

## **NRR-PMDAPEm Resource**

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**From:** Thompson, Jon  
**Sent:** Wednesday, August 01, 2012 5:11 PM  
**To:** Ashe, Ken; Bryant, Julius W  
**Cc:** Sheng, Simon  
**Subject:** Request for Additional Information for License Amendment Request dated March 5, 2012 (TAC Nos. ME8213 and ME8214)

**SUBJECT:** MCGUIRE NUCLEAR STATION, UNITS 1 AND 2, REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT RELATED TO MEASUREMENT UNCERTAINTY RECAPTURE POWER UPRATE (TAC NOS. ME8213 AND ME8214)

By letter dated March 5, 2012, Duke Energy Carolinas, LLC (the licensee), submitted a proposed license amendment to change the McGuire Nuclear Station, Units 1 and 2 (McGuire 1 and 2), Technical Specifications (TSs). The proposed change revises the TSs to implement a measurement uncertainty recapture power uprate for McGuire 1 and 2.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's submittal and determined that additional information is needed in order to complete our review. The enclosed document describes this request for additional information (RAI). Please note that the numbering of the questions in this RAI does not begin at the number one. Three prior RAIs regarding this proposed license amendment were issued to you by letters dated April 27, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12117A175), May 22, 2012 (ADAMS Accession No. ML12138A267), June 6, 2012, (ADAMS Accession No. ML12158A481), June 15, 2012, with RAI questions numbered one through four, five through nineteen, twenty through thirty-one, and thirty-two through forty respectively.

A telephone conference will be set up to discuss these RAI questions and the due date that your responses will be due will be set at that time. At this time, the NRC anticipates the need for a license condition associated with the answer to RAI question 41 and the need for a licensee commitment associated with the answer to RAI question 42. This will be discussed during the telephone conference as well. If you have any questions, please call me at 301-415-1119.

Sincerely,

Jon Thompson, Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-369 and 50-370

Enclosure: RAI

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REQUEST FOR ADDITIONAL INFORMATION  
BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REGARDING LICENSE AMENDMENT REQUEST RELATED TO THE  
IMPLEMENTATION OF A MEASUREMENT UNCERTAINTY RECAPTURE POWER UPRATE  
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

By letter dated March 5, 2012 (Agencywide Documents Access and Management System (ADAMS), Accession No. ML12082A210), Duke Energy Carolinas, LLC (Duke Energy, the licensee), submitted a license amendment request (LAR) to change the McGuire Nuclear Station, Units 1 and 2 (McGuire 1 and 2), Technical Specifications (TSs). The proposed change revises the TSs to implement a measurement uncertainty recapture (MUR) power uprate for McGuire 1 and 2.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's submittal and determined that the following additional information is needed in order to complete our review:

41. Pressure-Temperature (P-T) limit curves

The regulation at 10 CFR Part 50, Appendix G, Paragraph IV.A states that, "the pressure-retaining components of the reactor coolant pressure boundary [RCPB] that are made of ferritic materials must meet the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code [ASME Code, Section III], supplemented by the additional requirements set forth in [paragraph IV.A.2, "Pressure-Temperature (P-T) Limits and Minimum Temperature Requirements"]..." Therefore, 10 CFR Part 50, Appendix G requires that P-T limits be developed for the ferritic materials in the reactor vessel (RV) beltline (neutron fluence  $\geq 1 \times 10^{17}$  n/cm<sup>2</sup>,  $E > 1$  MeV), as well as ferritic materials not in the RV beltline (neutron fluence  $< 1 \times 10^{17}$  n/cm<sup>2</sup>,  $E > 1$  MeV). Further, 10 CFR Part 50, Appendix G, requires that all RCPB components must meet the ASME Code, Section III, requirements. The relevant ASME Code, Section III, requirement that will affect the P-T limits is the lowest service temperature requirement for all RCPB components specified in Section III, NB-2332(b).

The P-T limit calculations for ferritic RCPB components that are not RV beltline shell materials may define P-T curves that are more limiting than those calculated for the RV beltline shell materials due to the following factors:

1. RV nozzles, penetrations, and other discontinuities have complex geometries that may exhibit significantly higher stresses than those for the RV beltline shell region. These higher stresses can potentially result in more restrictive P-T limits, even if the reference temperature (RTNDT) for these components is not as high as that of RV beltline shell materials that have simpler geometries.
2. Ferritic RCPB components that are not part of the RV may have initial RTNDT values, which may define a more restrictive lowest operating temperature in the P -T limits than those for the RV beltline shell materials.

Consequently, please describe how the current P-T limit curves at 34 EFY for McGuire, Units 1 and 2 and the methodology used to develop these curves, considered all RV materials (beltline and non-beltline) and the lowest service temperature of all ferritic RCPB materials, consistent with the requirements of 10 CFR Part 50, Appendix G, in the MUR power uprate LAR.

42. RV Internals

McGuire 1 and 2 participated in the industry effort for providing inspection and evaluation guidelines for plants to ensure integrity of RV internals. The product of this industry effort is the MRP-227-A report "Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines." Sections 7.2 and 7.3 of the MRP-227-A report have specified requirements related to RV internals to be executed during the current 40-year license:

- (1) Aging management program development Section 7.2 requires, "Each commercial U.S. PWR unit shall develop and document a program for management of aging of reactor internal components within thirty-six months following issuance of MRP-227-Rev. 0 (that is, no later than December 31, 2011)."
- (2) Reactor internals Guidelines Implementation Section 7.3 requires, "Implementation of these guidelines [MRP-227-A Tables 4-1 through 4-9 and Tables 5-1 through 5-3] is to take effect 24 months following issuance of MRP-227-A (that is, no later than December 31, 2013). Implementation means performance of inspections of applicable components within the time frame specified in the guidance provided in the applicable tables."

Please confirm that you will meet the above MRP-227-A requirements by the dates specified in the parentheses to support the MUR power uprate application.

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