Tennessee Valley Authority, Post Office Box 2000, Spring City, TN 37381-2000

September 26, 2008

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop: OWFN P1-35
Washington, D.C. 20555-0001

In the Matter of) Docket No. 50-391
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) - UNIT 2 - REGULATORY FRAMEWORK FOR THE COMPLETION OF CONSTRUCTION AND LICENSING ACTIVITIES FOR UNIT 2 – CORRECTIVE ACTION AND SPECIAL PROGRAMS, AND UNRESOLVED SAFETY ISSUES

References: 1. TVA letter dated January 29, 2008, "Watts Bar Nuclear Plant (WBN) - Unit 2 – Regulatory Framework for the Completion of Construction and Licensing Activities for Unit 2"

2. TVA letter dated May 29, 2008, Watts Bar Nuclear Plant (WBN) – Unit 2 – Cable Issues Corrective Action Program for the Completion of WBN Unit 2

3. TVA letter dated July 29, 2008, "Watts Bar Nuclear Plant (WBN) Unit 2 – Generic Communication Status for Unit 2 - Revision 1 (TAC No. MD8314)"

The regulatory framework for the completion of construction and licensing activities for WBN Unit 2 was submitted in TVA's January 29, 2008, letter to the NRC, "Watts Bar Nuclear Plant (WBN) - Unit 2 - Regulatory Framework for the Completion of Construction and Licensing Activities for Unit 2" (Reference 1). Based on subsequent discussions with the staff, TVA agreed to supplement the Regulatory Framework Corrective Action Program (CAP) and Special Program (SP) summaries to provide additional information on the status of these programs, basis for proposed action, and impact on other aspects of the licensing framework due to these programs. Summaries for those cable sub-issues for which TVA proposed to use a different approach than used on Unit 1, or that TVA considers to be complete, are not included in this submittal since they were included in Reference 2, which included bases for the actions proposed. In Reference 3, TVA agreed to provide a status of the WBN Unit 2 Unresolved Safety Issues (USIs).

D030
NRR

The summaries of the CAPs and SPs include seven items. These are:

1. Proposed Actions – The actions that TVA requests of the NRC.

2. Current Status of Licensing Review – A brief summary of the Unit 1 completion resolution; TVA's plan to resolve the issue for Unit 2 when it is different than the Unit 1 plan and its basis; and a summary of submittals, both TVA's plan for resolution and NRC approvals.

3. Analysis of Conformance – The manner by which applicable requirements are satisfied for Unit 2 and applicability of Unit 1 requirements to Unit 2.

4. Final Safety Analysis Report (FSAR) – Impact of the Unit 2 program on the FSAR, if any.

5. Technical Specifications/Technical Requirements Manual (TS/TRM) – Impact of the Unit 2 program on TS/TRM, if any.

6. Other Items Requiring Verification/Inspection – A brief description of those deliverables that will be available for review and inspection for each program.

7. Interdependencies – The identification of other submittals that depend upon the results provided in this submittal or that this submittal depends upon, if any.

The summaries for the CAPs and SPs are included as Enclosure 1.

Additionally, TVA has reviewed the 19 USIs that were determined to be applicable to WBN Unit 2 in the Safety Evaluation Report (SER) related to the operation of WBN Units 1 and 2 (NUREG-0847). The details of this review are in Enclosure 2. The applicable USIs are either closed, deleted, or captured in the SER Framework, the WBN Unit 2 Generic Communications, or part of the CAPS and SPs.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 26th day of September, 2008. If you have any questions, please contact me at (423) 365-2351.

Sincerely,

M. Bajestani

Masoud Bajestani
Watts Bar Unit 2 Vice President

Enclosures
cc: (see page 3)

cc (Enclosures):

Lakshminarasimh Raghavan
U.S. Nuclear Regulatory Commission
MS 08H4A
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

Patrick D. Milano, Senior Project Manager
U.S. Nuclear Regulatory Commission
MS 08H4
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

Loren R. Plisco, Deputy Regional Administrator for Construction
U. S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center, Suite 23T85
61 Forsyth Street, SW,
Atlanta, Georgia 30303-8931

U. S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303-8931

NRC Resident Inspector Unit 2
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

Enclosure 1

Summary of Corrective Action and Special Programs

Cable Issues CAP, Silicone Rubber Insulated Cables Sub-Issue

TVA provides the following information to support NRC's review of the silicone rubber insulated cables sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Hi-pot testing of silicone rubber insulated cables manufactured by American Insulated Wire (AIW), Rockbestos, and Anaconda revealed a significant number of failures in AIW cables. For Unit 1, TVA confirmed that no AIW cables were used. Rockbestos and Anaconda cables were successfully tested at Wyle Laboratories for 40-year qualified life.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letters dated December 16, 1988, to January 13, 1994, CAP Plan for Cable Issues, Revisions 0 to 3

NRC Approval of Unit 1 Approach:

- Safety Evaluation for WB Unit 1 – Corrective Action Program (CAP) Plan for Cable Issues, April 25, 1991

- Supplemental Safety Evaluation 7 (SSER7) of NUREG-0847, Safety Evaluation Report Related to the Operation of WBNP, Units 1 and 2, dated September 1991

- SSER9, June 1992

- NRC letter, February 14, 1994, Watts Bar Unit 1 – Cable Issues Corrective Action Program, Revision 3 (Approval of Revision 3 of the TVA CAP Plan)

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and design documents and replacement cable installation will be available for inspection.

7. Interdependencies

None

Cable Issues CAP, Cable Support in Vertical Conduits Sub-Issue

TVA provides the following information to support NRC's review of the cable support in vertical conduit sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

A concern was raised that cables in long vertical conduits were inadequately supported, and that random failures due to cutting of the insulation and conductor creep may occur during normal service conditions, especially for silicone rubber insulated cables.

For Unit 1, TVA identified the critical cases of silicone rubber insulated cables in vertical conduits, with cable bearing pressure occurring at the edge of the condulet the determining factor. A comparison was made of WBN critical cases with those already tested at SQN. If SQN conduits enveloped WBN, no cable testing by WBN was performed. If SQN conduits did not envelope WBN, cable was replaced or in situ cable testing was performed; any cable found unacceptable was replaced. TVA also evaluated Class 1E conduits containing cables of all insulation types and added cable supports when acceptance criteria were not satisfied. In addition, cable installation specification and site procedures were revised to incorporate appropriate cable support requirements for cable installed in vertical conduits, and thereby prevent recurrence.

Conduits that exceeded the support requirements of General Construction Specification G-38 were analyzed, and conduit support points with bearing pressure greater than allowable were inspected and supports added as required.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letters dated December 16, 1988, to January 13, 1994

NRC Approval of Approach:

- Safety Evaluation for WB Unit 1 – Corrective Action Program (CAP) Plan for Cable Issues, April 25, 1991

- SSER7, September 1991

- SSER9, June 1992
- NRC letter, February 14, 1994

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used. This is acceptable because G-38 requirements are still valid and Unit 2 will utilize installation procedures which point to Unit 1 procedures that implement G-38.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and design documents, existing installations, and installed supports will be available for inspection.

7. Interdependencies

None

Cable Issues CAP, Cable Support in Vertical Trays

TVA provides the following information to support NRC's review of the cable support in vertical trays sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

TVA's specifications require that cables in vertical trays be supported in accordance with the National Electric Code to prevent long-term cable damage and that this support may be provided by tie wraps. However, TVA had no basis to verify that cable ties could provide adequate support.

TVA evaluated the acceptability of various tie wrap configurations as support systems. If a configuration was found to be inadequate, it was shown by analysis, similarity to other installations, or testing that no cable damage had occurred or would occur. Cable support was added when manufacturers' limits were exceeded. To prevent recurrence, TVA revised the cable installation specification and site procedures to identify acceptable methods for support of cables in vertical trays.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letters dated December 16, 1988, to January 13, 1994

NRC Approval of Approach:

- Safety Evaluation for WB Unit 1 – Corrective Action Program (CAP) Plan for Cable Issues, April 25, 1991
- SSER7, September 1991
- SSER9, June 1992
- NRC letter, February 14, 1994

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used. This is appropriate since National Electrical Code NFPA-70-1987 is part of the licensing bases for both Unit 1 and Unit 2 (see FSAR Section 8.1.5.2).

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and design documents, existing installations, and installed supports will be available for inspection.

7. Interdependencies

None

Cable Issues CAP, Cable Proximity to Hot Pipes Sub-Issue

TVA provides the following information to support NRC's review of the cable proximity to hot pipes sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Cable design did not include the local effects of hot pipes which increase local temperature that can degrade the cable insulation and shorten the life of the cables. For Unit 1, criteria were developed to detail required clearances between cable/raceways and hot pipes/valves to eliminate this potential impact. Class 1E cables were walked down against the criteria to ensure that adequate separation existed between the cables and hot pipes/valves. Deviations were resolved by analysis, change of pipe insulation, or raceway rework.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letters dated December 16, 1988, to January 13, 1994

NRC Approval of Approach:

- Safety Evaluation for WB Unit 1 – Corrective Action Program (CAP) Plan for Cable Issues, April 25, 1991
- SSER7, September 1991
- SSER9, June 1992
- NRC letter, February 14, 1994

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and design documents and field implementation will be available for inspection.

7. Interdependencies

None

Cable Issues CAP, Cable Bend Radius Sub-Issue

TVA provides the following information to support NRC's review of the cable bend radius sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

The minimum bend radius recommended by the Insulated Cable Engineers Association had been violated at WBN. To resolve this issue on Unit 1, TVA established bend radius parameters (upper and lower bounds) for Class 1E cables and revised General Construction Specification G-38 to include the bend radius requirements for cable installation. Cable was then categorized based on 10 CFR 50.49 (Equipment Qualification) requirements, classification and voltage level; and inspected and replaced, retrained, or their qualified life reduced, based on bending or kinking relative to upper and lower bound bend radii.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letters dated December 16, 1988, to January 13, 1994

NRC Approval of Approach:

- Safety Evaluation for WB Unit 1 – Corrective Action Program (CAP) Plan for Cable Issues, April 25, 1991
- SSER7, September 1991
- SSER9, June 1992
- NRC letter, February 14, 1994

3. Analysis of Conformance

The industry and regulatory requirements incorporated into TVA specifications are still applicable. Additionally, Unit 2 design and installation activities will use procedures that point to Unit 1 procedures which implement G-38. Thus, for Unit 2, the Unit 1 approach,

which is still valid, will be used. Cables with reduced life will be addressed by the Equipment Qualification program.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and design documents and field changes will be available for inspection.

