

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

Report No. 99900049/80-01

Program No. 51300

Company: Atwood & Morrill Company
285 Canal Street
Salem, Massachusetts 01970

Inspection Conducted: May 5-6, 1980

Inspectors: William D. Kelley
William D. Kelley, Contractor Inspector
Vendor Inspection Branch

6/19/80
Date

Approved by: D. E. Whitesell
D. E. Whitesell, Chief
Components Section 1
Vendor Inspection Branch

06/19/80
Date

Summary

Inspection on May 6-7, 1980 (99900049/80-01)

Areas Inspected: Implementation of 10 CFR 50, Appendix B and applicable codes and standards including; design and document control - design verification; manufacturing process control - material identification and control, - forming and bending of pressure retaining materials, and - machining; inspection and test - liquid penetrant examination; and training - welder qualification. Also performed a review of the vendor's activities, reviewed vendors documents pertaining to a licensee 10 CFR 21.21. report and conducted an exit interview. The inspection involved twelve (12) inspector-hours on site by one (1) NRC inspector.

Results: In the eight (8) areas inspected, no deviations or unresolved items were identified in six (6) areas. The following were identified in the remaining two (2) areas.

Deviations:

Design and Document Control - Design Verification (Details paragraph C.) Contrary to Criterion V of Appendix B to 10 CFR 50, paragraphs NB-3111 and NCA-4134.5 of Section III to the ASME Code, and paragraph II.A.2 of AM's procedure 20-71-04 the design and stress report did not include in the calculations the force imposed by the operator in the closed position.

Manufacturing Process Control - Machining (Details, paragraph F.) Contrary to Criterion V of Appendix B to 10 CFR 50, paragraphs NCA-4134.5 of Section III to the ASME Code.

1. and paragraph NB-2538(a) of Section III of the ASME Code AM procedures did not provide for the removal of surface defects (arc-strikes).
2. and paragraphs NB and NC-4231.2(e) of Section III of the ASME Code AM procedures did not provide for marking the area around temporary attachments.

DETAILS

A. Persons ContactedAtwood & Morrill Company (A&M)

- R. Brennam, Field Service Engineer
- *E. H. Morency, Quality Control Supervisor
- *A. G. Roussopoulos, Design Engineer
- *V. W. Toneatti, Corporate Quality Assurance Manager
- A. H. Webber, Product Service Manager

Hartford Steam Boiler Inspection & Insurance Company

- *G. Pirie, Authorized Nuclear Inspector

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

B. General Review of Vendor's Activities

1. There has been no change in the status of the ASME Certificates of Authorization, the authorized inspection agency or the authorized nuclear inspector as reported in NRC IE RIV Report 99900049/79-01
2. AM's contribution to the nuclear industry represents approximately 15 percent (15%) of its total workload.

C. Design and Document Control - Design Verification1. Objectives

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

- a. Procedures had been prepared and approved by the vendor to prescribe a system for design verification which is consistent with NRC rules and regulations, and the vendor's commitments in the ASME accepted Quality Assurance Program.
- b. The design verification procedures are properly and effectively 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, Issue #5,
 - (1) Section 3, "Order Processing and Design Control,"
 - (2) Section 5, "Instructions, Procedures, and Drawings" and
 - (3) Section 6, "Document Control;"

to verify that the vendor had established procedures to prescribe a system for design verification.
- b. Reviewed the following procedures:
 - (1) 20-71-04, "Controlling Design of Products under ASME," and
 - (2) Section III Engineering Instruction #39, "Reconciliation of Stress/Design Report,"

to verify that they had been prepared by the designated authority, approved by management, and reviewed by QA.
- c. Reviewed the documents referenced in paragraphs a. and b. to verify that they contained measures to verify the adequacy of design, require documented results of the design verification, required the design verification to consider the importance to safety, identify the method of performing the design verification, identify items to be addressed during the design review, and prescribes the requirements for performing verification by alternate calculations, or by qualification test.
- d. Reviewed design verification of 16 in. - 1500# W.E. "Wye" Stop Check Valve w/Hydraulic Actuator," (A&M Order Number 14225 drawing 14225-01-H) to verify that the design verification procedures are being implemented.
- e. Interviews with personnel to verify that they are knowledgeable in the procedures applicable to design Verification.

