

TENNESSEE VALLEY AUTHORITY

NUCLEAR SAFETY REVIEW STAFF

INVESTIGATION REPORT NO. I-85-652-SQN

EMPLOYEE CONCERN: XX-85-083-001

SUBJECT: SEQUOYAH WELD INSPECTIONS NOT AS STRICT AS WATTS BAR

DATES OF  
INVESTIGATION: October 1-17, 1985

INVESTIGATOR:

E. F. Harwell  
E. F. Harwell

12/6/85  
Date

REVIEWED BY:

R. C. Sauer  
R. C. Sauer

12/6/85  
Date

APPROVED BY:

M. A. Harrison  
M. A. Harrison

12/12/85  
Date

8605290586

XA

## **I. BACKGROUND**

A Nuclear Safety Review Staff (NSRS) investigation was conducted to determine the validity of an expressed employee concern as received by Quality Technology Company (QTC)/Employee Response Team (ERT). The concern of record as summarized on the Employee Concern Assignment Request Form from QTC and identified as XX-85-083-001, stated:

"Sequoyah: Individual expressed that during previous employment at Sequoyah, welding inspection was not as strict as it is at WBNP. The concern is that either Sequoyah was not properly inspected, or that WBNP is excessively inspected, and unduly increases the cost of welding."

Further information was requested from the ERT followup group regarding whether the concern was related to particular type welds, type inspections, or location within the plant. QTC/ERT was unsuccessful in contacting the Concerned Individual (CI) to obtain any more specific information. Because the nature of the expressed concern could not be narrowed in scope, it was addressed in a broad generic manner.

## **II. SCOPE**

- A. The scope of the investigation is defined by the concern of record which entails determining two specific issues.
  - 1. Were Sequoyah welds properly inspected?
  - 2. Were Watts Bar welds excessively inspected resulting in unjustified welding cost?
- B. Construction Specifications, Design Criteria, FSAR, and construction installation procedures which govern the design, classification, and installation requirements for Sequoyah and Watts Bar were reviewed. A comparison was made between the two plants with regard to code requirements and installation commitments. Interviewed several people that had been associated with either welding requirements or actual inspections for both plants.

## **III. SUMMARY OF FINDINGS**

- A. Requirements and Commitments
  - 1. ANSI Standard B31.7 (1969) and 1970 Addendum Nuclear Power Piping - Governed installation and inspection requirements for Sequoyah Safety Class A, B, C, and D piping systems.
  - 2. ASME Section III, 1971 Edition through Summer 73 Addenda - Nuclear Power Plant Components - Governed Installation and Inspection Requirements for Watts Bar Safety Class A, B, C, and D Piping Systems.

3. ANSI Standard B31.1.0 (1967) - Power Piping - Governed installation and inspection requirements for Sequoyah Safety Class G and H piping systems.
4. ANSI Standard B31.1, 1973 Edition, Summer 1973 Addendum - Power Piping - Governed the installation and inspection requirements for Watts Bar Safety Class G and H piping systems.
5. 10CFR50 Appendix B - Basis for Quality Assurance (QA) program at Sequoyah.
6. ASME Section III, Subsection NA-4000 - Basis for NCM (Nuclear Components Manual) code manual QA requirements for Watts Bar.

#### B. Findings

1. Although different construction codes were in effect at each site, the installation requirements and level of inspections was essentially the same for both plants with the exception that portions of the Watts Bar plant are ASME Code stamped which requires verification by a third party inspector (Authorized Nuclear Inspector, ANI).
2. Although the inspection requirements are essentially the same for both plants, the QA requirements at each specific location required the inspections to be implemented and documented differently. For example, at Watts Bar the inspection of each safety-related pipe weld for "fitup" and "release for welding" requires verification by an inspector of certain parameters (i.e., cleanliness, weld prep, gap, purge, preheat, etc.), and the inspection for fitup is broken down into several Quality Control (QC) holdpoints which may require multiple inspections and completion of more than one weld inspection data card for a given weld. Conversely, at Sequoyah all these parameters were accomplished under one QC holdpoint and documented on one weld data card.
3. Up to 1984 many of the welds at Watts Bar have undergone additional or supplemental reinspections to address various safety concerns such as integrity of welded supports, fillet welds potentially undersized, and inspectability of painted welds.
4. Some structural supports at Watts Bar required QC fitup verification; whereas, similar supports at Sequoyah required fitup verification by the welder foremen and QC inspection of the finished weld.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### Conclusions