7. Interdependencies

None

Cable Issues CAP, Cable Splices

TVA provides the following information to support NRC's review of the cable splice sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

To resolve a concern that the installed splices may not conform to the qualified configurations and materials tested by the vendor, a list of Class 1E cable splices in harsh and mild environments was developed. Cables and splices were identified by reviewing equipment qualification binders and construction records to determine which equipment uses pigtails for field cable connection. All 10 CFR 50.49 harsh environment cable splices requiring Raychem Type N material were replaced, and some mild environment cable splices deemed susceptible to moisture intrusion were reworked. A sampling program was implemented to verify that the splice list was complete for intermediate splices.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letters dated December 16, 1988, to January 13, 1994

NRC Approval of Approach:

- Safety Evaluation for WB Unit 1 – Corrective Action Program (CAP) Plan for Cable Issues, April 25, 1991
- SSER7, September 1991
- SSER9, June 1992
- NRC letter, February 14, 1994

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used. Splices will be verified by the walkdown of safety related cable.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and design documents and field changes will be available for inspection.

7. Interdependencies

None

Cable Tray Supports CAP

TVA provides the following information to support NRC's review of the cable tray supports CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Deficiencies with cable trays and their supports included inadequate tray connections, inconsistencies between as-designed versus as-built tray configurations and their orientation, and failure to evaluate all loading on cable tray members.

The CAP for Unit 1 ensured the structural adequacy and compliance with design criteria and licensing requirements by:

- Review and revision of design criteria.
- Review or development of design output requirements to comply with design criteria and to adequately translate TVA design requirements. This included validation calculations for appropriate loading, typical hardware configurations, and critical cases.
- Walkdown of field configurations to identify deviations from design output.
- Modifications to field conditions, where necessary, to ensure that they are consistent with design output documents.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated November 18, 1988, Corrective Action Program Plan for Category I Cable Tray and Cable Tray Supports

NRC Approval of Approach:

- Safety Evaluation of the WB CAP Plan for Category I Cable Tray and Cable Tray Supports, September 13, 1989
- SSER6, April 1991

3. Analysis of Conformance

The Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review, and design documents and modified configurations will be available for inspection.

7. Interdependencies

The structural responses and amplified response spectra from the Seismic Analysis CAP are design input to this CAP.

Conduit Supports CAP

TVA provides the following information to support NRC's review of the conduit supports CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Specific structural deficiencies with conduit supports including inadequate conduit clamps, conduit runs supported at only one location, and excessively cantilevered conduit fell into four primary categories:

- Design Basis discrepancies.
- Design output not enveloping all design parameters.
- Installed configurations not in compliance with design documents.
- Discrepancies between as-installed configurations and inspection documentation.

The CAP for Unit 1 ensured the structural adequacy and compliance with design criteria and licensing requirements by:

- Revisions to design criteria.
- Updated design output documents including specifications to factor in changes to design criteria, changes to typical support details, and new support details. Critical case attributes were defined, and critical case evaluations performed to qualify installations.
- Walkdowns - first to support critical case evaluations, then to identify configurations not enveloped by critical cases.
- Modifications, as required.
- Revisions of implementing procedures to ensure the adequacy of new or modified supports and prevent recurrence.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated November 18, 1988, Corrective Action Program (CAP) Plan for Conduit Support Installation

NRC Approval of Approach:

- Safety Evaluation of the WB CAP Plan for Electrical Conduit and Conduit Supports, September 1, 1989

- SSER6, April 1991

3. Analysis of Conformance

The critical case attributes identified for Unit 1 bound the configurations that exist for Unit 2 and will be used for the walkdowns to support critical case evaluations for Unit 2. The Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review, and design documents and modified configurations will be available for inspection.

7. Interdependencies

The structural responses and amplified response spectra from the Seismic Analysis CAP are design input to this CAP.

Design Baseline Verification Program (DBVP) CAP

TVA provides the following information to support NRC's review of the DBVP CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

WBN licensing and design basis documentation as well as plant configuration issues included:

- Inconsistencies between the FSAR and WBN design documentation.
- Incomplete and some inconsistent design input information.
- Missing, incomplete, and out-of-date design calculations.
- Inconsistencies between the actual plant configuration and the "as-constructed" drawings.

The causes of these conditions were found to be:

- Lack of effective procedures and databases to ensure that design requirements were properly controlled.
- Insufficient definition of design criteria and system descriptions.
- Lack of a listing to establish the full scope of calculations needed for WBN and inadequate procedures to ensure calculations are properly controlled.
- Lack of an effective process to maintain drawings for configuration control and keep appropriate drawings "as-constructed" as plant changes are made.

The underlying root cause of this situation was determined to be ineffective design and configuration control measures. Based on these issues, the WBN DBVP had four major

components, each having objectives that addressed one or more of the above problems. These were:

- Licensing Verification – to ensure that commitments to NRC are captured in the appropriate controlling document and establish procedures to maintain compatibility between commitments and controlling documents.

- Design Basis Development – to establish design basis documents that contain or reference appropriate engineering requirements and establish procedures to maintain the design basis consistent with the plant, technical requirements, and licensing commitments.

- Calculation Verification – to ensure the existence and retrievability of calculations that are technically adequate and consistent with the "safety-related" plant design and establish a process to status calculations to maintain them current with plant configuration.

- Configuration Control - to develop and implement an improved design change control system with a single set of configuration control drawings (CCDs); and to utilize walkdowns, evaluations, or testing to verify that the functional configurations of the portions of systems that mitigate design basis events are consistent with CCDs.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated October 20, 1988, Corrective Action Program (CAP) Plan for the Design Baseline and Verification Program (DBVP) for Unit 1 and Common Features

- TVA letter dated March 8, 1994, Revision 7 to the CAP Plan for DBVP

NRC Approval of Approach:

- Safety Evaluation Report on the WB Nuclear Performance Plan (WBNPP) – NUREG-1232, Volume 4, December 28, 1989

- Inspection Report 50 390/95-36 dated June 21, 1995

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review; and design basis documents including systems descriptions, calculations, and drawings will be available for inspection.

7. Interdependencies

None

Electrical Issues CAP, Flexible Conduit Installation Sub-Issue

TVA provides the following information to support NRC's review of the flexible conduit installation sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

The problems identified with flexible conduits were:

- Inadequate length to account for seismic/thermal movement
- Lack of compliance with minimum bend radius requirements
- Loose fittings

To resolve these issues for Unit 1, TVA revised design output documents to more specifically define flexible conduit requirements for:

- Seismic/thermal movement
- Minimum bend radius
- Tightness of fittings

A list of flexible conduits attached to Class 1E pipe mounted devices was then developed to identify those flexible conduits that would experience both seismic and thermal movement. Finally, TVA walked down Unit 1 Class 1E flexible conduits and reworked those found to be damaged or in noncompliance with the design output documents.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated February 15, 1989, CAP Plan for Electrical Issues

NRC Approval of Approach:

- Safety Evaluation of the WB Unit 1 CAP Plan for Electrical Issues, September 11, 1989

- NUREG-1232

3. Analysis of Conformance

The Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and design documents and rework of flexible conduit installation will be available for inspection.

7. Interdependencies

None

Electrical Issues CAP, Physical Separation and Electrical Isolation Sub-Issue

TVA provides the following information to support NRC's review of the physical separation and electrical isolation sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

There were isolated cases of redundant closed raceways with less than the minimum required 1-inch separation.

For Unit 1, this issue was subdivided into three issues, and each was resolved separately. The issues were:

- Separation between redundant divisions of Class 1E raceways.
- Internal panel separation between redundant divisions of Class 1E cables.
- Coil-to-contact and contact-to-contact isolation between Class 1E and non-Class 1E circuits.

For inadequate separation between redundant divisions of Class 1E raceways, the raceways were reworked to meet the minimum 1-inch separation requirement, and site implementing procedures were revised to require specific signoffs for raceway separation attributes.

For inadequate internal panel separation between redundant divisions of Class 1E cables, design criteria were revised to include more detailed requirements for internal panel cable separation, an engineering output document was issued to define these requirements, and a list of all panels with redundant divisions of Class 1E cables was developed. Panels containing cables of redundant divisions were walked down to identify cables did not comply with the revised engineering output document, and these were evaluated to determine acceptability or reworked to meet required separation distances.

For coil-to-contact and contact-to-contact isolation between Class 1E and non Class 1E circuits, a calculation was developed to determine acceptability; design criteria were revised to specify acceptable isolation methods; and the existing Class 1E coil and contact devices used as isolators were reviewed to determine that they were qualified for their intended use.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated February 15, 1989, CAP Plan for Electrical Issues

NRC Approval of Approach:

- Safety Evaluation of the WB Unit 1 CAP Plan for Electrical Issues, September 11, 1989

- NUREG-1232

3. Analysis of Conformance

The Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review. Additionally, design documents, as well as rework and final configuration of raceway installation, will be available for inspection.

7. Interdependencies

None

Electrical Issues CAP, Contact and Coil Rating of Electrical Devices Sub-Issue

TVA provides the following information to support NRC's review of the contact and coil rating of electrical devices sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Issues

Historical Summary

Design and procurements of inductive devices contained in circuits did not consider the inductive load ratings of contacts or the maximum credible voltage available at the device terminals.

To resolve this for Unit 1, TVA reviewed devices that performed inductive load switching, and determined if the contacts had acceptable current ratings and reviewed inductive devices to determine if coils were qualified for the highest and lowest credible voltages. If a device could not be qualified, design output documents were issued to require replacement, and qualified devices were installed.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated February 15, 1989, CAP Plan for Electrical Issues

NRC Approval of Approach:

- Safety Evaluation of the WB Unit 1 CAP Plan for Electrical Issues, September 11, 1989

NUREG-1232 CAP Plan:

- TVA letter dated February 15, 1989, CAP Plan for Electrical Issues

3. Analysis of Conformance

The Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and design documents and replacement devices will be available for inspection.

7. Interdependencies

None

Electrical Issues CAP, Torque Switch and Overload Relay Bypass Capability for Active Safety-Related Valves Sub-Issue

TVA provides the following information to support NRC's review of the torque switch and overload relay bypass capability for active safety-related valves sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Thermal overload and torque switch bypass capability was not provided for certain active safety-related valves, as recommended by Regulatory Guide 1.106.

For Unit 1, TVA issued design criteria to provide the basis for determining which active valves were required to have their thermal overload relays and torque switches bypassed and issued a calculation to identify these valves. System design criteria or system descriptions were revised to identify which valves within a system require this capability, design output documents were revised to provide the required capability, and thermal overload and torque switch bypasses were installed where they did not already exist and were required.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated February 15, 1989, CAP Plan for Electrical Issues

NRC Approval of Approach:

- Safety Evaluation of the WB Unit 1 CAP Plan for Electrical Issues, September 11, 1989

- NUREG-1232

3. Analysis of Conformance

The Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and system descriptions, design documents, and bypass installation will be available for inspection.

