Entergy

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Charles M. Dugger
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September 27, 2002

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
Docket 50-293
License No. DPR-35

Response to NRC Request for Additional Information
Appendix K Measurement Uncertainty Recovery – Power Uprate Request

REFERENCE:
1. NRC Letter, "Request for Additional Information," dated August 30, 2002 (TAC NO. MB5603)
2. Entergy Letter 2.02.048, dated July 5, 2002, Appendix K Measurement Uncertainty Recovery – Power Uprate Request

LETTER NUMBER: 2.02.087

Dear Sir or Madam:

Entergy has reviewed the subject NRC request for additional information (RAI) dated August 30, 2002 and the requested information is attached. This response supports approval of the license amendment request for the Appendix K Measurement Uncertainty Recovery – Power Uprate Request.

Should you have any question or comments concerning this submittal, please contact Bryan Ford at (508) 830-8403.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 27th day of September 2002.

Sincerely,

Charles M. Dugger

JRH/dd

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Attachments:
1. Response to Request For Additional Information (2 – pages)
2. Revised FSAR Table 1.8-1 "Summary of Maximum Offsite Effects of Design Basis Accidents" (1 – page)
3. Revised FSAR Table 14.5-2 "Radiological Doses for Loss of Coolant And Steam Line Break Accidents Based on TID-14844 Assumptions (1 – page)
4. Figure 17-8 "Pilgrim Station Main Generator Capability Curves" (1 – page)

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ATTACHMENT 1

Response to NRC Request For Additional Information

Appendix K Measurement Uncertainty Recovery – Power Uprate Request

1. NRC Request: Section 9.2 of Attachment 2 to the licensing amendment application dated July 5, 2002, addresses Design Basis Accidents (DBA). The submittal states that radiological consequences due to postulated DBAs have been calculated using a source term of 102% of the current licensed reactor thermal power. However, the staff finds that the analyses addressed in the Updated Final Safety Analysis Report (UFSAR) appears to indicate that the radiological consequences may have been determined at the current rated thermal power. Please provide discussion on the analyses/evaluation addressed in Section 9.2, identifying changes, if any, to the assumptions, methodologies, and accidents analyzed from those documented in the UFSAR. Please provide the results and acceptance criteria of the analyses referenced in Section 9.2.

Response:

The radiological consequences for the control rod drop accident (CRDA) and the fuel handling accident (FHA) were previously evaluated at 102% of the current licensed thermal power (CLTP) 1998 MWt. The results are contained in the current PNPS FSAR.

In support of the PNPS thermal power uprate program, calculations for the loss-of-coolant accident (LOCA) and the main steam line break (MSLB) accident were updated. These calculations were performed at 102% CLTP using current NRC guidance information. The calculations updated the evaluation models to be consistent with the current regulatory guidance and to include a power uncertainty factor of 2%. For radiological dose considerations, releases now consider main steam isolation valve leakage and emergency core cooling system leakage in addition to the drywell leakage. Also, the atmospheric relative concentration values were based on Regulatory Guide 1.145 models. The results of these calculations were below regulatory limits and are provided in Attachments 2 and 3, FSAR tables (Table 1.8-1 and Table 14.5-2). FSAR change requests associated with these tables have been approved and will be included in the next FSAR update.

2. NRC Request: Provide details about the grid stability analysis including assumptions and results and conclusions for the power uprate condition.

Response:

The grid stability analysis is in progress with > 50 grid system fault scenarios (contingencies) being evaluated at various system loading conditions. These scenarios consist of both normal and extreme contingencies involving different types of electrical faults of increasing severity. These contingencies are selected based on their system interaction with Pilgrim Station. Preliminary results indicate that four scenarios result in instability due to the Pilgrim Station power uprate. These four scenarios are all associated with the failure of a breaker at the West Walpole substation to open fast enough to clear an electrical fault. The preliminary recommended fix for this condition is replacement of a stuck breaker lockout relay at the West Walpole substation with a relay that operates more quickly. The final approved results of this analysis (from ISO-New England) are expected to be provided to Pilgrim Station by October 2002. Following Pilgrim Station review, the results will be submitted as stated in Reference 1.

3. NRC Request: Also, provide in detail (including the ratings) the effect of the power uprate on the following equipment:

Response:

a. Main generator

The main generator rating remains at 780 MVA. However, with the increased turbine capability, the main generator can be operated at a higher power factor at 780 MVA. This results in an increased MWe output from approximately 694MWe at a 0.89 power factor to an approximate maximum 733 MWe at 0.94 power factor. The main generator capability curves are provided in Attachment 4 to illustrate this.

b. Isophase bus

The isophase bus rating remains at 20kA for the main section and 850A for the branch section. The power uprate does not change the current in the main section as it remains at 18.764kA for 780MVA at a rated 24,000 volts. Per the main generator vendor manual, the generator may operate at $\pm$ 5% voltage. Therefore the maximum isophase bus current due to low voltage remains at 19.752kA for 780MVA @ 22,800 volts. The branch section current would increase from approximately 686A to 698A @ 24,000 volts (721A to 734A @22,800 volts) due to the slight increase in non-1E loads on the unit auxiliary transformer.

c. Main power transformer

The main power transformer rating remains at 880 MVA. The maximum load on the main power transformer does not change and remains at 780 MVA if operating at 100% power with the station electrical loads being supplied from the startup transformer. When using the unit auxiliary transformer, the uprate (including the secondary side improvements being implemented) results in an increase from 669MWe (752 MVA @ 0.89 pf.) to 707 MWe (751MVA @ 0.94 pf.).

d. Startup transformer

The rating of the startup transformer remains at a maximum 37.3 MVA with an increased load from 28.5 to 29 MVA at 100% power.

e. Unit auxiliary transformer

The rating of the unit auxiliary transformer remains at a maximum 37.3 MVA with an increased load from 28.5 to 29 MVA at 100% power.

f. Non-Class 1E loads increased

The increase in Non-Class 1E loads due to the Pilgrim Station power uprate is negligible but is conservatively estimated at less than 0.5MWe. (See startup and unit auxiliary transformer increases – d & e above). The Class 1E loads do not change.