1. The employee concern is not substantiated for the following reasons:

- a. The allegation that Sequoyah welds may not have been properly inspected could not be substantiated because these welds were inspected under an inspection and QC program which met the QA and Code requirements applicable to construction activities at Sequoyah.
  - b. The allegation that Watts Bar welds were excessively inspected could not be substantiated because these welds were inspected under an inspection and QC program which met the ASME Code requirements applicable to Watts Bar. Since Watts Bar is an ASME Code stamped plant, the independent third party (ANI) verification of inspections performed by TVA personnel could be construed as a more strict inspection program. In addition, Watts Bar has been subjected to many reinspections to resolve possible safety concerns and to satisfy NRC inquiries. These, also, could be construed as a more strict inspection program.
2. A comparison of the overall welding inspection and documentation requirements between two nuclear plants of different ages, different codes of record, and code plant versus noncode plant cannot be described succinctly and if done differences will be observed. These differences would not necessarily indicate that one inspection program is better than the other or that the weld integrity of one plant is better than the other.

Recommendations

None

DOCUMENTS REVIEWED IN INVESTIGATION I-85-652-SQH  
AND REFERENCES

1. SNP Construction Procedure W-3, Revision 3, dated December 4, 1978, "Weld Procedure Assignment and Welding Surveillance"
2. SNP Construction Specification No. N2M-865, Revision 3, dated April 12, 1977, "Field Fabrication, Assembly Examination, and Tests For Pipe and Duct Systems"
3. SNP General Design Criteria No. SQN-DC-V-3.0, Revision 1, dated June 28, 1985, "The Classification of Piping, Pumps, Valves, and Vessels"
4. WBNP Quality Control Instruction QCI-4.03, Revision 6, dated August 25, 1984, "Process Control, Welding Surveillance, and Weld Procedure Assignment"
5. WBNP Construction Specification No. N3M-868, Revision 2, dated February 4, 1985, "Field Fabrication, Assembly, Examination, and Tests For Piping Systems"
6. WBNP General Design Criteria No. WB-DC-40-36, Revision 1, dated March 15, 1984, "The Classification of Piping, Pumps, Valves and Vessels"
7. TVA General Construction Specification G-29, sections P.S.3.C.5.2(R2) dated March 7, 1983 and P.S.3.C.5.4(R2) dated January 28, 1985, "Process Specifications for Welding, Heat Treat, Nondestructive Examination, and Allied Field Fabrication Operations"
8. SNP FSAR Section 3.2 - Classification of Systems, Structures, and Components

NOTE: Revision history of some documents were also reviewed.



