September 13, 2004

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

FROM: Lee A. Licata, Project Manager, Section 2 ***/RA/***
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: PILGRIM NUCLEAR POWER STATION - DRAFT REQUEST FOR ADDITIONAL INFORMATION REGARDING A LIMITED SCOPE APPLICATION OF THE ALTERNATE SOURCE TERM FOR THE RE-EVALUATION OF THE FUEL HANDLING ACCIDENT DOSE CONSEQUENCES (TAC NO. MC2705)

By letter dated April 14, 2004, Entergy Nuclear Operations, Inc. (Entergy or the licensee) submitted a license amendment request to amend Pilgrim Nuclear Power Station's (Pilgrim's) Technical Specifications to change the requirements associated with handling irradiated fuel and performing core alterations.

The attached draft request for information (RAI) was transmitted on September 13, 2004, to Mr. Edward Sanchez of Entergy. This draft RAI was transmitted to facilitate the technical review being conducted by the Office of Nuclear Reactor Regulation and to support a conference call with the licensee to discuss the RAI.

Review of this RAI would allow the licensee to determine and agree upon a schedule to respond to it. This memorandum and the attachment do not convey or represent a Nuclear Regulatory Commission staff position regarding the licensee's request.

Docket No. 50-293

Attachment: Draft RAI

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DRAFT REQUEST FOR ADDITIONAL INFORMATION

CHANGE TO THE REQUIREMENTS ASSOCIATED WITH HANDLING

IRRADIATED FUEL AND PERFORMING CORE ALTERATIONS

PILGRIM STATION

DOCKET NO. 50-293

By letter dated April 14, 2004, Entergy Nuclear Operations, Inc. (Entergy or the licensee) submitted a license amendment request to amend Pilgrim Nuclear Power Station's (Pilgrim's) Technical Specifications to change the requirements associated with handling irradiated fuel and performing core alterations.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed your letter dated April 14, 2004, and requests the following additional information to clarify the license amendment request:

1. The April 14, 2004 submittal includes various radiological consequences analyses for the fuel handling accident (FHA) assuming that the damaged fuel has decayed 24 hours and assuming credit for filtration by the standby gas treatment system (SGTS) and/or the control room high efficiency air filtration system (CRHEAFS).

    a. For the analyses that credit CRHEAFS operation, give the basis for the control room envelope unfiltered inleakage assumption of 500 cfm. Has testing been performed to verify this assumption?

    b. For the analyses that credit SGTS operation, what is the design SGTS flow rate that would be expected for the design basis FHA? This is not the modeling assumption that allows for the release to the environment in 2 hours, but the actual flow rate.`

2. The April 14, 2004 submittal includes various FHA analyses to show that after the fuel has decayed 48 hours, no filtration credit for the SGTS or CRHEAFS is necessary to meet the regulatory dose acceptance criteria. Is movement of the fuel expected to occur prior to 48 hours after the reactor has shut down? Are there any technical specifications or administrative controls at Pilgrim that apply to when fuel movement is allowed post shutdown?

3. On page 26 of Attachment 1 of the April 14, 2004 submittal, Pilgrim commits to implement the provisions of Section 11.3.6.5 of NUMARC 93-01, "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," to address capabilities to promptly close secondary containment, as is consistent with TSTF-51. NUMARC 93-01 states in part that "these prompt methods need not completely block the penetrations nor be capable of resisting pressure, but are to enable the ventilation systems to draw from the postulated FHA such that it can be treated and monitored."

    a. Please describe the prompt methods including time required to close and the degree of closure that will be achieved.

Attachment

b. How much of an open area to the environment would be permitted?

c. Also describe the ventilation systems that would be used to draw the release from the postulated FHA. Specifically, are the ventilation systems engineered safety feature systems, do they have carbon adsorber filters and high-efficiency particulate air filters, are they tested in accordance with Regulatory Guide (RG) 1.52 or other standards, and do they have sufficient drawing capacity to assure that air flow is from environment to the containment?

Would there be a test to determine that all air flow was into the containment in the event that the Pilgrim procedure allows partial closure?

d. Other licensees have provided information on how they intend to meet the recommendations and made specific notation of the requirement in the Technical Specifications to close the containment in the event of an FHA. Does Pilgrim have the capability to make a similar commitment?

