

SUPPLEMENTAL
ENGINEERING ASSURANCE
OVERSIGHT REVIEW REPORT

SEQUOYAH NUCLEAR PLANT - UNIT 1
DESIGN BASELINE AND VERIFICATION PROGRAM

EA-OR-003-S

J. W. Semore 9-7-88
J. W. Semore Date
Team Leader

D. L. Malone 9/8/88
D. L. Malone, Manager Date
Technical Audit and Surveillance Group

A. P. Capozzi 9/8/88
Anthony P. Capozzi Date
Manager, Engineering Assurance

N. C. Kazanas 9/9/88
Nicholas C. Kazanas, Vice President Date
Nuclear Quality Assurance

SUPPLEMENTAL
ENGINEERING ASSURANCE OVERSIGHT REVIEW REPORT

TEAM MEMBER CONCURRENCE

Name	Title	Signature	Date
T. G. Chapman*	Lead Nuclear Engineer	<i>T.G. Chapman</i>	9/7/88
J. W. Semore	Lead Electrical Engineer	<i>J.W. Semore</i>	9/7/88
K. F. Liao	Electrical Engineer	<i>K.F. Liao</i>	9/7/88
B. Levenson	Lead I&C Engineer	<i>B. Levenson</i>	9/7/88
T. G. Chapman*	Lead Mechanical Engineer	<i>T.G. Chapman</i>	9/7/88
D. W. Bogaty	Lead Civil Engineer	<i>D.W. Bogaty</i>	9/7/88
B. Levenson*	Lead Operations Engineer	<i>B. Levenson</i>	9/7/88

TREND ANALYSIS

Name	Signature	Date
A. K. Khosla	<i>A.K. Khosla</i>	9-7-88

*Assumed duties and responsibilities after transfers and retirement of previous EA team members

Note: Only EA Team members included that were involved in the resolution of restart concerns

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1-1
1.1 Background.	1-1
1.2 Report Content.	1-1
2.0 CONCLUSIONS	2-1
3.0 SUMMARY OF RESULTS	3-1
3.1 General	3-1
3.2 Review and Assessment of the DB&VP Results	3-2
3.2.1 Restart Test Activities	3-2
3.2.2 Change Document Evaluations	3-2
3.2.3 System Evaluations and C/A	3-3
3.2.4 Transitional Design Change Control/Permanent Design Change Control.	3-3
3.2.5 DBVP Unit 1 Phase I Report	3-4
3.3 Results of Trend Analysis for EA Action Items	3-4
4.0 DETAILS BY DISCIPLINE	4-1
4.1 Nuclear	4.1-1
4.2 Electrical.	4.2-1
4.3 Instrumentation and Controls.	4.3-1
4.4 Mechanical.	4.4-1
4.5 Operations.	4.5-1
5.0 TREND ANALYSIS OF RESTART EA TEAM FINDINGS	5-1
5.1 Scope	5-1
5.2 Approach.	5-1
5.3 Updated Analysis of EA Team Action Items	5-1
5.4 Detailed Analysis	5-4
5.5 Conclusion	5-6
Attachment 1	5-7

Appendix A - EA Action Items Evaluated in the Follow-up Effort (Tables A-1, A-2, and A-3)

ABBREVIATIONS AND ACRONYMS

AFW	Auxiliary Feedwater
AFWPT	Auxiliary Feedwater Pump Turbine
AGBTS	Auxiliary Building Gas Treatment System
ANSI	American National Standards Institute
AC	Alternating Current
ACA	Auxiliary Control Air
ACR	Auxiliary Control Room
AI	Administrative Instruction
AOI	Abnormal Operating Instruction
AP	Auxiliary Power
AP SYS	Auxiliary Power System
AUO	Assistant Unit Operator
BBC	Brown Boveri
BIT	Boron Injection Tank
BISI	Bypassed and Inoperable Status Indication
B/M	Bill of Material
C/A	Corrective Action
C/R	Commitment/Requirement
CACTAT	Cable Average Conductor Temperature Analysis
CAQ	Condition Adverse to Quality
CAQR	Condition Adverse to Quality Report
CAR	Corrective Action Report
CATS	Commitment Action Tracking System
CBI	Chicago Bridge and Iron
CCB	Change Control Board
CCD	Configuration Control Drawing
CCP	Centrifugal Charging Pump
CHRIS	Calculation Cross-Reference Information System
CCS	Component Cooling System
CCW	Component Cooling Water
CDA	Commitment Document Assignment
COES	Change Document Evaluation Sheet
CGCS	Combustible Gas Control System
CEB	Civil Engineering Branch
CLE	Civil Lead Engineer
CRAD	Control Room As-constructed Drawings
CSS	Containment Spray System
CVCS	Chemical and Volume Control System
CWR	Completed Work Request
DB&VP	Design Baseline and Verification Program
DBA	Design Basis Accident
DC	Direct Current
DES	Discipline Evaluation Supervisor
DG	Diesel Generator
DGEPVF	Diesel Generator and Electrical Panel Ventilation Fans
DI	Discipline Instruction
DNS&L	Division of Nuclear Safety and Licensing
DIM	Design Input Memo
DNC	Division of Nuclear Construction

DR	Discrepancy Report
DRC	Design Review Checklist
DCR	Design Change Request
EA	Engineering Assurance
ECB	Engineering and Computer Methods Branch
ECN	Engineering Change Notice
EEB	Electrical Engineering Branch
EGTS	Emergency Gas Treatment System
EIR	Engineering Installation Requirements
ELE	Electrical Lead Engineer
EPT	Ethylene Propylene Terpolymer
ER	Engineering Report
ERCW	Essential Raw Cooling Water
ER/SD	Evaluation Review/Study Drawing
E&TS	Engineering and Technical Services
ESF	Emergency Safety Feature
ESFAS	Engineered Safety Features Actuation System
EQ	Environmental Qualification
EPVF	Electrical Panel Vent Fans
FCN	Field Change Notice
FCR	Field Change Request
FCV	Flow Control Valve
FSAR	Final Safety Analysis Report
FT	Functional Tests
ft/lb	Foot/Pound
GSPS	Generating Station Protective System
GDC	General Design Criteria
hp	Horsepower
HMS	Hydrogen Mitigation System
HVAC	Heating, Ventilating, and Air-Conditioning
HX	Heat Exchanger
I&C	Instrumentation and Controls
ICSB	Instrumentation and Control Systems Branch
IM	Instrument Maintenance Instruction
IMPL	Implemented
L-DCR	Local Design Change Request
LC	Loss of Charger
LER	Licensee Event Report
LOCA	Loss-of-Coolant Accident
M&A	Modifications and Additions Instruction
MCR	Main Control Room
MEB	Mechanical Engineering Branch
MFIV	Main Feedwater Isolation Valves

MI	Maintenance Instruction
MLE	Mechanical Lead Engineer
MOV	Motor-operated Valves
MR	Maintenance Request
MRT	Management Review Team
MSS	Main Steam System
NCR*	Nonconformance Report
NE	Nuclear Engineering
NEB	Nuclear Engineering Branch
NEMA	National Electrical Manufacturers Association
NEP	Nuclear Engineering Procedure
NLE	Nuclear Lead Engineer
NPSH	Net Positive Suction Head
NQA	Nuclear Quality Assurance
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NSD-TB	Nuclear Service Division - Technical Bulletin (Westinghouse)
NSSS	Nuclear Steam Supply System
NUC PR	Formerly the Division of Nuclear Power
OBE	Operating Basis Earthquake
OEP	Office of Engineering Procedure
OES	Operations Engineering Services
OIE	Office of Inspection and Enforcement (NRC)
OL	Operating License
O&MO	Operations and Maintenance
ONP	Office of Nuclear Power
OWIL	Outstanding Work Item List
PAM	Postaccident Monitoring
PAS	Project Administrative Staff
PGCE	Potential Generic Condition Evaluation
PIR	Problem Identification Report
PL	Punchlist
PLS	Precautions, Limitations, and Setpoints
PM	Policy Memorandum
PMRS	Preliminary Modification Recommendation Sheet
PMT	Postmodification Test
PRO	Potential Reportable Occurrence
PS	Project Staff
psid	Per square inch differential
QA	Quality Assurance
QC	Quality Control
QIR	Quality Information Release
QMDS	Qualification Maintenance Data Sheet
RAH	Rigorous Analysis Handbook
RAP	Responsible Action Party
RCS	Reactor Coolant System
RDBD	Restart Design Basis Document
RG	Regulatory Guide

*Also may indicate Nonconforming Condition Report.

P4R	Residual Heat Removal
RIMS	Records and Information Management System
RPS	Reactor Protection System
RTP	Restart Test Program
RWST	Refueling Water Storage Tank
SCR	Significant Condition Report
SCV	Steel Containment Vessel
SDE	Senior Discipline Engineer
SE	System Engineer
SER	Safety Evaluation Report
SG	Steam Generator
SGB	Steam Generator Blowdown
SHDN BD	Shutdown Board
SI	Surveillance Instruction
SIL	Section Instruction Letter
SIP	Safety Injection Pump
SIS	Safety Injection System
SMI	Special Maintenance Instruction
SOI	System Operating Instruction
SOR	Static-O-Ring
SQEP*	Sequoyah Engineering Project
SQN	Sequoyah Nuclear Plant
STA	Shift Technical Advisor
SSE	Safe Shutdown Earthquake
STEP	System Test Evaluation Package
SWBID	System Walkdown Boundary Identification Drawing
SYSTEM	System Evaluation Report
TACF	Temporary Alterations Control Form
TCV	Temperature Control Valve
TDAF	Turbine-Driven Auxiliary Feedwater
TDAFP	Turbine-Driven Auxiliary Feedwater Pumps
TOCC	Transitional Design Change Control
TI	Technical Instruction
TROI	Tracking and Reporting of Open Items
TVA	Tennessee Valley Authority
UHI	Upper Head Injection
USQD	Unreviewed Safety Question Determination
VP	Vital Power
VP SYS	Vital Control Power System
WBN	Watts Bar Nuclear Plant
WDS	Waste Disposal System
WDP	Walkdown Package
WOG	Westinghouse Owner's Group
WP	Workplan
WR	Work Request
WCAP	Westinghouse Unique No. on Calculations

*Also used to mean Sequoyah Engineering Procedure.

1.0 INTRODUCTION

1.1 Background

The results and conclusions of the EA Oversight Review Team's effort for Phase I of the SQN Unit 1 Design Baseline and Verification Program (DB&VP) were presented in the Engineering Assurance Oversight Review Report, Sequoyah Nuclear Plant Unit 1, DB&VP, EA-OR-003, issued June 27, 1988. There were 106 action items issued to the DB&VP, of which, 57 were closed and 36 were determined to require project implementation of C/A and EA verification as part of Phase II of the DB&VP. The remaining 13 action items were considered by the EA Team to be Unit 1 restart issues requiring resolution, appropriate corrective action implementation and EA verification prior to the restart of Unit 1.

