

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

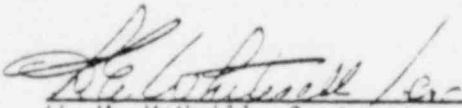
Report No. 99900001/81-01

Program No. 51500

Company: Babcock and Wilcox Company
Nuclear Materials Division
P. O. Box 1260
Lynchburg, Virginia 24505

Inspection Conducted: January 20-23, 1981

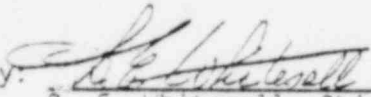
Inspector:



W. M. McNeill, Contractor Inspector
Components Section I
Vendor Inspection Branch

02/04/81
Date

Approved by:



D. E. Whitesell, Chief
Components Section I
Vendor Inspection Branch

02/04/81
Date

Summary

Inspection on January 20-23, 1981 (99900001/81-01)

Areas Inspected: Implementation of 10 CFR 50, Appendix B, including control of special processes, handling, storage and shippings, fuel rod manufacture; periodic management meeting; and followup on previous inspection findings. The inspection involved twenty-six (26) inspector-hours on site by one (1) NRC inspector.

Results: In the four (4) areas inspected, no apparent nonconformances or unresolved items were identified in three (3) areas, one nonconformance was found in one (1) area.

Nonconformance: Fuel Rod Manufacture - the metallographic procedure did not have the same criteria as the specification (as required by the QA Manual and Criterion V of Appendix B (Notice of Nonconformance)).

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DETAILS SECTIONA. Persons Contacted

- *J. L. Brown, Data Evaluation, Supervisor
- R. E. Davidson, Metallagraphic Supervisor
- *W. T. Engelke, Manufacturing Engineering Manager
- *J. Fidor, Manager QC
- *R. J. Flicker, Supervisor QC Engineer
- T. E. Ford, Manufacturing Supervisor
- A. F. Garnier, Manufacturing Engineer
- *L. T. Lee, Manufacturing Foreman
- *J. R. Mayberry, Inspection Supervisor

*Denotes those attending the exit interview.

B. Action on Previous Inspection Findings

(Closed) Follow Up Item (Report No. 80-02): Revision of the welder qualification procedure MA 498. The welder qualification procedure now requires the same or a very similar weldment to be used to qualify.

C. Control of Special Processes1. Objectives

The objectives of this area of the inspection were to verify that special processes are properly qualified and controlled in accordance with Criterion IX, Appendix B, 10 CFR 50 and the Quality Assurance Manual.

2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of the Commercial Nuclear Fuel Plant Quality Assurance Manual, Revision 10, Section 9, Control of Special Processes, which established the general requirements for autoclave and corrosion testing.
- b. Review of the specifications pellet type, Zircaloy Clad Fuel Rod, 08-116-03; Zirconium Alloy Structural Tubing, 08-1006-2, and Zirconium Alloy Tubing, 08-1214-05 which established the design requirements.
- c. Review of the procedures, Corrosion Testing Specification, QC-823, Revision 1; and Destructive Sampling of Zircaloy

and Stainless Steel Welds, QC-907, Revision 5 which established the specific requirements.

- d. Inspection of the autoclave equipment, loading of samples, pressure gages, temperature charts, reports, visual standards, test coupons, and test samples. Also, the equipment used for the water pH and resistivity measurements were inspected. This verified the implementation of the above requirements and procedures.

3. Findings

a. Nonconformances

None.

b. Unresolved Items

None.

D. Handling, Storage and Shipping

1. Objectives

The objectives of this area of the inspection were to verify that:

- a. Handling, storage and shipping operations are conducted in such a way as to give reasonable assurance that damage or deterioration will not occur.
- b. The manufacturer's system meets the requirements of Criterion XIII, 10 CFR 50, Appendix B.

2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of the Commercial Nuclear Fuel Plant Quality Assurance Manual, Revision 10, Section 13, Handling, Cleanliness, Preservation, Packaging, Shipping and Storage which established the general requirements for handling, storage and shipping.
- b. Review of specifications Packaging, Shipping, and Storage Criteria for the Mark B Series Fuel Assembly, Drive Guide, and Support Plate Assemblies, and Core Control Components, 1185-1271 and Cleanliness, 08-1000100-03 and the Contract Information Sheets for a current contract which established the design requirements.

