January 28, 2004

Mr. Joseph E. Venable
Vice President Operations
Entergy Operations, Inc.
17265 River Road
Killona, LA 70066-0751

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - REQUEST FOR ADDITIONAL INFORMATION RELATED TO REVISION TO FACILITY OPERATING LICENSE AND TECHNICAL SPECIFICATION - EXTENDED POWER UPRATE REQUEST (TAC NO. MC1355)

Dear Mr. Venable:

By letter dated November 13, 2003, Entergy Operations, Inc. proposed revisions to the Waterford Steam Electric Station, Unit 3 (Waterford 3) operating license and Technical Specifications which would allow an increase in the rated thermal power from 3,441 megawatts thermal (MWt) to 3,716 MWt.

After reviewing your request, the U.S. Nuclear Regulatory Commission staff has determined that additional information is required to complete the review. On January 14, 2004, we discussed this information with your staff by telephone and they agreed to provide the additional information requested in the enclosure within 30 days of receipt of this letter.

If you have any questions, please call me at (301) 415-1480.

Sincerely,

/RA/

N. Kalyanam, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure: Request for Additional Information

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

ENTERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

Meteorological Data and Atmospheric Dispersion Calculations

1. Please provide an electronic copy of the hourly meteorological data used to calculate the control room atmospheric dispersion factors as well as the joint frequency distributions used in the PAVAN calculations. The hourly data should be provided either in the format specified in Appendix A to Section 2.7, "Meteorology and Air Quality," of NUREG-1555, "Environmental Standard Review Plan," or in the ARCON96 format described in NUREG/CR-6331, "Atmospheric Relative Concentrations in Building Wakes." Data may be provided in compressed form, but a method to decompress the data should be provided. What are the heights at which the data were measured? Was stability class determined as a function of delta-temperature? If so, which delta-temperature measurement heights were used and how were these measurements converted to stability class (e.g., converted to °C/100 meters for comparison to Regulatory Guide (RG) 1.23, "Onsite Meteorological Programs" criteria)? What are the units of wind speed (e.g., miles per hour, meters per second)? In generating the hourly meteorological files used as input to ARCON96, did the valid wind direction values range from 1° to 360° and were invalid data designated by completely filling the field for that parameter with 9's? Page 2.13-12 states that data were obtained from "each of the meteorological towers." Which towers were used to provide what data and how were the data combined in the hourly data files and in the joint frequency distributions used to make the relative concentration (X/Q) calculations?

2. For control room X/Q calculations, please provide a figure or figures showing the assumed locations of release and control room intakes with respect to the overall plant layout. Provide a quantitative list of all inputs used in estimating the postulated transport of effluents from each of the release locations to the intakes. A copy of the ARCON96 printouts is acceptable to show inputs. Was the physical height of the release location assumed or was an effective release height used in any calculation? If flow rates were assumed when making X/Q calculations, were they based on technical specification (TS) values? If more than one release to the environment or more than one transport scenario could occur (e.g., loss-of-offsite power and non-loss of site power, single failure), were comparative X/Q calculations made to ensure consideration of the limiting dose?

   X/Q values have been calculated for two intakes. Were the X/Q values used in the dose assessment based upon the more limiting release and intake pair, upon a weighted average (e.g., as described in RG 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants,") or some other criteria? If weighted values were used, describe how estimates were calculated,

including inflow rates of each intake and any reduction factors (e.g., due to automatic selection of the least contaminated outside air intake). Provide justification for the use of any reduction factors. If applicable, are control room air intake inflow rates based upon measured values? Confirm that each of the control room intakes meet applicable design criteria of an engineered safeguards feature, including single-failure criterion, missile protection, seismic criteria, and operability TS to merit reduction credit as dual intakes.

3. Provide a list of all inputs and assumptions used in the PAVAN calculations. A copy of the summary pages of the PAVAN outputs is acceptable to show inputs.