Because a number of the restart action items related to design change control program, the EA Team could not conclude on the adequacy of the implementation of the transitional design change control program in the EA-OR-003 report. This program was instituted as an interim system to correct the weaknesses of the past design control process.

The 13 restart action items were tracked by the EA Team for resolution and closure and were identified to the DB&VP project as requiring additional action before final assessment was possible.

The follow-up effort of the EA Team included the review, the assessment, and the verification of the project's actions to resolve the restart action items.

1.2 Report Content

This supplemental report presents the results of the EA Team reviews and verification of C/A pertaining to the resolution, verification, and closure of the EA-generated restart action items for completion of Phase I of the SQN DB&VP. Those action items designated as a postrestart issue in the EA-OR-003 report are not addressed in this supplemental report.

Section 1.0, Introduction, provides a brief description of the purpose and scope of this follow-up effort.

Section 2.0, Conclusions, includes the EA Team's conclusion on the DB&VP Phase I effort and identifies any remaining actions required to be addressed in the Phase II effort.

Section 3.0, Summary of Results, quantifies the details with regard to restart action items addressed in this follow-up effort, the status of action items at the conclusion of this effort, a brief description by DB&VP activity of actions taken by the project and the EA Team to address the action items, the EA Team's final assessment of the adequacy of the DB&VP project's result for each activity, and trending of the EA findings.

Section 4.0, Details by Discipline, includes the details of the project actions taken and the EA Team's evaluation of project actions by action item numbers. The overall conclusions of the adequacy of DB&VP results are included for each discipline.

Section 5.0, Trend Analysis of Remaining EA Team Findings, includes an analysis of the findings associated with the action items and a comparison of these results with those reported in the EA-OR-003 report.

Appendix A has been included to provide detailed supporting information relating to the final status of EA restart action items, and the information to support the additional trend analysis.

2.0 CONCLUSIONS

Based on the results reported in EA-OR-003 and these additional results of the EA Team's evaluations and verifications for resolving the Phase I portions of the restart action items, the following conclusions are reached:

- Implementation of the DB&VP procedures was complete and adequate and met the objectives of the program; and the activities conducted by the DB&VP project were correct, adequate, and in accordance with program procedures.
- The DB&VP project demonstrated the functional and technical adequacy of modifications by providing and/or identifying sufficient supporting documentation and justifications to establish that modifications reviewed by the DB&VP comply with the restart design basis requirements.
- The transitional design change control (TDCC) process is being implemented in a satisfactory manner. Although there were occasional documentation errors noted in the implementation of the TDCC procedures, the results were technically acceptable. Tighter project management controls appear to be necessary to ensure continued procedure compliance. EA will continue to monitor this area as part of EA's continued oversight activities.

The results of the DB&VP actions, EA Team actions, and the trend analysis of the restart action items indicate there were no programmatic weaknesses remaining to be addressed by the DB&VP as a result of the 106 findings reported in EA-OR-003 and the EA Team's follow-up work as documented in this report. For Phase I items, the extent of deficiencies was determined, the deficiencies were corrected or are in the process of being corrected, and appropriate preventive action was identified and implemented. In addition, the root cause assessment of the EA Team concerns indicate that continued project management attention to ensure the provision of thorough and appropriate procedures and adherence to those procedures will be necessary during Phase II of the DB&VP. For Phase II items, the EA Team required sufficient documentation be provided to verify the postrestart decision was correct.

Based upon EA verification of root cause determination by the DB&VP and adequate C/A implementation of the EA findings, the EA Team concluded that 11 action items of the prerestart phase of the DB&VP have been fully and effectively addressed and 2 action items have been determined to be postrestart as a part of the Phase II DB&VP effort. The EA verification of all Phase II DB&VP action items will be included as part of the EA oversight scope for Phase II of the DB&VP. These Phase II action items are listed in Table A-3 of Appendix A.

3.0 SUMMARY OF RESULTS

3.1 General

The EA Team issued a total of 106 action items to address findings against the SQN unit 1 DB&VP activities. The EA Oversight Report, EA-OR-003, included the results of actions taken by the DB&VP and the EA Team on these findings. Of 106 action items issued, 57 were closed and 36 will require project implementation of C/A and EA verification as part of Phase II. Thirteen open action items were considered by the EA team to be restart issues requiring resolution and appropriate corrective action implementation prior to the restart of unit 1. A list of the "Restart" action items is presented in Table A-1 of Appendix A. This follow-up report presents the results of the DB&VP and the EA Team actions to resolve and close the restart (Phase I) portion of these action items.

The project was required to investigate and document the cause, extent, and significance as well as provide corrective and preventive actions for all of the valid action items. The EA Team approval and verification of these actions were required in all cases.

Of the 13 "Restart" action items, C/A for 4 of these had been agreed to by the EA Team at the time the EA-OR-003 report was issued and only required project implementation of C/A and the Team verification. These 4 action items were related to the restart test program, system evaluations, and the transitional design change control program. (See Table A-2 of Appendix A for distribution.) The EA Team's approval of the project's investigation of cause, extent, significance, and definition of corrective/preventive actions was documented and reported in EA-OR-003. The EA Team verification of C/A was required in this follow-up effort for these 4 action items.

For the remaining 9 action items, the DB&VP project was required to investigate cause, extent, and significance as well as definition of corrective and preventive actions. These 9 action items were related to the restart test program, change document evaluations, the transitional design change control program, and the DB&VP Unit 1 Phase I report. (See Table A-2 of Appendix A for distribution.)

The project determined that some of the problems in these action items were single occurrences and these were appropriately corrected. In all cases, the EA Team required the project to document the rationale that was used to bound the problems. The EA Team verified the adequacy of this documentation and judged that the EA-identified problems were satisfactorily bounded.

The results of the trend analysis presented in the EA-OR-003 report were updated in section 5.0 of this report to reflect these additional DB&VP and EA Team actions. The updated trending incorporated the Project and EA actions related to resolution and verification of open action items that were considered to be Unit 1 restart issues. The same trending procedure, attribute codes, and conventions used for the EA-OR-003 report were applied to the update effort.

All of the problems identified in these 106 action items were either corrected and EA verified or the EA Team agreed with and will verify DB&VP actions to be implemented in Phase II (postrestart of Unit 1).

Details by discipline are presented in section 4.0. Table A-3 of Appendix A presents the status of each "Restart" action item at the conclusion of the follow-up effort.

3.2 Review and Assessment of the DB&VP Results

The EA Team evaluated the project's actions and verified applicable project's implemented C/A for the action items requiring Phase I project action. In addition, the EA Team has agreed with project's postrestart decision for all Phase II actions. The following is a brief description of the results of the reviews and assessments performed on the project actions by activity.

There were no EA Team restart action items on activities associated with the system boundaries determination, design criteria, and system walkdown. Therefore, the results and conclusions reported in EA-OR-003 for these activities were completed and are unaffected by this follow-up effort.

3.2.1 Restart Test Activities

As shown in Table A-2 of Appendix A, there was one restart action item (01-007) in the resolved status and one restart action item (01-010) in the unresolved status against this activity.

- For the resolved action item (01-007), the project provided information indicating that the C/A of making the FSAR and design criteria consistent for CAQR SQP871446 adequately addresses EA's concern. The project committed to complete the CAQR SQP871446 C/A during Phase II. The EA Team concurred with the project and will verify C/A for the CAQR during Phase II.
- For the unresolved action item (01-010), the project revised the SQEP-63, pages 211 and 212, Restart Test Package for System 63, to show the correct cold leg recirculation flow rate for the RHR pump runout condition is 5500 gpm. The EA Team verified the C/A by the project was adequate and closed this item.

Based on the results reported in EA-OR-003 and the resolution of the above concerns, EA supports the project's position to accept the results of the restart test program effort to satisfy any of its system/component functional requirement definition commitments.

3.2.2 Change Document Evaluations

As shown in Table A-2 of Appendix A, there were two unresolved action items (E1-007, N1-002) against this activity.

- For Action Item E1-007, a work request was initiated to install a caution tag for the alternate DC feeder to the AFWPT transfer switch to control its use. In addition, the project committed to revise the C/A of CAQR SQP871335 R3 to reflect the Unit 1 C/A work. The project also reviewed additional CAQRs to verify the adequacy of the CAQR's C/A to correct Unit 1 concerns. This review identified no other CAQRs which did not address Unit 1 concerns. The EA Team verified C/A, reviewed the same six CAQRs, and judged the results of the CAQR review to be adequate. The EA Team also concurred in the postrestart decision to revise the C/A of CAQR SQP871335 R3 to address Unit 1. The EA Team will verify C/A for the CAQR during Phase II.

- For Action Item N1-002, the project provided documentation to show that the loss of this equipment would not adversely affect the control room habitability; therefore, EA's concern with ECN L6180 is a postrestart issue. The EA Team concurred in the postrestart decision to provide C/A for PIR SQNEEB8824. Final resolution and closure of this item will be postrestart.

Based on the results reported in EA-OR-003, the EA verification of the project's C/A and EA's concurrence to provide C/A for PIR SQNEEB8824 and revise C/A for CAQR SQP871335 R3 postrestart, the EA Team judged that the DB&VP Change Document Evaluation activities were satisfactory.

3.2.3 System Evaluations and C/A

There was one restart action item (E1-013) against this activity which was resolved but required verification of the C/A revision to PIR SQNMEB86108.

The project issued Revision 2 of PIR SQNMEB86108 dated July 28, 1988, which contains the revised C/A addressing the Unit 1 restart work for ECN L7185 to replace motor operators because of inadequate torque and/or excessive stroke time. The EA Team verified that the project's C/A was implemented and the action item closed.

Based on this EA verification and the results presented in the EA-OR-003 Report for system evaluations and corrective actions, the EA Team judged the DB&VP's effort on the system evaluations and corrective actions to be satisfactory.

3.2.4 Transitional Design Change Control/Permanent Design Change Control

The Transitional Design Change Control Process (TDCCP) was instituted as an interim system to correct the weaknesses of the past design control process and to prepare for the permanent design control program to be initiated at restart for Unit 2. For Unit 1, work initiated after April 1, 1988, was to be performed under the permanent design change control process. EA reviewed the design change control process to determine if the program was procedurally controlled and adequately implemented.

SQEP-13 was developed and issued to comply with a SQN commitment in the Nuclear Performance Plan Volume 2 that a transitional design change control process be implemented before restart to improve the existing design control process and provide an effective transition to the permanent system. NEPs-6.2, 6.3, 6.4, and 6.6 were issued to procedurally control the permanent design change control process and the project issued SQEP-26 to implement these NEPs.

The EA-OR-003 report identified 13 open action items pertaining to potential technical issues for the TDCC with a majority (7 of 13) of these considered restart issues. Further reviews by EA on the transitional design control process were conducted to resolve these action items or verify project actions.

