

ATTACHMENT B

Duke Power Company

Oconee Nuclear Station

Proposed Technical Specification Revision

Pages 4.17-1 thru 4.17-6

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4.17 STEAM GENERATOR TUBING SURVEILLANCE

Applicability

Applies to the surveillance of tubing of each steam generator.

Objective

To ensure integrity of the steam generator tubing through a defined inservice surveillance program, and to minimize exposure of personnel to radiation during performance of the surveillance program.

Specification

4.17.1 Examination methods

Inservice inspection of steam generator tubing shall include non-destructive examination by eddy-current testing or other equivalent techniques. The inspection equipment shall provide a sensitivity that will detect defects with a penetration of 20 percent or more of the minimum allowable as-manufactured tube wall thickness.

4.17.2 Acceptance Criteria

The steam generator shall be considered operable after completion of the specified actions. All tubes examined exceeding the repair limit shall be repaired by sleeving or removed from service (e.g., plugged, stabilized).

4.17.3 Selection and Testing

The steam generator tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 4.17.1. The inservice inspection of steam generator tubes shall be performed at the frequencies specified in Specification 4.17.4 and the inspected tubes shall be verified acceptable per Specification 4.17.5. The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in both steam generators, with one or both steam generators being inspected. The tubes selected for these inspections shall be selected on a random basis except:

- a. The first sample inspection during each inservice inspection of each steam generator shall include:
 1. All tubes that previously had detectable wall penetrations (>20%) and have not been plugged or sleeve repaired in the affected area.
 2. At least 50% of the tubes inspected shall be in those areas where experience has indicated potential problems.
 3. A tube adjacent to any selected tube which does not permit passage of the eddy current probe for tube inspection.
- b. Tubes in the following Group(s) may be excluded from the first sample if all tubes in a Group in both OTSG are inspected. No credit will be taken for these tubes in meeting minimum sample size requirements.

1. Group A-1: Tubes within one, two, or three rows of the open inspection lane.
- c. The tubes selected as the second and third samples (if required by Table 4.17.1) during each inservice inspection may be subjected to less than a full tube inspection provided:
1. The tubes selected for these samples include the tubes from those areas of the tubesheet array where tubes with imperfections were previously found.
 2. The inspections include those portions of the tubes where imperfections were previously found.

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

<u>Category</u>	<u>Inspection Results</u>
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 no 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.

- NOTES:
- (1) In all inspections, previously degraded tubes must exhibit significant (>10%) further wall penetrations to be included in the above percentage calculations.
 - (2) Where special inspections are performed pursuant to 4.17.3.b, defective or degraded tubes found as a result of the inspection shall be included in determining the Inspection Results Category for that special inspection but need not be included in determining the Inspection Results Category for the general steam generator inspection, unless the mechanism of degradation is random in nature.

4.17.4 Inspection Intervals

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

- a. Inservice inspections shall be performed at intervals of not less than 12 nor more than 24 calendar months after the previous inspection. If the results of two consecutive inspections following service under all volatile treatment (AVT) conditions fall 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 results of the inservice inspection of a steam generator performed in accordance with Table 4.17-1 at 40 month intervals fall in Category C.3, subsequent inservice inspections shall be performed at intervals of not less than 10 months nor more than one fuel cycle after the previous inspection. The increase in inspection frequency shall apply until a subsequent inspection meets the conditions specified in 4.17.4.a and the interval can be extended to a maximum of 40 months.
- c. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 4.17-1 during the shutdown subsequent to any of the following conditions:
 - 1. A seismic occurrence greater than the Operating Basis Earthquake,
 - 2. A loss-of-coolant accident requiring actuation of the engineered safeguards, or
 - 3. A main steam line or feedwater line break.
- d. After primary to secondary leakage in excess of the limits of Specification 3.1.6, an inspection of the affected steam generator will be performed in accordance with the following criteria:
 - 1. If the leaking tube is in a Group as defined in Section 4.17.3.b, all of the tubes in this Group in this steam generator will be inspected. If the results of this inspection fall into the C-3 category, additional inspections will be performed in the same Group in the other steam generator.
 - 2. If the leaking tube is not in a Group as defined in 4.17.4.d.1, then an inspection will be performed on the affected steam generator in accordance with Table 4.17-1 with an initial inspection sample size of 6% of the tubes in the affected steam generator.

