



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-390/93-86 and 50-391/93-86

Licensee: Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 & CPPR-92

Facility Name: Watts Bar 1 and 2

Inspection Conducted: November 29 - December 22, 1993

Team Leader: *R. D. Gibbs*
R. D. Gibbs, Project Engineer

1/24/94
Date Signed

Inspectors: J. H. Greene, NRC Contractor
K. W. Van Dyne, NRC Contractor
B. W. Smith, NRC Contractor

Approved by: *P. E. Fredrickson*
P. E. Fredrickson, Section Chief
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1/24/94
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SUMMARY

Scope:

This special, announced inspection was conducted to review the QA records and the QA record plans for the Electrical Equipment, Instrument Line Supports, Foundations, and Concrete Structures hardware elements of the Additional Systematic Records Review (ASRR) portion of the QA Records Corrective Action Program (CAP).

Results:

Review of the record plan for Electrical Equipment identified a number of technical deficiencies, which led the team to conclude that the plan, as originally presented for inspection, was technically inadequate. As a result, TVA issued a revision to that record plan. In addition, TVA planned to conduct an additional review of the record plans, which have not yet been inspected by NRC, in an effort to incorporate lessons learned from NRC inspections of all record plans to date (See paragraph 4.a for additional information on this subject). Inspection team review of the record plans for Instrument Line Supports, Foundations and Concrete Structures identified only

minor deficiencies in those plans. Those deficiencies were corrected by TVA during the inspection.

TVA was able to retrieve all records requested by the inspection team, or was able to retrieve the alternate records that were specified as the licensing basis records by the applicable QA record plan. The records for Electrical Equipment, Foundations and Concrete Structures adequately documented installation of the hardware in the plant.

Inspection Team review of the records for technical adequacy, identified one significant issue involving the technical adequacy of the bounding analysis for the sampling of instrument line supports. The team noted that the bounding analysis for sampling of instrument line supports did not meet the latest site procedure for sampling. In addition, conditions noted during the records review and walkdown of two of the supports selected for inspection were not bounded by the sampling analysis. This issue is identified as an Unresolved Item (See paragraph 5.a and 5.c).

In addition, the inspection identified two examples of failure to follow procedure concerning the installation of valve motors. These problems were of only minor safety significance, and TVA's corrective actions (planned and taken) were determined to be adequate to address the deficiencies. As a result, no enforcement action will be taken and the problems are identified as a Non-cited Violation (See paragraph 4.c). An additional issue concerning the corrective action for a site issued deficiency report will require followup during a later inspection (See paragraph 5.d).

Review of ASRR identified findings and corrective actions for those findings determined that the corrective actions were adequate.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. Adair, Lead Civil Engineering Manager
- *A. Capozzi, PAC/AQ Manager
- *J. Christensen, Construction QA Manager
- *W. Elliott, Engineering and Modifications Manager
- *D. Harrison, Project Manager
- *J. Hubbuck, QA Specialist
- *F. Laurent, Manager QA Special Projects
- *R. Lewis, Project Manager
- *D. Malone, Quality Engineering Manager
- *W. Museler, Site Vice President
- *C. Nelson, Maintenance Manager
- *P. Pace, Compliance Licensing Manager
- *G. Pannell, Site Licensing Manager
- *L. Peterson, QA Records Project Manager
- *J. Swanson, Mechanical Maintenance Manager
- *K. Westervelt, QA Records Engineer

Other licensee employees contacted included engineers and administrative personnel.

NRC Resident Inspectors

- G. Walton, Senior Resident Inspector, Construction
- K. Van Doorn, Senior Resident Inspector, Operations
- J. Lara, Resident Inspector
- *K. Ivey, Resident Inspector
- M. Glasman, Resident Inspector

Other NRC Employees

- *R. Gibbs, Project Engineer, RII

NRC Contractors

- *B. Smith
- *K. Van Dyne
- *J. Greene

*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Background

The QA Records CAP was developed by TVA to address an adverse trend in CAQs, which indicated that records at Watts Bar (1) were not retrievable in a timely manner, (2) were maintained in improper storage, and (3) had quality problems (e.g., were incomplete, technically or administratively deficient). Initially the CAP was directed at corrective actions for known records problems which were identified on CAQs. During later versions of the CAP, the ASRR was added to the CAP, which provided for a systematic evaluation of all Watts Bar records in accordance with ANSI N45.2.9. The ASRR includes several different types of records reviews: the records quality review assesses the retrievability and quality of all of the ANSI types of records, the records hardware review compares the records to the installed hardware, and the records technical content review compares the design output to the hardware and records.

In 1985/1986 TVA began a recovery process to ensure that Watts Bar was adequately constructed (i.e., plant hardware was acceptable). This recovery process has been and continues to be accomplished by various CAPs and SPs, as well as corrective actions to nonconformance reports, resolution of employee concerns, corrective actions for CDRs, etc. During each of these corrective actions, records have been developed which document the completion of corrective actions. These records are being used by TVA to supplement the original construction records, or, in some cases, serve as a substitute for the original construction records. These corrective actions are termed by TVA as "alternate technical basis" and the records developed by these efforts are termed "alternate records".

As a result of the findings by the ASRR and in an effort to properly document the construction records licensing basis for Watts Bar, TVA has developed a series of QA record plans, which describe in detail the records which are applicable to each type of system, structure, or component. These record plans make use of the extensive CAPs and serve as a "road map" to define which records provide the licensing basis, i.e. original construction records in combination with alternate records. TVA has developed thirty nine (39) of these record plans. The NRC plans to review these record plans and the associated plant records to verify technical adequacy of Watts Bar records for licensing. This inspection of Electrical Equipment, Instrument Line Supports, Foundations and Concrete Structures involved the review of the individual record plans, record retrievability, the technical adequacy of the records, and a sampling of the corrective actions for ASRR identified records problems.

3. Inspection Scope (TI 2512/28)

a. Record Plan Review

Part of this inspection was conducted to review the QA Record Plans for Electrical Equipment (Revision 4, dated August 11, 1993), Instrument Line Supports (Revision 2, dated June 2, 1993),

Foundations (Revision 2, dated April 12, 1993), and Concrete Structures (Revision 2, dated April 12, 1993). These plans included a matrix of approximately fifteen to twenty attributes which are critical to the proper installation of these items in the plant. For each of these attributes the plans listed the TVA record type, the original inspection process procedures, and the alternate records which were applicable (if any). In addition, the plans indicated which process procedures were applicable based upon the period of time when the item was installed or modified. Each attribute listed on the record plans included a highlighted area, which indicated the licensing records basis for each attribute (i.e., old construction records or alternate basis records).

