December 28, 2007

Mr. J. R. Morris
Site Vice President
Catawba Nuclear Station
Duke Power Company LLC
4800 Concord Road
York, SC 29745

SUBJECT: CATAWBA NUCLEAR STATION, UNITS 1 AND 2, - GENERIC LETTER 2004-02, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED-WATER REACTORS," EXTENSION REQUEST APPROVAL (TAC NOS. MC4674, MC4675)

Dear Mr. Morris:

The Nuclear Regulatory Commission (NRC) staff has evaluated a request from Duke Power Company LLC, for an extension of the Catawba Nuclear Station, Units 1 and 2 (Catawba 1 and 2), sump clogging corrective actions due date of December 31, 2007. The December 31, 2007, date is included in Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors." The NRC staff's evaluation is enclosed.

The NRC staff has determined that for Catawba 1, it is acceptable to extend the due date for completion of corrective actions for GL 2004-02, as described in the enclosure, until restart from Catawba 1 refueling outage scheduled to begin May 19, 2008. The NRC staff has also determined that for Catawba 2, it is acceptable to extend the due date for completion of corrective actions for GL 2004-02, as described in the enclosure, until April 30, 2008.

Sincerely,

/RA/

John Stang, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-413 and 50-414

Enclosure:
As stated

cc w/encl: See next page

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CATAWBA NUCLEAR STATION , UNITS 1 AND 2

GSI-191/GL 2004-02 EXTENSION REQUEST

DOCKET NOS. 50-413 AND 50-414

In a letter dated December 7, 2007, (Agencywide Documents Access and Management System (ADAMS), Accession No. ML073460410), Duke Power LLC, (the licensee, Duke) requested an extension to the corrective action due date of December 31, 2007, stated in Nuclear Regulatory Commission (NRC) Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors," for the Catawba Nuclear Station, Units 1 and 2 (Catawba 1and 2)

Duke stated that it has taken actions, as described in its letters dated March 1, 2005 (ADAMS Accession No. ML050670465), September 1, 2005 (ADAMS Accession No. ML050670465), and updated the status of these actions in a letter dated June 28, 2006 (ADAMS Accession No. ML061870061), toward bringing Catawba Nuclear Station (Catawba), Units 1 and 2 into compliance with GL 2004-02. Duke plans to replace the original sump screens with substantially larger sump strainers of about 2400 square feet, with the Unit 2 strainer having already been replaced and the Unit 1 strainer to be replaced in the spring 2008 refueling outage (RFO), scheduled to begin no later than May 19, 2008. The installation of the strainer after the GL 2004-02 completion date of December 31, 2007, has been evaluated and approved by the NRC staff in an license amendment dated October 31, 2007 (ADAMS Accession No. ML072740062). The amendment allows Catawba Unit 1 to operate until the spring 2008 RFO, but requires installation of the strainer prior to startup from that outage. The replacement strainers are sized for the bounding debris load following a loss-of-coolant accident (LOCA) with some margin added.

Duke further stated that it is continuing the evaluation of the adequacy of the replacement strainers. The results of chemical effects testing conducted during October and November 2007 are being evaluated with preliminary conclusions expected by December 31, 2007. Preliminary vertical test loop and integrated prototype test results from tests already performed by Duke and its vendors have indicated that the strainers designed for Catawba 1 and 2 will perform their required functions. Duke stated that final sump strainer head loss/chemical effects testing reports would not be available to Duke until February 29, 2008; and, therefore, Duke requested until April 30, 2008, to complete the final engineering and design documentation and issue a GL 2004-02 supplemental response based on the final chemical effects testing information.

Duke stated in its December 7, 2007, letter that it, along with the pressurized water reactor (PWR) industry, is working on a downstream effects evaluation to determine whether any components downstream of sump strainers could be adversely affected by chemical effects. Duke anticipates that this work will be completed for Catawba 1and 2 by December 31, 2007.

The NRC staff notes that Duke stated that the original evaluation of Catawba downstream effects was completed using WCAP-16406-P, “Evaluation of Downstream Sump Debris Effects In Support of GSI-191,” Revision 0, prior to the issuance of WCAP-16406-P Revision 1 dated August 2007, with the NRC staff’s Safety Evaluation. The Duke request for extension makes no mention of performing an analysis with the updated version. The staff expects that an adequate ex-vessel downstream evaluation will be completed by Duke for Catawba 1and 2 by April 30, 2008.

Enclosure

Duke should either justify the original analysis or perform an analysis based on WCAP-16406-P, Revision 1, dated August 2007, with the NRC staff's Safety Evaluation.