- For E1-016 the project issued a Safety Evaluation form and a revision to an ECN in addition to issuing an update to the Updated Final Safety Analysis Report. EA reviewed these actions and concurred that this adequately addresses the concerns and considers this item closed.
- For E1-017, involving documentation inconsistencies, the project issued a revision to the calculation log and committed to revise PM-86-02 (EEB) postrestart. EA verified that this action adequately addresses the concern and is sufficient to resolve this action. Final closure will be postrestart pending EA's verification.

- For E1-018, involving documentation inconsistencies, the project revised a calculation, the modification criteria, and committed to revise another calculation postrestart. EA verified that this action adequately addresses the prerestart concern. Final closure will be postrestart pending EA's verification.
- For M1-008, involving room cooler performances, the project supplied a copy of the memo which revises the FSAR text in addition to a draft copy of the Plant Modification package which revises the ultimate heat sink temperature. A CAQR was supplied to note recurrence control as being a preventative maintenance program to maintain cooler flows and cleanliness. EA has reviewed these actions and verified that the prerestart concerns have been adequately addressed. This item is resolved with final verification of FSAR figure revision being postrestart.
- To resolve I1-20 the project issued ECN L7381 to replace an improperly sized orifice in the containment spray piping before restart. EA concurs with this action and closed item I1-20.
- For I1-021 the project supplied information addressing documentation errors to support deferring this concern to postrestart. The EA Team reevaluated and reclassified this concern as a postrestart issue because the documentation errors did not meet the SQN restart criteria on unit 1 operation. Final closure will be postrestart pending C/A approval and verification postrestart.
- For O1-005 the project has updated the Control Room drawings. Only a few red lined drawings remain in use with controls in place to limit the use of red line drawings in the control room. EA has verified the project actions and closed this item.

To verify project improvement in the design change control process, EA performed an additional review (as a part of EA surveillance S88-23) of 11 ECNs/DCNs along with their supporting calculations that were issued between July 15, 1988 and August 31, 1988 under the transitional design change control process. These were considered to be examples of ECNs/DCNs issued after publication of the EA-OR-003 report and include certain project enhancements that were to correct the types of deficiencies identified in EA-OR-003. In addition, EA has had an ongoing review of work in progress under the permanent design change control process.

EA found the types of concerns previously identified in EA-OR-003 were corrected in the sampled ECNs/DCNs. This provided evidence to the EA Team that project C/As and modifications done under the permanent process have improved design change control. However, the EA Team identified documentation discrepancies in this additional review which were in the area of the technical adequacy of the supporting calculations. These discrepancies, when corrected, will not change the calculational results. Therefore, this issue will be addressed in the Unit 1 EA calculation assessment (S88-24) which is currently in progress.

Based on the results of this additional review in conjunction with the resolution of the prerestart portions of the seven action items and the ongoing review of SQEP-26 work, EA judged the implementation of the Design Change Control Process to be acceptable. EA will continue to monitor this area as part of EA's continued oversight activities.

3.2.5 DB&VP Unit 1 Phase I Report

There was one restart action item (O1-011) identifying a lack of components being included on the CSSC list which was in unresolved status against the DB&VP Unit 1 Phase I Report. The

project responded that the SWBID-CSSC comparison was not a requirement of the DB&VP as defined by the Unit 1 Program Plan or the DB&VP procedures. In addition, the project indicated that TVA has committed to develop a Q-list which will incorporate the existing CSSC list and the DB&VP systems components. This is a postrestart commitment (4/89) and is being tracked in CCTS.

The EA Team reviewed this response and found that the SQN Q-list implementation plan adequately addressed this concern. Since this commitment is being adequately tracked by the CCTS system, the EA Team closed this item.

Based on the EA Team's concurrence with the project's response and the results reported in the EA-OR-003 report, the project's DB&VP Unit 1 Phase I Final Report was judged by the EA Team to be technically acceptable.

3.3 Results of Trend Analysis for EA Action Items

The updated trend results in section 5.0 indicate that the trends discussed in EA report EA-OR-003 have not changed. However, for the TOCC activity, a detailed analysis was performed in this report since the programmatic aspect of the TOCC process was identified previously as an overall area of concern that required further investigation. Based on actions taken by the project and EA Team in section 3.2.4, the TOCC process has been judged to be acceptable. However, EA will continue to monitor this area and the effectiveness of the C/A programs as part of the EA oversight activities.

4.0 DETAILS BY DISCIPLINE

This section provides detailed information regarding the discipline review results by activities. A brief general description of the project actions and the EA review is included for each of the following activities:

- Restart test activities
- Change document evaluations
- System evaluations and corrective actions
- Transitional design change control
- DB&VP Unit 1 Phase I Report

4.1 Nuclear

4.1.1 Background

The Nuclear discipline of the EA Team evaluated project action and verified implemented C/As for an action item associated with the following activity:

- Change document evaluation (Action Item N1-002 R1)

4.1.2 Details

One Nuclear discipline action item was evaluated. At the time of issuance of the EA-OR-003 report, the action item was in an unresolved status; that is, project C/A was not agreed to by the EA Team.

4.1.2.1 Change Document Evaluation

Action Item N1-002 R1

The EA Nuclear review of change documentation had a restart concern unresolved on ECN L6180 for which the Project had issued PIRSQNEEB8824. This PIR documents the concern about the effect of the engineering change of ECN L6180 on the Main Control Room Habitability Zone (MCRHZ). [Reference: section 6.5.1.1 (Action Item N1-002 R1) of EA-OR-003].

Project Action

The Project submitted a response (Reference 1) summarizing two concerns with the unresolved Action Item N1-002 R1 on ECN L6180 to replace a temporary alternation change form (TACF) as follows:

- (1) Material compatibility with the existing installation, in relation to the MCRHZ pressure boundary and (2) the effect on the MCRHZ if the temporary installation should fail during an isolation event. For concern (1), the TACF as currently installed does not appear to conform to TVA Code Class C, thereby violating pressure boundary requirements for the MCRHZ. From a pressure boundary standpoint, if the temporary installation should fail, plant safe operation is not adversely effected. Recent testing performed by SI-144.2 documents high pressurization levels provided by the Control Building Emergency Pressurization System. The sensing line leading to the outside is less than 1" diameter and therefore would be an insignificant outleakage path of pressurization air (i.e., an insignificant pressure loss). Thus, this concern does not pose any threat to safe plant operation at restart. For concern (2), if the temporary installation should fail, the functional requirements of O-PDT-31A-14 could be adversely affected, causing the solenoid valve operation for the modulating damper FC0-31A-14 downstream of the Control Building Normal Pressurization Fans to malfunction, potentially over-pressurizing the lower elevations of the Control Building with respect to the MCRHZ. If this over-pressurization were to occur, this condition would be in violation of design criteria SQN-DC-V-13.9.6, Section 3.7.g, allowing the potential infiltration of unfiltered outside air into the MCRHZ from the lower floors of the Control Building. This condition cannot occur at restart because SQNP DCN X00051C (B25 871008 S06) authorized the locking out of the Control Building Normal Pressurization Fans and the locking open of modulating dampers FC0-31A-14 and -15. This DCN action was taken because of a malfunction in the controls maintaining the proper pressurization level. With this equipment out-of-service at restart, the potential for concern (2) does not exist for an event after plant startup

(i.e., over-pressurization of the lower elevations with respect to the MCRHZ). Administrative controls are in place to assure this equipment is not returned to service before the system/equipment is repaired, determined to operate safely, and meets all TVA design criteria requirements and specifications. Therefore, this concern also does not pose any threat to safe plant operation at restart.

Based on the above discussion, DB&VP Nuclear regards these concerns as nonrestart items. Although detailed corrective action has not been defined for these concerns, the problem as presented and rationalized in the PIR has been evaluated by the responsible personnel as being a nonrestart issue. Procedures and administrative controls are in place to assure these concerns are analyzed and handled correctly with respect to safe operation of the plant. The project requested that EA appropriately revise the restart category for N1-002R1 to postrestart.

Results of EA Evaluation

EA Nuclear concurs with the Project that final resolution of action item N1-002R1 could be deferred to "Postrestart" provided adequate justification to show that the "Normal" Control Building Pressurization fans are not safety related, and that their current status of "out-of-service" is an acceptable one. The Project subsequently submitted additional documentation (Reference 2) that EA Nuclear judged as adequate to support the Project position.

4.1.3 Conclusion

EA Nuclear concurs that Action Item N1-002 R1 is Postrestart but remains unresolved. Closure of this action item requires an acceptable corrective action plan, implementation of corrective action, and verification by EA for PIR SQNEEB8824.

4.1.4 References

<u>Reference Number</u>	<u>Document and Revision</u>	<u>Issue Date</u>	<u>Title and Description</u>
1	Memo from A. P. Bianco to J. von Weisenstein	8/1/88	SQL DB&VP EA Action Item N1-002 R1 - Reclassification of Restart Category to Postrestart
2	Memo from A. P. Bianco to J. von Weisenstein	8/4/88	SQL DB&VP EA Action Item N1-002 R1 - Additional Documentation Supporting Postrestart Category Classification

4.2 Electrical

4.2.1 Background

The Electrical discipline of the EA Team evaluated project actions and verified implemented C/As for action items associated with the following activities:

- Change document evaluations (Action Item E1-007)
- System evaluations and C/A (Action Item E1-013)
- Transitional design change control (Action Items E1-016, -017, and -018)

4.2.2 Details

A total of 5 Electrical discipline action items which were determined to be restart issues were evaluated for this report. At the time of issuance of the EA-OR-003 report, one of the action items (E1-013) was in a resolved status; that is, C/A was agreed to by the EA Team and project implementation of C/A and EA verification of C/A were required. Two action items (E1-007 and E1-016) were in an unresolved status; that is, project C/A was not agreed to by the EA Team. No response was received by the EA Team for the remaining 2 action items (E1-017 and E1-018).

4.2.2.1 Change Document Evaluation

Action Item E1-007

The EA Electrical's review of DB&VP change document ECN LS346 (Reference 1) resulted in Action Item E1-007 which involved verifying a Unit 1 C/A which was not addressed by CAQR SQP871335 R3. Additionally, EA questioned whether other CAQRs which the DBVP took credit for correcting Unit 1 problems also had the appropriate C/A defined to address Unit 1. (Reference section 6.5.2.1.a.4 of EA-OR-003 Report). The Electrical discipline of the EA Team evaluated the adequacy of the Unit 1 C/A for CAQR SQP871335 R3 (Reference 2).

Project Actions:

1. A work request WRB255922 (Reference 3) was initiated to install a caution tag for the alternate DC feeder to the AFWPT. The C/A of CAQRSQP871335 R3 will be revised postrestart to reflect the WR 8255922 which implemented C/A for Unit 1.
2. The project randomly selected and evaluated the following six CAQs from the Unit 2 punchlist which were reviewed by the DBVP for roll-over into the Unit 1 punchlist: CAQRSQ1870150, SCRSQNEEB8742, SCRSQNEEB8743, SCRSQNEEB8773, SCRSQNEEB8777, and SCRSQNEEB8799 (References 4 through 9). This review did not identify any other breakdown in implementation of NEP 9.1 or the SQA-190 or SQA-203 procedures. Therefore, the project concluded that the extent of this concern was isolated to this single occurrence.

