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

Report No. 99900025/80-01

Program No. 51300

Company: Southwest Fabricating & Welding Co., Inc.
7525 Sherman Street, P. O. Box 9449
Houston, Texas 77011

Inspection Conducted: February 28-29, 1980

Inspector: D M Hunnicutt 3/24/80
for I. Barnes, Contractor Inspector Date
Components Section II
Vendor Inspection Branch

Approved by: D M Hunnicutt 3/24/80
D. M. Hunnicutt, Chief Date
Components Section II
Vendor Inspection Branch

Summary

Special Inspection on February 28-29, 1980 (99900025/80-01)

Areas Inspected: Review and evaluation of reported errors in drawings (relative to branch connection requirements), which were applicable to nuclear piping assemblies furnished to the V. C. Summers Unit 1 site. The inspection involved a total of seven (7) inspector-hours on site.

Results: In the one (1) area inspected, no deviations from commitment or unresolved items were identified.

DETAILS SECTIONA. Persons Contacted

- *B. J. Goodwin, President and Chief Executive Officer
- *N. H. Moerke, Vice President, Engineering
- *R. P. Bornes, Manager, Quality Assurance
- *R. L. Pearson, Manager, Welding
- E. R. McAnally, Chief Engineer
- H. Kent, Squad Supervisor, Engineering

*Denotes those persons attending exit meeting.

B. Specification of Incorrect Fillet Weld Size Requirements for Branch Connections1. Introduction

Southwest Fabricating and Welding Co., Inc. (SWF) was contacted in February, 1980, by South Carolina Electric and Gas Company and Gilbert Associates Inc. personnel to ascertain the basis and justification for the specification by SWF on Virgil C. Summer Unit 1 shop drawings of 1/4 inch leg length reinforcement fillet welds for branch connections. The specific area of concern related to interpretation of the applicable fillet weld size requirements for branch connections, contained in paragraph NC-3643 of the ASME Code (through the 1973 Summer Addendum).

Figure NC-3643.2(a)-1, which is identified by NC-3643 as depicting acceptable methods of joining a coupling to a run pipe for branch connections not requiring reinforcement, included a reference to fillet weld throat size (t_c) for the type of joint design, i.e. full penetration weld with fillet weld reinforcement, utilized by SWF for branch connections on this contract. Requirements for t_c were not, however, specified in this Figure. In an attempt to interpret applicable ASME requirements for this t_c dimension, an assumption was made by the Architect Engineer/Utility that the branch connection weld could be classified as an ASME Code Category D weld joint (nozzle to main shell weld). With this classification the t_c dimension would be required to be not less than the smaller of 1/4^c inch or 70% of the coupling thickness at the branch pipe region.

Specification of a 1/4 inch minimum leg length fillet weld will produce a minimum equivalent throat dimension of 0.176 inches. This dimension was established to exceed 70% of coupling thickness for all branch connections, with the exception of those used to attach

1½ inch and 2 inch schedule 160 branch piping. Review by SWF identified three (3) shop drawings, Sales Order (S.O.) Q4165-B, Sheet Nos. 7, 12 and 15, which contained couplings attached by full penetration welds with 1/4 inch minimum leg length reinforcement fillet welds and to which 2 inch schedule 160 branch piping would be connected in the field.

2. Inspection Objectives

The objectives of this inspection were to review the nature and scope of the reported deficiency and determine any generic implications.

3. Method of Accomplishment

The preceding objectives were accomplished by:

- a. Review of QA program requirements in Section 2.0 (Drawing and Specification Control) of Revision 13 of the QA Manual.
- b. Discussion with SWF management relative to background information on the criteria used to evaluate the nature and scope of the reported deficiency.
- c. Ascertaining that actual weld measurements had been requested from the utility to determine whether a product deficiency existed.
- d. Review of ASME Code requirements for Class 2 branch connections in the 1st Edition through Summer 1973 Addendum and in the subsequent 1974 and 1977 Editions.
- e. Examination of the design and fabrication requirements contained in Gilbert Associates Inc. Specification SP-544-044461-000, dated October 12, 1973, for Class 2 piping branch connections.

4. Findings

- a. Within the area of this inspection, no deviations from commitment or unresolved items were identified.
- b. After review of applicable ASME Code requirements, the inspector was unable to determine any basis for applying the ASME Code Category D fillet weld size requirements on the subject branch connections, in that:

(1) The size and type of couplings and method of attachment

satisfied the specific provisions of NC-3643 for branch connections not requiring reinforcement.

- (2) The 1974 Edition of the ASME Code clarified this matter by elimination of any reference to a t_c fillet weld throat dimension on the applicable Figure.
- (3) The ASME Code weld joint classification categories do not appear to be applicable to piping fabrication, in that the definitions are written solely in terms of vessel fabrication.

- c. No contractual requirements were identified in the customer specification with respect to fillet weld sizes for Class 2 branch connections up to two (2) inch pipe size.

C. Exit Meeting

The inspector met with the management representatives denoted in paragraph A. above on February 29, 1980, at the conclusion of the inspection. The inspector informed management that the special inspection was performed as a result of information provided to Region IV by Region II of the Office of Inspection and Enforcement, relative to identified errors on SWF drawings concerning fillet weld size requirements for piping branch connections. The inspector summarized the scope of the inspection and informed management that no deviations from commitment or unresolved items had been identified. Management acknowledged the statements of the inspector and affirmed their commitment to the quality assurance program.