Reportable

File No: 211-001

Concern No.	Concern	Action Items	Investigators	Schedule Date	Comp. Date	Substantiated	
						YES	NO
001	<p>RE WEED DESCRIPTIONS FROM FILE 10 1982 DID NOT MEET CODE REQUIREMENTS ONLY WITH CRACK CONSIDERED</p> <p>ASSOCIATED FILES</p> <p>10-85-134-005</p> <p>10-85-579-001</p> <p>10-85-155-001</p> <p>10-85-134-001</p> <p>10-85-295-002</p> <p>10-85-282-002</p> <p>10-85-282-003 ✓</p>	<p>1) ESTABLISH FROM TWA TOPICAL REPORT 75 THE CODES &amp; STANDARDS COMMUNICATIONS.</p> <p>2) ESTABLISH CRITERIA FOR TWA DESCRIPTION AND ACCEPTANCE PER. AIDS / AIDS / AIDS</p> <p>3) REVIEW 629 SPECIFICATIONS (DAN &amp; APPLICABLE RCP / RCP) TO ESTABLISH THAT PROGRAMS THIS HAVE PROCEEDED ONLY SATISFIED.</p> <p>4) REVIEW DOCUMENTATION &amp; INTERVIEW RECORDS FOR TOWNS</p> <p>5) CONDUCT RANDOM CHECK OF TOWNS FOR AIDS / AIDS / AIDS</p> <p>6) TYPE OF TOWNS TO BE CHECKED - FIRST - FIRST PERIOD. FIRST - SECOND PERIOD ETC.</p> <p>7) CHECK DIVERSITY STATE. INCLUDING (FROM 5TH UP THROUGH FOURTH TOWNS</p> <p>* OPTION 2</p> <p>8) INTERVIEW TOWNS</p> <p>9) SUBMIT REPORT TO LIA SUPERVISOR.</p>	WALK	8/22/85			
				8/22/85			
				8/22/85			
				8/27/85			
				8/28/85			
				8/29/85			
				8/29/85			
			*	8/30/85			
				9/4/85			

ERT

FORM 11

EMPLOYEE CONCERN ASSIGNMENT REQUEST

TO: Director - NSRS

TRANSMITTAL NUMBER T50144

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

Priority: 1

Concern: XX-85-083-001

Category: 33

<sup>I-85-652-SGN</sup>  
Confidentiality YES NO (I&H)

Supervisor Notified: YES X NO

NUCLEAR SAFETY RELATED YES

Concern: Sequoyah: Individual expressed that during previous employment at Sequoyah, welding inspection was not as strict as it is at WBNP. The concern is that either Sequoyah was not properly inspected, or that WBNP is excessively inspected, and unduly increases the cost of welding. CI has no further information.

No follow up required.

CCP for 9-19-85  
MANAGER, ERT DATE

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

ERT \_\_\_\_\_

NSRS/ERT \_\_\_\_\_

NSRS ✓

OTHERS (SPECIFY) \_\_\_\_\_

[Signature]  
NSRS

9/25/85  
DATE

*welding  
inspection*

EMPLOYEE CONCERN ASSIGNMENT REQUEST

TO: Director - NSRS

TRANSMITTAL NUMBER T50144

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

Priority: 1

Concern: XX-85-083-001

Category: 33

Confidentiality YES NO (I&H)

Supervisor Notified: YES X NO NUCLEAR SAFETY RELATED YES

Concern: Sequoyah: Individual expressed that during previous employment at Sequoyah, welding inspection was not as strict as it is at WBNP. The concern is that either Sequoyah was not properly inspected, or that WBNP is excessively inspected, and unduly increases the cost of welding. CI has no further information.

No follow up required.

CCP for 9-19-85  
MANAGER, ERT DATE

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

ERT \_\_\_\_\_

NSRS/ERT \_\_\_\_\_

NSRS /

OTHERS (SPECIFY) \_\_\_\_\_

[Signature] 9/20/85  
NSRS DATE

*welding  
inspection*



EMPLOYEE CONCERN ASSIGNMENT REQUEST

To: Director - NSRS

TRANSMITTAL NUMBER T50014

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

Priority: 1

Concern # ~~IN 85-182-003~~ 85-083-001

Category: 10

Confidentiality: YES NO (I & H)

Supervisor Notified: YES X NO NUCLEAR SAFETY RELATED YES

Concern: INDIVIDUAL EXPRESSED THAT DURING PREVIOUS EMPLOYMENT AT SEQUOYAH, WELDING INSPECTION WAS NOT AS STRICT AS IT IS AT WBNP. THE CONCERN IS THAT EITHER SEQUOYAH WAS NOT PROPERLY INSPECTED, OR THAT WBNP IS EXCESSIVELY INSPECTED, AND UNDULY INCREASES COST OF WELDING. NO FURTHER DETAILS WERE AVAILABLE.

