UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 7, 1989

Docket No. 50-390

See Rpt.

APPLICANT: Tennessee Valley Authority (TVA)

FACILITY: Watts Bar Nuclear Plant, Unit 1

SUBJECT: MEETING SUMMARY FOR THE JULY 20, 1989 MEETING REGARDING VERTICAL SLICE REVIEW (VSR) PROGRAM

On July 20, 1989, a meeting was held at the Watts Bar Site in Spring City, Tennessee between the NRC staff and representatives of TVA. The purpose of the meeting was for TVA and Sargent and Lundy (S&L) to present the results of the VSR program. Attachment 1 is the list of the attendees and Attachment 2 is a copy of the handouts provided by TVA at the meeting.

TVA opened the meeting and provided a brief overview of the Watts Bar Program Plan and of the systematic evaluation. The program is both a confirmatory as well as a discovery process. There have been several previous reviews but they did not assure total coverage. TVA stated that as part of the systematic evaluation, an element/attribute list was prepared, which included a total of sixty-five elements with a total of 3313 attributes. There are four major segments of the evaluation.

- Corrective Action Programs (CAPs) and Special Programs (SPs)
- Vertical Slice Review
- Employee Concern Special Program
- Attribute coverage reports

There are a total of 18 CAPs and 11 SPs. All these programs were reviewed by the Watts Bar Program Team (WBPT). These programs covered a total of 2320 attributes. S&L performed the Vertical Slice Program and it covered 2208 attributes. The NRC staff raised the question of how did TVA assure that the elements and attributes (E&A) list was complete. TVA's response was that its review was broad and also included the review of the employee concerns which assured that the E&A list was inclusive and sufficient.

S&L presentation included a brief description of the overall VSR Program and the objective and conclusions from the results of the program. The purpose was to confirm that the deviations found are addressed by the existing corrective action programs and also to discover new issues not addressed by the CAPs.

S&L stated that the selection of systems was based on criteria contained in NRC Inspection and Enforcement Manual Chapter 2530, "Integrated Design

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memo

Inspection Program." The criteria lists nine requirements. The Component Cooling System (CCS) met all nine selection criteria. It provides safety-related cooling water to a large number of plant components required for safe shutdown of the reactor. The CCS is complex in design and has required considerable interface between internal TVA disciplines and external vendors and suppliers. The electrical review of the CCS addressed emergency auxiliary power which included 6900-volt and 480-volt shutdown power systems and portions of the emergency 125 Vdc and 120 Vac vital power systems.

In order to ensure complete coverage, additional areas of the plant design were selected for horizontal review. The areas/topics included:

- high energy line break (HELB)
- fire protection
- control room habitability, and
- buried pipe design

The processing of findings included Observations Reports (ORs), Discrepancy Reports (DRs), Resolution Reports (RRs) and Completion Reports (CRs). Trend analyses included evaluations to assess the nature, significance and frequency of occurrence. Root cause for each discrepancy was determined and evaluated for generic implication. There were a total of 505 Discrepancy Reports resulting in 1040 discrepancies. These included 179 in engineering, 233 in construction, 91 in records and two in record quality.

In the area of engineering, S&L concluded that most of the licensing commitments have been appropriately implemented in design and these were found to be not safety-significant. There was not sufficient documentation available to determine the adequacy of the systems to perform their intended design function. Overall adequacy will be verified through various CAPs, including specific commitments made in response to the VSR. S&L stated that the most significant issue is the calculations (technical adequacy, completeness, and documentation.) There is a CAP to address this issue. S&L also noted that some of the design documents were released prior to completing the calculations. TVA has enhanced their current verification procedures and according to S&L, they appear to be adequate.

In the area of construction, S&L noted that some of the documents lack details and there were many unapproved field changes. CAPs are being developed to bring components into compliance with the design requirements. Main elements of the plant, however are conservatively designed and adequately constructed.

In the area of records verification, S&L noted that the QA/QC records generally conform to the controlling procedures, but the discrepancies found were not identified in the inspection records. TVA is developing CAPs to address this area.

In summary, S&L's conclusion was that assuming successful completion of the proposed CAPs, as modified by the VSR commitments, there is sufficient assurance that the design, construction and records will comply with the applicable licensing commitments and be technically adequate.

The WBPT maintained a continuous involvement with the VSR team and the process. The program team met with the VSR team at least once every two weeks but did not attempt to provide direction. WBPT reviewed sixty-eight design significant DRs and as a result four were revised.

The Watts Bar line organization is responsible for implementing the corrective actions. These actions include commitments from CAP plans and special programs, VSR completion reports and recommendations, employee concern special program corrective actions (CATDs) and systematic evaluation attribute coverage reports (ACRs). In response to NRC's concern regarding commitment reductions, TVA stated that commitment reductions are controlled by the Vice President and there are are strict site instructions and procedures. The NRC staff stated that an inspection will be scheduled to look into the areas not (trending, etc) looked at the previous two inspections.

On the morning of July 21, 1989 TVA briefly described the cable damage issue at Watts Bar Unit 2. According to TVA, there was an employee concern related to the fact that cable inside conduits 0-4PLR-292-1383 and 2-2PM-292-6474-D could have been damaged by heat from a cutting or welding operation close to the conduit. Upon inspection, TVA did not find any damage from heat but found at least five cables damaged down to the conductor. There were a total of twenty-six cables in that conduit. TVA stated that they are in the process of determining the root cause for this damage and will brief the NRC staff at a later date.

A discussion was also held at the site with TVA representatives regarding the efforts involved in four CAPs in the civil/structure area. The focus on these four of the five in the civil engineering area was related to the current task of Brookhaven National Laboratory to provide support for the NRC staff on the TVA Nuclear Performance Plan (NPP) for Watts Bar in the area of seismic design, seismic equipment qualification and the structural integrity of supported systems.

Hanger Analysis and Update Program (HAAUP): The engineering lead for this CAP is S. A. Bokhari. TVA has contracted the work for this effort out to Bechtel from their Oak Ridge office with support from Gaithersburg and the Los Angeles offices. The work completed for piping under rigorous analysis was provided by TVA in the attached document which was provided at the meeting. Additionally, TVA noted that for the rigorously analyzed piping approximately 20% of the redesign was complete and for alternately analyzed supports, approximately one hundred evaluations were completed. TVA also indicated that field work on the alternately analyzed and small bore pipe supports would begin in September of 1989, with field work completed by August 1990.

Conduits and Conduit Supports: The engineering lead for this effort is T. Cureton under the direction of James Adair. The work is a joint effort with TVA personnel and Sargent and Lundy (S&L) personnel with the revised criteria having input from Stone and Webster (S&W) personnel. Currently approximately 25 TVA and S&L personnel are involved in the work. The following items were noted in the status of the effort.

- Revised design criteria, WB-DC-40-31.1, issued 5/31/88.
- Standard drawings and details of conduit supports reissued.
- Walk through procedure WP-51 issued 4/3/89.
- Training for walk through teams in first group underway 4/3/89 with first teams completing training. Training module still being used for new team members.
- Projected target date for 20% walk through completion is 8/30/89.
- Projected target date for the completion of engineering is 3/30/90.
- Projected target date for the completion of field modifications is early August 1990.
- At the present time approximately 1500 conduit supports have been reviewed in the field walk through out of approximately 30,000.
- Evaluation of field data for critical cases to begin on 8/1/89.

Cable Trays and Cable Tray Supports: The engineering lead for this effort is D. Dombroski under the direction of James Adair. The work is under TVA direction with the bulk of the work to be performed by S&L under a contract. Currently there are approximately 10 personnel involved with the effort. The following items were noted in the status of the effort.

- Revised design criteria, WB-DC-20-21.1, issued 7/22/88.
- Walk though procedure issuance target date the week of 7/31/89.
- Target date for commencement of training is 8/7/89.
- Target date for 20% completion of the walk through is 8/30/89.
- Target date for completion of engineering is 3/30/90.
- Target date for completion of field modifications is early August 1990.
- The number of cable tray supports is approximately 3500.

