UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 6, 2009

Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - REQUEST FOR ADDITIONAL INFORMATION RE: LICENSE AMENDMENT REQUEST TO MODIFY CORE POWER CALCULATOR POWER CALIBRATION ADJUSTMENT LIMIT (TAC NO. MD9657)

Dear Sir/Madam:

By application dated September 17, 2008 to the U.S. Nuclear Regulatory Commission (NRC), Entergy Operations, Inc. (Entergy, the licensee), submitted a license amendment request (LAR) to the NRC requesting an amendment to the license in the form of changes to the Technical Specification 3/4.3.1. The proposed changes are supposed to result in the addition of conservatism to Core Protection Calculator power indications when calibrations are required in certain conditions.

The NRC staff has reviewed the application and determined that additional information contained in the enclosure is needed to complete the review.

NRC discussed the additional information needed with Mr. M. Mason of the Entergy staff on February 5, 2009. Mr. Mason agreed to provide a response within 30 days of the receipt of this letter.

If you have any questions, please contact me at (301) 415-1480 or by electronic mail at kaly.kalyanam@nrc.gov.

Sincerely,

N. Kalyanam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure: As stated

cc w/encl.: Distribution via ListServ

OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR ADDITIONAL INFORMATION

WATERFORD STEAM ELECTRIC STATION, UNIT 3

LICENSE AMENDMENT REQUEST REGARDING

CORE POWER CALCULATOR

POWER CALIBRATION ADJUSTMENT LIMIT (TAC NO. MD9657)

By letter dated September 17, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML082630032), to the U.S. Nuclear Regulatory Commission (NRC), Entergy Operations, Inc. (Entergy, the licensee), submitted a license amendment request (LAR) to the NRC requesting an amendment to the license in the form of changes to the Technical Specification (TS) 3/4.3.1. The proposed changes are expected to result in the addition of conservatism to Core Protection Calculator (CPC) power indications when calibrations are required in certain condition.

The NRC staff has reviewed the application and determined that the following information is needed to complete the review.

1. Explain how paragraph 50.36(c)(3) of Title 10 of the *Code of Federal Regulations* (10 CFR) is met, even when not performing a heat balance calibration Surveillance Requirement (SR) during the initial power ascension following refueling.

   Background:

   Note 2 of Table 4.3-1 currently states, in part, "Between 15% [percent] and 80% of RATED THERMAL POWER, compare the Linear Power Level, the CPC at ΔT power, and CPC nuclear flux power signals to the calorimetric power. If any signal is greater than the calorimetric calculation by more than 10%, then adjust the affected signal(s) to within 0.0% to 10% of the calorimetric."

   The LAR proposes to modify Note 2 to state, in part, "Between 15% and 80% of RATED THERMAL POWER, compare the RPS Linear Power, CPC ΔT power, and CPC neutron flux power indications to calorimetric power and take the following actions as applicable: IF either the CPC ΔT power or the CPC neutron flux power indication is greater than calorimetric power by more than 10% of RATED THERMAL POWER, THEN calibrate the affected CPC power indication such that it is 8% to 10% of RATED THERMAL POWER greater than calorimetric power. This requirement does not apply during the initial power ascension following refueling but becomes applicable after the first calibration of the CPC power indications at or above 80% of RATED THERMAL POWER in the power ascension."

   Regarding why the requirement does not apply during the initial power ascension following refueling, the LAR states, "This is because it is recognized that all power indications are closely monitored during startup testing and significant deviations of CPC power from calorimetric power would be promptly corrected. Therefore, this situation is not explicitly addressed in the setpoint and safety analyses because the

likelihood that a power increasing event would occur and result in conditions inconsistent with analysis assumptions is acceptably low."

10 CFR 50.36(c)(3) states "Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

It is unclear how the justification in the LAR is sufficient enough to support the assertion that a SR, as required by 10 CFR 50.36(c)(3), does not need to apply during the initial power ascension following refueling. The licensee's justification that indications are closely monitored and significant deviations would be promptly corrected appears insufficient. The ability to closely monitor and promptly correct deviations does not negate the regulatory requirement for inclusion in TS.