Steam Generator (SG) Integrity and Chemical Engineering

1. In order for the staff to evaluate the acceptability of the flow-accelerated corrosion (FAC) program, please provide a list of the components in the program most susceptible to FAC. The list should include initial wall thickness (nominal), current wall thickness and future predicted wall thickness. Table 2.1-3 of the application shows the most significant increases in wear rate. Please clarify whether the piping listed in Table 2.1-3 are the most susceptible piping to FAC. If they are, provide initial and current wall thickness of these piping and predicted wall thickness of these piping in the current operating conditions and post-uprated conditions. If they are not, please provide the aforementioned wall thickness data of a sample of the most susceptible piping systems.

2. The pipe wall thinning caused by FAC is predicted by the Electric Power Research Institute's CHECWORKS computer code. In order to allow the staff to evaluate the accuracy of these predictions, please provide examples of the piping components for which wall thinning is predicted by the code based on the current operating conditions and at the same time measured by ultrasonic testing or any other method employed in Waterford 3. This procedure (predicted wall thickness vs. measured wall thickness comparison) will show the effectiveness of CHECWORKS in predicting the as-found condition.

3. The last paragraph on page 2.1-11 states that during each outage, inspections are performed based on an aggressive program to identify piping in need of replacement.

   (a) Please discuss the inspection technique and inspection scope (e.g., how many piping systems are inspected) in the Waterford 3 FAC program.

   (b) As for the statement "...Repairs are performed to preclude falling below minimum wall thickness...," please discuss the specific subsection in the American Society of Mechanical Engineers (ASME) Code from which the minimum wall thickness is calculated.

4. The first paragraph on page 2.1-12 states that "...if the measured wall thickness at the current refueling outage, and/or, the projected wall thickness at the next refueling outage falls below the code allowable wall thickness, the piping should be replaced..."

(a) Since the ASME code does allow pipe wall thickness to fall below the nominal wall thickness but not the minimum wall thickness, please clarify the terminology "code allowable wall thickness" on page 2.1-12.

(b) Discuss the limit on the percentage of wall thickness below which the pipe is replaced.

(c) Discuss whether the pipe replacement due to FAC is consistent with (1) ASME Code, Section XI, Case N-597-1, which is referenced in RG 1.147, Revision 13, "Inservice Inspection Code Case Acceptability–ASME Section XI, Division 1," June 2003; and (2) EPRI Report, "Recommendations for an Effective Flow-Accelerated Corrosion Program," NSAC-202L-R2, April 1999.

5. Section 2.1.9 states that Waterford 3 has implemented the requirement of Nuclear Energy Institute (NEI) 97-06 SG Program Guidelines. It is recommended in NEI 97-06, Revision 1, January 2001, that primary-to-secondary operational leakage be limited to 150 gallons per day per SG. However, in the proposed changes to TS 3.4.5.2c, it is proposed to change the primary-to-secondary operational leakage from 720 gallons per day per SG to 540 gallons per day per SG. Discuss why NEI 97-06 recommended operational leakage limit of 150 gallons per day per SG is not being adopted even though NEI 97-06 is implemented at Waterford 3.

6. The licensee states that feedwater flow will be increased as a result of extended power uprate, and the capacity of the SG blowdown system under power uprated conditions will still be adequate to maintain chemistry in the secondary systems.

(a) Please discuss the feedwater flow increase in the power uprated conditions as a percentage of the original rated flow.

(b) If the blowdown flow is increased as a result of increased feedwater flow rate, provide a percentage of the increase in terms of original rated flow.

(c) Discuss whether the blowdown demineralizers are adequate to treat the increased blowdown flow rate under the power uprated conditions.

7. Please clarify whether the primary and secondary water chemistry programs follow the primary and secondary water chemistry guidelines in EPRI reports TR-105714 and TR-102134, respectively.

(a) Clarify which revision of the EPRI reports are currently being used at Waterford 3.

(b) Clarify whether procedures are implemented at Waterford 3 to adopt the latest version of the EPRI water chemistry reports, if they are revised in the future.

Waterford Steam Electric Station, Unit 3

cc:

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