

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

Report No. 99900262/79-01

Program No. 51300

Company: Babcock & Wilcox
Control Components, Inc.
2567 S. E. Main Street
Irvine, California 92714

Inspection Conducted: June 18-21, 1979

Inspector: Wm D. Kelley 7/13/79
Wm. D. Kelley, Contractor Inspector
Vendor Inspection Branch Date

Approved by: D. E. Whitesell 07-13-79
D. E. Whitesell, Chief, Components Section I
Vendor Inspection Branch Date

Summary

Inspection on June 18-21, 1979 (99900262/79-01)

Areas Inspected: Implementation of 10 CFR 50, Appendix B and applicable codes and standards, including design verification, procurement source selection, welding material control, control of special processes - welding procedures specifications and joint fit up and welding; also reviewed previously identified findings and follow-up on a 10 CFR 50.55(e) report. The inspection involved fifty-six (56) inspector-hour on site by two (2) NRC inspectors.

Results: In the seven (7) areas inspected, no deviations or unresolved items were identified in six (6) areas. The following were identified in the remaining one (1) area.

Deviation: Design Verification (Details Section 1, paragraph D)

Certain Procedures had not been reviewed and approved by Quality Assurance prior to their release.

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Details Section I

(Prepared by Wm. D. Kelley)

A. Persons ContactedBabcock & Wilcox - Control Components, Inc. (B-WCC)

- *M. J. Gancar, Vice President Marketing, Acting
- *T. N. Gordon, Manager, Quality Control
- *G. Kent, Manager, Manufacturing and Planning
- *H. L. Miller, Vice President Engineering, Acting
- *A. M. Riggle, Manager, Quality Assurance Engineering
- D. W. Smeller, Senior Research Engineer

*Denotes those persons who attended the Exit Interview (See paragraph I).

B. General Review of Vendor's Activities

1. The ASME issued the following Certificates of Authorization to B-WCC to use their symbol; for the manufacture of flow control valves, parts and piping subassemblies for installation in nuclear facilities:

<u>Certification No.</u>	<u>Symbol</u>	<u>Product</u>
N-1404	N	Class 1, 2, and 3 valves
N-1405	NPT	Class 1, 2, and 3 valve parts and appurtenances and piping subassemblies

These certificates expire on June 7, 1982.

2. The authorized inspection agency is Hartford Steam Boiler Inspection and Insurance Company. The authorized nuclear inspector is an itinerant inspector.
3. B-WCC's contribution to the nuclear industry represents approximately twelve percent (12%) of its total workload.
4. The president of Babcock & Wilcox, Industrial Products Group, Bailey Meter Company, is the acting executive officer for B-WCC.

C. Previously Identified Items

(Closed) Deviation (Report No. 78-01, Item A): Contrary to B-WCC's Director of Quality Assurance letter of February 15, 1978, to NRC Region IV, a heat treating vendor had not been reaudited.

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The inspector verified that the heat treating vendor had been reaudited by B-WCC on December 7, 1978, and was acceptable and is now an approved vendor.

(Closed) Deviations (Report No. 78-01, Item B): Contrary to Criterion III of Appendix B to 10 CFR 50, paragraph NCA-4134.3(b) of Section III to the ASME Code, and paragraph 11 of Procedure 1704-01 in Section 3 of B-WCC's ASME accepted Quality Assurance Manual the Product Application Supervisor, in his review of the design and calculations for the 1 1/2" - 1500# Self Drag Valve Model No. B9G5-05-15SW-14AA44 for completeness and correctness did not identify that the calculations for the Disc Bearing area had not been completed.

The inspector verified that the calculations submitted as an attachment to B-WCC's letter to NRC Region IV dated January 3, 1978 (sic) were applicable and complete for the valve.