W. J. Dubach 6/11/85  
MANAGER, ERT DATE

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

ERT ✓

NSRS/ERT       

NSRS       

OTHERS (SPECIFY)       

*Welding  
Inspection*

W. J. Dubach 6/17/85  
NSRS DATE

TVA EMPLOYEE CONCERNS  
SPECIAL PROGRAM

REPORT NUMBER: I-85-735-SQN

REPORT TYPE: Welding Project

REVISION NUMBER: 0

TITLE: NDE Inspectors Cannot Write Notice of  
Indications for Preservice-Related Defects

REASON FOR REVISION: N/A

SWEC SUMMARY STATEMENT: N/A

PREPARATION

PREPARED BY:

Original Signed By R. M. Bateman  
SIGNATURE

11-06-86  
DATE

REVIEWS

PEER:

Original Signed By J. E. Rose  
SIGNATURE

11-06-86  
DATE

TAS *11/11/86* TECHNICAL REVIEW ONLY  
*RRH*

*W. Stewart*  
SIGNATURE

*11/26/86*  
DATE

CONCURRENCES

SIGNATURE

DATE

Original Signed By  
CEG-H: J. F. Lewis for LEM

11-25-86

SRP: *James R. Russell*  
SIGNATURE\*

12-2-86  
DATE

APPROVED BY:

*M. C. Russell*  
ECSP MANAGER

*12-2-86*  
DATE

N/A  
MANAGER OF NUCLEAR POWER  
CONCURRENCE (FINAL REPORT ONLY)

DATE

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

WELDING PROJECT  
SQLN SPECIFIC EMPLOYEE CONCERNS

DATE 11/6/86

SUBJECT: SEQUOYAH SPECIFIC EMPLOYEE CONCERNS -  
SUMMARY OF WP ENGINEERING EVALUATION

CONCERN CONSIDERED: XX-85-102-011

PREPARED BY R. Bateman, 11/6/86, DNC, WP

REVIEWED BY J.E. Rose, 11/6/86, DNC, WP

REVIEWED BY R.P. Lynskey, 11/20/86, DQA, WP

REVIEWED BY James F. Lewis, 11/25/86 FOR LRM, CEG-H, Welding

APPROVED BY M. W. Rudolph, 12-2-86, Program Manager

This package summarizes the actions taken by the Welding Project (WP) to evaluate and disposition the subject SQN-specific employee concern which was previously evaluated by NSRS/OTC/ERT and summarized in WP Phase I and Phase II reports.

The Welding Project analyzed each SQN-specific employee concern (Attachment 2) to determine the statement(s) being voiced by these individuals.

These statement were then evaluated both individually and collectively to develop issues.

Each issue was then incorporated into the WP review activities of Phase I, "Procedural Assessment" and Phase II, "Procedural Implementation."

During Phase I, each issue was analyzed against requirements of the applicable QA program, policies, NSRS/OTC/ERT Investigation Reports, and other relevant information to determine if program elements were deficient when evaluated against upper tier requirements.

Phase II consisted of a sample reinspection of hardware and independent program audit by Bechtel.

In each area analyzed by Bechtel, the auditors found no objective evidence to substantiate the employee concerns considered. The following areas directly related to employee concern were investigated by the audit team:

1. Welder qualification and attendant records
2. Welder qualification and attendant on-the-job-training
3. Welding inspections
4. Welding inspectors training programs
5. Weld material traceability
6. Welding inspections by craft personnel
7. Weld material control

Each of these areas was investigated by the auditors for both construction and operations phases. In all cases, there was no objective evidence to substantiate the employee concerns. The audit report concludes that both construction and operations phases have had and now have a functioning Welding Quality Assurance Program which meets code, standard, and regulatory requirements and that the employee concerns considered were found to be unsubstantiated and without technical merit.

