

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

Report No. 99900355/79-02

Program No. 51300

Company: Hirata Valve Industry Co., Ltd.  
15, Hisamoto, Takatsu-Ku  
Kawasaki - City, Kanagawa - Pref., Japan

Inspection  
Conducted: August 27 - September 3, 1979

Inspector: I. Barnes  
I. Barnes, Contractor Inspector  
Components Section II  
Vendor Inspection Branch

9/27/79  
Date

Approved by: R. E. Allen for  
D. M. Hunnicutt, Chief  
Components Section II  
Vendor Inspection Branch

9/27/79  
Date

Summary

Inspection on August 27 - September 3, 1979 (99900355/79-02)

Areas Inspected: Implementation of 10 CFR 50, Appendix B, criteria and applicable codes and standards; including action on previous inspection findings, review of special welding applications, liquid penetrant examination, procurement document control, procurement source selection, material identification and control, and manufacturing process control. The inspection involved forty-eight (48) inspector-hours on site.

Results: In the seven (7) areas inspected, no deviations or unresolved items were identified in two (2) areas; the following deviations and unresolved items being identified in the remaining areas:

Deviations: Action on Previous Inspection Findings - Vendor statement correcting WPS No. shown on a certain Weld Repair Record, not attached to Weld Repair Record as committed by Hirata corrective action response letter of April 12, 1979 (Notice of Deviation, Item A). Review of Special Welding Applications - Observation of use of hardsurfacing travel speeds and Tungsten electrode extension values in excess of DWP permitted values, not consistent with Criterion V of 10 CFR 50, Appendix B, and Section 5 of the QA Manual (Notice of Deviation, Item B).

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Liquid Penetrant Examination - Absence of test specimen description and liquid penetrant practical examination results in the qualification records for two (2) Level II personnel is not in accordance with Criterion V of 10 CFR 50, Appendix B, and SNT-TC-1A (Notice of Deviation, Item C).

Procurement Document Control - Approval of vendor detail radiographic procedure, that was not in accordance with the penetrometer selection and geometric unsharpness requirements of Hirata Procedure NAF-14, is not in conformance with Criterion V of 10 CFR 50, Appendix B, and the applicable purchasing specification (Notice of Deviation, Item D). Approval of vendor CMTR showing voiding of welding procedure postweld heat treatment qualification is not in accordance with Criterion V of 10 CFR 50, Appendix B, and Section 3 of the QA Manual (Notice of Deviation, Item E).

Procurement Source Selection - Failure to perform required vendor resurvey and place use limitations on the Qualified Vendors List is not in accordance with Criterion V of 10 CFR 50, Appendix B, and Section 3 of the QA Manual (Notice of Deviation, Item F).

Unresolved Items: Procurement Document Control - System used for accomplishment and control of changes in procurement requirements is not addressed by the QA program (Details, E.3.b.).

Procurement Source Selection - Latitude given by QA Manual, with respect to qualification without survey of vendors providing non-code items and services, is not in accordance with 10 CFR 50, Appendix B, relative to required procurement controls for non-pressure boundary safety related items (Details, F.3.b.).

Other Significant Items: Hirata Valve Industry Co. Ltd. has completed approximately 16% of the ASME Section III valves to be manufactured for WPPSS Project Nos. 1 and 4 and 3 and 5. Approximately 2000 ASME Section III valves remain to be completed in this contract, with a current projected completion date of March, 1980.

DETAILS SECTIONA. Persons Contacted

- \*T. Hirata, President
- \*M. Hirata, Vice President (Marketing)
- \*Y. Hirata, Vice President (Kawasaki Division)
- \*S. Tanimoto, QA Manager
- \*K. Shimizu, Operations Manager
- \*S. Iizuka, Key Person, Atomic Power Team
- \*T. Hatakeyama, Quality Engineering (Acting as Translator)
- \*M. Ryu, Quality Engineering (Documentation)
- \*R. Saito, Quality Engineering (Documentation)
- S. Hirano, Level III Examiner

\*Attended exit meeting.

E. Action on Previous Inspection Findings

1. (Closed) Deviation (Item A, Notice of Deviation, Inspection Report No. 79-01): Two hardfacing welding procedure specifications were observed to have not been fully qualified with respect to all applicable Code specified essential variables.

