Entergy

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Charles M. Dugger
Vice President - Operations

December 30, 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: NRC Letter "PILGRIM NUCLEAR POWER STATION – REQUEST FOR ADDITIONAL INFORMATION RE: APPENDIX K MEASUREMENT UNCERTAINTY RECOVERY – POWER UPRATE REQUEST (TAC NO. MB5603)," dated December 23, 2002

LETTER NUMBER: 2.02.112

Dear Sir or Madam:

The NRC and Entergy conducted a teleconference on December 12, 2002 to discuss certain NRC questions related to the Entergy Power Uprate Request and on December 24, 2002 Entergy received the reference letter. Attachment 1 of this letter provides the responses to the requested information. Attachment 2 provides the results of the PNPS grid stability study, meeting commitment C14 from the initial submittal letter 2.02.048, dated July 5, 2002.

Should you have any questions 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 30th day of December 2002.

Sincerely,

Charles M. Dugger

JRH/dd

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Attachment: 1. Response to NRC Request for Additional Information

Attachment: 2 Summary of Results of the PNPS Grid Stability Study

cc: Mr. Travis Tate, Project Manager
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ATTACHMENT 1

LETTER NUMBER 2.02.112

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

1. **NRC Request:**

Item 2 (a) on page 1-5 of the General Electric Company report, NEDC-33050P, Revision 1, "Safety Analysis Report for Pilgrim Nuclear Power Station [PNPS] Thermal Power Optimization," stated the following:

"PNPS does not have an existing Crossflow [ultrasonic flow meter] UFM installation. It does have a crossbeam UFM system..."

In the first line on page 3 of 9 of Letter 2.02.096 dated November 6, 2002, you stated the following:

"During the past 4 years Pilgrim found the AMAG UFM to be extremely reliable.."

The staff approved topical report, CENPD-397-P, dated May 2000, does not include the Crossbeam type UFM and the staff believes the Crossflow and Crossbeam UFMs are two different types of UFMs. If the AMAG UFM referenced in the second statement above is a crossbeam UFM, please provide justification of how the historical data and experience of this Crossbeam UFM could be applied to determine allowed outage time (AOT) for the proposed Crossflow UMF. Please include a discussion of similarities and differences between the design of the Crossflow and Crossbeam UFMs.

Response:

PNPS installed an AMAG CROSSBEAM Ultrasonic Flow Meter (UFM) on the feedwater system to improve the accuracy of the flow measurement about four years ago. The underlying technology of the existing CROSSBEAM installation and the new CROSSFLOW UFM is the same for both systems. However, the new CROSSFLOW installation will be in accordance with the Westinghouse Topical Report and the NRC SER, while the existing system is not.

Both CROSSBEAM and CROSSFLOW utilize the same cross-correlation technology as described in the Westinghouse Topical Report CENPD-397-P-A, Rev 01. That is, both rely on sophisticated technology to recognize a flow turbulence signature as it passes two separate transducer pairs, which are precisely spaced longitudinally along the pipe. Each transducer pair contains a transmitter and a receiver.

CROSSBEAM is technology, which offsets the transducer pairs radially to account for flow-induced swirl in the fluid. The offset is designed to correspond to the amount of swirl between the two sets of transducer pairs to facilitate recognition of the turbulence signature. Although this system has proved to be very accurate and reliable, this installation is not in accordance with the Topical Report.

CROSSBEAM will remain a backup system following installation of the new CROSSFLOW system. PNPS has monitored the drift of the installed CROSSBEAM Correction Factor over a one-year period and found it to be very stable. One standard deviation is approximately 0.086%. Both the CROSSBEAM system and the plant flow nozzles provide repeatable results and when compared, duplicate readings very well.

The fourteen-day period of operation without CROSSFLOW was chosen based on engineering judgment and the estimated time to complete component replacement, maintenance and testing on the system. Although actual historical data based on the availability of the CROSSBEAM demonstrates the window of operation without CROSSFLOW could be extended much longer than fourteen days, the period of fourteen days was considered reasonable and adequate.

2. **NRC Request:**

In your response to item 3.B on page 3 of 9 of Letter 2.02.096 dated November 6, 2002, you stated, "In the event the AOT is reached, PNPS will be required, by procedure, to reduce its power level to an alternate value that accounts for the uncertainty associated with instrumentation then being used to measure power." In the event that both AMAG UFMs are out of service, please provide the alternate power level to be allowed by procedure for the instrumentation available to be used for measuring power. If the reduced power level is greater that the current licensed power level of 1998 MWt, please provide a discussion of the technical basis for the proposed power level.

Response:

Should both CROSSFLOW systems remain out of service longer than the proposed 14 day allowed out-of-service time (AOT) or if both the CROSSFLOW and the CROSSBEAM systems are unavailable, reactor thermal power will be lowered to the original licensed thermal power of 1998 MWt within 24 hours. Procedures incorporating the AOT and the associated actions will be developed consistent with commitment C5 of Entergy Letter 2.02.048, dated July 5, 2002.

3. **NRC Request:**

Section 10.3.1 of NEDC-33050p, Revision 1, addresses environmental qualification (EQ) for electrical equipment. In this section you indicate that power uprate issues related to EQ for electrical equipment are under review. Please provide the results of this review or provide a commitment to complete the review and incorporate any changes, as necessary, in accordance with applicable regulatory requirements prior to implementing the power uprate.

Response:

A review of the environmental qualifications of equipment potentially impacted by TPO is under review and revisions are being made as identified. As stated in Entergy Letter 2.02.048, dated July 5, 2002, Commitment C2, "All changes necessary to support operation above the current licensed thermal power will be completed prior to exceeding 1998 MWT." This includes performing necessary updates of affected environmental qualification files.

ATTACHMENT 2

LETTER NUMBER 2.02.112

Response to NRC Request for Additional Information

Appendix K Measurement Uncertainty Recovery-Power Uprate Request

PNPS Grid Stability

PNPS completed a grid stability study in November 2002 that was approved by ISO New England on December 10, 2002. This action meets the requirement of commitment C14 contained in Entergy Letter 2.02.048, dated July 5, 2002.

The study provided the following information. The current operating point of the main generator is 699 MWe at 0.896 power factor (pf). At the 1.5% power uprate, the main generator will operate at 734 MWe at 0.941 pf. The generator capability curve contained in the study shows that operation at power uprated condition is possible at a power factor of 0.941. The main generator can operate within the range of 280 megavolt-ampere reactive (MVAR) lagging and 100 MVAR leading. The leading limit is a result of the generator excitation system's under-excited reactive ampere limit (URAL) set point. The study identified a "minor" stability issue requiring the replacement of a lockout relay for the West Walpole substation 345 kV circuit breaker 108. The relay replacement is scheduled prior to TPO implementation in 2003. The study identified no other stability issues for the 1.5% measurement uncertainty recapture uprate for the unit.