

March 28, 2003

Mr. Mike Bellamy
Site Vice President
Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
600 Rocky Hill Road
Plymouth, MA 02360

SUBJECT: PILGRIM NUCLEAR POWER STATION - ISSUANCE OF AMENDMENT
RE: CHANGE TO APPLICABILITY OF PRESSURE-TEMPERATURE CURVES
(TAC NO. MB5121)

Dear Mr. Bellamy:

The Commission has issued the enclosed Amendment No. 197 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station. This amendment is in response to your application dated December 4, 2002, which replaced your original application dated May 1, 2002.

This amendment revises the current pressure-temperature curves presented in Pilgrim Technical Specification Figures 3.6.1, 3.6.2, and 3.6.3, to extend the applicability of the curves for two additional operating cycles through Operating Cycle 16. The amendment also removes the 20 and 32 Effective Full Power Year curves from the figures.

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,

/RA/

Travis L. Tate, Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosures: 1. Amendment No. 197 to
License No. DPR-35
2. Safety Evaluation

cc w/encls: See next page

Pilgrim Nuclear Power Station

cc:

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U. S. Nuclear Regulatory Commission
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Plymouth, MA 02360

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Chairman, Duxbury Board of Selectmen
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Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108

Office of the Attorney General
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Commonwealth of Massachusetts
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Regional Administrator, Region I
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Executive Office of Public Safety
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Massachusetts Emergency Management
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Chairman
Nuclear Matters Committee
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Plymouth, MA 02360

Pilgrim Nuclear Power Station

cc:

Mr. William D. Meinert
Nuclear Engineer
Massachusetts Municipal Wholesale
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Travis L. Tate, Project Manager, Section 2
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cc w/encls: See next page

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ENERGY NUCLEAR GENERATION COMPANY

ENERGY NUCLEAR OPERATIONS, INC.

DOCKET NO. 50-293

PILGRIM NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 197
License No. DPR-35

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
 - A. The application for amendment filed by Entergy Nuclear Operations, Inc. (the licensee) dated December 4, 2002, which replaces the original application dated May 1, 2002, 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.

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:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 197, 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 the date of issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: March 28, 2003

ATTACHMENT TO LICENSE AMENDMENT NO. 197

FACILITY OPERATING LICENSE NO. DPR-35

DOCKET NO. 50-293

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

3/4 6-14

3/4 6-15

3/4 6-16

Insert

3/4 6-14

3/4 6-15

3/4 6-16

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 197 TO FACILITY OPERATING LICENSE NO. DPR-35
ENERGY NUCLEAR GENERATION COMPANY
ENERGY NUCLEAR OPERATIONS, INC.
PILGRIM NUCLEAR POWER STATION
DOCKET NO. 50-293

1.0 INTRODUCTION

By application dated May 1, 2002, Entergy Nuclear Operations, Inc. (ENO or the licensee) requested changes to the Technical Specifications (TSs) for the Pilgrim Nuclear Power Station (PNPS or Pilgrim) to extend the applicability of the plant's reactor pressure vessel (RPV) pressure-temperature (P-T) curves from the end of Operating Cycle (OC) 14 through the end of OC 15. Following discussions with the U.S. Nuclear Regulatory Commission (NRC) staff in teleconferences on August 27, 2002, and October 21, 2002, regarding the validity of the fluence value calculation methodology, ENO replaced its original submittal by application dated December 4, 2002. The proposed changes would extend applicability of the current Pilgrim RPV P-T curves through the end of OC 16. Specifically, the proposed changes would revise Pilgrim TS Figures 3.6.1, 3.6.2, and 3.6.3, to use RPV P-T curves estimated with 48-Effective Full Power Year (EFPY) fluence. In addition, the 20 and 32 EFPY curves would be deleted and the wording in the figure title blocks would be changed to allow use of the P-T curve through the end of OC 16.

2.0 REGULATORY EVALUATION

The NRC has established requirements in Title 10 of the *Code of Federal Regulations* Part 50 (10 CFR Part 50) to protect the integrity of the reactor coolant pressure boundary in nuclear power plants. The staff evaluates the P-T limit curves based on the following NRC regulations and guidance: 10 CFR Part 50, Appendix G; Generic Letter (GL) 88-11; GL 92-01, Revision 1; GL 92-01, Revision 1, Supplement 1; Regulatory Guide (RG) 1.99, Revision 2; and Standard Review Plan (SRP) Section 5.3.2. Appendix G to 10 CFR Part 50 requires that P-T limit curves for the RPV be at least as conservative as those obtained by applying the methodology of Appendix G to Section XI of the American Society of Mechanical Engineers Code (ASME Code).