The inspection team conducted a review of the technical adequacy of the records licensing basis for each attribute. For attributes where the original construction records were the licensing basis, (i.e., original procedures were referenced) the team reviewed the referenced procedures to determine what records were required. This information was used in the detailed records review which is discussed in paragraphs 4.c, 5.c, and 6.c of this report. For attributes where an "alternate technical basis" or alternate records were used, the team reviewed the referenced alternate technical basis to verify that the alternate basis adequately addressed (and took corrective action for) the attribute being reviewed. The team also determined what records were generated by this alternate basis, and used this information in the detailed records review which is discussed in paragraph 4.c, 5.c, and 6.c of this report.

b. Retrievability

The TVA data bases and drawings related to electrical equipment, instrument line supports, foundations and concrete structures at Watts Bar were used to select a sample of specific areas for review during this inspection. From this data a sample of items was selected to determine if TVA was able to retrieve the construction records. The listing of items selected, and a generic listing of the types of records provided by TVA is included in Attachment A to this inspection report. The records for these items were selected completely independent of records reviewed by TVA during performance of the ASRR, in order to compare the results of this inspection to the deficiencies identified by ASRR. The records for the items listed in Attachment A were reviewed to verify that TVA was able to retrieve the records. In addition, TVA was requested to retrieve supplementary records such as welder/inspector qualification records, NDE records, receipt inspection reports, etc. The inspection team verified that these records could also be retrieved, and reviewed these records for technical adequacy (see paragraphs 4.c, 5.c, and 6.c below and Attachment B).

c. Records Review

The inspection team selected a smaller subset of the retrieved records (from paragraph 3.b) for a more detailed technical review. These records were reviewed against the design output documents (drawings, design changes, workplans, etc.) and the installation of materials in the plant (including a plant walkdown), to determine if the records and installation agreed with the design. The records were also reviewed to verify whether or not the records properly documented the technical attributes of the installed equipment. In addition, supplementary records such as welder/inspector qualification records, NDE records, receipt inspection reports, etc. were requested from TVA and were reviewed by the inspection team. The record plans for electrical equipment, instrument line supports, foundations and concrete structures were used in this review to determine if installation had been properly documented. For attributes where the plan specified that the original construction records were the licensing basis, this consisted of a review of the applicable inspection procedures and verification that the appropriate records required by procedure had been completed during the performance of the original work. For attributes where the plan specified an alternate record as the licensing basis, this consisted of a review of the alternate basis to determine if the attribute was bounded by the alternate records.

d. ASRR Deficiencies and Corrective Actions

The ASRR performed several general types of records and hardware reviews which are discussed in detail in the QA Records CAP. The deficiencies identified by these reviews were documented and resolved in several different ways. Record quality review deficiencies were documented (as RRSSs) on WBSCA910227, the workplan reviews were documented (as SPERs) on WBP910463, and the hardware review and technical content review deficiencies were documented and resolved in most cases on the evaluation checklists used to perform the review.

The inspection team requested TVA to provide a copy of all deficiencies found by the above ASRR reviews within the electrical equipment, instrument line supports, foundations and concrete structures hardware elements. The team reviewed a sample of these deficiencies within each of the hardware elements to determine what types of problems had been found by TVA, and to determine the adequacy of corrective actions for these items. Specific information regarding this review is included in paragraphs 4.d, 5.d, and 6.d of this report.

4. Electrical Equipment - Inspection Results (TI 2512/28)

a. Record Plan Review

Review of the Electrical Equipment Record Plan (Rev. 4, dated August 11, 1993) resulted in the following observations and concerns (records and procedures discussed are further detailed in Attachment A):

General Observations and Concerns:

- The electrical equipment record plan was arranged such that it contained seven separate sections that covered the following generic electrical equipment categories: 1) switchgear and motor control centers; 2) panels and boards; 3) containment electrical penetrations; 4) batteries; 5) transformers; 6) inverters and battery chargers; and 7) motors and generators. During the inspection team's initial review it became apparent that observations made in one area of the record plan were usually applicable to another area of the record plan. Additionally, a significant number of technical deficiencies were noted in the record plan. Consequently, TVA revised the record plan to 1) correct the technical deficiencies identified by the inspection team, and 2) enhance user friendliness by providing a generic and equipment specific section to eliminate redundancy.

The inspection team reviewed the revised record plan and concluded that the revision enhanced the user friendliness of the record plan and adequately addressed the inspection team's specific observations and concerns detailed in subsequent paragraphs of this report.

- Based on the significant number of technical deficiencies noted during this review, the inspection team requested a meeting with site management. In this meeting the inspection team expressed their concerns over the number of technical deficiencies identified in the record plan. The inspection team further noted that TVA QA had performed an assessment of the QA Records CAP, including a review of the individual record plans, and failed to identify the technical deficiencies identified by the inspection team.

TVA acknowledged the inspection team's concerns and planned to conduct a further assessment of the remaining record plans. This assessment will be designed to ensure the record plans are technically adequate and that the types of observations and concerns documented in this report, and previous NRC reports, are addressed. The adequacy of this assessment will be evaluated in future inspections of the QA Records CAP.

Specific Observations and Concerns:

- The record plan did not list initial Control Circuit Functional Testing (Test 75) as an attribute to be verified. This testing was required to be performed on various types of electrical equipment to support installation testing and documentation. This deficiency was discussed with TVA.

TVA determined that Control Circuit Functional Testing was a required record that should have been included in the record plan. The record plan was revised to include the attribute "Control Circuit Functional Testing" with Test 75 being the primary QA record for demonstrating compliance with this attribute.

The inspection team verified the revision to the record plan and requested that these records be included in the applicable record packages inspected for retrievability during this inspection (refer to section 4.b of this report). This deficiency was considered to be satisfactorily resolved.

- The record plan did not specify welding as an attribute to support inverter installation. The inspection team determined that the installation of the inverters required the inverter sills to be welded to anchor plates, thus requiring weld records to support the installation. This issue was discussed with TVA.

TVA agreed with this issue and revised the record plan to include welding as an attribute to support inverter installation.

The inspection team verified the revision to the record plan and requested that these records be included in the inverter record packages inspected for retrievability during this inspection (refer to section 4.b of this report). This issue was considered to be satisfactorily resolved.

- The record plan did not list Final Internal Wiring Verification (Test 61), Termination From (Test 55), and Termination To (Test 56) as being required to support installation of electrical equipment. This observation was discussed with TVA.

TVA responded that these tests are required QA records to support installation activities and are already included under the Cable Record Plan.

The inspection team verified that these attributes were covered by the Cable Record Plan and concluded that no action was required for this observation.

- Inventory and Assembly (Test 02) and Circuit Breaker (Test 05) were listed on the record plan along with Device Installation Inspection (Test 25) as being the primary QA records to support the configuration attribute. The inspection team could not determine how Test 02, and 05 supported the configuration attribute and requested TVA to clarify this issue.

TVA responded that Test 02 and Test 05 did not provide any support for this attribute. Test 25 is the primary QA record for this attribute. The record plan was revised to remove Test 02 and Test 05 from the record plan.

The inspection team verified the revision to the record plan and agreed with the resolution to this concern.

- Test 83 was listed as the primary record to support the pressure rating attribute for electrical penetrations. This test only documented the fact that the pressure leak test was performed. The actual testing data was documented in QCT-3.6, Test 46, and appeared to be the appropriate QA record to reference for this attribute. This observation was discussed with TVA.

TVA responded that QCT-3.6, Test 46, would be included in the record plan to support the pressure rating attribute for electrical penetrations.

The inspection team verified that QCT-3.6, Test 46, was added to the record plan and agreed with the resolution to this observation.

