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August 09, 2007

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Power Company LLC d/b/a Duke Energy Carolinas, LLC (Duke)
McGuire Nuclear Station, Unit 1
Docket Number 50-369
Response to Request for Additional Information
Proposed Technical Specification (TS) Amendment
TS 5.5.2 Containment Leak Rate Testing Program

Please find the Duke Power Company LLC d.b.a. Duke Energy Carolinas, LLC (Duke) response to the Request for Additional Information (RAI) transmitted electronically on June 5, 2007. The RAI responses are included as Attachment A to this letter.

There are no regulatory commitments contained in this letter or the associated attachment.

Inquiries on this matter should be directed to K.L. Ashe at (704) 875-5715.

Sincerely,

Gary R. Peterson

Attachments

A017

NRR

Gary R. Peterson affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

Gary R. Peterson, Vice President

Subscribed and sworn to me: August 9, 2007
Date

Kay L Crane
Notary Public

My commission expires: 4-1-2012
Date

KAY L. CRANE NOTARY PUBLIC LINCOLN COUNTY, N.C.

SEAL

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Attachment A

REQUEST FOR ADDITIONAL INFORMATION
MCGUIRE NUCLEAR STATION UNIT 1
LICENSE AMENDMENT REQUEST
PROPOSED TECHNICAL SPECIFICATION (TS) AMENDMENT
TS 5.5.2 CONTAINMENT LEAK RATE TEST PROGRAM

RAI 1 In Attachment 3, you stated that a general visual examination was performed on accessible surface areas during Refueling Outage 1EOC16 in 2004. Some conditions, such as moisture barrier degradation, boric acid crystals, and coatings degradation were observed at a number of locations and were noted in the corrective action program. Please provide the information about the specific locations of the associated containment surface areas. Also, please describe what corrective actions have been taken or will be taken to prevent potential further degradation at these locations.

Response to RAI 1:

1. *Moisture Barrier Indications*

   a. *Locations of Specific Indications and Corrective Actions Taken or Planned to Prevent Potential Further Degradation at These Locations:*

      Missing or degraded moisture barrier materials were observed at the following locations at the embedment zone interface on the exterior side of the containment vessel:

      - *2" long portion of sealant is missing at azimuth 135°/elevation 725'*
      - *Sealant missing under penetration Mk. M-278 at azimuth 176°/elevation 725'*
      - *Sealant at end of vertical stiffener needs repair at azimuth 180°/elevation 725'*
      - *Sealant along side of vertical stiffener needs repair at azimuth 198°/elevation 725'*
      - *Sealant applied over coatings needs touch-up repair at azimuth 202°/elevation 725'*
      - *Sealant is missing and existing paint is cracked at azimuth 220°/elevation 725'*

      These indications were documented in the examination record (Indication #1-SCVO-0001.2004.6) and Duke's corrective action program. Duke's corrective action program indicates that all corrective actions (restoration of sealant materials) associated with these indications were completed during refueling outage 1EOC17.

2. *Containment Surface Area Indications Where Boric Acid Crystals Were Observed*

   a. *Locations of Specific Indications and Corrective Actions Taken or Planned to Prevent Potential Further Degradation at These Locations:*

      Rust and boron stains were observed on the interior surface of the containment vessel shell at azimuth 270°, between elevations 728' and 735'. During 1EOC16, the affected surfaces were cleaned, recoated, reinspected,

and were found to be acceptable. These conditions were documented in the examination record (Indication #1-SCVI-0014.2004.1), and continued monitoring of these conditions during future examinations was recommended.

Leakage from Pump #1NVPU0046 has caused boric acid crystals to collect on Annulus floor and base of the containment vessel (including moisture barrier sealant), and on stiffening ring on exterior of the containment vessel between azimuths 318° and 325°, between elevations 725' and 728'. This indication was documented in the examination record (Indication #1-SCVO-0001.2004.4) and Duke's corrective action program. The affected area was cleaned and reinspected, maintenance was completed on this pump, and a functional test was performed following completion of this work.

Leakage from Pump #1NV849AL has caused boric acid crystals to collect on Annulus floor and base of the containment vessel (including moisture barrier sealant), and on stiffening ring web on exterior of the containment vessel between azimuths 226° and 230°, at elevation 725'. This indication was documented in the examination record (Indication #1-SCVO-0001.2004.5) and Duke's corrective action program. Duke's corrective action program indicates that the area has been cleaned, inspected by Civil Engineering, and that the condition of the area is considered acceptable.

Leakage from Valve #1NV-936 has caused borated water to contact the containment vessel shell at the embedment zone on the exterior side of the containment vessel at azimuth 273°/elevation 725', near the access door to the Fuel Transfer Tube. This indication was documented in the examination record (Indication #1-SCVO-0001.2004.2) and Duke's corrective action program. The affected area was cleaned and reinspected.