HVAC Supports: The engineering lead for this effort is H. Stevens under the direction of James Adair. The work is under TVA direction with the bulk of the work to be performed by S&L under a contract. Currently, there are approximately 10 personnel involved in the effort. The following items were noted in the status of the effort.

- Design criterion, WB-DC-40-31.8, has yet to be revised; target date for completion is to be established.
- Target date for the walk through procedure is set for 8/31/89.
- Target date for the beginning of training is set for 9/7/89.
- Target date for 20% completion of the walk through is 10/30/89.
- Target date for completion of engineering is 3/31/90.
- Target date for the completion of field modifications is early August 1990.

TVA will be putting special schedule emphasis on completion of the walk through and any necessary field modifications for conduits, conduit supports and HVAC supports in the control room by 10/30/89 in order to free up that critical area for system testing. Additionally, TVA noted that while the walk through effort in the conduit and conduit supports is being done by area zones, the overall effort at Watts Bar is to establish priorities by system group completion requirements to facilitate prestart testing. Integration of these concepts will be an on-going effort within the project.

The NRC noted that the staff efforts will be supplemented by Brookhaven National Laboratory personnel who were introduced to TVA.

Walter Grossman - HAAVP and Cable Trays
Joseph Braveman - Conduit and HVAC

It was also noted that the Engineering Branch of ADSP has completed the SER for the programmatic aspects of the electrical conduit and conduit support corrective action program. The projects group of ADSP will issue the SER in the future. Additionally, two inspection reports which contain the observations relative to the execution of training and the walk throughs for the CAP were identified. These are Inspection Report 50-390/89-05 and 50-391/89-05 dated May 25, 1989 and Inspection Report No. 50-390/89-07 and 50-391/89-07 dated July 11, 1989.

A short discussion was held on the cross checking of deficiency reports cited in the Vertical Slice Review (VSR) for closure by a CAP. TVA indicated they have carefully reviewed this aspect to assure complete closure and traceability in anticipation of NRC review. TVA indicated the availability of documents which resulted from that effort if the NRC staff or consultants needed the information.

As a result of the meeting it was clear that additional NRC effort needs to be focused on the HAAUP activities so TVA can be properly notified of any necessary corrective actions.

Original signed by
Rajender Auluck, Senior Project Manager
TVA Projects Division
Office of Nuclear Reactor Regulation

Enclosures:
1. Attendance List
2. TVA Handouts

cc w/enclosures:
See next page

Document Name: MTG. SUMMARY JULY 1920

OFC	NRR:TVAPD	NRR:TVAPD				
NAME	RAuluck	SBlack				
DATE	10/7/89	10/7/89				

OFFICIAL RECORD COPY

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Meeting Summary, Memoranda for Trip Reports or Site Visits**

Docket File
NRC PDR
Local PDR
WB Reading File
ADSP Reading
J. Sniezek
D. Crutchfield
T. Quay
B. D. Liaw
S. Black
R. Pierson
LA
R. Auluck
B. Wilson, Region II
OGC
NRC Participants
ACRS (10)
GPA/CA (M. Callahan) (3)
E. Jordan
B. Grimes
J. Scarborough
G. Marcus
L. Norrholm
C. Ader
J. Gray
R. Borchardt

*cc: Licensee/Applicant & Service List

DF01
1/1

50-390 WATTS BAR 1 TVA

Meeting Summary for the July 20, 1989 Meeting Regarding Vertical Slice Review (VSR) Program

Rec'd w/memo dtd 11/7/89...8911210081

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-NOTICE-

ATTENDANCE ROSTER

MEETING TOPIC: Systematic Evaluation Presentation

DATE: July 20, 1989

NAME	Title	Organization	Telephone
Chris Riedl	Nuclear Engr	Site Licensing	8518
DENNIS MCCLOUD	ACTING SLM	"	8650
SUZANNE BLACK	AD TVA Project	NRC	(301) 492-0796
KEN BARR	Sec. Of - NRR	NRR	404-331-0342
Bruce Wilson	AD for Insp Programs	NRC	404-331-5526
RAJ AULUCK	Project Manager	NRR	301-492-0759
Bob Pierson	AD Tech Prog	NRC	301-492-0757
ANGELO MARINOS	Tech Program	"	301-492-3311
WALTER GROSSMAN	CIVIL CAP REVIEW	BROOKHAVEN NATIONAL LABS	516-282-205
Peter Hearn	Senior Systems Engineer	NRC, NRR, ROB	301-492-0763
Robert E. Stewmaker	Senior Structural Engr	NRC/NRR/ADSP/EB	301-492-0719
JOSEPH BRAVERMAN	CIVIL CAP REVIEW	BROOKHAVEN NAT'L. LAB	516-282-2186
HUKAM GARG	Sr. Elec. Engr.	NRC	301-492-0789
Morris Brand	Resident	NRC	(615) 365-548
Glenn Walton	Resident	NRC	(615) 365-5487
George Hubbard	Chief, Plant Sys. Br.	NRC	301-492-0786
P. Gary Humphrey	Resident	NRC	615-365-5488
ROBERT E. LEWIS	QA MEMBER	WBPT	365-3374
TA Ippolito	WBPT	WBPT	365-3517
A. K. Gwal	WBPT	WBPT	365-3729
J. A. McDonald	Manager of Projects	TVA-WBN	365-8627
Walt Horn	WBPT member	TVA-WBPT	365-3516
Roger A. Erler	Project Director	Sargent & Lund.	312-[illegible] 7132

ATTENDANCE ROSTER

MEETING TOPIC: Systematic Evaluation Presentation

DATE: July 20, 1989

NAME	Title	Organization	Telephone
ROGER HEIDER	Proj MANAGER	SARGENT & LUNDY	312-269-7046.
Ed Fuller	WBPT - Chair.	TVA	3441
EJ VIGLUICCI	OGC-	TVA	7304-K
R.R. HOESLY	Sr Coord Proj Engr	TVA	1665
R.A. PEDDE	SITE DIR.	TVA	8767
R.L. George	WBPT Eng Member	TVA	3403
J.E. Konklin	Section Chief	NRC/NRR	(301) 492-0953
S.R. STEIN	Senior Qs. Engineer	NRC/NRR	(301) 492-0977
H.S. TAYLOR	CHAIRMAN, IRC WATS BAG, VSR	SARGENT & LUNDY	(312) 269-637
L.J. PETERSON	MOR QC	TVA	8105
H.C. Johnson	Site Qual Mgr	TVA	8667

MEETING ATTENDEES

DATE 7/21/89

TOPIC NRC - TVA MEETING
CONDUIT, CABLE TRAY, HVAC
AND HAAUP CAPs.

NAME	ORGANIZATION	PHONE
Walter Horn	WBPT	3516
Ed Fuller	WBPT	3441
Walter Grossman	Brookhaven Nat. Lab	516-282-2055
JOSEPH BRAVERMAN	BROOKHAVEN NAT. LAB	516-282-2186
Robert E. Shewmaker	NRC	301/492-0719
STEVEN R. STEIN	NRC/RSIB	(301)492-0977
ROGER W. ALLEY	LEAD CIVIL MGR.	x 1695
James E. Adair	SR C/S ENGR.	x 1759
KEVIN B. WESTERVELT	WBPT	3475
R.L. George	WBPT	3403
V.L. PATUZZI	QA/QMS	3679
S.A. BOKHARI	Lead ENG (HAAUP)	1158
Mark Reeves	Proj. Mgt - TVA	3519
W.E. Wofford	NLRA	3822

WBPT--1406V

Handout
7/21/89

HAAUP CAP IMPLEMENTATION STATUS

Design Criteria Complete

Design Procedures Complete

Rigorously Analyzed ASME Piping

- Walkdown for as-built information complete
- Analysis 25 percent complete - schedule April 1990 completion
- Field implementation in progress - August 1990 completion

