

U. S. ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE

REGION III

CO Inspection Report No. 999-54/72-01

Subject: Dresser Industries
Alexandria, Louisiana
Main Steam Safety Valves for:
Toledo Edison Company
Davis-Besse (50-346)

License No.: N/A
Priority: N/A
Category: Vendor

Type of Licensee: N/A

Type of Inspection: Routine, Announced

Dates of Inspection: February 23 - 24, 1972

Dates of Previous Inspection: March 16 - 17, 1971

Principal Inspector: *R. E. Oller*
R. E. Oller

3/10/72
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By: *W. E. Vetter*
W. E. Vetter, Senior Reactor Inspector

3-10-72
(Date)

Proprietary Information: None

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SECTION I

Enforcement Action

- A. Noncompliance: None
- B. Nonconformance: None
- C. Safety Items: None

Licensee Action on Previously Identified Enforcement Matters: N/A

Unresolved Items: None

Status of Previously Reported Unresolved Items: N/A

Design Changes: N/A

Unusual Occurrences: N/A

Persons Contacted

The following personnel were contacted during this inspection:

Dresser Industries (Dresser)

H. W. Cloud, Operations Manager
J. W. Richardson, QA Manager
L. M. Brown, QA Engineer
D. Roberts, QC Manager
C. K. Brewer, Chief Application Engineer
R. H. Williams, Product Manager - Nuclear Cell
W. Chenor, Welding Inspector

Management Interview

The following personnel were present during the management interview:

Dresser Industries (Dresser)

J. W. Richardson, QA Manager
L. M. Brown, QA Engineer

During the interview, the following item was discussed:

The inspector commented that the omission of the Dresser PT report for the nozzles in the record package and miswording on a hydro test report, i.e., "no defects," rather than "no leakage," indicated a closer review of final records appeared warranted.

The inspector said that any deficient items revealed during a thorough review of the inspection findings would be transmitted to the licensee for resolution.

Mr. Richardson replied that he welcomed the inspection and the inspector's comments and would take action to correct the conditions noted.

SECTION II

Additional Subjects Inspected, Not Identified in Section I, Where No Deficiencies or Unresolved Items Were Found

1. General

a. Status of Valve Manufacture

On arrival at Dresser, the inspector was told by Mr. Richardson that 16 of the total of 18 Maxiflow safety valves for the Davis-Besse contract had been manufactured, tested and inspected and that they were boxed for shipment and were on the loading dock. Richardson said that the balance of two valves were in the final assembly stages. Examination of the crated valves established that they were identified by contract number and valve identity. The inspector examined the components, body castings, nozzles, and trim parts of the remaining two valves and determined that they were properly identified and were accompanied by traveler process documents. No evidence of workmanship deficiencies were observed.

2. Proprietary Information

Prior to the inspection, the inspector requested that any items which Dresser considered company confidential or proprietary should be identified. During the inspection, no items were identified as being proprietary.

3. Dresser QA/QC Program

During discussions with Messrs. Richardson and Brown, the inspector was told that Dresser has recently upgraded their quality activities by adding a separate quality assurance group which reports directly to the works manager, audits quality control activities, and prepares QC instructions and standards. In addition, Mr. Brown said Dresser has a group called a "Nuclear Cell" composed of members from Engineering, Production Control, Sales and Purchasing who are responsible for resolving problems related to nuclear valve contracts.

4. Specifications and Procedures Reviewed

a. Babcock & Wilcox (B&W) Main Steam Safety Valve Purchase Specification No. 1103/0969

The controlling codes and B&W specifications for design, fabrication, inspection, and hot functional testing were as follows:

- (1) ASME Section III-68 and Winter Addenda 1969.
- (2) USAS B16.5, Steel Pipe Flange.
- (3) B&W Specifications.
 - (a) No. 1107/0467, "Sesmic Design Basis."
 - (b) No. 1095/1069, "Cleanliness of Nuclear Reactor Systems and Components."
 - (c) No. CS-3-106, "General Technical Specification for Components in Auxiliary Fluid Systems."
 - (d) No. 1152/1061, "Nuclear Quality Program Requirements."