3. *Coatings Degradation Indications*

   a. *Locations of Specific Indications and Corrective Actions Taken or Planned to Prevent Potential Further Degradation at These Locations*

   Minor rusting observed on 3" long portion of fillet weld between stiffening ring web and flange at azimuth 240°/elevation 816'. This indication was documented in the examination record (Indication #1-SCVO-0010.2004.2) and Duke's corrective action program. Duke's corrective action program indicates that this area was cleaned and recoated during refueling outage 1EOC17.

   Minor corrosion observed at base of HVAC support at connection to stiffening ring web at azimuth 238°/elevation 826'+5". This indication was documented in the examination record (Indication #1-SCVO-0011.2004.3) and Duke's corrective action program. Duke's corrective action program indicates that all corrective actions associated with this indication (corrective coatings maintenance) were completed during refueling outage 1EOC17.

   Minor rusting observed and coatings maintenance recommended at the following locations:

   - *On containment vessel shell welds at elevation 837', azimuths 7°, 235°, and 340°*

- *On weld at containment vessel shell/stiffening ring interface at azimuth 248° to 250°/elevation 835'*
- *On containment vessel shell circumferential weld and on ring stiffener web at azimuth 307°/elevation 835'+9"*

These indications were documented in the examination record (Indication #1-SCVO-0012.2004.3) and Duke's corrective action program. Duke's corrective action program indicates that all corrective actions associated with these indications (corrective coatings maintenance) were completed during refueling outage 1EOC17.

Rust and minor corrosion were observed on containment vessel stiffening ring web and welds at azimuth 270°/elevation 725'. These indications were documented in the examination record (Indication #1-SCVO-0013.2004.1) and Duke's corrective action program. The staining on floor indicated that borated water might have migrated to the containment vessel shell surfaces behind the labyrinth door (access to Fuel Transfer Tube area on exterior of containment vessel). The area behind the labyrinth door was inspected and a very thin film of boron was observed on the floor. There was no sign of corrosion or any other problems noted. Rust and minor corrosion on the ring stiffener weld and web was cleaned and the affected surfaces were recoated during 1EOC17.

The following conditions were observed on the Equipment Hatch Cover and Barrel:

- *Bottom of barrel at base of cover has areas of flaking paint and minor corrosion*
- *Bottom of barrel (portion that extends through Reactor Shield Building) has areas of corrosion. The examination record indicated that these conditions do not adversely affect containment integrity.*
- *Minor dings in coatings were observed at various locations around the interior of the barrel and on exterior surfaces of the hatch cover*

These indications were documented in the examination record (Indication #1-PENE-C412.2004.1) and Duke's corrective action program. Duke's corrective action program indicates that all corrective actions associated with these indications (corrective coatings maintenance) were completed during refueling outage 1EOC17.

RAI 2 In summary of Refueling Outage 1EOC17 (2005) Examinations, you did not specify the observations on moisture barrier, boric acid crystals, and coatings degradation. If you have performed the similar general visual examination in 2005 as you had done during Refueling Outage 1EOC16 in 2004, please describe your findings and compare the locations and degradation levels in 2005 with those in 2004.

Response to RAI 2:

A general visual examination was not performed during refueling outage 1EOC17. However, a general visual examination was recently completed during refueling outage 1EOC18 in accordance with the ASME Code, Section XI, Subsection IWE (1998 Edition through the 2000 Addenda), IWE-2500, Table IWE-2500-1, Examination Category E-A, Item E1.11 in 2007. The visual examination results were generally consistent with results reported during previous examinations, and included a description of areas requiring coatings maintenance, minor corrective action to restore some moisture barrier conditions, and cleaning of surfaces exposed to staining. A description of the most significant results of this general visual examination are provided below, including a summary of indications identified in our response to RAI-1.

A. *The following are the results of examinations performed on indications identified in our response to RAI-1:*

1. *Moisture Barrier Indications*

   Moisture Barrier Indications (Indication #1-SCVO-0001.2004.6) have been corrected and no indications were recorded for these items during the Refueling Outage 1EOC18 general visual examination.

2. *Containment Surface Area Indications Where Boric Acid Crystals Were Observed*
   Indication #1-SCVI-0014.2004.1: Surfaces of the containment vessel have been cleaned and recoated, and no degradation was observed. The condition of this area was acceptable.
   Indication #1-SCVO-0001.2004.4: Boric acid crystals were again observed at this location during the general visual examination. The area was cleaned to the extent needed to perform an examination of the containment vessel and embedment zone moisture barrier, and the condition of these items was found to be acceptable at this location.
   Indication #1-SCVO-0001.2004.5: Boric acid crystals were again observed at this location during the general visual examination. The area was cleaned to the extent needed to perform an examination of the containment vessel and embedment zone moisture barrier, and the condition of these items was found to be acceptable at this location.
   Indication #1-SCVO-0001.2004.2: During this examination, all visible and accessible surfaces in this area were clean, dry, with no evidence of boron. The condition of this area was acceptable.