- QCP-3.6, Test 00 (Receipt of Permanent Material) and Test 02 (Inventory and Assembly) were highlighted on the record plan for the material attribute. A review of the record requirements for these tests indicated that they would not adequately document the material attribute. The inspection team noted that QCP-1.6 and 1.06, Receipt, Inspection, Storage, and Withdrawal of Permanent Equipment, appeared to provide the appropriate records required to support the material attribute. This concern was discussed with TVA.

TVA agreed with the inspection team's conclusions and indicated that the record plan would be revised to list QCP-1.6 and 1.06 as the primary record to support the material attribute.

The inspection team verified the revision to the record plan and requested that these records be included in the record packages inspected for retrievability during this inspection (refer to section 4.b of this report). This concern was considered to be satisfactorily resolved.

- QCP-3.6, Electrical and Instrumentation Equipment Installation, Standard Tests, Inspections, and Documentation, listed the following tests as being performed on liquid filled transformers:

- 6-27 - Doble Power Factor Tests on Bushings
- 6-29 - Post Installation Assembly Including Insulating Oil Fill of Transformers, Power Circuit Breakers and other Devices
- 6-33 - Doble Power Factor Test for Transformers, Power Circuit Breakers, and other Equipment except Bushings
- 6-36 - Ratio and Polarity Tests for Transformers
- 6-37 - Initial Calibration of Graphic and Indicating Meters or Devices
- 6-43 - Kelvin Bridge Resistance Test
- 6-80 - Operational Check of Coolers and Fans and Controls for Large Power Transformers

None of the above tests were listed on the record plan for Transformers, even though they appeared to support original installation attributes. Several of these Tests (6-27, 6-29, 6-33, 6-36, and 6-43) were contained in the records packages provided to the inspection team for review. TVA was requested to evaluate the need to include these on the record plan for Transformers.

TVA responded that Tests 6-29, 6-37, and 6-80 were not considered Life of Plant (LOP) documents and were not maintained. Test 6-27, 6-33, 6-36, and 6-43 had been categorized as LOP documents and should have been listed on the record plan. The record plan was revised to include these tests, along with Test 6-25, Device Installation, as providing the specific installation records for Transformers.

The inspection team verified the revision to the record plan and concluded the referenced tests were adequate to support specific installation records for Transformers.

b. Retrievability

For the electrical equipment under review, construction records were retrievable or alternate records were provided.

- During the review of 1-MCC-213-A1-A, 480 Volt Reactor MOV Board, the inspection team was unable to locate Test 62A, Inspection of Bolted Electrical Connections. This was the only record listed on the record plan as documenting this type of inspection, with the exception of general note number five. This note indicated that maintenance records may provide the most current documentation of the

achievement of an installation attribute. The inspection team requested TVA to provide Test 62A for 1-MCC-213-A1-A or provide additional documentation showing acceptability of this attribute.

TVA provided the inspection team with a section of SCAR No. WBP870036SCA which documented the missing Test 62A for 1-MCC-213-A1-A. This condition was evaluated as acceptable by verification that Maintenance Instruction MI-57.20, Periodic Inspection of 480V and 6900V Switchgear Bus and 480V Motor Control Center Bus, had been performed on 1-MCC-213-A1-A as documented on WO#C152554.

The inspection team reviewed the applicable portion of SCAR No. WBP870036SCA and WO#C152554. The inspection team agreed that this documentation provided an alternate record that adequately addressed the inspection of bolted electrical connections.

c. Records Review

From the list of electrical equipment in Attachment A, a sample of twelve items were chosen for a detailed review of the hardware and supporting documentation. These twelve items and specific records reviewed are listed in Attachment B. Specific observations resulting from this review are detailed below:

1-BD-211-A-A, 6.9 KV shutdown board:

- Purchase Specification 1765 required power equipment to be vendor tested at not less than 36 kv for 1 minute with breakers open and closed. The inspection team could not determine from the test data provided that this test was conducted with the breakers in the open and closed position. TVA was requested to resolve this issue.

TVA responded that the test was conducted in accordance with ANSI and NEMA standards as recorded on the test data sheets contained in the records package. A copy of ANSI C.37.09-1964 (R1969) was provided to the inspection team for review. The testing instructions in this document required this test to be conducted with the breaker contacts open and closed. In addition, TVA provided a copy of TVA Inspection Report 16, dated March 3, 1975, which documented this type of testing being performed on the 1200 amp 1E breakers in the open and closed positions.

Based on the information provided, the inspection team concluded that adequate documentation was available to support breaker testing in the open and closed position. This concern was resolved.

- Purchase Specification 1765 required calculations or other documentation to be furnished by the vendor to confirm that the method of attaching the shutdown board to the sill channels would meet the design basis earthquake (safe shutdown earthquake) conditions. The inspection team could not locate a specific document in the records package that provided this information. TVA was requested to furnish documentation that indicated this requirement was met.

TVA provided the inspection team with Vendor Seismic Test Report No. 0317HA300. This report required the shutdown board to be mounted in accordance with drawing 0121D3495. This drawing showed that the attachment to the test stand utilized the same mounting holes in the shutdown board frame and the same anchor bolts for attaching the shutdown board to the test stand as was used to mount the shutdown board to the sill channels during permanent installation in the plant.

The inspection team reviewed Seismic Test Report 0317HA300, drawing 0121D3495, and equipment seismic qualification walkthrough report for 1-BD-211-A-A. In addition, the inspection team conducted a visual inspection of the permanent mounting method to confirm agreement with the test stand mounting method. The inspection team agreed that the records furnished provided satisfactory documentation to support that the method of mounting the shutdown board to the sill channels was adequate. This concern was resolved.

- The equipment seismic qualification walkthrough report for 1-BD-211-A-A identified a number of discrepancies that required an evaluation for acceptability. The types of problems noted were: 1) bolts missing, 2) panel clips not welded, 3) questions on mounting acceptability, 4) additional loading, and, 5) thread engagement. In each case a technical justification was provided. These included the issuance of a work order, DCN, calculations, and use-as-is determinations.

The inspection team reviewed the corrective actions for the noted discrepancies and concluded that these actions were adequate to resolve the discrepancies.

- During the field inspection of the 6.9 KV shutdown board, the inspection team noted that a bolt was missing on the rear enclosure of panel 6, and a washer was missing from the front of panel 12.

TVA initiated WR# C176031 to correct these items.

The inspection team concluded this action was adequate to address the missing hardware.

1-OXF-212-A-A, 480V shutdown board emergency transformer 1A-A:

- Contract 74C2-84647 for the 480 volt switchgear and transformers required the Unit 1 shutdown board transformer (item 9) to be a 1500 kva unit. Receipt and inspection documentation, vendor test data, and field verification by the inspection team confirmed this transformer was a 2000 kva unit. The inspection team discussed this observation with TVA.

TVA provided the inspection team with Change No. 1 to Contract 74C2-84647, which authorized changing the shutdown board transformer from 1500 kva to 2000 kva.

The inspection team reviewed Change No. 1 to the contract and concluded the installed 2000 kva shutdown board transformer was adequately documented.

- Drawing 8278D74 was initially provided to the inspection team as the detailed drawing covering 1-OXF-212-A-A. This drawing was for a 1500 kva unit board common emergency transformer. TVA provided this drawing based on information obtained in the Equipment Management System (EMS) for 1-OXF-212-A-A. The inspection team discussed this observation with TVA.

