TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

November 19, 1984

050 0 0390

U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNIT 1 - NRC OIE BULLETIN 79-14 - SEISMIC ANALYSES FOR AS-BUILT SAFETY-RELATED PIPING SYSTEM

In response to your July 27, 1979 letter which transmitted NRC-OIE Bulletin 79-14, we submitted the results of our investigations for Sequoyah, Watts Bar, Bellefonte, Hartsville, Phipps Bend, and Yellow Creek Nuclear Plants on September 7, 1979.

In order to address the requirements of Bulletin 79-14 for Watts Bar, we developed an inspection program for as-built configurations of safety-related piping systems. This program consisted of a Phase I program which was a detailed inspection of all category 1 safety-related piping 2-1/2 inches in diameter and larger, all category 1 piping regardless of size which was dynamically analyzed by computer, and a Phase II sampling program to audit the quality of the Phase I inspections and TVA's quality assurance program as applied to piping and supports.

During a telecon with NRC-OIE Region II representatives on August 16, 1983, we committed to provide the NRC with a copy of Special Engineering Procedure (SEP) 8225 R1. The SEP describes TVA's programs for implementation of Bulletin 79-14, Phase II inspections at Watts Bar Nuclear Plant unit 1. We submitted a copy of this SEP on November 2, 1983. Enclosed is a copy of the Phase II inspection summary report (CEB Report 83-31) which constitutes TVA's final response to Bulletin 79-14 for Watts Bar Nuclear Plant unit 1. The Phase II inspections were performed by an independent audit team from Teledyne Engineering Services (TES) at Watts Bar. The Phase II program has verified that TVA's Phase I inspection program was adequate and demonstrated compliance with NRC-OIE Bulletin 79-14.

IE11

If you have any questions, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer

for J. W. Hufham, Manager
Licensing and Regulations

Enclosure
cc (Enclosure):
Mr. Richard C. DeYoung, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

WATTS BAR NUCLEAR PLANT UNIT 1

NRC-OIE BULLETIN 79-14 PHASE II

CEB REPORT 83-31

WBN UNIT 1

PHASE II

CEB REPORT

CEB REPORT

TVA 10752 (EN DES-2-83)

TITLE	REPORT NO.
NRC-OIE Bulletin 79-14 Phase II Inspection Summary Report	CEB 83-31
	PLANT/UNIT WBN/1
	SAR SECTION(S) NA

VENDOR	CONTRACT No.	KEY NOUNS	UNID SYSTEM(S)
NA	NA	Piping, NRC, Phase II, 79-14	NA

APPLICABLE DESIGN DOCUMENTS	REV	(FOR MEDS USE)	MEDS ACCESSION NUMBER
NA	R0	831129F0063 (299)	CEB'831115 004
REFERENCES EN DES-SEP 82-25 R1 (CEB 830921 018)	R1		CEB'840402 012
	R2		

TENNESSEE VALLEY AUTHORITY

DIVISION OF ENGINEERING DESIGN

CIVIL ENGINEERING SUPPORT BRANCH

	Revision 0	R1	R2
Date	NOV 15 1983	APR 2 1984	
Prepared	J K Shelley	ck chung	
Checked	J. Hansen	J. Hansen	
Submitted	Wm. J. Kagey	Wm. J Kagey	
Reviewed	E. D. Mynatt	E D Mynatt	
Recommended	W A Eckelkamp		
Approved	L O Schmidt		

RSP

TVA

Title: NRC-OIE Bulletin 79-14 Phase II
Inspection Summary Report

REVISION LOG

Revision No.	DESCRIPTION OF REVISION	Date Approved
1	Revision to resolution, Discrepancy No. 1T01-0600200-06-04/07H, Index No. 5, in attachment 4 Original discrepancy form was an advance copy. Revision from WBN/1 and 2 to WBN/1 in PLANT/UNIT block, CEB REPORT cover sheet	4-2-84

TABLE OF CONTENTS

WATTS BAR NUCLEAR PLANT UNIT 1
PHASE II SUMMARY REPORT

1.0 PURPOSE

The purpose of this report is to describe the Phase II inspection program and to summarize the results of the inspections.

2.0 PHASE II INSPECTION DESCRIPTION

The Phase II inspection program was issued as the Special Engineering Procedure (SEP) 82-25 (attachment 1) by the Civil Engineering Support Branch (CEB). This program was conducted to verify the effectiveness of TVA's Phase I program (SEP 82-13) and to assure and demonstrate TVA's compliance with NRC-OIE Bulletin 79-14. The Phase II inspections were performed by an independent audit team from Teledyne Engineering Services (TES) at the Watts Bar Nuclear Plant (WBN). (See attachment 2.) The evaluations of the Phase II inspection findings were made by TVA and are summarized in section 3.0. The relationship of the Phase II inspection to the Phase I inspection is presented in the "WBN Units 1 and 2 Program Plan for IE Bulletin 79-14" (attachment 3).

3.0 PHASE II INSPECTION SUMMARY

The Phase II inspection was an audit of the as-constructed piping and supports on 9 piping analysis isometrics from different safety-related systems. Five hundred seventy-nine deviations were identified originally by the TES inspection team. Only 67 of the 579 deviations

were classified by TVA as Phase II discrepancies; each of the others was not classified as a discrepancy because: (1) it was acceptable per issued TVA criteria, (2) it was identified by the Phase I inspection, or (3) it was declassified by TES from being a deviation through further inspection. (See attachment 4.)

Tables 1 and 2 summarize the results of the Phase II inspections. Attachment 4 is the complete evaluation of all Phase II deviations and discrepancies. The complete TES inspection checklists and records are stored at WBN.

Twenty of the 67 discrepancies require some minor onsite field work. Twenty-three of the 67 discrepancies require some minor changes to 7 of the 9 inspection isometrics. Twenty-three of the 67 discrepancies require some minor changes to pipe support drawings. All drawing changes will be made (under ECN 4376) to reflect the as-constructed condition. None of the 67 discrepancies were classified as a definite potential for loss of pressure boundary; 66 were classified as insignificant and 1 as significant. The 1 significant discrepancy was a localized stress problem where the lug induced stress exceeded the reserve stress; the pipe stress exceeded yield but not ultimate because the pipe displacement was limited to 0.15 inch by an adjacent flued head anchor (see discrepancy evaluation for 1T01-0600200-06-04/13H in attachment 4). Eight of the 67 discrepancies were designated by TES as P type (pipe) discrepancies; 9 as V type (valve) discrepancies; 0 as X type (floor and wall penetration clearance) discrepancies; 15 as C type (potential interference) discrepancies; and 35 as H type (support) discrepancies.

Table 1

Phase II Inspection Summary

Index Number	79-14 Phase II Package	Number of Deviations		Number of Discrepancies	
		Nonsupport	Support	Nonsuppport	Support
1	1T62-47W406-203	18	22	4	7
2	1T63-47W435-217	17	21	0	0
3	1T72-47W437-201	55	58	5	3
4	1T68-47W465-206	54	43	12	5
5	1T01-0600200-04-04	48	53	7	14
6	1T67-47W450-217	9	52	2	4
7	1T70-47W464-242	3	55	1	2
8	1T03-47W401-208	20	15	0	0
9	1T03-47W427-200	10	26	1	0
	Total	234	345	32	35
		579		67	

Table 2

Phase II Discrepancy Summary

Index Number	Discrepancy Number	Is Field Rework Required?	Is Discrepancy Significant?	Will Isometric Be Revised?	Will Support Drawing Be Revised?	Comment
1	1T62-47W406-203/01P	No	No	Yes	No	17-3/8" less pipe
2	1T62-47W406-203/02V	No	No	Yes	No	90° off in orient.
3	1T62-47W406-203/03V	No	No	Yes	No	45° off in orient.
4	1T62-47W406-203/04C	No	No	No	No	No contact
5	1T62-47W406-203/01H	No	No	No	Yes	1" off on dimen.
6	1T62-47W406-203/02H	No	No	No	Yes	Added stiffener
7	1T62-47W406-203/03H	No	No	Yes	No	2" off on loc.
8	1T62-47W406-203/04H	No	No	Yes	No	2" off on loc.
9	1T62-47W406-203/05H	No	No	Yes	No	1" off on loc.
10	1T62-47W406-203/06H	No	No	Yes	No	1-5/16" off on loc.
11	1T62-47W406-203/07H	No	No	Yes	No	1-11/16" off on loc.
12	1T72-47W437-201/01V	No	No	Yes	No	Iso did not show CG
13	1T72-47W437-201/02V	No	No	Yes	No	Iso did not show CG
14	1T72-47W437-201/03V	No	No	Yes	No	Iso did not show CG
15	1T72-47W437-201/04V	No	No	Yes	No	Iso did not show CG
16	1T72-47W437-201/05V	No	No	Yes	No	Iso did not show CG
17	1T72-47W437-201/01H	No	No	No	Yes	Bolt spacing
18	1T72-47W437-201/02H	Yes*	No	No	Yes	Bad design; NCR written
19	1T72-47W437-201/03H	Yes*	No	No	Yes	Bad design; NCR written
20	1T68-47W465-206/01C	Yes	No	No	No	Need 1/4" clearance
21	1T68-47W465-206/02C	Yes	No	No	No	Need 15/16" clearance
22	1T68-47W465-206/03C	Yes	No	No	No	Need 11/16" clearance
23	1T68-47W465-206/04P	No	No	Yes	No	Pipe 1" off
24	1T68-47W465-206/05C	Yes	No	No	No	Need 15/16" clearance

*Not due to the discrepancy.

