



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

October 31, 2012

LICENSEE: Entergy Operations, Inc.

FACILITY: Grand Gulf Nuclear Station

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON AUGUST 21, 2012, 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 August 21, 2012, 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", written over a horizontal line.

Nathaniel 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

TELEPHONE CONFERENCE CALL
GRAND GULF NUCLEAR STATION
LICENSE RENEWAL APPLICATION

LIST OF PARTICIPANTS
AUGUST 21, 2012

PARTICIPANTS

AFFILIATIONS

Nate Ferrer	U.S. Nuclear Regulatory Commission (NRC)
Jim Gavula	NRC
Alice Erickson	NRC
Jim Medoff	NRC
Ted Ivy	Entergy Operations, Inc. (Entergy)
Andy Taylor	Entergy
Alan Cox	Entergy
Kirk Ehren	Entergy
Jacque Lingenfelter	Entergy

REQUESTS FOR ADDITIONAL INFORMATION (SET 33)

LICENSE RENEWAL APPLICATION AUGUST 21, 2012

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of Entergy Operations, Inc., held a telephone conference call on August 21, 2012, to discuss and clarify the following requests for additional information (RAIs) concerning the license renewal application (LRA).

Draft RAI 4.1-2a

Background. In the response to RAI 4.1-2 dated July 3, 2012, the applicant stated that the spent fuel cask crane, new fuel handling crane, and polar crane are designed for a minimum of 100,000 cycles in accordance with CMAA-70, and that the allowable cycles based on CMAA-70 allowable stress ranges are not time-limited and are well above the estimated number of cycles for the aforementioned cranes during 60 years of plant operation. Based on this information the applicant concluded that there are not any time-limited aging analysis (TLAAs) associated with these cranes.

Issue. The staff concurs that the CMAA-70 allowable stress ranges for the analysis of these cranes is not a time-dependent variable defined by the life of the plant. However, the staff also noted that the monitoring of load cycle lifts against the upper bound CMAA-70 design limit for these load cycle lifts may be a time-dependent assessment defined by the life of the plant. Therefore, the staff does not have sufficient information to conclude that the current licensing basis (CLB) does not include any assessments for these cranes that would need to be identified as TLAAs for the LRA because the analyses may include a time-dependency.

Request.

- a. Provide an explanation and the basis why the analyses of loading cycle lifts for the spent fuel cask crane, new fuel handling crane, and polar crane do not need to be identified as TLAAs for the LRA when compared to the six criteria for defining TLAAs in 10 CFR 54.3(a). In the response, specifically clarify and justify why the assessment of load cycle lifts against the design limits set for these lifts per the CMAA-70 criteria would not be time-dependent defined by the life of the plant or why the number of load lift cycles would not need to be monitored during the period of extended operation. Include in the response a clear explanation on how the analyses compare to each of the six criteria for defining TLAAs in 10 CFR 54.3(a) and provide the basis on why the analyses are either in conformance or out of conformance with each of the six criteria for defining TLAAs.
- b. If it is determined that the analyses of loading cycle lifts for the spent fuel cask crane, new fuel handling crane, and polar crane do need to be identified as TLAAs, amend the LRA to include an assessment of these TLAAs and provide the basis for accepting each of the TLAAs in compliance with one of three TLAA acceptance requirements in 10 CFR 21(c)(1)(i), (ii), or (iii). In addition, provide the applicable changes to both the aging management review (AMR) results in LRA Section 3 and updated final safety analysis review (UFSAR) Supplement in LRA Appendix A.

Discuss: The applicant stated that the issue section was unclear because of the statements of life of plant. The staff was referring to the current operating term of the plant and will reword the issue section as follows:

Issue. The staff concurs that the CMAA-70 allowable stress ranges for the analysis of these cranes is not a time-dependent variable defined by the life of the plant. However, the staff also noted that the monitoring of load cycle lifts against the upper bound CMAA-70 design limit for these load cycle lifts may be a time-dependent assessment defined by the current operating term. Therefore, the staff does not have sufficient information to conclude that the CLB does not include any assessments for these cranes that would need to be identified as TLAA's for the LRA because the analyses may include a time-dependency.