Result of EA Evaluation:

EA Electrical reviewed Work Request B255922, the above six CAQs, the SQA203, Attachments A dated March 21, 1988 and March 6, 1988 (References 10 and 11) and a TROI Report dated August 14, 1988 (Reference 12). EA electrical concurred in the project's assessment of the concern and found the project's C/A and CAQR reviews to be adequate. In conclusion, EA Electrical considers the project's C/A adequately addresses the Unit 1 restart concern with only a documentation of a CAQR C/A revision remaining for completion in Phase II. This action item is resolved and will be closed pending EA Electrical's postrestart verification of the revision to the C/A for CAQRSQP871335R3 to include WR B255922.

4.2.2.2 System Evaluations Including C/A and Restart Categorization

Action Item E1-013

The EA Electrical's evaluation of the Auxillary Feedwater System Evaluation (System 3B) resulted in Action Item E1-013 which was resolved but required verification of project's C/A revision of PIR SQNMEB86108 (Reference 13). The Electrical discipline of the EA Team evaluated the adequacy of the revised C/A of PIRSQNMEB86108 to address Unit 1 restart work of replacing the motor operators of certain Unit 1 motor operated valves for inadequate torque and/or excessive stroke time. (Reference: section 6.6.2.1.b of EA-OR-003 Report.)

Project Actions:

The project issued Revision 2 of PIR SQNMEB86108 which addressed the Unit 1 restart work of ECN L7185.

Result of EA Evaluation:

EA discipline reviewed PIR SQNMEB86108R2 dated July 28, 1988 and verified that the PIR C/A was revised to include the Unit 1 restart work of ECN L7185 and to indicate that the ECN must be field complete prior to the restart of Unit 1. EA Electrical found the projects action acceptable and closed this action item.

4.2.2.3 Transitional Design Change Control

Action Items E1-016, -017, and -018

EA Electrical's review of the transitional design change control process resulted in 3 action items (E1-016, E1-017, and E1-018). At the time of issuance of the EA-OR-003 report, the project's response for Action Item E1-016 was being assessed for adequacy while project responses for Action Items E1-017 and E1-018 were not received. The Electrical discipline assessed the project's responses for these action items to ensure that the concerns raised are adequately addressed. (Reference: section 6.7.2.1 of the EA-OR-003 Report.)

a. Action Item E1-016

EA Electrical's review of ECN L7211 identified several documentation inconsistencies in the ECN package.

Project Actions:

The project responded to EA's concerns raised in Action Item E1-016 as follows:

- (1) The Modification Criteria N2-7211-011, section 6.1 marked "Y," for Safety Analysis Report affected and data sheet required was not in conflict with the ECN cover sheet which indicated that no Nuclear data sheet was required. Since the Electrical discipline was responsible for the affected Sections of the FSAR, Section 6.1 of the Modification Criteria indicates that an electrical data sheet is required per Section B of the cover sheet to handle the revision to the FSAR.
- (2) The USQ Screening Review Form dated July 21, 1987 for ECN L7211 (Reference 14) was prepared using preliminary information concerning potential effects on the FSAR and the diesel loading. The ECN package was inadvertently issued without being updated to the latest modification criteria and completed Calculation SQN-EPS-010 (Reference 15). Subsequently, the discrepancies noted by EA were independently corrected by the project through the SQEP-13 process of completing the modification. Revision C of ECN L7211 (Reference 16) was subsequently issued to include a Safety Evaluation Form (No. 2EEB040) and an update to the Updated Final Safety Analysis Report (UFSAR).
- (3) Since the ECN cover sheet was not in error and the affects upon the FSAR and the diesel transient loading were addressed through the normal SQEP-13 process, a review of the additional 7000 series ECNs for similar problems to determine the extent of the concern is not warranted by the project.

Results of EA Evaluation

EA Electrical reviewed the Safety Evaluation Form dated June 2, 1988 and the update to the UFSAR contained in the revised ECN L7211C package and found them both technically acceptable. EA concurs with the project assessment and closed Action Item E1-016.

b. Action Item E1-017R0

Action Item E1-017 R0 involved technical justification memorandums for ECNs L7130 and L7129 which were issued in lieu of calculations and not tracked to ensure that the calculations were revised. This action item was not responded to by the project at time the EA-OR-03 Report was issued (Reference: section 6.7.2.1 of EA-OR-003 Report).

Project Action:

In response to EA Action Item E1-017R0, the DB&VP addressed the concerns as follows:

- (1) A technical justification statement was allowed to be used in lieu of a calculation per section 3.0 of NEP-3.1 (Reference 17). Although the two technical justifications (References 18 through 19) in question were not officially entered into the SQN EEB Calculation Tracking Log, their existence was known. In addition, attachment 1R3 dated July 18, 1988 of SQEP-09 for ECN L7130D (Reference 20) indicates that the FCRs associated with this ECN were reviewed by SQEP-EEB according to the SQEP-09 (Reference 21) procedure, and no breakdown in complying with this procedure was observed.
- (2) The DB&VP's review indicated that three (3) technical justifications were issued in lieu of calculations: the 2 mentioned above plus 1 recently issued (Reference 22). However, the latter is being tracked by the SQN EEB Calculation Log.

- (3) To correct EA's concern, the project issued Revision 5 of Calculation SQN-VD-VAC-2 (Reference 23) referencing the 2 technical justifications in the calculation revision log to ensure that the major as-constructed calculation will be revised to reflect the as-constructed status of the workplan when modification is complete. As indicated above, the 3rd technical justification issued is being tracked in the SQN EEB Calculation Tracking Log.
- (4) As an action to prevent recurrence, PM-85-01 (EEB) (Reference 24) will be revised post-restart to state: "Technical justifications prepared and issued in lieu of formal revisions to existing calculation shall be documented as revision log revisions to the calculation affected by such justifications."

Results of EA Evaluation:

EA Electrical reviewed the revision log of Calculation SQN-VD-VAC-2R5 and Attachment 1 R3 of SQEP-09 (Change Review Checklist for Electrical Calculation) and found them acceptable. EA concurred in the project's assessment of this concern. Action Item E1-017 was resolved and will be closed pending EA verification of the revision to PM-86-01 (EEB) to address technical justifications. This documentation work will be verified in Phase II.

c. Action Item E1-018RO

Action Item E1-018 RO resulted from EA Electrical's review of ECN L7334B and pertains to a documentation error and to certain limiting conditions of operation that were identified in electrical calculations but were not included in any output document. At the time of the issuance of the EA-OR-003 Report, this action item was not responded to by the project (Reference: section 6.7.2.1 of the EA-OR-003 Report).

Project Action:

In response to EA's concerns presented in Action Item E1-018, the project provided an assessment as follows:

- (1) The apparent cause of the concerns appear to be: a) The ECN preparer failed to note in the USQO and modification criteria that the FSAR was affected by the ECN changes as a result of the FSAR compliance review included in calculation SQN-ALS-11 (Reference 25), and b). The limiting conditions outlined in calculation SQN-ALS-013RO (Reference 26) were based on the diesel generator (D.G.) loading limits provided in DIM-SQN-DC-V-11.4.1-9 dated March 27, 1988 (Reference 27). Subsequently, DIM-SQN-DC-V-11.4.1-10 dated April 27, 1988 (Reference 28) deleted the 0-3 min. D.G. margin thus eliminating the limiting conditions for the D.G. loading during this period. Also, further study revealed that the 75 hp main turbine turning gear oil pump and the 30 kw D.G. engine jacket water heaters which require manual tripping per calculation SQN-ALS-013RO did not operate during the critical D.G. loading time. Both of these problems seem to have resulted from an ineffective communication between electrical and mechanical disciplines.

- (2) The DB&VP considers the first concern (a documentation error) is limited to this oversight in the modification criteria and the USQD (for ECNs L7334B Unit 1 and L7335B Unit 2) since the EA Team, based on the results of their review of several 7000 series ECNs, identified no trend of negligence in properly revising the FSAR. For the second concern, the project determined soon after calculation SQN-ALS-013R0 was issued that no limiting conditions existed. This calculation has since been revised to indicate that the D.G. loading due to the ECN change is acceptable. No other instances of this nature were noted by the project in EA's report, EA-OR-003.
- (3) To alleviate EA concerns, the project revised the modification criteria N2-L-7335-01 (Reference 29) and the USQD support sheet for ECN L7335C (Reference 30) to agree with the FSAR compliance review included in the calculation SQN-ALS-11 and initiated Attachment B of SQEP-129R0 (Change Request to FSAR Form) dated August 18, 1988 (Reference 31) to revise FSAR Table 8.3.1-8 (Reference 32). For ECN L7334 the project determined that the modification criteria did not require revision. The FSAR Section 9.4.2.2.3 (Reference 33) revision is being handled via ECN L7242D (Reference 34). In addition, the project issued Revision 1 of Calculation SQN-ALS-013 (Reference 35), based on the latest revision (R8) of Calculation SQN-E3-002 (Reference 36), to show that no limiting conditions for the D.G. loading exist.
- (4) Since both problems appear to have resulted from a single instance of miscommunication between electrical and mechanical disciplines, no action to prevent recurrence is deemed necessary because both parties involved are sufficiently aware that more care is needed in this area. The DB&VP considers the concerns raised in this action item insignificant because the operability of the plant was never affected.

Results of EA Evaluation:

EA Electrical reviewed Modification Criteria N2-L-7335-01R2, USQD Support Sheet Revision C dated August 17, 1988 (for ECN L7335C), Change Request to FSAR Form dated August 18, 1988, ECN L7242D, Table 2 of Calculation SQN-E3-002R8 dated August 4, 1988, and the revision log of Calculation SQN-ALS-013R1 dated August 16, 1988, and found them technically acceptable. Action Item E1-018 was resolved and will be closed pending EA verification of the revision to Calculation SQN-E3-002R8 to show the additional loads to the D.G. due to ECNs L7334 and L7335. Since this is a documentation revision which will not affect the results of the calculation, this verification will be performed in Phase II.

4.2.3 Conclusions

EA Electrical has completed the verification of the Phase I (restart) portion of the restart action items. The DB&VP objectives for change document evaluations, system evaluations, and the transitional design change control, were verified to have been met. Based on the EA verification of Phase I C/A for the "restart" action items reported in the EA-OR-003 report and for the preceding action items EA Electrical concluded that:

- Documentation assembled to support the engineering conclusions reached by the DB&VP electrical discipline was technically adequate.

- The system evaluations and C/As including restart determinations and implementation of restart items were technically acceptable and confirm that the system's ability to perform its safety functions for the events described in Chapter 15 of the FSAR was not degraded by the changes made since OL.
- In general, the transitional design change control program was adequate for the design changes reviewed by EA Electrical. Additional project attention to the area of coordination between disciplines is recommended to further reduce errors. Because this activity represents a major change from past TVA change control methods, EA will continue to monitor this activity.