Index Number	Discrepancy Number	Is Field Rework Required?	Is Discrepancy Significant?	Will Isometric Be Revised?	Will Support Drawing Be Revised?	Comment
25	1T68-47W465-206/06C	No	No	No	No	Clearance adequate
26	1T68-47W465-206/07C	Yes	No	No	No	Need 15/16" clearance
27	1T68-47W465-206/08C	Yes	No	No	No	Need 3/8" clearance
28	1T68-47W465-206/09C	Yes	No	No	No	Need 5/16" clearance
29	1T68-47W465-206/10C	Yes	No	No	No	Need 1-1/4" clearance
30	1T68-47W465-206/11C	Yes	No	No	No	Need 1-1/4" clearance
31	1T68-47W465-206/12C	Yes	No	No	No	Need 15/16" clearance
32	1T68-47W465-206/01H	No	No	Yes	No	Drawing error
33	1T68-47W465-206/02H	No	No	No	Yes	Drawing error
34	1T68-47W465-206/03H	No	No	No	Yes	Pin to pin dimension
35	1T68-47W465-206/04H	No	No	No	Yes	Bolt location
36	1T68-47W465-206/05H	No	No	Yes	No	Supt off 2-7/8"
37	1T01-0600200-06-04/01C	Yes	No	No	No	Need 1-5/16" clearance
38	1T01-0600200-06-04/02C	Yes	No	No	No	Need 1/16" clearance
39	1T01-0600200-06-04/03C	Yes	No	No	No	Need 1/16" clearance
40	1T01-0600200-06-04/01P	No	No	Yes	No	Supt 15-3/4" off loc.
41	1T01-0600200-06-04/02P	No	No	Yes	No	Flow indic. loc.
42	1T01-0600200-06-04/03P	No	No	No	No	Thickness of insulation
43	1T01-0600200-06-04/04P	No	No	Yes	No	Supt 13" off loc.
44	1T01-0600200-06-04/01H	No	No	No	Yes	Load setting off
45	1T01-0600200-06-04/02H	No	No	No	Yes	Rod length
46	1T01-0600200-06-04/03H	Yes	No	No	No	Beam attachment
47	1T01-0600200-06-04/04H	No	No	No	Yes	Plate size
48	1T01-0600200-06-04/05H	No	No	No	Yes	Pipe clamp
49	1T01-0600200-06-04/06H	No	No	No	Yes	Load setting
50	1T01-0600200-06-04/07H	No	No	No	Yes	Beam size
51	1T01-0600200-06-04/08H	No	No	No	Yes	Beam supports grating not pipe
52	1T01-0600200-06-04/09H	No	No	No	Yes	Stiffener loc.
53	1T01-0600200-06-04/10H	No	No	No	Yes	Anchor bolts

Index Number	Discrepancy Number	Is Field Rework Required?	Is Discrepancy Significant?	Will Isometric Be Revised?	Will Support Drawing Be Revised?	Comment
54	1T01-0600200-06-03/11H	No	No	No	Yes	Support field weld
55	1T01-0600200-06-04/12H	No	No	No	Yes	Pipe clamp
56	1T01-0600200-06-04/13H	Yes	Yes	No	Yes	Local stress problem
57	1T01-0600200-06-04/14H	Yes	No	No	Yes	Same as #56
58	1T67-47W450-217/01V	No	No	Yes	No	C.G. loc.
59	1T67-47W450-217/02V	No	No	Yes	No	C.G. loc.
60	1T67-47W450-217/01H	Yes	No	No	No	Loose bolts
61	1T67-47W450-217/02H	Yes	No	No	No	Gaps too big
62	1T67-47W450-217/03H	Yes	No	No	No	Gaps too big
63	1T67-47W450-217/04H	Yes	No	No	No	Pipe clamp
64	1T70-47W464-242/01P	No	No	Yes	No	Iso error
65	1T70-47W464-242/01H	No	No	No	Yes	Supt dwg error
66	1T70-47W464-242/02H	No	No	No	Yes	Vent hole
67	1T03-47W427-200/01P	No	No	Yes	No	Pipe 2-1/2" off

4.0 CONCLUSION

In conclusion, the Phase II program (SEP 82-25) has verified that TVA's Phase I program (SEP 82-13) is more than adequate, and it has assured and demonstrated TVA's compliance with the NRC-OIE Bulletin 79-14.

5.0 ATTACHMENTS

5.1 Attachment 1, EN DES-SEP 82-25, Revision 1, Program for NRC-OIE Bulletin 79-14 Phase II Inspection at Watts Bar Nuclear Plant Unit 1 (CEB 830921 018).

5.2 Attachment 2, Letter from TES to TVA dated September 14, 1983, Trip Report for Phase II Inspection - WBN Power Plant (CEB 830919 252).

5.3 Attachment 3, WBN Units 1 and 2 - Program Plan for IE Bulletin 79-14 (CEB 810713 019).

5.4 Attachment 4, WBN Unit 1 Phase II Evaluations on All Deviations and Discrepancies.

5.5 Attachment 5, NRC-OIE Bulletin 79-14 Phase II TVA Internal Correspondence.

5.6 Attachment 6, EN DES-SEP 82-25 Inspection and Evaluation Forms (Masters).

5.7 Attachment 7, NRC-OIE Bulletin 79-14 Pha. II Discrepancy Listing.

5.8 Attachment 8, The Nine Phase II Inspection Isometrics.

CEB 830819 005

CEB 830921 018 R1

TENNESSEE VALLEY AUTHORITY

Division of Engineering Design

SPECIAL

ENGINEERING PROCEDURE

EN DES- SEP 82-25

TITLE: Program for NRC-OIE Bulletin 79-14 Phase II

Inspections at Watts Bar Nuclear Plant Unit 1

ISSUE DATE: August 19, 1983

CONTROLLED COPY

	REVISION RO	R1	R2	R3	R4	R5
	DATE 8/19/83	9/21/83				
PREPARED	JVH WBK EDM	EDM WBK JSR				
SPONSORED						
REVIEWED		Ph.D.				
SUBMITTED						
APPROVED						

TVA 10833 (EN DES-12-82)
MEDS, WSRS C-K

COORDINATION LOG

Document No.: SEP 82-25

Title: PROGRAM FOR NRC-OIE BULLETIN 79-14 PHASE II INSPECTIONS AT WATTS BAR NUCLEAR PLANT UNIT 1

Revision: R1

R–Denotes review

A–Denotes approval

ENGINEERING SUPPORT BRANCHES

CEB		EEB		MEB		NEB		QEB							
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
2W+2A															
JEM	JEM														
TCM	TCM														
	WBE														

NUCLEAR PROJECTS DESIGN

BLP		BWP		DNP		IRP		PWP		WBP					
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
										R&P	R&P				
										JCS	SQL				

FOSSIL, HYDRO, & SPECIAL PROJECTS DESIGN AND ARCHITECTURAL SUPPORT BRANCH

CBP		COP		FDP		HDP		SDP		ASB					
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A