The staff will issue the reworded question as a formal RAI.

Draft RAI 4.1-2b

Background. In the response to RAI 4.1-2 dated July 3, 2012, the applicant stated that the containment hatchway crane load bearing parts were analyzed by GGNS for all applicable loads per the requirements of the AISC Steel Construction Manual (hence AISC standard), 7th Edition and that the evaluation of the crane per the AISC standard criteria did not include any time-dependent evaluation defined by the life of the plant. Therefore, the applicant concluded that there are not any TLAA's for the containment hatchway crane because the evaluations of crane were not based on time-dependent criteria defined by the life of the plant.

Issue. Based on its review of this AISC standard, the staff noted that the crane rails were required to be designed in accordance with requirements for crane rail designs in Section 1 of the AISC standard and that the load bearing parts of the cranes were required to be evaluated in accordance with the specification requirements in Section 5 of the AISC standard. This includes a potential evaluation of the crane load bearing parts for possible fatigue loading conditions per Chapter 5, Section 1.7 of AISC standard and Section 1.7 of Appendix B of the AISC standard. Specifically, the staff noted that Table B1 "Number of Loading Cycles," in Appendix B of the AISC standard would establish a loading condition for each of the crane load bearing parts based on the following load cycle ranges for the cranes: (a) 20,000 – 100,000 loading cycles establish cranes for loading condition 1; (b) 100,000 – 500,000 loading cycles establish cranes for loading condition 2; (c) 500,000 – 2,000,000 loading cycles establish cranes for loading condition 3; and (d) over 2,000,000 loading cycles establish cranes for loading condition 4. The staff noted that the Tables B2 and B3 in Appendix B of the AISC specification then used the loading condition category for each of the load bearing parts to establish maximum allowable stresses for these components.

In addition, UFSAR Section 9D.3.1 states that the evaluation of load bearing parts for the containment hatchway crane was used to perform structural modifications of the crane and to "derate" the crane. However, the UFSAR Section 9D.3.1 does not identify specifically what modifications were made to the design of this crane or which criteria in the AISC standard or other NRC requirements applicable to the crane were specifically "derated" per the crane analysis, or whether the specific evaluation or evaluations used for "derating" of the crane was

(or were) based on a TLAA. Thus, the staff does not have sufficient information to conclude that evaluation of the containment hatchway crane does not include any time-dependent analyses that conformed to the definition of a TLAA in 10 CFR 54.3(a).

Request.

- a. Provide a full explanation on how the load bearing parts for the containment hatchway crane were assessed to potential fatigue bearing loads, or else to provide a complete explanation why the crane bearing would not have been required to be assessed for fatigue if fatigue analyses were not performed for the containment hatchway crane load bearing parts as part of the GGNS CLB.
- b. If the CLB does include a applicable fatigue analysis or analyses for the containment hatchway crane load bearing parts, provide your basis why the analysis or analyses would not need to be identified as a TLAA or TLAA's for the LRA based on a comparison to the six criteria for TLAA's in 10 CFR 54.3(a). If the CLB does include such evaluations, provide a clear explanation on why the evaluation or evaluations in the CLB is either in conformance or out of conformance with each of the six criteria for defining TLAA's in 10 CFR 54.3(a). Amend the LRA appropriately if it is determined that CLB does include such a fatigue analysis or analyses and the analysis or analyses are determined to conform to the definition of a TLAA.
- c. Identify all modifications of the containment hatchway crane that were made per the AISC standard evaluation of the crane and specifically what is meant by the term "derating" of the crane. In addition, identify all specific AISC standard subpart evaluations that were used to either modify the structure of the crane or to "derate" this crane and the specific AISC criteria or other NRC requirements that the crane was "derated" from and explain the basis for such "derating" objectives. Explain and justify why the specific AISC standard subpart evaluations that were used either modify the containment hatchway crane or used to "derate" the containment hatchway crane would not need to be identified as TLAA's when compared to the six criteria for defining TLAA's in 10 CFR 54.3(a).