(Closed) Deviation (Report No. 78-01, Item C): Contrary to Criterion III of Appendix B to 10 CFR 50, paragraph NCA-4134.3(b) of Section III to the ASME Code, and paragraph 11 of Procedure 1704-01 in Section 3 of B-WCC's ASME accepted Quality Assurance Manual the method of calculation verification for the bolting of a 1 1/2-1500# Self Drag Valve Model No. B9G5-05-15SW-14AA44 was not in the design package.

The inspector verified that the bolting calculation submitted as an attachment to B-WCC's letter to NRC Region IV dated January 3, 1978 (sic) met ANSI-B16.34-1973 Edition requirements rather than NSAS B16.5-1968 Edition.

(Closed) Deviation (Report No. 78-01, Item D): Contrary to Criterion VI of Appendix B to 10 CFR 50 and paragraph NCA-4134.6 of Section III to the ASME Code there was no documentary evidence that the Computational Procedure and Design Standard had been reviewed for adequacy and approved for release.

The inspector verified that the Calculation Procedure and Design Standard had been converted to Design Standards that are reviewed, approved, and controlled in accordance with the ASME accepted Quality Assurance Program.

(Closed) Deviation (Report No. 78-01, Item E): Contrary to Criterion IX of Appendix B to 10 CFR 50, paragraph NCA-4134.9(a) of Section III to the ASME Code, and B-WCC welding procedure specification WPS No. HS-27-4, Revision A, the interpass temperature was not being monitored to verify compliance with the WPS requirements.

The inspector verified that a contact pyrometer had been purchased, placed in the calibration system and that the welder and inspectors had been trained in its use.

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D. Design Verification

1. Objectives

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

- a. Procedures had been prepared and approved by the vendor which prescribes a system for the design verification which is consistent with NRC rules and regulations, ASME Code and contract requirements.
- b. The design verification procedures are properly implemented by the vendor.

2. Method of Accomplishment

The objectives of this area of the inspection were accomplished by:

- a. Review of the ASME accepted Quality Assurance Manual, Revision 2;
 - (1) Section No. 3, Design Control, and
 - (2) Section No. 5, Instructions, Procedures, and Drawings,to verify that the vendor had established procedures which prescribe a system for the verification of designs and calculations.
- b. Review of the following procedures;
 - (1) 0405-02, Preliminary Design Review,
 - (2) 0410-01, Revision A, Engineering Change Orders, and
 - (3) 0410-03, Engineering Change Orders,to verify that they had been prepared by the designated authority, approved by management, and reviewed by the Quality Assurance staff.
- c. Review of the following procedures;
 - (1) 0405-01, Design Review for New Products, and/or Generic Changes for Retrofit,
 - (2) 0405-02, Preliminary Design Review,

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- (3) 0405-04, Design Control,
- (4) DS-101, Revision 0, Pressure Boundary Design Standards,
- (5) DS-103, Revision 0, ANSI Rated Bottom Plate Thickness, and
- (6) DS-107, Seismic Proposal Guidelines,

to verify that they contained appropriate measures to verify the adequacy of designs, requires documented results of such verification, requires the design verification to consider the importance to safety, identifies a method for performing design verification, identifies the items to be addressed during the design review, and prescribes the requirements for performing verification by alternate calculations or by qualification test.

- d. Review of design verifications for 1500#, Class 1, Nuclear Pressurizer Power-Operated Relief Valves to verify the implementation of the design verification procedures.
- e. Interviews with personnel to verify they are knowledgeable in the procedures applicable to the design verification.

3. Findings

a. Deviation

See Notice of Deviation.

b. Unresolved Items

Within this area of the inspection, no unresolved items were identified.

E. Procurement Source Selection

1. Objectives

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

- (a) Procedures had been prepared and approved by the vendor which prescribes a system for procurement source selection which is consistent with NRC rules and regulations, ASME Code requirements, and vendor commitments.
- (b) The procurement source selection procedures are being properly implemented.