Alternately Analyzed ASME Small Bore Piping

- Evaluation criteria complete
- Evaluation in progress - completion schedule April 1990
- Field implementation - schedule start September 1989/complete August 1990

Pipe Support Component Substitution

- Development of sample populations complete
- Development of walkdown procedure - in progress/complete July 19~~89~~ 89
- Walkdown and evaluations - schedule complete August 1989

Pipe Rupture

- On going as output of rigorous analysis - schedule complete April 1990

Pressure Boundary Retention Piping

- Detailed implementation plan being developed

Position Retention

- Evaluation for compliance with updated design criteria - scheduled for FY90

06680

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : James L. McAnally, Corrective Action Program Manager, Watts Bar Nuclear Plant ONP

FROM : D. M. Lake, Project Manager, Watts Bar Nuclear Plant DNC

DATE : February 7, 1987

SUBJECT: WATTS BAR NUCLEAR PLANT - TRANSMITTAL OF ECSP FACT SHEETS AND CORRECTIVE ACTION TRACKING DOCUMENTS (CATDs)

ECSP CATD Number(s): 15100-WBN-01

The attached is our corrective action plans for the above CATDs.

for D. M. Lake

FS:HE
Attachment(s)

HE1.HE

ECSP Corrective Action Tracking Document (CATD)

INITIATION Applicable ECSP Report No.: 15100

1. Immediate Corrective Action Required: ☐ Yes ☒ No
2. Stop Work Recommended: ☐ Yes ☒ No
3. CATD No. 15100-WBN-01 4. INITIATION DATE 11-26-86
5. RESPONSIBLE ORGANIZATION:
6. PROBLEM DESCRIPTION: ☒ QR ☐ NQR Cable insulation inside conduits 0-4PLR-292-1383 and 2-2PM-292-6474-D could have been damaged by heat from a cutting or welding operation close to the conduit. Pulling the cables back for inspection of the insulation is recommended.

☐ ATTACHMENTS

7. PREPARED BY: NAME [signature] DATE: 1-9-87
8. CONCURRENCE: CEG-H [signature] DATE: 1-12-87
9. APPROVAL: ECTG PROGRAM MGR. [signature] for DATE: 1-13-87

CORRECTIVE ACTION

10. PROPOSED CORRECTIVE ACTION PLAN:

SEE NEXT PAGE

11. PROPOSED BY: [illegible]
12. CONCURRENCE: CEG-H [illegible]

ECTG PROGRAM MGR. [illegible]

VERIFICATION AND CLOSE-UP

13. Approved corrective actions have been verified as [illegible] implemented.

SIGNATURE TITLE DATE

2446T

CATG
CAPP 1.0
REV. 0
ATTACHMENT A

CATD NO. 15100-WBN-01

10. PROPOSED CORRECTIVE ACTION PLAN:

All cables contained in conduits 0-4PLR-292-1383 and 2-2PM-292-6474-D will be pulled out and inspected by DNQA personnel for any damage to the cables. *If any damage is found, an NCR will be written to document the damage and to initiate corrective action. The cable pull out and inspection activities for cables in conduit 0-4PLR-292-1383 will be handled on MR #A596114 by DNC Modifications. The cable pull out and inspection activities for cables in conduit 2-2PM-292-6474-D will be handled on workplan FB001MB by DNC electrical engineering unit.

Does the corrective action plan rely on or take credit for currently identified or previously completed work? Yes _____ No _____
If yes list parent documents (e.g. NCR, SCR, CAR, Audit, etc.) _____

Does the problem described constitute a condition adverse to quality (CAQ)?
Yes _____ No _____ *To be determined

If Yes CAQ No. _____

Schedule for completion of corrective action (schedule date, if known, or milestone (e.g. BFL1, etc.) Before unit 1 Fuel Load

11. [signature] 2-7-87 [signature] 2/7/87 [signature] for DNC 2/7/8
Prepared by/Date Proposed by/Date

0320V

CATD# 15100-WBN-01

	1987 START	FINISH	FEB	MAR	APR	MAY
M.R.# A596114	2-16-87	5-4-87				
W.P.# FB001MB	4-17-87	5-22-87				

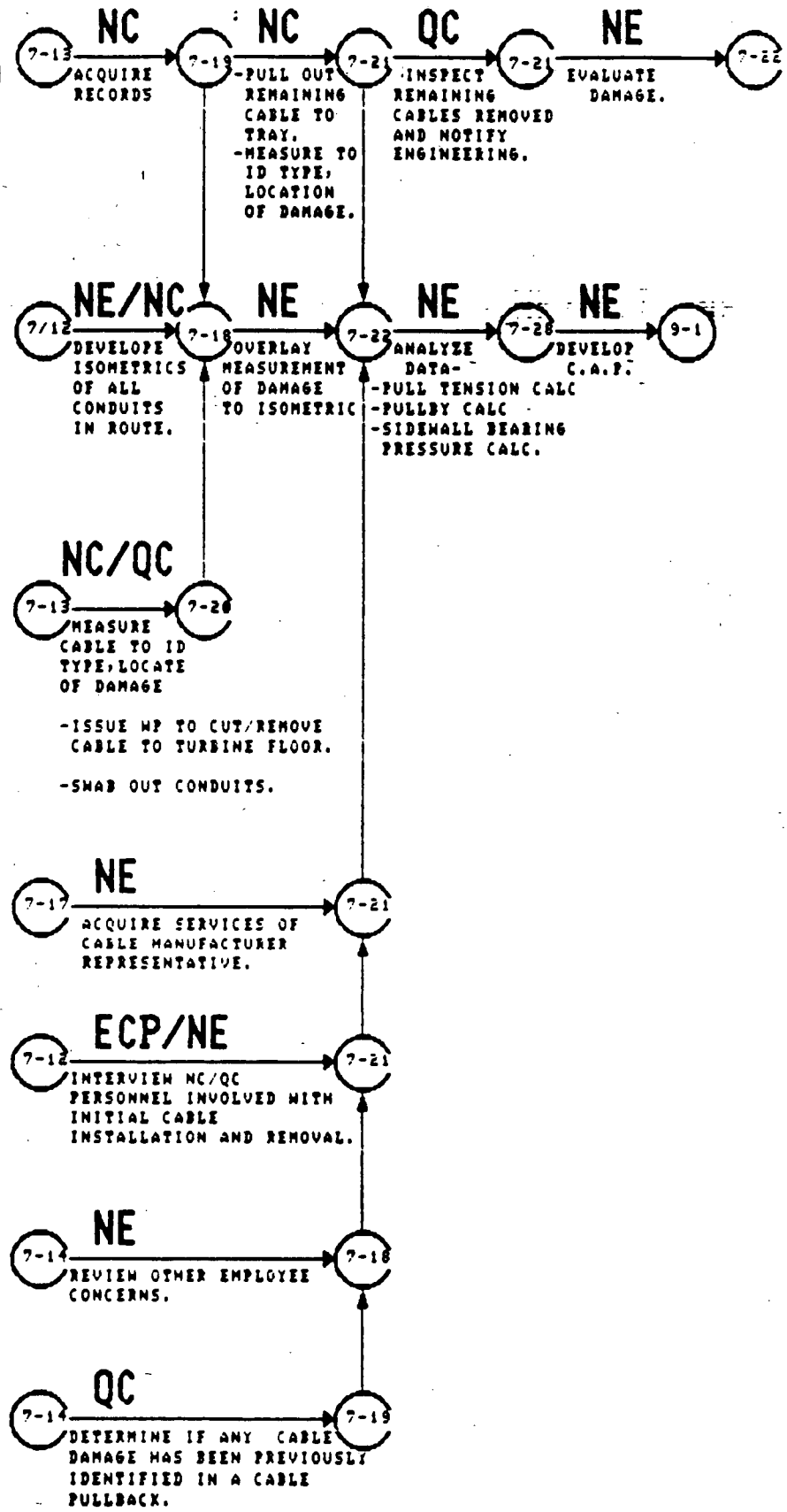
QA- LES OTTINGER X3684 (prin)
CHARLES WITSON (sec)

NC- STEVE STAGNOLIA X3228

NE- M. C. BRICKEY X1416

07/19/83

-QC PROC.
-PULLBACK REC.
-PULL TENSION REC.
-COND. CLEAN OUT
-PULL CARDS
-TEST MEGGER CONTIN./FUNC.
-PREOP REC.
-WP/MR ON CONDUITS AND CABLE INSTALL
-EMPL CONCERNS
-WP FOR EXIST CABLE REWORK
-ANCHOR BOLT
-PULL ROPE
-BROKEN CABLE
-NC PROC. FOR INITIAL PULL AND PULL BACK



SIGNAL TRACING ISSUE

NRC CONCERN

On March 27, 1989, NRC Resident Inspector Glen Walton identified a concern to the WBPT with respect to the accuracy of a statement contained in a submittal to NRC related to the number of cable routing verification by signal tracing. Mr. Walton has indicated that TVA did not provide the correct number of signal traced cable to verify cable route (NRC unresolved item URI 89-03-02).

