

INVESTIGATION REPORTS PREPARED BY QUALITY TECHNOLOGY
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ADDRESSES CONCERNS NUMBERS:

IN-85-305-001

WI-85-097-001

WI-85-097-002

HI-85-032-001

HI-85-078-001

HI-85-112-002

HI-85-046-001

HI-85-090-001

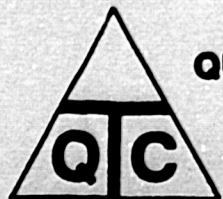
IN-85-119-006

IN 85-458-006

WI-85-046-003

WI-85-046-X18

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**QUALITY
TECHNOLOGY
COMPANY**

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ERT INVESTIGATION REPORT

PAGE 1 OF 4

CONCERN NO. IN-85-305-001

CONCERN: Over a period of time the bending of ears on small B001 support clamps will cause the A-36 material to yield beyond its yield point. Clamps are installed in both units.

INVESTIGATION

PERFORMED BY: William R. Pickering

DETAILS

PERSONNEL CONTACTED: (CONFIDENTIAL)

DOCUMENTS REVIEWED:

Drawing 47B001 Series (General Notes)
Drawing 47B001 - 10 Revisions 0 - 8

Field Change Request (FCR) MH-458
Field Change Request (FCR) I-479
Field Change Request (FCR) H-11,503

Quality Control Instruction (QCI) 3.11 "Seismically Qualified Instrumentation Supports" Revision 4

General Construction Procedure G-53 "ASME Section III and Non-ASME Section III Bolting Material"

Office of Construction Revision Request WBN-RR-301

Quality Control Procedure (QCP) 3.11-1 "Inspection and Documentation of Instrumentation Supports" Revision 6

Quality Control Procedure (QCP) 4.28-8 "Support Final Inspection" Revision 7

Quality Control Procedure (QCP) 3.11-2 "Inspection and Documentation of Instrument Lines" Revision 6

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CONCERN NO. IN-85-305-001

DETAILS, continued**SUMMARY OF INVESTIGATION:**

This concern is substantiated in that modifications to clamps were made to prevent them from bending. The investigation encompassed a review of activities applicable to supports utilizing clamps at the Watts Bar NPS.

FINDINGS:

Type B001 support clamps are installed in accordance with 47B001 drawing series. Typically, a Bergan-Patterson clamp is bolted to process pipe ranging from 2 inches to 30 inches in diameter. A stanchion is attached to the clamp to support 1" and smaller diameter sensing, sampling, radiation monitoring, test and process lines containing an isolation valve. Prior to 12-11-80 (47B001-10 Revision 7), it was observed that the ears of the clamps were bending when the bolts were torqued to the required minimum 100 ft lbs. FCR I-479 added "Note 10" to drawing 47B001-10 Revision 7 to denote welding of a "gusset" to ears on the clamps to help provide strength for torquing purposes. Individual "A" stated that modifications of this type were made to many clamps prior to the identification of this specific problem and felt no problems would arise if "stiffener" plates were welded to B001 type support clamps as well. FCR H-11,503 added to Note 10 that the ears of the clamps may be drawn to within 1/8" of each other when clamp bolts are torqued. An Instrumentation Engineer indicated that the clamps would still be subject to bending if drawn to within 1/8" of each other, adding, that since the requirement is to torque to a minimum value, torquing in excess of the minimum value so that the ears are within 1/8" of each other could permanently bend the clamp.

The vendor (Bergan-Patterson) was contacted and stated that it is acceptable to draw the ears within 1/8" of each other because, when the bolts are relaxed, the clamp is designed to spring back to its original configuration. However, since the clamps have been modified, the clamps may not perform as intended. The Contract Administrator for Bergan-Patterson added that there hasn't been any request from TVA to modify the clamp and that they (Bergan-Patterson) stand behind the product if the items are installed and used as manufactured; however, when modifications are made to those items without prior vendor concurrence, the warranty/insurance becomes void.

CONCERN NO. IN-85-305-001

DETAILS, continued

FINDINGS, continued

A TVA engineer concurred with the vendors' statement that no attempts were made to contact Bergan-Patterson, explaining that at times it took months to receive an answer from vendors for similar requests; and to meet schedule, TVA bypassed the vendor.

10CFR50 Appendix B Criterion XI states, in part, "A test shall be established...to demonstrate that structures, systems and components will perform satisfactorily...The test program shall include as appropriate proof tests prior to installation." Contrary to this requirement TVA has not conducted proof tests, prior to installation, to assure the clamps, modified from contract design specifications, will perform satisfactory.

10CFR50 Appendix B Criterion V states, in part, "Activities affecting quality shall be prescribed by documented instruction, procedures or drawings of a type appropriate to the circumstances..." Contrary to this requirement, TVA does not have a procedure directing steps to take when making modifications to vendor supplied items. In addition, FCR I-479, nor drawing 47B001-10, clearly identify the location of the 1/8" fillet weld.

10CFR50 Appendix B Criterion III states, in part, "Measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviation from such standards are controlled; also that the design control measures shall provide for verifying or checking the adequacy of design...by the use of...calculation methods or by the performance of a suitable testing program..." Contrary to this requirement, controls were not implemented to correctly translate the design basis into specifications. Approval for the modification as per FCR I-479 was obtained by telephone. Considering tests were never performed for such modifications it is difficult to understand how the engineer evaluated and approved the proposed modification.

OBSERVATION:

Craft at the Instrumentation Fabrication shop stated that "stiffener" plates were welded prior to welding the stanchion to the clamp. The heat input applied to the clamp during the welding process of the

CONCERN NO. IN-85-305-001

DETAILS, continued

OBSERVATIONS, continued

stanchion would draw the ears of the clamp upward so "stiffener" plates were added to alleviate that condition. FCR I-479 denotes a "gusset" to be welded to the clamp however, the drawing revision as a result of the FCR called for "stiffener" plates. By definition a gusset has a different configuration than stiffener plates; therefore it is noted that the applicable drawing does not reflect the modification to the clamp as the FCR denotes.

CONCLUSION:

This concern is substantiated. Installed supports that utilize process pipe clamps are designed by the manufacturer to retain a memory of their original configuration once the clamp bolts have been relaxed. Drawing 47B001-10 denotes a minimum torque value to be applied to the clamp bolts but does not denote a maximum value. Over torquing of the clamp bolts could permanently bend the clamp. TVA modified the clamps to prevent bending of the clamps during the torquing process; however, in doing such modifications, violated several 10CFR50 Appendix B requirements.

PREPARED BY:

William R. ...

3-25-86
DATE

REVIEWED BY:

O. J. ...

3/26/86
DATE

FINAL

REQUEST FOR REPORTABILITY EVALUATION

1. Request No. IN-85-305-001 _____ (ERT Concern No.) (ID No., if reported)
2. Identification of Item Involved: Process Pipe & Instrumentation Support Clamps
(Nomenclature, system, manuf., SN, Model, etc.)
3. Description of Problem (Attach related documents, photos, sketches, etc.)

Over a period of time the bending of ears on small B001 type support clamp will cause the A-36 material to yield beyond its yield point.

Also modifications were made of the clamp.

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 _____ Yes X If Yes, Explain: Support clamps could fail.

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 _____ Yes X If Yes, Explain: Tests are required as per Criterion XI of which were not performed.

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: N/A

OR