2. Method of Accomplishment

The objectives of this area of the inspection were accomplished by:

- a. Review of the ASME accepted Quality Assurance Manual, Revision 2;
 - (1) Section No. 4, Procurement Document Control, and
 - (2) Section No. 7, Control of Purchased Materials, Items and Services,

to verify that the vendor has established procedures for procurement source evaluation and selection.

- b. Review of procedures 1708-03, Nuclear Subcontractor Selection, Evaluation and Approval 1218-30, Issue, Revisions, and Control of Nuclear Purchase Orders, to verify that the procedures pertinent to procurement source selection, were prepared by the designated authority, approved by management, and reviewed by the Quality Assurance staff.
- c. Review of the procurement source selection procedures to verify that it provides for the integrated action and evaluation of the supplier's performance history.
- d. Review of six (6) sets of procurement source selection and purchase documents, to determine whether the procedures and procurement documents were available to the person responsible for the performance of the activity, and whether the vendor's procedures are being properly implemented.

3. Findings

- a. The inspector verified that:
 - (1) Procedures have been prepared and approved by the vendor that prescribes a system for procurement source selection which is consistent with NRC rules and regulations, ASME Code requirements, and the vendor's commitments.
 - (2) The procurement source selection procedure are properly implemented.
- b. Within this area of the inspection, no deviations or unresolved items were identified.

F. Manufacturing Process Control, Welding Material Control

1. Objectives

The objectives of this area of the inspection were to verify that welding material was identified and controlled until it is consumed in the welding process, in accordance with NRC rules and regulations, ASME Code and contract requirements, and the vendor's commitments.

2. Method of Accomplishment

The objectives of this area of the inspection were accomplished by:

a. Review of the ASME accepted Quality Assurance Manual, Revision 2;

- (1) Section No. 4, Procurement Document Control,
- (2) Section No. 7, Control of Purchase Materials, Items and Services, and
- (3) Section No. 9, Control of Manufacturing Processes,

to verify that procedures have been established for purchasing, receiving, distribution and handling of welding materials.

b. Review of procedures;

- (1) 1701-01, Control of Welded Fabrication (Nuclear), and
- (2) 1710-02, Control of Welding Material Storage and Issue

to verify that the distribution of welding material is controlled in accordance with the approved procedures, and that unused welding materials are scrapped or recycled in conformance with special procedures requirements.

c. Observations of the shop welding areas, and storage area, to verify that:

- (1) Welding materials are clearly identified in accordance with the approved procedures and that the identification of acceptable material is maintained throughout storage and manufacturing until the material is consumed in the welding process.
- (2) Welding materials requiring environmental control are stored at the appropriate holding and/or baking temperatures for the time specified by the procedure.

- d. Interviews with personnel to verify that they are knowledgeable of the vendor's procedures applicable to Welding Material Control.

3. Findings

- a. The inspector verified that welding material is identified and controlled until it is consumed in the welding process in accordance with NRC rules and regulations, ASME Code requirements, and the vendor's procedure commitments.
- b. Within this area of the inspection, no deviations or unresolved items were identified.

G. Joint Fit-Up and Welding

1. Objective

The objectives of this area of the inspection were to verify that the production welding is controlled in accordance with the vendor's ASME accepted Quality Assurance Program, the ASME Code requirements, and the applicable NRC regulations.

2. Method of Accomplishment

The objectives of this area of the inspection were accomplished by:

- a. Review of the ASME accepted Quality Assurance Manual, Revision 2, Section No. 9, Control of Manufacturing Processes, to verify that the control of welding is included in the quality assurance program.
- b. Review of Routing Sheets to verify that the work is performed in the established sequence and in accordance with the referenced welding procedures and specifications, hold points are identified, and space provided for production, quality control, and the ANI to date and sign off.
- c. Review of the welding procedure specifications, and the drawings at the work stations, to verify that they are available to the crafts.
- d. Review of filler metal requisitions to verify that the welding filler metals are of the type and grade, specified in the WPS and have been properly inspected, and identified and traceable to certification.
- e. Visual observations in the shop to verify that:

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- (1) Weld joint geometry is as specified, and that the surfaces to be welded had been prepared, cleaned, and inspected in accordance with the applicable procedures.
 - (2) Parts to be welded are assembled and held within the specified gap and alignment tolerances.
 - (3) Temporary attachments (if used) are compatible to the base metal and have been attached by qualified welders using qualified welding procedures.
- f. Interviews with personnel to verify that they are knowledgeable of the procedures applicable to weld joint fit-up and welding.

