



BRUCE H HAMILTON
Vice President
McGuire Nuclear Station

Duke Energy Corporation
MG01VP / 12700 Hagers Ferry Road
Huntersville, NC 28078

704-875-5333
704-875-4809 fax
bhhamilton@duke-energy.com

June 29, 2009

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC (Duke)
McGuire Nuclear Station, Unit 1
Docket No. 50-369
Relief Request Serial #09-MN-004

Pursuant to 10 CFR 50.55a(a)(3)(ii), Duke hereby submits the enclosed alternative to the visual examination interval requirements of the ASME Code, Section XI, IWB-2500.

An alternative is requested to extend the third inservice inspection visual examination interval of McGuire Unit 1 reactor vessel accessible interior attachment welds beyond the beltline region (Examination Category B-N-2) and accessible core support structure surfaces (Examination Category B-N-3) from 10 years to 20 years to coincide with the refueling outage requested in Relief Request 09-MN-003 for Examination Categories B-A and B-D welds.

In accordance with 10 CFR 50.55a(a)(3)(ii), the proposed alternative is requested on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

To support outage planning, approval is requested by November 30, 2009.

The attachment to this letter contains the relief request. If you have any questions or require additional information, please contact P.T. Vu at (704) 875-4302.

Sincerely,

Bruce H. Hamilton

Attachment

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NRR

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xc:

L. A. Reyes, Region II Administrator
U.S. Nuclear Regulatory Commission
Sam Nunn Atlanta Federal Center, 23 T85
61 Forsyth St., SW
Atlanta, GA 30303-8931

J. H. Thompson, Project Manager
U. S. Nuclear Regulatory Commission
11555 Rockville Pike
Mail Stop O-8G9A
Rockville, MD 20852-2738

J. B. Brady
NRC Senior Resident Inspector
McGuire Nuclear Station

ATTACHMENT

Relief Request 09-MN-004

Proposed Alternative

In accordance with 10 CFR 50.55a(a)(3)(ii)

-Hardship or Unusual Difficulty without Compensating Increase in Level of Quality or Safety-

1. American Society of Mechanical Engineers (ASME) Code Component(s) Affected

The affected component is the McGuire Nuclear Station (MNS) Unit 1 reactor pressure vessel (RPV), specifically the following ASME Boiler and Pressure Vessel (BPV) Code Section XI (Reference 1) examination categories and item numbers covering examinations of the RPV. These examination categories and item numbers are from IWB-2500 and Table IWB-2500-1 of the ASME BPV Code.

Examination Category	Item No.	Description
B-N-2	B13.60	Interior Attachments Beyond Beltline Region
B-N-3	B13.70	Core Support Structure

(Throughout this request the above examination categories are referred to as “the subject examinations” and the ASME BPV Code Section XI is referred to as “the Code”.)

2. Applicable Code Edition and Addenda

American Society of Mechanical Engineers Code Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components,” 1998 Edition with 2000 Addenda.

3. Applicable Code Requirement

In accordance with IWA-2430(d)(1), each inspection interval may be reduced or extended by as much as one year. Adjustments shall not cause successive intervals to be altered more than one year from the original pattern of intervals.

Additionally, Table IWB-2500-1, examination categories B-N-2 and B-N-3, item numbers B13.60 and B13.70 require a visual examination of the accessible interior attachment welds beyond the beltline region and a visual examination of the accessible core support structure surfaces of the RPV once each ten-year interval. The MNS Unit 1 Third Ten-Year Inservice Inspection (ISI) interval is scheduled to end November 30, 2011.

4. Reason for Request

In Westinghouse Topical Report WCAP-16168-NP-A, Revision 2 (Reference 2), the Pressurized Water Reactor Owners Group provided the technical and regulatory basis for decreasing the frequency of inspections by extending the ASME Code Section XI ISI interval from the current 10 years to 20 years for ASME Code Section XI examination categories B-A and B-D RPV welds. The Nuclear Regulatory Commission approved the topical report by letter dated May 8, 2008 (Reference 3). To implement the change presented in Reference 2, MNS previously submitted relief request 09-MN-003, in accordance with the Safety Evaluation (Reference 3) to request an alternative from the Code requirements pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternative inspection interval (20 years) provides an acceptable level of quality and safety. In relief request 09-MN-003, MNS Unit 1 identified 2020 (plus or minus one refueling outage) as the year in which the next inspection of the examination categories B-A and B-D RPV welds will be performed. The intent of relief request 09-MN-004 is to allow deferral of the subject examinations to the same refueling outage as the examination categories B-A and B-D RPV welds described in relief request 09-MN-003 (Reference 4).

During the ten-year ISI of the RPV shell, lower head, and nozzle welds in 2001, McGuire Nuclear Station Unit 1 also performed visual examinations of the RPV interior attachments and the core support structure. Since the lower internals requires removal to facilitate examination of the RPV shell, lower head, and nozzle welds, the visual examinations of ASME examination categories B-N-2 and B-N-3 have historically been performed during the same outage at the end of the ISI interval.