Discussion: The applicant stated that the second paragraph of the issue section was unclear in its description of the UFSAR section. The staff's concern was what derating involved and if modifications were made to the design of the crane. The applicant also stated that request (a) was unclear in its description. The staff was referring to potential loads on the containment hatchway crane. The staff will reword the applicable portions of the issue and request sections as follows:

In addition, UFSAR Section 90.3.1 states that the evaluation of load bearing parts for the containment hatchway crane was used to perform structural modifications of the crane and to "derate" the crane. The staff is not clear if modifications were made to the design of this crane or what "derating" the crane involved. Thus, the staff does not have sufficient information to conclude that evaluation of the containment hatchway crane does not include any time-dependent analysis that conformed to the definition of a TLAA in 10 CFR 54.3(a).

Request.

- a. Provide a full explanation on how the load bearing parts for the containment hatchway crane were assessed for potential loads, or else provide a complete explanation why the crane loads would not have been required to be assessed for fatigue if fatigue analyses were not performed for the containment hatchway crane load bearing parts as part of the GGNS CLB.

The staff will issue the reworded question as a formal RAI.

Draft RAI 4.1-4a

Background. In the response to RAI 4.1-4 dated July 3, 2012, the applicant stated that the plant-specific fracture mechanics evaluation does not need to be identified as a TLAA because the analysis does not include a time dependency and therefore is not a time-dependent analysis defined by the life of the plant. The applicant further stated that the intent of the plant-specific fracture mechanics evaluation was to justify the inspection intervals in the GE generic evaluation.

The applicant stated that the specific evaluation concluded that the results presented therein were valid for use in establishing future feed water nozzle inspection intervals based on the alternate requirements specified in the generic evaluation, and therefore that the plant-specific evaluation did not qualify the feedwater nozzles for a fixed term and is not a TLAA.

Issue. The staff does not agree with the applicant on that the plant-specific flaw tolerance analysis does not need to be identified as a TLAA for the GGNS LRA. As has been confirmed by the applicant, the applicant is using the plant-specific flaw tolerance as the safety basis for establishing the inspection frequency of its alternative inservice inspections for the FW nozzles, which involve recommended alternative ultrasonic test examination techniques.

The applicant claimed that the inspection interval serves as a basis (or input) for the plant-specific flaw tolerance analysis. In contrast, the staff noted that the inspection interval is part of the safety basis determination for the nozzles because it is part of the basis for establishing acceptable alternative inservice requirements for the nozzle under the requirements of 10 CFR 50.55a. Since the inspection interval is part of the safety basis determination, it cannot serve as a basis (or input) for establishing the time frame assumed for the plant-specific flaw tolerance analysis.

Thus, the staff's position is that the applicant should have identified the plant-specific flaw tolerance analysis as a TLAA because it meets all six of the criteria in 10 CFR 54.3(a). This includes conformance with TLAA identification Criterion 3 in that the evaluation is based on time-dependent assumptions defined by the life of the plant.

Request.

- a. Provide the basis why the plant-specific cycle-dependent flaw tolerance analysis does not need to be identified as a TLAA in accordance with 10 CFR 54.21(c)(1).
- b. If the response to request (a) concludes that the plant-specific analysis needs to be identified as a TLAA, provide the necessary information and LRA revision to support the TLAA disposition in accordance with 10 CFR 54.21(c)(1)(i), (ii), or (iii). Assess and

justify if the inservice inspection interval for the alternative FW nozzle examinations under the BWR Feedwater Nozzle Program will need to be adjusted for inspections on FW nozzle during the period of extended operation, based on the justification that is used to disposition the TLAA in accordance with 10 CFR 54.21(c)(1)(i), (ii), or (iii),

Discussion: The applicant stated that the second paragraph to the issue section was unclear because it described the issue in the same manner as the first paragraph of the section. The staff determined that the paragraph was not needed to describe the issue and will remove it from the question. The staff will issue the reworded question as a formal RAI.