TVA determined that this drawing was in error and provided the inspection team with Drawing 8278D71, Shutdown Board Transformer Items 9 and 11. TVA further determined that EMS was in error for 1-OXF-212-A-A (item 9) and correct for 1-OXF-212-B-B (item 11). EMS was updated to reflect the correct drawing.

The inspection team verified that Drawing 8278D71 was applicable to 1-OXF-212-A-A and verified the change to EMS. This observation was satisfactorily resolved.

1-ARB-082-B-B, diesel generator 1B-B protection relay panel 1:

- Test Card 26, Inspection of Welds on Electrical & I&C Equipment, which would have documented the welding of the relay panel sill to the embedded plate in the concrete pad, could not be retrieved. However, the record plan listed the Equipment Seismic Qualification (ESQ) CAP and the Welding CAP as providing a possible alternate means of documentation to support this attribute. The inspection team requested that TVA supply the alternate records from these CAPs that would document the acceptability of the sill to embedded plate welding operation.

TVA provided the inspection team with the results of the Weld Evaluation Project (WEP) Assessment Plan No. 254,

Electrical Equipment and Support Welds. This plan, referred to as Group 254, was formed to assess the quality of welds in electrical equipment and supports. The assessment plan required a 100% visual examination of the representative sample of 64 components (385 welds). Thirty components (144 welds) were documented as acceptable without further evaluation. Thirty-four components (146 welds) were documented as having one or more deviations that required engineering analysis to determine acceptability. These welds had a suitability-for-service analysis (SFSA) performed, which determined they were acceptable. Two components (3 welds) were documented as having discontinuities that required characterization. The weld discontinuities were characterized and were determined to be acceptable.

WEP determined that Group 254 components met the applicable FSAR construction code, and concluded there were no generic problems associated with the unsampled population. Additionally, the WEP concluded with a high degree of confidence, that the unsampled components within the group boundaries also met the applicable FSAR construction code.

The inspection team agreed that the Welding CAP and WEP Group 254 sampling plan, bounded the missing weld record and provided adequate evidence that the panel sill to embedded plate weld was satisfactory.

The Equipment Seismic Qualification (ESQ) Walkthrough package for 1-ARB-082-B-B documented three potential discrepant conditions requiring further evaluation for acceptance. The three conditions were: 1) inability to verify some panel to panel bolting due to inaccessibility; 2) missing panel anchor bolts; and 3) additional conduit loading on relay panel. TVA provided the inspection team with Seismic Calculation WCG-ACQ-0526 that evaluated and dispositioned these conditions. Condition 1) had been evaluated as acceptable based on the fact that the three sections of the panel were assembled by the vendor prior to arrival on-site, and the bolts that were accessible were verified installed. Condition 2) had been dispositioned by issuing WO#C236809 to install the missing panel anchor bolts. Condition 3) had been dispositioned by performance of a seismic calculation which verified the additional mass created by the conduits was acceptable.

The inspection team reviewed the seismic calculation and concluded that the identified conditions were adequately dispositioned. Further, the inspection team verified that WO#C236809 was still open and being tracked as a required item to be closed prior to the Seismic Qualification CAP being closed. As a result of the supplemental information

provided, the inspection team had no further concerns in this area.

1-INV-235-0001-D, 12-V AC vital Inverter 1-1:

- A review of the Seismic Simulation Test Report No. 42854-1, dated May 5, 1975, performed on a specimen static inverter to prove seismic and environmental capabilities, documented that unexpected high output voltage readings were recorded during the environmental test. The inspection team could not locate a document that accepted this test report acknowledging the unexpected high output voltage readings experienced during the Environmental Test. This concern was discussed with TVA.

TVA retrieved TVA Memorandum dated June 5, 1975 which stated in part: "...results from the temperature retest made on May 20 are satisfactory, and they will be incorporated in Wyle's seismic test report. With the inclusion of the temperature retest data, we are approving the seismic test report along with other retest data acknowledged above."

The inspection team reviewed the memorandum and concluded that it satisfactorily resolved this concern.

- VTD-S250-0040, Solid State Controls, Inc. Recommended Maintenance Guide for Ferroresonant UPS Systems, Item I.D.1 recommends replacement of the electrolytic capacitors in the inverter and charger every eight to ten years as these capacitors have a ten to twelve year life before losing their capacity. The inspection team requested TVA provide records to support the last replacement of these capacitors.

TVA provided WO#93-03982-00 to the inspection team to support TVA's 7 year PM requirement for inverter capacitor replacement. This work was completed on March 20, 1993.

The inspection team reviewed the completed WO and determined it provided adequate evidence of compliance with the manufacturer's recommendation. This concern was resolved.

1-MTR-063-0072-A, 480V motor for containment sump valve to RHR pump 1A-A (valve 1-FCV-63-72-A):

- WO#91-00759-15 and WO#91-00759-21 documents the installation of replacement motors for 1-FCV-063-0072-A and 1-FCV-063-0073-B respectively. These motors are identical and are installed on valves that provide the same design function for Train A and B. Documentation contained in the work orders indicated that the motors were swapped during the installation process. Although nuclear engineering had approved the installations, and EQ engineering had

recognized that the motors had been swapped, the corrective actions taken at that time were inadequate. SSP-10.04, Material Issue, Control, and Return, step 2.3.2, required a Material Transfer Document to be completed in order to correctly document the reassignment of the motors to a different work authorizing document other than that referenced on the original Nuclear Storeroom Requisition form 575N. This document was not processed.

Additionally, during the review of WO#91-00759-15, the inspection team noted that the verification step for motor installation (step 7) was signed the day before engineering review of the nameplate motor data (step 3). This WO and DCN P-01667-C required engineering review prior to motor installation. Discussion with TVA personnel indicated that the intent of this requirement was for engineering to review the motor data prior to returning the motor to service, which was accomplished. Although this item appeared to be of little safety significance, the inspection team concluded that this item was still a failure to follow the specific instructions of the WO.

The inspection team discussed the failure to comply with the requirements of SSP-10.04, and the failure to comply with the requirements of WO#91-00759-15 and DCN P-01667-C with TVA. TVA agreed with the inspection team's findings. Problem Evaluation Report (PER) No. WBP930502 was issued to document these specific issues and initiate the corrective actions necessary to resolve the documentation discrepancies. PER No. WBP930330, Rev. 0, verbatim compliance and procedural adherence problems, (written on October 14, 1993) would be used as the corrective action vehicle to address the failure to comply with procedures issue detailed above.

The inspection team reviewed PER's WBP930502 and WBP930330 and determined that the corrective actions planned and completed were adequate to correct the records in WO#91-00759-15 and to address the failure to follow procedures.

The failure to follow procedures is a violation of 10 CFR 50, Appendix B, Criterion V. This violation was considered minor in nature and the corrective actions completed and planned are considered adequate to resolve the violation. Therefore, this NRC identified violation is not being cited because criteria specified in Section VII.B.(1) of the Enforcement Policy were satisfied. This violation is identified as NCV 390, 391/93-86-01, Failure to Follow Procedures for Valve Motor Installation.