ESB		MEDS		PBB		OQA									
R	A	R	A	R	A	R	A	R	A	R	A	R	A	R	A
	JE for MSB														

EN DES– 5/83

EN DES SPECIAL ENGINEERING PROCEDURE (SEP) INDEX

EN DES SEP NO.	REV	DATE ISSUED	TITLE	SPONSOR ORGANIZATION AND PREPARER	AFFECTED ORGANIZATIONS	REMARKS
82-17	0		Control Room Design Reviews for All TVA Nuclear Plants	EEB J. R. Hennessy	ENS Branches NPD (except DNP and IRP)	
82-18	1		Program for Alternate Analysis Fix for Watts Bar Nuclear Plant - Coordinating, Documenting, and Verifying	WBP N. F. Consumo	CEB WBP	
82-19	0	4-26-83	Resolution of Piping Analysis Review Findings for Watts Bar Nuclear Plant	CEB J. H. Hoover	CEB ESB SWP	
82-20	0	3-15-83	Electrical Equipment Environmental Qualification Report for Bellefonte Units 1 and 2 - Preparation and Handling	EEB B. E. Reagan	BLP NEB EEB NUC PR MEB	
82-21	0	11-8-82	Independent Review of Watts Bar Nuclear Plant - Handling Findings	NEB H. L. Jones	CEB QAB EEB SWP MEB NEB	
82-22	0	1-14-83	Phase 1 of Alternate Analysis Design Review Sampling Program at Watts Bar Nuclear Plant, Unit 1	CEB J. D. Hansen	CEB SWP	
82-23	0	1-14-83	Documentation Control for Bellefonte Probabilistic Risk Assessment	NEB M. A. Linn	BLP NEB CEB EEB MEB	
82-24	1		Safe Shutdown Analysis for Postulated Fires at Bellefonte Nuclear Plant	MEB J. J. Pierce	EEB BLP MEB NEB	
82-25	1	9-21-83	Program for NRC-OIE Bulletin 79-14 Phase II Inspections at Watts Bar Nuclear Plant Unit 1	CEB S. K. Sherfey	CEB WBP	

TVA

Title: PROGRAM FOR NRC-OIE BULLETIN 79-14 PHASE II INSPECTIONS AT WATTS BAR NUCLEAR PLANT, UNIT 1

REVISION LOG
EN DES-SEP 82-25

Revision No.	DESCRIPTION OF REVISION	Date Approved
1	Revised Attachment 2, sections 2.0-a. and 2.0-c. for clarification of support inspection requirements.	9/21/83

CONTENTS

1.0 PURPOSE AND SCOPE

This special engineering procedure (SEP) describes the method by which inspections and evaluations will be performed on selected Watts Bar Nuclear Plant (WBN) piping isometrics to verify the effectiveness of TVA's Phase I inspection program and to demonstrate TVA's compliance with NRC-OIE Bulletin 79-14. These piping isometrics will include only rigorously analyzed Seismic Category I piping regardless of size.

The Phase II inspections will be conducted by an independent inspection team not involved in Phase I.

2.0 DEFINITIONS

2.1 Deviation - Any disagreement between as-analyzed and as-constructed piping and support configurations or requirements.

2.2 Discrepancy - Any deviation not identified under the 79-14 Phase I inspections or outside the tolerances of existing acceptance criteria.

2.3 Nonsignificant Discrepancy - A discrepancy which would not cause the affected piping to exceed its qualification level.

2.4 Significant Discrepancy - A discrepancy which could cause the affected piping to exceed its qualification level.

2.5 Definite Potential for Loss of Pressure Boundary - An engineering judgment by the evaluator which indicates that a pipe break is likely under design loading due to the discrepancy.

3.0 PROCEDURE

Civil Engineering Support Branch (CEB)

1. Selects nine isometrics from nine of the safety-related systems; totals the number of supports. All selected isometrics must have been subjected to the Phase I inspections (see reference 1, Attachment 11 for the complete isometric list) before Phase II begins.

2. Selects an inspection team of persons not involved in Phase I inspection as defined in EN DES-SEP 82-13; notifies the team members and receives formal acceptance that they will accept the task. (This team may be provided by a personal services contractor.)

3. Requests that the Division of Construction (CONST) provide the following personnel, services, and equipment during the onsite inspection:

   a. Field engineers to guide the team and to aid in locating the piping in the plant.

b. At least one Construction Engineer representative to aid in preparing the deviation evaluation forms.

c. Measuring devices, flashlights, ladders, lighting, scaffolding, etc., as required to perform the inspections.

d. Site office space for approximately 12 people.

e. Site conference room for training (approximately 200 feet square).

f. Removal of insulation for inspecting valves, supports, etc., as necessary. (Note: Insulation must be replaced after inspection.)

g. Inspection package for each of the selected isometrics.

All inspection packages must contain the following documents. (Each document must be the latest revision except for the color coded isometric revisions. They must be the same as were used in the Phase I inspections.)

(1) Two prints of the math model isometric drawing for the rigorously analyzed piping. (One print must be color coded to clearly and conservatively show predicted maximum pipe movements for all isometric piping.)

(2) Prints of the mechanical (physical) drawings which show the actual routing of the piping in the building.

(3) Prints of the manufacturers' drawings of all valves and/or special components within the piping system.

(4) Copies of the inspection/recording forms (Attachment 1).

(5) Prints of the pipe support design drawings as required to perform the inspections described in Attachment 2 and all related Field Change Requests (FCRs), including pending FCRs.

4. Conducts a training session for the inspection team in accordance with Attachment 3.

Inspection Team

5. Performs all detailed inspections in accordance with Attachment 2 using the 79-14 Phase II checklists (Attachment 1).

6. Consecutively numbers all support deviations on one set of isometrics and consecutively numbers all nonsupport deviations on another set of isometrics.

Site CEB and Watts Bar Project (WBP) EN DES Team

7. Reviews all 79-14 Phase II checklists to ensure clarity and completeness.

8. Evaluates every deviation identified by the inspection team using the Deviation Evaluation Form in Attachment 4.

9. Assigns to CEB the responsibility to resolve all discrepancies.

CEB

10. Reviews all discrepancies for evaluation and resolution.

11. Sends to WBP those support-related discrepancies needing resolution by WBP. (Transmittal is by the standard two-way memo.)

12. Evaluates discrepancies that require review by qualified pipe stress analysts who have access to the analysis packages.

13. Sends to WBP, using the standard two-way memo, all nonsupport-related discrepancies for review.

WBP

14. Evaluates and resolves all pipe support structural discrepancies and other discrepancies as required.

15. Reviews all nonsupport-related discrepancies.

16. Sends to CEB, using the standard two-way memo, all completed discrepancy evaluation forms.

CEB

17. Reviews all support-related discrepancies.

18. Writes and issues a summary report according to Attachment 5 (coordinated with WBP).

19. Sends to CONST the inspection packages and summary report for storage during life of the plant.

20. Submits the summary report to the NRC.

Note: In all transmittals each inspection package will be kept intact.

4.0 REFERENCES

4.1 EN DES-SEP 82-13, Program for NRC-OIE Bulletin 79-14 Phase I Inspections at Watts Bar Nuclear Plant Unit 1.

4.2 NRC-OIE Bulletin 79-14.

4.3 WBN Program Plan for NRC-OIE Bulletin 79-14 (CEB 810713 019).

4.4 General Construction Specification G-43.

4.5 WBN Construction Specification N3C-912.

4.6 EN DES-EP 4.21, Revision and Voiding Engineering Drawings.

4.7 EN DES-EP 3.03, Design Calculations.

4.8 General Construction Specification G-29C.

5.0 ATTACHMENTS

5.1 Attachment 1, 79-14 Phase II Inspection Forms

5.2 Attachment 2, 79-14 Phase II Detailed Inspection Requirements

5.3 Attachment 3, 79-14 Phase II Instruction Agenda for Inspectors

5.4 Attachment 4, 79-14 Phase II Evaluation Criteria for Discrepancies

5.5 Attachment 5, 79-14 Phase II Summary Report Instructions

5.6 Attachment 6, Distribution for EN DES-SEP 82-25

79-14 PHASE II INSPECTION FORMS

DATA PACKAGE COVER SHEET Revision _____

WATTS BAR NUCLEAR PLANT UNIT 1

Package No.: _____

1. The attached package contains _____ data sheet(s) 1
   _____ data sheet(s) 2
   _____ data sheet(s) 3
   _____ data sheet(s) 4
   _____ data sheet(s) 5
   _____ data sheet(s) 6

2. No additional supports exist on piping other than those specified by the analysis isometric.

   Remarks:

_____ _____
Inspector No. 1 Date

_____ _____
Inspector No. 2 Date

3. Reviewed by: _____ _____
   EN DES Site Representative Date

79-14 PHASE II DATA SHEET 1 Revision ____

PIPE SUPPORT* CHECKLIST Page ___ of ___

WATTS BAR NUCLEAR PLANT UNIT 1

Package No.: _____

1. Pipe Support Drawing No. _____

2. Is support installed per support drawing(s)? (Yes or No) _____

   If no, indicate deviations on the support drawing and list them below.