3. Findings

- a. The inspector verified that production welding is controlled in accordance with the vendor's ASME accepted Quality Assurance Program, the ASME Code, and the applicable NRC rules and regulations.
- b. Within this area of the inspection, no deviations or unresolved items were identified.

H. Control of Special Processes Welding Procedure Specification (WPS)

1. Objective

The objectives of this area of the inspection were to determine whether the welding procedure specifications used in production welding had been prepared, qualified and controlled in accordance with the vendor's ASME accepted Quality Assurance Program, the ASME Code requirements, and applicable NRC rules and regulations.

2. Method of Accomplishment

The objectives of this area of the inspection were accomplished by:

- a. Review of the ASME accepted Quality Assurance Manual, Revision 2, Section 9, "Control of Manufacturing Processes," to verify that the vendor had established procedures for the preparation, qualification, certification, distribution, and revision of welding procedure specifications.
- b. Review of welding procedures;
 - (1) WS-201, Revision D, Submerged Arc Welding of Carbon Steel (P-1) to Carbon Steel (P-1), and

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- (2) WS-201, Revision D, Manual Gas Tungsten Arc Welding of Carbon Steel (P-1) to Carbon Steel (P-1),

to verify that all of the essential variables, supplementary essential variables, and nonessential variables, were provided in accordance with the applicable sections of the ASME Codes.

- c. Review of the Certification of the welding procedures referenced in paragraph b, to verify that:
 - (1) The procedures had been properly qualified in accordance with Section IX of the ASME Code, and that the supporting procedure qualification records were on file.
 - (2) The procedure qualification records were certified by the vendor and that the mechanical test results meet or exceed the minimum ASME Code requirements.
- d. Review of the qualification records of the welding procedures referenced in paragraph b, to verify that the procedure qualification records list the essential variables for the specific welding processes and that the values and ranges of the variables are consistent within the limits of the WPS.
- e. Review of the Welding Procedure Specifications and Procedure Qualification Records referenced in paragraph b, to verify that:
 - (1) All mechanical tests required by Sections III and IX of the ASME Code had been completed and are properly documented in the procedure qualification records.
 - (2) Changes and/or revisions of the welding procedure specification essential variables are supported by requalification of the original welding procedure specification.
 - (3) Changes in the welding procedure specification nonessential variables are properly identified and documented.
- f. Observation in the shop to verify that the welding procedure specifications are available to the welders and the welding supervisor, and that the specifications are being followed in the performance of production welding.
- g. Interviews with personnel to verify that they are knowledgeable concerning the applicable procedures used in production welding.

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3. Findings

- a. The inspector verified that the welding procedure specifications being used by the vendor in production welding, had been prepared, qualified, and controlled in accordance with the applicable NRC rules and regulations, ASME Code and contract requirements, and the vendor's commitments.
- b. Within this area of the inspection, no deviations or unresolved items were identified.

I. Exit Interview

At the conclusion of the inspection on June 21, 1979, the inspectors met with the company's management, identified in paragraph A, for the purpose of informing them concerning the results of the inspection. During this meeting, the deviation was discussed and the evidence which supported the finding was identified.

The company's management acknowledged the finding and supporting evidence as being understood, but had no additional comments.