EA Electrical closed action items E1-013 and E1-016. Additional Phase II C/A verification remains for action items E1-007, E1-017, and E1-018. This will be accomplished and reported as part of the Phase II effort.

4.2.4 References

<u>Reference Number</u>	<u>Document and Revision</u>	<u>Issue Date</u>	<u>Title/Description</u>
1	ECN L5346 R0	02/26/81	Increased Inlet Air Area to the Turbine driven Auxiliary Feedwater Pump Room and Replace DC Fan on Unit 1 (SQP 810226 509)
2	CAQR SQP871335R3	04/18/88	Auxiliary Feedwater Pump Turbine Controls - Alternate Feeder (S13 880418 803)
3	Work Request 8255922	08/05/88	Caution Tag For Alternate DC Feeder to AFWPT Transfer Switch
4	CAQR SQT870150R0	03/06/87	ECN L6500 - Implementation of Field Modifications Not Properly Documented (S13 870309 842)
5	SCR SQNEEB8742R0	01/17/87	Isolation Criteria (B25 870130 032)
6	SCR SQNEEB8743R0	01/18/87	Calculation Inadequacy For Instrument Adequacy (B25 870209 010)
7	SCR SQNEEB8773R0	12/04/87	Failure To Follow The Intent of Design Criteria SQN-DC-V-13.9R0 (B25 870223 032)
8	SCR SQNEEB8777R0	02/03/87	ECN 2909 - Wide Range Steam Generator Level Transmitters (B25 870220 071)
9	SCR SQNEEB8799R0	02/18/87	SQN-DC-V-12.2, IE Bulletin 80-06 (B25 870407 134)

<u>Reference Number</u>	<u>Document and Revision</u>	<u>Issue Date</u>	<u>Title/Description</u>
10	Attachment A of SQA203	03/21/88	Unit 1 Restart Determination Form For SCR SQNEEB743
11	Attachment A of SQA203	03/06/88	Unit 1 Restart Determination For For SCR SQNEEB8773
12	TROI Report	08/14/88	Tracking and Reporting of Open Items
13	PIR SONMEB86108 R2	07/29/88	Replace the 15 ft-lb motors on valves 1-FCV-1-15, -16, and -17 with 25 ft-lb motors (982 880805 003)
14	ECN L7211 R0	06/17/88	Change power supplies to hydrogen analyzers, 2A-A and 2B-B from 480-V Reactor Vent Board to Reactor MOV Board (B25 880617 582)
15	DNE Calculations	07/31/88	Hydrogen Analyzers Power Supply (B43 870803 903)
16	ECN L7211C	06/15/88	Change Power Supplies To Hydrogen Analyzers 2A-A and 2B-B From 480-V Reactor Vent Board to 480 V Reactor Mov Board (B25 880617 582)
17	NEP 3.1 R1	09/27/87	Calculation (B05 870928 500)
18	Technical Justification	08/11/87	B43 870813 903
19	Technical Justification	04/06/88	B25 880414 004
20	Attachment 1 R3, SQEP-09 to ECN L71300	07/18/88	Change Review Checklist For Electrical Calculations
21	SQEP-09R3	02/03/88	Change Review Checklist For Electrical Calculations (B25 880203 029)
22	Technical Justification	07/04/88	B25 880804 017
23	SQW-VD-VAC-2R5	08/11/87	DNE Calculation (B25 880817 901)
24	PM-86-01R1	10/15/87	EEB Procedure Method Engineering Judgment (B43 871015 901)

<u>Reference Number</u>	<u>Document and Revision</u>	<u>Issue Date</u>	<u>Title/Description</u>
25	SQN-ALS-11R0	03/23/88	DNE Calculations (B25 880323 304)
26	SQN-ALS-013R0	03/30/88	Calculation (B25 880330 300)
27	DIM-SQN-DC-V-11.4.1-9	03/27/88	Design Input Memo on Design Criteria SQN-DC-V-11.4.1 (B25 880327 002)
28	DIM-SQN-DC-V-11.4.1-10	04/27/88	Design Input Memo on Design Criteria SQN-DC-V-11.4.1 (B25 880427 015)
29	N2-L-7335-01R2	-	Modification Criteria For ECN L7335C
30	Attachment 1 of SQEP-A1-11RC	08/17/88	USQO Support Sheet For ECN L7335C
31	Attachment B of SQEP-129	08/18/88	Change Request To Final Safety Analysis Report Form For ECN L7335C
32	FSAR Table 8.3.1-8	-	Unit 2 Power Train B Board Loading
33	FSAR Section 9.4.2.2.3	-	Safety Feature Equipment Coolers
34	ECN L7242D	08/19/88	Revise ERCW Flows and/or Air Flow Requirements For Specified HVAC Coolers (B25 880820 582)
35	SQN-ALS-013R1	08/16/88	DNE Calculations (B25 880817 900)
36	SQN-E3-002RB	08/08/88	DNE Calculations (B25 880808 807)

4.3 Instrumentation and Controls

4.3.1 Background

The Instrumentation and Controls (I&C) discipline of the EA Team evaluated project actions and verified implemented C/As for the action items associated with the following activities:

- Transitional Design Change Control (Action Items 11-020 and 11-021)

4.3.2 Details

Two I&C discipline restart action items were evaluated. At the time of issuance of the EA-OR-003 report, one action item 11-020 was in a resolved status; that is, C/A was agreed to by the EA Team and project implementation of C/A and EA verification of C/A was required. The one remaining Action Item 11-021 was not responded to by the project. The results of the above Action Item evaluations are presented in the following sections.

4.3.2.1 Transitional Design Change Control

EA I&C's review of DB&VPs transitional Design Change Control process resulted in two Action Items (11-020 and 11-021) which were considered "Restart" items.

Action Item 11-020 was "resolved" but required EA I&C verification of project C/A.

Action Item 11-021 was considered a "Restart" item since the design modification could affect the Upper Head Injection (UHI) flow rate to the reactor head. In addition, DB&VP did not provide a response to the action item by the time of issuance of EA-OR-003 Report (Reference: section 6.7.3.1 of EA-OR-003 Report).

a. Action Item 11-020

EA I&C provided Action Item 11-020 which identified 4 concerns as a result of reviewing ECN L7112 (Reference 1) for Unit 2.

DB&VP provided responses which resulted in closure of three concerns by EA I&C prior to issue of the EA-OR-003 report. The remaining concern was resolved but open pending verification of project C/A. The open concern identified an improper containment spray piping orifice size for which the project issued CAQR SQP880081 (reference 2). EA concurred with the approved C/A plan per CAQR SQP880081 to issue an ECN to install the proper orifice size before restart.

Project Action

The project provided ECN L7381 (Reference 3) which was issued April 18, 1988 (B25 880418 575) for Unit 1 to implement C/A for CAQR SQP880081. ECN L7381 provided for the modification of the orifices in the containment spray pumps 1A-A and 1B-B discharge lines to the containment spray ring headers for unit 1.

Results of EA Evaluation

EA I&C reviewed the Project action to address the remaining concern of Action Item 11-020 and found the ECN L7381 design modification documentation acceptable. EA I&C considers Action Item 11-020 closed.

b. Action Item I1-021

EA I&C provided Action Item I1-021 to identify 10 potential concerns involving ECN L6859 as follows:

1. USQD Sheet 6 (Reference 4) incorrectly stated that the "modification" does not affect water volume delivery through the valves whereas water volume delivered is a function of the UHI isolation valves closure time and therefore, the modification could affect the safety evaluation.
2. The logic diagram 47W611-87-1 (Reference 5) for the UHI system is not presently shown in the FSAR (section 6.3).
3. Value of minimum operating pressure shown in SQN-DC-V-27.7, Table 3.7-3 (Reference 6) does not agree with value shown in section 3.7-3 (should be section 3.7-1).
4. FSAR Table 6.3.2-1 does not show max operating pressure of 1285 psig.
5. DNE calculation 1-PT-87-21 (Reference 7) presently shows SPEe as not applicable where SPEe is the zero error due to the effects of the static operating pressure. EA recommends that the DNE calculation include a value for SPEe in the calculation for determining the overall value of An, the normal accuracy. Standard industrial practice uses the following equation for calculating SPEe:
$$\pm (0.25\% VR + 0.25\% SP)$$

(Reference: Rosemount and Gould)
6. SQEP-13, Attachment 3 was included in the ECN package as Attachment 5 without being completed. EA I&C believes that SQEP-AI-11, R4 (Reference 8) attachment should have been attached to the ECN and completed.
7. ECN L6859 (Reference 9) modification was provided to change the setpoints for units 1 and 2, PIS-87-21, -22, -23, and -24. The control diagram 47W610-87-1 (Reference 10) did not show the instrument identification tag numbers for these pressure indicating switches (PISs).
8. The origin of PT Sensing Line was not clear. It is not apparent if the origin should be the hydraulic process line or accumulator?
9. The root valves for the pressure transmitter (PT) presently shown normally closed (NC) should be normally open (NO) on drawing 47W610-87-1.
10. In design criteria SQN-DC-V-27.7, the table 3.5-3 values for PT-87-21, 22, 23, 24, should be 2970 psig per ECN L6859.

Project Action

Project provided a response which was as follows:

1. This modification improves the operability of the valve and does not alter its mechanical configuration. Therefore, flow through the valve is not affected; the intent of the statement in the USQD was in regard to flow through the valve.

2. Control diagram 47W610-87-1 references flow diagram 47W811-2 (Reference 11) which in turn references logic diagram 47W611-87. The control and flow diagrams are in the FSAR and adequately represent system operation and configuration.
3. Section 3.7-3 of SQN-DC-V-27.7 does not state minimum operating pressure.
4. The pressure of 1285 psig is for the UHI accumulator tank. This pressure is correctly listed in Table 6.3.2-3 of the FSAR.
5. A review of calculation 1-PT-87-21 determined that the value for SPEe is negligible. Hence, the NA designation. Furthermore, the equation mentioned for determining SPEe is not valid for use on BLH electronics transducer.
6. The contents of Attachment 2 of SQEP-AI-11 are included in the SQEP-13 Attachment 3. The SQEP-13 Attachment 3 is adequate since it is more comprehensive.

The project response stated that concern items 7 through 10 are design documentation errors. The affected drawings will be corrected and the design criteria will be revised to show correct information for resolution of items 7 through 10.

Results of EA Evaluation

As a result of the project response, EA I&C reconsidered the restart determination of Action Item 11-021. There are now only documentation errors involved in this action item, and they have been evaluated by EA I&C as not meeting the SQN restart criteria. Therefore, EA I&C has reclassified 11-021 as "postrestart" rather than restart.

EA I&C does not agree with the project responses to address the documentation discrepancies on concerns 1 through 6, and therefore Action Item 11-021 is partially unresolved and open. This is a part of the phase II effort to resolve C/A, implement, and EA to verify.

EA I&C does concur with project responses on concerns 7 through 10 as resolved but open pending verification of C/A to the affected documentation "postrestart."