   NOTE: See Attachment 2, section 2.0, for items to be checked and instructions.

3. Is there load carrying attachment(s) welded to pipe? (Yes or No) _____

   If yes, does the weld(s) conform to support drawing(s)? (Yes or No) ___

_____ _____
Inspector No. 1 Date

_____ _____
Inspector No. 2 Date

_____ ___
EN DES Site Representative Comments:

_____ _____
EN DES Site Representative Date

*For springs use Data Sheet 5.

79-14 PHASE II DATA SHEET 2 Revision ____

VALVE CHECKLIST Page ___ of ___

WATTS BAR NUCLEAR PLANT UNIT 1

Package No.: _____

1. Valve Tag No. _____
   TVA Valve Mark No. _____
   Valve Size and Type (e.g., 4" BW Globe) _____
   Valve Drawing No. _____
   Valve Manufacturer and Model No. _____

   Note: See Attachment 2, section 3.0, for instructions.

2. Is valve location correct? (Yes or No) _____
   (If no, show location on drawing)

3. If the valve has an extended operator, is the orientation of the operator correct? (Yes or No) _____
   (If no, indicate orientation on drawing.)

4. Operator Manufacturer and Model No. _____

_____ _____
Inspector No. 1 Date

_____ _____
Inspector No. 2 Date

_____
EN DES Site Representative Comments:

_____ _____
EN DES Site Representative Date

79-14 PHASE II DATA SHEET 3 Revision ____

ISOMETRIC CHECKLIST Page ___ of ___

WATTS BAR NUCLEAR PLANT UNIT 1

Package No.: _____

1. Does the general configuration of the piping system, including support location, match the isometric? (Yes or No) _____

2. List deviations below and submit marked drawings. See Attachment 2, section 4.0, for instructions.

_____ _____
Inspector No. 1 Date

_____ _____
Inspector No. 2 Date

EN DES Site Representative Comments:

_____ _____
EN DES Site Representative Date

79-14 PHASE II DATA SHEET 4 Revision _____

PENETRATION CLEARANCE CHECKLIST Page ___ of ___

WATTS BAR NUCLEAR PLANT UNIT 1

Package No.: _____

1. Does the pipe have proper clearance through all penetrations (see Attachment 2, section 5.0, for instructions)? (Yes or No): _____
If no, indicate interferences below and mark them on the isometric. Initial and date beside each penetration of the design drawing as it is checked.

_____ _____
Inspector No. 1 Date

_____ _____
Inspector No. 2 Date

EN DES Site Representative Comments:

_____ _____
EN DES Site Representative Date

79-14 PHASE II DATA SHEET 5 Revision ____

SPRING HANGER CHECKLIST Page ___ of ___

WATTS BAR NUCLEAR PLANT UNIT 1

Package No.: _____

Hanger Dwg. No.: _____

Note: See Attachment 2, section 6.0, for instructions.

1. Vendor _____
2. Size and Type of Canister _____
3. Travel Limits (inches) _____
4. Load Setting and Condition (lb) _____
   (i.e., hot or cold, full or empty)
5. Dynamic Travel Limit (inches) _____

_____ _____
Inspector No. 1 Date

_____ _____
Inspector No. 2 Date

EN DES Site Representative Comments:

_____ _____
EN DES Site Representative Date

79-14 PHASE II DATA SHEET 6 Revision ____

GENERAL CLEARANCE CHECKLIST Page ___ of ___

WATTS BAR NUCLEAR PLANT UNIT 1

Package No.: _____

Identify interferences below per Attachment 2, section 5.0.

INTERFERENCE IS _____ IN THE _____ DIRECTION FROM PIPE TO _____ _____ , LOCATION: _____

INTERFERENCE IS _____ IN THE _____ DIRECTION FROM PIPE TO _____ _____ , LOCATION: _____

INTERFERENCE IS _____ IN THE _____ DIRECTION FROM PIPE TO _____ _____ , LOCATION: _____

INTERFERENCE IS _____ IN THE _____ DIRECTION FROM PIPE TO _____ _____ _____ , LOCATION: _____

INTERFERENCE IS _____ IN THE _____ DIRECTION FROM PIPE TO _____ _____ , LOCATION: _____

INTERFERENCE IS _____ IN THE _____ DIRECTION FROM PIPE TO _____ _____ , LOCATION: _____

INTERFERENCE IS _____ IN THE _____ DIRECTION FROM PIPE TO _____ _____ , LOCATION: _____

_____ _____
Inspector No. 1 Date

_____ _____
Inspector No. 2 Date

_____ _____
EN DES Site Representative Date

033131.25

79-14 PHASE II

DETAILED INSPECTION REQUIREMENTS

WATTS BAR NUCLEAR PLANT UNIT 1

1.0 General

The inspectors must not use acceptance criteria or judgment to dismiss any disagreement between the design document and the as-constructed condition. (See Atachment 3 for measurement tolerances.) Two isometric sets are recommended to be used in performing the inspections. One set can be used in recording support deviation locations and the other set in recording nonsupport deviation locations.

Data sheets 1 through 6 must be used to record all deviations. Each set of data sheets will be preceded by a data package cover sheet.*

Additional checklists and/or worksheets may be used by the inspectors; however, they must be approved by EN DES and signed and dated by the inspector. All inspection documents must be signed and dated by two inspectors.

2.0 Detail Support Inspection

a. Verify that each support specified on the selected analysis isometric is installed in the proper location and provide the intended support as specified on the analysis isometric drawing. Also, verify that there are no additional supports, damaged supports, or missing supports. R1

b. Verify that all pipe supports shown on the selected isometrics constructed per the detailed support design drawings. Inspection should include all components of the supports (including support gaps) and all attachment welds. If support gaps are inaccessible due to insulation, then the gaps should be designated inaccessible. However, insulation must be removed, if necessary, to guarantee that at least 50 percent of all supports with gaps are inspected. Exempt from the detailed support inspection are spring hangers and supports with pending FCRs. Spring hangers must be verified to be functional. (See data sheet 5*.) Approved FCRs must be used to supplement the design shown on the support design drawings.

*All data sheets are included in Attachment 1.

c. Any deviation to the support design drawing must be noted on the drawing and turned in with data sheet 1*. The deviation description should provide all new information needed to perform a support structural analysis, if necessary. All support deviations must be numbered on both the support design drawing and the isometric used for recording support deviations.

The following items must be inspected:

**1) Support location
**2) Restraint direction
**3) Restraint type
4) Structural member dimensions
5) Welds
6) Anchor bolts
7) Bolted connections
8) Snubber size and setting
9) Spring can size
10) Cotter pins
11) Component standard support sizes
12) Lug sizes
13) Gaps
14) Support damage
15) Additional attachments to the support

R1

3.0 Valve Inspection

a. Verify that all valves are installed as specified by the isometrics and the mechanical piping drawings and inspect each valve using data sheet 2*. The following will be documented:

1) Valve tag number
2) TVA valve mark number
3) Valve size and type (specify B.W., F.W., S.O., etc.)
4) Valve drawing number
5) Valve manufacturer and model
6) Valve location
7) Operator orientation
8) Operator manufacturer and model

Any deviations in valve location and/or orientation must be marked and numbered on the isometric drawing and submitted as part of the inspection package.

*All data sheets are included in Attachment 1.

**Note: These checks are also required in section 4.0.a under isometric inspection, and it is intended that the isometric check will satisfy this requirement.

R1

b. In most cases, the required information can be obtained from the valve itself and the inspection package valve drawing. If a model number, figure number, or some other positive identification number is not available on the valve, record all information that can be obtained from the valve. This may require removing insulation from the valve body.

