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March 8, 2010

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

Subject: Duke Energy Carolinas, LLC (Duke)  
Catawba Nuclear Station, Units 1 and 2  
Docket Numbers 50-413 and 50-414  
Technical Specifications (TS) and/or Bases Sections:  
3.3.2, Engineered Safety Feature Actuation System  
(ESFAS) Instrumentation  
3.3.3, Post Accident Monitoring (PAM) Instrumentation  
3.5.4, Refueling Water Storage Tank (RWST)  
3.6.6, Containment Spray System  
License Amendment Request for Emergency Core Cooling  
System (ECCS) Water Management Initiative

References: Letters from Duke to NRC, same subject, dated  
September 2, 2008, June 18, 2009, July 8, 2009,  
August 13, 2009, September 8, 2009, and November 10,  
2009

The September 2, 2008 reference letter requested a license amendment pursuant to 10 CFR 50.90 to revise the Unit 1 and Unit 2 TS and associated Bases to allow manual operation of the Containment Spray System and to revise the upper and lower limits on the RWST. The June 18, 2009, July 8, 2009, August 13, 2009, September 8, 2009, and November 10, 2009 reference letters responded to five sets of Requests for Additional Information (RAIs) and supplemented the September 2, 2008 original submittal.

On December 16, 2009, the NRC electronically transmitted two additional RAIs. The purpose of this letter is to formally respond to these RAIs.

Attachment 1 to this letter contains our RAI response. The format of the response is to restate the RAI question, followed by our response.

ADD1  
NRR

March 8, 2010

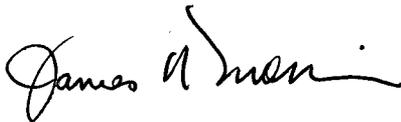
Additionally, Duke notes that our initial submittal of September 2, 2008 proposed a limited adoption of Technical Specification Task Force (TSTF)-493, Rev. 3, "Clarify Application of Setpoint Methodology for LSSS Functions" for TS Table 3.3.2-1 Function 7b (RWST Level - Low). Subsequent to the September 2, 2008 submittal, TSTF-493 was revised from Rev. 3 to Rev. 4. Rev. 4 included editorial changes to one of the applicable TSTF TS footnotes and TS Bases discussion. In order to maintain consistency between the ECCS Water Management Initiative submittal and Rev. 4 of TSTF-493, Duke is therefore revising the affected TS and TS Bases insert pages to incorporate these editorial changes. Attachment 2 to this letter contains the affected TS and TS Bases insert pages. These additional changes do not result in any impact to the original No Significant Hazards Consideration Analysis or Environmental Analysis contained in the September 2, 2008 submittal.

There are no regulatory commitments contained in this letter or its attachments.

Pursuant to 10 CFR 50.91, a copy of this letter and its attachments is being sent to the designated official of the State of South Carolina.

If you have any questions or require additional information, please contact L.J. Rudy at (803) 701-3084.

Very truly yours,



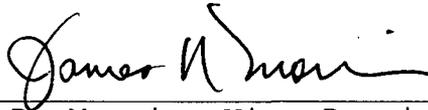
James R. Morris

LJR/s

Attachments

March 8, 2010

James R. Morris 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.



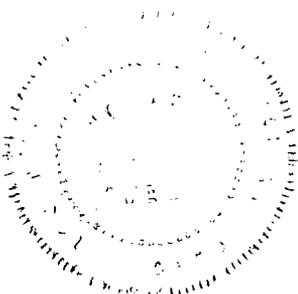
James R. Morris, Vice President

Subscribed and sworn to me: 3-8-10  
Date



Notary Public

My commission expires: 7-10-2012  
Date



SEAL

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xc (with attachments):

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bxc (with attachments):

R.D. Hart  
L.J. Rudy  
M.E. Patrick  
R.L. Gill, Jr.  
Document Control File 801.01  
RGC Date File  
ELL  
NCMPA-1  
NCEMC  
PMPA

Attachment 1

Response to NRC Request for Additional Information

On December 16, 2009, the NRC electronically transmitted the following RAIs:

1. The licensee stated, in its November 10, 2009 letter, in response to Question 1, that

"For the purpose of equipment evaluations, the "Environmental Qualification (EQ) Equip Evaluation Curve consists of the highest temperature value from each of the Emergency Core Cooling Systems (ECCS) Water Management calculation subcurves for each time instance ... with an extra 5.0°F of margin added for conservatism."

The Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Stations," Section 6.3.2.5, "Margin," indicates that the margin (the difference between the most severe specified conditions of the plant and the conditions used in type testing) should be 15°F. Section 3.11.2, "Qualification Tests and Analysis," of the Catawba Updated Final Safety Analysis Report states that the initial environmental qualification was performed in accordance with IEEE Std. 323-1971 and equipment being replaced will be environmentally qualified in accordance with IEEE Std. 323-1974. Provide a detailed technical justification for choosing a 5°F margin when determining the composite "EQ Equip Qualification Curve" instead of the recommended 15°F per IEEE Std. 323-1974.

**Duke Response:**

In terms of the Catawba ECCS Water Management Project, there are no planned replacements of EQ equipment which would meet the requirements of Catawba UFSAR Section 3.11.2. The evaluation of EQ equipment as documented in engineering calculation CNC-1381.05-00-0239 (Revision 0) is based on the overall difference between the original environmental curves and the revised curves as part of ECCS Water Management activities.

The method used to develop the "EQ Equip Evaluation Curve" (shown as Figure B-6A and Figure B-6B) as part of the ECCS Water Management activities included the noted 5°F margin above the highest accident curve value at any point in time. The "EQ Equip Evaluation Curve" was superimposed onto each

equipment type test curve, and the resulting margins for each equipment evaluation met the recommendations of IEEE 323-1974.

Thus, the evaluations performed within calculation CNC-1381.05-00-0239 (Revision 0) remain consistent with Catawba UFSAR Section 3.11.2 and IEEE 323-1974, and it was concluded that there were no adverse impacts on the existing qualifications for EQ equipment.

2. Figure B-6B, "Long-Term EQ Reactor Building Temperature Response," provided in letter dated November 10, 2009, indicates that the lower containment bounding temperature is greater than the EQ Equip Evaluation Curve from one day to 8.5 days, approximately. Provide a detailed explanation of how EQ equipment in lower containment remains qualified and will be able to perform its safety function when exposed to a temperature greater than the qualification curve.

**Duke Response:**

As noted in the above EQ response to RAI #1, the "EQ Equip Evaluation Curve" is shown as Figure B-6A and Figure B-6B contained within engineering calculation CNC-1381.05-00-0239 (Revision 0). The curve was a composite of the highest temperature values from the referenced subcurves developed for ECCS Water Management for all locations of the Reactor Building (comprised of Containment and Annulus areas) as shown in Figure B-5A and Figure B-5B.

Figure B-6A is the logarithmic scale of the composite subcurves shown to develop the "EQ Equip Evaluation Curve" while Figure B-6B is the same set of profiles using a linear scale. The scale of the X-axis for Figure B-6B is skewed due to the lack of intermediate data points in the "Lower Cont (Bounding Temp)" curve from 33,100 seconds to 2,300,000 seconds and the long time duration of the Annulus temperature response ("Annulus (ECCS WM)" curve). Data points from the "Annulus (ECCS WM)" curve were utilized during this time period to create the "EQ Equip Evaluation Curve". The "EQ Equip Evaluation Curve" shown on Figure B-6A (using the logarithmic scale) was used for the equipment evaluations in calculation CNC-1381.05-00-0239 (Revision 0).

