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FILE NUMBER:

TO: Mr. Benard C. Rusche

FROM: Duke Power Company
Charlotte, North Carolina
Mr. William O. Parker, Jr.

DATE OF DOCUMENT: 11/30/76

DATE RECEIVED: 12/6/76

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DESCRIPTION

Ltr/ w/attached....notorized 11/30/76.... re our 9/21/76 ltr....Amdt. to ol/change to Appendix A tech specs....concerning operability and inservice inspections of Steam Generators.

(10-P)

PLANT NAME:
Oconee Units 1-2-3

ENCLOSURE

ACKNOWLEDGED

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DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

November 30, 1976

Mr. Benard C. Rusche
Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. A. Schwencer

Re: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Mr. Rusche:

Your letter of September 21, 1976 requested that we submit a request for a license amendment for the Oconee Nuclear Station to incorporate requirements concerning the operability and inservice inspections of steam generators. Model Technical Specifications were provided which were to be appropriately adapted to the specific format and number of steam generators in the Oconee units. In response to this request and pursuant to the provisions of 10CFR50, §50.90, the attached amendment to Appendix A to Facility Operating Licenses DPR-38, -47, and -55 is requested.

The attached specification for the inservice inspection of the Oconee once-through steam generators (OTSG) is consistent with the intent of the model specifications in endeavoring to assure the integrity of the steam generators. As described, the two OTSG's per Oconee unit will normally be inspected on an alternating schedule. The initial sample of each inspection will consist of 6 percent of the total tubes per unit. Tube plugging and subsequent samples, if necessary, will be taken dependent upon the results of the preceding sample. In this manner, adequate assurance of the satisfactory condition of the OTSG's will be obtained. This specification differs from the model specification in that complete steam generator tube inspection is not considered necessary upon a C-3 inspection result. The steam generator tube sample size, corrective actions and subsequent inspection frequencies proposed in this specification are consistent with the requirements of Section XI of the ASME Code, and where feasible, incorporate the principles of Regulatory Guide 1.83, Rev. 1, "Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes."

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Although primary-to-secondary leakage through steam generators may be indicative of a loss of tube strength or pressure boundary integrity, there is no known correlation between leakage rate and tube strength. The limitation of 1 gpm leakage through the steam generator tubes is considered to be overly restrictive in the model technical specification. Adequate assurance of safe operation will be provided by adhering to the present Oconee Technical Specifications 3.1-6, "Leakage," and 3.13, "Secondary System Activity."

Experience at Oconee with four inservice inspections of the steam generators (two for Oconee 1 and one each for Oconee 2 and 3) have revealed essentially no measurable wall thinning. Two small steam generator leaks have been experienced (see Reportable Occurrence Reports RO-269/76-17 and RO-287/76-10) which are considered to have been the result of isolated manufacturing defects. For this reason, the requirement to perform steam generator inspections for isolated manufacturing defects, not related to wall thinning, have not been included.

The attached specification is considered to provide adequate assurance of continued steam generator integrity while permitting maximum operating flexibility for the Oconee units.

Very truly yours,

William O. Parker, Jr.

MST:vr

Attachment

WILLIAM O. PARKER, JR., being duly sworn, states that he is Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this request for amendment of the Oconee Nuclear Station Technical Specifications, Appendix A to Facility Operating Licenses DPR-38, -47 and DPR-55; and that all statements and matters set forth therein are true and correct to the best of his knowledge.

William O. Parker, Jr.

William O. Parker, Jr., Vice President

ATTEST:

Lewis F. Camp, Jr.

Lewis F. Camp, Jr.
Assistant Secretary
(Seal)

Subscribed and sworn to before me this 30th day of November, 1976.

Edna B. Farmer

Notary Public
(Notarial Seal)

My Commission Expires:

October 24, 1977

4.17 STEAM GENERATORS

Applicability

Applies to inservice inspection surveillance of steam generator tubes.

Objective

To provide surveillance inspection requirements for steam generator tubes in order to assure steam generator operability.