4.0 Isometric Configuration Inspection

a. Isometric configuration inspection must include verifying:

1) Pipe diameter
2) Routing
3) Support location and type
4) Restraint direction
5) Fitting type and location
6) Insulation type and thickness
7) Equipment connections
8) Pipe wall thickness

This will entail taking actual measurements to verify correct:

1) Pipe segment lengths
2) Branch line locations
3) Support locations
4) Fitting locations
5) Insulation thickness (three places per isometric)
6) Pipe diameter (three places per isometric)
7) Pipe wall thickness (three places per isometric)

Those measurements corresponding to the dimensions on the analysis isometric must be circled in ink on the isometric drawing and/or piping physical drawing with any discrepancies marked and numbered on the isometric.

b. Data sheet 3* should be included with the marked isometrics. In cases where the isometric is congested, it may be necessary to mark up more than one copy. Areas which are not inspected or that are inaccessible must be marked on the drawing. Piping physical drawings may be used to supplement isometrics where dimensions on the isometrics are missing.

5.0 Clearance Inspection

Note: Prior to the Phase II inspections, CONST will have color coded the isometrics to clearly and conservatively show predicted maximum pipe movements for all isometric piping.

*All data sheets are included in Attachment 1.

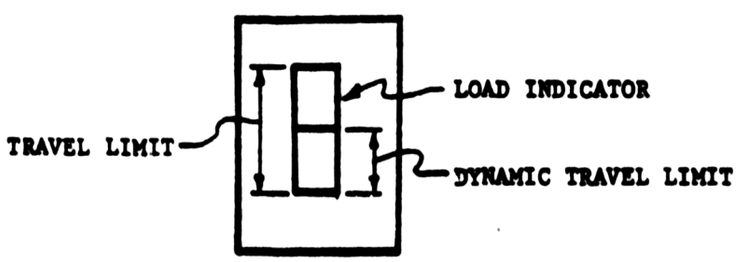
a. Inspect whether the piping which penetrates walls or floors has clearance with the sleeve to accommodate maximum pipe movements specified on the isometric; record the inspection results on data sheet 4*. Any problem in penetration clearance must be marked on the isometric drawing and submitted as part of the inspection package. Sleeves sealed with foam are to be treated the same as sleeves without foam.

b. Inspect whether the piping has clearance with adjacent piping, supports and other fixed items to accommodate maximum pipe movements as noted on the isometrics; record the inspection results on data sheet 6*. Each clearance problem must be marked on the isometric drawing and submitted as part of the inspection package. Any insulation damaged during the hot functional testing due to lack of clearance must be identified. Maximum pipe movements must be doubled for checking clearance with adjacent piping (instrument lines and conduit are not considered adjacent piping).

6.0 Spring Hanger Data

The following information will be required on all spring hangers and must be recorded on data sheet 5*.

a. Vendor
b. Size and type of canister
c. Travel limit
d. Load setting and condition (i.e., hot or cold, full or empty)
e. Dynamic travel limit



SPRING CANISTER

*All data sheets are included in Attachment 1.

79-14 PHASE II

INSTRUCTION AGENDA FOR INSPECTORS

I. Briefing by CEB

A. Introduction
B. Scope of Inspection
C. Procedures and Documentation

II. Question Period

Note: The inspectors will be instructed not to use acceptance criteria or judgment in order to dismiss any variance between the design document and the as-constructed conditions. However, no measured dimensional variance will be recorded unless it exceeds 1 inch for a piping design dimension or 1/4 inch for a support design dimension. Recorded dimensional variances are to be rounded to the nearest 1/4 inch for piping design dimensions and 1/8 inch for support design dimensions. Support gaps, weld sizes, pipe thicknesses, pipe diameters, and insulation thicknesses are to be recorded as measured.

79-14 PHASE II

EVALUATION CRITERIA
FOR DEVIATIONS

WATTS BAR NUCLEAR PLANT UNIT 1

1.0 Purpose

The purpose of this criteria is to provide guidelines for evaluating the deviations found in the Phase II inspections.

2.0 Scope

This criteria will be used for Watts Bar Nuclear Plant Unit 1 and will be used for evaluating the results of the NRC-OIE Bulletin 79-14 Phase II inspections.

3.0 Evaluation Procedure

During the Phase II inspection, the packages will be marked by the inspectors to indicate all deviations. The deviations are to be evaluated in accordance with section 4.0 to determine their significance.

3.1 The EN DES site team, with aid from CONST, must review the inspection packages immediately following the inspection in order to determine their clarity and completeness. The team must then evaluate all deviations using the "Deviation Evaluation Form" with help from CONST. Finally, the team will give all inspection packages to CEB in order to resolve the discrepancies.

3.2 CEB will evaluate all discrepancies transmitted to them by the EN DES site team, paying particular attention to the piping configuration, including additional or missing supports. Those discrepancies which involve WBP will be transmitted to them and will later be reviewed by CEB.

3.3 WBP will review, evaluate, and resolve all structural discrepancies against individual supports and other support-related discrepancies as required. WBP will also review all nonsupport discrepancies.

3.4 A summary of the significant and nonsignificant discrepancies will be prepared by CEB with input from WBP and/or the CEB Engineering Mechanics Group (EMG).

3.5 Any significant discrepancies which have a definite potential to cause a loss of pressure boundary must be identified by CEB immediately. If one condition is found which was not identified in Phase I and which could result in a pressure boundary failure, endangering the safety of the plant or the health and safety of the public, the entire program will be stopped and reevaluated.

3.6 For deviations common to both the Phase I and Phase II programs, a comparison review will be conducted under the direction of CEB to determine the effectiveness of the Phase I inspection program.

4.0 Evaluation Forms

"Deviation Evaluation Form" (page 6 of 7) will be used to address all deviations. If the evaluator finds that a deviation is actually a discrepancy, he will assign a discrepancy number to the deviation and describe it on a "Discrepancy Evaluation Form" (page 7 of 7). Each discrepancy will be reviewed to determine whether it is significant or nonsignificant. (Refer to section 2.0 of this SEP for applicable definitions.) Support-related discrepancy evaluation forms will be prepared and checked by WBP; nonsupport by CEB. Support-related discrepancy evaluation forms will be concurred and reviewed by CEB; nonsupport by WBP.

5.0 Evaluation Considerations

The evaluators must take into consideration, as a minimum, the following items when reviewing inspection packages:

1) Analysis requirements
2) Pipe configuration and routing
3) Locations of all pipe fittings and special components
4) Pipe wall thickness and diameter
5) Valve locations
6) Support locations
7) Valve weights and center of gravity locations
8) Valve operator orientations
9) Insulation weights
10) Clearances around supports
11) Clearances around piping
12) Support type and function
13) Structural adequacy of all supports

6.0 Documentation:

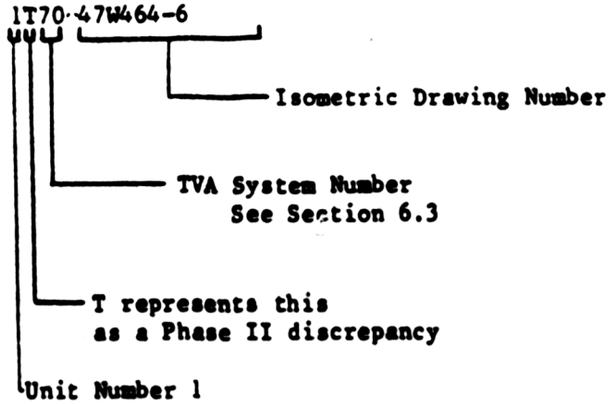
NOTE

All revisions, deletions, or additions to quality assurance records must be made with black ink and must be initialed and dated by the author. Deletions or revisions must be lined out. No correction fluid, correction tape, or erasures are permitted.

