

WELDING PROJECT

EMPLOYEE CONCERN

EVALUATION REPORT

STRUCTURAL STEEL PREWELD INSPECTIONS AT
BROWNS FERRY NUCLEAR PLANT

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EMPLOYEE CONCERN

SUMMARY SHEET

STRUCTURAL STEEL PREWELD INSPECTIONS AT
BROWNS FERRY NUCLEAR PLANT

I. SCOPE OF EVALUATION

This report addresses seven employee concerns dealing with structural steel preweld inspections at Browns Ferry Nuclear Plant (BFN). These concerns were grouped into two issues to aid in the evaluation effort.

- A. General Construction Specification G-29C, Process Specification O.C.1.1, which allows uncertified welder foremen to perform preweld inspections, is in conflict with ANSI, AWS D1.1 and the TVA Quality Assurance commitments.
- B. General Construction Specification G-29C is in conflict with the requirements of AWS D1.1 by allowing inspection of welds through carbo-zinc primer.

The text of the concerns may be found in the technical report (WP-16-BFN) under Attachment 1.

II. ANALYSIS OF ISSUES ADDRESSED BY CONCERNS

The issues addressed by this evaluation evolved from six concerns from other TVA sites that were applied to Browns Ferry for evaluation for generic implication and one Browns Ferry site specific concern.

- A. One issue implies that uncertified welder foremen performing preweld inspections on installations they are directly responsible for is in violation of ANSI, AWS D1.1, and TVA Quality Assurance Commitments. The change to Process Specification P.S.O.C.1.1, which allowed welder foremen to perform preweld verifications (fitup), prompted several questions regarding TVA's commitment to ANSI N45.2.5. These concerns resulted in a Bellefonte audit finding.

Results of an investigation and evaluation, initiated due to the Bellefonte audit finding showed that TVA was in compliance with its quality assurance commitments.

This issue is discussed in detail in Weld Project Report WP-16-BFN, Paragraph III A.

- B. One issue implied that the General Construction Specification G-29C was in conflict with AWS D1.1 by allowing inspection of welds through carbo-zinc primer. This issue is discussed in detail in Weld Project Report WP-02-BFN, and is not addressed further by this evaluation.

III. COLLECTIVE SIGNIFICANCE

This evaluation revealed no hardware or programmatic deficiency.

IV. ROOT CAUSE(S)

The basic reason for the employee concerns is the perception that the change to the process specification violated or contradicted the TVA Quality Assurance Program, ANSI N45.2.5 and the installation code, AWS D1.1. This perception evolves from the misunderstanding of the intent of the construction code and TVA's commitment to the requirements of ANSI N45.2.5.

V. CORRECTIVE ACTION

No corrective action is indicated.

VI. REINSPECTION REQUIRED

No.

VII. ISSUE CLOSURE

Closed.

VIII. ATTACHMENTS

1. Evaluation Report WP-16-BFN.

WELDING PROJECT
EMPLOYEE CONCERN
EVALUATION REPORT
STRUCTURAL STEEL PREWELD INSPECTIONS AT
BROWNS FERRY NUCLEAR PLANT

I. SCOPE OF EVALUATION

This report addresses seven employee concerns. Text of the concerns is provided under Attachment 1.

Six of the subject concerns originated at other TVA sites, and were generically applied to Browns Ferry Nuclear Plant (BFN). This evaluation is based on review of the BFN Welding Phase 1 Report, current and superseded process specifications and construction implementing procedures and the Weld Project Report WP-16-SQN. Also reviewed were the BFN Corrective Action Reports, Nonconformance Reports, the TVA Topical Report, and the AEC/USNRC Inspection Reports. The American Welding Society Structural Welding Code AWS D1.1-72, AWS D1.1-86 and American National Standard ANSI N45.2.5-74 were reviewed and compared with the text of the concerns.