4.17.5 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. Eddy-current testing indications below 20% of the nominal tube or sleeve wall thickness, if detectable, may be considered as imperfections.
- b. Degradation means a service-induced cracking, wastage, wear or general corrosion occurring on either the inside or outside of a tube or a sleeve.
- c. Degraded Tube means a tube or a sleeve containing imperfections \geq 20% of the nominal wall thickness caused by degradation.

- d. % Degradation means the percentage of the tube or sleeve wall thickness affected or removed by degradation.
- e. Defect means an imperfection of such severity that it exceeds the repair limit. A tube or sleeve containing a defect is defective.
- f. Repair Limit means the imperfection depth beyond which the tube shall be either removed from service by plugging or repaired by sleeving because it may become unserviceable prior to the next inspection; it is equal to 40% of the nominal tube or sleeve wall thickness.
- g. Unserviceable describes the condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operating Basis Earthquake, a loss-of coolant accident, or a steam line or feedwater line break as specified in Specification 4.17.4.
- h. Tube Inspection means an inspection of the steam generator tube from the point of entry completely to the point of exit.

4.17.6 Reports

- a. The number of tubes plugged or repaired in each steam generator shall be reported to the Director, Office of Inspection and Enforcement, Region II, within 30 days following the completion of the plugging or repair procedure.
- b. The results of the steam generator tube inservice inspection shall be reported to the NRC within 3 months following completion of the inspection. This report shall include:
 - 1. Number and extent of tubes inspected.
 - 2. Location and percent of wall-thickness penetration for each indication of a degraded tube.
 - 3. Identification of tubes plugged or repaired.
- c. Results of steam generator tube inspections which fall into Category C-3 and require prompt notification of the NRC shall be reported pursuant to Specification 6.6.2.1.a prior to resumption of plant 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 program of periodic inservice inspection of steam generators provides the means to monitor the integrity of the tubing and to maintain surveillance in the event there is evidence of mechanical damage or progressive deterioration due to design, manufacturing errors, or operating conditions. Inservice inspection of the steam generator tubing also provides a means of characterizing the nature and cause of any tube degradation so that corrective measures may be taken.

Repair or removal from service will be required for any tube with service-induced metal loss in excess of 40% of the tube or sleeve nominal wall thickness or with a through wall crack. Additional corrective actions may be required to stabilize a circumferentially cracked tube.

The initial sample of tubes inspected in a steam generator includes tubes from three groups. First, lane tubes are inspected to assure their integrity. Second, all other inservice tubes with degradation, inspected in previous inspections, are inspected to assure tube integrity and determine degradation growth, if any. Third, a random sample of 3% of the total number of tubes in both steam generators is inspected. The results of the latter inspection dictate the extent of further examinations.

An objective of this Specification is to provide an inspection plan which will insure, with a high degree of confidence, that no more than 30 defective tubes will remain in a steam generator after an initial C-3 category inspection.

Following an 18% random inspection (C-3 category inspection) an unaffected area is identified. The unaffected area will be logically and consistently defined based on generator design, defect location and characteristics. The criteria for accepting an area as unaffected depend on the number of defects found in the sample inspected in that area and are established such that there is a 0.05 or smaller probability of accepting the area as unaffected if it contains 30 or more defective tubes.

Experience with Babcock and Wilcox steam generators has indicated that tubes near the open inspection lane are susceptible for forms of degradation unique to that area. Therefore, tubes within one, two, or three rows of the inspection lane have been defined as a special group. If all of these tubes are inspected in both steam generators, no credit will be taken in meeting minimum sample size requirements and the results of inspection will not be used in classifying the results of the general inspection into C-1, C-2 or C-3 categories, unless the mechanism of tube degradation is random in nature. Random degradation mechanisms are those which based on location, steam generator design and operation, and operating experience cannot logically and consistently be shown as limited to a local area.

The affected area will be 100% inspected to assure all defective tubes therein are identified and either removed from service or repaired by sleeving. NRC concurrence in this determination is required prior to completion of the inspection.

Degraded steam generator tubes can be repaired by the installation of sleeves which span the area of degradation and serve as a replacement pressure boundary for the degraded portion of the tube, thus permitting the tube to remain in service.

This inspection plan enables exposures to be maintained as low as reasonably achievable to the personnel involved in the inspection and assures that generator areas with significant numbers of degraded tubes are adequately inspected.