7. Interdependencies

None

Electrical Issues CAP, Adhesive Backed Cable Support Mounts (ABCSMs) Sub-Issue

TVA provides the following information to support NRC's review of the ABCSM sub-issue for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this sub-issue. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

ABCSMs were used inside equipment to support and restrain wire and field cables in a neat and orderly fashion. The ABCSMs sometimes separated from the inside of the equipment and, as a result, may not have properly secured the wire or cable.

For Unit 1, TVA contacted the vendors of the panels/equipment to ascertain the technical requirements for the ABCSMs for the vendor's wiring, evaluated the use of ABCSMs for field wiring, and issued a calculation identifying the technical requirements for existing ABCSMs. TVA then evaluated the as-installed conditions to determine if any corrective action was required, issued and implemented design output documents in the field to ensure wire or cable were properly secured, and revised site implementing procedures to incorporate the necessary installation requirements and to restrict the use of ABCSMs.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated February 15, 1989, CAP Plan for Electrical Issues

NRC Approval of Approach:

- Safety Evaluation of the WB Unit 1 CAP Plan for Electrical Issues, September 11, 1989

- NUREG-1232

3. Analysis of Conformance

The Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the CAP closure documentation for this sub-issue will be available for review, and design documents and ABCSM installation will be available for inspection.

7. Interdependencies

None

Equipment Seismic Qualification (ESQ) CAP

TVA provides the following information to support NRC's review of the ESQ CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Deficiencies in seismic qualification of equipment involved configuration and document control issues and specific technical issues identified by TVA internal reviews.

To provide assurance that Category I and I (L) equipment is seismically qualified, that the qualification documentation is retrievable, and that this documentation is consistent with the design and licensing basis, the ESQ CAP:

- Reviewed design bases to ensure that they were technically adequate and that consistent interfaces existed between them and other design bases.
- Resolved specific technical issues utilizing:
  - Document retrieval
  - Walkdowns to identify and describe required actions
  - Engineering evaluations and modifications when equipment could not be qualified in the as-built configuration
- Developed and populated an ESQ database.
- Performed process improvements to prevent recurrence.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated June 29, 1989 – WBN Equipment Seismic Qualification Corrective Action Program Plan, Revision 1

NRC Approval of Approach:

- Safety Evaluation of the WB Unit 1 Corrective Action Program Plan for Equipment Seismic Qualification, September 11, 1989
- NUREG-1232
- SSER15, June 1995

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review, and design documents and modified configurations will be available for inspection.

7. Interdependencies

The structural responses and amplified response spectra from the Seismic Analysis CAP are design input to this CAP.

Fire Protection CAP

TVA provides the following information to support NRC's review of the Fire Protection Program CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC concur with TVA's understanding that the approach for this program was approved for both units during Unit 1 completion and that the only NRC actions remaining involve implementation.

2. Current Status of Licensing Review

Historical Summary

The issues that resulted in the determination to initiate the Fire Protection CAP included:

- Fire-rated walls were breached by HVAC ducts without fire dampers, violating Appendix R requirements for fire-rated walls that separate safety-related equipment of redundant trains.

- Review of Sequoyah Nuclear Plant (SQN) Appendix R discrepancies for applicability to WBN.

- Deficiencies with the Safe Shutdown Analysis (SSA).

In response to the above issues and other more specific deficiencies, the Unit 1 Fire Protection Program (for Unit 1 and common areas) contained the following actions:

- Documentation of the measures taken to evaluate violation of the Appendix R requirements and issuance of design change notices (DCNs) to correct the deficiencies.

- Review of SQN Appendix R allegations, as well as issues raised by the NRC during SQN inspections, for applicability to WBN and issuance of DCNs to correct the deficiencies.

- Fire Protection Compliance Review to ensure WBN conformance with NRC requirements and applicable guidelines. The review included:

  - SSA
  - Area Heat-up Analysis
  - Fire Hazards Analysis
  - Lighting and Communication
  - Post-Fire procedures
  - Associated Circuits

- Modification Compliance Review
- Fire Protection Training/Administrative Procedures

The results of the Compliance Review were used as the basis for developing the remaining scope of work (calculations/analysis, DCNs, and document updates) and the consolidation of fire protection documentation into an organized package to support and substantiate the Compliance Review.

The SSA was updated based on the latest "as constructed" plant configuration and the lessons learned from the SQN and Browns Ferry Nuclear Plant (BFN) Appendix R programs.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated March 28, 1990, Revision to CAP Plan for Fire Protection

NRC Approval of Approach:

- SSER18, October, 1995
- SSER19, November, 1995

This CAP plan was approved for both units.

3. Analysis of Conformance

The Fire Protection CAP plan was accepted for both units in SER supplements 18 and 19. On the basis of these considerations, the Unit 1 approach will be used for Unit 2. Additionally, Generic Letter (GL) 92-08, Thermolag 330-1 Fire Barriers, will be resolved for Unit 2 by review of WBN design and installation requirements for Thermolag 330-1 fire barrier systems and evaluation of the Thermolag currently installed in Unit 2. Finally, GL 2006-03, Potentially Nonconforming Hemyc and MT Fire Barrier Configurations, was addressed in TVA letter dated September 7, 2007, Watts Bar Nuclear Plant (WBN) Unit 2 Initial Responses to Bulletins and Generic Letters." In that letter, TVA stated that they do not rely on Hemyc or MT materials to protect electrical and instrumentation cables or equipment that provide safe shutdown capability during a postulated fire.

4. FSAR

None required because the FSAR already includes references to the Fire Protection Program from Unit 1 completion.

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review. Additionally, the analyses that support the Fire Protection Compliance Review and modifications that support this program will be available for inspection.

7. Interdependencies

None

Hanger Analysis and Update Program (HAAUP) CAP

TVA provides the following information to support NRC's review of the HAAUP CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Piping and support deficiencies identified during the design and construction of WBN, as a result of responses to Bulletins 79-02 and 79-14 and internal findings, were incorporated into the following categories:

- Control of Design Input/Output

  - Design input was not consistently defined and controlled.

  - Design output was not clearly defined and, thus, was not consistently implemented by Construction.

- Design/Analysis Methodology

  Design criteria for piping analysis and pipe support design did not specify a consistent and comprehensive set of design/analysis methods. In some cases, relevant industry issues were not considered.

- Level of Design Documentation

  Requirements for closure of unverified assumptions and documentation of engineering judgments were neither fully defined nor procedurally controlled.

The scope of the HAAUP activities for Unit 1 included Seismic Category I piping, Seismic Category I (L) piping, and those instrument lines that could not be decoupled from their process piping and associated supports. Those instrument lines that could be decoupled were addressed in the Instrument Line CAP. The following corrective actions were taken to address the deficiencies:

- Control of Design Input/Output

  – Walkdowns of installed piping and associated pipe supports to obtain as-built information.

- Updating or regeneration of pipe stress and support calculations to:

    - Incorporate changes in the seismic response spectra input to envelope sets B and C, and to add consideration of mass participation above 33 hz.

    - Qualify as-built conditions in design documents.

    - Ensure drawings and calculations are in compliance with current design criteria and procedures.

- Design/Analysis Methodology

  Review of governing criteria and procedures to ensure compliance with industry practices and, where necessary, revision of the implementing criteria and procedures.

- Level of Design Documentation

  Update of design documents to incorporate as-built piping and support configurations and other open items.

Resolution in many cases involved a combination of the above activities and modifications, when required.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated June 29, 1989, WBNP – Revision to Corrective Action Program Plan for Hanger Analysis and Update Program

NRC Approval of Approach:

- NUREG-1232

- SSER6, April 1991

- SSER8, January 1992

3. Analysis of Conformance

The Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review. Additionally, design documents, including as-built drawings, and modified configurations will be available for inspection.

7. Interdependencies

The structural responses and amplified response spectra from the Seismic Analysis CAP are design input to this CAP.

Heat Code Traceability CAP

TVA provides the following information to support NRC's review of the Heat Code Traceability CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Traceability concerns involved ASME loose piping and fitting material and ASTM material installed as welded attachments on ASME piping systems, and were categorized as:

- ASME Class 1 systems that may contain ASME Class 2, Class 3, and/or ASTM piping for which adequate nondestructive examinations (NDE) may not have been performed,

- ASME Class 2 systems that may contain Class 3 piping, and ASME Class 2 and Class 3 systems that may contain ASTM piping for which adequate NDE may not have been performed, and

- ASME systems that may have ASTM plate material attached (welded).

For the Unit 1 program, which included common systems, the following corrective actions were taken:

- Accuracy of the information contained in the Heat Code Database (HCDB) was verified, and this information was used to flag situations where the same ASME material was used in systems of different classifications.

- For Class 1 piping, surface NDE was performed on all piping materials where the heat number was the same as for material used in a non-Class 1 system. When NDE was not feasible, alternate analysis prescribed by the ASME Code was performed. Material which could not be examined or technically justified was replaced.

- For Class 2 and 3 piping, required NDE was performed when classification traceability was questionable and items were installed in locations where stress ratios exceeded 0.80 for welded carbon steel and 0.85 for welded stainless steel. For cases involving ASTM, ASME Section II, and ASME Section III material which may have been upgraded to ASME Section III, Class 2 or 3 materials, the items were reverified as meeting all other requirements of Section III on a sampling basis. Engineering

evaluations were performed on noncomplying items to provide a basis of acceptance. Material determined to be unacceptable was replaced.

- ASTM plate attachment material used in ASME applications was determined to be acceptable by verifying equivalence to an ASME specification, that it was supplied to an acceptable Quality Assurance (QA) program, and the necessary NDE was performed. Material that could not be verified or justified as being acceptable was replaced.

- Recurrence control included revising the General Construction Specification to include specific ASME requirements for reclassification of material and site implementing procedures to require certified material test report traceability of materials to be installed.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated September 21, 1989, Revision to the CAP Plan for Heat Code Traceability

NRC Approval of Approach:

- Inspection Report 50-390/89-09 and 50-391/89-09 dated September 20, 1989

- NUREG-1232

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review. Additionally, results of examination, evaluation, and replacements will be available for inspection.

7. Interdependencies

None

HVAC Duct Supports CAP

TVA provides the following information to support NRC's review of the HVAC duct supports CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Adverse conditions involving HVAC duct and duct supports can be programmatically characterized as: incomplete design basis, inadequate design documents, as-built configurations not in conformance with existing design documents, inadequate or incomplete inspection documentation, and incomplete instructions.

