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

Report No. 99900063/81-01 Program No. 51300

Company: Pacific Pumps
Division Dresser Industries, Inc.
5715 Beckett Street
Huntington Park, California 90255

Inspection Conducted: January 20-23, 1980

Inspector: H. W. Roberds 2/26/81
H. W. Roberds, Contractor Inspector Date
Components Section II
Vendor Inspection Branch

Approved by: I. Barnes 2-26-81
I. Barnes, Chief Date
Components Section II
Vendor Inspection Branch

Summary

Inspection on January 20-23, 1980 (99900063/81-01)

Areas Inspected: Implementation of 10 CFR Part 50 Part, Appendix B, and applicable codes and standards including: regional request follow-up inspection and IE Information Notice No. 80-38 follow-up inspection. The inspection involved twenty-eight (28) inspector hours on site by one (1) NRC inspector.

Results: In the two (2) areas inspected, there were no nonconformances or unresolved items identified.

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DETAILS SECTION

A. Persons Contacted

*D. J. Moyer, Quality Assurance Manager
*S. R. Grajenda, Welding Engineer
*W. R. Karp, Level III Quality Engineer

*Denotes those present at the exit interview.

B. Regional Request Follow-up Inspection

1. Introduction

During inspection of the overlay cladding on the Sequoyah 2 2B-B centrifugal charging pump casing in response to IE Information Notice 80-38, the licensee made a determination that the barrel cladding thickness appeared to be inadequate. The pump was manufactured by the Pacific Pump Division of Dresser Industries, Inc., Huntington Park, California.

2. Inspection Objectives

The objectives of this area of the inspection were to review the nature and scope of the reported discrepancy, to analyze the probable cause, and determine if the problem had generic implications.

3. Method of Accomplishment

The preceding objectives were accomplished by:

a. Review of Westinghouse Atomic Power Division Purchase Order No. 546-CAE-103311BN, dated July 23, 1969.

b. Review of Westinghouse Equipment Specification F-677125, Revision 0, dated February 4, 1969.

c. Review of Pacific Pump record package for Shop Order B46-617, S/N 45609, including heat treatment charts and nondestructive test report (PT), dated June 4, 1970.

d. Review of NDE personnel Qualification records for the years 1969, 1970, and 1971.

e. Review of Drawing Nos. D-12982, D-13010 and D-13593.

f. Review of Weld Procedure Specification No. 042-2-5100, "Submerged Arc Weld Overlay (P-8) to (P-1)," approved for contract No. 546-CAZ-103311 BN.

g. Visual examination of barrel case S/N 45621/22 and observation of copper sulfate test of areas where samples had been removed for chemical analysis.

h. Review of the results of the wet analysis of cladding samples from barrel case S/N 45621.

4. Findings

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

5. Comments

The Westinghouse equipment specification F-677125 required 1/8 inch minimum cladding thickness on the I.D. of the barrel case.

Pacific Pump removed samples of the cladding for wet chemical analysis to a depth of 0.135 inch and also tested the excavation with copper sulfate solution for exposure of carbon steel. No carbon steel was detected by the copper sulfate etch, thus indicating that the cladding thickness was in excess of the 1/8 inch minimum requirement.

C. IE Information Notice No. 80-38 Follow-up Inspection

1. Introduction

In January 1980, Commonwealth Edison Company reported to the NRC that a radiographic examination had revealed crack indications in the cladding on the suction end plate of the 1A centrifugal charging pump at Zion Unit 1. An in-situ ultrasonic examination confirmed clad cracking indications at the barrel case to end plate inner radius for approximately 330 degrees around the circumference. Subsequent metallographic examination showed that the cracks had extended from the cladding to a maximum depth of 1/16 inch in the pump base material.

2. Inspection Objectives

The objectives of this area of the inspection were to examine the nature of the reported discrepancy and determine, from records, if the provisions of the applicable ASME Code and contract requirements had been complied with. Also ascertain if a similar condition might exist for other pumps designed and fabricated by Pacific Pump for the nuclear industry.

3. Method of Accomplishment

The preceding objectives were accomplished by:

a. Review of Westinghouse Atomic Power Division Purchase Order No. 546-CAZ-103311 BN, dated July 23, 1969.

b. Review of Westinghouse Equipment Specification F-677125, dated February 4, 1969, Revision 0.

c. Review of Pacific Pump record package for shop order No. B46617, Item A21; including heat treatment charts of June 30, 1971, and Nondestructive Report No. HT41971-16, dated August 14, 1971.

d. Review of NDE personnel qualification records for the years 1969, 1970 and 1971.

e. Review of Drawing Nos. D-12982, D-13010 and D-13593.

f. Review of Weld Procedure Specification No. 042-2-5100-1 "Submerged Arc Overlay (P-8) to (P-1)," approved by customer for contract 546-CAZ-103311 BN on October 3, 1969, for conformance with ASME Code, Section IX, 1968 Edition requirements.

g. Review of Welding Procedure Qualification Test Record for Automatic Subarc (P-8) to (P-1) materials.

h. Review of Weld Procedure Specification No. 042-2-5780, Revision 3, dated August 1, 1973, "Submerged Arc Welding."

4. Findings

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

5. Comments

a. The available evidence indicates that the clad cracking resulted from difficulties in control of overlay dilution by base material, in the vicinity of a sharp corner geometry at the barrel plate to suction end plate inner radius.

b. This configuration was modified by Drawing No. D-13593, dated September 1, 1970, to include a minimum radius of 1/8 inch at the corner in question. No records were available, however, to allow identification of the specific casings that had been machined and overlay clad in accordance with the original design configuration.

c. The overlay cladding operation was eliminated in 1972 by the substitution of a stainless steel forging for the carbon steel.

d. No information was obtained by the inspector to indicate that similar overlay clad corner geometries had been utilized in other pump designs.

D. Exit Meeting

A post inspection meeting was held on January 23, 1981 with management representatives denoted in paragraph A above. The inspector discussed the actions necessary to provide information relative to cladding thickness on the barrel case of the pump in question. Management had no questions or comments in regards to the inspection.