



STEVEN D CAPPS  
Vice President  
McGuire Nuclear Station

Duke Energy  
MG01VP / 12700 Hagers Ferry Rd.  
Huntersville, NC 28078

980-875-4805  
980-875-4809 fax  
Steven.Capps@duke-energy.com

August 22, 2012

10 CFR 50.55a

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

SUBJECT: Duke Energy Carolinas, LLC (Duke Energy)  
McGuire Nuclear Station Unit 2  
Docket Number 50-370  
Relief Request 12-MN-003  
Response to Request for Additional Information

By letter dated May 8, 2012, Duke Energy submitted Relief Request 12-MN-003 requesting approval for use of an alternative depth-sizing qualification for volumetric examinations of the reactor vessel hot leg and cold leg nozzle-to-pipe dissimilar metal welds performed from the inside surface during the McGuire Unit 2 fall 2012 refueling outage. On August 10, 2012 as amended on August 16, 2012, the NRC electronically requested additional information regarding this relief request. Enclosed is Duke Energy's response.

If you have any questions or require additional information, please contact P. T. Vu at (980) 875-4302.

Sincerely,

Steven D. Capps

Enclosure

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xc:

V. M. McCree, Region II Administrator  
U.S. Nuclear Regulatory Commission  
Marquis One Tower  
245 Peachtree Center Ave., NE Suite 1200  
Atlanta, GA 30303-1257

J. H. Thompson, Project Manager  
U. S. Nuclear Regulatory Commission  
11555 Rockville Pike  
Mail Stop 0-8 G9A  
Rockville, MD 20852-2738

J. Zeiler  
NRC Senior Resident Inspector  
McGuire Nuclear Station

Enclosure  
Relief Request 12-MN-003  
Response to NRC Request for Additional Information

Response to NRC Request for Additional Information  
Relief Request 12-MN-003

NRC Request for Additional Information:

"By a letter dated May 8, 2012, (Agency Wide Document Access and Management System (ADAMS) Accession No. ML12138A008), Duke Energy Carolinas, LLC (the licensee) submitted Relief Request (RR) 12-MN-003 requesting the use of alternate root mean square (RMS) error criteria for sizing flaws that are greater than the requirements of ASME Code Case N-695, "Qualification Requirements for Dissimilar Metal Piping Welds," (N-695).

The U.S. Nuclear Regulatory Commission (NRC) staff requests that the licensee provide additional information to support the relief from the RMS error sizing requirements of ASME Code Case N-695.

In recent submittals requesting relief from the 0.125 inch RMS Error requirements of ASME Supplement 10 and Code Case N-695 Dated March 9, 2012, March 12, 2012, and June 1 2012, (ADAMS Accession Nos. ML12072A233, ML120730196, and ML12156A227 respectively), the submittals include a regulatory commitment to not start up until NRC approval of the flaw evaluations has been received if any inner-diameter connected flaws are found. RR 12-MN-003 does not contain such a commitment.

On July 27, 2012, NRC staff met with representatives of the Performance Demonstration Initiative (PDI) and industry representatives to review the PDI database for detailed information on the sizing errors for the failed qualification tests at PDI. This review of the sizing errors in the PDI database provided information that helped determine the safety significance of the sizing errors. Important findings of this review include:

- Using a series of statistical regressions on the sizing results of the PDI database, it was determined that the probability of a flaw in a dissimilar metal weld being undersized by 0.5 inches or more for each inspection procedure was typically between 1% and 2%.
- A detailed flaw by flaw review of the sizing errors in the PDI database showed that the 1-2% of large undersizing errors were primarily made when sizing the deepest of flaws. Even with the large undersizing errors these very deep flaws in the test blocks were still sized at greater than 50% through-wall in depth.
- The flaws in the 10-50% through-wall depth range had smaller undersizing errors compared to the deepest flaws.
- One concern of the NRC staff was that an undersizing error could result in mechanical stress improvement (MSIP) being inappropriately applied to a weld containing a flaw that was of greater than ≈50% through-wall depth, which could result in rapid leakage.

Response to NRC Request for Additional Information  
Relief Request 12-MN-003

NRC staff determined that this scenario was extremely unlikely after reviewing the safety factors built in to MSIP and the sizing errors found in the PDI database.

If twice the RMS error is not to be added to the depth of any measured flaw depths, the NRC staff requests that the licensee supplement the relief request 12-MN-003 via an RAI response in the following way:

- Flaw(s) detected and measured as less than 50 percent through-wall in depth will be adjusted by adding the industry-proposed correction factor of the RMS Error - 0.125 inches to the depths of any flaws.
- Flaw(s) detected and measured as 50 percent through-wall depth or greater, and to remain in-service without mitigation or repair, the licensee commits to submitting the flaw evaluations to the NRC for review and approval prior to reactor startup."

Response:

In response to the Request for Additional Information for Relief Request 12-MN-003, dated August 10, 2012 as amended on August 16, 2012, Duke Energy supplements Relief Request 12-MN-003, as follows:

If twice the RMS error is not added to the depth of any measured flaw depth, Duke Energy shall satisfy the following additional requirements:

- Flaw(s) detected and measured as less than 50% through- wall in depth shall be adjusted by adding the industry-proposed correction factor of the RMS Error – 0.125 inches to the depths of any flaws.
- For flaw(s) detected and measured as 50% through-wall depth or greater, and to remain in-service without mitigation or repair, Duke Energy shall submit flaw evaluations to the NRC for review and approval prior to reactor startup.