CONCLUSION

- Completion of several action items as described in the enclosed attachment confirms the original results of cable route i.e., cable routing is correct.
- Appropriate NRC submittals will be revised to address the signal tracing issue, due to incorrect number of signal traced cables depicted on these submittals.
- Only 15 statements out of 189 (100%) accomplishment statements from the CAPs and VSR submittals could not be substantiated. WBPT has concluded that these are of non-significant nature and do not warrant any generic action.

E / A MATRIX
TVA - WATTS BAR NUCLEAR PLANT
DESIGN , CONSTRUCTION , QA/QC (REVISION 1)

ATTRIBUTE	SUB-ATTRIBUTE	
** 15.11.1 PUMPS		
* DESIGN		
- CAVITATION/RUNOUT PROTECTION		
- CLASSIFICATION		
- CODES AND DESIGN STANDARDS		
- CONNECTION LOADS		
- CONTROLS (INTERLOCKS/TRIPS)		R/1
- COOLING SYSTEMS		
- CORROSION/EROSION ALLOWANCE		R/1
- DESIGN FLOW/MIN. FLOW/RUNOUT		
- DESIGN HEAD/SHUTOFF HEAD		
- DESIGN PRESSURE		
- DESIGN TEMPERATURE		
- DRIVER CHARACTERISTICS		
- MATERIALS		
- MOUNTING DETAILS		
- NPSH/SUBMERGENCE/SUCTION LIFT		
- OPERATING MODES		
- RECIRCULATION FLOW		
- SERVICE/FLUID		
- TOLERANCES		
- TYPE (STAGES)		R/1

SEGMENTS OF THE EVALUATION

- CORRECTIVE ACTION PROGRAMS
  SPECIAL PROGRAMS
- VERTICAL SLICE REVIEW
- EMPLOYEE CONCERN SPECIAL PROGRAM
- ATTRIBUTE COVERAGE REPORTS

CORRECTIVE ACTION PROGRAMS
SPECIAL PROGRAMS

- ATTRIBUTES COVERED BY EACH:
  - PREPARED BY CAP / SP SPONSORING ORGANIZATION
  - REVIEWED BY WBPT

- 2320 ATTRIBUTES BY CAP / SP

VERTICAL SLICE REVIEW

- INDEPENDENT CONTRACTOR (S&L)
  - DETERMINED SCOPE OF VSR
  - PREPARED CHECKLISTS
  - IDENTIFIED E/A LIST COVERAGE
- 2208 ATTRIBUTES COVERED

WBN MTS159 0 0 0 G R

TVA WATTS BAR NUCLEAR PLANT

VERTICAL SLICE REVIEW PROGRAM

SUMMARY OF CHECKLIST ATTRIBUTES

1. Element No. 15.11.3 of E/A Matrix Dated 3/29/89

2. Checklist No. MRV-1511 Rev. 0 Date 7-28-88

3. Title Pumps - QAOC

4. Correlation of Attributes/Subattributes

E/A Matrix	VSR Checklist
Design Records	
- As-designed drawings	- MEV-1511
- Design calculationss	- MEV-1511
- Design change requests	- MEV-1511
- Design reports	- MEV-1511 & MEV-1517
- System descriptions/design criteria	- MEV-1511 & MEV-1517
- Design specificationss	- MEV-1511
- Stress reports	- MEV-2114
Installation - Construction Records - General	
- As-constructed drawings and records	- Records reviewed/ drawings not reviewed
- Final inspection results and releases	- MRV-1511
- Specification and Drawings	- MEV-1511
Installation - Construction Records - Mechanical	
- Material property records	- MRV-1511
- Lubrication records	- ARV-9900 (during construction control only)
Installation - Construction Records - Welding	
- NDE final test results	- Not reviewed
- Weld repair results	- Not reviewed

EMPLOYEE CONCERN SPECIAL PROGRAM

- TECHNICAL ISSUES ONLY
- BROAD SCOPE ONLY
- WBPT REVIEWED FOR BROAD SCOPE AND APPLICABILITY
- 162 ATTRIBUTES BY ECSP

ATTRIBUTE COVERAGE REPORTS

- 387 ATTRIBUTES NOT COVERED BY OTHER SEGMENTS OF THE EVALUATION
- ACRs PREPARED TO ADDRESS THESE
- ACCEPTABILITY DETERMINED BY:
  - VSR OR OTHER PROGRAM COVERAGE
  - SIMILARITY TO VSR REVIEW ITEM
  - DOCUMENTED ENGINEERING JUDGEMENT
  - RECORDS REVIEW
- IF NOT ACCEPTABLE, FURTHER ACTION DEFINED IN ACR