6.1 Inspection Package Number - Each inspection package will be assigned an identification number. The number will include the designations as shown below:

EDS Example 1T70-0600200-04-04

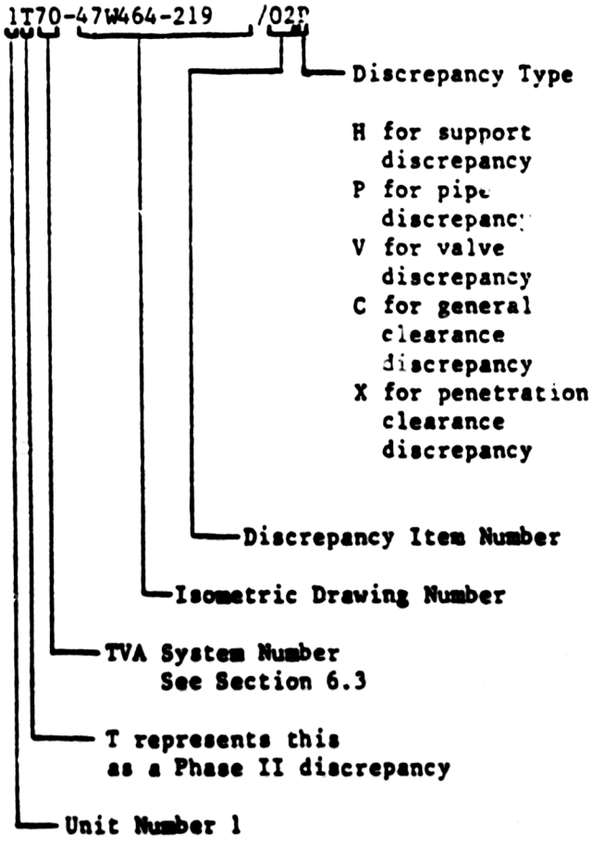
TVA Example 1T70-47W464-6



6.2 Discrepancy Number - Each discrepancy will be assigned an identification number. The number will include the designations as shown below:

EDS Example 1T70-0600200-04-04/01H

TVA Example 1T70-47W464-219 /02P



6.3 WBN Piping System Identifications

System Abbreviation	TVA Drawing Series	System	EDS System No.	TVA System No.
MS	400	Main Steam	06	1
FW, AFW	401, 427	Main & Aux. Feedwater	02, 05	3
BD	400	Blowdown	07	1
IM		Incore Monitoring	10	
AB	431	Aux. Boiler System		12
RC	465	Reactor Coolant System	13	68
HC	915	Hydrogen Collector		30
HPFP	491, 206	High Pressure Fire Protection		26
HVAC	915	Heating, Vent, and Air Conditioning		30
CA	600	Control Air System		32
SA	492	Service Air System		33, 81
SD	476	Station Drainage		40
DW	492	Demineralized Water		59
CVCS	406, 555	Chemical & Volume Control	08	62
SIS	435	Safety Inspection	09	63
ICCS	462	Ice Condenser Contain. System		61
ERCW	450, 206	Essential Raw Cooling Water		67
CCS	464	Component Cooling Water	04	70
CS	437	Containment Spray		72
RHR	432	Residual Heat Removal System	03	74
WD	560	Waste Disposal System		77
SFPC	454	Spent Fuel Pit Cooling		78
UHI	435	Upper Head Injection	15	87
RMS	600	Radiation Monitoring		90

6.4 WBN Drawing Revisions - All drawings which are to be revised to resolve any discrepancies must be revised according to EN DES-EP 4.21 with the applicable discrepancy number(s) noted in the revision description block.

6.5 Calculation Package Updating - Discrepancy reports including any hand calculations which affect analysis are to be added to the analysis packages in accordance with EP 3.03.

79-14 PHASE II
DEVIATION EVALUATION FORM
WATTS BAR NUCLEAR PLANT UNIT 1

Revision ____
Page ___ of ___

Package No.: _____ _____ Inspection Drawing:(1) _____

(2) Deviation No.	(3) Phase I Discrepancy No.	(4) Acceptance Criteria	(5) Phase II Discrepancy No.	(6) Comments

NOTES:

(1) This is an analysis isometric drawing number.

(2) All deviations are to be listed consecutively.

(3) If this deviation was previously assigned a Phase I discrepancy number, identify the number and do not address columns (4) and (5).

(4) If this deviation is acceptable per existing acceptance criteria, identify the acceptance criteria and page number and do not address column (5).

(5) If this deviation was not assigned a Phase I discrepancy number or is not acceptable per existing acceptance crieria, then this deviation must be assigned a Phase II discrepancy number per EN DES-SEP 82-25, Attachment 4, page 4.

(6) Any related comments of interest should be recorded.

Prepared by _____ _____
CONST/EN DES Date

Reviewed by _____ _____
EN DES Date

033131.25

79-14 PHASE II
DISCREPANCY EVALUATION FORM
WATTS BAR NUCLEAR PLANT UNIT 1

Revision _____
Page ___ of ___

Discrepancy No.: _____

Support No.: _____

Description of Discrepancy: _____

_____

_____

Significant: _____ Nonsignificant: _____

Definite potential for loss of pressure boundary: _____

Basis for judgment: _____

_____

_____

Resolution: _____

_____

_____

_____

Preparer	Date	Checker	Date
		Supervisor	Date
Concurrer	Date	Reviewer	Date
		Supervisor	Date

033131.25

79-14 PHASE II

SUMMARY REPORT INSTRUCTIONS

Summary Report

Significant differences between this data and that used in the analysis will be recorded and compared with that obtained in the Phase I inspection. This report will be sent to the NRC.

Outline of Summary Report

Final Response for NRC-OIE Bulletin 79-14 Phase II:

1. Inspection Description

    a. Training
    b. Attendance
    c. Procedure

2. The selected isometrics, including drawing number, system, and number of supports

3. The purpose of Phase II

4. Deviation numbers assigned to all deviations made by the inspection team

5. The results of the deviation evaluation (All deviations must show resolution and/or rationale for acceptance.)

6. The rationale for the success of the program, or if not successful, the corrective action

7. Backup Data: comparison of Phase I and Phase II parameters for deviations with possible importance to seismic analysis

DISTRIBUTION

FOR

EN DES-SEP 82-25

		Number of Copies
R. O. Barnett	W9D224 C-K	2
J. C. Standifer	204 GB-K	7
ESB Procedures Control Section	S70 C-K	1
MEDS	W5B63 C-K	1
R. M. Pierce	104 ESTA-K	1
E. G. Beasley	W12B21 C-K	1

TELEDYNE
ENGINEERING SERVICES

130 SECOND AVENUE

WALTHAM, MASSACHUSETTS 02254

(617) 890-3350 TWX (710) 324-7508

September 14, 1983
No. 2160
TES/TVA-476

cc: W. R. [illegible] NSTA-K
G. L. [illegible] 126 C-K
C. A. [illegible] 126 C-K
J. A. [illegible] 126 C-K
G. R. [illegible]
R. M. [illegible] MM-K
S. B. [illegible]
MEDS, [illegible]
R. A. Painter, [illegible] C-K
R. M. Pierce, [illegible]
M. N. Spence, [illegible] C-K
J. C. Standifer, [illegible]
J. P. Vineyard, 304 ESTC-K

Mr. R. O. Barnett
Chief, Civil Engineering Branch
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902

Attn: Mr. Joe Hansen

Subject: Personal Service Contract TV-43310A - Trip Report for Phase II Inspection - Watts Bar Nuclear Power Plant Unit 1

Gentlemen:

Recently, TES completed a 79-14 Phase II Inspection at Watts Bar Nuclear Plant, located in Spring City, TN. This inspection was performed in accordance with TVA Special Engineering Procedure SEP 82-25, a procedure developed by TVA to:

- Describe the method by which TES would perform this inspection.
- Verify the effectiveness of TVA's Phase I inspection program.
- Demonstrate TVA's compliance with NRC-OIE Bulletin 79-14.

TES arrived at the plant site on August 22, 1983 with the following personnel:

Joseph Santangelo
Catherine McDonough
Vernon Fritch
Al Staffieri
Craig Stott
Don Messinger (Q.A. Engineer)
Joe Calagione
Neil Mager*
Dan Gelinas*

At this time, Bob McKay and Steve Sherfey of TVA provided orientation on plant safety, and described in detail SEP 82-25.

*These inspectors arrived 8/24/83.

TELEDYNE
ENGINEERING SERVICES

2160-476

TES was instructed to verify all piping dimension and support design drawings per the SEP, along with piping interferences for TVA designated systems listed below. (Please see attached EN DES SEP 82-25 for complete walkdown verification procedure).

Main Steam
Feedwater
Auxilliary Feedwater
Chemical & Volume Control
Safety Injection
Essential Raw Cooling Water
Reactor Coolant
Component Cooling
Core Spray.

(One piping isometric was chosen from each of these systems)

The inspectors were told not to use any acceptance criteria or judgement in order to dismiss any deviation between the design drawings and the as-constructed condition. After reviewing the SEP in detail, TES inspectors were taken into the plant by a TVA guide to locate designated piping systems. From this point, TES inspectors worked completely on their own. TES completed the independent inspection on August 31, 1983.

Bob McKay (TVA) developed a 79-14 Phase II status reflecting TES findings. This status includes any deviations and definite potential for loss of pressure boundaries found by TES. By using their acceptance criteria, TVA classified these deviations as discrepancies, both significant and non-significant. A copy of this status is included.

