August 20, 2002

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 TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENT FOR THE STANDBY GAS TREATMENT SYSTEM (TAC NO. MB2775)

Dear Mr. Bellamy:

The Commission has issued the enclosed Amendment No. 194 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station (Pilgrim). This amendment is in response to Entergy Nuclear Generation Company's (ENGC) application dated August 22, 2001, as supplemented March 5, 2002. On May 5, 2002, the operating authority for Pilgrim was transferred from ENGC to Entergy Nuclear Operations, Inc. (ENO). By letter dated May 8, 2002, as supplemented May 24, 2002, ENO requested that the U.S. Nuclear Regulatory Commission (NRC) continue to review and act on any pending actions and correspondence which had been submitted by ENGC before the transfer. Accordingly, the NRC staff has acted upon the request.

This amendment revises the Technical Specification (TS) Surveillance Requirement 3/4.7.B.1.a.2 for the Standby Gas Treatment (SBGT) System and associated TS Bases 3/4.7.B.1, by increasing the SBGT inlet heaters minimum output testing requirement from 14 kilowatts (kW) to 20 kW.

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. 194 to License No. DPR-35
2. Safety Evaluation

cc w/encls: See next page

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cc w/encls: See next page
DISTRIBUTION:

J. Zimmerman	C. Anderson, RI	PUBLIC	T. Clark
PDI-2 R/F	T. Tate	OGC	G. Hill (2), T-5C3
ACRS	R. Dennig	S. Richards	C. Holden
E. Weiss	D. Nguyen	J. Raval	

**See previous concurrence
Accession Number: ML021980372 *Safety evaluation dated 3/29/02, no major changes made

OFFICE	PDI-2/PM	PDI-2/LA	EEIB/SC*	SPLB/SC**	RTSB/SC**	OGC**	PDI-2/SC(A)
NAME	TTate	TClark	CHolden	EWeiss	RDennig	JHeck	JZimmerman
DATE	8/19/02	8/19/02	3/29/052	7/29/02	7/26/02	8/5/02	8/19/02

OFFICIAL RECORD COPY

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

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

Chairman, Duxbury Board of Selectmen
Town Hall
878 Tremont Street
Duxbury, MA 02332

Office of the Commissioner
Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108

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

Dr. Robert M. Hallisey, Director
Radiation Control Program
Commonwealth of Massachusetts
Executive Offices of Health and
Human Services
174 Portland Street
Boston, MA 02114

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

John M. Fulton
Assistant General Counsel
Pilgrim Nuclear Power Station
600 Rocky Hill Road
Plymouth, MA 02360-5599

Mr. C. Stephen Brennion
Licensing Superintendent
Pilgrim Nuclear Power Station
600 Rocky Hill Road
Plymouth, MA 02360-5599

Mr. Jack Alexander
Manager, Reg. Relations and
Quality Assurance
Pilgrim Nuclear Power Station
600 Rocky Hill Road
Plymouth, MA 02360-5599

Mr. David F. Tarantino
Nuclear Information Manager
Pilgrim Nuclear Power Station
600 Rocky Hill Road
Plymouth, MA 02360-5599

Ms. Jane Perlov
Secretary of Public Safety
Executive Office of Public Safety
One Ashburton Place
Boston, MA 02108

Mr. Stephen J. McGrail, Director
Attn: James Muckerheide
Massachusetts Emergency Management
Agency
400 Worcester Road
Framingham, MA 01702-5399

Chairman
Nuclear Matters Committee
Town Hall
11 Lincoln Street
Plymouth, MA 02360

Mr. William D. Meinert
Nuclear Engineer
Massachusetts Municipal Wholesale
Electric Company
P.O. Box 426
Ludlow, MA 01056-0426

ENTERGY NUCLEAR GENERATION COMPANY

ENTERGY NUCLEAR OPERATIONS, INC.