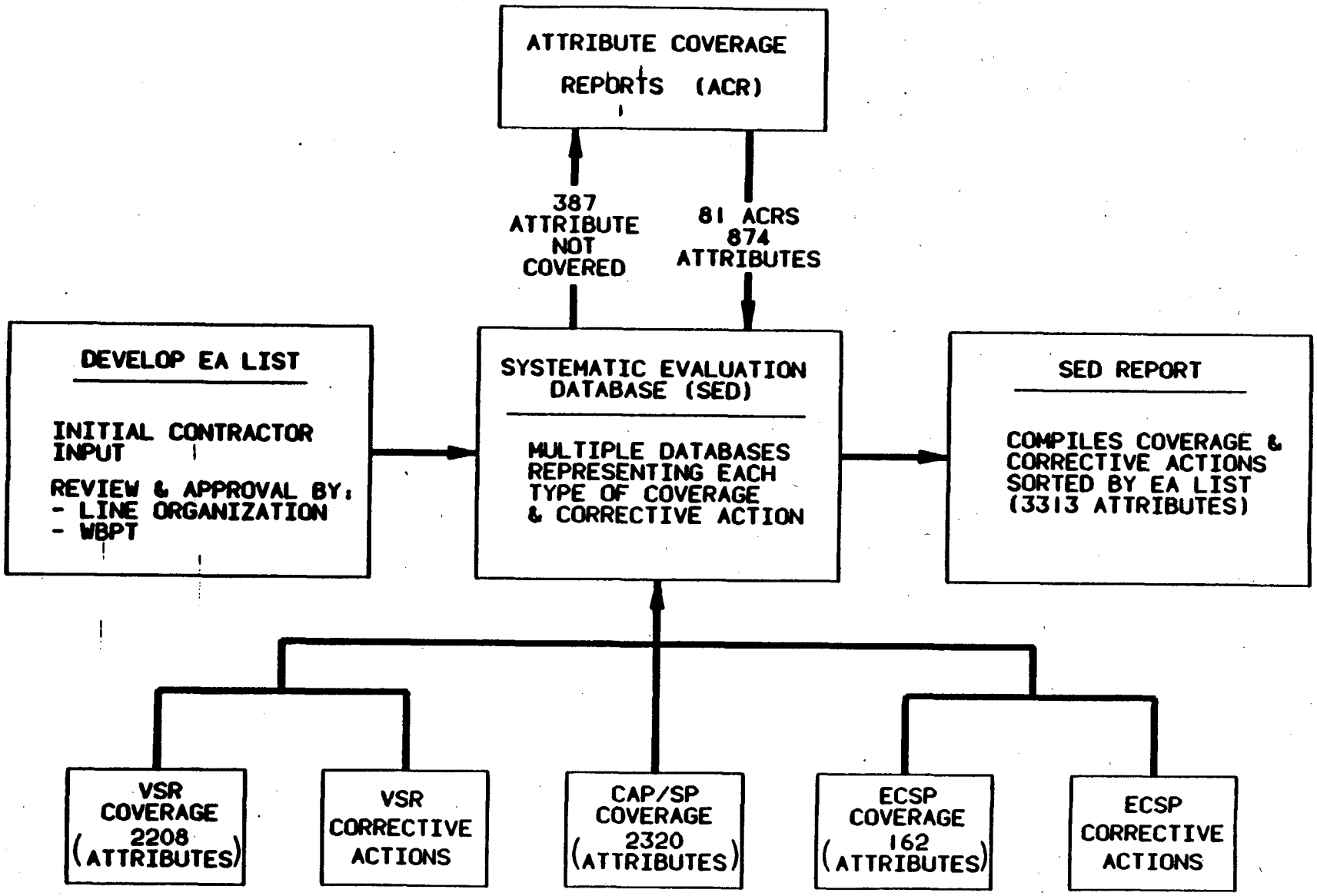
ATTRIBUTE COVERAGE REPORTS

- 81 ACRs PREPARED

- 10 ACRs REQUIRED FURTHER ACTION
  - ACTIONS PLANNED BY WBN
  - WBPT REVIEWED AND CONCURRED WITH ACTIONS

- 874 ATTRIBUTES COVERED BY ACRs

SYSTEMATIC EVALUATION DATABASE



VERTICAL SLICE REVIEW

Discrepancy DR Numbers	Paragraph Numbers	Condition Adverse To Quality (CAQ)	Corrective Action: CAP/SP Number	Maint Request / Work Package	Other Corrective Action

ELEMENT / ATTRIBUTE

Element: 8.1.1 CABLE
Attribute: Ampacity Derating Factor

CAP/SP

---Coverage---

CAP/SP Numbers:	(1) W-004	(2)	(3)	(4)	
ECSP Report Numbers:	(1) 26200	(2) 26600	(3) 26600	(4) 26600	(5)
	(6)	(7)	(8)	(9)	(10)
ECSP Issue Numbers:	(1) 202.0.c	(2) 239.0.b	(3) 240.0.a	(4) 240.0.c	(5)
	(6)	(7)	(8)	(9)	(10)
ECSP CAID Numbers:	(1)	(2) 23900-WBN-02	(3) 24000-WPS-01	(4)	(5)
	(6)	(7)	(8)	(9)	(10)
ACR Numbers:	(1)	(2)	(3)		
ACR Tracking Identifiers:	(1)	(2)	(3)		
VSR Check Listing:	(1) EEV-0101	(2)	(3)		

ECSP

ACR

VSR

1	5	WBFB70030 SCANBNECB0601	W-001	
3	6	WBFB70030 SCANBNECB0601	W-001	
13	5	SCANBNEEB0571	W-004	
629	5a	SCANBNEEB0571	W-004	WP TEE000

Attribute: Bending and Training Radius

---Coverage---

CAP/SP Numbers:	(1) W-001	(2) W-004	(3)	(4)	
ECSP Report Numbers:	(1)	(2)	(3)	(4)	(5)
	(6)	(7)	(8)	(9)	(10)
ECSP Issue Numbers:	(1)	(2)	(3)	(4)	(5)
	(6)	(7)	(8)	(9)	(10)
ECSP CAID Numbers:	(1)	(2)	(3)	(4)	(5)
	(6)	(7)	(8)	(9)	(10)
ACR Numbers:	(1)	(2)	(3)		
ACR Tracking Identifiers:	(1)	(2)	(3)		
VSF Check Listing:	(1) EEV-0101	(2)	(3)		

SYSTEMATIC EVALUATION

- COMPLETE REVIEW OF WBN
  - COMPLETE COVERAGE
  - THOROUGH REVIEW
  - DISCIPLINED
  - INDEPENDENT
  - DOCUMENTED
- DISCOVERY OF ISSUES
- RESONABLE ASSURANCE THAT WBN WILL MEET LICENSING REQUIREMENTS

Presentation Outline

- Scope and Methodology
- Summary of Results
- Conclusions

Scope and Methodology

- Engineering verification
  - Conformance with licensing
  - Requirements
  - Functional review
  - Physical review
    - System components
    - System interface with plant
- Construction verification
  - Constructed plant in accordance with design output documents
- Records verification
  - Records agree with the constructed plant

Scope and Methodology

System Selection

- Component cooling system
- Electrical

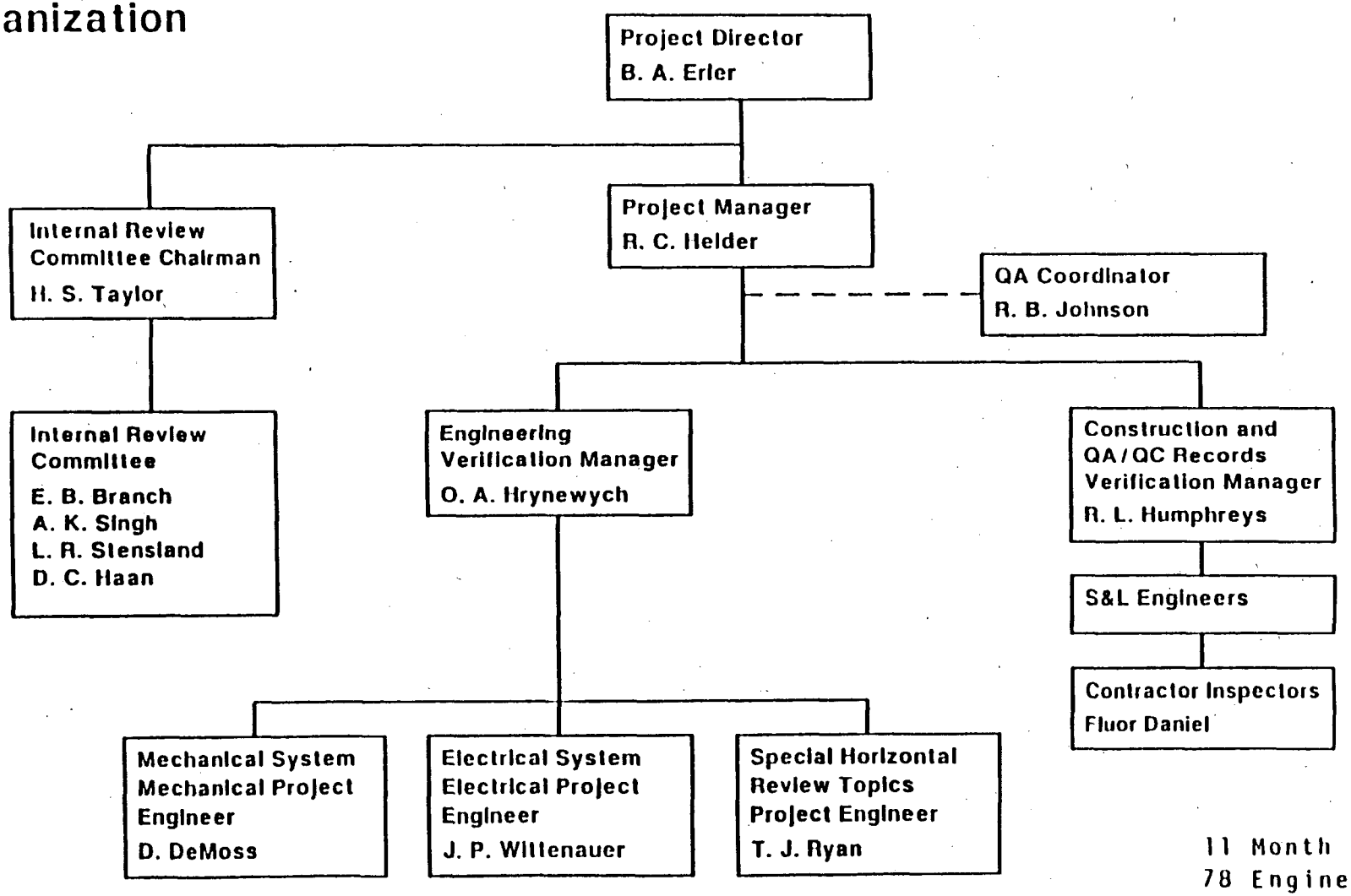
  6900-volt shutdown power
  480-volt shutdown power
  125-Vdc vital power
  120-Vac vital power