II. ISSUES ADDRESSED BY CONCERNS

- A. General Construction Specification G-29C, Process Specification O.C.1.1, which allows uncertified welder foremen to perform preweld inspections, is in conflict with the TVA Quality Assurance Commitments, ANSI requirements and AWS D1.1.
- B. General Construction Specification G-29C is in conflict with the requirements of AWS D1.1 by allowing inspection of welds through carbo-zinc primer

III. ANALYSIS OF ISSUES ADDRESSED BY CONCERNS

- A. Six concerns state that uncertified welder foremen performing preweld inspections on installations they are directly responsible for is in violation of ANSI, AWS D1.1 and TVA Quality Assurance Commitments. These concerns are not factual.

In the foreword to ANSI N45.2, Quality Assurance Program Requirements for Nuclear Power Plants, it is stated in part, " . . . This standard sets forth the general provisions for planning, managing, and performing overall quality assurance programs but does not define specific or detailed technical requirements for achieving quality" Paragraph 6 states in part, " . . . Activities affecting quality shall be prescribed by documented instructions, procedures or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures or drawings. Instructions, procedures or drawings shall include appropriate quantitative or qualitative criteria for determining that important activities have been satisfactorily accomplished"

At paragraph 11 it states in part, " . . . A program for inspection of activities affecting quality shall be established to verify conformance to documented instructions, procedures, and drawings for accomplishing the activity. Inspection activities to verify the quality of work shall be performed by persons other than those who performed the activity to be inspected" Paragraph 11 further states in part, " . . . If inspections of processed items is impossible or disadvantageous, indirect control by monitoring shall be provided"

ANSI N45.2.5, "Supplemental Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants," Section 1 at 1.2 states in part, " . . . The extent to which individual requirements of this standard apply will depend upon the nature and scope of the work to be performed and the importance of the item or service involved" Paragraph 5.5 requires in part that inspection of structural steel welding shall be performed in accordance with the provisions of AWS D1.1, Section 6, and inprocess inspections shall include joint fitup prior to start of welding.

Addendum 1 to Process Specification P.S.3.C.5.2, Visual Examination of Welds was issued in February 1979. This change to P.S.3.C.5.2 allowed individuals who were not certified inspectors to perform preweld verifications of structural welds.

This requirement was later adopted by P.S.O.C.1.1, Specification for Welding of Structures Fabricated in Accordance With AISC Requirements For Buildings. This change to P.S.O.C.1.1 was issued in revision (a) on September 1, 1981 and established the requirement that the welder foreman perform the preweld verifications.

The change to Process Specification P.S.3.C.5.2 prompted several questions regarding TVA's commitment to ANSI N45.2.5. This issue was identified as a finding in the Bellefonte Quality Assurance Audit Report BN-W-80-08 and was determined to be significant and reportable as a 10CFR50.55(e) condition. It was reported as applicable to all TVA sites under construction. In response to the audit finding, an extensive investigation and evaluation of AWS D1.1, ANSI N45.2.5, and TVA's commitments were performed to determine what corrective action, if any, was necessary. In the area of weld fitup inspections, it was determined that TVA had been overly conservative in their past interpretation and that an inprocess (surveillance) inspection by Quality Control would satisfy the requirements of AWS D1.1 and ANSI N45.2.5. TVA was in compliance with its commitment to ANSI N45.2.5. In that TVA has taken the same exception to ANSI N45.2.5 in the Topical Report for operating plants, the results of the investigation also apply to Browns Ferry.

DPM No. N73M2 Process Specification O.C.1.1 at Section 6.2 requires in part that Weld Joint Dimensions (Fitup) shall be verified, by the welder foremen, to be correct using the quality control program of 6.3 to 6.7. Section 6.3 requires in part that each foreman's work be monitored, by QC, through a surveillance program at least once every two weeks to verify the foremen are properly performing the required activities of Section 6.2.

Browns Ferry Standard Practice SP BF-6.2, "Quality Control of Welding," issued at 6-29-83, at Section 6.3.3.1 states in part, "Fitups shall be verified by QC Inspectors after components have been secured in place by tack welds or mechanical methods. The inspection shall be performed prior to welding per the requirements of N80E3 (now PMP 1502.07), N-VT-2 or N-VT-3 and applicable drawings." Site Director Standard Practice SDSP 13.1, "Quality Control of Welding Activities," which superseded SP BF-6.2 on 11-17-86, adopted the same criteria.