DOCKET NO. 50-293

PILGRIM NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 194
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 Entergy Nuclear Generation Company (the licensee) dated August 22, 2001, as supplemented March 5, 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. 194, 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 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Jacob I. Zimmerman, Acting 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: August 20, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 194

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	Insert
3/4.7-11	3/4.7-11
B3/4.7.9	B3/4.7.9

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 194 TO FACILITY OPERATING LICENSE NO. DPR-35

ENTERGY NUCLEAR GENERATION COMPANY

ENTERGY NUCLEAR OPERATIONS, INC.

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

1.0 INTRODUCTION

By application dated August 22, 2001, as supplemented on March 5, 2002, Entergy Nuclear Generation Company (ENGC) requested changes to the Technical Specifications (TSs) for the Pilgrim Nuclear Power Station (Pilgrim or the licensee). The supplement dated March 5, 2002, provided additional information that clarified the application, and did not expand the scope of the application or change the staff's proposed no significant hazards consideration determination as published in the *Federal Register* on November 14, 2001 (66 FR 57121). On May 5, 2002, the operating authority for Pilgrim was transferred from ENGC to Entergy Nuclear Operations, Inc. (ENO). By letter dated May 8, 2002, as supplemented May 24, 2002, ENO requested that the U.S. Nuclear Regulatory Commission (NRC) continue to review and act on any pending actions and correspondence which had been submitted by ENGC before the transfer. Accordingly, the NRC staff has acted upon the request.

The proposed changes would revise the TS surveillance requirement (SR) and the associated Bases for the Standby Gas Treatment (SBGT) System based upon revised design basis calculations performed for the SBGT inlet heaters and the replacement of the existing heaters with heaters of higher output capability. Specifically the proposed change would revise: (1) SR 3/4.7.B.1.a.2, and (2) Bases 3/4.7.B.1, to reflect an increase in the SBGT inlet heater's minimum output capability required to be demonstrated once per operating cycle for each train from at least 14 kilowatts (kW) to 20 kW.

2.0 REGULATORY EVALUATION

As discussed in Section 7.18 of the Pilgrim Updated Final Safety Analysis Report (UFSAR), the purpose of the SBGT system is to mitigate the release of radioactive materials to the environment such that the offsite doses resulting from a postulated loss-of-coolant-accident (LOCA) or postulated fuel handling accident in the reactor building are below the limits in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 100. The SBGT system is designed to filter reactor building exhaust air and discharge through a ventilation exhaust stack. During accident conditions, charcoal filters used in the SBGT system must remove 99% of the

radioactive methyl iodide from the air to ensure the 10 CFR Part100 limits are not exceeded. A limiting maximum value of 70% relative humidity (RH) for the inlet airstream ensures that the charcoal filters will remove 99% of the radioactive methyl iodide. The rate of elemental iodine removal is relatively insensitive to humidity. The SBGT system uses a bank of electric heaters designed to raise the temperature of the inlet airstream sufficiently to decrease the humidity of the airstream to 70% RH at assumed inlet air conditions of 120 °F and 100% RH.

During a review of the adequacy of the SBGT system, the licensee discovered that the inlet heaters could not assure the desired 70% RH under all conditions. The licensee determined that the electric heaters have a total capacity of 21.9 kW at 480 Vac, but degraded ac voltage conditions can significantly decrease the heaters' effective capacity. The licensee reviewed this condition in accordance with the guidance of Generic Letter 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability," and determined the SBGT system to be operable but in need of modification.

To ensure the RH of the SBGT airstream will be no greater than 70% under the assumed inlet airstream conditions of 120 °F and 100% RH and other conservative assumptions, the minimum capacity of the heaters must be increased to 20 kW under all conditions. The licensee implemented a plant design change (PDC 00-26) and installed heaters to increase the capacity to a total rated capacity of 30.2 kW with a degraded voltage capacity of approximately 23.4 kW. The heaters were installed in accordance with the provisions of 10 CFR 50.59. The higher heater output may impact the environmental qualification (EQ) of other electrical equipment. In accordance with the requirements of 10 CFR 50.49, electrical equipment important to safety must be environmentally qualified for its intended safety function. The licensee's 10 CFR 50.59 evaluation considered the impact of updated temperature conditions to ensure that the increased heater capacity does not adversely impact other equipment.