Horizontal Review Items

- High-energy line break effects
- Fire protection
- Control room habitability
- Buried pipe design

Scope and Methodology

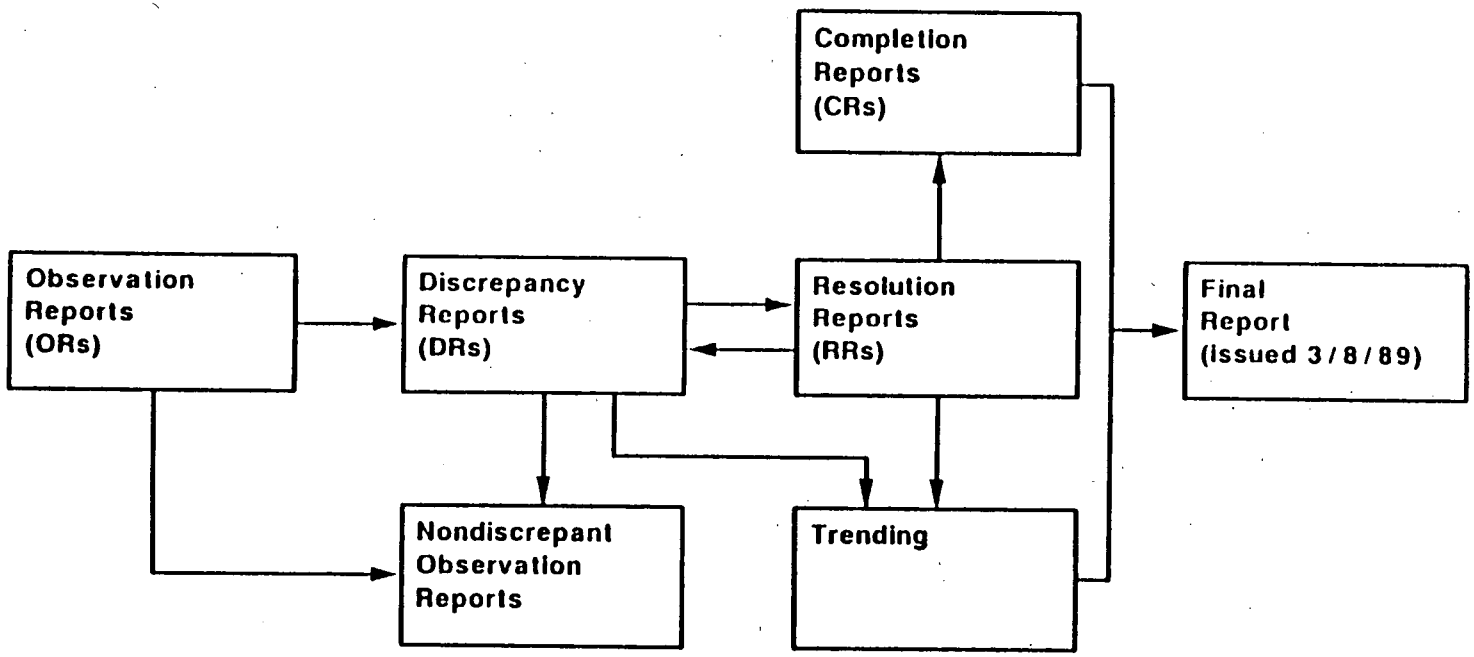
Organization



11 Month Duration
78 Engineers
69,000 Manhours
3500 Documents
973 Components

Scope and Methodology

Processing of Findings and Resolutions



Scope and Methodology

Trend Analysis

- Discrepancy reports were evaluated to assess their
  - Nature
  - Significance
  - Frequency of occurrence
- Apparent root causes of each discrepancy were determined
- Discrepancy reports were summarized and reported by cause, design area, and affected document
- Discrepancy reports were evaluated individually and collectively to determine any generic implications

Summary of Results

WBN-VSR

	Number of Checklists	Components	DRs	Valid DRs
Engineering verification	78	446	242	179
Construction verification	50	397	290	233
Records verification	56	130	120	91
Records quality	1	--	2	2
		973	654	505

505 DRs resulted in 1040 discrepancies

DEVELOPMENT OF CONCLUSIONS

WBH -VSI

- PLANT DESIGN DOCUMENTS, PROCEDURES AND HARDWARE
- EXPERIENCED REVIEW TEAM
- IDENTIFICATION OF DISCREPANCIES
  - DR / RR / CR
  - ADDITIONAL INFORMATION
  - ROOT CAUSE ANALYSIS
  - CORRECTIVE ACTIONS
- CAP's, SPECIAL PROGRAMS, CAQR's
- TRENDING

→ INTERNAL REVIEW COMMITTEE → CONCLUSIOI

Conclusions

Engineering Verification - Licensing Commitments

- Most have been appropriately implemented in the design of WBN
- None of the discrepancies were found to be safety-significant
  - Some resulted in a requirement for field modification
  - Most were documentation corrections

Conclusions

Engineering Verification - Technical Adequacy

- Documentation available to review was not sufficient to determine the adequacy of the systems to perform their intended design function
- Overall adequacy will be verified through Corrective Action Programs, including specific commitments made in response to the VSR
- Most significant issue is calculations

  Technical adequacy

  Completeness

  Documentation
- Corrective Action Programs are being developed to address the calculation issue

Conclusions

Engineering Verification - Design Process

- Implementation of design process
- Procedures appear to have been used as guidelines
- Calculations not prepared prior to release of design documents
- No detailed verification procedures
- Current procedures enhanced and appear adequate

Conclusions

Construction Verification

- Main elements of the plant conservatively designed and adequately constructed
- Design documents lack specific details
- Construction personnel made unapproved field changes
- Corrective Action Programs are being developed to bring components into compliance with design requirements

Conclusions

Records Verification

- QA/QC records reviewed generally conformed to controlling procedures
- Construction discrepancies found were not identified in the inspection records
- Corrective Action Programs are being developed

Conclusions

Corrective actions reasonable when

- Fully scoped
- Technically defined
- Integrated
- Implemented

Conclusions

- TVA is currently verifying the adequacy of the WBN plant design and construction
- Corrective action is being developed to confirm that the design - documentation and the as-installed construction are consistent with licensing commitments
- Assuming successful completion of the planned Corrective Action Programs, as modified by the VSR commitments, the VSRT concludes there is sufficient assurance that the design, construction, and records will comply with the applicable licensing commitments and be technically adequate.

WBPT REVIEW OF VSR

OBJECTIVE

- TO ADOPT THE CONCLUSIONS AND THE RECOMMENDATIONS PROVIDED IN THE FINAL REPORT OF THE VSR

METHOD

- MAINTAIN CONTINUOUS INTIMATE INVOLVEMENT WITH THE VSR PROCESS FROM BEGINNING TO END.

- MAINTAIN AN AWARENESS OF ALL ACTIVITIES OF THE VSRT AND TVA RESPONSES.