1-PENT-293-0043D, safety related cable penetration (nuclear instrumentation channel I):

- This electrical penetration had been purchased with a pressure gage installed for the purpose of monitoring the nitrogen pressure inside the penetration. Field inspection of the penetration revealed that this gage was removed. Design Criteria WB-DC-40-66, Penetration Assemblies and Seals for Category I Structures, specified that the electrical penetrations are not required to be filled with pressurized dry nitrogen except for leak testing. This would appear to support a design change to remove these gages. The inspection team requested TVA to provide either the design change that authorized removal of this gage or the document that was tracking reinstallation of this gage.

TVA provided the inspection team with DCN 24448-B which authorized removal of the electrical penetration gages.

The inspection team reviewed the DCN to verify applicability to penetration 1-PENT-293-0043D and concluded that this issue had been adequately resolved.

d. ASRR Deficiencies and Corrective Actions

RRSS-80, 113, and 116:

- These RRSS's documented numerous retrievability problems associated with nonpermanent vendor records. These records were 1) Certification of Inspection and Test Personnel Qualification, 2) Work Processing and Sequencing Documents, and 3) Electrical Control Verifications and Test Results. TVA determined that the inability to retrieve the nonpermanent vendor records would not affect operability because these records provided no significant value in 1) demonstrating the capability for safe shutdown, 2) maintaining, repairing, or replacing components, 3) determining the cause of an accident or malfunction, and 4) providing baseline data for inservice inspection. In the case of the Electrical Control Verifications and Test Results records it was determined that most of the documentation would most likely be available in the "backfile" located in Chattanooga. The "backfile" was a non-indexed file composed of vendor QA records, contract and procurement files, personnel certification records, and other vendor type records. However, TVA further determined that subsequent construction and preoperational testing would provide adequate documentation of testing to verify integrated operation with system design.

The inspection team reviewed the dispositions for these RRSS's and in general agreed with the resolutions. However,

the inspection team noted that the Chattanooga "backfile" has subsequently been indexed into the present DCRM RIMS system, making records retrievable that were unable to be retrieved during the disposition process of these RRSS's. This is evidenced by the fact that vendor electrical test results data sheets required by specific purchase specifications were contained in the record packages requested by the inspection team for detailed review during this inspection. The inspection team concluded that the actions taken by TVA were adequate to resolve these issues.

RRSS-97:

- This RRSS documented an indeterminate number of primary deficiencies associated with electrical and mechanical equipment storage and maintenance records that were not retrievable. Fourteen components in the initial sample were determined to be Quality-Related (QR) Seismic Category 1LB (position retention only) and were replaced with 14 Quality (Q) components in the sample. Six component records were determined to be retrievable after it was discovered they were purchased as part of a unit package. One component record was retrieved from the old construction vault. This record, as well as other records found in this vault were addressed in SCAR WBP890277SCA and were transmitted to the TSOB vault for retention in hard copy. The storage and maintenance records for a motor operated valve (MOV) were determined to be unretrievable. This primary deficiency was determined to be negated due to the fact that MOV problems had already been identified in numerous industry-sponsored and regulatory reports which resulted in the establishment of the TVA MOVATS Program. This program will ensure MOV operability against design basis events prior to startup. Therefore, MOVs were excluded from this record sample and resampling was conducted to replace this component. In summary, storage and maintenance records associated with the revised random sample of electrical and mechanical components were retrieved and all deficiencies resolved.

The inspection team concluded that this action was adequate to address the identified deficiencies.

RRSS-111:

- This RRSS initially identified 15 nonretrievable records associated with electrical equipment installation. Twelve records were later found to be retrievable and were reviewed with no additional deficiencies being identified. One component was determined to be installed as a piping component and did not require this type of record. This component was replaced in the sample with a Q component and the installation record was retrieved with no additional

discrepancies identified. The retrievability of the 7 Day Tank 1B-B Fuel Oil Transfer Pump #2, 1-MTR-018-0059/2, installation record was determined to be invalid due to the CID problems identified with the diesel generator fuel oil pumps (refer to Hardware Checklist 004-008 write-up below for details) and the subsequent retrieval and review of 1-MTR-018-0054-B installation record. The last item was determined to be QR and was replaced with a Q component as QR components were determined to not require retention of this documentation. Additionally, all previous components that were QR were replaced with Q components in the sample with no additional discrepancies identified.

The inspection team agreed with the resolution to the identified discrepancies associated with electrical equipment installation records in this RRSS.

ASRR Technical Content (ordered) Review for 1-MTR-062-0108-A, Centrifugal Charging Pump 1A-A:

- This review evaluated the technical content of the following record types for 1-MTR-062-0108-A:

- 1) system description
- 2) as-constructed drawings
- 3) equipment qualification binder
- 4) calculations
- 5) insulation tests
- 6) motor rotational check

No discrepancies were noted by TVA as a result of this ordered review.

The inspection team agreed with TVA's conclusions documented in this ordered review.

ASRR Technical Content (random) review for electrical equipment insulation tests:

- This review evaluated the records for electrical equipment insulation tests for the following equipment:

- | | |
|---------------------|-------------------------|
| 1) 0-MTR-030-0714-A | 13) 1-MTR-018-0054-B |
| 2) 1-MTR-082-DOPB-B | 14) 1-MTR-062-0232-B |
| 3) 1-MTR-003-0128-B | 15) 1-MTR-030-0187-B |
| 4) 1-MTR-030-443B-A | 16) 1-MTR-067-0431-A |
| 5) 0-MTR-030-0192-A | 17) 1-HTR-068-0341A/A7A |
| 6) 1-MTR-082-A1-A | 18) 0-MTR-031-0036/2-a |
| 7) 1-MTR-031-0465-A | 19) 1-BD-235-1-D |
| 8) 2-BD-212-A2-A | 20) 1-BD-235-2-E |
| 9) 0-BD-236-2-E | 21) 1-MTR-003-0118D-A |
| 10) 1-BD-212-B2-B | 22) 0-BD-236-1-D |

- | | |
|---------------------|--------------------|
| 11) 0-BD-236-3-F | 23) 1-BD-235-4-G |
| 12) 1-MTR-30-80/1-B | 24) 1-MCC-214-A1-A |

No discrepancies were noted by TVA as a result of this random review.

The inspection team agreed with the conclusions documented in this review.

ASRR Technical Content (random) review for motor rotational check:

- This review evaluated the records for motor rotational checks for the following equipment:

- | | |
|----------------------|---------------------|
| 1) 1-MTR-003-0128-B | 4) 1-MTR-030-0187-B |
| 2) 1-MTR-067-0431-A | 5) 1-MTR-082-A1-A |
| 3) 1-MTR-003-0118D-A | |

No discrepancies were noted by TVA as a result of this random review.

The inspection team agreed with the conclusions documented in this review.