4.3.3 Conclusions

EA I&C concludes that Action Item 11-020 is closed.

In addition, EA I&C concludes for Action Item 11-021 that EA's concerns 1 to 10 were documentation errors and did not meet the SQN restart criteria, and therefore Action Item 11-021 was changed from "restart" to a "postrestart" item. EA I&C considers Action Item 11-021 partially resolved pending verification of correction of the documentation errors (items 7 to 10) and partially unresolved/open pending resolution of concerns (items 1 to 6).

4.3.4 References

<u>Reference Number</u>	<u>Document and Revision</u>	<u>Issue Date</u>	<u>Title/Description</u>
1	ECN L7112 R0	4-11-87	Replace or Modify Existing Orifices in the CSS Pump Discharge Lines (B25 870611 551)
2	CAQR SQP880081	2-17-88	Orifice Sizing Calculation (S13 880127 807)
3	ECN L7381	4-18-88	Modify the Orifices in the Containment Spray Pumps Discharge Lines to the Spray Ring Headers - Pumps 1A-A and 1B-B (B25 880418 575)
4	USQD Sheet 6	2-14-87	ECN L6859 (B25 870214 506)
5	47W611-87-1 R8	9-22-87	Electrical Logic Diagram - UHI System
6	SQN-DC-V-27.7 R2	7-22-87	Design Criteria - UHI System (B45 870722 257)
7	1-PT-87-21	9-15-87	Demonstrated Accuracy Calculation (B43 860917 913)
8	SQEP-AI-11 R4	6-23-87	Handling of ECNs
9	ECN L6859	2-14-87	Change the Setpoints for 1 and 2 - PIS-87-21, -22, -23, and -24 (B25 870214 506)
10	47W610-87-1 R10	5-22-87	Mechanical Control Diagram - UHI System
11	47W811-2 R21	4-13-87	Flow Diagram - Mechanical SIS - Upper M Injection

4.4 Mechanical

4.4.1 Background

The Mechanical discipline of the EA Team evaluated project actions and verified implemented C/As for an action item associated with the following activity:

- Transitional Design Change Control

4.4.2 Details

One Mechanical discipline action item was determined to be a restart issue and was evaluated. This action item was not responded to by the project.

4.4.2.1 Transitional Design Change Control

Action Item M1-008

The EA Mechanical review of ECN L7242B for the Transitional Design Change Control (TDCC) resulted in Action Item M1-008 being issued to the Project on April 28, 1988 identifying several concerns with safety-related room coolers. The action item was not responded to by the Project before EA-OR-003 was issued. EA-OR-003 identified Action Item M1-008 as required for restart. [Reference: section 6.7.4.1 (Action Item M1-008) of EA-OR-003.]

Project Action:

Project's informal response of August 11, 1988 supplied Action Item M1-008 statements on cause, extent, action to correct, action to prevent recurrence, and significance. Also, the following specific information was included:

1. Cooling water flow rates for several coolers were changed by ECN L7242B (Reference 1). All cooling water flow rates changes are within the range of the instruments. The instrument ranges do not have to be revised. See Table 1 for flow elements involved. The table shows the old flow rates, new flow rates, and the flow range.
2. Surveillance Instruction SI-679 (Reference 2) requires inspection and cleaning of coolers and heat exchangers supplied by ERCW. This maintenance would keep the equipment in a condition which supports the use of the 0.001 fouling factor for these equipment calculations.
3. A copy of the FSAR revision memo for section 9.4.2.2.3 was attached. It changed the text to reference the FSAR figures for air and water flows. These figures will be revised as part of the yearly FSAR update therefore FSAR figures with revised flows are not available. The changes to the environmental drawings and the associated FSAR sections for these ECNs is being incorporated in Plant Modification Package (PMP) P000001. This PMP revises the ultimate heat sink temperature to 84.5°F. The PMP has not been issued yet, but a draft copy of the scope section was attached to show that portion of the scope.

4. Special Test STI-122 (Reference 3) verified the air flow rates for all Unit 1 coolers. It will document the acceptability of these coolers for restart. The most current available data from the test and the test instruction were attached for review. There is no surveillance test that requires verification of air flows. This has been noted in the recurrence control of CAQR SQP871697 R1 (Reference 4). The recurrence control for this CAQR requires implementation of a preventive maintenance program to maintain cooler air flows.

Workplan 12692 (Reference 5) contained documentation of the A-train ERCW flows. The 1A header flows were in section Xa of the workplan and 2A header flows are documented in workplan 12572 (Reference 6) as indicated in the workplan signoffs. The air flows were signed off as meeting the DCA requirements in the workplan but the specific flows measured are documented in the STI-122.

5. The revised pages from the SI-566 (Reference 7) revision do not need to be included in the workplan because the flows were verified to the DCA requirements from the ECN therefore the SI-566 criteria is not required.

Results of EA Evaluation

EA Mechanical reviewed the Project's informal response dated August 11, 1988, to Action Item M1-008 and finds the response acceptable. EA has determined M1-008 is resolved and the Phase 1 portion is complete but remains open pending "Post-Restart" verification of the revision of FSAR Section 9.4.2.2.3 and Figures 9.4.2-3 and 9.2.2-4 for the air and water flows.

The individual items in the Project response was judged to be acceptable for all five concerns based on the following:

1. The Project response satisfactorily provided all the temperature and flow instrumentation data required for the HVAC coolers affected by the ECN.
2. SI-679 provides the necessary yearly inspection and cleaning at appropriate of the coolers which supports the use of the 0.001 fouling factor.
3. FSAR revision memo included in the ECN revision for section 9.4.2.2.3 provides the necessary changes for updating the FSAR.
4. Special Test, STI-122 verified the air flow rates for all Unit 1 coolers. Also, workplan 12692 provided documentation of the A Train ERCW flows. Workplan 12572 provided documentation of the 2A header flows. The air flows were properly signed off as meeting the DCA requirements in the workplan. The specific flows were monitored and documented in STI-122.
5. SI-566 criteria not required since the flows were verified to the DCA requirements from the ECN.

4.4.3 Conclusions

EA concludes that the Phase 1 portion of Action Item M1-008 is complete. EA also considers Action Item M1-008 resolved but remains open pending postrestart verification of the FSAR revisions.

4.4.4 References

<u>Reference Number</u>	<u>Document and Revision</u>	<u>Issue Date</u>	<u>Title and Description</u>
1	ECN L7242B	10-9-87	Revised ERCW flow and/or air flow requirements for HVAC coolers (B25 871123 526)
2	Surveillance Instruction SI-679 R4	6-25-88	ERCW Heat Exchangers Inspection
3	Special Test Instruction STI-122 R0	5-7-88	Unit 1 Equipment Cooler Air Flow Test
4	CAQR SQP871697 R1	7-29-88	S13 8800229 808
5	Workplan 12692 for ECN L7242	10-9-87	Verify ERCW and/or air flow requirements for HVAC coolers. Update affected documents with revised flow rates
6	Workplan 12572 for ECN L7243	9-12-87	Piping replacement flow verification test
7	Surveillance Instruction SI-556 R17	5-28-87	ERCW flow verification test

TABLE 1

ECN L7242 ROOM COOLERS EVALUATED FOR UNIT 1

<u>Flow Element</u>	<u>Cooler</u>	<u>Old Flow GPM</u>	<u>New Flow GPM</u>	<u>Range GPM</u>
1-FE-67-177	SIS Pump Rm CLR	14	14	0-30
1-FE-67-183	SIS Pump Rm CLR	14	14	0-30
1-FE-67-189	RHR A Pump Rm CLR	12	12	
1-FE-67-191	RHR B Pump Rm CLR	12	12	
1-FE-67-163	RCS & FW Pump Rm CLR	50	53.1	0-90*
1-FE-67-165	CCS & FW Pump Rm CLR	50	53.1	0-90*
1-FE-67-214	CCS TB & SFP	25	26.2	0-30*
1-FE-67-216	CCS TB & SFP Pump CLR	25	26.2	0-30*
1-FE-67-185	CS Pump Rm CLR A	9	9	0-30
1-FE-67-187	CS Pump Rm CLR B	9	9	0-30
1-FE-67-347	Pent Rm CLR A1 EL 670	12	12	0-30
1-FE-67-349	Pent Rm CLR B1 EL 670	12	12	0-30
1-FE-67-351	Pent Rm CLR A2 EL 670	7	7	0-30
1-FE-67-353	Pent Rm CLR B2 EL 690	7	7	0-30
1-FE-67-355	Pent Rm CLR A3 EL 714	7	15	0-30*
1-FE-67-357	Pent Rm CLR B3 EL 714	7	15	0-30*

*Items which changed

Notes:

1. Orifice plates only. No permanent instrumentation.
2. No items exceeded their maximum range.

4.5 Operations

4.5.1 Background

The operations (OPS) discipline of the EA Team evaluated project actions and verified implemented C/As for the action items associated with the following activities:

- Restart Test Program (Action Items 01-007 and 01-010)
- Transitional Design Change Control (Action Item 01-005)
- DB&VP Phase I Program Final Report (Action Item 01-011)

4.5.2 Details

A total of four OPS discipline Restart Action Items were evaluated. At the time of issuance of the EA-OR-003 report, two action items (01-005 and 01-007) were in a resolved status; that is, C/A was agreed to by the EA Team and project implementation of C/A and EA verification of C/A were required. The two remaining action items (01-010 and 01-011) were in an unresolved status; that is, project C/A was not agreed to by the EA Team. The results of the above action items evaluations are presented in the following sections.

4.5.2.1 Restart Test Program

EA OPS review of DB&VPs Restart Test Program resulted in two action items (01-007 and 01-010) which were considered "Restart" items.

4. Action Item 01-007

Action Item 01-007 pertains to discrepancies between the maximum allowable stroke time (MAST) values in SI-166.6 test runs for valves LCV-62-135 and -136 and values shown in the FSAR Table 6.3.2-1. EA OPS evaluated the adequacy of the revision to the C/A for CAQR SQP871446 (reference 1). (Reference: section 6.4.1.1 of the EA-OR-003 report.)

Project Action

The Project provided a copy of CAQR SQP871446 which was previously written that recognized and identified discrepancies between the MOV MAST values shown in the FSAR Table 6.3.2-1, SI-166, and in Design Criteria SQN-DC-V-27.3 Table 3.7-8 (reference 2). This CAQR also identified other documentation discrepancies for MOVs which were outside the bounds of EA's problem identification. The Project responded with the following information in the corrective action to the CAQR:

1. The SI-166 (reference 3) MAST acceptance values exceed the FSAR MAST values for LCV-62-135 and -136 but the actual measured MAST stroke times are within the design criteria values.
2. In addition, the SI-166 MAST acceptance values exceed the FSAR MAST values for FCV-63-72 and -73 but the actual measured MAST stroke times are within the design criteria allowables. The design criteria stroke time had been justified by Westinghouse in 1972 and is documented in C/R data sheet No. SQNWESRJF1069 (reference 4).