REVIEW OF VSR PREPARATIONS

- SELECTION OF SYSTEMS
- SELECTION OF ELEMENTS / COMPONENTS
- CRITERIA FOR SELECTION
- PLAN AND PROCEDURES
- CHECKLISTS
- CONCLUSIONS

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OVERSIGHT OF IMPLEMENTATION

- MONITOR VERIFICATION
- REVIEW FINDINGS
- ATTEND RESOLUTION MEETINGS
- ACCEPT CRs FOR DES. SIG. DRs
- CONCLUSION

WBPT REVIEW OF VSR PROTOCOL

- ACHIEVED THROUGH:
  - PRESENCE AT RESOLUTION MEETINGS AND TELECONS
  - DISTRIBUTION TO WBPT OF ALL FORMAL VSR CORRESPONDENCE

- PROVIDED:
  - ASSURANCE OF OBJECTIVITY AND INDEPENDENCE OF VSR
  - HIGH LEVEL OF AWARENESS OF VSR ACTIVITIES AND RESULTS BY WBPT

REVIEW OF DESIGN SIGNIFICANT DRs

- REVIEWED 68
- REVISED 4
- CONCLUSION

RESOLUTION OF UNRESOLVED DRs

- DR-32 EQUIPMENT SEISMIC QUALIFICATION
- DR-156 GROUT UNDER PIPE SUPPORT BASE PLATE
- DR-268 SHEAR WALL CLACS
- DR-319 DEDICATION OF NON IE MOTORS
- DR-386 STR. STEEL CONNECTION CALCS
- DR-480 BASE PLATE LOADING CALCS
- DR-634 SINGLE UNIT CHANGES ON TWO UNIT DRAWINGS

REVIEW OF VSR FINAL REPORT

- CONCLUSIONS
- TREND ANALYSIS
- RECOMMENDATIONS

RECOMMENDATIONS

- 13 FROM CONCLUSIONS, SUMMARY AND TRENDS
- 9 FROM OTHER PARTS OF REPORT
- 4 FROM WBPT
- RESOLUTION OF RESPONSES IS CURRENTLY UNDERWAY

WBPT CONCLUSIONS

- WBPT HAS ADOPTED THE CONCLUSIONS AND RECOMMENDATIONS PROVIDED BY THE VSRT IN THE VSR FINAL REPORT

- RESPONSES BY TVA TO FORMALLY IDENTIFIED DISCREPANCIES HAS BEEN ADEQUATE

- SATISFACTORY RESPONSES TO RECOMMENDATIONS ARE BEING FINALIZED BY TVA

IMPLEMENTATION OF CORRECTIVE ACTIONS

OBJECTIVE

PROVIDE HIGH CONFIDENCE THAT:

- SYSTEMATIC EVALUATION COMMITMENTS ARE EFFECTIVELY AND COMPLETELY PERFORMED

SCOPE

- CORRECTIVE ACTION PROGRAM (CAP) PLANS AND SPECIAL PROGRAMS
- VERTICAL SLICE REVIEW COMPLETION REPORTS (CRs) AND RECOMMENDATIONS
- EMPLOYEE CONCERN SPECIAL PROGRAM CORRECTIVE ACTIONS (CATDs)
- SYSTEMATIC EVALUATION ATTRIBUTE COVERAGE REPORTS (ACRs)

CAP AND SPECIAL PROGRAM

- 18 CAPs AND 11 SPECIAL PROGRAMS
- PROJECT MANAGER ASSIGNED
- WORK IN SITE INTEGRATED SCHEDULE AND TRACKED IN TROI
- PRIORITY BY SYSTEM GROUP COMPLETION
- COMMITMENT REVISIONS CONTROLLED BY SITE INSTRUCTIONS
- FINAL REPORT CONFIRMS OBJECTIVES ACHIEVED

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VERTICAL SLICE REVIEW

COMPLETION REPORTS

- 507 CRs PROVIDED COMMITMENTS
- RESPONSIBLE ORGANIZATIONS ASSIGNED
- TRACKED IN TROI WITH VSR CODING
- PRIORITY BY SYSTEM GROUP COMPLETION
- COMMITMENT REDUCTION CONTROLLED BY VP
- ITEM CLOSURE BASED ON ORIGINAL COMMITMENT
- ITEM CLOSURE BASIS REVIEWED BY PROJECT MANAGEMENT
- FINAL PROGRAM REPORT CONFIRMS OBJECTIVES ACHIEVED

RECOMMENDATIONS

- 26 VSR FINAL REPORT RECOMMENDATIONS
- RESPONSIBLE ORGANIZATIONS WILL BE ASSIGNED TO COMMITMENTS
- ACTIONS WILL BE TRACKED IN TROI WITH VSR CODING
- COMMITMENT REDUCTION CONTROLLED BY SITE DIRECTOR
- ITEM CLOSURE BASED ON ORIGINAL COMMITMENT
- ITEM CLOSURE BASIS REVIEWED BY PROJECT MANAGEMENT
- FINAL PROGRAM REPORT CONFIRMS OBJECTIVES ACHIEVED

EMPLOYEE CONCERNS SPECIAL PROGRAM

- 532 WBN CATDs
- RESPONSIBLE ORGANIZATION ASSIGNED
- TRACKED IN TROI, CODED AS CATDs
- PRIORITY BY SYSTEM GROUP COMPLETION
- COMMITMENT REDUCTION CONTROLLED BY ECSP AND VP LEVEL
- COMPLETION BASED ON ORIGINAL COMMITMENT
- ITEM COMPLETION BASIS VERIFIED BY ECSP
- FINAL PROGRAM REPORT CONFIRMS OBJECTIVES ACHIEVED

ATTRIBUTE COVERAGE REPORTS

- 10 ACRs WILL COMPLETE THE SYSTEMATIC EVALUATION
- WBPT CONCURS WITH PLANNED REVIEWS
- REVIEWS WILL BE TRACKED IN TROI
- COMMITMENTS WILL BE TRACKED IN TROI, CODED BY VSR
- PRIORITY BY SYSTEM GROUP COMPLETION
- COMMITMENT REDUCTION
- ITEM CLOSURE BASED ON ORIGINAL COMMITMENT
- ITEM CLOSURE BASIS REVIEWED BY PROJECT MANAGEMENT
- FINAL PROGRAM REPORT CONFIRMS OBJECTIVES ACHIEVED

