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December 2, 2009

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

Subject: Duke Energy Carolinas, LLC (Duke)

McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369 and 50-370

Response to Request for Additional Information Regarding Amendment to
Technical Specification 3.8.1, "AC Sources-Operating," Revised Surveillance
Requirements

By letter dated December 1, 2008, Duke submitted a license amendment request (LAR) to correct a non-conservative condition by revising McGuire Technical Specification Surveillance Requirement 3.8.1.4 to increase the minimum required amount of fuel oil for the Emergency Diesel Generators (EDG) fuel oil day tank from 120 gallons to approximately 160 gallons or 39 inches of fuel oil as read on the local gauge used to perform the surveillance. On July 30, 2009, Duke submitted responses to the NRC staff's request for additional information pertaining to this LAR. On October 28, 2009, the NRC staff electronically requested additional information regarding this LAR. The attachment to this letter provides the requested additional information.

Please direct any questions you may have in this matter to P. T. Vu at (980) 875-4302.

Very truly yours,

Bruce H. Hamilton

Attachment

A001
NRR

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xc:

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Bruce H. Hamilton 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.

Bruce Hamilton

Bruce H. Hamilton, Vice President, McGuire Nuclear Station

Subscribed and sworn to me: 12/2/09
Date

Lori C. Jibday, Notary Public

My commission expires: July 1, 2012
Date



Attachment

Response to Request for Additional Information

Request for Additional information (RAI)

The NRC staff requests the following additional information to complete the review of the proposed amendment.

RAI Question #1:

The current Technical Specification (TS) Surveillance Requirement 3.8.1.4 requires adequate supply of fuel in the day tank to provide 30 minutes of run time for the EDG. This is significantly less than the 60 minute fuel oil storage requirement recommended in American National Standards Institute N195-1976 which is endorsed by Regulatory Guide (RG) 1.137. Provide supporting documentation that approved the reduced fuel oil storage requirement in the day tank.

Response:

ANSI standard N-195-1976 section 6.1 states:

- 6.1 Tanks. Each diesel shall be equipped with day or integral tank or tanks whose capacity is sufficient to maintain at least 60 minutes of operation at the level where oil is automatically added to the day or integral tank or tanks....

In the NRC letter dated January 29, 1980 you asked Duke if we comply with ANSI standard N195-1976, if not provide justification.

Duke responded via a letter dated April 3, 1980 in which we indicated we are taking exceptions to ANSI N195-1976. We specifically told you that the day tank for the diesel has a capacity which is sufficient to maintain approximately 60 minutes of operation. Oil is automatically added to the day tank at approximately one-half this level...

- It is our understanding that the ANSI standard is asking that you have a tank sufficient in size to be able to have 60 minutes of operation at the time that you add more fuel (i.e., when your transfer pump starts) to the tank. However, what we told you is that our tank can hold approximately 60 minutes of fuel but we add fuel at half that (i.e., 30 minutes) capacity. In other words, the ANSI standard indicates that upon transfer pump failure you would have 60 minutes of fuel available, whereas, at McGuire we have half that amount (30 minutes) of fuel available.

In supplement 4 of NUREG 0422 (our SER) dated January 1981, Section 8.0 you acknowledge transmitting the January 1980 letter and receiving our April 1980 response by stating the following:

"...Information requests concerning these recommendations, and also concerning the design of the fuel oil storage and transfer system, were transmitted to the applicant on January 29, 1980. The applicant responded in a letter dated April 3, 1980, stating how they meet or will meet the recommendations of NUREG/CR-0660 and our additional concerns.

We have reviewed these responses and have determined that conformance to the recommendations is as follows:"

Recommendation

Conformance

9. Fuel Storage and Handling

Partial

Therefore, it is our understanding that you recognized we were only partially complying with the ANSI standard. In addition, the SER goes on to say:

“On the basis of our review we have concluded there is sufficient assurance of diesel generator reliability to warrant unrestricted plant operation through the first refueling period. However, to assure long-term reliability of the diesel generator installations, we require that the following design and procedural modifications be implemented prior to the first refueling.”

Of the design and procedural modifications you identified for implementation, only Item 5 mentions fuel oil storage and it does not mention a condition regarding the capacity or capability of the day tank as it relates to 30 minutes or 60 minutes of fuel at the time fuel is added to the tank (i.e., Section 6.1 of ANSI N195-1976). Item 5 is focused on tank overflow. However, the second paragraph of item 5 goes on to say:

“This design is an acceptable alternative to the recommend design of ANSI N195-1976, in that there are sufficient alarms and indications of a tank overflow, sump pump capacities are in excess of the maximum day tank overflow rate, ...”

The concluding paragraph of section 8 of Supplement 4 of NUREG 0422 (our SER) dated January 1981 goes on to say:

“The present diesel generator design meets the requirements of Criteria 17 and 21 of Appendix A of 10 CFR Part 50. Upon completion of the above changes and modifications, the design of the diesel generator and its auxiliary systems will also be in conformance with recommendations of NUREG-CR/0660 for enhancement of diesel generator reliability and the related NRC guidelines and criteria. We therefore conclude that this will provide reasonable assurance of diesel generator reliability through the design life of the plant.”