3.0 TECHNICAL EVALUATION

The NRC staff reviewed the licensee's application dated August 22, 2001, as supplemented on dated March 5, 2002.

The proposed change involves requesting approval of a more restrictive TS SR and does not involve changes in the frequency, method, or scope of testing of the operability and capacity of the inlet heaters. The inlet heaters will be tested to higher acceptance criteria. The licensee evaluated the effects of the higher capacity heaters (e.g., increased electrical load and heat load on components and charcoal) and found no adverse impacts on other equipment. The licensee also determined the increased electrical load of the higher capacity heaters will not adversely impact other equipment during a design-basis accident. The licensee increased the heaters' capacity to meet the 70% RH design requirement for the charcoal beds in the SBGT system in accordance with the provisions of 10 CFR 50.59. The impact of the increased heater capacity and component replacements on supply breakers, cable sizing, 480 Vac motor control center (MCC) loading, and emergency diesel generators (EDGs) loading was considered in the 10 CFR 50.59 evaluation.

In addition to the heaters, the licensee also replaced electrical support components to accommodate the higher capacity of the heaters and/or to obtain appropriate EQ documentation for the higher temperature conditions. The existing 30-ampere, three-pole

circuit breakers were replaced with 50-ampere breakers for each SBGT system unit. The four contactors for the four banks of heaters and the 480/120 Vac control transformer for each SBGT system unit were also replaced. In addition, some of the wiring in contactor panels was replaced and new cables were installed from these panels to the banks of heaters. The licensee evaluated the total effects of the modification and concluded that the modification did not adversely impact other equipment. Condolences

3.1 Analysis of Minimum Heater Capacity

The staff performed an independent calculation that verified the licensee's determination of at least 20 kW heater capacity is acceptable to maintain the SBGT system flow (downstream of the heaters) at 70% RH based on the bounding accident condition assumptions at the inlet of the heaters while taking into account the possibility of a degraded voltage supply. Therefore, the staff finds that the licensee's proposed inlet heater output surveillance requirement of at least 20 kW is acceptable because the heater output values are consistent with the system design, and are more conservative than the current values of the heater ratings.

3.2 System EQ Evaluation

3.2.1 Temperature Conditions

The assumed maximum SBGT system unit surface and room temperatures include the maximum electric heater output and a conservatively derived estimate of the effect from radioactive decay heat loading on the charcoal. The SBGT system unit surface and room temperatures are highest when only one SBGT system train is operating, after the other train has absorbed the maximum post-LOCA halogen loading and then becomes inactive (the fan is shut down).

Maximum temperature conditions can occur if the SBGT system A train is operated for the first 200 hours (8.3 days) after a LOCA to adsorb the maximum halogen loading and then the system is swapped over to the B train. In this configuration, the A train charcoal is cooled only by the 500 cubic-feet-per-minute (CFM) flow of air from the active B train. The total heat radiated to the SBGT system room is maximized because the surface temperature of the SBGT system in the inactive "A" train is maximized due to the charcoal decay heat load and the low bypass-airflow rate.

The highest temperatures on the surface of SBGT system units and in the SBGT system room occur when the total SBGT system airflow rate is minimized at 3,600 CFM, the electric heater output is maximized at 30.2 kW total, and 13.4 kW of energy is generated by the radioactive decay of halogen on the charcoal in the inactive train. At these conditions, the airstream temperatures of the SBGT system units are highest for each of the calculated locations downstream of the electric heaters and downstream of the inactive charcoal beds (bypass air only) and for the total mixed exhaust airstream. At the peak charcoal decay heat loading 200 hours after the LOCA, the airstream temperature of the SBGT system unit downstream of the electric heaters entering the charcoal beds is 148 °F; downstream of the inactive charcoal bed is 199 °F (bypass air only); the mixed exhaust is 155 °F (air flow of active train plus bypass airflow); and the SBGT system room temperature is 140 °F.