The inspector verified that the corrective actions with respect to welding procedure qualification, valve rework, procedure review and training had been accomplished as committed. During this inspection, it was established that WPS No. HVPS-102, Revision 1 had been incorrectly attributed in Inspection Report No. 79-01 to be applicable to the shielded metal arc welding process, when it was, in fact, a gas tungsten arc metal welding procedure specification. Further qualification tests were performed, however, by Hirata Valve Industry Co. Ltd. (HV) to qualify the procedure with respect to Code requirements that exist for use of different filler material sizes with the gas tungsten arc welding process.

2. (Closed) Deviation (Item B, Notice of Deviation, Inspection Report No. 79-01): Absence of customer required restriction on use of a weave bead technique in two shielded metal arc welding procedure specifications.

The inspector verified that committed actions with respect to DWP revision, training and review system revision had been accomplished.

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3. (Closed) Deviation (Item C, Notice of Deviation, Inspection Report No. 79-01): Qualification of a heat of SFA 5.18 E70S-G wire without using the interpass temperature applicable to the WPS to be used in production welding.

The inspector verified that the committed revision of WPS No. HVPS-106 had been accomplished with respect to allowable interpass temperature, that previous welding work records were consistent with the interpass temperature restriction, and that actions had been implemented with respect to both CMTR checklist revision and incorporation of WPS reference in welding materials purchase orders.

4. (Closed) Deviation (Item D, Notice of Deviation, Inspection Report No. 79-01): Failure of a casting vendor CMTR to include the welding procedure used for defect repairs requiring radiography.

The inspector verified that committed actions had been taken with respect to acquiring and review of the WPS and welding materials CMTR, which were applicable to the weld repair performed by the casting vendor. It was also established that personnel training actions had been completed as committed. During the inspection, however, a deviation from corrective action commitment was identified, pertaining to the failure to attach the vendor request for correction, of the WPS No. shown to each applicable Weld Repair Record.

It should be noted that this was accomplished prior to the end of the current inspection. (See Notice of Deviation, Item A).

5. (Closed) Unresolved Item (Details I, D.3.b., Inspection Report No. 79-01): Adequacy of casting vendor heat treatment procedure could not be established because the document was available only in the Japanese language.

This item was resolved by review of the committed translation into the English language.

## C. Review of Special Welding Applications

### 1. Objective

The objective of this area of the inspection was to determine whether control of special welding applications such as hard surfacing conformed with the additional requirements established by Sections III and IX of the ASME Code and the requirements of the HV QA program.

## 2. Method of Accomplishment

The preceding objective was accomplished by:

- a. Review of Section 5 Revision 7 of the QA Manual, "Welding Quality Assurance."
- b. Observation of gas tungsten arc and oxy-acetylene hard surfacing operations with respect to welder compliance with applicable Detailed Welding Procedure instructions.
- c. Comparison of Detailed Welding Procedure content against the applicable Welding Procedure Specification.
- d. Review of material and fabrication requirements in United Engineers and Constructors (UE&C) Specification, 9779-41, Revision 38, "ASME III Valves," applicable to WPPSS Project Nos. 1 and 4.
- e. Review of material and fabrication requirements in Ebasco Specification, 3240-41, "Station Valves 2½" and larger, Contract 3240-41B," applicable to WPPSS Project Nos. 3 and 5.
- f. Examination of Certified Material Test Reports (CMTR) for filler materials observed in use with respect to Purchase Specification NPS 0014 Revision 0.
- g. Examination of hardsurfacing qualifications of welders observed performing production welding operations.

## 3. Findings

### a. Deviation from Commitment

The following examples of welding personnel not complying with Detailed Welding Procedure instructions were observed during witness of production hardsurfacing operations:

- (1) DWP 118-A18 Revision 0 requires all gas tungsten arc hardsurfacing operations to be performed using a Tungsten electrode extension of 6 mm. and first layer deposition to be made at a travel speed of 90-100mm./minute.