TABLE 4.17-1
STEAM GENERATOR TUBE INSPECTION

1st SAMPLE INSPECTION			2nd SAMPLE INSPECTION		3rd SAMPLE INSPECTION	
SAMPLE SIZE	RESULT	ACTION REQUIRED	RESULT	ACTION	RESULT	ACTION
A minimum of S Tubes per S.G. (1)	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug or repair defective tubes and inspect additional 2S tubes in	C-1	None	N/A	
			C-2	Plug or repair defective tubes and inspect additional 4S tubes in this S.G.	C-1	N/A
					C-2	Plug or repair defective tubes
					C-3	Plug or repair defective tubes and perform action for C-3 result of 1st Sample
			C-3	Plug or repair defective tubes and perform actions for C-3 results of 1st Sample	N/A	N/A
	C-3	Inspect 6S tubes in this S.G., plug or repair defective tubes and inspect 2S tubes in the other S.G. Perform follow-on inspections in the other S.G. in accordance with results of the above inspection as applied to Table 4.17.1	C-1	N/A	N/A	N/A
			C-2	N/A	N/A	N/A
			C-3 (2)	(a) if defects can be localized to an affected area, inspect all tubes in affected area and plug or repair defective tubes.	C-1	N/A
					C-2	N/A
					C-3	N/A
				(b) If defects cannot be localized to an affected area, inspect all tubes in this S.G. and plug or repair defectives tubes.		

Notes: (1) $S = 3(N/n)\%$ Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection

(2) Affected and unaffected areas shall be determined in the manner described in the Bases of this specification. The definition of these areas will be reported to the NRC when they are determined.

AFFIDAVIT OF JAMES H. TAYLOR

- A. My name is James H. Taylor. I am Manager of Licensing Services in the Nuclear Power Division of Babcock & Wilcox, and as such I am authorized to execute this Affidavit.
- B. I am familiar with the criteria applied by Babcock & Wilcox to determine whether certain information of Babcock & Wilcox is proprietary and I am familiar with the procedures established within Babcock & Wilcox, particularly the Nuclear Power Division, to ensure the proper application of these criteria.
- C. In determining whether a Babcock & Wilcox document is to be classified as proprietary information, an initial determination is made by the Unit Manager, who is responsible for originating the document, as to whether it falls within the criteria set forth in Paragraph D hereof. If the information falls within any one of these criteria, it is classified as proprietary by the originating Unit Manager. This initial determination is reviewed by the cognizant Section Manager. If the document is designated as proprietary, it is reviewed again by Licensing personnel and other management within Nuclear Power Division as designated by the Manager of Licensing Services to assure that the regulatory requirements of 10 CFR Section 2.790 are met.
- D. The following information is provided to demonstrate that the provisions of 10 CFR Section 2.790 of the Commission's regulations have been considered:
- (i) The information has been held in confidence by the Babcock & Wilcox Company. Copies of the document are clearly identified as proprietary. In addition, whenever Babcock & Wilcox transmits the information to a

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customer, customer's agent, potential customer or regulatory agency, the transmittal requests the recipient to hold the information as proprietary. Also, in order to strictly limit any potential or actual customer's use of proprietary information, the following provision is included in all proposals submitted by Babcock & Wilcox, and an applicable version of the proprietary provision is included in all of Babcock & Wilcox's contracts:

"Purchaser may retain Company's proposal for use in connection with any contract resulting therefrom, and, for that purpose, make such copies thereof as may be necessary. Any proprietary information concerning Company's or its Supplier's products or manufacturing processes which is so designated by Company or its Suppliers and disclosed to Purchaser incident to the performance of such contract shall remain the property of Company or its Suppliers and is disclosed in confidence, and Purchaser shall not publish or otherwise disclose it to others without the written approval of Company, and no rights, implied or otherwise, are granted to produce or have produced any products or to practice or cause to be practiced any manufacturing processes covered thereby.

Notwithstanding the above, Purchaser may provide the NRC or any other regulatory agency with any such proprietary information as the NRC or such other agency may require; provided, however, that Purchaser shall first give Company written notice of such proposed disclosure and Company shall have the right to amend such proprietary information so as to make it non-proprietary. In the event that Company cannot amend such proprietary information, Purchaser shall, prior

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to disclosing such information, use its best efforts to obtain a commitment from NRC or such other agency to have such information withheld from public inspection.

Company shall be given the right to participate in pursuit of such confidential treatment."