3.2.1.a Electrical Equipment

The SBGT system room was previously defined as a mild-temperature environment (not exceeding 130 °F). Accordingly, new electrical support components were installed and the EQ profile was updated to 140 °F to meet the design-basis requirement to evaluate all components affected by the new conditions. The existing control transformers and contactors for the inlet heaters were replaced with transformers and contactors having appropriate EQ profiles. EQ data was also updated for the new wiring installed and EQ evaluations for existing components requiring EQ design record files were updated to reflect the new temperature conditions. The NRC staff verified that the licensee's action to upgrade equipment and verify the EQ profile meets the requirements of 10 CFR 50.49.

3.2.1.b Charcoal Beds

The maximum airstream temperature from the SBGT system units entering the charcoal beds downstream of the electric heaters operating at 30.2 kW capacity is 148 °F with a total flow of 3,600 CFM (4,000 CFM -10%). The over-temperature cutoff switch has a setpoint of 200 °F. The highest temperature exiting the inactive charcoal bed is bounded by a maximum potential value of 244 °F so that the airstream through the high energy particulate filters remain below the design-basis value of 260 °F.

Using a conservative heat transfer calculation for the decay heat load on the charcoal, it was determined that the charcoal temperature is bounded by a maximum potential value of 253 °F. Therefore, the charcoal will be below the design-basis value of 330 °F under all conditions and iodine desorption is prevented.

3.2.2 Outlet Damper Operations

Special consideration was given to the qualification status of the motor-operated standby gas fan outlet dampers. For the emergency mode of operation, the outlet dampers are in the full-open position and remain in that position; that is, the damper is a static component and the motor-operator has no required active function in the emergency mode. Therefore, the EQ design record file for this component does not require an evaluation of the active operation of the motor-operator during the worst-case design-basis-accident temperatures. The staff reviewed the outlet dampers and concluded that the licensee's treatment of these dampers is consistent with 10 CFR 50.49.

3.3 Electrical Load Analysis

The licensee evaluated the increased EDG loads due to the increased heater capacity and determined that the increased load was within the EDG ratings. The increased EDG loads were included in the EDG loading profile. In addition, the licensee updated: (1) certain electrical calculations for ampacity and degraded voltage to include the higher kW heaters; (2) the undercurrent relay trip setpoint for detecting SBGT system inlet heater failures; and (3) the SBGT system airflow, temperature, humidity, charcoal temperature, and SBGT system room temperature in the design-basis analysis. The updated design-basis calculation uses a maximum SBGT system flow rate of 4,400 CFM (4,000 CFM +10%), which is the highest potential flow rate for the SBGT system in actual operation. The continuous rating of the EDG is 2,600 kW. The 2,000-hour rating is 2,750 kW and the 2-hour rating is 2,860 kW.

Tables 8.5-1 and 8.5-2 of the UFSAR list the total kW of continuous and short-term emergency loads for a Loss of Offsite Power (LOOP) or LOOP/LOCA events. The staff verified that the increased load was within these EDG ratings and the EDGs are periodically tested at these ratings.

The licensee also evaluated the impact of increased heater capacity on the 480 Vac MCCs and replaced the 480/120 Vac control transformer for each SBGT system unit to accommodate the additional electrical loading.

3.4 Conclusion

Based upon the preceding discussion, the NRC staff concludes that the licensee has evaluated the effects of the larger heaters (e.g., increased electrical load and heat load on components and charcoal) and has provided sufficient data to support the conclusion that the increased electrical load of the larger heaters will not adversely impact other equipment during a design-basis accident. The staff concludes that this change is acceptable since the affected electrical equipment remains qualified per 10 CFR Part 50.49, the additional load is within the EDG rating, and this change will ensure 10 CFR Part 100 limits will be met for all conditions.

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 and changes surveillance requirements. 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 (66 FR 57121). 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 Contributors: D. Nguyen
J. Raval

Date: August 20, 2002