Figure B-6A and the "EQ Equip Evaluation Curve" was developed first from the data taken from the subcurve

profiles shown on Figure B-5A. Following this, the X-axis on Figure B-6A was reformatted via Microsoft EXCEL from a logarithmic scale to a linear scale to create Figure B-6B. No data was changed to create the linear scale plot. In review of the data file in Microsoft EXCEL, it was noted that subcurve "Lower Cont (Bounding Temp)" consists of only three data points which are used to form a bounding straight line approximation. This was taken from another input calculation referenced in CNC-1381.05-00-0239 (Revision 0). The data file also showed that for each data point listed for the "Lower Cont (Bounding Temp)" curve, the temperature point was lower than the respective temperature point on the "EQ Equip Evaluation Curve" (see values provided below). The "EQ Equip Evaluation Curve" between 33,100 seconds and 205,000 seconds is a result of actual data points that exist for the highest profile curve, the "Annulus (ECCS WM)" curve. Because the "Lower Cont (Bounding Temp)" curve has no resolution during this timeframe, the data becomes skewed. The "Annulus (ECCS WM)" curve and subsequently, the "EQ Equip Evaluation Curve" both have intermediate data points and are thus used for the equipment evaluations during this timeframe.

The following table shows the data from the Microsoft EXCEL data file comparing the curves for "Lower Cont (Bounding Temp)" and "EQ Equip Evaluation Curve" at the same times:

Time:	Lower Cont (Bounding Temp):	EQ Equip Evaluation Curve:
33,100 sec	188.58°F	193.58°F
2,300,000 sec	143.57°F	155.86°F *
5,200,000 sec	134.91°F	140.48°F *

\* Temperature values for "EQ Equip Evaluation Curve" were based on higher values at the same time taken from "Annulus (ECCS WM)" curve.

The "EQ Equip Evaluation Curve" presented in Figure B-6A was superimposed onto each equipment type test curve to perform all of the equipment evaluations in support of the ECCS Water Management Project. All evaluations were performed using the "EQ Equip Evaluation Curve" with the X-axis set on a logarithmic time scale to demonstrate if there were any concerns with the revised environmental profiles developed for the ECCS Water Management Project.

Based on the review and evaluations documented within calculation CNC-1381.05-00-0239 (Revision 0), there were no

adverse impacts on equipment due to the revised profiles, and all EQ equipment located within the Containment and Annulus locations for Catawba Nuclear Station remains qualified for the environmental profiles proposed for the Catawba ECCS Water Management Project.

Attachment 2

Revised TS and TS Bases Insert Pages

## TS Markup Inserts

- INSERT 1: \* The requirements of this Function are not applicable for entry into the applicable MODES following implementation of the modifications associated with ECCS Water Management on the respective unit.
- INSERT 2: \* Following implementation of the modifications associated with ECCS Water Management on the respective unit, the Allowable Value for this Function shall be  $\geq 91.9$  inches and the Nominal Trip Setpoint for this Function shall be 95 inches.
- INSERT 3: \* Following implementation of the modifications associated with ECCS Water Management on the respective unit, the RWST borated water volume for this SR shall be  $\geq 377,537$  gallons.
- INSERT 4: \* Following implementation of the modifications associated with ECCS Water Management on the respective unit, the requirements of SR 3.6.6.3 and SR 3.6.6.4 shall no longer be applicable.
- INSERT 5: \*\* Following implementation of the modifications associated with ECCS Water Management on the respective unit, spray pump starting and spray pump discharge valve opening are manual functions.
- INSERT TSTF-493 NOTE 1: If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.
- INSERT TSTF-493 NOTE 2: The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The methodologies used to determine the as-found and the as-left tolerances are specified in the UFSAR.

INSERT for SR 3.3.2.7:

For Functions for which TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions" has been implemented, this SR is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the Nominal Trip Setpoint (NTSP). Where a setpoint more conservative than the NTSP is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the NTSP, then the channel shall be declared inoperable. The second Note also requires that the methodologies for calculating the as-left and the as-found tolerances be in the UFSAR.

INSERT for SR 3.3.2.9:

For Functions for which TSTF-493, "Clarify Application of Setpoint Methodology for LSSS Functions" has been implemented, this SR is modified by two Notes as identified in Table 3.3.2-1. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be returned to within the as-left tolerance of the Nominal Trip Setpoint (NTSP). Where a setpoint more conservative than the NTSP is used in the plant surveillance procedures (field setting), the as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the NTSP, then the channel shall be declared inoperable. The second Note also requires that the methodologies for calculating the as-left and the as-found tolerances be in the UFSAR.