The inspector examined the subject B&W specifications and determined they were consistent with code requirements.

b. Dresser "Order Special" Engineering Instructions and Drawings

(1) OS-175, Revision 0 and Revision 2

In response to questioning, Mr. Richardson explained that the OS-175 was the controlling shop manufacturing instructions. This OS, and others, were Dresser's Engineering Department's interpretation of the customer's requirements. The inspector examined OS-175 and determined that it was approved by the customer prior to release to the shop. Mr. Richardson further explained that after customer approval the industrial engineering group transposed the OS requirements to shop route sheets and drawings. OS-175 was found to cover four B&W contracts...including the Davis-Besse B&W PO No. 021864LS. The OS-175 included requirements for NDT, hydrostatic testing, hot functional testing, cleaning, painting, preparation for shipment, NV stamping of the completed valves, and requirements for the National Board approval certificate.

Overall, the OS-175 was in accordance with the B&W Specification 1103/0969 and referenced code requirements.

(2) Dresser Final Release for Fabrication Drawings CP-1005 and CP-1006

A review of these two drawings established that they were for two types of Maxiflow valves identified as 6"-3707RAX and 6"-3777QAX. The only difference between the two valves

was in the inlet nozzle design. The drawings indicated that the inlet nozzles were the only part of the valves which were subject to pressure containment. In response to questioning, the inspector was told that these nozzles were made of centrifugally cast austenitic stainless steel, were precision machined and measured, and were 100% inspected by radiographic and dye penetrant techniques.

- (3) Radiographic Examination Specifications for Centrifugally Cast Austenitic SS Seat Bushing (Nozzles) RG-8
- (4) Ultrasonic Test Procedure for Solid and Hollow Forgings and Wrought Bars (Valve Stem Stock) SP-20, Revision 0
- (5) Dye Penetrant Inspection of Cast or Forged Steel and High Alloy Steel to ASME Section III
- (6) OS-118, Revision 0, Cleaning Specification for Commercial Nuclear Power Plant Valves
- (7) Instructions for Steam Testing of Maxiflow Valves, PT-18, Revision 3
- (8) Standard Painting Specification for Safety and Safety Relief Valves, PC-10, Revision 2

The inspector examined all of the above instructions and procedures and determined they were in accordance with the requirements of the ASME Code Section III, ASTM specifications, B&W specifications, and SNT-TC-1A standards for NDT personnel qualifications.

The instructions for steam testing of the safety valves were reviewed in depth by the inspector. This procedure provided for valve warmup time; the set pressure for actuating within a tolerance of $\pm 1\%$; blowdown reset pressure of approximately 7% with smooth valve operation; final test actuation requirements; tightness check at 6% under opening pressure for leakage; and identification stamping. Upon request, the inspector was shown the manner in which the valves were adjusted and tested using dual calibrated pressure gages. The inspector observed the actual hot testing of a safety valve of the same type as the Davis-Besse valves. The information gained was of considerable value to the inspector in reviewing test data discussed hereafter in this report.

5. Record Packages Reviewed

Examination was made of a record package for 13 of the 18 safety valves which was to be sent to B&W (customer) for contents, completeness, conformance, and sign off. The records were found to be acceptable except in one instance involving a missing nozzle PT test report and in a second instance wherein the hydro test results were wrongly described. The inspector commented that this situation indicated a possible need for closer review of record packages by Dresser. A typical record package contained the following items:

- a. Test data sheet for set pressures, actuating pressures, and closure blowdown reset pressures.
- b. Assembly and cleaning record.
- c. Cleaning and preparation for shipment record.
- d. Quality assurance engineer certification sheet which included:
 - (1) Certification of the entire valve to code.
 - (2) Material specification.
 - (3) Parts heat numbers.
 - (4) Parts Marking.
 - (5) NDT performed (as applicable).
 - (6) Hydrostatic test (where applicable).
 - (7) Valve design data.
 - (8) Hot functional test for valve components as base, disc, nozzle, etc.
- e. Certified test reports for:
 - (1) Supplied bases, material A-216, Grade WCB.
 - (2) Supplied disc bar stock, material MA-15, equivalent to A-565, Grade 616.
 - (3) Supplied nozzles, material A-451, Grade CPF8C. (Centrifugally cast austenitic stainless.)