Specification

4.17.1 Steam Generator Sample Selection and Inspection

a. The inservice Inspection may be limited to one steam generator on a rotating schedule encompassing 6% of the tubes in the steam generator if the results of previous inspections indicate that both steam generators are performing in a like manner. If the operating conditions in one steam generator are found to be more severe than in the other steam generator, the sample sequence shall be modified to inspect the most severe conditions. If both steam generators are inspected, the sample size shall encompass at least 3% of the total tubes in both steam generators.

b. The steam generator tube sample size, inspection result classification, and the corresponding action required for each sample inspection shall be as specified in Table 4.17-1. Sample inspections shall be repeated as necessary for each steam generator inspected until sample results fall into Category C-1 as defined below. The inservice inspection of steam generator tubes shall be performed at the frequencies given in Specification 4.17.2 and the inspected tubes shall be categorized per the criteria of Specification 4.17.3. The tubes selected for inspection shall be selected on a random basis except where experience indicates critical areas to be inspected. In this case, at least 50% of the tubes inspected shall be from these critical areas.

c. The results of each sample inspection shall be classified into one of the following three categories:

Category	Inspection Results
C-1	Less than 5% of the total tubes inspected are degraded tubes and none of the inspected tubes are defective.
C-2	One or more tubes, but not more than 1% of the total tubes inspected are defective, or between 5% and 10% of the total tubes inspected are degraded tubes.
C-3	More than 10% of the total tubes inspected are degraded tubes or more than 1% of the inspected tubes are defective.

NOTE: In all inspections, previously degraded tubes must exhibit significant (>10%) further wall penetrations to be included in the above percentage calculations.

4.17.2 Inspection Frequencies

The above required inservice inspections of steam generator tubes shall be performed at the following frequencies:

a. Scheduled inspection shall be performed at intervals of not less than 12 nor more than 24 calendar months after the previous inspection. If two consecutive inspections result in all inspection results falling into the C-1 category or if two consecutive inspections demonstrate that previously observed degradation has not continued and no additional degradation has occurred, the inspection interval may be extended to a maximum of 40 months.

b. If the inservice inspection of a steam generator conducted in accordance with Table 4.17-1 requires a third sample inspection whose results fall in Category C-3, the inspection interval shall be decreased to 20 months. This decrease in inspection interval shall apply until a subsequent inspection demonstrates that a third sample inspection is not required.

c. In the event that primary-to-secondary tube leakage (not including leaks originating from tube sheet welds) exceeding the limits of Specification 3.1.6.1 is experienced due to tube defects, 3% of the tubes in the steam generator where the leakage occurred, shall be inspected prior to the resumption of service and subsequent actions shall be performed in accordance with Table 4.17-1.

4.17.3 Definitions

As used in this Specification:

a. Imperfection means an exception to the dimensions, finish or contour of a tube from that required by fabrication drawings or specifications. Testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.

b. Degradation means a service-induced cracking, wastage, wear or general corrosion occurring on either inside or outside of a tube.

c. Degraded Tube means a tube containing imperfections $\geq$ 20% of the nominal wall thickness caused by degradation.

d. % Degradation means the percentage of the tube wall thickness affected or removed by degradation.

e. Defect means an imperfection of such severity that it equals or exceeds the plugging limit. A tube containing a defect is defective. Any tube which does not permit inspection due to service induced phenomena shall be deemed a defective tube. This definition shall not be applicable whenever a tube defect(s) is determined to be an isolated defect (e.g., random manufacturing deficiency) and not indicative of unusual steam generator tube degradation. For purposes of inspection and categorization per Specifications 4.17.1 and 4.17.2, such defects shall not be included.

f. Plugging Limit means the imperfection depth at or beyond which the tube shall be removed from service because it may become unserviceable prior to the next inspection and is equal to 40% of the nominal tube wall thickness unless higher limits are shown acceptable by analysis.

g. Tube Inspection means an inspection of that portion of the tube located between the lower surface of the upper tube sheet and the upper surface of the lower tube sheet.

4.17.4 Reports

a. Following each inservice inspection of steam generator tubes, the number of tubes plugged in each steam generator shall be reported to the Director, Office of Inspection and Enforcement, Region II, within 15 days.

b. The complete results of the steam generator tube inservice inspection shall be included in the applicable unit inservice inspection report or in the Annual Operating Report for the period in which this inspection was completed. This report shall include:

1. Number and extent of tubes inspected.

2. Location and percent of wall-thickness penetration for each indication of an imperfection.

3. Identification of tubes plugged.

c. Results of steam generator tube inspections which fall into Category C-3 and require prompt notification of the Director, Office of Inspection and Enforcement, Region II, shall be reported pursuant to Specification 6.6.2.1(a) prior to resumption of unit operation. The written followup of this report shall provide a description of investigations conducted to determine cause of the tube degradation and corrective measures taken to prevent recurrence.

Bases

The surveillance requirements for inspection of the steam generator tubes assure that the structural integrity of this portion of the RCS will be maintained. The surveillance requirements of steam generator tubes is based on a modification of Regulatory Guide 1.83, Revision 1 and Section XI of the ASME Code. Inservice inspection of steam generator tubing is essential in order to maintain surveillance of the conditions of the tubes in the event that there is evidence of mechanical damage or progressive degradation due to design, manufacturing errors, or inservice conditions that lead to corrosion. Inservice inspection of steam generator tubing also provides a means of characterizing the nature and cause of any tube degradation so that corrective measures can be taken.