Draft RAI 4.7.1-1a

Background. By letter dated June 5, 2012, the staff issued RAI 4.7.1-1 requesting that the results of the projected analyses be provided to demonstrate that the intended functions of the main steam line (MSL) flow restrictors are maintained in accordance with the current licensing basis during the period of extended operation. The response, dated July 3, 2012, stated that the erosion rate of 0.004 inches per year stated in UFSAR Section 5.4.4.4 was highly conservative, and that information from a "later evaluation" shows that the expected erosion of the flow restrictors would be less than the 0.160 inches derived from the 0.004 inches per year for 40 years of operation. The response also provided several attributes to explain the reduction in the erosion-corrosion rate from the 0.004 inches per year given in the UFSAR, including: (a) materials with minimal chromium content are resistant to erosion-corrosion damage, (b) the relative erosion-corrosion rate for steels begins to decrease above 300F, and (c) the Grade CF8 stainless steel material will not experience pitting or stress corrosion cracking due to chloride ions.

EPRI 1011231, "Recommendations for Controlling Cavitation, Flashing, Liquid Droplet Impingement, and Solid Particle Erosion," states that while materials such as stainless steel are immune to flow-accelerated corrosion, erosive mechanisms will eventually damage virtually any material.

Issue. Although the flow restrictors are constructed from stainless steel, the chrome content in stainless steel does not prevent loss of material due to erosion in all situations. In addition, the response to RAI 4.7.1-1 did not provide the results of the projected analyses or the bases for the conclusion in the "later evaluation" that the erosion-corrosion projected through the period of extended operation will be less than the total originally projected for 40 years. The applicant stated that the evaluation is proprietary; however, this does not preclude the information from being provided to the NRC.

Request. Provide the evaluation discussed in the response to RAI 4.7.1-1 that shows the expected erosion of the flow restrictors would be less than 0.160 inches for 60 years of operation.

Discussion: The applicant indicated that the question is clear. The staff will issue the question as a formal RAI.

Draft RAI 4.7.1-2

Background. The components addressed in LRA Table 3.1.2-3, "Reactor Coolant Pressure Boundary," include cast austenitic stainless steel (CASS) flow elements, which appear to be the MSL flow restrictors. The table indicates that these components are being managed for cracking through LRA Table 3.4.1, item 11, and for loss of material through LRA Table 3.1.1, item 79 using the Water Chemistry – BWR program, with verification of the program's effectiveness through the One-Time Inspection program.

UFSAR Section 5.4.4.3 states that ASTM A351 (Type 304) CASS material was selected for the MSL flow restrictors based on its excellent resistance to erosion-corrosion in a high velocity steam environment. In addition, LRA Section 4.7.1 includes a plant-specific time limited aging analysis for evaluating erosion of the MSL flow restrictors.

Issue. 10 CFR 54.21(a) states, in part, that license renewal applications must identify and list components within scope that are subject to an aging management review and must describe and justify the methods used to demonstrate that the effects of aging will be adequately managed.

The staff reviewed the applicant's AMR results in LRA Table 3.1.2-3 "Reactor Coolant Pressure Boundary," and noted it did not include an AMR item for the TLAA associated with erosion of the MSL flow restrictors. It is not clear to the staff why these components evaluated by the TLAA and discussed in LRA Section 4.7.1 are not included as AMR items in the applicable table.

Request. Provide an AMR item for the MSL flow elements in LRA Table 3.1.2-3 that credit the TLAA for evaluating loss of material in the components by an erosion-corrosion mechanism, or provide the bases for why the MSL flow elements are not included.

Discussion: The applicant stated that the second paragraph of the background section was unclear in its description of the LRA section. The staff was highlighting that the LRA section describes a plant-specific TLAA and will reword the applicable portions of the background section as follows:

UFSAR Section 5.4.4.3 states that ASTM A351 (Type 304) CASS material was selected for the MSL flow restrictors based on its excellent resistance to erosion-corrosion in a high velocity steam environment. In addition, LRA Section 4.7.1 describes the evaluation of a plant-specific TLAA for erosion of the MSL flow restrictors.

The staff will issue the reworded question as a formal RAI.

October 31, 2012

LICENSEE: Entergy Operations, Inc.

FACILITY: Grand Gulf Nuclear Station

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON AUGUST 21, 2012, 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)

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The applicant had an opportunity to comment on this summary.

/RA/

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

Docket No. 50-416

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2. List of Requests for Additional Information

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DATE	10/02/12	10/15/12	10/31/12	10/31/12

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Memorandum to Entergy Operations, Inc. from N. Ferrer dated October 31, 2012

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