Details Section II

(Prepared by D. E. Whitesell)

A. Follow-up of a 10 CFR 50.55(e) Report (Action Control No. H10377F4)1. Background Information

- a. On April 12, 1979, Duke Power Company submitted a written significant deficiency report to Region II, pursuant to 10 CFR 50.55(e). The report states that during the hot functional testing of the McGuire Nuclear Station, Unit 1, the pressurizer power operated relief valve (PORV) had stuck in the partially open position. The cause was attributed to the PORV plug binding in the recess area of the valve bonnet.
- b. Duke Power Company's significant deficiency report number SD 369/370-79-01 contains the evaluation of the safety significance of this deficiency.

B. Persons Contacted

- H. Miller, Vice-President for Engineering
- A. Riggle, Quality Assurance Manager
- F. Riddle, Contract Administrator
- C. Sieloff, Contract Administrator
- D. W. Smeller, Senior Research Engineer

C. Review of the Quality Assurance Program1. Objectives

- a. The objectives of this area of the inspection were to review the Control Components Quality Assurance Program, in compliance with item 1 of the action requested specified in NRC Action Control number H10377F4, dated May 4, 1979.

2. Method of Accomplishment

Control Components is now a Division of Babcock & Wilcox, Nuclear Energy Power Group, and was included in the NRC Vendor Inspection Program in February 1977, and the NRC inspection reports were reviewed and it has been determined that the adequacy and implementation of the following program elements have been inspected in depth:

- a. Design and Document Control
- b. Procurement Control, including Source Evaluation

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c. Control of special Processes

(1) Heat Treatment

(a) Heat Treat Procedures and qualification

(b) Heat Treat Documentation

(2) Welding

(1) Welding procedure qualifications, including hardfacing

(2) Welders performance qualification

(3) Control of Welding materials

(4) Observation of production welding in progress, including the welding and removal of temporary attachments

(5) NDE procedures and procedure qualifications as appropriate

(6) Qualifications of NDE technicians

(7) Observation of NDE in progress

d. Manufacturing Process Control

e. Nonconformance and Corrective Actions

f. Inspections and Tests

g. Calibration

h. QA/QC documents and records

i. Training

j. Audits

k. Interface with the ANI

3. Findings

a. It was determined that the Babcock & Wilcox Control Components (B-WCC) has developed a Quality Assurance Program which is consistent with NRC regulations, Code and contract requirements.

b. Enforcement items identified during previous inspections have been corrected, verified, and closed.

D. Part 21 Evaluation and Reporting Procedures

1. Objectives

The objectives of this area of the inspection (item 2, Action Request) were to ascertain the following:

- a. Was 10 CFR 21 invoked by Duke Power procurement documents for McGuire.
- b. Has 10 CFR 21 been imposed on the vendor by any contract.
- c. Has the vendor implemented procedures for reporting and evaluating the safety significance of identified deficiencies.
- d. Is Section 206 of Public Law 93-438 posted.

2. Method of Accomplishment

The foregoing objectives were accomplished as follows:

- a. Review Duke Power Purchase Order number A-63031, dated June 19, 1973, to ascertain whether the procurement document imposed 10 CFR 21.

Since the date of the PO predates the enactment date of 10 CFR 21 and PL 93-438, it is obvious that the requirement of these regulations and the law were not imposed.
- b. Discussions with the B-WCC Contract Administrators it was determined that 10 CFR 21 has been imposed by other customer's contracts, which were negotiated subsequent to the enactment of the regulation and the law.
- c. Observation of the bulletin board available to all shop personnel, on which Section 206 of PL-93-438 was posted, together with the instructions as how, and to whom, identified defects are to be reported by employees of B-WCC.
- d. Review of Procedure No. 1716-04, "Significant Deficiency Reporting," which identifies the company official responsible for reporting significant defects to both the Customer, and the Commission; and how the deficiencies are to be reported and documented.
- e. Discussions with the cognizant responsible officers.

3. Findings

The inspector was informed that B-WCC seldom possessed sufficient information relating to the use, or system, the components are to be installed in, to

perform an analysis of the safety significance of a failure or malfunction of its component; and therefore, rely on its customers to assume the responsibility for such an evaluation.