3. Findings

- a. Deviation: See Notice of Deviation Item A.
- b. Follow-up Item

Correction had been made to the Design and Stress Report using "paste ons" and the corrections had not been initialed and dated

to provide traceability. The AM personnel stated these corrections were made during the preparation of the design calculation and prior to the design verification. The customer "technical specification" invokes ANSI N45.2.2 but does not invoke ANSI N45.2.9; therefore, AM did not adhere to paragraph 3.2.6 which states in part, ". . . The correction or supplement shall include the date and the identification of the person authorized to issue such corrections."

AM stated they will modify their quality assurance program to eliminate "paste-ons" on the Design and Stress Reports prior to the design verification. Any subsequent modification or revision to the reports would be identified in accordance with the quality assurance program requirements.

AM's corrective action will be reviewed on a subsequent inspection.

D. Manufacturing Process Control - Material Identification and Control

1. Objective

The objective of this area of the inspection was to verify that material identification and control during manufacturing is in accordance with NRC rules and regulations, and the vendor's commitments in the ASME accepted Quality Assurance Program.

2. Method of Accomplishment

The objective of this area of the inspection was accomplished by:

a. Review of the ASME accepted Quality Assurance Manual, Issue #5;

- (1) Section 7, "Control of Purchased Material, Items, and Services,"
- (2) Section 8, "Identification and Control of Material and Items," and
- (3) Section 9, "Control of Manufacturing Processes;"

to verify that procedures had been established for material identification and control during manufacturing.

b. Review of AM procedures:

- (1) 90-67-001, "Transferring Material Identification During Fabrication,"
- (2) 20-67-03, "Receiving and Verifying Certified Material Test Reports (CMTR)," and
- (3) 40-65-07, "Receiving Incoming Materials and Services;"

to verify they provided for the identification and control of purchased materials, requires positive identification of materials throughout the manufacturing cycle, and provide for the segregation and disposition of nonconforming materials.

- c. Reviewed certified material test reports to verify they conformed with ASME Code requirements, applicable material specifications, and/or special requirements, are included in the procurement documents.
- d. Examined representative material in various stages of manufacturing and verified that the identification, and traceability to the certified mill test report, was being maintained.
- e. Interviews with personnel to verify they are knowledgeable in the procedures applicable to material identification and control.

3. Findings

- a. The inspector verified that the material identification and control during manufacturing was consistent with NRC rules and regulation, and the vendor's commitments.
- b. Within this area of the inspection no deviations or unresolved items were identified.

E. Manufacturing Process Control - Forming and Bending of Pressure Retaining Materials

1. Objectives

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

- a. The forming and bending of pressure retaining materials were under a controlled system of fabrication which meets NRC rules and regulations and the vendor's commitments in the ASME accepted Quality Assurance Programs.
- b. The controlled system of forming and bending of pressure retaining materials was effective in assuring product quality.

2. Method of Accomplishment

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

- a. Review of the ASME accepted Quality Assurance Manual, Issue #5,

- b. Interviews with personnel to verify if forming and bending of pressure retaining materials was performed during the manufacture of the present line of valves offered to the nuclear industry for installation in a nuclear plant.

3. Findings

- a. The inspector verified that no forming and bending of pressure retaining materials was performed during the manufacturing of valves for nuclear service.
- b. Within this area of the inspection no deviations or unresolved items were identified.

F. Manufacturing Process Control - Machining

1. Objectives

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

- a. The machining operations were performed under a controlled system of manufacturing which meets NRC rules and regulations and the vendor's commitments in the ASME accepted Quality Assurance Program.
- b. The controlled system of manufacturing was effective in assuring product quality.

2. Method of Accomplishment

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

- a. Review of the ASME accepted Quality Assurance Manual, Issue #5,
 - (1) Section 9, "Control of Manufacturing Processes,"
 - (2) Section 10, "Examination, Tests, and Inspections," and
 - (3) Section 13, "Handling, Storage, Shipping, and Preservation;"
 to verify that procedures had been established to prescribe a control system of operation.
- b. Review these selective AM specification and procedures:
 - (1) 40-65-02, "Preparing Master Routings and Shop Process Orders,"

- (2) 40-65-15, "Processing Parts Orders for Procurement, Fabrication, and Shipment," and
- (3) 40-65-16, "Maintaining Computer File of Manufacturing Routings;"

to verify that they had been prepared by the designated authority, approved by management, and reviewed by QA, and are consistent with NRC regulation, and the vendor's commitments.

c. Review of the following documents of five (5) parts:

- (1) Master Routing and Shop Process Orders,
- (2) Drawings,
- (3) Receiving Logs, and
- (4) Certified Material Test Reports,

to verify that they provide drawing/document control in the shop, and also provides for part identification and traceability, in-process and final inspections, identification and segregation of defective items, the resolving of nonconforming items, and that the gages and measuring devices are under a controlled calibration system.

d. Examine three (3) representative samples of finished machined parts to verify that they were properly identified and machined to conform to the drawings and specifications.

e. Examined the documents of the following parts:

- (1) Body, S/N - 1500B,
- (2) Poppet Head, Order No. 14225. Item 01, and
- (3) Body, S/N - 3-14225,

to verify compliance with applicable documentation requirements.

3. Findings

- a. The inspector verified that the machining operations were performed under a controlled system of manufacturing which meets NRC rules and regulations and the vendor's commitments in the ASME accepted Quality Assurance Program.

- b. Deviations: See Enclosure - Notice of Deviations Items B&C.
- c. Within this area of the inspection no unresolved items were identified.

G. Inspection Test-Liquid Penetrant Examination

1. Objectives

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

- a. The liquid penetrant examination procedures used by the vendor are consistent with the NRC rules and regulations, and the vendors commitments in the ASME accepted Quality Assurance Program.
- b. The liquid penetrant examinations are being conducted by properly qualified personnel in accordance with approved and qualified procedures.

2. Method of Accomplishment

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

- a. Review of the ASME accepted Quality Assurance Manual, Issue #5,
 - (1) Section 10, "Examinations, Tests, and Inspections," and
 - (2) Section 15, "Nonconforming Materials or Items,"

to verify that the vendor had established procedures for performing the liquid penetrant examinations.

- b. Review of AM procedures:
 - (1) 90-67-015, "Liquid Penetrant Examination Procedure in Accordance with 1977 ASME Section III," and
 - (2) QC-C-2, "Program for Qualification and Certification of Personnel in Nondestructive Testing per ASME Sections III and V;"

to verify that the procedures had been approved, certified, and issued in accordance with the vendor's ASME accepted Quality Assurance Program commitments.

- c. Review of procedure referenced in paragraph b. to verify that they were currently being used, and that they define the significant

examination variables, and that these variables are controlled within the limits specified by the ASME code.

- d. Review of the documents referenced in paragraph a and b to verify they provide for the requalification when changes are made to surface preparations or change in penetrant materials.
- e. Observed the performance of a liquid penetrant examination using procedure 90-67-015, and verified that the personnel performing and evaluating the examination was qualified, and that the examination was conducted in accordance with the procedures.
- f. Verified that indications revealed by the examination are evaluated in accordance with the procedure and the results reported in the prescribed manner.
- g. Interviews with personnel performing liquid penetrant examination to verify that they are knowledgeable in the applicable procedures.

3. Findings

- a. The inspector verified that:
 - (1) The liquid penetrant examination procedures used by the vendor was consistent with the NRC rules and regulations, and the vendor's commitments in the ASME accepted Quality Assurance Program.
 - (2) The liquid penetrant examination witnessed was conducted by properly qualified personnel, in accordance with approved and qualified procedures.
- b. Within this area of the inspection no deviations or unresolved items were identified.

H. Training - Welder Qualification

1. Objective

The objectives of this area of the inspection were to verify that the welders and welding operators are qualified in accordance with NRC rules and regulations, and the vendor's commitments in the ASME accepted Quality Assurance Program.

2. Method of Accomplishment

The objectives of the inspection were accomplished by:

- a. Review of the ASME accepted Quality Assurance Manual Issue #5, Section 9.0, paragraph 9.5, "Welding" to verify that procedures had been established requiring the qualification of welders and welding operators.
- b. Review of the Record of Performance Qualification tests of welders and welding operators, to verify that they are in conformance with ASME Code requirements.
- c. Review of welders qualification log, to verify that the vendor has provided a system for maintaining a continuous record of the welder qualifications; and that the welders have been, and are currently, qualified to weld under the prescribed procedures.
- d. Interviews with personnel to verify they are knowledgeable in the procedures applicable to welder qualification.