3. The SI-166 MAST acceptance values for LCV-62-135 and -136 and FCV-63-72 and -73 have already been revised to agree with the design criteria SQN-DC-V-27.3, Table 3.7-8.
4. The remaining corrective action is to revise the design criteria and FSAR to be in agreement as appropriate. The project further indicated that Action Item 01-007 has no impact on restart and can be a postrestart issue.

Results of EA Evaluation

EA OPS reviewed the Project response concerning Action item 01-007 and found the information and corrective action acceptable. In addition, EA OPS verified that the SI-166 MAST values were revised.

Therefore, EA OPS concurs that C/A and verification of Action Item 01-007 can be performed "Postrestart." In addition, EQ OPS considers Action Item 01-007 "Resolved" but remains "open" pending "Post-Restart" verification of the implementation of the corrective action to make the design criteria SQN-DC-V-27.3 (Table 3.7-8) and FSAR (Table 6.3.2-1) consistent.

b. Action Item 01-010

Action Item 01-010 identified a lack of calculation basis for specified maximum RHR pump runout criteria for the SI mode. EA OPS evaluated the project's follow-up response to determine if this concern was adequately addressed. (Reference: section 6.4.1.1 of the EA-OR-003 report).

Project Action

Project responded that the Unit 1 and 2 SQEP-63 (reference 5) Restart Test Packages for System 63, pages 211 and 212 were revised to state that the cold leg recirculation flow rate for the RHR pump runout condition should be 5500 gpm in lieu of 4679 gpm. The revision log for the Unit 1 package has been revised to reference the correct revision level of the Unit 2 package.

Results of the Evaluation

EA OPS reviewed the Project's response concerning Action Item 01-010 and found the response acceptable. EA OPS verified that the Units 1 and 2 RHR pump(s) runout flow rates were changed from 4679 to 5500 gpm on System 63, SQEP-63, Attachment 2 (pages 211 and 212). Action Item 01-010 was closed.

4.5.2.2 Transitional Design Change Control

Action item 01-005

EA OPS review of DB&VPs Transitional Design Change Control process resulted in one Action Item 01-005 which was considered a "Restart" item. This action item involved the timeliness and the quantity of the backlog of red lined main room drawing updates. EA OPS evaluated the adequacy of the current control room drawing configuration status. (Reference: section 6.7.6.1 of the EA-OR-003 report.)

Project Action

The Project responded that, Revision 28 of AI-19, Part IV which was approved March 5, 1988, better controls the red lining process and requires the revised drawing to be issued to the Control Room prior to declaring the system operable. They are currently working on the last three red line drawings to complete the backlog of updating MCR drawings.

Results of EA Evaluation

EA OPS reviewed Project response to Action Item 01-005 and found the response acceptable. EA also determined that as part of a recent on-going DNQA audit SQAB8-826, approximately 75 Main Control Room drawings were reviewed. This audit by DNQA substantiated that very few red-line markings now appear on the Control Room drawings, and that the revision to AI-19, Part IV (reference 6) offers better controls than existed in the past. EA OPS concludes that the backlog of red line Main Control Room drawings have adequately been incorporated into the primary drawings and that no further verification was deemed necessary. Action Item 01-005 was closed.

4.5.2.3 DB&VP Phase I Program Final Report

Action Item 01-011

EA OPS review of DB&VPs Phase I Program Final Report to verify completion of the DB&VP program requirements resulted in one action item (01-011) which was considered an unresolved "Restart" item. This action item pertains to EA's request for a comparison of DB&VP's System Walkdown Boundary Identification Drawings (SWBID) and safety related components with the SQN CSSC list. A sample evaluation by EA OPS had indicated that SWBID components were not in the CSSC list. EA OPS evaluated the project's follow-up response to determine if EA's concern on this issue is adequately addressed. (Reference: section 6.8.6.1 of the EA-OR-003 report.)

Project Action

The project responded that the Phase I DB&VP "system evaluation boundary(s)" was limited to those systems and parts of systems needed to mitigate Chapter 15 events. The DB&VP boundary is defined by the SWBIDs. The project stated that this "scope" is less comprehensive than the "safety-related" CSSC list and that comparison to or confirmation of the CSSC list was not a requirement of the DB&VP as defined by the Unit 1 Program Plan or the DB&VP procedures. In addition, the project indicated that TVA has committed to the NRC to develop a Q-list which will incorporate the existing CSSC list and the DB&VP Systems including components on the flow, control, and schematic drawings of these systems. This is a postrestart commitment (4/89) as documented in TVA's letter to the NRC dated 2-29-88 (reference 7) and is being tracked in CCTS as item NC0880035001.

Results of EA Evaluation

EA OPS reviewed the Project response concerning TVA's commitment to develop a Q-List by April, 1989 and found that the SQN Q-List implementation plan will adequately address this concern. Since this commitment item is being adequately tracked by the CCTS system, EA OPS judged that no further verification was deemed necessary. Action Item 01-011 was closed.

4.5.3 Conclusion

EA OPS concludes that the Phase I portion of Action Item 01-007 is complete. EA OPS considers Action Item 01-007 resolved but remains open pending "Postrestart" verification of the implementation of the corrective action to make design criteria SQN-DC-V-27.3 and the FSAR compatible.

Action Items 01-005, 01-010, and 01-011 were closed.

4.5.4 References

<u>Reference Number</u>	<u>Document and Revision</u>	<u>Issue Date</u>	<u>Title/Description</u>
1	CAQR SQP871446	9-15-87	S13 871019 817
2	Design Criteria SQN-DC-V-27.3 R2	7-24-86	Safety Injection System (B45 870722 252)
3	Surveillance Instruction SI-116 R14	9-2-87	Summary of Valve Tests for ASMF Section XI
4	SQNWESRJF1069	5-8-86	C/R Data Sheet (B45 860508 80)
5	SQEP-63, System 63 R3	8-7-87	System Functional Requirements Package - System 63
6	AI-19, Part IV R22	-	Modifications after plant licensing
7	TVA Letter to NRC	2-29-88	L44 880229 806

5.0 TREND ANALYSIS OF RESTART EA TEAM FINDINGS

This section updates the summary and trend analysis results presented in section 7.0 of the EA Oversight Review Report (EA-OR-003).

5.1 Scope

This update is presented to incorporate the Project and EA actions related to resolution and verification of open action items that were considered to be Unit 1 restart issues in section 5.0 of EA Report (EA-OR-003).

5.2 Approach

The Project and EA actions performed to resolve and/or close the action items were used as the basis for assigning trend codes for the unresolved/open items, and for confirming the trend codes assigned previously to the resolved but unverified action items. The same 11 major categories and 83 subcategory codes used to trend the action items for EA Report EA-OR-003, were also applied to the updated action items.

5.3 Updated Analysis of EA Team Action Items

This section presents the results of the trend analysis of the restart items that were stautused open in section 5.0 of EA Report EA-OR-003. A list of these restart items is presented in Table A-1 of Appendix A.

5.3.1 Restart Action Items

From section 5.0 of EA Report EA-OR-003, there were 13 restart items that were stautused open (i.e., resolved, unresolved, or no response). These items were classified by the 11 major categories and then sorted by these categories using a data base program. The results of these sorts are presented below.

5.3.1.1 Activity Types

This category describes the project activity affected by the action item. The sort on this category revealed the following distribution:

<u>Activity Type</u>	<u>Number of Action Items</u>
Transitional Design Change Control*	7
Change Document Evaluation	2
Restart Test Program	2
System Evaluation	1
DB&VP Final Report	1

*See Detailed Analysis Section for further assessment of this activity.

5.3.1.2 Document Type

This category describes the document(s) affected by the action item. The sort on this category revealed the following distribution:

<u>Document Types</u>	<u>Number of Action Items</u>
ECN/FCN/LDCR/TACF	7
Design Criteria	2
Program Procedures (NEPs, SQEBs)	2
Calculations	1
Drawings	1

5.3.1.3 Element

This category describes the type of problem addressed by the action item. The sort on this category revealed the following distribution:

<u>Element</u>	<u>Number of Action Items</u>
Documentation	4
Technical Adequacy	3
Procedural	2
Design Consistency	2
Review/Approval	2

5.3.1.4 Discipline Affected

This category describes the discipline affected by the concern. The sort on this category revealed the following distribution:

<u>Discipline Affected</u>	<u>Number of Action Items</u>
Electrical	5
Operations	3
I&C	2
Mechanical	1
Nuclear	1
All (generic)	1

5.3.1.5 Conditions Adverse To Quality (CAQ)

This category identifies if a CAQR or a PIR was issued or revised as a result of an action item. The sort on this category revealed that one item resulted in the issuance of a CAQR, one other item resulted in the issuance of a PIR, two other items required revisions to existing CAQRs and one already had an existing CAQR. The action item and the CAQR/PIR numbers are listed below. (This list is based on the information provided to the EA Team on the Project responses.)

<u>Action Item Number</u>	<u>CAQR/PIR Number</u>
E1-007	CAQR SQP871335 (Revised to include Unit 1 C/As)
E1-013	PIR SQNMEB86108 (Revised to include Unit 1 C/As)*
I1-020	CAQR SQP880081
N1-002	PIR SQNEEB8824*
O1-007	CAQR SQP880148 (Voided because of existing (CAQR SQP871446)

*Not considered a CAQ based on NEP 9.1 definition.

5.3.1.6 Validity

This category describes the number of action items that are valid concerns or comments. The sort on this category revealed that all 13 restart items were considered valid.

5.3.1.7 Extent Code

This category defines the extent of the concern. A sort on this category revealed the following distribution:

<u>Extent</u>	<u>Number of Action Items</u>
Limited	11
Unique	2

5.3.1.8 Cause Code

This category describes the cause of the concern addressed by the action items. The sort on this category revealed the following distribution:

<u>Cause Code</u>	<u>Number of Action Items</u>
Inadequate Review	9
Inadequate Procedures	2
Inadequate Implementation	1
Lack of Interface Control	1

5.3.1.9 Impact

This category describes the type of changes that resulted from the action item. The sort on this category revealed the following distribution:

<u>Impact</u>	<u>Number of Action Items</u>
Technical Change	10
Programmatic Change	3

5.3.1.10 Status

This category is used to determine if the corrective action(s) will be verified pre- or postrestart. The sort of this category revealed the following distribution.

<u>Status</u>	<u>Number of Action Items</u>
Postrestart	7
Prerestart*	6*

*These 6 restart items which required verification prerestart have been closed by the EA Team.

