WELDING PROJECT

SPECIFIC EMPLOYEE CONCERN

EVALUATION REPORT

REPORT NUMBER: WP-18-SQN, R1

DATE 08-26-86

SUBJECT: EFFECTS OF LAMINATIONS ON WELD QUALITY

CONCERN CONSIDERED: XX-85-098-001

PREPARED BY J.E. Rose 8/26/86, OC, WP

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REVIEWED BY J.E. Mauldin 9/3/86, CEG-H, WELDING

APPROVED BY W.R. Brown 9/3/86, PROGRAM MANAGER

Revision 1 to this report incorporates comments made by the Senior Review Panel on 8/19/86.

SPECIFIC EMPLOYEE CONCERN

SUMMARY SHEET

Report Number: WP-18-SQN, R1

Report Title: EFFECTS OF LAMINATIONS ON WELD QUALITY

I. CONCERNS CONSIDERED: XX-85-098-001

II. ISSUES INVOLVED

Laminations in pipe prevented making an acceptable weld in unit 2 condenser.

III. STATEMENT OF CONCERN/ISSUE VALIDITY

Validity: Y X , N_____, Substantiated: Y_____, N X

IV. EFFECT ON HARDWARE AND/OR PROGRAM

None

V. JUSTIFICATION

Laminations in pipe are parallel to principal stress direction. Welds terminate the lamination at the weld joint.

VI. RECOMMENDATION AND/OR CORRECTIVE ACTION NEEDED

None

VII. REINSPECTION NEEDED: Y_____, N X .

VIII. ISSUE CLOSURE

By this report.

IX. ATTACHMENT

1. Text of Employee Concerns

00370

SPECIFIC EMPLOYEE CONCERN

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I. SCOPE OF EVALUATION

This engineering evaluation relates to the following SQN specific concern:

XX-85-098-001

II. ISSUES ADDRESSED BY CONCERNS

The concern was analyzed to determine the issue voiced by the concerned individual. This issue is as follows:

Laminations in pipe prevented making a good butt weld in unit 2 condenser.

III. CONCERN VALIDITY OR SUBSTANTIATION

Condensers are nonsafety-related equipment built to manufacturers standard designs with custom specifications for fabrication and erection. They generally specify ASME-type materials for construction, ASME welding procedure qualifications, and ASME welder performance qualifications. Working pressures in condensers are characteristically very low (near atmospheric or slight vacuum) and the piping materials used in condenser construction do not need to be of the stringent quality that is used in high pressure piping service. They are constructed of carbon steel materials which conform to either ASTM or ASME Section II material requirements. Piping material for these applications is commonly A-53. This material specification makes no mention of laminations being injurious defects. A lamination is simply a discontinuity which is formed when blow holes resulting from the steel ingot casting process are not fully fused together in the rolling process for a particular product form. These discontinities are located parallel to the direction of rolling of the product form and are usually at mid-depth of that product, although they may appear at other depths. It is important to note that they occur in a plane which is parallel to the product surfaces. R1

Wrought products such as pipe and plate which are subsequently rolled and welded into pipe products, commonly have laminations due to the steel making process. It is important to note that in piping applications where pipe is subject to internal pressures, laminations are of no consequence.

ASME Section III which defines requirements for nuclear pressure piping in safety systems which are designed to much more stringent requirements than those used for condenser construction accepts laminations with qualifications. ASME Section III, NB-5130 does not require weld repair of weld prep laminations which are one-inch and less in length. Those which exceed one-inch in length are customarily ground back three eighths-inch and sealed-off by welding. This sealing-off simply moves the lamination a distance from the weld joint which will prevent small porosity from appearing in the weld joint during subsequent welding. This is done as a convenience for subsequent nondestructive testing, if required. The net effect of welding over a lamination is simply to stop it and seal it off. Welding over laminations will usually evolve a small amount of oxides or gases into the molten weld puddle which will appear as porosity. This porosity is bothersome to the welder, but if repaired, is acceptable. R1

In summary, the issue voiced in this concern is valid but not substantiated. It has been determined not to be detrimental for the following reasons:

1. ASME Class 1 rules state that weld prep laminations one-inch and less in length are acceptable material conditions which do not require weld repair. Those greater than one-inch are allowed to be weld repaired after grinding to a specified depth.

2. Condensers are constructed to requirements less stringent than ASME Class 1 which do not address laminations as injurious defects.

3. Laminations are commonly occurring discontinuities in wrought steel products and are not prohibited by material specifications.

4. The effect of a lamination in a pipe subjected to internal pressure is of no concern.

5. Laminations pose no problem to weld joint integrity.

Based on the foregoing analysis, this concern is closed.

03/24/86 (EMPLOYEE CONCERNS)
11:43:17

LOC	STATUS	RESP	-QIC-	PPP	CFR	INSP	TC	------CONCERN-------	PROBLEM ID
							NR	XX-85-098-001	WCMHC

KEYWORDS: WELDMENT QUALITY SPECIFIC X: S Y: C Z: Y

SEQUOYAH: THERE WAS A LAMINATED PIPE 12" OR 14" DIAMETER COMING OUT OF THE CONDENSER IN UNIT 2 TURBINE BUILDING. THE CRAFT COULD NOT GET A GOOD WELD DUE TO LAMINATION. OCCURRED IN 1977. DETAILS KNOWN TO QIC, WITHHELD DUE TO CONFIDENTIALITY. CONST. DEPARTMENT CONCERN. C/I HAS NO ADDITIONAL INFORMATION.

TECHNICAL COMMENTARY:

ISSUE CONSIDERED: LAMINATION IN PIPE PREVENTED MAKING A GOOD BUTT WELD IN THE UNIT TWO CONDENSER.