The results of the reinspection program at SQN also give another, additional verification of the Welding Quality Assurance Program for both construction and operations phases and serve to establish additional confidence in the accuracy and implementation of these programs through hardware inspections and attendant document reviews. In all cases, the components and items were found to be acceptable upon initial reinspection or found to be acceptable after engineering analysis.

The WP analysis of SQN Specific Employee Concerns supplemented by the independent Bechtel Audit, reinspection of installed components and systems, and independent (NSRS) overview and investigations has not revealed any significant or generic inadequacies in the welding programs for either the construction or operations phase at SQN which have been directly identified through the Employee Concern Program. The Employee Concern Program has simply reiterated problems which have been or are now being resolved through existing corrective action programs in the overall Nuclear Quality Assurance Program.

A summary analysis of the WP evaluations and recommendations is included in Attachment 1.

SUMMARY OF SQN SPECIFIC EMPLOYEE  
CONCERNS REVIEWED BY WELDING PROJECT

EMPLOYEE CONCERN NUMBER	ISSUE	WP ACTION
XX-85-088-003	Alterations to Welder Qualification Records in Knoxville	Not substantiated by ERT Report XX-85-088-003 of 3/8/86 (Attachment 3).
XX-85-124-001	Burial of Electrode Stubs	Not safety-related. No action required.
XX-85-086-003	Box Anchor Design Deficiency.	Substantiated by NSRS Report I-85-560-SQN (Attachment 3). WP concurs with report recommendations.
XX-85-069-003-R1	Acceptance of Previously Rejected NDE Items	Not Substantiated by NSRS Report I-85-738-SQN (Attach- ment 3). WP concurs with report recommendations.
SQM-5-001-001 SQM-5-001-002 WBM-5-001-002 (Also Listed in the Generic Summary)	Uncertified Welder Foreman Performing Preweld Inspections	Substantiated by WP Evaluation Report WP-16-SQN (Attachment 3). Interim corrective actions are being formulated. Closure is based on these actions. Additional corrective actions may be implemented.
XX-85-068-007	Manufacture of Dravo Spool Piece	Not substantiated by NSRS REPORT I-85-636-SQN (Attachment 3).
XX-85-069-001 XX-85-069-001-R1 XX-85-069-X05 XX-85-069-007	Inadequate OJT-Records for ISI and QC Personnel for NO	The general issue of inadequate OJT-records was substantiated by NSRS Report I-85-373-NPS (Attachment 3). No falsification of records was substantiated. WP con- curs with report recommen- dations.

EMPLOYEE CONCERN NUMBER	ISSUE	WP ACTION
SQM-6-005-001 SQM-6-005-X02	Craft Welder Incapable of Making Proper Welds	SQM-6-005-001 was substantiated; SQM-6-005-X02 was not substantiated by NSRS Report I-86-115-SQN (Attach- ment 3). WP concurs with report.
XX-85-013-001	E309 Electrode Used to Weld E316 Steels	This is an acceptable practice. ERT investigated in ERT Report XX-85-013-001, dated 3/22/85 (Attachment 3). WP concurs.
XX-85-041-001	Improper Weld Rod Used in Diesel Generator Building	Not substantiated by NSRS Report I-85-756-SQN (Attachment 3).
XX-85-049-001 XX-85-049-X03	Welder Certifications Updated Without Meeting Requirements	XX-85-049-001 was substantiated as it relates to Welder Continuity Require- ments. This had previously been identified by NO in an audit. XX-85-049-X03 was not substantiated. Details and recommendations are given in NSRS Report I-85-135-SQN (Attachment 3). WP concurs with I-85-135-SQN-01 through -03 and recommends they be closed based on the WP-Bechtel Audit of SQN in Key Elements 4.0, 5.0, and 17.0 (Attachment 4).
XX-85-054-001	QC Holdpoint Sign-Off Violation	Not substantiated by NSRS Report I-85-346-SQN (Attachment 3).
XX-85-065-001	Performance of Remote Visual Inspections	Not substantiated by NSRS Report I-85-750-SQN (Attachment 3).