CONCLUSION

- SYSTEMATIC EVALUATION COMMITMENTS WILL BE EFFECTIVELY AND COMPLETELY PERFORMED

NRC - TVA MEETING
WBN - JULY 20, 1989

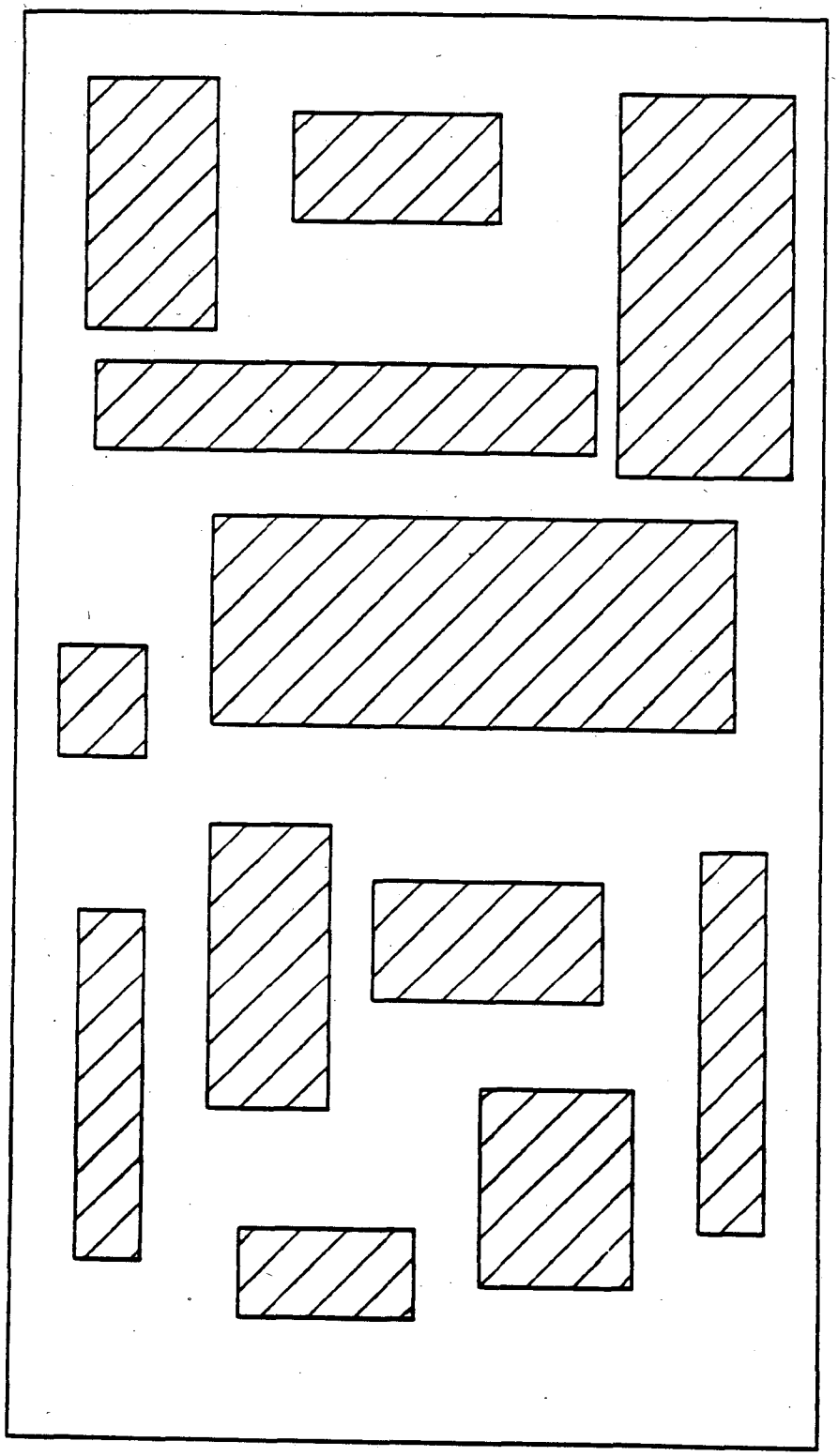
AGENDA

9:00	INTRODUCTION	EDF
9:15	SYSTEMATIC EVALUATION	WVH
9:45	VERTICAL SLICE REVIEW	BAE
10:15	BREAK	
10:30	WBPT REVIEW OF VSR	REL
11:00	IMPLEMENTATION OF CORRECTIVE ACTION	JAM
11:30	CONCLUSION	EDF
11:45	LUNCH	
1:00	SPECIAL TOPICS	CONFERENCE ROOM
	- CIVIL CAPS	B
	- CABLE DAMAGE - SIGNAL TRACING	C
3:15	CAUCUS	
3:45	RECONVENE FOR SUMMARY	B

SYSTEMATIC EVALUATION

- COMPLETE REVIEW OF WBN
  - COMPLETE COVERAGE
  - THOROUGH REVIEW
  - DISCIPLINED
  - INDEPENDENT
  - DOCUMENTED
- DISCOVERY OF ISSUES
- RESONABLE ASSURANCE THAT WBN WILL MEET LICENSING REQUIREMENTS

PRIOR REVIEWS DID NOT ASSURE TOTAL COVERAGE



VARIOUS REVIEWS PERFORMED AT WBN

SYSTEMATIC EVALUATION

- ELEMENT / ATTRIBUTE LIST
- SEGMENTS OF THE EVALUATION
- SYSTEMATIC EVALUATION DATABASE

ELEMENT/ATTRIBUTE/COMPONENT

65 • ELEMENT: (A PLANT FEATURE)

- PUMPS

3313 • ATTRIBUTE: (A QUALITY CHARACTERISTIC)

- DESIGN: PRESSURE
- CONSTRUCTION: ALIGNMENT
- QA/QC: INSPECTION RECORD

• COMPONENT: (A PARTICULAR PUMP)

- CCS PUMP C-S
- CCS PUMP 1A-A
- THERMAL BARRIER BOOSTER PUMP 1A-A
- CW CIRC PUMP A-A

SIGNAL TRACING ISSUE
(Status as of 7/19/89)

No.	Action Item Description	Action Party	Completion Date Schedule	Completion Date Actual	Status
A.	Corrective Action				
1.	Signal Tracing Issue - verification of routing and method of verification for "57 plus 16" cables	H. C. Johnson (NQA)	4/15	4/06	Complete, reverification of the sample of 21 cables has confirmed the original results of cable route. However, signal traced cable quantity does not match the depicted cable quantity in the NRC submittal. (See item 3b)
2.	Root Cause Analysis Preparation	PORS	4/11	4/07	Complete. As part of recurrence control, there were several actions to provide training to appropriate personnel in areas of procedure/program adherence. All of these actions were completed by 5/30/89
3.	Revision of appropriate NRC submittal for signal tracing issue only (i.e. cable routing was verified by signal tracing and visual attribute inspection)	D. E. McCloud (Licensing)	4/07	4/07	Complete. Letter (L44 890407 800) was sent to NRC to address signal tracing issue.

SIGNAL TRACING ISSUE
(Status as of 7/19/89)

o.	Action Item Description	Action Party	Completion Date Schedule	Completion Date Actual	Status
A.	Corrective Action				
	(3 continued)				
	TVA made the following commitments to NRC in this letter				
a)	TVA will determine the method of cable route verification from existing documentation for 57 EQ and the 16 App. R cables	H. C. Johnson (NQA) and D. E. McCloud	07/24/89		Verification from existing documentation is complete. Licensing to issue a letter to NRC of TVA's findings
b)	TVA will submit revisions to the affected chart, and the cable issues CAP	D. E. McCloud (Licensing)	07/24/89		Attached chart is revised and being reviewed. Cable Issues CAP is revised and was issued on 06/27/89.
	NRC unresolved item (URI) 89-03-02 Closure Package	D. E. McCloud (Licensing)	07/24/89		

SIGNAL TRACING ISSUE
(Status as of 7/19/89)

No.	Action Item Description	Action Party	Completion Date Schedule	Completion Date Actual	Status
B.	Preventive Action				
5.	Plans for validating entire diagram (attachment, "Adequacy of CCRS database)	WBPT	5/12/89	5/12/89	Complete
6.	Impact of this issue on all CAPs and VSR submittals	WBPT	6/30/89	6/08/89	Complete. The NQA review of 189 (100 percent review) accomplishment statements from the CAPs and the VSR submittals to NRC revealed that 15 statements could not be substantiated. WBPT has reviewed these 15 statements and determined that all were of non-significant nature.
7.	Assessment of this issue in light of todays' procedures for submittals, certifications', etc. (AI-13.0 procedure)	D. E. McCloud	4/11/89	4/07/89	Complete. Memo issued on 4/07/89 documenting the assessment of the AI-13.0 procedure. In this memo, it was concluded that having generated the cable issues CAP in accordance with the AI-13.0 program would not have prevented this problem.

SIGNAL TRACING ISSUE
(Status as of 7/19/89)

No.	Action Item Description	Action Party	Completion Date Schedule	Completion Date Actual	Status
	B. Preventive Action (continued)				
8.	Management notification of significant issues. (C. D. Nelson to discuss with J. Bynum and DEM to discuss with R. Gridley and C. Fox)	C. D. Nelson to J. Bynum D. E. McCloud to C. Fox	4/04/89 4/04/89		Discussions completed. Forms and instructions to be used for management notifications are being reviewed. Proposal for implementation will be made to R. Pedde

A. K. Gwal