3. *Coatings Degradation Indications*
   Indication #1-SCVO-0010.2004.2: Conditions are unchanged from the previous examination. Duke's corrective action program indicated that corrective coatings maintenance was performed. However, this area continues to warrant

corrective maintenance. The condition of the containment vessel is considered acceptable.
Indication #1-SCVO-0011.2004.3: Adverse conditions identified during previous inspection were corrected and the condition of this area is acceptable.
Indication #1-SCVO-0012.2004.3: Conditions are unchanged from previous examination. Duke's corrective action program indicated that corrective maintenance was performed. However, this area continues to warrant corrective maintenance. The condition of the containment vessel is considered acceptable.
Indication #1-SCVO-0013.2004.1: Indications observed during Refueling Outage 1EOC16 were not observed during examinations performed during Refueling Outage 1EOC18. The visual examination was performed by looking through the Fuel Transfer Tube area access door. All visible and accessible areas looked satisfactory, including the moisture barrier. The Annulus floor area behind the access door was dry and clean with no evidence of boron. Please note that not all surfaces within this area could be seen from outside the door.
Indication #1-PENE-C412.2004.1: Conditions are unchanged from previous examination. Duke's corrective action program indicated that corrective coatings maintenance was performed. However, this area continues to warrant corrective maintenance. The condition of the containment vessel is considered acceptable.

B. *The following is a description of the most significant examination results observed during the visual examination performed during 1EOC18 for items other than those identified above.*

1. *Delaminated topcoat observed on containment vessel interior surface in the Vent Unit A/D Room on Penetration Mk. M465 at azimuth 356° (Indication #1-SCVI-0002.2007.1). Loose coatings were removed during 1EOC18 and this condition was entered into Duke's corrective action program for future corrective coatings maintenance. The condition of the containment is considered acceptable at this location.*

2. *Delaminated topcoating observed on containment vessel interior surfaces in the Vent Unit B/C Room near azimuth 165°, elevation 760' (Indication #1-SCVI-0007.2007.1 – approx. 2" x 4" area), and near azimuth 185°, elevation 760' (Indication #1-SCVI-0007.2007.2 – approx. 6" x 15" area).. Loose coatings were removed during 1EOC18 and these conditions were entered into Duke's corrective action program for future corrective coatings maintenance. The condition of the containment is considered acceptable at this location.*

3. *Boron residue, flaking paint, and light rusting observed on containment vessel interior surface between azimuths 270° and 280°, between elevations 738'+3" and 739' (Indication #1-SCVI-0009.2007.1). Boron was removed, the area was cleaned, and containment coatings maintenance was performed during refueling outage 1EOC18. The condition of the containment is considered acceptable at this location.*

4. *Flaking paint and small amount of rust was observed on intermittent welds (approx. 12" in length) connecting the insulation panel angle to the interior surface of the containment vessel in the Pipe Chase at azimuth 30° (Indication #1-SCVI-0011.2007.1). This condition was entered into Duke's corrective action program for future corrective coatings maintenance. The condition of the containment is considered acceptable at this location.*

5. *Boron, debris, rust, and staining observed on containment vessel shell interior surfaces and surfaces of Penetrations Mk. M-302 and M-278 within the ECCS sump area at azimuth 184° (Indication #1-SCVI-0017.2007.1) and azimuth 176° (Indication #1-SCVI-0018.2007.1). These areas had previously been considered inaccessible for general visual examination because of debris screens which prevented access for visual examination. However, ECCS sump modifications conducted during 1EOC18 removed these screens, providing access to perform these visual examinations. Boron at this location was identified in Duke's corrective action program. The boron, debris, and corrosion was removed, a VT-1 examination was performed on surfaces in this area, including containment vessel surfaces below the concrete floor interface (some concrete was removed to perform this examination), and ultrasonic thickness measurements were performed to confirm the containment vessel shell thickness in these areas. The ultrasonic thickness measurements revealed no significant wall thickness loss, and the affected surfaces were restored, corrective coatings maintenance performed, and moisture barrier material was installed at the concrete/containment vessel interface to seal this embedment zone from any future moisture intrusion. Additional action is planned to include this area in the inservice inspection plan for examination in accordance with IWE-2500, Table IWE-2500-1, Examination Category E-C, Item E4.11 during the next inspection period. The condition of the containment vessel was found to be acceptable in this area.*

6. *Moisture barrier was observed missing for a length of approximately ¾" at azimuth 133°, elevation 725' (Indication #1-MBRO-001.2007.1) at the embedment zone on the exterior side of the containment vessel. This moisture barrier condition was corrected during 1EOC18, and the condition of the containment vessel is acceptable at this location.*

7. *The bottom portion of the Equipment Hatch Cover mating flange surfaces were observed to have areas where minor surface imperfections exist (Indication #1-PENE-C412.2007.1). These imperfections, including some minor scratches, dings, gouges, and residue have cause problems with sealing the equipment hatch. The affected surfaces were blasted, cleaned, and refaced to improve the sealing surface condition. The Equipment Hatch was subsequently retested with very low leakage (approximately 10 sccm), confirming the adequacy of the corrective action.*

RAI 3 You mentioned that "In addition, although McGuire is only required to test the bellows following an ILRT, a more conservative approach (test plan) has been implemented." Please provide more information about this test plan.

