



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

April 3, 2013

LICENSEE: Entergy Operations, Inc.

FACILITY: Grand Gulf Nuclear Station

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON FEBRUARY 19, 2013, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND ENTERGY OPERATIONS, INC., CONCERNING REQUESTS FOR ADDITIONAL INFORMATION PERTAINING TO THE GRAND GULF NUCLEAR STATION, LICENSE RENEWAL APPLICATION (TAC. NO. ME7493)

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of Entergy Operations, Inc. (Entergy), held a telephone conference call on February 19, 2013, to discuss and clarify the staff's requests for additional information (RAIs) concerning the Grand Gulf Nuclear Station, license renewal application. The telephone conference call was useful in clarifying the intent of the staff's RAIs.

Enclosure 1 provides a listing of the participants and Enclosure 2 contains a listing of the RAIs discussed with the applicant, including a brief description on the status of the items.

The applicant had an opportunity to comment on this summary.

A handwritten signature in black ink, appearing to read "N. Ferrer", with a long horizontal flourish extending to the right.

Nathaniel B. Ferrer, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures:

1. List of Participants
2. List of Requests for Additional Information

cc w/encls: ListServ

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/RA/

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REQUESTS FOR ADDITIONAL INFORMATION (SET 45)

LICENSE RENEWAL APPLICATION

February 19, 2013

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of Entergy Operations, Inc., held a telephone conference call on February 19, 2013, to discuss and clarify the following requests for additional information (RAIs) concerning the license renewal application (LRA).

Draft RAI 4.2.1-2c

Background. The Grand Gulf Nuclear Station License Renewal Application (LRA) states, "[t]he neutron fluence for the welds and shells of the reactor pressure vessel (RPV) beltline region was determined using the General Electric-Hitachi (GEH) method for neutron flux calculation documented in report NEDC-32983P-A and approved by the NRC."

The applicant's response to RAI 4.2.1-2.a, provided by letter dated July 25, 2012, indicates that the statement in the LRA did not provide a complete description of the method used to determine the reactor vessel neutron fluence. The RAI response states, in part, "[p]re-EPU [extended power uprate] fluence values were generated from the MPM Technologies, Inc. analysis." The RAI response also included a revision to LRA Section 4.2.1 to provide a more complete and accurate description of the calculational methods used to determine the reactor pressure vessel neutron fluence.

In response to RAI 4.7.3-1a, provided by letter dated January 18, 2013, the applicant also stated the following, regarding the fluence for the reactor vessel internals, "[d]esign basis pre-EPU fluence values were used in total end-of-life fluence calculations for the reactor vessel internals where available. In cases where design basis pre-EPU fluence values were unavailable, pre-EPU flux/fluence values were derived from the GEH-calculated EPU flux distribution."

Based on the information above, the NRC staff has determined that the applicant has created a new method for determining the neutron fluence on the reactor pressure vessel and internals. In some cases, MPM fluence values are synthesized with GEH fluence values; in other cases, GEH fluence values are used alone, incrementally adjusted to account for the effects of a power uprate. This method is not described in an NRC-approved methodology, and the NRC staff is unable to determine whether the applicant has provided a complete and accurate description of the synthesis technique.

Further, the application of this technique based on a synthesis of two fluence calculations has not been shown to adhere to the guidance contained in NRC Regulatory Guide 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence." This includes documenting the solution to the neutron transport equation, describing the computational representation of the core and vessel geometry, providing the synthesis technique used to combine various computational methods, performing an analytic uncertainty analysis, and providing comparisons to suitable benchmarking.

Prior Staff Approval of GGNS Fluence Calculations

In response to RAI 4.2.1-2.c, the applicant also stated that the GEH method was incorporated into the licensing basis via the 10 CFR 50.90 process during EPU license amendment approval, and that the MPM method had been incorporated into the licensing basis under the auspices of 10 CFR 50.59. The NRC staff reviewed this information to determine whether the composite fluence approach is staff-approved. The NRC staff was unable to verify that the composite method now described by the applicant was approved, as described below.

The NRC staff reviewed Section 2.1 of NEDO-33477, "Safety Analysis Report for Grand Gulf Nuclear Station Constant Pressure Power Uprate," and was unable to determine that MPM fluence values were a component of the reactor vessel fluence calculation. Page 3-2 of NEDO-33477 states:

As explicitly stated in Section 3.2.1 of the CLTR [Constant Pressure Power Uprate Licensing Topical Report], EPU may result in a higher operating neutron flux at the vessel wall, consequently increasing the integrated flux over time (neutron fluence). The neutron fluence is **recalculated** [emphasis added] using the NRC-approved GEH fluence methodology.

The NRC staff also reviewed the safety evaluation approving the GGNS EPU, dated July 18, 2012, and similarly was unable to determine that the NRC staff approved this composite fluence method. Specifically, Section 2.1.8 (Page 27) of the NRC staff safety evaluation states:

The GGNS [Grand Gulf Nuclear Station] PTLR [Pressure-Temperature Limits Report] indicated that the neutron fluence was calculated per the NRC-approved methodology NEDC-32983-A, "Licensing Topical Report, General Electric Methodology for Reactor Pressure Vessel Fast Neutron Flux Evaluation," January 2006. This approved report documents the transport calculation methods including computer codes and formula used to calculate neutron fluences.

The NRC staff also reviewed the PTLR included with the EPU request, and observed that the MPM fluence method is not included in Section 3.0, "Methodology," of the PTLR.

Based on the NRC staff retrospective review, the NRC was unable to determine that the approach of synthesizing MPM and GEH fluence values to determine total fluence is NRC-approved.

Request. Provide fluence values that are determined using an acceptable calculational method. This may include:

- describing the current approach in a topical report with sufficient completeness and accuracy to establish adherence to RG 1.190, and providing comparisons to industry-standard and plant-specific benchmarking data,
- demonstrating that the current values are conservative relative to those calculated using a single, NRC-approved method, or
- re-calculating fluence values using a method that is documented in an NRC-approved licensing topical report.

Discussion: The applicant stated that it was unclear what additional information was being requested from what has been provided in the previous RAI responses. The staff stated that it has not found the applicant's fluence methodology acceptable and that the staff would need additional time to review the information in the LRA, and previous RAI responses to develop a more specific description of the staff's concerns. The staff will not issue this question as a formal RAI at this time.

TELEPHONE CONFERENCE CALL
GRAND GULF NUCLEAR STATION
LICENSE RENEWAL APPLICATION

LIST OF PARTICIPANTS
February 19, 2013

PARTICIPANTS

AFFILIATIONS

Nate Ferrer	Nuclear Regulatory Commission (NRC)
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Ben Parks	NRC
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SUBJECT: Summary of Telephone Conference Call conducted on February 19, 2013

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