(ii) The following criteria are customarily applied by Babcock & Wilcox in a rational decision process to determine whether the information should be classified as proprietary. Information may be classified as proprietary if one or more of the following criteria are met:

- a. Information reveals cost or price information, commercial strategies, production capabilities, or budget levels of Babcock & Wilcox, its customers or suppliers.
- b. The information reveals data or material concerning Babcock & Wilcox research or development plans or programs of present or potential competitive advantage to Babcock & Wilcox.
- c. The use of the information by a competitor would decrease his expenditures, in time or resources, in designing, producing or marketing a similar product.
- d. The information consists of test data or other similar data concerning a process, method or component, the application of which results in a competitive advantage to Babcock & Wilcox.

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- e. The information reveals special aspects of a process, method, component or the like, the exclusive use of which results in a competitive advantage to Babcock & Wilcox.
- f. The information contains ideas for which patent protection may be sought.

The document(s) listed on Exhibit "A", which is attached hereto and made a part hereof, has been evaluated in accordance with normal Babcock & Wilcox procedures with respect to classification and has been found to contain information which falls within one or more of the criteria enumerated above. Exhibit "B", which is attached hereto and made a part hereof, specifically identifies the criteria applicable to the document(s) listed in Exhibit "A".

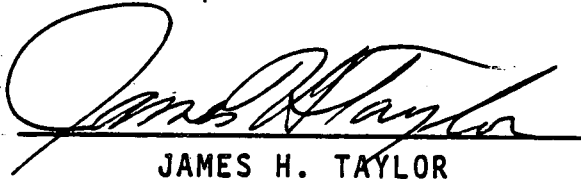
- (iii) The document(s) listed in Exhibit "A", which has been made available to the United States Nuclear Regulatory Commission was made available in confidence with a request that the document(s) and the information contained therein be withheld from public disclosure.
- (iv) The information is not available in the open literature and to the best of our knowledge is not known by Combustion Engineering, EXXON, General Electric, Westinghouse or other current or potential domestic or foreign competitors of Babcock & Wilcox.
- (v) Specific information with regard to whether public disclosure of the information is likely to cause harm to the competitive position of Babcock & Wilcox, taking into account the value of the information to Babcock & Wilcox; the amount of effort or money expended by

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Babcock & Wilcox developing the information; and the ease or difficulty with which the information could be properly duplicated by others is given in Exhibit "B".

E. I have personally reviewed the document(s) listed on Exhibit "A" and have found that it is considered proprietary by Babcock & Wilcox because it contains information which falls within one or more of the criteria enumerated in Paragraph D, and it is information which is customarily held in confidence and protected as proprietary information by Babcock & Wilcox. This report comprises information utilized by Babcock & Wilcox in its business which afford Babcock & Wilcox an opportunity to obtain a competitive advantage over those who may wish to know or use the information contained in the document(s).



JAMES H. TAYLOR

State of Virginia)

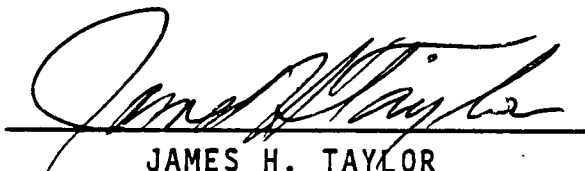
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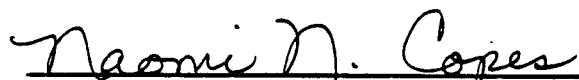
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James H. Taylor, being duly sworn, on his oath deposes and says that he is the person who subscribed his name to the foregoing statement, and that the matters and facts set forth in the statement are true.


JAMES H. TAYLOR

Subscribed and sworn before me
this 21st day of November 1985.


Notary Public in and for the City
of Lynchburg, State of Virginia

My Commission Expires April 15, 1988

Exhibit A

"Once-Through Steam Generator Mechanical Sleeve Qualification", BAW-1823P
Revision 1, Babcock & Wilcox, Lynchburg, Virginia, November 1985.

Exhibit B

Public disclosure of the Report "Once-Through Steam Generator Mechanical Sleeve Qualification" BAW-1823P Revision 1, is likely to cause harm to the competitive position of Babcock & Wilcox due to the amount of effort and money expended by Babcock & Wilcox in developing the information and the use or difficulty with which the information could be duplicated by others. The information considered proprietary to Babcock & Wilcox relates to the following aspects of this report:

1. Specific design conditions.
2. Sleeve dimensions and materials.
3. Specific analytical methods and results.
4. Details of test specimens, methods, and results.
5. Details of the installation process.
6. Details of examination methods for the sleeved tube.

The proprietary criteria which apply to this information are c, d, e, and f.

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