From this closing paragraph it was and is our interpretation that the NRC was aware of the tank's limitations (the tank's maximum capacity is approximately 60 minutes of fuel and fuel is added at one half (30 minutes) of this capacity). In addition, the SER did not identify any modifications that would change the tank to address these limitations (at 30 minutes we add fuel and the tank can contain approximately 60 minutes of fuel). Therefore, when the SER stated:

“Upon completion of the above changes and modifications, the design of the diesel generator and its auxiliary systems will also be in conformance with recommendations of NUREG-CR/0660 for enhancement of diesel generator reliability and the related NRC guidelines and criteria. We therefore conclude that this will provide reasonable assurance of diesel generator reliability through the design life of the plant.”

we interpreted this to include the day tank ("an auxiliary system of the diesel generator") such that the tank design and capacity was an acceptable alternative to the ANSI standard ("meeting the related NRC guidelines and criteria") and that there is reasonable assurance of diesel generator reliability through the design life of the plant.

RAI Question #2:

In the letter dated July 30, 2009, the following responses were provided:

- a. **Question #3: The calculations for fuel oil storage tanks assume a specific gravity of 0.83.**
- b. **Question #1: Fuel oil day tank setpoint calculations are based on a minimum fuel oil specific gravity that accounts for maximum EDG room design basis temperature.**

Provide a detailed explanation on how the specific gravity value of 0.83 (including any temperature measurements), is verified onsite. Also, describe how this specific gravity value is used in calculating the day tank volume at the maximum EDG room design basis temperature as indicated above in part b.

Response:

This question is best answered as two parts. The first part will provide a detailed explanation of how the specific gravity of 0.83 is verified on site and the second part will describe how this specific gravity value is used in calculating the day tank volume at maximum EDG room design basis temperatures.

1. The minimum specific gravity value of 0.83 is verified to be met during diesel fuel receipt and prior to off-loading of a tanker truck into the underground storage tank. Chemistry procedure CP/0/A/8600/027 "Sampling Diesel Fuel Oil Tank Trucks" is used to draw the sample(s). This procedure includes the requirements that the fuel must meet certain test parameters (including API gravity) prior to off-loading of the tanker. Once drawn, the sample is analyzed documenting results in procedure PT/0/B/4700/085 "Environmental Chemistry Periodic Surveillance for Emergency Diesel Generator New Fuel Oil". This procedure compares the fuel sample test results to the acceptance criteria, one of which is API gravity. In addition, current Technical Specification Bases 3.8.3.2 includes the following statement:

Verify that the new fuel oil has an absolute specific gravity at 60 / 60°F of ≥ 0.83 and ≤ 0.89 when tested in accordance with ASTM D1298 or an API gravity at 60°F of $\geq 27^\circ$ and $\leq 39^\circ$ when tested in accordance with ASTM D287.

PT/0/B/4700/085 "Environmental Chemistry Periodic Surveillance for Emergency Diesel Generator New Fuel Oil" uses the acceptance criteria which verifies API gravity at 60°F of $\geq 27^\circ$ and $\leq 39^\circ$ when tested in accordance with ASTM D287. This ensures the specific gravity of the fuel placed in the underground tank is greater than 0.83.

2. The calculations which determine the day tank level setpoints assume the fuel in the day tank has heated to the maximum assumed EDG room temperature and is therefore of a minimum specific gravity due to this elevated room temperature. The specific gravity value corresponding to this maximum room temperature, and used in the calculations is 0.805. The calculation then derives the required level of fuel in the tank based on the lower density. This is a conservative approach; the specific gravity value assumed is lower than empirical test data determined under these same conditions, therefore there is margin built into the analysis.

RAI Question #3:

Provide details on instrumentation and setpoint, including any uncertainties in the setpoint, used to verify the quantity of fuel oil in the day tank.

Response:

In our follow up phone call, November 10, 2009 to clarify your request, we understood you to say you were not interested in specific information related to the instrument and setpoint, but your focus was on the uncertainties factored into the setpoint calculation. Therefore, our response focus is on the uncertainties included in the setpoint calculation.

Instrument uncertainties calculated for the McGuire Nuclear Station EDG Fuel Oil Day Tanks are consistent with the intent of Instrumentation Society of America Standard ISA-RP67.04, Part II-1994, Methodologies for the Determination of Setpoints for Nuclear Safety Related Instrumentation. The loop uncertainty is based primarily on the Square-Root-Sum-of-the-Squares (SRSS) technique for combination of random-independent uncertain terms. Random-dependent and bias uncertainty terms were addressed through a combination of the SRSS and/or algebraic techniques. The following uncertainty terms were addressed in the calculation of the EDG Fuel Oil Day Tanks: instrument accuracy, repeatability, drift, resolution/readability, setting tolerance, calibration effects (including measurement & test equipment effects), environmental allowances, power supply effects, variations in process physical properties (density, water legs), static pressure effects and temperature effects. The setpoint change identified in the License Amendment Request incorporates these uncertainties.