The unit is expected to be operated in a manner such that the secondary coolant will be maintained within those chemistry limits found to result in negligible corrosion of the steam generator tubes. If the secondary

coolant chemistry is not maintained within these chemistry limits, localized corrosion may likely result in stress corrosion cracking. The extent of degradation during plant operation would be limited by the allowable steam generator tube leakage between the primary coolant system and the secondary coolant system.

Wastage-type defects are unlikely with AVT chemistry treatment of the secondary coolant. However, even if a defect should develop in service, it will be found during scheduled inservice steam generator tube examinations. Plugging will be required for defective tubes. Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation that has penetrated 20% of the original tube wall thickness.

Whenever the results of any steam generator tubing inservice inspection fall into Category C-3, these results will be promptly reported to the Commission prior to resumption of plant operation.

Table 4.17-1

STEAM GENERATOR TUBE INSPECTION

SAMPLE INSPECTION		
Sample Size	**Result**	**Action Required**
6% of the tubes in the S.G., inspected or 3% of the total number of tubes in both steam generators if both steam generators are inspected.	C-1	None
	C-2	Plug defective tubes and inspect additional 3% of the tubes in this S.G.
	C-3	Plug defective tubes and inspect additional 3% of the tubes in both steam generators. Notify of NRC pursuant to Specification 6.6.2.1.(a).

6.6.2 Non-Routine Reports

6.6.2.1 Reportable Occurrences

a. Prompt Notification with Written Followup

The types of events listed below shall be reported within 24 hours of discovery (by telephone, telegraph, mailgram, or facsimile transmission to the Director, Office of Inspection and Enforcement, Region II, or his designate) with a written followup report within two weeks to the Director, Office of Inspection and Enforcement, Region II (copy to the Director, Office of Management Information and Program Control).

(1) Failure of the Reactor Protective System to trip, as required, when a monitored parameter reaches the setpoint specified as the limiting safety system setting in the Technical Specifications.

(2) Operation of the unit or affected systems when any parameter or operation subject to a limiting condition for operation is less conservative than the least conservative aspect of the limiting condition for operation established in the Technical Specifications.

(3) Abnormal degradation discovered in fuel cladding, reactor coolant pressure boundary, primary containment, or steam generator tubes as indicated in Specification 4.17.

(4) Reactivity anomalies involving disagreement with predicted value of reactivity balance under steady-state conditions greater than or equal to 1% $\Delta k/k$; a calculated reactivity balance indicating shutdown margin less conservative than specified in the technical specifications; short-term reactivity increases that correspond to a reactor period of less than 5 seconds, or if subcritical, an unplanned reactivity insertion of more than 0.5% $\Delta k/k$; or any unplanned criticality.

(5) Failure or malfunction of one or more components which prevents or could prevent, by itself, the fulfillment of the functional requirements of systems required to cope with accidents analyzed in the Safety Analysis Report.

(6) Personnel error or procedural inadequacy which prevents or could prevent, by itself, the fulfillment of the functional requirements of systems required to cope with accidents analyzed in the Safety Analysis Report.

(7) Conditions arising from natural or man-made events that, as a direct result of the event, require unit shutdown, operation of safety systems, or other protective measures required by Technical Specifications.

(8) Errors discovered in the transient or accident analyses or in the methods used for such analyses as described in the Safety Analysis Report or in the bases for the Technical Specifications that have or could have permitted reactor operation in a manner less conservative than assumed in the analyses.

6.6.3 Special Reports

Special reports shall be submitted to the Director, Office of Inspection and Enforcement, Region II, within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification:

a. Electrical System Degradation, Specification 3.7.
b. Excessive Liquid Waste Releases, Specification 3.9.
c. Excessive Gaseous Waste Releases, Specification 3.10.
d. Inservice Inspection, Specification 4.2.4.
e. Reactor Vessel Specimen Surveillance, Specification 4.2.8.
f. Containment Integrated Leak Rate Test, Specification 4.4.1.1.7.
g. Reactor Building Annual Inspection Report, Specification 4.4.1.4.
h. Tendon Stress Surveillance, Specification 4.4.2.2.
i. End Anchorage Concrete Surveillance, Specification 4.4.2.3.
j. Liner Plate Surveillance, Specification 4.4.2.4.
k. Single Loop Operation, Specification 3.1.8.
l. Fuel Surveillance Program, Specification 4.13.
m. Steam Generator Tube Inservice Inspection Program, Specification 4.17