Don Messinger (TES) audited TES performance to insure their compliance with SEP 82-25. This audit is attached for your review.

TES found TVA's procedure of verifying design drawings for as-constructed conditions to comply with NRC-OIE Bulletin 79-14 and appreciate TVA's acceptance of TES to perform this inspection.

If you have any questions or comments, please call.

Very truly yours,

TELEDYNE ENGINEERING SERVICES

Joseph R. Santangelo

Joseph R. Santangelo
Project Engineer

JRS:alt
attachments
cc: TES Document Control

79-14 PHASE II STATUS

I. Phase II Contractor: Teledyne Engineering Services

II. Phase II Start Date: August 22, 1983

III. Total Phase II Packages: 9 Packages (listed below)

IV. Teledyne Inspection Completed: 9 Packages

V. TVA Review Complete: 9 Packages (status shown below)

System	Phase II Package No.	Deviations		Discrepancies		Non-Significant		Significant		DPLPB*	
		Pipe	Hangers	Pipe	Hangers	Pipe	Hangers	Pipe	Hangers	Pipe	Hangers
MS	1T01-600200-06-04	49	53	7	14	7	14	0	0	0	0
FW	1T03-47W401-208	20	15	0	0	0	0	0	0	0	0
AFW	1T03-47W427-200	10	26	1	0	1	0	0	0	0	0
CVCS	1T62-47W406-203	18	22	4	7	4	7	0	0	0	0
SI	1T63-47W435-217	17	21	0	0	0	0	0	0	0	0
ERCW	1T67-47W450-217	8	52	1	4	1	4	0	0	0	0
RC	1T68-47W465-206	54	44	12	5	12	5	0	0	0	0
CC	1T70-47W464-242	3	55	1	2	1	2	0	0	0	0
CS	1T72-47W437-201	42	58	0	3	0	0	0	0	0	0

*Definite Potential For Loss of Pressure Boundary

TELEDYNE
ENGINEERING SERVICES

QA AUDIT SUMMARY

INTERNAL	EXTERNAL	PROJECT	MANAGEMENT	FUNCTION (Specify)
	X			Field

PROJECT NO. 2160 DK CAR NO. N/A

PRE-AUDIT CONFERENCE DATE 8/19/83 POST-AUDIT CONFERENCE DATE 8/30/83

BY/TITLE D. Messinger, QA Supervisor DATE 8/22, 23, 24/83

PERSONNEL INVOLVED JRS, CMM, JAC, VCF, AAS, CWS, NMM, DLG

STATEMENT OF PURPOSE Audit of TES personnel on location performing walkdown for NRC-OIE Bulletin 79-14 Phase II inspections at Watts Bar Plant, Unit 1.

SUMMARY OF OBSERVATIONS Walkdown of 9 systems are performed by TES field personnel in accordance with TVA procedure ENDES-SEP 82-25, Attachment 2. (CEB 830819 005)

CORRECTIVE ACTION REQUIRED FOR N/A

A "HOLD" IS BEING PLACED ON THE FOLLOWING PENDING RESOLUTION OF THE DEFICIENCIES:

N/A

AUDITOR SIGNATURE D. Messinger - Lead Auditor

ACKNOWLEDGEMENT Robert D. Fitz - Project Manager
(signature indicates understanding of specific findings)

REPORT ON FOLLOW-UP ACTION

CORRECTIVE ACTION COMPLETED PROJECT MANAGER DATE

APPROVED QA MANAGER DATE

cc: QA Manager
Project Manager
Sr. Vice President, Engineering

9/82

Q.A. AUDIT CHECKLIST

TELEDYNE ENGINEERING SERVICES

AREA/ACTIVITY:

AUDIT DATE: 8/22, 23, 24/83

AUDITED BY: Don Messinger

A=COMPLIANCE N=NONCONFORMANCE

BASIS: ENDES-SEP 82-25

PROJECT NO.: 2160 DK

ITEM	CHARACTERISTIC CHECK	RESULTS	A	N
1.0	Do all TES personnel have a controlled copy of the latest TES PQAP?	Team #1: J. Santangelo, C. McDonough; Team #2: J. Calagione, V. Fritch; Team #3: A. Stafferi, C. Stott All teams had a copy of PQAP 2160 Rev. 4, dated 3/22/83. Note: The PQAP does not contain any info/references for this field walkdown. PQAP carried for any possible questions other than the walkdown.	X	
2.0	Do All TES personnel have a controlled copy of the latest procedure for the NRC-OIE Bulletin 79-14 Phase II Inspections?	A copy of TVA procedure #ENDES-SEP 82-25 was issued to each TES inspector by TES Document Control. During orientation meeting with TVA engineering staff a few minor changes were made to the procedure. TVA personnel involved in assisting TES personnel were: Bob MacKay, Jim Waldrop, Steve Sherfly and Dan Sample. Note: JRS requested two additional inspectors from TES office. N. Mager & D. Gelinas on site as of 8/24/83. N. Mager working with J. Calgione and D. Gelinas working with V. Fritch - Now four teams.	X	

Q.A. AUDIT CHECKLIST

TELEDYNE ENGINEERING SERVICES

AREA/ACTIVITY: Design Input.
AUDIT DATE: 8/22-23-24/83
AUDITED BY: D. Messinger

A=COMPLIANCE N=NONCONFORMANCE

BASIS: EN DES-SEP82-25
PROJECT NO.: 2160 DK
PAGE 2 OF 10

ITEM	CHARACTERISTIC CHECK	RESULTS	A	N
3.0	Did All inspection packages ~~must~~ contain the following documents:			
	1. Two prints of the math model isometric drawing for the rigorously analyzed piping.		✓	
	2. Prints of the mechanical (physical) drawings which show the actual routing of the piping in the building.		✓	
	3. Prints of the manufacturers' drawings of all valves and/or special components within the piping system.			✓*
	4. Copies of the inspection/recording forms (Attachment 1).			✓*
	5. Prints of the pipe support design drawings as required to perform the inspections described in Attachment 2 and all related Field Change Requests (FCRs).		✓	

ALL

*3.3 – Packages did not always contain all manufacturers drawings. This was discovered during walkdown of system. TVA field engineering dept. was notified and they provided TES personnel with those that were missing from the packages

*3.4 – Inspection/recording forms were not contained in walkdown packages. They were available in the field office as needed by TES personnel

Packages Reviewed by TES Auditor:

IT70 - 47W464-242
IT63 - 47W435-217
IT68 - 47W465-206
IT02 - 47W401-208 ✓
IT62 - 47W406-203 ✓
IT72 - 47W437-201 ✓
IT67 - 47W450-217 ✓

Q.A. AUDIT CHECKLIST

TELEDYNE ENGINEERING SERVICES

AREA/ACTIVITY:
AUDIT DATE: 8/22-23-24/83
AUDITED BY: D. Messenger

A=COMPLIANCE N=NONCONFORMANCE

BASIS: GV-PES-SGPSJ-25
PROJECT NO.: 7160DK
PAGE 3 OF 10

ITEM	CHARACTERISTIC CHECK	RESULTS	A	N
4.0	**Detail Support Inspection**			
	a. Verify that each support specified on the selected analysis isometric is installed in the proper location and provides the intended support in the direction as specified. Also, verify that no additional supports exist or that a support does not support the pipe in a manner not intended by the analyst. Damaged or missing supports are to be reported.	4.A supports not installed in proper location, missing or damaged supports, additional supports or any other deviations were documented on the pipe support checklist - Data Sheet 1		*
	b. Verify that all pipe supports shown on the selected isometrics conform to the detailed support design drawings. Inspection should include all components of the supports (including clearance to pipe) and all attachment welds. Exempt from the detail support inspection are spring hangers. Spring hangers must be verified to be functional. (See data sheet 5*). FCRs must be used to supplement the design shown on the support design drawings.	4.b pipe supports that did not conform to support design drawings were documented on Data Sheet 1		*
	c. Any deviations or additions to the support design drawings must be noted on the drawing and turned in with data sheet 1*.			
	The following items must be inspected: 1) Support location 2) Restraint directon 3) Restraint type 4) Structural member dimensions 5) Welds 6) Anchor bolts 7) Bolted connections 8) Snubber size and setting 9) Spring can size 10) Cotter pins 11) Component standard support sizes 12) Lug sizes 13) Clearances 14) Support damage 15) Additional attachments to support	[illegible] by the pipe support		*