Response to RAI 3: TS and Containment Leak Rate Testing Program manual

Currently containment penetration bellows leak testing is required to be performed after an ILRT but no longer than 10 year test interval (TS 3.6.1).

As a result of the test plan, between-the-plies leak testing of all containment penetration bellows was performed since the one immediately after the last ILRT for Unit 1 (May 1993). Additionally as required, all penetration bellows found with detectable between-

the-plies leakage (more than the minimum instrument error of 2 sccm at reduced pressure – 4 psig) were subjected to full pressure (15 psig) leak test from the containment direction during 1EOC16 (April 2004)to satisfy the 10 year surveillance.

All bellows with detectable leakage are tested during each refueling outage by between-the plies leak testing or were tested in 1EOC18 by internal pressurization using temporary boundaries to full containment pressure tests in cases where between-the - plies leakage cannot be performed. These tests demonstrate that these bellows are not degrading.

The results of the bellows leakage testing ensures that containment leakage is within acceptance criteria and provides confidence that no degradation is occurring that would challenge meeting 10CFR50 Appendix J leakage requirements.

RAI 4 Please describe what programs, if any, are used to monitor the inaccessible, uninspectable, or embedded areas of the containment, such as steel shell on the back of the ice baskets. Also, please discuss your findings from the programs.

Response to RAI 4:

1. *Surfaces of the containment vessel that are embedded in concrete are inaccessible for examination from either side, and Duke Energy Corporation does not perform any visual, surface, or volumetric examinations on these surfaces. However, testing is performed on groundwater samples to monitor the susceptibility of the embedded containment liner plate exterior surfaces to corrosion, as described below:*

   A groundwater sample collection penetration is installed in the floor of the incore instrumentation room to permit periodic collection and testing of groundwater directly beneath the containment embedded liner plate at this location. Samples are collected every 5 years and are analyzed to determine whether the groundwater is corrosive. During 1EOC18, a sample was collected from this penetration, was analyzed, and was found to meet established acceptance criteria.

2. *During our Containment Inservice Inspection Interval 1 (September 9, 1998 through September 9, 2006), a number of surface areas were examined in accordance with the ASME Code, Section XI, Subsection IWE, IWE-2500, Table IWE-2500-1, Examination Category E-C (1992 Edition with the 1992 Addenda, as modified by approved relief requests). These locations and the basis for examining these areas was identified in our letter to the NRC, dated September 25, 2002. The results of augmented examinations performed during the first inspection interval revealed no unacceptable conditions or detectable wall thickness loss on any area examined.*

   During the Containment Inservice Inspection Interval 2 (starting on July 15, 2005), most of the areas that were subject to examination under Examination Category E-C during the first interval were no longer included in the Inservice Inspection plan because the requirement of IWE-2420(c) (1998 Edition through the 2000 Addenda) had been satisfied. The remaining areas subject to examination under Examination Category E-C are those that had not yet been examined during at least two consecutive inspection periods, as required by IWE-2420(c). All of the Examination Category E-C examinations scheduled for the current inspection interval were

completed during refueling outage 1EOC18, and the examination results revealed no unacceptable conditions or detectable wall thickness loss on any item examined.

Containment vessel interior surfaces located behind the ice condensers are not examined in accordance with the ASME Code, Section XI, Subsection IWE, IWE-2500, Table IWE-2500-1, Examination Category E-C. The reason for this is as follows:

a. *Operating experience at McGuire has shown that containment vessel surface areas at greater risk of degradation include those where cork expansion joint material has been installed between floor slabs of interior structures and the containment vessel shell. As a result of this operating experience, the cork expansion joint material was removed from between the ice condenser floor slabs and the containment vessel. As such, these surfaces are no longer deemed to be at greater risk that warrants examination in accordance with IWE-2500, Table IWE-2500-1, Examination Category E-C. It should be noted that the cork expansion joint material at these locations was removed prior to the start of the Containment Inservice Inspection Interval 1.*

3. *Portions of containment penetrations are not accessible for visual examination, and local leak-rate testing performed in accordance with 10 CFR 50, Appendix J is another program that is used to confirm the leak-tight integrity of these containment penetrations.*