For Unit 1, TVA resolved these issues via the following four tasks:

- Completing the design basis by reviewing and revising the design criteria; issuing supporting calculations and updating the FSAR to be consistent with the upgraded design criteria.

- Updating design output documents to be consistent with the completed design basis.

- Revising construction, maintenance, and QA procedures to incorporate design output documents.

- Developing bounding critical cases of existing installations and evaluating their adequacy, and performing unique evaluations or modifying installations when they could not be qualified by the critical case evaluations.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated November 18, 1988, Corrective Action Program for Heating, Ventilation, and Air Conditioning Duct and Duct Supports

NRC Approval of Approach:

- Safety Evaluation of the WB CAP Plan for Safety-Related Heating, Ventilation, and Air Conditioning Duct and Duct Supports, October 24, 1989

- NUREG-1232
- SSER6, April 1991

3. Analysis of Conformance

Revision to procedures for construction, maintenance, and QA activities will be common to both units, and since they have already been implemented, are considered to be complete. For the remaining activities, the Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review, and design documents and modified configurations will be available for inspection.

7. Interdependencies

The structural responses and amplified response spectra from the Seismic Analysis CAP are design input to this CAP.

Instrument Line CAP

TVA provides the following information to support NRC's review of the Instrument Line CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve this CAP. Additionally, based on the information provided below, TVA requests that NRC approve the elimination of a separate Unit 2 statistically random sample of instrument line supports to address installation discrepancies.

2. Current Status of Licensing Review

Historical Summary

The problems identified with instrument lines fell into two categories:

- Functional problems related to instrument line minimum slope requirements.

- Structural problems related to:

  - Thermal effects
  - Pipe and tube bending devices
  - Compression fittings
  - Installation discrepancies

The scope of the structural issues included Seismic Category I and I (L) instrument lines, and their associated supports, which are analytically decoupled from the process lines.

Sense Line Slope

A number of sense lines were found that did not conform to the minimum slope requirements specified on design output drawings. This resulted in preparation of an Engineering Requirements (ER) Specification; isometric and support drawings; analysis of lines identified for rework; and installation and inspection per design output requirements.

In addition to the ER Specification, other recurrence control measures included site implementing procedures to incorporate ER requirements in the process for the installation, maintenance, and inspection.

Thermal Effects

Instrument lines and associated supports were not designed to consider the effects of thermal expansion, and operating modes indicated that portions of systems will be subjected to thermal effects. These Unit 1 lines were field sketched to identify material, support type, and configuration; then analyzed for dead weight, seismic, and thermal effects. Isometric drawings were prepared showing required line configuration and material, and deficiencies were corrected by design changes.

Pipe and Tube Bending Devices

Site implementing procedures used to qualify pipe and tube bending devices were not rigorously executed, and qualification records for the bending were not always maintained. A sample of bends was evaluated considering wall thickness reduction, ovality, acceptable bend contour, and surface condition and found to be acceptable; and bender qualification records were updated to incorporate the results of the evaluation.

Compression Fittings

Compression fitting installations were found that did not satisfy the manufacturer's installation requirements. Discrepancies included: tubing cuts that were not deburred; tubing that was not bottomed out inside the fittings; nuts that were not properly tightened; and ferrules that were unidentifiable, missing, or reversed.

Discrepant compression fitting installations were vibration and pressure tested. This included testing of the effect on flow rate due to the presence of tubing burrs, testing of the integrity of fittings with various installation deficiencies by tensile pullout, and vibration and seismic tests. The results demonstrated that for the instances where tube ends were not deburred, tubes were not bottomed out, or nuts were not properly tightened, fitting performance was still satisfactory. Also, normal operation vibration testing did not result in leaks in any of the samples tested, and seismic testing only produced very slight leakage in 2 of the 47 samples.

The test program for fittings with missing, reversed, or unidentified ferrules determined that: missing ferrules would cause a definite leak during pressure testing; reversed ferrules would leak if they are "CPI" fittings (manufactured by Parker Hannifin) and would not leak if they are reversed "Hi-Seal" ferrules.

It was determined that for these questionable ferrule installations, unacceptable installations would be detected during pressure testing due to leakage, and for instrument lines that are not pressure tested, there would be no driving force to create any significant leakage. Therefore, the following corrective actions were taken:

- Instrument lines designated as Seismic Category I or I(L) were pressure tested in accordance with appropriate piping code requirements.

- Fittings seeing radioactive service in lines not pressure tested (i.e., drains) were re-inspected to verify installation in accordance with manufacturer's recommendations, and fittings with discrepancies repaired or replaced.

Since pressure testing was performed as required and leaking compression fittings were repaired or replaced, the final configurations were ultimately acceptable.

Installation Discrepancies

Support documentation for some instrument lines was determined to be lost or incorrect. A statistically random sample of over 10,000 instrument line supports installed at the time, including Unit 2 supports on lines that support Unit 1 operation, was selected for a detailed evaluation to determine the acceptability of the as-built condition, and it was determined that the instrument lines and supports would comply with existing design basis requirements provided that the attachment clamps and bolts were properly installed. The supports were then walked down, and proper clamps and bolts were installed in accordance with engineering requirements.

Recurrence controls for each of the above structural issues consisted of revising specifications, design drawings and procedures, and required training.

Revision/Deviation from Unit 1 Approach

Code requirements, design criteria, construction specifications, and site implementing procedures for instrument sensing line used at the time of Unit 1 completion are applicable for resolution of Unit 2 issues. In addition, Unit 2 has installations similar to Unit 1 installations, Unit 2 fabrications used the same drawings where applicable, the same craft worked on both units, and problems had common root causes. Thus, TVA will implement the Unit 1 approach for Unit 2, with the following exception. To resolve the installation discrepancies issue, TVA will not perform an evaluation of a separate random sample of Unit 2 supports since the evaluation performed for Unit 1 was based on a statistically random sample of over 10,000 supports installed at the time, including Unit 2 supports on lines that support Unit 1 operation. The walkdown of supports performed for Unit 2 will use the Unit 1 approach.

History of TVA CAP Plan and NRC Approvals

CAP Plan:

- TVA letter dated March 11, 1994, WBN Unit 1 – Revision to Corrective Action Program Plan for Instrument Lines (R3)

NRC Approval of Approach:

- NUREG-1232

- SSER6, Appendix K, April 1991
- Supplemental SER on the Instrument Line Corrective Action Program, May 6, 1994

3. Analysis of Conformance

The discussion of Revision/Deviation from Unit 1 Approach describes the manner in which the Unit 2 program will be in conformance with requirements.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review. Design documents, including test results, evaluations, and design changes will also be available for review. Reworked and modified configurations will be available for inspection.

7. Interdependencies

None

QA Records CAP

TVA provides the following information to support NRC's review of the QA Records CAP for Unit 2.

1. Proposed Action

Based on the discussion included below, TVA requests the NRC close this CAP.

2. Current Status of Licensing Review

Historical Summary

A number of the quality records required for licensing:

- Were not retrievable in a timely manner or potentially missing.
- Were not maintained in proper storage.
- Had quality problems (were incomplete; technically or administratively deficient).

To address these issues, the QA Records CAP was developed with the following objectives for these records:

- Ensure adequate storage and retrievability.
- Resolve quality and technical problems.
- Ensure programs are established that are adequate to prevent reoccurrence of records problems.

During the course of implementation of the CAP, additional records issues were identified. Evaluation of these issues indicated a need to expand the scope to address the full extent of condition by including a broader set of records categories. This was accomplished through incorporating an Additional Systematic Records Review of all ANSI/ASME N45.2.9, 1974, Appendix A, record types into the CAP. This review was based on sampling and statistical analysis and provided the necessary information to develop procedures to evaluate and correct records considering their significance in the documentation of the quality of safety systems and components. This provided a high level of confidence in the adequacy of QA Records.

Basis for Closure

Relevant Unit 2 records are similar to Unit 1 records, and personnel involved with Unit 1 records were also involved with Unit 2 records. For these reasons, the Unit 2 issues will be similar to those found during the Unit 1 effort. Furthermore, as a result of the

sampling and subsequent evaluation, procedures were put in place to ensure similar problems would be addressed going forward. Since these processes will be used for Unit 2 activities, and these activities cover QA records with the broad scope of CAPs, Special Programs and other design, modification and construction activities; the problems that exist in Unit 2 documentation will be identified and corrected.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letters dated December 21, 1988, to April 6, 1994, WBN Unit 1 – CAP Plan for QA Records, Revisions 0 through 6

NRC Approval of Approach:

- SSER9, June 1992
- WB Unit 1 - Staff Position on Certain Aspects of QA Records CAP, January 12, 1993
- Supplemental Safety Evaluation on the QA Records CAP Plan, April 25, 1994

3. Analysis of Conformance

This item is discussed under Basis for Closure.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, records completed as part of the completion effort will be available for inspection.

7. Interdependencies

None

Q-List CAP

TVA provides the following information to support NRC's review of the Q-List CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

The problems associated with the WBN Q-List Program included:

- Multiple Q-Lists.
- Inadequate training.
- Lack of and improper classifications.
- Wrong component identification.

The objectives of the Q-List CAP were to:

- Develop a new Q-List.
- Compare this new Q-List to the old Q-List to identify upgraded components.
- Review maintenance and modification activities performed since 1984 to ensure that those activities had the appropriate QA program controls applied.

As part of corrective action for this CAP, over 5,000 component classification upgrades were identified during the comparison of the new and old Q-Lists. No field work resulted from these upgraded components.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letters dated October 27, 1988, to July 8, 1993, WBN CAP Plan for Q List (R0 - R5)

NRC Approval of Approach:

- NRC letter – CAP Plan for Quality Assurance List, September 11, 1989
- SSER6, April 1991
- SSER13, April 1994
- Watts Bar Unit 1 - Supplemental Safety Evaluation on the Q-List Corrective Action Program, March 17, 1994 (approving Revision 5 to the CAP plan)

3. Analysis of Conformance

The Unit 1 Q-List will be used as the basis for the Unit 2 Q-List in lieu of comparing a new Q-List to the old Unit 2 Q-List. Unique component identifiers (UNIDs) which are unique to Unit 2 will be evaluated for classification. Components that do not meet this acceptability will be replaced or refurbished to ensure the appropriate quality level. The remaining components will be evaluated for acceptability. Thus, Unit 2 implementation will utilize the Unit 1 Q-List and include an evaluation of existing components.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP and the Q-List will be available for review.