Contrary to the above:

- (a) Second layer gas tungsten arc hardsurfacing operations using DWP 118-A18 Revision 0 were observed being performed on Manufacturing Order (MO) No. N0333-4 R.O. using a Tungsten electrode extension of 9.5mm.

- (b) First layer gas tungsten arc hardsurfacing operations using DWP 118-A18 Revision 0 were observed being performed on MO No. N0029-4 R.O. at a travel speed of 107mm/minute.
- (2) DWP 119-C02 Revision 0 requires oxy-acetylene hardsurfacing operations to be performed at a travel speed of 90-110mm/minute.

Contrary to the above, oxy-acetylene hard surfacing operations using DWP 119-C02 Revision 0 were observed being performed on MO No. N0197-5 RO at a travel speed of 150mm./minute. (See Notice of Deviation, Item B)

b. Unresolved Items

None.

D. Liquid Penetrant Examination

1. Objectives

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

- a. Liquid penetrant examination is performed in accordance with approved procedures.
- b. Liquid penetrant examination procedures meet the requirements of the ASME Code and other applicable contract requirements.
- c. Examinations are accomplished by and test results are interpreted by appropriately trained and qualified personnel.

2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of Section 7 Revision 7 of the QA Manual, "Examinations, Tests and Inspections."
- b. Review of HV procedure, NAF-15 Revision 2, "General Procedure for Liquid Penetrant Examination," which was approved for use on WPPSS Project Nos 1 and 4.
- c. Review of HV procedure, NLP-003 Revision 0, "Detail Procedure for Liquid Penetrant Examination."

- d. Review of HV procedure, GNAF-35 Revision 1, "Qualification and Certification Program for NDE Personnel."
- e. Observation of penetrant examinations being performed by two (2) Level II inspectors on two (2) discs from MO N0328-3 R.O.
- f. Verification of halogen and sulfur control of penetrant materials.
- g. Review of qualification data for the liquid penetrant procedure and materials.
- h. Review of the qualification and certification records of the Level II personnel observed performing liquid penetrant examinations.
- i. Review of the qualification and certification records of the HV Level III Examiner.
- j. Examination of NDE requirements in customer specification 9779-41, Division 17, "Welding and NDE."

3. Findings

a. Deviation from Commitment

See Notice of Deviation, Item C.

b. Unresolved Items

None.

E. Procurement Document Control

1. Objectives

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

- a. A system had been prepared for the control of procurement documents, which was consistent with regulatory and Code requirements.
- b. The system had been properly and effectively implemented.

2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of Section 3 Revision 7 of the QA Manual, "Procurement, Vendor Evaluation, Receiving Inspection and Material Control."
- b. Evaluation of procurement documents applicable to the disc, body, bonnet, seat ring, stem, bonnet nuts and bolts, bonnet bush and stellite welding materials used in Valve Identification No. N0328B, with respect to:
  - (1) Conformance with QA program requirements for review and approvals.
  - (2) Identification of scope of work to be performed by the supplier.
  - (3) Appropriate definition of technical requirements.
  - (4) Identification of test, inspection and acceptance criteria.
  - (5) Use of suppliers with documented accepted QA programs.
  - (6) Identification of documents required to be submitted by the supplier for purchaser review or approval.
  - (7) Provisions for access to the supplier plant by purchaser inspection or audit personnel.
  - (8) Provisions for reporting and approving disposition of nonconformances by the purchaser.
  - (9) Consistency of procurement requirements with purchaser contractual commitments.
- c. Review of controls applied to changes in procurement requirements.
- d. Evaluation of procurement documents applicable to both castings that had been subject to radiographic examination or weld repair.

### 3. Findings

#### a. Deviations from Commitment

- (1)(a) Purchase Order 0019, dated July 29, 1977, to Nippon Stainless Steel Co. Ltd. references HV purchase specification, NPS-0011, as the applicable specification for Item 10, Body, Identity No. N0178A. Paragraph 7.4.3 in



specification NPS-0011 states in part with respect to radiographic method, "The RT Method shall accord with Hirata Procedure No. NAF-14, but shall be executed on the RT Detail Procedure that the supplier shall prepare and Hirata shall have approved. . . ."