They have developed and published approved procedures which identifies the responsible officer, and the methods which are to be followed by BWCC employees in reporting deficiencies. Also detailed procedures explaining how the responsible officer is to notify the customers, as applicable, and request an evaluation to be performed to determine whether the safety significance of the deficiency is reportable.

E. Review Design Modifications to Correct Deficiencies Identified at McGuire

1. Objectives

The objectives of this area of the inspection were to determine the following:

- a. Whether the deficiency has generic implication, and reportable under Part 21.
- b. Ascertain what corrective action has been or will be taken to correct the deficiency and prevent recurrence of the malfunction.

2. Method of Accomplishment

The foregoing objectives were accomplished by the following:

- a. Review Duke Power Company Purchase Order (PO) number A-63031, dated June 19, 1973; Design Specification (DS) number MC-1205.09.2, Revision 0, dated January 15, 1973, and certified by R. E. Miller, PE# 4860, in the state of North Carolina. To ascertain the size, type, class, and quantity of the valves ordered.

Reviewed six (6) change orders to the foregoing documents to ascertain whether any changes were required concerning the design, manufacture, inspection and test requirements specified in the initial DS.

- b. Review of Duke Power Company Drawing number MC-1553-2.0, Revision B, dated April 5, 1973, for information.
- c. Review of B-WCC Sketch number 15958-1, Pressurizer Relief Valve, dated April 6, 1979, which is a drawing comparing by half sections, the original valve as designed and half section delineating the recommended modification of the original design.

- d. Review of manufacturing process sheets (travelers) for WD 15958-1 for the valve parts as follows;

- (1) Body Machining, part No. 118762-1,
- (2) Seat Ring, part No. 118763,
- (3) Spindle - # 140210,
- (4) Disk Stack - #118765, and
- (5) Bonnet seal - #118767,

to verify that the travelers had been reviewed with the ANI and his hold points selected and identified prior to release for production.

- e. Review of the Hydrostatic Test Reports numbers 15958-1, 2 and 3 dated November 18, 1975, to verify that the hydrostatic test had been performed to the specified pressure and held for the specified time, the temperature and chloride content of the medium was controlled, and that the gages used had been calibrated, and were of the range and graduations appropriate for the pressure specified. Also to verify that the hydrostatic test had been witnessed by the ANI and found to be acceptable, and documented by his signature and date.
- f. The material certified test reports for the body, bonnet and leak off connection were reviewed, to verify that the materials used for the valve parts were as specified in the customer's specification, or changes thereto.
- g. Review of the Manufacturer's Data Report Forms to verify that they had been properly prepared by the manufacturer, as prescribed by the code; and certified by the ANI signature and date.
- h. Review of the Minutes of a B-WCC meeting with Duke Power Company representatives concerning the malfunction of the valve during hot functional testing. The date of this meeting was documented as being May 24, 1979.

3. Findings

- a. The pressurizer PORV, as initially ordered, was to be air actuated, modulating relief valve. The air valves were to be operated by three 125V AC solenoids in series. The purpose of the valves were to relieve pressure in the pressurizer, to prevent the safety valves from opening.

From the documents reviewed, it was determined that the valves, which are class 1 -2500 lb. class, had been designed, manufactured, inspected and tested in accordance with the requirements of the contract documents, and the ASME Section III Code.

During the meeting held with Duke on May 24, 1976, Duke stated that the valves had been modified by them after delivery, to change from modulating service, to on-off service. The modification involved the removal of the plug positioner and using the solenoid valves as the actuator.

- b. Since the malfunction of this valve is attributed to the modification of the valve after its delivery to the site, there is no evidence of generic implications. However, Duke stated that similar valves ordered for Catawba will be modified in accordance with the revised design of the McGuire valves.
- c. The corrective action cannot be determined or scheduled until the modification of the valve is resolved to the satisfaction of both Duke and B-WCC, and a prototype valve can be designed, fabricated, tested, and qualified for its intended service.