ASRR Technical Content (random) review for manufacturer performance test results:

- This review evaluated the records for manufacturer performance test results for the following equipment:

- | | |
|-----------------------|------------------------|
| 1) 0-MTR-070-0051-S | 9) 1-BKR-211-B/6-B |
| 2) 0-MTR-031-0036/2-A | 10) 1-MTR-030-0187-B |
| 3) 0-BKR-031-0036/2-A | 11) 0-BKR-031-0128/2-A |
| 4) 1-INV-235-0004-G | 12) 1-MTR-067-0431-A |
| 5) 1-MTR-003-0128-B | 13) 0-MTR-030-0192-A |
| 6) 0-BKR-031-0080/2-A | 14) 1-MCC-214-214-B1-B |
| 7) 1-BKR-070-0038-B | 15) 1-INV-235-0001-D |
| 8) 1-MTR-031-0465-A | |

No discrepancies were noted by TVA as a result of this random review.

The inspection team agreed with the conclusions documented in this review.

Hardware checklist 004-008 (1-MTR-0018-0059/2):

- This review identified a potential tagging problem associated with a diesel generator oil transfer pump. TVA's evaluation concluded that DCN-S-10581-A, Issuance of 92QL018 Q-List for System 18, had assigned unique component identification numbers (CIDs) to some components that had

not been originally identified by unique CID on several drawings. However, this DCN did not change the electrical one line drawings that made reference to these components and utilized a CID scheme that was different from the system 18 Q-List DCN. This resulted in the Q-List being in conflict with the field tag, and other drawings not referenced in the system 18 Q-List DCN. Additionally, this checklist referenced RRSS's 104, 111, and 125 as documenting problems associated with CIDs and descriptions for diesel generator fuel oil pumps and motors. DCN-S-10581-B was written on December 10, 1992 to correct the discrepancy between the Q-List and issued drawings. This DCN is being tracked against the closure of the QA Records CAP under RRSS-104.

The inspection team reviewed DCN-S-10581-A and -B; RRSS's 104, 111, and 125; and, Configuration Control Drawings (CCD) 1-45W760-82-2, 1-45W760-82-4, 1-45W732-3, 1-45W760-18-1, 1-45W732-1, 1-45W732-2, 1-45W732-3, 1-45W732-4, 1-47W840-1B, and 1-47W610-18-1. In addition, the inspection team conducted a field inspection of the fuel oil transfer system for diesel generator 1A-A. The inspection team reviewed the implementation of DCN-S-10581-B to ensure it addressed all the problems associated with this issue. The inspection team concluded that this DCN adequately addresses the CID problems associated with the DG Fuel Oil Transfer System. In addition, the inspection team reviewed the process for the correction of the tagging of components (as a result of the CID changes on the DCN) with TVA's tagging group, and concluded that adequate controls were in place to assure that the components would be adequately tagged in the field.

The inspection team concluded that the action taken and planned by TVA was adequate to address the identified deficiencies.

Hardware checklist 004-027 (0-MA-032-0084):

- This review identified that documentation could not be retrieved and field verification could not be performed on moisture alarm, 0-MA-032-0084.

TVA's resolution to this issue determined that this alarm had been originally shown on configuration control drawing (CCD) 1-45W600-57-28, Rev. 1, and as-constructed drawing 47B601-55-56, Rev. L. A subsequent revision to the design output, DCN-P-03000-A, had deleted this alarm.

The inspection team verified that DCN-P-03000-A had deleted this alarm, and concluded that the resolution to checklist 004-027 was adequate.

Hardware checklist 004-034 (1-MTR-061-0461A):

- This review identified a missing CID tag on the motor.
TVA's resolution was to initiate a temporary tag request (T390856) to have the CID tag installed.

The inspection team concluded that this action was adequate.

Hardware checklist 004-052 (1-MVOP-001-0014-A):

- This review identified a conflict between the EMS vendor information and the installation records for valve 1-FCV-001-0014-A and associated valve operator 1-MVOP-001-0014-A. A field walkdown confirmed the installation records were correct. ASRR resolution was to issue a memorandum (dated February 4, 1993) to the EMS Group requesting an update of the vendor information in the EMS data base.

The inspection team verified the EMS data base had been updated with the correct vendor information. TVA action to resolve this issue was considered adequate.

Hardware checklist 004-068 (0-HS-082-0116-B):

- This review identified a difference between the installation card and the installed CID tag for the local-normal-stop switch (0-HS-082-0116-B) associated with diesel generator 2B-B. The installation card did not have the train B designator at the end of the CID. The train B designator requirement was verified by use of the instrument tabulation drawing and the Q-List. This item was determined not to have any impact on the hardware installation and was classified as a secondary deficiency associated with record quality. Disposition of record quality secondary deficiencies were addressed generically in TVA position paper dated July 1992. This position paper concluded that record changes to correct secondary deficiencies were not required.

The inspection team agreed with TVA's resolution to this issue.

Hardware checklist 004-084 (1-BKR-030-0472-A):

- This hardware review found the field CID tag for this breaker identifying the breaker load and not breaker. Tag request T390861 was initiated to correct this discrepancy.

The inspection team agreed with TVA's resolution to this issue.

5. Instrument Line Supports - Inspection Results (TI 2512/28)

a. Record Plan Review

Review of the Instrument Line Supports Record Plan (Revision 2, dated June 2, 1993) resulted in the following observations and concerns (records and procedures discussed are further detailed in Attachment A):

- For Instrument Line Supports, NCR W334PSCA is listed on the record plan as the primary QA record for demonstrating qualification of instrument line supports for numerous attributes. Those attributes are as follows:

- * Support Type
- * Configuration
- * Clamp Type and Size
- * Structural Welding (Configuration and Location)
- * Structural Bolting
- * Clamp Tightness
- * Spring Nut Aligned In Unistrut
- * Anchor Bolt Configuration
- * Baseplate Gaps
- * Anchor Spacing to Adjacent Embed Items

NCR W334PSCA was generated on June 6, 1986 to document discrepancies associated with the Unit 1 program for the documentation of the fabrication and installation of instrument line supports. Primarily, the discrepancies were related to lost documentation and differences between existing documentation and the actual field installations. The deficiency was subsequently reported to the NRC in accordance with 10 CFR 50.55(e), as "Discrepancies Identified From Walkdown of Instrument Lines WBRD-50-390/86-29". The corrective action plan for this issue included a walkdown of a random sample of sixty supports for structural compliance with the design criteria. The data from the walkdown was provided to engineering for evaluation. Out of the sample of sixty, twenty-six supports were found to have discrepancies. Engineering performed a calculation for each of the sixty supports based on the as-built configuration to determine if they would perform their design function. The results of this evaluation indicated that supports were structurally adequate, however four instrument lines were identified which could be overstressed during worst case conditions due to loose or missing clamping. TVA concluded that "...a high confidence level exists that instrument lines will perform their intended design functions provided that attachment clamps and their respective bolts are properly installed". TVA then committed to document the proper use and installation of attachment clamps and their associated bolts via walkdowns prior to fuel load. The inspection team

determined that the corrective action for this deficiency is in progress but is not yet complete.