PMP 1502.07, Procedure No. N-VT-2 defines the requirements and acceptance standards for visual examination of welded joints in buildings and tubular structures in accordance with the requirements of the AISC Specification and the AWS D1.1 Code. In the scope of N-VT-2 it states in part that "Only when specified by the design drawing or by the work instruction, shall the inspector be required to verify the requirements of paragraphs 4.0 and 5.0." Paragraph 5.0 identifies activities to be verified prior to welding to include fitup.

AWS D1.1, Section 6, states "The inspector designated by the engineer shall ascertain that all fabrication by welding is performed in accordance with the requirements of this code." Section 6 further states "The inspector shall examine the work to make certain that it meets the requirements of Section 3 and 8.15, 9.25 and 10.17 as applicable." (Section 3 addresses workmanship requirements and Section 8.15, 9.25 and 10.17 address requirements for final visual inspection.) Clarification of AWS intent on preweld inspections states, "Except for final visual inspection, which is required for every weld, the inspector shall inspect the work at suitable intervals to make certain that the requirements of the applicable sections of the code are met. Such inspection, on a sampling basis, shall be made before assembly, during assembly and during welding."

Surveillance or spot inspections of preweld and in process activities for AWS D1.1 applications is an industry wide practice. Design Engineering and installation drawings establish mandatory hold points based on need, significance of the installation and sound engineering judgement.

The TVA Topical Report TVA-TR75-1A does not mandate that a 100 percent fitup inspection be performed by quality on all structural installations. The Topical Report Revisions 2 through 9 require that inspection is performed during maintenance, modification and repair to verify conformance with applicable requirements. Instructions covering these inspection activities contain appropriate inspection requirements, to include mandatory hold points, which are in accordance with the original design.

This requirement is clearly defined in Revision 9 where TVA's conformance status to ANSI N45.2.5 is stated as "Verification of preweld activities, including fitup, will be verified through selective QC inspection, unless 100 percent inspection is specified by DNE in design output documents." Even though this commitment was not as clearly defined in the earlier revisions of the Topical Report, the intent has remained unchanged. Thus, TVA has always been in compliance with its quality assurance commitment relative to fitup inspections.

- B. One concern stated that the General Construction Specification G-29C is in conflict with the requirements of AWS D1.1 by allowing inspection of welds through carbo-zinc primer. This issue is discussed in detail in Weld Project Report WP-02-BFN and is not addressed further by this evaluation.

IV. COLLECTIVE SIGNIFICANCE

This evaluation revealed no hardware or programmatic deficiency.

V. ROOT CAUSE(S)

The basic reason for the employee concerns is the perception that the change to the process specification violates or contradicts the TVA Quality Assurance Program, ANSI N45.2.5 and the installation code, AWS D1.1. This perception evolves from the misunderstanding of the intent of the construction code and TVA's commitment to the requirements of ANSI N45.2.5.

VI. CORRECTIVE ACTION

No corrective action is indicated.

VII. ATTACHMENTS

1. Employee concerns

WELDING PROJECT
EMPLOYEE CONCERN EVALUATION REPORT

ATTACHMENT 1

TEXT OF EMPLOYEE CONCERNS

Evaluation Report WP-16-BFN addresses seven employee concerns. The text of the concerns is shown on the following pages.