4. Confirm that, overall, the meteorological data used in the assessment are of high quality, suitable for use in the assessment of atmospheric dispersion to which it was applied, and provide an electronic copy of the hourly meteorological measurements on the docket. Does the collection program meet RG 1.23, "Onsite Meteorological Programs," guidelines? During the period of data collection, was the tower base area on a natural surface (e.g., short natural vegetation) and was the tower free from obstructions (e.g., trees, structures, terrain) and micro-scale influences to ensure that the data were representative of the overall site area? In the case of possible obstructions, were trees, structures, etc., at least 10 times their height away from the meteorological tower? Were instruments and systems maintained within specifications? What types of quality assurance audits were performed on the meteorological measurement systems to ensure that data were of high quality and to identify any problems and questionable data and correct problems in a timely manner? What additional checks and at what frequency were the checks performed on data following collection, prior to archival, and following formatting for input into the analysis of atmospheric dispersion (e.g., using ARCON96)? If deviations occurred, describe such deviations and why the data are still deemed to be adequate. Were the data compared with other site historical or regional data? If so, what were the findings?

5. Staff review indicates some apparent anomalies in the 1996 through 2000 meteorological data as submitted. The following are provided as examples. Therefore, please check the data and confirm that the data as provided are of high quality or amend the file(s) as appropriate. If an amendment is needed, provide a copy of the revised file(s), the basis for acceptability of any residual departures from typical conditions and RG 1.23, "Onsite Meteorological Programs," and the revised χ/Q values, if appropriate.

a. Why were there several periods of relatively long data outage (e.g., more than a week)? Have changes been implemented to address conditions causing such outages?

b. With regard to general data formatting, how are invalid atmospheric stability data identified? Is the wind data for Pilgrim A 1999 transposed with upper level values in the lower level columns and vise versa?

c. Staff acknowledges Pilgrim A data were measured at the 67.1 and 10.1 meter levels on one tower and Pilgrim B data were measured at the 48.8 and 10.1 meter levels on a second tower. In the following questions, the tower used to measure Pilgrim A data will be called Tower A and the tower used to measure Pilgrim B data will be called Tower B. Where are the two towers located? Does the difference in location result in differences in the measurements (e.g., due to terrain) and, if so, under what conditions are the differences likely to occur? What is the resultant impact on the χ/Q values?

d. With regard to atmospheric stability, there appears to be a higher reported occurrence of stability class A on Tower A, between the 67.1 and 10.1 meter levels (about 25%), as compared to measurements on Tower B, between the 48.8 and 10.1 meter levels (14%). Generally, for measurements on a single tower, one would expect a higher occurrence of class A conditions between the narrower measurement interval than between the wider measurement interval. Similarly, neutral conditions were reported to occur slightly more frequently on Tower B, over the narrower measurement interval, than on Tower A, over the wider measurement interval. Further, the 25% average for the Pilgrim A data is slightly higher than the averages for classes D and E. Why does class A occur so frequently?

   Regarding the Pilgrim B data, there appears to be considerable year-to-year variability in a couple of cases in the occurrence of classes A and G. To what is this attributed?

   In both the Pilgrim A and B files, multiple lengthy occurrences of both class A and class G are reported. The longest occurrence of class A is approximately 374 hours and class G is 2489 hours. Is some of this data invalid? Also, in general, there was a relatively large number of occurrences of unstable conditions reported at night and stable conditions during the day. Since unstable conditions typically tend to occur during the daytime and stable conditions at night at many sites, what factors contributed to the occurrence of unstable conditions at night and stable conditions during the day at the Pilgrim?

e. The reported Pilgrim B wind speeds at the 10.1 meter level appear to be somewhat higher than the 10.1 meter Pilgrim A data. To what is that attributed?

6. Provide a figure or figures showing structures, assumed paths of air flow, dimensions, heights and distances used as input in estimating the postulated transport of effluent from each of the release locations to the receptors. Are all directional inputs defined in terms of true north? If the figures are drawn in relation to plant or magnetic north, what is the relationship to true north, assuming that the meteorological measurements are based upon true north?

7. If more than one release to the environment/transport scenario could occur (e.g., loss of offsite power and non-loss of site power, single failure), were comparative χ/Q calculations made to ensure consideration of the limiting dose?

8. Was RG 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants," guidance used when making the χ/Q estimates for the stack release to the control room air intake? Were the ARCON96 χ/Q values always the more limiting case?

9. The stack effluent vertical velocity is input into ARCON96 as 4.06 meters per second and stack flow as 1.7 cubic meters per second. Can this flow be maintained during the course of an accident (e.g., as addressed by technical specifications) even if a single failure or loss of offsite power occurs?

j. Did dose estimates for the exclusion area boundary and low population zone use previously approved χ/Q values? If so, provide a reference citation. If new χ/Q values were calculated, provide a description of the methodology, inputs and assumptions used. If the PAVAN (NUREG/CR-2858, "PAVAN: An Atmospheric Dispersion Program for Evaluating Design Basis Accidental Releases of Radioactive Materials from Nuclear Power Stations") computer code was used, provide a copy of the PAVAN input files.