7. Interdependencies

None

Replacement Items CAP

TVA provides the following information to support NRC's review of the Replacement Items CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve this CAP and, instead of back checks of previously installed and/or procured replacement items, plans an extensive refurbishment program which will include ensuring that replacement items have been properly procured, have adequate documentation and are traceable.

2. Current Status of Regulatory Review

Historical Summary

Previous TVA policies and procedures had not adequately directed and controlled engineering involvement in the procurement process used to purchase replacement items, and had not incorporated industry guidance or complied with NRC GLs 89-02 and 91-05.

The CAP grouped the issues into four categories:

- Current and future purchases,
- Current warehouse inventory,
- Plant installed items from previous maintenance activity, and
- Replacement items installed by previous construction activities.

To address these categories, TVA:

- Created the Procurement Engineering Group (PEG), which reviewed and evaluated procurements made for safety-related applications, and developed a process for these activities.
- Created the Material Improvement Project to evaluate the adequacy of current inventory with respect to technical adequacy, QA receipt inspection, and material storage.
- Back checked materials installed from previous maintenance activities to ensure that a proper documentation trail existed from the warehouse to maintenance history for each item.

- Reviewed the construction group's procurements of replacement items. This review indicated that required documentation for parts traceability was available and that the materials were procured properly with engineering involvement.

Revision/Deviation from Unit 1 Approach

Industry practices and regulatory acceptance of those practices at completion of Unit 1 are still applicable now. Several of the actions performed at that time, such as the PEG and evaluation of warehouse inventory (and continued control of dedications), will be common to both units and, since they have already been implemented, are considered complete. For Unit 2, TVA plans an extensive refurbishment program, which will address the replacement items used during prior Unit 2 activities and this process will ensure proper documentation and control of replacement items.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letter dated August 7, 1989, WBN Unit 1 – Revision to CAP Plan for Replacement Items Program (Piece Parts)

- TVA letter dated January 20, 1995, WBN Unit 1 – Revision 6 to CAP Plan for Replacement Items Program

NRC Approval of Approach:

- Safety Evaluation of the WB Unit 1 Plan for the Replacement Items Program, November 22, 1989

- NUREG-1232

- SSER6, Appendix N, April 1991

- NRC letter dated February 6, 1995, Watts Bar Unit 1 – Replacement Items Corrective Action Program Plan

3. Analysis of Conformance

The discussion of Revision/Deviations from the Unit 1 Approach describes the manner in which the Unit 2 program will be in conformance with requirements.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP and evaluations of procurement of spare parts for safety-related applications will be available for review.

7. Interdependencies

None

Seismic Analysis CAP

TVA provides the following information to support NRC's review of the Seismic Analysis CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Concerns were identified with the following aspects of seismic analysis calculations for Category I structures:

- Integration time step used in time history analysis.
- Soil properties and soil-structure interaction.
- Torsional modeling of structures.
- Criteria for the Additional Diesel Generator Building.
- The effect of floor and wall flexibility on design of structures, systems, and components (SSCs) in Category I buildings.

To address these categories, TVA:

- Reviewed seismic analysis criteria and licensing requirements for Category I structures.
- Reviewed seismic analysis calculations for Category I structures and revisions as required or prepared new calculations when necessary.
- Dispositioned identified issues.
- Defined criteria or future evaluations and new designs or modifications of SSCs.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letter dated May 9, 1990, Revision to the CAP Plan for Seismic Analysis (R2)

NRC Approval of Approach:

- Safety Evaluation of WBNP Unit 1 – CAP for Seismic Analysis, September 7, 1989
- Safety Evaluation of WBNP Unit 1 - Validation of SASSI Computer Code for Soil-Structure Interaction Analysis, October, 31, 1989
- NUREG-1232
- SSER6, April 1991

3. Analysis of Conformance

The soils issues addressed by this program for Unit 1 completion involved common structures, and thus Unit 1 resolution closed these issues for both units. Likewise, Unit 1 resolution of the other analysis issues for the common Category I structures (i.e., Auxiliary Building, Diesel Generator Building, and the ERCW Pumping Station) closed these issues for both units. Unit 1 completion also revised the criteria for the Additional Diesel Generator Building to be consistent with the other Category I structures, resolving the analysis issues for this common building as well.

Unit 1 completion resolved these same analysis issues for the Unit 1 specific Category I structures. The applicable regulatory requirements for these issues (integration time steps, soil-structure interaction, torsional modeling, and floor flexibility) have not changed since Unit 1 completion and remain applicable to the Unit 2 configurations. Thus, for the Unit 2 specific Category I structures, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP and calculations to support closure will be available for inspection.

7. Interdependencies

The structural responses and amplified response spectra from the Seismic Analysis CAP are design input to the Cable Tray Support, Conduit Support, HVAC Duct Support, HAAUP, Instrument Sensing Lines, and ESQ program.

Vendor Information CAP

TVA provides the following information to support NRC's review of the Vendor Information CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Problems with vendor information included:

- Vendor information didn't match the plant configuration.
- Vendor information was inconsistent with associated TVA-developed design input/output documents.
- Vendor documents were incorrect or out of date.
- Vendor manuals were lost or were uncontrolled.

The Vendor Information CAP for Unit 1 addressed the problems and their causes via the following actions:

- Relevant vendor information for safety-related and quality-related Unit 1, common, and Unit 2 components needed for Unit 1 operation was identified, reviewed for technical adequacy, and consolidated into applicable vendor technical manuals and documents, which were issued as controlled documents.
- A TVA procedure was issued to control vendor manual update activities.
- Open item reports were generated, tracked, and controlled to resolve the inconsistencies found in the vendor documents.
- Vendor drawings which included information necessary to support safety-related plant activities, but were not in "Approved" status, were reviewed and approved.
- DCNs were issued to resolve identified design discrepancies/open items.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letter dated February 4, 1993, WBN Unit 1 – Revision 4 to CAP Plan for Vendor Information

NRC Approval of Approach:

- WB Unit 1 - Volume 4 NPP, Chapter III, Vendor Information, Safety Evaluation, September 11, 1990

- SSER11, April 1993

3. Analysis of Conformance

Unit 2 equipment identical to Unit 1 will be incorporated in the appropriate lists of existing Unit 1 manuals, and the manuals made common for both units. For equipment that is unique to Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP and affected vendor information for safety-related applications will be available for review.

7. Interdependencies

None

Welding CAP

TVA provides the following information to support NRC's review of the Welding CAP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Programmatic and implementation deficiencies associated with safety-related welding activities resulted in initiation of the TVA Welding Project to review and determine the adequacy of the overall welding program. Subsequently, the Welding CAP was established to ensure that Unit 1 safety-related welds met licensing requirements, and corrective actions were implemented to address the prior issues and those identified by the Welding Project. The CAP included deficiencies that were related to weld quality, inspections, NDE, fabrication/installation code compliance, and associated documentation.

The CAP consisted of three phases:

- A programmatic assessment.
- An in-depth review of the implementation of the welding program and corrective actions to address specific discrepancies.
- Program enhancements to prevent recurrence.

The programmatic assessment and program enhancements to prevent recurrence applied to Unit 2 as well as Unit 1.

The specific deficiencies that had to be addressed for Unit 1 involved structural steel, piping components, pipe supports, instrument panels, HVAC ductwork, and vendor-supplied components such as tanks and heat exchangers. The types of deficiencies included:

- Designs that did not satisfy design criteria for welding.
- Lack of documentation of required visual inspections.
- Indications or weld discontinuities.

- Radiographs accepted with rejectable indications, inadequate radiographic techniques, and identification of discrepancies.

- Misinterpretation of the ASME Code.

- Discrepancies on vendor performed welds.

- Errors on installation documentation.

These problems were addressed by a combination of techniques that included the following:

- Re-inspections to validate results and support analysis.

- Conservative bounding analysis.

- Evaluation of as-is condition to determine acceptability.

- Repairs, if necessary.

History of TVA CAP Plan Submittals and NRC Approvals

CAP Plan:

- TVA letter dated May 12, 1989, WBN – Corrective Action Program Plan for Welding

- TVA letter dated July 31, 1990, WBN - Welding CAP Program – Revisions to CAP Plan and Phase I Weld Report

NRC Approval of Approach:

- Inspection Report Nos. 50-390/89-04 and 50-391/89-04, August 9, 1989

- Letter dated March 5, 1991, WB Unit 1 – Review of Two Submittals Regarding the Welding CAP

- NUREG-1232

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used. Furthermore, generic issues that have been raised since completion of Unit 1 are addressed by TVA responses to generic communications.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this CAP will be available for review. Additionally, results of examination, evaluation, repairs, and accept-as-is conditions will be available for inspection.

7. Interdependencies

None

Concrete Quality SP

TVA provides the following information to support the NRC's review of the Concrete Quality SP for Unit 2.

1. Proposed Action

Based on the discussion included below, the documents referenced and the fact that actions taken address both units, TVA requests the NRC close this SP.

2. Current Status of Licensing Review

Historical Summary

An employee concern identified 24 issues related to concrete that subsequently resulted in the identification of three significant conditions involving concrete quality. They were:

- Some concrete mixes did not meet design compressive strength requirements,
- The use of mortar was not properly controlled, and
- Concrete sampling frequencies did not always comply with the requirements identified in specifications.

To address these issues, TVA performed a study which included a review of concrete cylinder test data to identify potential low-strength concrete placements, testing of cylinder cores in potential low-strength areas, and in-place testing of other low-strength areas. From this information, a database of equivalent in-place concrete strengths was developed for areas having lower strength concrete pours. Concrete drawings and Design Criteria WB-DC-20-11 were revised to reference this database of equivalent in-place concrete strength for lower strength areas.

Basis for Closure

The Concrete Quality SP is complete for both units based on the following considerations:

- The issues associated with concrete quality were not unit specific and involved material used for both units. This is supported by TVA reports CEB-86-19C, Watts Bar Nuclear Plant Concrete Quality Evaluation (identified as being for both Units 1 and 2) and CEB-87-03C, Watts Bar Nuclear Plant – Concrete Quality Evaluation – Testing of In-place Concrete (also identified as being for both Units 1 and 2). Both of these reports are referenced in the NRC inspection report which closed this program and is discussed below. Thus, resolution of these issues constitutes resolution for both units.

- TVA letter August 31, 1990, WBN - Completion of the Concrete Quality Evaluation, stated that based on the staff evaluation in NUREG-1232 the issues on concrete quality at WBN are resolved. While the NUREG only addresses Unit 1, it is based on the same Unit 1 and Unit 2 evaluations.