The inspection team found that in February of 1991, NCR W334PSCA was considered "significant" and subsequently converted to Significant Corrective Action Report (SCAR) No. NCRW334PSCA. The inspection team reviewed this SCAR for adequacy as the primary QA record for the record plan attributes listed previously. The inspection team determined that although the sampling process used was in accordance with procedures in place at that time (mid 1986), it does not meet TVA's present standard for evaluation of results. Present standards require that if discrepant items are found, an analysis must be performed to assess the underlying cause(s) even though the discrepant item would not cause the failure of the component. In addition, present standards require a review of the discrepancies and causes as applied to the entire population. In other words, this evaluation would validate that the sample selected reasonably captured (bounded) the most limiting conditions of discrepant items that existed in the total population. Based on the primary records provided, the inspection team was unable to reach the conclusion that the calculations performed, adequately bound the entire population. The inspection team learned from subsequent discussions with TVA, that other technical information is available as part of other programs and documents which can be used to validate the subject sample. TVA is in the process of collecting and organizing this information for inclusion in the record plan as primary documentation. In addition, TVA is reviewing other samples used as primary QA records in other record plans to assure their validity in representing their respective element populations. Because of the importance of this sample plan in that it is the primary QA record for the qualification of instrument line supports for 10 of the 15 record plan attributes, and the importance of using sampling in other record plans, the inspection team is identifying this issue as an unresolved item URI 50-390,391/93-86-02, Resolve Adequacy of Sample Bounding for QA Records CAP, pending further NRC review of the issue.

b. **Retrievability**

For the instrument line supports under review, the inspection team found that the records required were retrievable. However, it should be noted that for most supports in this sample, the original construction fabrication and installation records are no longer considered as the licensing basis documents. They have been replaced by programmatic alternate records. As a result, there was a relatively small number of documents to be retrieved for this inspection sample as primary records. Although unusual,

the inspection team finds this acceptable provided the unresolved item identified in section 5.a is satisfactorily resolved.

c. Records Review

From the fifteen instrument line supports for which TVA had provided the inspection team records, a sample of six was chosen for a detailed review of the hardware and supporting documentation. These six supports and specific records reviewed are listed in Attachment B. Specific observations resulting from this review are detailed below:

Support No. FOS-9267, ERCW Pumps Discharge Pressure Sensing Line:

- The inspection team noted that there were steel spacer blocks (3"x 1 5/8"x 1 5/8") between the instrument line and the unistrut support. This was not shown on the "Typical" drawing and it was not apparent from the design information on hand whether or not this was permissible. This was pointed out to TVA for resolution. TVA provided drawing 47A050-1K1 to the inspection team. This drawing contains notes stating that the spacers are allowed.

The inspection team reviewed this drawing and concluded that the spacers were authorized.

Support No. N1-072-0024, Containment Spray Pump A Discharge Pressure Sensing Line:

- The inspection team noted that this support varied from the "Typical" drawing but had no engineering approved field variance to authorize the as built configuration. This was pointed out to TVA for resolution. TVA responded by acknowledging that there are numerous examples in the plant where the as built condition is unlike the "Typical" drawings. This condition led to NCR W334-P written in 1986. As discussed earlier in this report, the inspection team identified an unresolved item regarding the adequacy of the disposition of this NCR.

The inspection team considers the field discrepancy for this particular support an example of the broader issue to be resolved by TVA's actions concerning the unresolved item.

Support No. FOS-2800, Reactor Coolant Pump 1 Outlet Flow Sensing Line:

- This support had its configuration changed in 1982 and this change was documented through Support Variance Sheet No. I-51-42B-974. However, the inspection team was unable to find an engineering calculation to substantiate the variance. TVA was questioned regarding the adequacy of this support.

TVA responded by stating that the sample of 60 as built supports per NCR W334-P provides assurance that the total population of supports is technically adequate. For additional assurance on this particular support, TVA provided an informal calculation which demonstrated that this support is structurally adequate.

The inspection team was satisfied with the response for this particular support and again, will consider the broader issue as part of TVA's actions concerning the unresolved item.

d. ASRR Deficiencies and Corrective Actions

RRSS-93:

- This RRSS identified an example where an individual's certification record pertaining to Rev. 5 of QCP-3.11, Inspection and Documentation of Instrument Line Bending and Supports, was missing. TVA determined that, although no record of training on Rev. 5 of the procedure could be located, the individual had been trained on the previous two revisions, and had maintained his certification for the previous twenty-one months. Because the revision involved only a format change, this deficiency was classified as insignificant with regard to safety and was dispositioned "accepted-as-is".

The inspection team found this resolution satisfactory.

RRSS-94:

- This RRSS documented examples where a data sheet from QCP-3.11 Rev. 5 was initialed rather than signed. In each case it was possible to identify who had initialed the blanks by referring to other blanks signed, or by referring to initial/signature logs. For each case identified, it was possible to verify that the individuals who had initialed the data sheet were authorized and qualified to perform the steps in question. As a result, deficiency was considered by TVA to be insignificant with regard to safety and was dispositioned "accepted-as-is".

The inspection team found this resolution satisfactory.

RRSS-126:

- This RRSS identified two examples of instrument line support calculations which were not retrievable by the original reviewers. The records were later retrieved by personnel more familiar with the records and the retrieval system.

The inspection team found this resolution satisfactory.

ASRR Technical Content Review and Resolution
(Ordered Review):

- This ordered review evaluated the technical content of the instrument line support records associated with ANSI record types applicable to the installation of support No. 47A600-820-001. The following record types were reviewed:

- Drawing Change Authorization
- As Constructed Drawing
- As Designed Drawing
- Support Removal, Installation, and Inspection Data Sheet
- Inspection of Bolted Connections
- Wedge Bolt Anchor Test Data
- Welding Operation Sheet
- Structural Attachment Load Transmittal Form
- Support Calculation

Within those record types, numerous attributes were considered including identification, configuration, material, location, installation, bolt tightness, anchor characteristics, weld size, and analysis technique. All aspects of this ordered review were stasured as "acceptable" with the exception of two instances. The ASRR review found that for the "material" attribute, there were three instances where the wedge bolt lengths were incorrectly described on documents. The problem was resolved by issuing Design Change Notice No. S-27159-A. In a second example, although the field configuration for a support was in accordance with design, the "as constructed" drawing did not accurately reflect the field condition. The latest design was field incorporated by Work Plan D-16507-24 but that document had not yet closed. Upon closure of the Work Plan, the "as constructed" drawing will be revised.

The inspection team reviewed all of the checklists, the verification bases, the results, and the resolution of deficiencies and found the ordered review of the instrument line supports to be acceptable.

ASRR Hardware Inspection Results and Resolutions:

- The results and resolutions of the ASRR hardware inspection was documented on Problem Evaluation Report (PER) No. WBP920070. The inspection team reviewed the PER to determine if the resolutions were adequate. The ASRR inspection identified 107 apparent deficiencies on the 72 supports inspected. Of the 107 apparent deficiencies, 42 were deemed not to require corrective action for a number of

reasons. Most were found to be authorized by the Hanger Drawing General Notes. Revision 1 of the PER provided an evaluation and justification for dispositioning another 62 as not needing additional corrective action. The bases for the dispositions were as follows:

1. (23 Items) Missing documents were subsequently retrieved.
2. (31 Items) Additional examples of previously identified conditions that are being addressed as part of the corrective action for NCRW334PSCA.
3. (3 Items) A note on a design document had been misinterpreted. No deficiencies existed.
4. (3 Items) Work previously identified on a Remaining Work List.
5. (1 Item) Work previously identified as Unit 2 incomplete work.
6. (1 Item) Items are not quality related and do not require records to be retained.
7. (1 Item) Work document already existed to resolve discrepancy.