The NRC approved Pilgrim's current P-T limits for use through OC 14 (~19 EFPYs) in license amendment (LA) 190, dated April 13, 2001 (ML011060046). In its Safety Evaluation (SE) supporting LA 190, the staff evaluated Pilgrim's pressure vessel fluence and P-T limit calculations. The staff noted in the SE that although the staff believed Pilgrim's plant-specific calculations for the original fluence value are outdated, there was reasonable assurance of safety based on conservatism in the fluence value used to calculate the P-T curves with

regard to the maximum fluence value to be achieved during the proposed applicability period. Also, the staff concluded that the P-T limits for the reactor coolant system for hydrotesting, heatup, cooldown, and criticality satisfied the requirements in Appendix G to Section XI of the ASME Code, as modified by ASME Code Case N-588 and N-640, and Appendix G of 10 CFR Part 50 for 20, 32, and 48 EFPY's. Additionally, the staff concluded that the P-T limits satisfy GL 88-11 since the licensee used the methodology in RG 1.99, Rev. 2, to calculate adjusted reference temperature (ART).

The scope of this SE focuses on the acceptability of the proposed extension of the P-T curves applicability period in view of the 48 EFPYs fluence estimate. The regulatory requirements for fluence calculations are defined in General Design Criteria (GDCs) 30 and 31, as established in Appendix A to 10 CFR Part 50. In March 2001, the staff augmented those GDCs by issuing RG 1.190. Since that time, the NRC staff has approved vessel fluence calculation methodologies that satisfy the requirements of GDCs 30 and 31 and adhere to the guidance in RG 1.190. Specifically, fluence calculations are acceptable if they are done with approved methodologies or other methods that are shown to adhere to the guidance of RG 1.190.

3.0 TECHNICAL EVALUATION

The staff evaluated Pilgrim's P-T limits for 20, 32, and 48 EFPY in LA 190. However, due to concerns regarding the validity of the fluence calculation methodology, the staff based its approval of the P-T curves on a number of conservatisms in the fluence value and the limit on use of the P-T curves through OC 14. Specifically, the conservatism in the licensee's calculations were: (1) a factor of 1.7 (i.e., a fluence estimate for 32 EFPYs with applicability through 19 EFPYs); and (2) a 25-percent fluence overestimation in the Pilgrim fluence evaluation report, MDE Report No. 277-1285, "Pilgrim Nuclear Power Station Reactor Pressure Vessel Fast Neutron Flux as a Function of Fuel Cycle," Revision 1, dated November 27, 1985. This SE is limited to the vessel fluence calculations for application to Pilgrim's current RPV P-T curves.

The licensee proposes to employ a 48-EFPY fluence value to calculate the P-T curves for use through the end of OC 16 (~23 EFPYs). This amounts to a conservatism factor of approximately 2.1. Additionally, the 25-percent fluence overestimation discussed above will still apply providing additional conservatism in the fluence calculation. The licensee stated that the original fluence measurement was accomplished by removing the first surveillance capsule at the end of OC 4. However, the refueling methods following OC 4 located used assemblies in the periphery of the core, resulting in a lower rate of irradiation to the vessel. Thus, the reading from the first capsule and the extrapolation to subsequent cycles effectively overestimated the actual vessel fluence. Finally, the licensee stated that none of the surveillance capsules were placed in either the "shadow" of the jet pumps or the pump risers. Therefore, the capsules received full exposure from the core. This increases the staff's confidence that the results of the measured values are realistic.

The staff has reviewed the licensee's regulatory and technical analyses in support of its proposed license amendment which are described in Sections 4 and 5 of Attachment 1 of the licensee's submittal. The staff evaluated the proposed use of the 48-EFPY fluence for calculating P-T curves for use at Pilgrim through OC 16 (equivalent to ~23 EFPYs). Although the vessel flux calculations do not adhere to the guidance in RG 1.190, the staff finds that the proposed calculations have large conservatism built into the fluence estimate. On the basis of

this evaluation, the staff finds that the proposed Pilgrim P-T curves estimated with the 48 EFPY fluence provide sufficient conservatism to permit operation up to 23-EFPYs which corresponds to the end of OC 16. The staff bases this conclusion on quantified and unquantifiable conservatism in the estimation of the vessel fluence. The staff further finds that operation with the proposed P-T curves provides reasonable assurance of safety. This finding is based, in part, in the staff's judgment that the 48 EFPY fluence used to calculate the P-T curves provide sufficient assurance of safety for the requested period of operation (through OC 16). In order for Pilgrim to operate beyond OC 16, a vessel fluence calculation that complies with the guidance of RG 1.190 should be performed.

4.0 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.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment 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 (68 FR 7816). 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.

6.0 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: L. Lois

Date: March 28, 2003