the minimum cooling systems noted above. No single failure of CSCS equipment occurring during a loss-of-coolant accident under these limiting conditions of operation will result in inadequate cooling of the reactor core.

Core spray distribution has been shown, in full-scale tests of systems similar in design to that of Pilgrim, to exceed the minimum requirements by at least 25%. In addition, cooling effectiveness has been demonstrated at less than half the rated flow in simulated fuel assemblies with heater rods to duplicate the decay heat characteristics of irradiated fuel. The accident analysis takes credit for core spray flow into the core at vessel pressure below 205 psig. However, the analysis is conservative in that no credit is taken for spray cooling heat transfer in the hottest fuel bundle until the pressure at rated flow for the core spray (104 psig vessel pressure) is reached.

The LPCI subsystem is designed to provide emergency cooling to the core by flooding in the event of a loss-of-coolant accident. This system functions in combination with the core spray system to prevent excessive fuel clad temperature. The LPCI subsystem and the core spray subsystem provide adequate cooling for break areas of approximately 0.2 square feet up to and including the double-ended recirculation line break without assistance from the high pressure emergency core cooling subsystems.

The allowable repair times are established so that the average risk rate for repair would be no greater than the basic risk rate. The method and concept are described in reference (1). Using the results developed in



UNITED STATES  
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 131 TO FACILITY OPERATING LICENSE NO. DPR-35

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

INTRODUCTION

By letter, dated December 11, 1989, the Boston Edison Company (the licensee) for Pilgrim submitted a proposed change to Technical Specification (TS) Section 3/4.5.A.1.d, Core Spray Pump Flow Rate Testing. Pilgrim's current core spray pump surveillance test acceptance criteria is a flow rate of at least 3600 gpm with a pump discharge pressure greater than 260 psig. This criterion is, and has always been, very close to the limit of pump capability. As the core spray pumps continue to age normally, small variations in pump performance, within the tight tolerance, may result in a core spray pump failing to deliver a flow rate of 3600 gpm, resulting in Pilgrim entering a Limiting Condition of Operation (LCO). To reduce the potential for unnecessarily entering an LCO, the licensee has proposed a reduction of 300 gpm in the flow limit based on a revised, less conservative LOCA analysis.

EVALUATION

The licensee has proposed a TS change to reduce the core spray pump flow rate from its present allowable value of 3600 gpm to 3300 gpm, less than ten percent reduction. To justify this change, the licensee used a LOCA analysis performed by GE ("Justification of Interim Operation of Pilgrim Nuclear Power Station with Reduced Core Spray Flow Rate," EAS-65-0989, September 1989) in its submittal.

The LOCA analysis performed by GE using SAFE/REFLOOD models per Appendix K to 10 CFR Part 50, demonstrates that, for a ten percent decrease in core spray flow (3240 gpm) the fuel peak centerline temperature (PCT) will increase by 45° F. The calculated PCT for the limiting case (recirculation suction line break with an assumed failure of the LPCI injection valve) assuming a 10 percent reduction in core spray system rated flow (3240 gpm) is 2185°F which is below the 2200°F limit. The local cladding oxidation is 2.7 percent (well below the 17 percent limit) and the core wide cladding oxidation is less than 0.2 percent (well below the 1 percent limit). The LOCA was reanalyzed utilizing the staff approved GE evaluation models SAFE/REFLOOD CHASTE. Pilgrim would continue to meet the requirements of Appendix K to 10 CFR Part 50.46. Therefore, the proposed reduced core spray flow of 3300 gpm is acceptable based on LOCA considerations. The proposed change requests a minimum flow of 3300 gpm instead of 3240 gpm to reflect the impact of degraded voltage on pump performance. This gives additional margin in the pump test acceptance criteria and hence is acceptable.

### ENVIRONMENTAL CONSIDERATION

This amendment involves a change in a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and/or changes to the surveillance requirements. The 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 published a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this 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 this amendment.

### CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (55 FR 2432) on January 24, 1990 and consulted with the Commonwealth of Massachusetts. No public comments were received and the Commonwealth of Massachusetts did not have any comments.

The proposed TS changes in Sections 4.5.A.1.d and 3.5.A are acceptable as given in the SER.

The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and (3) issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: G. Thomas

Dated: October 22, 1990