- An NRC inspection (Inspection Report 390/90-26 and 391/90-26 – January 8, 1991) which followed the TVA letter, included a walkdown inspection of several structures including the Unit 1 and Unit 2 Reactor Building and the Unit 1 and Unit 2 Reactor Containment Shield Structures. This inspection report also indicates that NRR evaluated the above reports prior to issuing their SER dated January 1990, for Unit 1. The inspection concluded that the concrete quality concern issues were resolved. Given that the reports are based on evaluation of testing of concrete from both units and the walkdowns included both units, the conclusions apply to both units.

<u>History of TVA SP Plan Submittals and NRC Approvals</u>

SP Plan:

- TVA letter dated September 6, 1991, WBN - Nuclear Performance Plan Volume 4, Revision 1, Section III.3.1, Concrete Quality Program

NRC Approval of Approach:

- NUREG-1232

3. Analysis of Conformance

See discussion under Basis for Closure.

4. FSAR Documentation

None required because the FSAR already includes a discussion of problems with low concrete strength (see Section 3.8).

5. TS/TRM

No impact.

6. Other Items Required for Inspection

None since Inspection Report 390/90-26 and 391/90-26 closed this issue by inspection.

7. Interdependencies

None

Containment Cooling SP

TVA provides the following information to support NRC's review of the Containment Cooling SP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Post-accident pressure and temperature analysis for the lower compartment in containment failed to consider the long-term effects of a main steam line break (MSLB) inside containment for a plant going to hot standby conditions as opposed to cold shutdown. In order to ensure that 10 CFR 50.49(e).1 is satisfied, TVA performed the Containment Cooling Special Program to develop time dependent temperature profiles for the lower compartment, which were then used for equipment qualification (EQ). This was accomplished by the following tasks:

- Correcting the long-term containment temperature profile for the lower compartment considering the design basis MSLB event.
- Upgrading the Lower Compartment Cooler units and associated ducting.
- Evaluating containment coatings transport and replacing nonqualified coatings.
- Using the revised calculated MSLB temperature profile to qualify components in the lower containment that are important to safety.
- Replacing components in the lower compartment to meet 10 CFR 50.49 requirements.

History of TVA SP Plan Submittals and NRC Approvals

SP Plan:

- NPP, Section III.3.2, Containment Cooling

NRC Approval of Approach:

- WB Unit 1 – Supplemental Safety Evaluation of the Special Program on Containment Cooling, May 21, 1991

3. Analysis of Conformance

The Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this SP will be available for review. Additionally, evaluation of MSLB for determination of temperature profiles and coatings transport for acceptability, and affected components in containment will be available for inspection.

7. Interdependencies

None

Control Room Design Review (CRDR) SP

TVA provides the following information to support NRC's review of the CRDR SP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

The CRDR program was developed to identify and correct human factor discrepancies in the control room. The CRDR included a Preliminary Design Assessment (PDA) to identify any Human Engineering Discrepancies (HEDs) and completion of a full CRDR at a later date.

TVA performed a PDA, and discrepancies identified resulted in commitments to implement corrective actions to resolve these discrepancies, and a CRDR Summary Report was identified as a license condition. TVA conducted the CRDR and submitted a CRDR Summary Report in October 1987 for both units. The CRDR addressed the man-machine interfaces and potential misapplication of human factor principles in the main control room, the auxiliary control room, and the adjacent switch transfer rooms. TVA established a review program plan incorporating accepted human factor principles, gathered and reviewed required plant design information, surveyed the Control Room, identified and assessed HEDs, determined design improvements required, and verified that improvements would address deficiencies and not create new ones.

The CRDR Program ultimately included development of HED corrective actions for Unit 1, common equipment needed for Unit 1, and Unit 2 equipment needed to support Unit 1.

Actions to ensure recurrence controls included issuing Human Factor Design Guides and Human Factor Design Criteria, and the Design Change Process requiring human factors to be addressed.

History of TVA SP Plan Submittals and NRC Approvals

SP Plan:

- TVA letter dated October 2, 1987, WBN – Detailed Control Room Design Review Summary Report

- NPP, Section III.3.3, Detailed Control Room Design Review

NRC Approval of Approach:

- NUREG-1232
- SSER5, November 1990
- SSER6, Appendix L, April 1991 - Safety Evaluation for Units 1 and 2
- SSER15, June 1995

3. Analysis of Conformance

The NRC requirements established for a CRDR that governed the Unit 1 effort have not changed since completion of Unit 1. While there are design differences between the two units that may require differences in design changes, they are similar; and the approach to design changes and correcting deficiencies will be the same. Thus for Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this SP will be available for review; and a CRDR summary report, HED corrective actions, and design changes to address human factors will be available for inspection.

7. Interdependencies

None

Equipment Qualification (EQ) SP

TVA provides the following information to support NRC's review of the EQ SP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

TVA determined that much of the EQ documentation to support 10 CFR 50.49 requirements was not fully auditable, and in some cases, the documentation available did not demonstrate full qualification. The EQ SP was initiated to document that safety-related electrical equipment installed in the plant was qualified to perform its designated function in the environment to which it will be subjected during normal plant operation as well as during postulated accidents, and that programs and procedures have been established to ensure that qualification is maintained as future plant modifications are made.

The processes put in place to accomplish these objectives included:

- Procedures to maintain EQ over the operating life of the plant.

- Consistent documentation requirements for electrical equipment located in harsh environments and required to function after an accident, and the EQ Documentation Package providing evidence of the qualification of equipment for its specific application and environment.

- Incorporation of EQ considerations into maintenance activities.

The activities performed using these processes were:

Analyses of the effects of pipe breaks on temperature, humidity, dose, and water level at various locations in containment and auxiliary buildings to establish the environmental parameters for all areas of the plant containing equipment that must meet 10 CFR 50.49 requirements:

- Identification of all 10 CFR 50.49 equipment in these areas, the 50.49 list, including electrical equipment located in harsh environment and required to function after an accident. It was developed through a series of steps:

- A systems analysis to determine for each design basis accident those equipment items required to ensure completion of a safety-related function.

- For each item, a review of drawings to identify those ancillary devices and cable required to operate or maintain electrical integrity to ensure completion of the item's safety-related function.

- Reduction of this list by failure analysis to eliminate those components whose failure would not prevent achievement of the required safety action.

- Establishment of EQ binders that contain the qualification information in an auditable manner. A package was developed for each Unit 1 equipment type. The package included:

  - Items comprising the equipment type

  - Checklist for evaluation of qualification

  - Analysis and justification of qualification

  - Qualification documents

  - Field verification data

  - Qualification Maintenance Data Sheets

  - Open items and deficiencies

<u>History of TVA SP Plan Submittals and NRC Approvals</u>

SP Plan:

- TVA letter dated September 30, 1986, Summary Status Update Report TVA's Compliance to 10 CFR 50.49, Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants, Watts Bar Nuclear Plant Unit 1

- TVA letter dated September 6, 1991, WBN - Nuclear Performance Plan, Volume 4, Revision 1, Section III.3.4, Equipment Qualification Program

NRC Approval of Approach:

- NUREG-1232

3. Analysis of Conformance

Processes put in-place to ensure that qualification of equipment is maintained throughout the life of the plant will be common to both units and since they have already been implemented, are considered complete. For the remaining activities, the Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this SP will be available for review, and the EQ binders will be available for inspection.

7. Interdependencies

None

Master Fuse List SP

TVA provides the following information to support NRC's review of the Master Fuse List SP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Lack of control of over current protection devices and the misapplication of Bussman KAZ actuators as protective devices on the Master Fuse List and the lack of procedural guidance for the development of the Master Fuse List resulted in design and configuration control deficiencies.

This SP included three primary elements to resolve these deficiencies:

- To address configuration control deficiencies, a baseline Master Fuse List was developed using design input to establish a comprehensive list of 1E fuses needed to support the operation of Unit 1 systems; then walkdowns were performed to gather as-installed information to be included on the list.

- To resolve the Bussman KAZ actuator misapplication, a review of schematic and connection drawings identified KAZ locations, and a DCN was developed to replace KAZ devices with conventional fuses.

- To correct deficiencies involving redundancy provided to electrical penetration assemblies, an analysis was conducted to verify that redundant protection was provided and, when not the case, identified deficiencies were corrected.

While the principle focus of the program was on 1E safety-related equipment, the program has evolved to establish similar controls and practices for all fuses needed to support the operation of the station.

History of TVA CAP Plan Submittals and NRC Approvals

SP Plan:

- NPP, Section III.3.5 – Master Fuse List

- TVA letter dated July 31, 1990, Response to Concerns in NRC SER for WBN NPP Volume 4 – Master Fuse List

- TVA letter dated May 31, 1991, Response to NRC Supplemental SER Concerning the WBN NPP on the Master Fuse List

NRC Approval of Approach:

- NUREG-1232

- NRC letter dated February 6, 1991, WB Unit 1 – Special Program on Master Fuse List

- SSER9, Appendix U, June 1992 - CAP on the Master Fuse List

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this SP will be available for review; and the Master Fuse List, devices used to replace KAZ actuators, and penetration deficiencies will be available for inspection.

7. Interdependencies

None

Mechanical EQ (MEQ) SP

TVA provides the following information to support NRC's review of the MEQ SP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

The MEQ Program included a documented evaluation of the ability of safety-related mechanical equipment located in harsh environment to perform its intended functions, as required by GDC-4 of Appendix A of 10 CFR 50.

The Unit 1 program utilized existing temperature and dose conditions developed for electrical equipment to satisfy 10 CFR 50.49. The program then identified active safety-related mechanical equipment located in harsh environments; analyzed the non-metallic subcomponents for effect of thermal and radiation conditions; produced controlled binders to establish and maintain qualified status for life of plant; and issued DCNs to modify the plant consistent with qualification tests and analyses.

History of TVA CAP Plan Submittals and NRC Approvals

SP Plan:

- NPP, Section III.3.6 – Mechanical Equipment Qualification

NRC Approval of Approach:

- NUREG-1232
- SSER15, June 1995

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this SP will be available for review; and the MEQ binders, design documents, and modifications will be available for inspection.

7. Interdependencies

None

Microbiologically Induced Corrosion (MIC) Special Program (SP)

TVA provides the following information to support NRC's review of the MIC SP for Unit 2.

1. Proposed Action

TVA requests that the NRC concurs with TVA's understanding that the approach for this program was approved for both units during Unit 1 completion and that the only NRC actions remaining involve implementation.

2. Current Status of Licensing Review

Historical Summary

Due to leakage events in several water systems including Essential Raw Cooling Water and MIC degradation at other TVAN plants, TVA committed to a corporate program to address MIC in 1987. In addition, TVA committed to specific actions to address requirements of NRC GL 89-13, "Service Water System Problems Affecting Safety-related Equipment," and the potential for existing MIC conditions in Unit 1.