- (4) Dresser NDT report for minor repairs of bases.
- (5) Dresser radiograph log sheet for nozzles.
- (6) Dresser PT report for nozzles.
- (7) Dresser hydro test report for nozzles.
- (8) Dresser disc hardness report.
- (9) Dresser heat treatment charts for discs.
- (10) Photographs of nameplates.

An examination of the above documents established they were signed by applicable responsible personnel.

6. Shop Routing Sheets

An examination of assembly shop routing sheets indicated that they were adequately detailed for assembly, test and inspection; provided valve part serialized identity, provisions for customer witness of hot functional tests, and signoffs by responsible personnel.

7. Radiograph Film Review

An examination of a package of 14 RT films, representing 100% RT coverage of one cast stainless steel valve inlet nozzle, established that all of the related records such as reader sheet, shooting sketch, and the RT shooting technique data sheet were complete. The films indicated good 2T penetrometer sensitivity, contrast, definition, and density for both the penetrameters and the material. No unacceptable defects were observed.

8. NDT Personnel Welder Qualification

a. NDT Personnel

An examination of a certification list and examination records of NDT personnel indicated that personnel were tested and qualified in accordance with the SNT-TC-1A standards and that there was an adequate number of qualified personnel for the techniques of RT, PT, and MT. Mr. Richardson said that Dresser contracts all ultrasonic examination work to a qualified outside testing laboratory which follows the Dresser UT specification.

b. Welding Personnel

In response to questioning, Mr. Chenor told the inspector that the plant had 17 qualified welders, consisting of eight for shielded metal arc, one for tungsten inert gas, and six for oxyacetylene stellite. He added that the manual and TIG welders were recently requalified on a basis of the upgraded requirements of ASME Code, Section IX, Paragraph Q-24(d). The inspector examined a selection of four welders' records and determined that they were qualified as reported.

9. Miscellaneous

a. Stellite

Although the subject valves did not require stellite of seating surfaces, the inspector questioned both Messrs. Brewer and Chenor with regard to Dresser's provisions to prevent carbide sensitization during stellite on austenitic stainless valve parts. According to Brewer and Chenor, close control is maintained to bring the base material uniformly to a temperature of 850°F and to hold it there by periodic temperature checks. This, Brewer said, is to provide a shallow penetration bonding during the stellite application. In addition, the inspector examined Dresser's stellite procedure (WS-103) and determined that it contained instructions consistent with the practice previously described. The Dresser stellite technique appears to be adequate to prevent carbide sensitization of austenitic valve parts.

b. Transfer of Valve Parts to the Davis-Besse Contract

The inspector questioned Mr. Williams with regard to the source of valve parts for the Davis-Besse contract. Mr. Williams said the original engineering instruction OS-175 included the same type of valves for the SMUD, Midland 1 and 2, and Davis-Besse contract and that this had enabled Dresser transfer of 17 of the Midland 1 valve base castings to expedite the Davis-Besse order.

c. Other Facilities' Safety and Safety Relief Valves

In response to questioning, Mr. Williams said Dresser was manufacturing Class 1 safety valves for the following nuclear facilities:

Calverts Cliff 1 and 2

Beaver Valley

Midland 1 and 2

Millstone 1 and 2

D. C. Cook

Calhound

Duane Arnold

Long Island Lighting

Prairie Island 1 and 2

Maine Yankee Atomic

Limerack 1 and 2

Newbold Island 1 and 2

Hatch 2