5.3.1.11 Hardware

This category identifies the action items that required hardware changes as part of their C/A(s). The sort on this category revealed that 4 of the 13 open restart items involved hardware changes. The four action items involving hardware changes are:

<u>Action Item Number</u>	<u>Hardware Change</u>
E1-007	Install caution tag
E1-013	Replace motor operators
I1-020	Replace/resize orifices
N1-002	Replace temporary instrumentation

5.4 Detailed Analysis

The summary evaluation of the 13 restart items revealed that seven (7) affected the Transitional Design Change Control (TDCC) activity. TDCC activity had a total of 14 action items issued against it by the EA Team. Since 8 of the 14 total TDCC action items were unresolved in EA Report EA-OR-003, section 7.6.3, no conclusions could be drawn as to the nature, extent, cause, or impact of this activity. Since 12 of the 14 TDCC action items have now been resolved, this activity will be analyzed in detail in the following section to determine any overall areas of concern. The category code distribution of the action items related to this activity are presented in the next section.

5.4.1 Transitional Design Change Control

Fourteen (14) or 13.9 percent of the 101 valid action items involved problems with TDCC. The 14 items are listed in Attachment 1. These 14 items involved the following attributes:

5.4.1.1 Document Type - The document type affected by the 14 action items are distributed as shown below:

<u>Document Type</u>	<u>Number of Action Items</u>
ECN/FCN/DCR/TACF	6
Drawings	2
Calculations	2
Design Criteria	2
Procedural Program (NEP, SQEP)	1
Administrative Procedures	1

5.4.1.2 Element - The type of problems addressed by the 14 action items included 5 items with procedural problems, 4 items involving documentation deficiencies, 3 involving technical adequacy, and 2 with lack of design consistency.

5.4.1.3 Discipline - Of the problems addressed by the 14 action items, 3 each affected the Electrical and Operation disciplines, 2 each affected the Civil, I&C and Nuclear disciplines, 1 affected the Mechanical discipline, and 1 affected all disciplines.

Note: Only the first four attributes for unresolved action items C1-008 and C1-009 could be coded, therefore, the remaining detail analysis of TDCC will address the remaining 12 resolved action items.

5.4.1.4 CAQ - CAQR SQP880081 was issued to address the concerns in Action Item 11-020. None of the other action items resulted in a CAQR or a PIR.

5.4.1.5 Validity - All 12 of the action items were valid findings.

5.4.1.6 Extent Code - Ten (10) of the 12 action items were limited in extent to the affected discipline while the other two action items identified isolated problems with the TDCC process.

5.4.1.7 Cause Code - The cause of the 12 action items consisted of 5 resulting from inadequate implementation of established procedures, 4 resulting from inadequate review, 2 from inadequate procedures, and 1 from lack of interface control.

5.4.1.8 Impact - Seven (7) of the 12 items resulted in a technical change and the other 5 required a programmatic change.

- 5.4.1.9 Status - Four (4) of the 12 action items have prerestart requirements regarding the implementation of their corrective actions and the other 8 require post-restart verification of their corrective actions. All four of the prerestart action items have been closed by the EA Team.
- 5.4.1.10 Hardware Affected - Only one (I1-020) of the 12 action items in the TDCC activity resulted in hardware change. The hardware change for I1-020 was replacement/resizing of orifices.

5.5 Conclusion

This section presents the overall areas of concern identified during the review of the detailed analysis section.

5.5.1 Transitional Design Change Control/Permanent Design Change Control

The detailed analysis section 5.4.1 reveals that the problems identified by the EA Team review of the TDCC activity affected all disciplines. The majority of the problem involved ECN/FCN, TACFs, and LDCRs and were primarily concerned with the procedural, documentation, and technical adequacy of the affected documents. The major cause of the identified problem was inadequate implementation of established procedures and inadequate review and the corrective actions primarily involved technical changes to the affected documents.

Several problems addressed by these action items included:

- Inadequacies and inconsistencies in ECN packages.
- Control room drawings not kept current.
- Deficiencies in the SQEP-13 process.

Based on the information given above, the programmatic adequacy of TDCC was an overall area of concern in EA report EA-OR-003.

The project has implemented the following C/As to address the problems:

- Revised the ECN packages as required.
- Updated control room drawings.
- Revised SQEP-13 to clarify identified discrepancies.
- Issued SQEP-26 to implement the permanent design change control program described in NEPs-6.2, 6.3, 6.4, and 6.6.

To assess effectiveness of the project's actions, EA performed an additional review of change documents issued after the issuance of the EA report EA-OR-003 and determined that the C/As implemented by the project have improved the design change control process. Based on implementation of the C/As of the action items and the results of the additional review, the EA Team has judged the design change control process to be acceptable.

- 5.5.2 The other six restart items analyzed in this report did not show any significant impact on the trends discussed in EA report EA-OR-003.

ACTION ITEMS WITH ACTIVITY TYPE
TRANSITIONAL DESIGN CHANGE CONTROL

ACTION
ITEM NO.

DETAIL DESCRIPTION OF ACTION ITEM

C1-008 ECN L7147 DATA SHEET IDENTIFIED INCORRECT DATE OF ISSUANCE FOR THE REFERENCED DRAWINGS
C1-009 CIVIL CALCULATIONS FOR ECNs L7141 AND 7147 EXHIBIT TECHNICAL INACCURACIES
E1-016 INADEQUATE EVAL OF ECN L7211 FOR POTENTIAL EFFECTS ON DSGN DOCUMENTS AND SAFETY EVALUATION
E1-017 TECH JUSTIFICATION MEMOs FOR ECNs L7130 & L7129 CONTAIN UNVERIFIED ASSUMPTIONS & NOT TRACED TO ENSURE CALCS ARE REVISED
E1-018 OUTPUT DOCUMENTS NOT ISSUED FOR LIMITING CONDITIONS IDENTIFIED IN ELECTRICAL CALC CONTAINED IN ECN L7334
I1-020 INADEQUATE TECH SPEC/SURVEILLANCE REQUESTS FOR CONTAINMENT SPRAY SYS PUMPS-UNIT 2
I1-021 INCONSISTENCIES IN SYSTEM 87 DESIGN DOCUMENTS
M1-008 REVIEW OF ECN-7242 AND RELATED CALC HAS IDENTIFIED TECHNICAL CONCERNS INVOLVING ERCM AND WATER FLOWRATES TO HVAC COOLERS
N1-010 DISCREPANCY CONCERNING AIR FLOW RATE TO THE PRESSURIZER ENCLOSURE BETWEEN PMT-105, QIR NEB87207R2 AND SQN-DC-V-13.9.5
N1-016 REVIEW IN ACCORDANCE WITH ATTACHMENT B CHECKLIST FOR ECN-6802 WAIVERED TO AI-11 WAS NOT FOUND IN THE ECN PACKAGE
O1-003 FAILURE TO UPDATE PRIMARY CONTROL ROOM DRAWINGS WITHIN 15 DAYS AS REQUIRED BY SQEP-10
O1-004 MODIFICATION WORKPLANS NOT BEING PREPARED, UTILIZED, OR COMPLETED IN ACCORDANCE WITH LATEST REVISION OF AI-19 (PART IV)
O1-005 RED-LINED PRIMARY CONTROL ROOM DRAWING UPDATE BACKLOG EXTENDS BACK TO 1986
Q1-001 RENUMBERING PROCESS FOR DCA IN SQEP-11 NEEDS CLARIFICATION AND REV LEVEL DISCREPANCIES FOR ECNs/DCNs NEED RESOLUTION

EA ACTION ITEMS EVALUATED
IN THE FOLLOW-UP EFFORT

A list of the restart action items that require project action to complete the Unit 1 phase I effort to the DB&VP is presented in Table A-1. Table A-2 presents the status of each action item considered to be a restart concern at the time the EA-OR-003 report was issued. For the resolved action item, the project's implementation of C/A and the EA Team's verification were required to satisfactorily close the action item. For the unresolved action items, the EA Team's approval of C/A and agreement of Phase I or Phase II C/A implementation status and EA verification of C/A were required. The status of restart action items at the conclusion of the EA follow-up effort is presented in Table A-3.

TABLE A-1
SQN DESIGN BASELINE AND VERIFICATION PROGRAM - PHASE I, UNIT 1
EA ACTION RESIART ITEMS FROM THE EA-OR-OLJ REPORT ISSUED JUNE 27, 1988

<u>Action Item Number</u>	<u>Description</u>
E1-007	Inadequate Unit 2 punchlist evaluation for applicability to Unit 1 ECN.
E1-013	Inadequate evaluation of ECN 2774 for System Evaluation 3B Unit 1.
E1-016	Inadequate evaluation of ECN L-7211 for potential effects on design documents and safety evaluations.
E1-017	Technical Justification Memos for ECN's L-7130 and L-7129 contain unverified assumptions and not tracked to ensure calculations are revised.
E1-018	Output documents not issued for limiting conditions identified in electrical calculation contained in ECN L-7334.
I1-020	Inadequate Technical Specification or surveillance requests for containment spray system pumps.
I1-021	Inconsistencies in System B7 design documents.
M1-008	ERCh and water flow rates to HVAC coolers: ECN L-7242
N1-002	Failure to use latest revision of SQN-OSG7-048 in change document categorization.
O1-005	Red-lined primary control room drawing update backlog extends back to 1986.
O1-007	Improper implementation of an NRC-approved technical specification change.
O1-010	Lack of a calculation basis for DB&VP specified maximum RHR pump runout criteria while operating in safety injection mode cold recirculation line-up.
O1-011	Comparison evaluation needed in program final report (draft) between DB&VP safety boundary results and the SQN CSSC list.

TABLE A-2
STATUS OF RESTART ACTION ITEMS BY
ACTIVITY REPORTED IN THE EA-OR-003 REPORT
AS OF JUNE 27, 1988

<u>DB&VP Activity</u>	<u>STATUS³</u>		
	<u>Resolved¹</u>	<u>Unresolved²</u>	<u>No Response</u>
System Boundary Determination	--	--	--
Design Criteria	--	--	--
System Walkdowns	--	--	--
Restart Test Program	01-007	01-010	--
Change Document Evaluations	--	E1-007, M1-002	--
System Evaluations and corrective actions	E1-013	--	--
Transitional Design Change Control	I1-020 01-005	E1-016	E1-017, E1-018, I1-021, M1-008
DB&VP Unit I Phase I Report	--	01-011	--

NOTES:

1. C/A was agreed to by EA but required either project C/A implementation and/or EA verification.
2. Project C/A was not agreed to by EA.
3. Thirty-six action items previously determined to be postrestart issues in EA-OR-003 are not included.

TABLE A-3
STATUS OF RESTART ACTION ITEMS AT
COMPLETION OF PHASE I UNIT 1 FOLLOW-UP
EFFORT AS OF AUGUST 31, 1988

<u>Action Item</u>	<u>Restart Action Item Status</u>
E1-007	Resolved: Phase I complete, Phase II verification required
E1-013	Closed
E1-016	Closed
E1-017	Resolved: Phase I complete, Phase II verification required
E1-018	Resolved: Phase I complete, Phase II verification required
I1-020	Closed
I1-021	Evaluated to be a Phase II issue
M1-008	Resolved: Phase I complete, Phase II verification required
N1-002	Evaluated to be a Phase II issue
O1-005	Closed
O1-007	Resolved: Phase I complete, Phase II verification required
O1-010	Closed
O1-011	Closed