BEM-85-001-001
BEM-85-001-002
BFN-85-001-001
BFN-85-001-002
WBM-85-001-001
WBM-85-001-002
WI-85-030-007

REFERENCE - ECPS132J-ECPS132C
 FREQUENCY - REQUEST
 OHP - ISSS - RHM

CATEGORY: WE NON QA/QC WELDING

TENNESSEE VALLEY AUTHORITY
 OFFICE OF NUCLEAR POWER
 EMPLOYEE CONCERN PROGRAM SYSTEM (ECP)
 EMPLOYEE CONCERN INFORMATION BY CATEGORY/SUBCATEGORY
 WP - 16 PERFORMANCE OF PREWELD INSPECTIONS

PAGE - 1
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 RUN DATE - 03/16

CONCERN NUMBER	CAT	SUB CAT	S H R D	P I T L O C	1 REPORT APPL 2 SAF RELATED BF BL SQ WB	HISTORICAL REPORT	CONCERN ORIGIN	CONCERN DESCRIPTION	REF. SECT CAT - 1 SUBCAT - 1
BEM-85-001-00101 T50227	WE	50716	N	BLN	1 Y Y Y Y 2 SR SR SR SR		QTC	BELLEFONTE - THE GENERAL CONST. SPEC . G-29C, PROCESS SPEC. O.C.1.1 IS IN CONFLICT WITH THE TVA QUALITY ASSURANCE COMMITMENTS AS STATED BY THE TV A TOPICAL REPORT, TVA-TR75-1A, IN TH AT PROCESS SPEC. O.C.1.1, SECTION 6.0 ALLOWS UNCERTIFIED WELDER FOREMEN, WHO HAVE DIRECT RESPONSIBILITY FOR THE INSTALLATION, TO PERFORM PREWELD INSPECTIONS. NUCLEAR POWER CONCERN . CI HAS NO FURTHER INFORMATION. (SQN ISSUES ADDRESSED IN RPT WP-16-SQN R2)	
BEM-85-001-00201 T50227	WE	50716	N	BLN	1 Y Y Y Y 2 SR SR SR SR		QTC	BELLEFONTE - UNCERTIFIED WELDER FOREMEN ARE REQUIRED BY TVA TO PERFORM PREWELD INSPECTIONS ON INSTALLATIONS THEY ARE DIRECTLY RESPONSIBLE FOR WHICH IS A VIOLATION OF ANSI REQUIREMENTS. NUCLEAR POWER CONCERN. CI HAS NO FURTHER INFORMATION. (SQN ISSUES ADDRESSED IN RPT WP-16-SQN R2)	
BEM-85-001-00101 T50221	WE	50716	N	BLN	1 Y Y Y Y 2 SR SR SR SR		QTC	BELLEFONTE - THE GENERAL CONST. SPEC . G-29C, PROCESS SPEC. O.C.1.1 IS IN CONFLICT WITH THE TVA QUALITY ASSURANCE COMMITMENTS AS STATED BY THE TV A TOPICAL REPORT, TVA-TR75-1A, IN TH AT PROCESS SPEC. O.C.1.1, SECTION 6.0 ALLOWS UNCERTIFIED WELDER FOREMEN, WHO HAVE DIRECT RESPONSIBILITY FOR THE INSTALLATION, TO PERFORM PREWELD INSPECTIONS. NUCLEAR POWER CONCERN. CI HAS NO FURTHER INFORMATION. (SQN ISSUES ADDRESSED IN RPT WP-16-SQN R2)	

CONCERNS ARE GROUPED BY LAST 2 DIGITS OF SUBCATEGORY NUMBER.

REFERENCE - ECPS132J-ECPS132C
 FREQUENCY - REQUEST
 ONP - ISSS - RIII

TENNESSEE VALLEY AUTHORITY
 OFFICE OF NUCLEAR POWER
 EMPLOYEE CONCERN PROGRAM SYSTEM (ECPS)
 EMPLOYEE CONCERN INFORMATION BY CATEGORY/SUBCATEGORY
 WP - 16 PERFORMANCE OF PREWELD INSPECTIONS

PAGE - 2
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CATEGORY: WE NON QA/QC WELDING