The SP for Unit 1 included:

- Identifying systems potentially affected by MIC.
- Performing visual inspections and assessing MIC-infested locations.
- Using pre-existing NDE results to identify vulnerable locations.
- Repairing unacceptable damage to Code requirements.
- Installing improved biocide treatment and a long-term chemical cleanup system.

This was later augmented by the implementation of Standard Programs and Process (SPP) 9.7, "Corrosion Control Program," which specifies the programmatic and organizational requirements for management of the MIC and Macrofouling Program.

History of TVA CAP Plan Submittals and NRC Approvals

SP Plan:

- TVA letter dated February 26, 1991, WBN - Microbiologically Induced Corrosion Program Report
- NPP, Section III.3.7 – Microbiologically Induced Corrosion

NRC Approval of Approach:

- SSER8, Appendix Q, January 1992, Safety Evaluation for WBN Units 1 and 2
- SSER10, Appendix Q, October 1992, SSE for WBN Units 1 and 2

3. Analysis of Conformance

The biocide injection system and corrosion monitoring equipment already installed at WBN are common for both units. In addition to these factors, the SP was approved for both units in SSER8 and 10. Thus, for the remaining programmatic actions, the Unit 1 approach, which is still valid, will be used for Unit 2.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this SP will be available for review. Additionally, inspection and evaluation results for the systems identified as potentially affected by MIC, repair of damage, and the systematic and programmatic actions to prevent recurrence will be available for inspection.

7. Interdependencies

None

Moderate Energy Line Break (MELB) Flooding SP

TVA provides the following information to support NRC's review of the MELB flooding SP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

For moderate energy lines, documentation did not adequately justify that there were no unacceptable consequences as a result of flooding in a Category I structure outside of containment following an MELB.

For Unit 1, essential equipment and structures were evaluated to ensure that they were either unaffected by postulated flooding due to an MELB, or were designed, specified, and/or qualified for the environment caused by such flooding. The evaluation involved pipe break analyses, determination of postulated break locations, determination of postulated flooding levels, and EQ evaluations. In those instances where it was determined that an item was impacted and it could not be qualified, modifications providing curbs, raising junction boxes, and adding or removing weather stripping were performed.

History of TVA CAP Plan Submittals and NRC Approvals

SP Plan:

- NPP, Section III.3.8 – Moderate Energy Line Break (MELB) Flooding

NRC Approval of Approach:

- NUREG-1232
- SSER11, April 1993

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure document for this SP will be available for review, and evaluation results and modifications will be available for inspection.

7. Interdependencies

None

Radiation Monitoring System (RMS) SP

TVA provides the following information to support NRC's review of the RMS SP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historic Summary

RMS deficiencies involved RMS design, documentation, installation, and hardware and are categorized in three areas of concern. These are:

- Sample line deficiencies involved line length, heat tracing, minimum bend radius, slope, and separation requirements.

- Design and documentation deficiencies involved:

  - Design of sample flow equipment.

  - Purge capability following an accident.

  - System interlocks with containment isolation in the containment upper and lower compartment monitor design.

  - Documentation of modifications to RMS rate meters.

  - RMS rate meter cable damage.

- Inadequate documentation of primary calibration records and uncertainty in the validity of equipment calibration.

The actions to address these deficiencies for Unit 1 were to review and update the RMS design basis, including applicable requirements of Regulatory Guide 1.97; evaluate the RMS against this design basis; and implement modifications to correct RMS deficiencies. This also included an evaluation of the RMS design, documentation, and installations against the updated design criteria to verify the acceptability of the installation or to identify required modifications for those monitors included in the TSs and modifications or reworking of existing documentation to correct identified documentation deficiencies.

History of TVA CAP Plan Submittals and NRC Approvals

SP Plan:

- NPP, Section III.3.9 – Radiation Monitoring

NRC Approval of Approach:

- NUREG-1232

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this SP will be available for review. Additionally, design bases documents, evaluations, design changes, and acceptable existing installations will be available for inspection.

7. Interdependencies

None

Soil Liquefaction SP

TVA provides the following information to support the NRC's review of the Soil Liquefaction SP for Unit 2.

1. Proposed Action

Based on the discussion included below, the documents referenced and the fact that actions taken address both units, TVA requests the NRC close this SP.

2. Current Status of Licensing Review

Historical Summary

The potential for soil to liquefy is a design consideration at WBN, and the Soil Liquefaction SP was implemented to ensure that issues regarding the design and construction of soil mitigating measures on the west side of the Intake Pumping Station were addressed. The actions taken as part of this program were an evaluation of issues in three areas:

- Alternate material used for backfill,
- Incomplete excavation of potentially liquefiable sand, and
- Leakage between the intake pumping station and Trench B.

To address these issues for Unit 1, TVA conducted an investigation as well as an independent investigation that was performed by R. L. Cloud and Associates with review by the late H. B. Seed of University of California, Berkeley (a noted expert in the area of soil liquefaction). Based on these investigations, it was concluded that the issues did not have a detrimental effect on liquefaction mitigation measures.

Basis for Closure

The Soil Liquefaction Program is complete for both units based on the following considerations.

The area of the plant which was of concern was the west side of the intake pumping station (see Figure 2.1.5 in the FSAR, Amendment 91) and involved a common system and structure. No other area had this concern.

The NRC documented their review and acceptance that the WBN underground barriers provide sufficient confinement for liquefied soil in the affected area in SER Supplement No. 3. The NRC endorsed the approach for the Soil Liquefaction SP by NUREG-1232, subject to inspection of TVA's actions. Final inspection accepting the completion of this

program for both units was reported in NRC Inspection Report 390/92-45 and 391/92-45, February 17, 1993.

History of TVA CAP Plan Submittals and NRC Approvals

SP Plan:

- TVA letter dated September 6, 1991, WBN - Nuclear Performance Plan Volume 4, Revision 1, Section III.3.10, Soil Liquefaction

NRC Approval of Approach:

- NUREG-1232

3. Analysis of Conformance

See discussion under Basis for Closure.

4. FSAR Documentation

None required because the FSAR already includes a discussion of problems with Soil Liquefaction (see Sections 2.5.4, 2.5.5, and 3.7.3).

5. TS/TRM

No impact.

6. Other Items Required for Inspection

None since the Inspection Report closed this issue by inspection.

7. Interdependencies

None

Use-As-Is Condition Adverse to Quality (CAQ) SP

TVA provides the following information to support NRC's review of the Use-As-Is CAQ SP for Unit 2.

1. Proposed Action

TVA requests that the NRC review and approve the approach for closing this program. For Unit 2, TVA will use the Unit 1 approach to resolve it.

2. Current Status of Licensing Review

Historical Summary

Engineering at WBN identified that use-as-is and repair nonconformance dispositions were not reflected on drawings; there was inadequate justification for disposition of these types of nonconformances; and no project-level procedural guidance was provided for use-as-is and repair dispositions. The Use-As-Is CAQ SP was initiated to address these issues.

To prevent recurrence, engineering procedures were issued to establish the requirements for handling CAQs including ensuring that design documents reflect the approved configuration for any use-as-is or repair disposition, and that the basis for approval of any use-as-is or repair dispositions be documented.

For Unit 1, this was followed by the identification of CAQs that had a final disposition of either use-as-is or repair and technical reviews of the latest revision of design documents considering the impact of the CAQ.

<u>History of TVA CAP Plan Submittals and NRC Approvals</u>

SP Plan:

- TVA letter dated September 14, 1988, WB Unit 1 and Unit 2 Use-As-Is and Repair Dispositions for Construction Nonconformance Reports – WBRD-50 390/87-05 and WBRD-50-391/87-05 Final Report

- TVA letter dated September 6, 1991, WBN - NPP Volume 4, Revision 1, Section III.3.11, Use-As-Is Special Program

NRC Approval of Approach:

- NUREG-1232

3. Analysis of Conformance

For Unit 2, the Unit 1 approach, which is still valid, will be used.

4. FSAR

None

5. TS/TRM

None

6. Other Items Requiring Inspection

Prior to fuel load, the closure documentation for this SP will be available for review, and design documents and acceptable existing installations will be available for inspection.

7. Interdependencies

None

Enclosure 2

Unresolved Safety Issues (USIs)

A USI is defined as a matter affecting a number of nuclear power plants that poses important questions concerning the adequacy of existing safety requirements for which a final resolution has not yet been developed and that involves conditions not likely to be acceptable over the lifetime of the plants affected.

The WBN USIs were reviewed in the SER related to the operation of WBN Units 1 and 2 (NUREG-0847) for applicability to WBN Units 1 and 2. Tasks found applicable to WBN in SER NUREG-0847 Appendix C were:

1. Item A-1: Water Hammer
2. Item A-2: Asymmetric Blowdown Loads on Reactor Primary Coolant Systems
3. Item A-3: Westinghouse Steam Generator Tube Integrity
4. Item A-9: Anticipated Transient Without Scram (ATWS)
5. Item A-11: Reactor Vessel Materials Toughness
6. Item A-12: Fracture Toughness of Steam Generator and Reactor Coolant Pump Supports
7. Item A-17: Systems Interactions in Nuclear Power Plants
8. Item A-24: Qualification of Class 1E Safety-Related Equipment
9. Item A-26: Reactor Vessel Pressure Transient Protection
10. Item A-31: Residual Heat Removal (RHR) Shutdown Requirements
11. Item A-36: Control of Heavy Loads Near Spent Fuel
12. Item A-40: Seismic Design Criteria
13. Item A-43: Containment Emergency Sump Performance
14. Item A-44: Station Blackout
15. Item A-45: Shutdown Decay Heat Removal Requirements
16. Item A-46: Seismic Qualification of Equipment in Operating Plants
17. Item A-47: Safety Implications of Control Systems
18. Item A-48: Hydrogen Control Measures and Effects of Hydrogen Burns on Safety Equipment
19. Item A-49: Pressurized Thermal Shock

In GL 89-21 (October 19, 1989), "Request for Information Concerning the Status of Unresolved Safety Issue (USI) Requirements," the NRC requested licensees and construction permit holders report the status of USIs applicable to the facility. TVA responded to GL 89-21 for both units on November 29, 1889. USIs were further reviewed for WBN in SSER15 Appendix C (June 1995) and SSER16 (September 1995).

Status of USIs for WBN Unit 2:

A-1: Water Hammer
This issue was specifically resolved for WBN in Appendix C and sections 10.4.7 and 10.4.9 of the SER. This issue is closed for WBN Unit 2.