EMPLOYEE CONCERN NUMBER	ISSUE	WP ACTION
XX-85-083-001	SQN Weld Inspections not as Strict as WBN	Not substantiated by NSRS Report I-85-652-SQN (Attachment 3).
XX-85-098-001	Laminated Pipe in Unit 2 Condenser. This issue is also on the Generic Summary	Not safety-related. Not substantiated by WP Evaluation Report WP-18-SQN (Attachment 3).
XX-85-100-001	Improper Weld Repair on an Undetermined Number of Welds	Not substantiated by ERT Report XX-85-100-001, dated 3/5/86 (Attachment 3).
XX-85-101-006	Welder Certification for the Construction Era	ERT Report XX-85-101-006 (Attachment 3) with NSRS Recommendations indicates that this concern is substantiated. WP takes exception to this ERT Report based on subsequent information provided in Attachment 4. WP exceptions, recommendations, and basis for closure were discussed with NSRS as documented in Attachment 5. WP recommends this concern not be substantiated and that it be closed based on the WP-Bechtel Implementation Audit, Key Elements 4.0, 5.0, 17.0 (Attachment 6).
XX-85-102-011	NDE Inspectors Cannot Write Notice of Indications for Preservice-Related Defects	Not substantiated by NSRS Report I-85-735-SQN (Attachment 3).
XX-85-108-001 XX-85-108-002	Socket Welds Not Inspected	Not substantiated by NSRS Report I-85-776-SQN (Attachment 3).

10/16/86

## (EMPLOYEE CONCERNS)

13:01:35

CAT	ISSUE	PLANT	PRIORITY	ORG	OTC	EGG	INSP	SD	RD	GD	IO	-----CONCERN-----
		S	1	NSRS				SR				XX-85-102-011

WORDS: INSPECTION IMPLEMENTATION DOCUMENT

PROB: WCDPW

SEQUOYAH: NDE INSPECTORS CAN ONLY WRITE A NOTICE OF INSPECTION ON IN-SERVICE RELATED DEFECTS. PRESERVICE RELATED DEFECTS CAN ONLY BE IDENTIFIED BY A MAINTENANCE REQUEST. NUCLEAR POWER DEPT. CONCERN. CI HAS NO FURTHER INFORMATION.

IR: 1-85-735-SQN

STAT: RC:

TECHNICAL COMMENTARY:

# Memorandum

TENNESSEE VALLEY AUTHORITY

TO : H. L. Abercrombie, Site Director, Sequoyah Nuclear Plant

FROM : K. W. Whitt, Director of Nuclear Safety Review Staff, E3A8 C-K

DATE : DEC 11 1985

SUBJECT: NUCLEAR SAFETY REVIEW STAFF INVESTIGATION REPORT TRANSMITTAL

Transmitted herein is NSRS Report No. I-85-735-SQN

Subject NDE INSPECTORS CANNOT WRITE NOTICE OF INDICATION FOR  
PRESERVICE-RELATED DEFECTS

Concern No. XX-85-102-011

No response or corrective action is required for this report. It is being transmitted to you for information purposes only. Should you have any questions, please contact R. C. Sauer at telephone 2277.

Recommend Reportability Determination: Yes \_\_\_\_\_ No X

  
\_\_\_\_\_  
Director, NSRS/Designee

RCS:JTH

Attachment

cc (Attachment):

R. P. Denise, LP6N35A-C  
R. J. Griffin, SQN E-10  
G. B. Kirk, SQN  
D. R. Nichols, E10A14 C-K  
QTC/ERT, Watts Bar Nuclear Plant  
Eric Sliger, LP6N48A-C  
J. H. Sullivan, SQN  
W. F. Willis, E12B16 C-K (4)

0164U

