

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

Report No. 99900730/80-01

Program No. 51400

Company: R. V. Harty Co., Inc.
Division of Door-Man
Manufacturing Company
Royal Oak, Michigan

Inspection
Conducted: December 3-5, 1980

Inspectors: *Ross L. Brown* 12/23/80
Ross L. Brown, Contractor Inspector
Components Section I,
Vendor Inspection Branch
Date

Approved by: *D. E. Whitesell* 12/23/80
D. E. Whitesell, Chief
Components Section I,
Vendor Inspection Branch
Date

Summary

Inspection on December 3-5, 1980 (99900730/80-01)

Areas Inspected: Initial management meeting and follow-up on the field reported deficiencies in the shock doors fabricated by this vendor. The inspection involved eighteen (18) inspector hours on site by one NRC inspector.

Results: No deviations from commitment or unresolved items were identified during this inspection.

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DETAILS SECTION

A. Persons Contacted

- *A. P. Johnson, President
- P. B. Hoke, Executive Vice President and Quality Assurance Manager
- *C. S. Flynn, Secretary/Treasurer

*Attended Exit Interview

B. Initial 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 R. V. Harty (RVH) Co., Inc. QA program and to establish channels of communication.
- b. To determine the extent of the company's involvement in the commercial nuclear business.
- c. To explain NRC direct inspection program including LCVIP organization VIB inspection methods and documentation.
- d. To describe the scope of the inspection relative to the field reported deficiencies in the shock doors for St. Lucie Unit 2. (See details in Paragraph C).

2. Method of Accomplishment

The preceding objectives were accomplished by a meeting with Mr. A. P. Johnson, President.

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 LCVIP 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 was discussed including current and projected activity.
- e. The company quality assurance program was discussed.

3. Results

The inspector was provided the following information:

- a. RVH designs, manufacturers, inspects, installs (if applicable), and tests various types of shielding doors, hatches and windows.
- b. The RVH Quality Assurance Manual, Revision 7 (QAM) was developed and implemented to comply with 10 CFR 50 Appendix B, ANSI N45.2 and meet the intent of N45.2.2, N45.2.6, N45.2.5, N45.2.11, N45.2.13, and AWS D1.1.
- c. The RVH commitment to the commercial nuclear industry is 15% of manhours. The company has in house, twelve (12) active and four (4) inactive (on hold) contracts. These sixteen (16) jobs are scheduled to be completed by 1983, however, no work was in progress during the inspection.
- d. The majority of the RVH plant activities are in compliance with American Welding Society (AWS) codes and standards.
- e. The inspector was conducted on an orientation tour of the facility.

No deviations from commitment or unresolved items were identified in this area of the inspection.

C. Vendors Quality Program Activities Related to Field Reported Deficiencies

1. Background

- a. The NRC, Region II office received a notification from Florida Power and Light Company (FP&L) deficient anchor stud welds in the Diesel Generator Building door frames for the St. Lucie Unit 2 facility.
- b. The NRC, Region II office received an interim report, date April 21, 1980, stating that additional deficient anchor stud welds have been identified in the door frames for installation in the Component Cooling Water Building and Diesel Oil Storage Tank Building.

2. Objectives

The objectives of this inspection were to verify that: The cause has been determined, action to correct the deficiency has been taken, preventive measures have been established and implemented and generic

possibilities have been evaluated.

3. Method of Accomplishment

The preceding objectives were accomplished by a detailed review of the following documents and discussions with cognizant personnel:

- a. Customers (Ebasco) Purchase Order No. NY-422669 date March 25, 1977. (RVH Job No. 77H39).
- b. Customer Specification No. FL0-2998-769J, Rev.1, date March 6, 1977. "Tornado Resistant Doors" Seismic Category 1. Non-Nuclear Safety Class (RVH Job No. 77H39).
- c. RVH Stud Welding Technique Procedure No. WP-14.
- d. RVH Stud Welding Process Qualification Procedure No. WP-34.
- e. RVH Stud Welding Stud Selection Procedure No. WP-24.
- f. RVH Drawing No. 77H39, Sheet No.'s A-20, and A-31.
- g. Customer approval of RVH welding procedures WP-14, WP-24, and WP-34.
- h. Certified Material Test Reports (CMTR) for Steel Shapes--Heat No.'s 67D865, and anchors Heat No.'s N93548 and 517E4751.
- i. Visual Inspection Report No.'s IR-H39-01 and H39-03.
- j. QAM Section 10.
- k. RVH letter date October 29, 1980, to Mr. G. A. Kanakaris, Chief Civil Engineer, Ebasco Services, Inc., New York, New York.
- l. Ebasco release for door frames.
- m. Pre-production Test Bar.
- n. AWS D.1.1-75 and AWS C.5.4-74.