In a December 19, 2007, conference call with the NRC Catawba Licensing Project Manager, Duke stated that the emergency core cooling system (ECCS) orifice plate replacement that was conducted during the Unit 1 fall 2006 RFO was not fully successful in allowing the throttle valves to open sufficiently to attain the required flow balance. Therefore, Duke stated that additional work on the orifices will be performed during the Unit 1 spring 2008 RFO scheduled to begin May 19, 2008.

The criteria for granting an extension to the due date of December 31, 2007, for completion of the GL 2004-02 corrective actions are stated in SECY-06-0078 (ADAMS Accession No. ML053620174. Specifically, an extension may be granted if:

- the licensee has a plant-specific technical/experimental plan with milestones and schedules to address outstanding technical issues with enough margin to account for uncertainties, and

- the licensee identifies mitigative measures to be put in place prior to December 31, 2007, and adequately describes how these mitigative measures will minimize the risk of degraded ECCS and containment spray system (CSS) functions during the extension period.

In regard to the first extension criterion, Catawba has a plant-specific technical/experimental plan, with milestones and schedules, to complete the GL 2004-02 corrective actions and modifications by April 30, 2008, or the spring 2008 RFO, as applicable. Specifically, the licensee has stated that it will:

1. Complete the evaluation of chemical effects testing and incorporate these results into the Catawba sump strainer analysis by April 30, 2008,
2. Evaluate downstream chemical effects by December 31, 2007,
3. Complete the installation of the new sump strainer on Unit 1 during the spring 2008 RFO (extension previously approved via license amendment), and
4. Complete an ECCS orifice plate modification to allow the valves to open to the proper position on Unit 1 during the spring 2008 RFO scheduled to begin May 19, 2008.

In addition, as stated above, the staff expects that an adequate ex-vessel downstream evaluation will be completed by Duke for Catawba Unit 1 and Unit 2 by April 30, 2008. Duke should either justify the original analysis or perform an analysis based on WCAP-16406-P, Revision 1, dated August 2007, with the NRC staff's Safety Evaluation.

In regard to the second extension criterion, the licensee has stated that several modifications, mitigative measures, compensatory measures, and/or favorable conditions are in effect at Catawba 1 and 2, minimizing the risk of degraded ECCS and CSS functions during the extension period. Duke stated that it has installed a new modular ECCS Sump Strainer in Catawba Unit 2. The Catawba 2 strainer was increased from the original sump screen area of 135 square feet to approximately 2400 square feet of strainer. (The Catawba 1 replacement strainer of 2400 square feet will be installed during the spring 2008 refueling outage, a substantial increase in surface are over the original 135 square foot screen.) In addition to providing a significant increase in strainer

surface area, the new strainer designs incorporate a reduction in strainer hole size from 0.125 inch nominal (original strainer) to less than 0.094 inch nominal (new strainer). Also, Duke stated that the placement of the new strainer provides for filtration of large debris as water passes through a tortuous path and openings in the crane wall. Further, Duke stated that Microtherm® insulation previously installed on the Unit 1 and Unit 2 reactor vessel heads has been removed and replaced with reflective metal insulation (RMI). (Microtherm® insulation has been demonstrated to be a problematic insulation from a strainer head loss perspective.) The licensee also stated that the Nukon insulation on the bottom bowls of the Unit 1 steam generators has been replaced with RMI to reduce the fibrous load on the strainer. Unit 2 already had RMI insulation in these locations, and the Catawba 2 ECCS orifice plates have been replaced to allow the ECCS throttle valves to open further to prevent clogging with debris.

The NRC staff believes that Duke has a reasonable plan for Catawba Units 1 and 2 that should result in the completion of final GSI-191 evaluations and modifications that ensure acceptable strainer function with adequate margin for uncertainties. Further, the NRC staff has concluded that Duke has put mitigation measures in place at Catawba Units 1 and 2 to adequately reduce risk for the requested 4-month extension period. It is, therefore, acceptable to extend the completion date for certain corrective actions for the issues discussed in GL 2004-02 (specifically, final strainer chemical effects testing evaluations and ex-vessel downstream effects evaluations as discussed above) until April 30, 2008. It is also acceptable for Duke to complete an ECCS orifice plate modification in Unit 1 during the spring 2008 RFO scheduled to begin May 19, 2008. Should Duke not commence the spring 2008 Catawba Unit 1 RFO within 30 days of May 19, 2008, Duke should provide the NRC staff with additional justification for the delay.

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Date: December 28, 2007

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