As part of License Renewal, McGuire Nuclear Station has also committed to the development and implementation of a plant specific Reactor Vessel Internals (RVI) inspection program and subsequent submittal to the Nuclear Regulatory Commission two years prior to the period of extended operation. McGuire Nuclear Station may elect to perform the license renewal enhanced examinations for the RVI inspection program coincident with the lower internals removal in 2020. To complete the full scope of the RVI examination, it is expected to require a complete core offload and removal of all internals to facilitate implementation of the examinations. Portions of the license renewal RVI inspection may be performed prior to or after 2020 as may be prescribed in that program.

Performing all related examinations with the RPV lower internals removed during the same refueling outage will result in significant savings in dose and outage duration.

5. Proposed Alternative and Basis for Use

The third ten-year ISI interval for MNS Unit 1 began on December 1, 2001 and is scheduled to conclude on November 30, 2011.

The subject examinations are currently scheduled to be performed during the spring 2010 refueling outage. MNS Unit 1 proposes to perform the subject examinations during the 2020 refueling outage (plus or minus one refueling outage) with the risk-informed extension of the RV ISI. In accordance with 10 CFR 50.55a(a)(3)(ii), this interval extension is requested on the basis that performing the examination of the RPV interior attachments and core support structure in a different refueling outage from the RPV shell, lower head, and nozzle welds would result in hardship or unusual difficulty without a compensating increase in quality or safety.

The full scope examination required by ASME examination categories B-N-2 and B-N-3 requires the removal of all the fuel and the lower internals from the RPV. An unnecessary risk is created by removal of the lower internals to perform a visual examination without a compensating increase in quality or safety. Further, the radiation exposure incurred would essentially double if the subject examinations were performed in a different refueling outage from the RPV shell, lower head, and nozzle weld examinations.

The visual examinations of the RPV interior attachments and the core support structure have been performed several times at MNS Unit 1 with no relevant indications noted during the examinations. The examinations were last performed during the 2001 refueling outage with acceptable results. Additionally, review of industry surveys indicate that these examinations have been performed many times by the industry without any significant findings relevant to the MNS Unit 1 reactor vessel design.

As stated in Reference 2, "...it must be recognized that all reactor coolant pressure boundary failures occurring to date have been identified as a result of leakage, and were discovered by visual examination. The proposed RV ISI interval extension does not alter the visual examination interval. The reactor vessel would undergo, as a minimum, the Section XI Examination Category B-P pressure tests and visual examinations conducted at the end of each refueling before plant start-up, as well as leak tests with visual examinations that precede each start-up following maintenance or repair activities."

The minimum visual examinations discussed in Reference 2 are not the subject examinations (i.e., B-N-2

and B-N-3) of this relief request. During the 2010 refueling outage, MNS Unit 1 will be performing the ASME examination category B-N-1 visual examination. This examination will include the space that is made accessible for examination by the removal of components during normal refueling outages. This examination is required once each period and will provide reasonable assurance of structural integrity. As discussed further in Reference 2, defenses against human errors are preserved with the increase in inspection interval. Specifically, the increase in the inspection interval reduces the frequency for which the RV lower internals need to be removed thereby reducing the possibility for human error and damage to the core.

Therefore, in accordance with 10 CFR 50.55a(a)(3)(ii), this interval change from 10 to 20 years for the subject examinations is requested on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

6. Duration of Proposed Alternative

This proposed alternative is applicable to the McGuire Nuclear Station Unit 1 Inservice Inspection Program for the third and fourth ten-year intervals.

7. Precedents

Calvert Cliffs Nuclear Power Plant, Docket No. 50-318, "Revised Request to Extend the Inservice Inspection Interval for Reactor Vessel Weld Examinations-Relief Request (ISI-020 and ISI-021)" dated October 1, 2008 (ML082760282)

Donald C. Cook Nuclear Plant Unit 2, Docket No. 50-316, "Request to Extend the Inservice Inspection Interval for Reactor Vessel Weld Examination - Relief Request ISIR-30" dated February 27, 2009 (ML090630055)

8. References

- 1 ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition with 2000 Addenda
- 2 WCAP-16168-NP-A, Revision 2, Risk-Informed Extension of Reactor Vessel In-Service Inspection Interval, June 2008
- 3 Final Safety Evaluation For Pressurized Water Reactor Owners Group (PWROG) Topical Report (TR) WCAP-16168-NP, Revision 2, "Risk-Informed Extension Of The Reactor Vessel In-Service Inspection Interval" (TAC No. MC9768), Dated May 8, 2008
- 4 McGuire Nuclear Station, Unit 1, Request for Relief to Extend the Unit 1 Inservice Inspection Interval for the Reactor Vessel Weld Examination - Relief Request 09-MN-003