October 29, 2002

Mr. William R. McCollum, Jr.
Vice President, Oconee Site
Duke Energy Corporation
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: SUMMARY OF CONFERENCE CALL WITH DUKE ENERGY COMPANY REGARDING THE 2002 STEAM GENERATOR INSPECTION RESULTS AT OCONEE NUCLEAR STATION, UNIT 1 (TAC NO. MB4458)

Dear Mr. McCollum:

On March 14, 19, and 25, and April 5, 17, and 22, 2002, your staff and our staff participated in conference calls regarding the steam generator inspection activities at Oconee Nuclear Station, Unit 1. Enclosure 1 is a brief summary of the calls, and Enclosures 2 and 3 contain material your staff sent us in preparation for the calls.

Based on the information discussed during the calls, we did not identify any issues requiring further discussion.

Sincerely,

/RA/

Leonard N. Olshan, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-269

Enclosures:
1. Summary of Calls with Duke Energy Company Regarding 2002 Steam Generator Results at Oconee Nuclear Station, Unit 1
2. ONS 1EOC-20 Steam Generator Inspection Plans
3. ONS-1B Sever of Tube 78-124

cc w/encls: See next page

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DATE	10/25/02	10/24/02	10/25/02

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SUMMARY OF CONFERENCE CALLS

WITH

DUKE ENERGY COMPANY

REGARDING 2002 STEAM GENERATOR INSPECTION RESULTS

AT OCONEE NUCLEAR STATION, UNIT 1

The NRC staff participated in conference calls with Duke Energy Company (the licensee) on March 14, 19, and 25, and April 5, 17, and 22, 2002, to discuss the steam generator (SG) inspection results from the 20th refueling outage at Oconee Nuclear Station, Unit 1 (Oconee 1).

During the calls prior to and on April 17, 2002, the NRC staff and the licensee discussed the licensee's actions in response to NRC Information Notice 2002-02 (IN 2002-02), "Recent Experience with Plugged Steam Generator Tubes" (ADAMS Accession Number ML013480327). As discussed in the information notice, certain plugged tubes may be susceptible to severance as a result of tube vibration and other factors (e.g., tube swelling). The scope of the licensee's inspection is included in the materials provided by the licensee in support of these calls.

On April 22, 2002, the NRC and the licensee discussed the steam generator tube inspection scope, the eddy current data analysis results, tube plugging and repair plans, and in-situ pressure testing. At the time of the call, the licensee had already completed the inspection. Details of the inspection results are contained in the attached inspection summary that the licensee provided in support of this call. Additional clarifying information provided during the call is provided below.

The inspection scope included the following:

- 100% of tubes in both SGs by bobbin probes
- 100% of sleeved tubes in both SGs by bobbin probes
- Lane and wedge areas with two rows around the sleeved tubes with plus point probes
- 100% of the upper tube sheet with plus point probes
- 100% of re-rolls in the upper tube sheet with plus point probes
- 100% of I-600 plugs with plus point probes
- 100% of the sleeve upper and lower rolls
- 100% of tubes in the kidney region (sludge piles) with plus point probes
- Rotating pancake coil (RPC) for areas of special interest, including 100% of bobbin indications and 100% of all dents regardless of size or location

Prior to shutdown for the inspection, Oconee 1 was experiencing a 1 to 2 gallons per day primary-to-secondary leak. However, no secondary side pressure tests were conducted during the outage.

During the April 22, 2002, phone call, the licensee discussed the location and size of significant indications detected during the outage inspection that will be included in the 90-day report

issued after the outage. The licensee discussed two indications detected at dents, one was axial in nature and the other was circumferential. Both indications initiated from the inside diameter of the tube. The licensee stated that the axial indication was considered small. The licensee also discussed indications found in the freespan region. The freespan cracks were axial in nature and initiated from the outside diameter.

Six tubes were in-situ pressure tested during the 20th refueling outage. These tubes contained axial freespan primary water stress corrosion cracking indications located at dents, axial outside diameter stress corrosion cracking/intergranular attack indications, and volumetric indications. The licensee's in-situ pressure-testing criteria used crack length and indication voltage to determine whether an indication fell within a "required zone" for testing. According to the licensee's screening criteria, only some of these indications required testing up to the structural integrity limit of three times the normal operating differential pressure ($3\triangle P$). During these tests, all tubes maintained leakage integrity, and all tubes chosen for testing up to the $3\triangle P$ limit maintained structural integrity. The graphical representation of the in-situ pressure-testing criteria suggests that a flaw with a relatively large crack length but low voltage would not fall in the "required zone" of testing. The licensee indicated that it historically has in-situ pressure tested selected tubes even though the selection criteria indicated the licensee did not need to test them.

As a result of inspecting plugged tubes in response to the information contained in Information Notice 2002-02, the licensee identified a wear scar on a plugged tube (B77-123). Because this indication was not present when the tube was plugged in 1991, the licensee performed a secondary side visual inspection. This inspection led to the discovery of a circumferentially severed plugged tube (B78-124) next to the affected (B77-123) tube. Tube B78-124 was severed at the secondary face of the lower tube sheet. The licensee performed in-situ pressure tests on the tubes with wear scars and reported that the test results were satisfactory, indicating that the severed tube had not significantly impacted the integrity of its neighboring tubes (all of which were plugged during prior outages).

The licensee removed portions of several of the affected tubes for destructive examination, including the severed tube. The destructive examinations, although inconclusive, indicated that the tube severed as a result of intergranular attack originating from the inside diameter of the tube. There were no obvious indications of fatigue or significant ductile tearing. The severed tube was 1 of 12 tubes instrumented with thermocouples during the first cycle of operation (early 1970s). The tubes in which these thermocouples were installed were plugged at one end while the other end remained open. Following the first cycle of operation, the thermocouples were removed and the tubes were plugged at the open end. The licensee speculated that the instrumentation (thermocouple) installed for the first cycle of operation is one of the causal factors. After the completion of the licensee's root cause evaluation, the NRC staff issued an information notice that summarized the finding (Refer to IN 2002-02, Supp. 1.).

At the conclusion of the April 22, 2002, call, the NRC staff requested that the licensee contact the NRC if the licensee identifies anything significantly different from that discussed during the call. The NRC staff also expressed an interest in receiving an update on the licensee's metallurgical analysis of the severed plugged tube and on the final root cause determination.

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