Paragraph 6.1.4(4) in Procedure, NAF-14 Revision 1, states in part, "The selection of type of penetrometer for respective ranges of thickness of RT objects shall be as follows. However, a thinner penetrometer than listed for that range may be used provided all other requirements for radiography are met. As per Table 4 seeing the range of thickness of RT objects, and relative identification number and essential hole size of the necessary penetrometer for single - wall exposure with single - wall viewing . . . ."

Contrary to the above, Table 5-2 in Nippon Stainless Steel Co. Ltd. procedure, NS-C-I3061 Revision 1, which was approved for use on Purchase Order 0019 by HV, permitted use of thicker penetrameters than allowed by Table 4 in HV Procedure NAF-14 Revision 1, when wall thickness to be radiographed exceeded 60mm.

Example:

- I. For a wall thickness range of 60-65mm., the required source side penetrameters were, respectively, ASTM 45-50 (NS-C-I3061 Revision 1) and ASTM 40-45 (NAF-14, Table 4).
  - II. For a wall thickness range of 107-120mm., the required source side penetrameters were ASTM 80-90 (NS-C-I3061 Revision 1) and ASTM 60 (NAF-14, Table 14).
  - III. For a wall thickness of 135mm., the required source side penetrometer was ASTM 100 (NS-C-I3061 Revision 1) and ASTM 60 (NAF-14, Table 4).
- (b) Paragraph 6.2.13 in Procedure NAF-14 Revision 1, states with respect to geometric unsharpness, "The source-object distance shall be decided from the limited value of geometric unsharpness given in Table 7." Table 7 gives limited geometric unsharpness values of below 0.508mm. and below 0.762mm. for radiographic thickness ranges, respectively, of up to 50.8mm. and over 50.8mm. to 76.2mm.

Contrary to the above, Table 5-1 in Nippon Stainless Steel Co. Ltd. procedure, NS-C-I3061 Revision 1, permitted geometric unsharpness values of 0.608 (location B9-12) and 0.727 (Location B13-16), respectively, at radiographic thicknesses of 42mm. and 48mm. (See Notice of Deviation, Item D)

- (2) Paragraph ND-4333 in Section III of the ASME Code states in part, "Postweld heat treatment of procedure qualification welds shall conform to the applicable requirements of ND-4600 and Section IX. The postweld heat treatment time at temperature to be at least 80% of the maximum time to be applied to the component weld material. . . ."

Contrary to the above, two (2) SA 216 grade WCB bodies (Purchase Order 0010A, Item 10, Identification Nos. N0040C and N0040D) were postweld heat treated by the vendor (Mitsubishi Steel Manufacturing Co. Ltd., Hirota Steel Works) for 6.1 hours at  $620 \pm 25^{\circ}\text{C}$  subsequent to weld repair, although the welding procedure specification used, HMI-14-06, had been qualified with three (3) hours postweld heat treatment time at temperature. i.e. Allowing use in applications of up to 3.75 hours component postweld heat treatment. (See Notice of Deviation, Item E.)

b. Unresolved Items

The QA program does not address how revision of procurement requirements is accomplished. During the inspection it was established that changes in requirements are made by HV using a Valve Engineering Communications Sheet, with similar review and approval requirements as apply to original purchase orders. The system in use is not documented, however, and is considered unresolved pending inclusion of mechanics and controls for accomplishing this function in the documented QA program.

F. Procurement Source Selection

1. Objectives

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

- a. A system had been prepared for the control of procurement source selection, which was consistent with regulatory and Code requirements.
- b. The system had been properly and effectively implemented.

2. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of Section 3 Revision 7 of the QA Manual, "Procurement, Vendor Evaluation, Receiving Inspection and Material Control."
- b. Evaluation of survey records, requirements and history for two (2) companies presently listed on the Qualified Vendors List.

3. Findings

a. Deviation from Commitment

After a survey of Mitsubishi Steel Manufacturing Co. Ltd., Hirota Steel Works, on March 25, 1978, the auditors prepared a survey report, which stated, "Acceptable only if the attached comments are resolved." The NRC inspector was verbally informed that a source inspector had been used to verify required corrective actions had been implemented. No documentation, survey report or other format, was available, however, to confirm, that the resurvey required by paragraph 3.1.5(b) in Section 3 of the QA Manual, had been performed.

