October 3, 2003

D. M. Jamil
Vice President
Catawba Nuclear Station
Duke Energy Corporation
4800 Concord Road
York, South Carolina 29745

SUBJECT: CATAWBA NUCLEAR STATION, UNIT 2 RE: SUMMARY OF NRC'S REVIEW OF STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT FOR THE FALL 2001 OUTAGE (TAC NO. MB3037)

Dear Mr. Jamil:

By letters dated October 24, 2001, January 17 and November 21, 2002, Duke Energy Corporation (the licensee) submitted reports and provided additional information summarizing the steam generator tube inspections performed during the end of cycle 11 (Fall 2001) refueling outage in accordance with the Catawba Nuclear Station, Unit 2 technical specifications (TS). The Nuclear Regulatory Commission (NRC) staff has completed its review of the licensee's inservice inspection reports and concludes that the licensee has provided the information required by the TS and that no additional follow-up is required at this time. A copy of the NRC staff's Safety Evaluation is enclosed.

Sincerely,

/RA/

Robert E. Martin, Senior Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-414

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO EVALUATION OF STEAM GENERATOR TUBE INSPECTION REPORT

DUKE ENERGY CORPORATION, ET AL

CATAWBA NUCLEAR STATION, UNIT 2

DOCKET NO. 50-414

By letters dated October 24, 2001, and January 17, 2002, Duke Power (Duke), the licensee for the Catawba Nuclear Station, Unit 2, submitted reports summarizing the steam generator tube inspections performed during the End of Cycle (EOC) 11 (Fall 2001) refueling outage. These reports were submitted in accordance with Catawba, Unit 2 technical specifications (TSs) sections 5.6.8.a. and 5.6.8.b. The Nuclear Regulatory Commission (NRC) staff developed a set of questions while reviewing these reports. Responses to these questions were submitted by the licensee in a letter dated November 21, 2002. A summary of the NRC's evaluation of the EOC 11 refueling outage inspection results is provided below.

Catawba Unit 2 has four Westinghouse Model D5 steam generators. The steam generators have full hydraulic expansion joints in the tubesheet and stainless steel tube support plates with quatrefoil holes. These steam generators were placed in service in 1986 and have thermally treated Alloy 600 tubing. According to the steam generator inspection summary reports, the licensee inspected between 1807 and 2210 tubes full length in each steam generator with a bobbin probe. In addition, the licensee inspected between 225 and 226 tubes partial length in each steam generator with a bobbin probe. The partial inspections were performed in the low row tubes and involved inspections from the tube end to the top support plate (the bobbin probe does not readily pass through the U-bend region due to the curvature of the bend). The licensee did not identify the inspections that were completed with specialized probes (e.g., rotating coil probes) in the summary reports. However, this information was provided in support of the conference call the NRC staff held with Duke during the Fall 2001 outage (See ADAMS Accession Number ML021780129 for a summary). The NRC staff requests that the licensee identify all probes (bobbin, rotating coil, etc.) used during inspections in future summary reports, including the extent of the inspections and the quantity of tubes inspected to aid the NRC staff in understanding the full extent of the inspections. As a result of these inspections no tubes were plugged.

The TSs also require the licensee to identify the location and percent of wall-thickness penetration for each indication of an imperfection. An imperfection is defined in the TSs (5.5.9.4.a.1) as an exception to the dimensions, finish or contour of a tube from that required by fabrication drawings or specifications. The licensee provided a listing of every tube (more than 5000) containing an imperfection. Due to the large number of tubes on the list and due to the multiple three letter codes associated with each tube, the NRC staff found it difficult to determine, based on this listing, what type of imperfections were being found and left in-service. In response to NRC questions, the licensee provided a discussion on this subject. Some of the imperfections being seen and left in-service are dents, wear marks and manufacturing buff

marks (MBMs). The licensee indicated that all dents were caused by manufacturing activities and that none of the dents are corrosion induced dents (i.e., service-induced). The licensee's report identified multiple "VOL" (volumetric) indications that were left in-service. In response to a NRC question, the licensee indicated that "VOL" would be a signal indicative of volumetric imperfections such as MBMs, intergranular attack (IGA) and wear. The licensee also stated that the site-specific eddy current guidelines indicate that "VOL" calls are below the plugging limit. The NRC staff questioned whether it would be appropriate to use the VOL code for IGA indications since industry has historically had difficulty reliably depth-sizing IGA. However, the NRC staff does not see this as a significant issue at this time because the licensee indicated that IGA has not yet been identified in the Catawba, Unit 2 steam generators. The licensee has identified wear marks at the tube-to-antivibration bar intersections and these are left in-service if their depth does not exceed the TS plugging limit (i.e., 40 percent throughwall). In addition, the licensee occasionally identifies wear from foreign objects. The licensee stated that manufacturing burnish marks are routinely observed and left in-service. In future summary reports, the NRC staff would find it beneficial if the licensee provided a summary of the types of imperfections being seen and left in-service in addition to the individual tube listing, since the individual tube listing does not make this clear in all cases (e.g., the use of "VOL" for multiple types of imperfections).

Based on review of the information provided by the licensee, the NRC staff concludes that the information the licensee was required to submit by their TSs was provided and that no additional follow-up is required at this time. However, the NRC staff made two observations as follows:

- In future summary reports, the NRC staff requests the licensee to identify all probes (bobbin, rotating coil, etc.) used during inspections, the extent of the inspections and the quantity of tubes inspected to aid the NRC staff in understanding the full extent of inspections.

- In future summary reports, the NRC staff would find it beneficial if the licensee provided a summary of the types of imperfections being seen and left in service in addition to the individual tube listing, since the individual tube listing does not make this clear in all cases (e.g., the use of "VOL" for multiple types of imperfections).

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Date: October 6, 2003

Catawba Nuclear Station

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