2. In order to ensure that the CPC trip signal calibration is captured in TS, state if the CPC indications and trip signals can be calibrated independently.

Background:

Section 7.2.1.1.2.5 of the FSAR states:

> Outputs of each CPC are:
>
> a. DNBR [departure from nucleate boiling ratio] trip and pretrip
> b. DNBR margin (to control board indication)
> c. Local power density trip and pretrip
> d. Local power density margin (to control board indication)
> e. Calibrated neutron flux power (to control board indication)
> f. CEA [control element assembly] withdrawal prohibit on DNBR or local power density pretrip or CEA misoperation
> g. Hot pin axial shape index (to control board indication)

The outputs of the CPC contain both indications and trip signals. Note 2 of Table 4.3-1 currently compares the Linear Power Level, the CPC at ΔT power, and CPC nuclear power signals to the calorimetric calculation above 15% RATED THERMAL POWER. Note 2 contains actions to adjust the signals for various deviations from the calorimetric calculation. The LAR proposes to modify Note 2 to compare the Linear Power Level, the CPC at ΔT power, and CPC nuclear power indications to the calorimetric calculation above 15% RATED THERMAL POWER and to adjust the indications for various deviations from the calorimetric calculation.

10 CFR 50.36(c)(3) states "Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

It is unclear if the CPC indications and trip signals can be calibrated independently such that, as a result of the proposed change, the trip signal calibration may not be captured in TS as required by 10 CFR 50.36(c)(3).

3. State if the discussion in the Bases on PCALIB (the CPC addressable constant) provides information that is an exception to the Note 2 TS SR, provides amplifying information on how to achieve the Note 2 TS SR, or provides information in order to ensure that parameters other than those listed in the Note 2 TS SR are maintained.

Background:

The Bases submitted with the proposed LAR state:

CPCs use the addressable constant PCALIB to determine power dependent biases for use in its calculations. Thus, when calibrations of CPC power indications are performed, it may be necessary to adjust the CPC constant PCALIB as described below:

- While operating below 80% RATED THERMAL POWER (plus uncertainty), whenever the calibration of either CPC neutron flux power or CPC ΔT power is adjusted, PCALIB must be set equal to the lower of the power level (in % RATED THERMAL POWER) of that adjustment and the power level (in % RATED THERMAL POWER) of the most recent calibration adjustment (or verification) of the other power indication (the one not being calibrated).

- PCALIB can be set to the current power level (in % RATED THERMAL POWER) whenever both CPC neutron flux power and CPC ΔT power are adjusted or verified to be within the Technical Specification requirements at that power level.

- PCALIB can be set to 100.0 whenever both CPC neutron flux power and CPC ΔT power have been adjusted or verified to be within the Technical Specification requirements at or above 80% RATED THERMAL POWER (plus uncertainty).

- PCALIB must be set to 20.0 prior to initial power ascension following refueling."

10 CFR 50.36(c)(3) states "Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

It is unclear if the discussion in the Bases on PCALIB provides information that is an exception to the Note 2 TS SR, provides amplifying information on how to achieve the Note 2 TS SR, or provides information in order to ensure that parameters other than those listed in the Note 2 TS SR are maintained. This clarification is needed in order to ensure that the SR contained in the TS continue to satisfy 10 CFR 50.36(c)(3).

4. Paragraph 3 on page 5 of Attachment 1 to the licensee's letter dated September 17, 2008 states that "...Specifying that adjustment limits are percentages of RATED THERMAL POWER instead of percentages of current power is essentially editorial..."

   Please clarify why changes to the units (rated thermal power vs. current power) in adjustment limits do not change the current TS requirements and are editorial in nature. (Are the changes consistent with the CPC power calculation algorithm?)

February 6, 2009

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Sincerely,
/RA/

N. Kalyanam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure: As stated

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