A-2: Asymmetric Blowdown Loads on Reactor Primary Coolant Systems
Generic resolution of this issue led to a revision of 10 CFR 50, Appendix A, General Design Criterion 4, based on the development of advanced fracture mechanics technology using the leak before break concept. A new section was added to the Standard Review Plan in 1987 (SRP 3.6.3). A Safety Evaluation in Appendix J of SSER5 approved elimination of postulated primary loop pipe ruptures as a design basis for both units. In SSER5 the NRC concluded that the probability or likelihood of large pipe breaks occurring in the primary coolant system loops of WBN Units 1 and 2 was sufficiently low such that dynamic effects associated with postulated pipe breaks need not be a design basis. The staff concluded in SSER12 (section 3.6.3) that TVA could eliminate pressurizer surge line rupture from the design basis for Units 1 and 2. The FSAR was revised to reflect the specific application. This issue is closed for WBN Unit 2.

A-3: Westinghouse Steam Generator Tube Integrity
In SER Section 5.4.2.2, potential degradation caused by flow-induced vibration in the preheater section of the Model D-3 steam generators at power levels above 50 percent was identified in nondomestic facilities. TVA implemented the NUREG-0966 modifications to address this. See further discussion in section 5.4.2 of the WBN Unit 2 Regulatory Framework.

In GL 85-02, "Staff Recommended Actions Stemming from NRC Integrated Program for the Resolution of Unresolved Safety Issues Regarding Steam Generator Tube Integrity," NRC requested information on WBN's program for steam generator tube integrity. In NUREG-0844 (draft attached to GL 85-02), NRC concluded that risk from steam generator rupture events is not a significant contributor to total risk at a given site, nor to the total risk to which the general public is routinely exposed. TVA responded to the GL on June 17, 1985. This GL is closed / implementation, with a required action to perform steam generator inspections.

A-9: ATWS
This issue was resolved for WBN in SSER 9, Appendix W, "Safety Evaluation Report, Watts Bar Nuclear Plant, Units 1 and 2, Compliance with ATWS Rule, 10 CFR 50.62." This issue is closed / TSs with a required action to address in TSs, as appropriate. See further discussion in Section 7.7.8 of the WBN Unit 2 Regulatory Framework.

A-11: Reactor Vessel Materials Toughness
In Appendix C of the SER, NRC staff concluded that the WBN Unit 2 reactor vessel meets 10 CFR 50 Appendix G requirements. This issue is closed for WBN Unit 2.

A-12: Fracture Toughness of Steam Generator and Reactor Coolant Pump Supports
Resolved by GL 80-46/47 - Generic Technical Activity A-12, "Fracture Toughness and Additional Guidance on Potential for Low Fracture Toughness and Laminar Tearing on PWR Steam Generator Coolant Pump Supports." No response was required for this GL, and NUREG-0577, "Potential for Low Fracture Toughness and Lamellar Tearing on PWR Steam Generator and Reactor Coolant Pump Supports," states that the lamellar tearing aspect of this issue was resolved by the NUREG. Further, the NUREG states that for plants under review, the fracture toughness issue was resolved. This issue is closed for WBN Unit 2.

A-17: Systems Interactions in Nuclear Power Plants
GL 89-18 resolved this issue and required no licensee action. This issue is closed for WBN Unit 2.

A-24: Qualification of Class 1E Safety-Related Equipment
This is an open SP for WBN Unit 2.

A-26: Reactor Vessel Pressure Transient Protection
NRC approved in SSER2 (see Section 5.2.2, "Overpressure Protection").
GL 88-11, "NRC Position on Radiation Embrittlement of Reactor Vessel Material and its Impact on Plant Operations," provided additional guidance. NRC accepted WBN approach by letter dated June 29, 1989, for both units. GL 88-11 is closed / implementation, with a required action to submit pressure temperature curves.

A-31: RHR Shutdown Requirements
Resolution of this issue was documented in Section 5.4.3, "Residual Heat Removal System," of the SER and SSER5. Section 5.4.3 is closed / implementation, with a required action to verify installation of an RHR flow alarm to alert the operator to initiate alternate cooling modes in the event of loss of RHR pump suction.

A-36: Control of Heavy Loads Near Spent Fuel
This USI was resolved with the issuance of GL 80-113. GL 80-113 was superseded by GL 81-07, "Control of Heavy Loads." GL 81-07 is closed / implementation, with a required action to be in compliance with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants."

A-40: Seismic Design Criteria
The USI was resolved and new requirements established by revisions to the NUREG-0800, "Standard Review Plan," Sections 2.5.2, 3.7.1, 3.7.2, and 3.7.3 in 1981. As part of the resolution of USI A-40, the method of analysis of above ground, flexible, vertical tanks was identified as a topic requiring technical resolution. In SSER7, Section 3.7.3, "Seismic Subsystem Analysis," NRC found the criteria for evaluating the refueling water storage tank (RWST) met the requirements of SRP section 3.7.3. The staff concluded that the issue of wall flexibility was considered resolved. The evaluation of RWST structural integrity was performed during a civil calculation audit as part of the Design Baseline Verification CAP. This is an open CAP for WBN Unit 2.

A-43: Containment Emergency Sump Performance
The initial NRC review of the WBN sump design against RG 1.82, Revision 0, is in SER Section 6.3.3. In GL 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors," NRC requests addressees perform new, more realistic analysis to confirm functionality of emergency core cooling systems and containment spray systems during design basis accidents requiring recirculation operations. GL 2004-02 is open / validation. Prior to fuel load, WBN Unit 2 will install new sump strainers identical to WBN Unit 1. As part of the modification, TVA will perform the necessary containment walkdowns and analysis (debris generation study, debris transport analysis, chemical effects and downstream effects analysis) for WBN Unit 2. TVA will inspect and repair service level I coatings and limit fibrous insulation to the extent practicable. The programmatic controls that ensure potential sources of debris introduced into containment are assessed for potential adverse effects will be put in place prior to fuel load.

The NRC performed an audit of the WBN Unit 1 sump evaluations and issued a final report by letter entitled "Watts Bar Nuclear Plant, Unit 1 – Audit Report of New Strainer Design in Response to Generic Letter 2004-02 and Generic Safety Issue -191" dated February 7, 2007. The letter concluded that "overall the staff's impression is that the WBN new sump modifications appear to be robust with sufficient design margin."

A-44: Station Blackout
Resolution of this issue led to revision of 10 CFR 50.63, "Loss of all alternating current power." A SE was issued for both units on March 18, 1993; a SSE was issued for both units on September 9, 1993. This issue is closed / implementation, with a required action to implement station blackout requirements.

A-45: **Shutdown Decay Heat Removal Requirements**
SECY-88-260, "Shutdown Decay Heat Removal Requirements (USI A-45)," stated that resolution of this issue would be through plant specific analysis under the Individual Plant Evaluation (IPE). For WBN Unit 2, GL 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities," is Open with required action to perform the IPE for Unit 2.

A-46: Seismic Qualification of Equipment in Operating Plants
The scope of Task A-46 is limited to dealing with the seismic qualification of equipment in currently operating plants. The NRC evaluation of WBN's seismic qualification of equipment was done in NUREG-0847, Section 3.10, on a case-by-case basis. In SSER 3, this USI was deleted.

A-47: Safety Implications of Control Systems
GL 89-19, "Request for Actions Related to Resolution of Unresolved Safety Issue A-47, Safety Implication of Control Systems in LWR Nuclear Power Plants Pursuant to 10 CFR 50.54(f)," communicated plant specific actions to resolve this issue. For WBN Unit 2, GL 89-19 is closed / implementation, with a required action to perform evaluation of common mode failures due to fire.

A-48: Hydrogen Control Measures and Effects of Hydrogen Burns on Safety Equipment
Generic resolution was by rulemaking under 10 CFR 50.44. A-48 was resolved in SSER8. To meet the rule, a hydrogen-ignition system with igniters located throughout the containment is used. Hydrogen SRP Section 6.2.5 is Open. The hydrogen recombiners will be removed from the design and licensing basis based on 10 CFR 50.44 final rule, September 16, 2003.

A-49: Pressurized Thermal Shock
Generic resolution by rulemaking under 10 CFR 50.61, Regulatory Guide 1.99 and GLs 88-11 and 92-01. For WBN Unit 2, GL 92-01 is closed. GL88-11 is closed / implementation, required action--submit pressure-temperature curves.

Summary

In the SER, 19 USIs were determined to be applicable to WBN. The USIs are either closed, deleted, associated with the SER Framework, WBN Unit 2 Generic Communications, or are part of the CAPs and SPs.

The following table summarizes the current status of each applicable USI:

USI	Status	Comment
Item A-1: Water Hammer	Closed	-
Item A-2: Asymmetric Blowdown Loads on Reactor Primary Coolant Systems	Closed	-
Item A-3: Westinghouse Steam Generator Tube Integrity	Closed / Implementation	GL 85-02 tracked with Generic Communications
Item A-9: ATWS	Closed / Technical Specifications	Tracked with SER section 7.7.8
Item A-11: Reactor Vessel Materials Toughness	Closed	-
Item A-12: Fracture Toughness of Steam Generator and Reactor Coolant Pump Supports	Closed	-
Item A-17: Systems Interactions in Nuclear Power Plants	Closed	-
Item A-24: Qualification of Class 1E Safety-Related Equipment	Open	Tracked with CAPs / SPs
Item A-26: Reactor Vessel Pressure Transient Protection	Closed / Implementation	GL 88-11 tracked with Generic Communications
Item A-31: RHR Shutdown Requirements	Closed / Implementation	Tracked with SER section 5.4.3
Item A-36: Control of Heavy Loads Near Spent Fuel	Closed / Implementation	GL 81-07 tracked with Generic Communications
Item A-40: Seismic Design Criteria	Open	Tracked with CAPs / SPs
Item A-43: Containment Emergency Sump Performance	Open / Validation	GL 2003-02 tracked with Generic Communications
Item A-44: Station Blackout	Closed / Implementation	Tracked with SER section 8.4
Item A-45: Shutdown Decay Heat Removal Requirements	Open	GL 88-20 tracked with Generic Communications
Item A-46: Seismic Qualification of Equipment in Operating Plants	Deleted	-
Item A-47: Safety Implications of Control Systems	Closed / Implementation	GL 89-19 tracked with Generic Communications
Item A-48: Hydrogen Control Measures and Effects of Hydrogen Burns on Safety Equipment	Open	Tracked with SER section 6.2.5
Item A-49: Pressurized Thermal Shock	Closed / Implementation	GL 92-01 tracked with Generic Communications