

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

NSRS INVESTIGATION REPORT NO. I-85-753-WBN

EMPLOYEE CONCERNS IN-85-001-005 AND IN-85-007-003

MILESTONE 6

SUBJECT: VENDOR WELDING

DATES OF INVESTIGATION: November 12, 1985

INVESTIGATOR:

*John C. Catlin*  
J. C. Catlin

*12-9-85*  
Date

VIEWED BY:

*J. D. Smith*  
J. D. Smith

*12-9-85*  
Date

APPROVED BY:

*fa W.D. Steven*  
M. A. Harrison

*12-10-85*  
Date

8605290620 KA

## BACKGROUND

NSRS conducted an investigation regarding two employee concerns received by Quality Technology Company (QTC). Concern IN-85-001-005 received on October 15, 1985 stated: "Vendor welds were bought off even though they exhibited 'shoddy workmanship'." The allegation was nonspecific. Concern IN-85-007-003 received June 10, 1985 stated: "General look over vendor welds should be performed. Vendor welds are not inspected at WBNF 1 or 2. They are easily distinguishable from field welds because of the bad quality of the vendor welds. Vendor welds would not pass the same acceptance. . . ." This allegation was also nonspecific. During the course of the investigation a similar concern was noted; i.e., IN-85-372-001. This concern had been investigated by the Office of Construction and closed out by QTC.

## II. SCOPE

The scope of the investigation included attempts to find a more specific example of the allegation and to track the example to its conclusion. QTC could provide no additional information other than to verify that the concerns were similar to IN-85-372-001.

## III. SUMMARY OF FINDINGS

### A. Requirements and Commitments

The nonspecific nature of the allegations rendered all requirements and commitments indeterminate.

### B. Findings

1. Employee Concern IN-85-372-001 cited manway hatch covers as a specific example of substandard vendor welds.
2. NCR 6341 was written on September 25, 1985 which defined the nonconforming condition as: "Contractor welds for stiffener plates on hatch covers appear to not meet requirements of AWS D1.1. Welds appear to be undersized in places and have undercut and overlap. Reference employee concern IN-85-372-001."
3. NCRs 6345 and 6345A were written on September 25 and 26, 1985 covering Units 1 and 2, respectively. The nonconforming condition noted on the NCRs was similar to that of NCR 6341.
4. A statement was issued on Employee Concern IN-85-372-001 which stated in part that OC agreed that these welds were not of the quality expected of TVA personnel and that the contractor welds for stiffener plates on these hatch covers did not appear to meet the requirements of AWS D1.1 and also that the welds appeared to be undersized in places and have undercut and overlap. These were structural attachment welds which were not part of the reactor primary containment; and, therefore, they did not require a leak tightness test.
5. Disposition of all three NCRs by Engineering was to "use as is" in accordance with memorandum B26 851012 007.

CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. The objective evidence of a similar employee concern substantiated the observed allegation of both concerned individuals (CI).
2. A typical case of a similar problem had been identified, reported, and documented in accordance with applicable procedures. Disposition was to "use as is."
3. Specific conclusions regarding these nonspecific allegations could not be reached.

B. Recommendations

None.



EMPLOYEE CONCERN DISPOSITION REPORT

CONCERN NO. IN-85-001-005

DATE OF PREPARATION: 1-9-86

CONCERN: Vendor welds were bought off even though they exhibited "shoddy workmanship".

INVESTIGATION PERFORMED BY: TVA NSRS

FINDING(S): See investigation report.

CORRECTIVE ACTION(S): Similar problem was identified, reported and documented in accordance with applicable procedures. Disposition was to "use as is".

CLOSURE STATEMENT: This concern was substantiated.

TSR

## EMPLOYEE CONCERN ASSIGNMENT REQUEST

To: Director - NSRS

TRANSMITTAL NUMBER T50011

ERT has received the Employee concern identified below, and has assigned the indicated category and priority:

Priority: 1

Concern # IN-85-007-003

Category: 05

Confidentiality: ☐ YES ☐ NO (I & H)Supervisor Notified: ☐ YES ☒ NO NUCLEAR SAFETY RELATED YES

Concern: GENERAL LOOK OVER VENDOR WELDS SHOULD BE PERFORMED. VENDOR WELDS ARE NOT INSPECTED AT WBNP 1 OR 2. THEY ARE EASILY DISTINGUISHABLE FROM FIELD WELDS BECAUSE OF THE BAD QUALITY OF THE VENDOR WELDS. VENDOR WELDS WOULD NOT PASS THE SAME ACCEPTANCE

*[Signature]* 6/10/85  
MANAGER, ERT DATE

NSRS has assigned responsibility for investigation of the above concern to:

ERT ☒NSRS/ERT ☐NSRS ☒OTHERS (SPECIFY) ☐

*Transferred to NSRS  
per memo to MSAH  
on 11/15/85 per  
John Catlin - JHC 11/21/85*

NSRS

DATE

# FINAL

## REQUEST FOR REPORTABILITY EVALUATION

1. Request No. IN-85-001-005  
(ERT Concern No.) (ID No., if reported)
2. Identification of Item Involved: VENDOR WELDS  
(Nomenclature, system, manuf., SN, Model, etc.)
3. Description of Problem (Attach related documents, photos, sketches, etc.)  
VENDOR WELDS WERE BOUGHT OFF EVEN THOUGH THEY EXHIBITED SHODDY WORKMANSHIP.
4. Reason for Reportability: (Use supplemental sheets if necessary)
- A. This design or construction deficiency, were it to have remained uncorrected, could have affected adversely the safety of operations of the nuclear power plant at any time throughout the expected lifetime of the plant.
- No X Yes \_\_\_\_\_ If Yes, Explain: \_\_\_\_\_
- AND
- B. This deficiency represents a significant breakdown in any portion of the quality assurance program conducted in accordance with the requirements of Appendix B.
- No X Yes \_\_\_\_\_ If Yes, Explain: \_\_\_\_\_
- OR
- C. This deficiency represents a significant deficiency in final design as approved and released for construction such that the design does not conform to the criteria bases stated in the safety analysis report or construction permit.
- No X Yes \_\_\_\_\_ If Yes, Explain: \_\_\_\_\_
- OR



**FINAL**

REQUEST FOR REPORTABILITY EVALUATION

- D. This deficiency represents a significant deficiency in construction of or significant damage to a structure, system or component which will require extensive evaluation, extensive redesign, or extensive repair to meet the criteria and bases stated in the safety analysis report or construction permit or to otherwise establish the adequacy of the structure, system, or component to perform its intended safety function.  
No ☒ Yes ☐ If Yes, Explain: \_\_\_\_\_

OR

- E. This deficiency represents a significant deviation from the performance specifications which will require extensive evaluation, extensive redesign, or extensive repair to establish the adequacy of the structure, system, or component to perform its intended safety function.  
No ☒ Yes ☐ If Yes, Explain: \_\_\_\_\_

IF ITEM 4A, AND 4B OR 4C OR 4D OR 4E ARE MARKED "YES", IMMEDIATELY HAND-CARRY THIS REQUEST AND SUPPORTING DOCUMENTATION TO NSRS.

This Condition was Identified by: \_\_\_\_\_

W. E. Rubach  
ERT Group Manager

W. E. Rubach  
ERT Project Manager

Acknowledgment of receipt by NSRS

Bruce L. Ligon  
Signed

Date

1-13-86

Time

TVA EMPLOYEE CONCERNS  
SPECIAL PROGRAM

REPORT NUMBER: WP-18-SQN

REPORT TYPE: Welding Project

REVISION NUMBER: 1

TITLE: Effects of Laminations on Weld Quality

REASON FOR REVISION: N/A

SWEC SUMMARY STATEMENT: N/A

PREPARATION

PREPARED BY:

Original Signed By J. E. Rose  
SIGNATURE

08-25-86  
DATE

REVIEWS

PEER:

Original Signed By R. M. Bateman  
SIGNATURE

08-25-86  
DATE

TAS: TECHNICAL REVIEW ONLY

*D. Stewart*

SIGNATURE

11/19/86  
DATE

CONCURRENCES

Original Signed By  
CEG-H: L. E. Martin

09-03-86

SRP:

*James B. Russell*  
SIGNATURE\*

11-20-86  
DATE

SIGNATURE

DATE

APPROVED BY:

*M. R. Rulph*  
ECSP MANAGER

11-19-86  
DATE

N/A

MANAGER OF NUCLEAR POWER  
CONCURRENCE (FINAL REPORT ONLY)

DATE

\*SRP Secretary's signature denotes SRP concurrences are in files.



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. Roe 8/25/86, OC, WP

REVIEWED BY R.N. Bateman 8/25/86, OC, WP

REVIEWED BY G.P. Lynskey 8/25/86, QA, WP

REVIEWED BY J.E. Martin 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

## SPECIFIC EMPLOYEE CONCERN

Report Number: WP-18-SQN, R1

Report Title: EFFECTS OF LAMINATIONS ON WELD QUALITY

### 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 discontinuities 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.

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.

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|  
| R1  
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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.

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)

Attachment 1

PAGE 1 of 1

11:43:17

LOC	STATUS	RESP	-QTC-	PPP	CFR	INSP	IC	-----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 QTC, 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.