Included in the 1978 survey findings for this supplier, were two findings pertaining to the absence of a qualified vendors list, and, the failure to perform a required internal audit and audit record. In the next scheduled annual survey of this supplier, which was performed on February 27, 1979, the auditor again identified the absence of a qualified vendors list and the fact that a required internal audit report had not been prepared. The HV 1979 survey findings demonstrate, that the supplier was placed on the Qualified Vendors List, without assuring that required corrective actions had been fully implemented by the supplier. The NRC inspector was also unable to establish that the 1979 survey findings had been appropriately resolved as of this inspection.

The survey reports for this supplier and also Sumida Kogyo Co. Ltd. restricted performance of Charpy-V impact testing to the HV impact machine. This limitation was not entered into the Qualified Vendors List, as required by paragraph 3.1.5 in Section 3 of the QA Manual.

In the case of Sumida Kogyo Co. Ltd., there was also no documentation available to confirm HV had performed a resurvey to verify that committed corrective actions had been implemented. (See Notice of Deviation, Item F)

b. Unresolved Items

Paragraph 3.1.2(d) in Section 3 of the QA Manual permits the QA Manager to qualify vendors, without performing a survey, for those items and services not included in the scope of the ASME Code. This latitude is inconsistent with 10 CFR 50, Appendix B, to which HV is contractually obligated, in that 10 CFR 50, Appendix B, is applicable to all safety related items, not simply pressure boundary materials. This matter is considered unresolved pending definition of valve safety significant items by HV and applicable procurement controls. This matter will be further examined at the next scheduled inspection of this facility.

G. 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 applicable regulatory and code requirements.

2. Method of Accomplishment

The preceding objective was accomplished by:

- a. Review of Section 3 Revision 7 of the QA Manual, "Procurement, Vendor Evaluation, Receiving Inspection and Material Control."
- b. Examination of material identification with respect to disc, body, bonnet, seat ring, stem, bonnet nuts and bolts, bonnet bush and hardsurfacing welding materials to be used in Valve Identification No. N0328 B.
- c. Comparison of observed identity with respect to receiving inspection records and applicable Certified Material Test Reports (CMTRs).
- d. Examination of Material and Service Checklists for the sample items with respect to verification of HV review and acceptance relative to the procurement documents.

- e. Review of material CMTRs for compliance to purchase order and purchase specification requirements.

3. Findings

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

H. Manufacturing Process Control

1. Objective

The objective of this area of the inspection was to verify that the manufacturing process is controlled in accordance with applicable regulatory, code and contract requirements.

2. Method of Accomplishment

The preceding objective was accomplished by:

- a. Review of Section 4 Revision 7 of the QA Manual, "Process Control, Handling, Storage, Preservation, and Shipping."
- b. Review of Section 7 Revision 7 of the QA Manual, "Examination, Tests and Inspections."
- c. Examination of Manufacturing Orders (MOs) applicable to a selected sample of valve items, including three (3) discs, one (1) body, one (1) seat ring and one (1) stem, with respect to:
  - (1) Definition and control of sequencing of manufacturing operations to provide for compliance with ASME Code Section III fabrication and examination requirements.
  - (2) Compliance with any designated hold points.
  - (3) Performance of required ASME Code nondestructive examinations at appropriate times of examination.
  - (4) Completeness of operation signoff.
  - (5) Evidence of manufacturing inspection definition and performance consistent with QA program commitments.
  - (6) Use of appropriately qualified personnel for assigned operations.

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### 3. Findings

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

#### I. Exit Meeting

A post inspection exit meeting was held on September 3, 1979, with the management representatives denoted in paragraph A. above. The inspector summarized the scope and findings of the inspection, with particular emphasis being placed on the deficiencies in procurement controls, that had been identified during the inspection. Management was also informed, that as a result of the finding identified as Item A in the Notice of Deviation of this report, the report would be sent to the company under the signature of the Director of the Region IV Office of Inspection Enforcement. Management acknowledged the statements of the inspector made with respect to the findings as presented to them and affirmed their commitment to and support of the QA program.