CONCERN NUMBER	CAT	SUB CAT	S H R D	PLT LOC	1 REPORT APPL 2 SAF RELATED BF BL SQ WB	HISTORICAL REPORT	CONCERN ORIGIN	CONCERN DESCRIPTION	REF. SECTI CAT - W SUBCAT - 1
BFM-85-001-00201 T50221	WE	50716	N	BFN	1 Y Y Y Y 2 SR SR SR SR		QTC	BROWN'S FERRY - UNCERTIFIED WELDER FOREMEN ARE REQUIRED BY TVA TO PERFORM PRE-WELD INSPECTIONS ON INSTALLATIONS THEY ARE DIRECTLY RESPONSIBLE FOR WHICH IS A VIOLATION OF ANSI REQUIREMENTS. NUCLEAR POWER CONCERN. CI HAS NO FURTHER INFORMATION. (SQN ISSUES ADDRESSED IN RPT WP-16-SQN R2)	
WDM-85-001-00101 T50227	QA	80103	S	WBN	1 Y Y N Y 2 SR SR NA SR		QTC	WATTS BAR - THE GENERAL CONST. SPEC. G-29C, PROCESS SPEC. O.C.1.1 IS IN CONFLICT WITH THE TVA QUALITY ASSURANCE COMMITMENTS AS STATED BY THE TVA TOPICAL REPORT, TVA-TR75-1A, IN THAT PROCESS SPEC. O.C.1.1, SECTION 6.0 ALLOWS UNCERTIFIED WELDER FOREMEN, WHO HAVE DIRECT RESPONSIBILITY FOR THE INSTALLATION, TO PERFORM PREWELD INSPECTIONS. NUCLEAR POWER CONCERN. CI HAS NO FURTHER INFORMATION. (SQN ISSUES ADDRESSED IN RPT WP-16-SQN R2)	
02	WE	50716	S	WBN	1 Y Y Y Y 2 SR SR SR SR				
WDM-85-001-00201 T50227	WE	50716	N	SQN	1 Y Y Y Y 2 SR SR SR SR		QTC	SEQUOYAH - UNCERTIFIED WELDER FOREMEN ARE REQUIRED BY TVA TO PERFORM PREWELD INSPECTIONS ON INSTALLATIONS THEY ARE DIRECTLY RESPONSIBLE FOR WHICH IS A VIOLATION OF ANSI REQUIREMENTS. NUCLEAR POWER CONCERN. CI HAS NO FURTHER INFORMATION. (SQN ISSUES ADDRESSED IN RPT WP-16-SQN R2)	

CONCERNS ARE GROUPED BY LAST 2 DIGITS OF SUBCATEGORY NUMBER.

REFERENCE - ECPS132J-ECPS132C
 FREQUENCY - REQUEST
 ONP - ISSS - RHM

TENNESSEE VALLEY AUTHORITY
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PAGE - 3
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CATEGORY: HE NON QA/QC WELDING

CONCERN NUMBER	CAT	SUB CAT	S H R D	PLT LOC	1 REPORT APPL 2 SAF RELATED BF BL SQ WB	HISTORICAL REPORT	CONCERN ORIGIN	CONCERN DESCRIPTION	REF. SECTI CAT - W SUBCAT - 1
WI -85-030-00701 T50185	HE	50716	S	WBN	1 Y Y Y Y 2 SR SR SR SR		QTC	THE WBN FSAR COMMITS TVA TO THE REQU IREMENTS OF AWS D.1.1 FOR STRUCTURAL WELDING. CONTRARY TO THESE REQUIRE MENTS, THE G-29C PROCESS SPECIFICATI ON WAS MODIFIED TO REFLECT LESS STRI NGENT INSPECTION REQUIREMENTS (E.G. VISUAL INSPECTION OF WELDS THROUGH P AINT (CARBO ZINC PRIMER) AND NO DOCU MENTED INSPECTION BY CERTIFIED VISUA L INSPECTORS (FIT-UP, IN-PROCESS) PR IOR TO FINAL INSPECTION.) CI HAS NO ADDITIONAL INFORMATION. NUC. POWER DEPT. CONCERN. (SQN ISSUES ADDRESSED IN RPT WP-16-SQN R2)	
02	HE	50702	S	WBN	1 Y Y Y Y 2 SR SR SR SR				

7 CONCERNS FOR CATEGORY HE WP - 16

CONCERNS ARE GROUPED BY LAST 2 DIGITS OF SUBCATEGORY NUMBER.