4. Findings

- a. The inspector verified the following information during the above document review and discussions with cognizant persons:
 - (1) The customer procurement documents states in part: the applicable standards include AISC, AWS-D.1.1-75, AWS-C.5.4-74, ASTM,

ANSI N45.2, N42.2.2, N45.2.9, ASNT-TC-1A, and 10 CFR 50; specific materials; design in accordance with AISC Specification for the "Design, Fabrication and Erection of Structural Steel for Buildings;" design loads; fabrication per AISC; welding in accordance with AWS D.1.1; anchor stud welding per AWS C.5.4-74; workmanship, inspection and testing per AWS D.1.1-75. 10 CFR Part 21 not imposed.

- (2) AWS D.1.1-75, Part F "Stud Welding," contain provisions for the installation and inspection of steel studs welded to steel, these provisions include the following as a minimum:
- (a) Studs shall be made from cold drawn bar stock ASTM A108, Grade 1010 through 1020 either semi, or fully killed.
 - (b) Stud base qualifications is the responsibility of the stud manufacturer, the test specimens shall be prepared by welding representative studs to suitable ASTM-A36 steel plates. The section also specified the type and number of acceptable tests to be performed for qualification.
 - (c) The inspection requirements are specified as visual and bending to an angle of 15 degrees of any stud shear connectors that does not show a full 360 degree weld fillet or has been repaired by welding.

For studs other than shear connectors, at least one stud in every 100 shall be bent to an angle of 15 degrees from its original axis.

RVH management stated that unofficial 45 degree bend tests were made at the beginning of each production run (the inspector inspected a test bar containing ten (10) stud welds that were bent to a 45 degree angle, the test bar was dated) and upon the completion of the production welding a 15 degree bend was performed by RVH on forty-eight (48) of the 1008 welds on the ten (10) door frames.

The management statements were verified in the letter identified in C.2.k.

- (3) AWS C.5.4-74 describes the equipment characteristics in an arc stud weld power source and weld gun. It also briefly describes the technique and procedural requirements for arc stud welding. It further imposes the QC and inspection requirements of AWS D.1.1-75.

- (4) The welding procedure identified in C.2.c.,d and .e. appear to be in accordance with the AWS standards.
- (5) The RVH drawings (used for inspection record notes) and inspection reports indicate the welds of the ten (10) door frames were inspected and signed by the RVH, QA Manager.
- (6) The CMTRs certified the steel shapes are in conformance with ASTM-A36-77A. and the anchors (studs) were in conformance with ASTM-A108-73 and AWS D.1.1-75.
- (7) The RVH letter identified in C.2.k is a copy of Harty's report on the subject. This letter is a resume of the following.
 - (a) R.V. Harty's position is that the diesel generator, diesel oil storage tanks and component cooling system equipment are not covered by the definitions stated in 10 CFR 21.3.
 - (b) RVH also rejects the applicability of the reporting procedures covered in 10 CFR 50.55(e).
 - (c) The letter briefly describes some of the requirements of AWS D.1.1-75, how RVH complied with those requirements.
 - (d) The letter also states the differences that RVH has with the Florida Power & Light Company (FP&L) documents relative to all welds on these door frames.
- (8) The pre-production test bars had ten (10) anchor studs welded to a steel plate and bent to a 45 degree angle. These welds were made using KSM studs and equipment, these studs and equipment was qualified in accordance with the requirements of AWS D.1.1-75.

The appearance of the anchor weld and expelled metal around the base of the stud (weld flash as defined in AWS 3.0) is different than welds produced by Nelson Stud Welding Equipment and Studs, because the ferrule (arc shield) used to contain the molten metal around a welded stud will permit a percentage of the weld flash to be expelled through the serrated edge of the ferrule, this expelled metal is excess to the weld required for strength and is not detrimental to the weld and need not be removed or reworked.

- b. No deviation from commitment or unresolved items was identified in this area of the inspection.

- c. RVH management stated that FP&L has made several referenced to "rewelding door frames." This rewelding has not been specifically identified to RVH engineering or quality assurance for their review and approval, therefore, RVH is not sure that the doors to be furnished later (by RVH) will fit and function properly, also that the design (RVH responsibility) is still valid. RVH has requested this information from FP&L.

D. Exit Interview

The inspector conducted an exit meeting at the conclusion of the inspection. Those persons indicated by an asterisk in Paragraph A were in attendance.

The inspector discussed the scope of the inspection and stated that in the areas inspected no deviations from commitments or unresolved items were identified.

The RVH management's comments were for clarification and to emphasize their concern about the lack of information supplied to them relative to the nature of the rework performed on the door frames by FP&L at the site.