- c. Review of procedures Fuel Assembly - Shipping Container Loading and Shipping Inspection, QC-815, Revision 2; Fuel Assembly Packing and Shipping, MA-470, Revision 12; NSC Fuel Assembly Transfer, Handling and Storage, EH-FA-468, Revision 3; and Fuel Rod cladding, Subassembly and Assembly Handling and Storage, MA 456, Revision, which established specific requirements.
- d. Inspection of fuel assembly packaging and rod handling and storage activities and verification that the above requirements and procedures have been implemented.

3. Findings

a. Nonconformances

None.

b. Unresolved Items

E. Fuel Rod Fabrication Controls

1. Objectives

The objectives of this area of the inspection were to verify that:

- a. The fuel rod assembly and quality control practices and procedures are sufficient to give assurance that manufactured fuel rods meet specifications and contractual requirements.
- b. The manufacturer's system is capable of producing quality fuel rods.

2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of the Commercial Nuclear Fuel Plant Quality Assurance Manual, Revision 10, Sections 5, "Instructions, Procedures, and Drawings;" 10; "Inspection;" 14, "Inspection Test and Operating Status," which established the general requirements for controls of fuel rod assemblies.
- b. Review of the specification Pellet Type, Zircaloy Clad Fuel Rod, 08-1116-03 and the Contract Information Sheets for a current project which established the design requirements.

- c. Review the following procedures which establish specific requirements:

Fuel Rod Inspection (In-Process & Final), QC-802, Revision 1;

NSC Fuel Rod Weldment, MA451, Revision 31;

NSC Fuel Rod Weldment Rework, MA-458, Revision 11;

Welding Operator Qualification (End Cap and Pressure Welding), MA-494, Revision 1; and

Metallographic Examination of Zircaloy Welds, QC-900, Revision 3.

- d. Inspection of the fuel rod welding station, metallographic lab and final inspection station. In order to verify the above requirements and procedures.

3. Findings

- a. Nonconformance

See Notice of Nonconformance

- b. Unresolved Items

None.

- c. Comments

The metallographic procedure QC-900 Addendum I states that internal defects within the "minimum wall" are to be evaluated. The specification states that the defects between the outside diameter and inside diameter are to be evaluated. The difference between "minimum wall" and the inside diameter is 0.002. However this difference precludes the full weld joint from evaluation when one follows the procedure. One sample #83D-37-5, was evaluated by the NRC inspector which contained numerous indications. These indications were not evaluated by the metallographic lab because they were not in the area of interest, defined by the outside wall and "minimum wall". These indications were in the weld joint between the end plug and the clad wall. This is an area of high probability of indications and defects. It was noted that the procedure had been submitted to Design for approval. This approval was documented on CR-CS-200, Revision 4. This document did not specifically approve the waiver or change of a specification requirement.

d. Follow Up Item

The fuel rod specification in section 3.1.2 requires a given level of impurities in the rod gas after pressurization.

Puncture type testing has reportedly been performed, however, time did not permit recovery of this record from the files.

F. Periodic Management Meeting

1. Objectives

The objectives of this meeting were to accomplish the following:

- a. To meet with the company management and those persons responsible for administrative of the Babcock and Wilcox Co., Inc. QA program and to reestablish channels of communication.
- b. To redetermine the extent of the company's involvement in the commercial nuclear business.
- c. To explain NRC direct inspection program including VIB organization, inspection methods and documentation.

2. Method of Accomplishment

The preceding objectives were accomplished by a meeting with Mr. C. J. Barock, General Manager.

The following is a summary of the meeting:

- a. The VIB organization was described and its relationship to NRC Region IV and the NRC Headquarters component of the Office of Inspection and Enforcement.
- b. The VIB was described including the reasons for its establishment, its objectives, its implementation structure.
- c. The conduct of VIB inspections was described and how our inspections are documented including the report, responses to reports, how proprietary information is handled, the Public Document Room, and the White Book.
- d. The company's contribution to the nuclear industry and inspection history were discussed including current and projected activity.
- e. The company quality assurance program was discussed.

3. Findings

No changes have occurred other than personnel since the last meeting.

G. Exit Interview

The inspector met with management representatives (denoted in paragraph A) at the conclusion of the inspection on January 23, 1981. The inspector summarized the scope and findings of the inspection. The management representatives had no comment in response to each item discussed by the inspector.