3. Findings

- a. The inspector verified that the welders and welding operators presently employed have been with AM in excess of ten (10) years and are properly qualified in accordance with NRC rules and regulations, and the vendor's commitments in the ASME accepted Quality Assurance Program.
- b. Follow-up Item During the verification of the welders qualification to weld under AM procedure 90-61-010 the inspector observed that the Poppet Head Item 01_o on Shop Order No. 14225, had been hard faced approximately 330° around the seating surface on a previous shift. The procedure did not address the extra care to be taken in restarting the hardfacing operation, to get the required fusion. AM's corrective action will be reviewed on a subsequent inspection.
- c. Within this area of the inspection no deviation's or unresolved items were identified.

I. Notification Pursuant to 10 CFR 21.21 Dated January 31, 1980 by Consolidated Edison Company of New York.

1. Background Information

Consolidated Edison Company of New York (Con Ed) notified NRC IE RI on January 31, 1980 pursuant to 10 CFR 21.21, that all four (4) reverse flow check valves (MS-2) were at, or near, full open position at Indian Point 2. Investigation revealed that free movement of the valve discs was apparently prevented by excessive tight shaft packing.

NRC IE HQ issued Information Notice No. 80-16 dated April 29, 1980 informing licensees of Con Ed's finding and further stated their own evaluation revealed that with the existence of the reported condition in the event of a main steam line break upstream of the main steam isolation valve together with coincident single failure of a main steam isolation valve to close in another loop the potential existed for blow down of the contents of two steam generators.

NRC - IE RIV, VIB, Component Section I was assigned the responsibility of performing an inspection at AM and develop information to the extent possible to disposition this problem.

2. Objectives

The objectives of this area of the inspection were to ascertain:

- a. The corrective action implemented
- b. The action initiated to prevent recurrence
- c. The generic impact.

3. Method of Accomplishment

- a. Reviewed AM Field Service Engineer's Trip Report dated January 18, 1980 to determine his finding at Con-Ed's Indian Point Nuclear Station Unit 2.
- b. Reviewed AM's "Instruction Manual - Main Steam Isolation and Main Steam Check Valves. . . for . . . Indian Point Nuclear Power Plant #2 Buchanan, New York" to determine the recommended maintenance requirements.
- c. Reviewed AM drawing 20727-H, Alt. 5, titled "28" O.D. Pipe Main Steam Isolation Check Valve" to determine if the Instruction Manual adequately describe the maintenance requirements.
- d. Interviewed AM Field Service Engineer for clarification of his Field Service Trip Report.

4. Findings

The AM field service engineer was at the Con Ed Indian Point Nuclear Station, Unit 2, on January 14 and 15, 1980 performing a service call on the main steam isolation valves (MS-1, 21, 22, 23 and 24). The field service engineer stated while performing the service of these valves he place his weight (approximately 150 pounds) on the two (2)

150 pound counter weight on one of the main steam isolation check valves and the 550 pound disc did not move. Further investigation revealed all four (4) isolation check valves were stuck in the open position; therefore, he recommended all valves be repacked and checked for freedom of movement in accordance with the AM instruction manual.

Section II "Installation" of the AM instruction manual states in part,

". . . Following installation and before putting pressure on valve, make certain that disc remains seated.

Weights actually should counteract 75 to 80% of the weight of the disc but should never hold valve open. Disc should always be free to seat by its own weight."

Section III "Maintenance," paragraph "Preventive Maintenance" in the AM instruction manual amplifies the degree of freedom required for these isolation check valve by stating in part,

"Care should be taken when repacking the stuffing box or tightening the glands, that the glands are screwed down equally and not cocked or tipped so that a corner of it presses on the valve shaft. The glands are not to be screwed down so tightly that the packing retards the easy movement of the valve shaft.

When any adjustments are made on a gland, it is advisable to cycle the valve two or three times to make sure of smooth operation. . . ."

AM does not have the steam capacity to test the valve packing for 1085 psig @ 600^oF; however, after assembly and during leakage test the valves were tested for operability. After the valves were hydrostaticly tested the packing is removed, the valve dried, new packing inserted into the valve, and the hex nut for tightening the gland are hand tightened, for shipment.

Since these valves have been in service for a number of years and had required repacking and/or gland adjustments to prevent leakage on several occasions it is apparent the licensee did not follow the instruction manual when performing these maintenance operations.

J. Exit Interview

At the conclusion of the inspection on May 6, 1980 the inspector met with the company's management, identified in paragraph A, for the purpose of informing them as to the results of the inspection. During this meeting each identified deviation was discussed and the evidence which supported the findings were identified.

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