AREA/ACTIVITY:
AUDIT DATE: 8/22-23-24/83
AUDITED BY: D. Messinger

Q.A. AUDIT CHECKLIST

A=COMPLIANCE N=NONCONFORMANCE

TELEDYNE ENGINEERING SERVICES
BASIS: EN-DES-SEP 82-3
PROJECT NO.: 2160.01

ITEM	CHARACTERISTIC CHECK	RESULTS	A	N
5.0	**Valve Inspection**			
	a. Verify that all valves are installed as specified by the isometrics and the mechanical piping drawings and inspect each valve using data sheet 2*. The following will be documented: 1) Valve tag number 2) TVA valve mark number 3) Valve size and type (specify B.W., F.W., S.O., etc.) 4) Valve drawing number 5) Valve manufacturer and model 6) Valve location 7) Operator orientation 8) Operation manufacturer and model Any deviations in valve location and/or orientation must be marked on the isometric drawing and submitted as part of the inspection package.	5.a Valve installation that was not as specified was documented on Data Sheet #2 All deviations were documented on Data Sheet #2	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	
	b. In most cases, the required information can be obtained from the valve itself and the inspection package valve drawing. If a model number, figure number, or some other positive identification number is not available on the valve, record all information that can be obtained from the valve. This may require removing insulation from the valve body.	5.b All information required for the valve inspections were available	✓	

Q.A. AUDIT CHECKLIST

TELEDYNE ENGINEERING SERVICES

AREA/ACTIVITY:
AUDIT DATE: 8/22-23-24-/83
AUDITED BY: D. Meeker

A=COMPLIANCE N=NONCONFORMANCE

BASIS: EN-DES-SEP 82-25
PROJECT NO.: 2160 DK
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ITEM	CHARACTERISTIC CHECK	RESULTS	A	N
6.0	**Isometric Configuration Inspection**			
	a. Isometric configuration inspection must include verifying:	2 NCR's written. Deviation were documented on Data sheet #3		
	1) Pipe diameter		✓	
	2) Routing		✓	
	3) Support location		✓	
	4) Restraint direction		✓	
	5) Fittings		✓	
	6) Valves		✓	
	7) Floor and wall penetration clearances		✓	
	8) Insulation type and thickness		✓	
	9) Equipment connections		✓	
	10) Pipe wall thickness	→ Did not witness during audit. This will be done at the end of the walkdown of all isometrics subject to availability of "D" welder.		
	This will entail taking actual measurements to verify correct:			
	1) Pipe segment lengths 2) Branch line locations 3) Valve location 4) Support locations 5) Fitting locations 6) Insulation thickness 7) Pipe diameter 8) Pipe wall thickness	} Measurements made & documented on Data sheet #3		
	Those measurements corresponding to the dimensions on isometrics must be circled in ink on the drawing with any discrepancies shown.	→ Discrepancies noted in red on drawing		
	b. Data sheet 3* should be included with the marked-up isometrics. In cases where the isometric is congested, it may be necessary to mark up more than one copy. Areas which are not inspected or that are inaccessible must be marked on the drawing. Piping physical drawings may be used to supplement isometrics where dimensions on the isometrics are missing.	→ Each set of data sheets packaged together. Areas not inspected or inaccessible were to be marked.		

Q.A. AUDIT CHECKLIST

TELEDYNE ENGINEERING SERVICES

AREA/ACTIVITY:

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D. Messenger

PROJECT NO.: 2110 DK

ITEM	CHARACTERISTIC CHECK	RESULTS	A	N
7.0	**Clearance Inspection**			
	Note: Prior to the Phase II inspections, CONST will have color coded the isometrics to clearly and conservatively show maximum pipe movements for all isometric piping.	7.0 - One copy of Isometrics was color coded	✓	
	a. Inspect whether the piping which penetrates walls or floors has clearance with the sleeve to accommodate maximum pipe movements specified on the isometric; record the inspection results on data sheet 4*. Any problem in penetration clearance must be marked on the isometric drawing and submitted as part of the inspection package. Sleeves sealed with foam are to be treated the same as sleeves without foam.	7.a all clearances for penetrations were documented on data sheet #4.	✓	
	b. Inspect whether the piping has clearance with adjacent piping, supports and other fixed items to accommodate maximum pipe movements as noted on the isometrics; record the inspection results on data sheet 6*. Each clearance problem must be marked on the isometric drawing and submitted as part of the inspection package. Any insulation damaged during the hot functional testing due to lack of clearance must be identified. Maximum pipe movements must be doubled for checking clearance with adjacent piping (instrument lines and conduit are not considered adjacent piping).	7.b all clearances for adjacent fixed items were documented on data sheet #6.	✓	

Q.A. AUDIT CHECKLIST

TELEDYNE ENGINEERING SERVICES

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ITEM	CHARACTERISTIC CHECK	RESULTS	A	N
8.0	**Spring Hanger Data** The following information will be required on all spring hangers and must be recorded on data sheet 5*. a. Vendor b. Size and type of canister c. Travel limit d. Load setting and condition (i.e., hot or cold, full or empty) e. Dynamic travel limit	Only one springhanger was inspected during this audit. All above information was checked & documented on data sheet #5		

Q.A. AUDIT CHECKLIST

TELEDYNE ENGINEERING SERVICES

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Don Messinger

ITEM	CHARACTERISTIC CHECK	RESULTS	A	N
9.0	A. Were all data sheets required for each Inspection (Support, Valve, ISO, Pen. Clearance & Springhanger) properly documented?	Data sheets for all completed supports, valves, ISO's, penetration clearances & springhangers were reviewed (ref. Attachment A of this audit for data sheets reviewed) for proper documentation & completeness. Questions that could not or need not be answered were marked "N/A".	X	
	B. Were all data sheets signed and dated by both the TES Inspector & Checker?	All data sheets for each team were properly signed & dated by both TES inspectors involved in the particular walkdown & documentation.	X	
	C. Were all packages marked, by the inspectors, to indicate all discrepancies?	All discrepancies were indicated on the respective data sheets as well as on the ISO & the manufacturers drawing.	X	

Q.A. AUDIT CHECKLIST

TELEDYNE ENGINEERING SERVICES

AREA/ACTIVITY:

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ITEM	CHARACTERISTIC CHECK	RESULTS	A	N
10.0	Remarks A. The following packages were completed during the scope of this audit: IT67-47W450-217 - walkdown completed - documentation incomplete. IT72-47W437-201 - walkdown completed - documentation incomplete. The following package is almost completed: IT63-47-W435-217 - both walkdown & documentation. B. Attachment "A" of this audit contains a list of all items reviewed by this auditor and references which team did the inspection.			

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ATTACHMENT "A"

Pipe Support Checklist - J. Santangelo & C. McDonough

67-1ERCW-R193	67-1ERCW-R195	67-1ERCW-R280
67-1ERCW-R196	67-1ERCW-R197	67-1ERCW-R198
67-1ERCW-R200	67-1ERCW-R194	67-1ERCW-R199
67-1ERCW-R192	67-1ERCW-R151	67-1ERCW-R166
67-1ERCW-R165	67-1ERCW-R163	67-1ERCW-R161
67-1ERCW-R162	67-1ERCW-R160	67-1ERCW-R158
67-1ERCW-R159	67-1ERCW-R157	67-1ERCW-R201
67-1ERCW-R152	67-1ERCW-R151	67-1ERCW-R150

Pipe Support Checklist - A. Staffieri & C. Stott

72-1CS-R36	72-1CS-R32	72-1CS-R57
72-1CS-R52	72-1CS-R44	72-1CS-R33
72-1CS-R31	72-1CS-R45	72-1CS-R35
47A437-5-25	47A555-18-27	47A060-72
47A060-72-2		

Valve Checklist - J. Calagione & V. Fritch

1-1SV-72-504	E2897-WH7	1-1SV-72-503
1-1SV-72-502	1-1SV-72-501	1-FCV-67-123-B
0-1SV-67-532-B	1-1SV-67-531-B	1-FE-67-245

Penetration Checklist - J. Santangelo & C. McDonough, and J. Calagione & V. Fritch

IT67-47W450-217	Node 85
IT67-47W450-217	Node 95
IT67-47W450-217	Node 103
IT67-47W450-217	Node 68
IT67-47W450-217	Node 47
IT67-47W450-217	Node 54
IT67-47W450-217	Node 1

Springhangers Checklist - J. Santangelo & C. McDonough

67-1ERCW-R197	Node 104