The inspection team reviewed the deficiency list and the evaluations as explained above and agreed with the ASRR disposition.

Revision 1 of the PER also identified deficiencies not identified on Revision 0. The inspection team reviewed the corrective action plans for those deficiencies which did require further corrective action. There were several examples found by the ASRR where clamp bolts had less than the required 72 inch-pounds torque after having been documented as tightened under the Instrument Lines CAP in workplan N-W-334-P-2. As a result, the sample was expanded to include additional clamps tightened in CAP workplans to assure a 95% confidence / 95% reliability sample plan. As a result, 5 examples were found with less than required torque. The as-found torque values ranged from 63 inch-pounds to a low of 25 inch-pounds. The corrective action for this issue included laboratory testing to determine if the low torque values would prevent the support clamps from performing their design function. Although the testing is complete and the results demonstrate that the clamps are acceptable, neither WBP920070 nor calculation SD3-023 has been revised to reflect the results of this testing. Also, the inspection team determined that the cause for the loose bolts as documented in the PER was not complete. In at least one example, physical binding was the apparent cause for the low torque but this was not reflected in the PER. The inspection team also noted that no explanation was provided in the PER regarding the expanded sampling which

was performed. TVA plans to revise the PER and the calculation as follows:

- * Include an explanation of the expanded sampling as part of the PER, and revise the PER to reflect the physical binding as a cause for low torque values.
- * Revise the calculation to reflect the results of the testing as a basis for allowing lower torque values.

Followup regarding implementation of these revisions is identified as Inspector Followup Item (50-390, 391/93-86-03), Verification of TVA's Corrective Actions in WBPER920070 regarding low torque values on instrument support clamping bolts.

6. Concrete Structures and Foundations - Inspection Results (TI 2512/28)

a. Record Plan Review

Review of the Concrete Structures Record Plan (Rev. 2, dated April 12, 1993) and the Foundations Record Plan (Rev. 2, dated April 12, 1993) resulted in the following observations (records and procedures discussed are further detailed in Attachment A):

- The inspection team reviewed the record plans to ensure that they provided the licensing basis installation records applicable to concrete structures and foundations. This review included a verification that the selection of attributes listed on the record plans was comprehensive as compared to the record types listed in ANSI N45.2.9-1974. Review of the record plans indicated that while the record plans do not provide a one-to-one correspondence for each ANSI record type, the selection of record plan attributes generally envelopes the ANSI record types related to component installation. The inspection team identified that the following ANSI record types were not addressed by the concrete structures and foundations record plans:

- * Material Property Reports for:
 - Reinforcing Steel
 - Reinforcing Steel Splice Sleeves
 - Steel Piling
- * Pile Loading Test Reports
- * Reinforcing Steel Splice Operator Qualification Reports
- * Soil Compaction Test Reports
- * User's Tensile Test Reports on Reinforcing Steel
- * User's Tensile Test Reports on Reinforcing Steel Splices

TVA was asked to explain why these record types were not referenced on the record plans for concrete structures and

foundations. TVA stated that these record types do not provide primary construction or installation records and, therefore, are not included in the concrete structures and foundations record plans. These record types, however, were assigned "Unique Element" numbers and were included in the ASRR sample reviews. The inspection team accepted this explanation, and decided to sample records from these "Unique Elements" (See paragraph 6.b and 6.c) and review the results of the ASRR reviews (See paragraph 6.d) for each of these record types.

- The inspection team questioned the use of the attributes soil/rock exploration and settlement observation on the record plan since these types of records are not included in the ANSI and, as stated by TVA, these record types do not provide primary construction or installation records. Additionally, FSAR Section 2.5 was listed as the QA record associated with these attributes. This section of the FSAR does not provide an inspection or verification of the associated attributes, but only a narrative of the site characterization. The inspection team considered that while the inclusion of these attributes was not an error, no added value was provided to the record plan by their presence. During the inspection period TVA revised the record plans to remove these attributes and the associated reference to FSAR Section 2.5.

The inspection team verified the revision to the record plan and agreed with the resolution of this item.

- According to the record plans, the following procedures provide the primary QA record for the corresponding attribute(s):

*	QCP-1.06	Rebar material, Splice material, and piling material
*	QCP-1.47	Concrete dimensions, Rebar dimensions, and Splice length
*	QCP-2.14	Splice length
*	QCP-2.01	Soil preparation
*	QCP-2.06	Soil preparation
*	QCP-2.17	Pile driving records

None of the above records were provided for the components selected. Only QCP-2.02, which was referenced (but not highlighted) for the concrete material attribute on the record plan, was provided for the selected components. Review of the above procedures indicated the following:

- * QCP-1.06 only describes the manner in which items are inspected upon receipt at the site. No QCP-1.06 records were provided to the inspection team because

Rebar is not traceable to the point of component installation (i.e. concrete pours). As a result, the inspection team reviewed the material design and purchase contract specifications to ensure that the installation of rebar, splice, and piling material was limited to at least the minimum specified by design (See paragraph 6.b and 6.c). No deficiencies were noted in these records.

- * QCP-1.47 records were not available for the components selected by the inspection team because the selected components were placed prior to the existence of QCP-1.47, which was written in May 1982. The inspection team identified that QCP-2.02 provided the actual primary QA record for concrete dimensions, rebar dimensions, and splice length attributes for the selected components. During the inspection period, TVA revised the record plan to add QCP-2.02 as providing the primary QA record for the above attributes.

The inspection team verified the revision to the record plan and agreed with the resolution of this item.

- * QCP-2.14 describes the method to be used for the qualification of cadweld splicing operators. While related to the splice length attribute, this procedure provided no actual installation verification of splice length and, therefore, provided no added value to the record plan. The method used for the actual splicing of all reinforcing steel is described in QCP-2.9, Splicing of Reinforcing Bar. However, QCP-2.9 records were not retrievable by association with the selected components (i.e., concrete pours). TVA stated that these records are retrievable only by reference to the record type. As a result, the inspection team sampled QCP-2.9 splice data sheets to verify that these records were retrievable and were technically adequate (See paragraph 6.b and 6.c). No deficiencies were noted in these records.

- * QCPs 2.01, 2.06, and 2.17 also were not retrievable by association with the selected concrete structures and foundations. The attributes associated with these inspection procedures do not correspond to the components selected by the inspection team for inspection team review (i.e. concrete pours). As previously discussed, these records were sampled as "Unique Elements" by ASRR. Further discussion on the inspection teams review of these records is provided in paragraphs 6.b and 6.c, below.

b. **Retrievability**

For the record plans under review, construction installation records or alternate records were retrievable. In addition, the records classified by TVA as "Unique Elements" were also found to be retrievable.

c. **Records Review**

The records review portion, of the typical QA records inspection, involves a verification that the records and installation agree with the design, and that the records adequately document the technical attributes of the installed components. For the inspection of concrete structures and foundations, however, the inspection attributes could not be verified for the specific components selected for review (i.e., rebar size and placement cannot be verified after concrete placement). Additionally, as discussed in paragraph 6.b, most of the records were not retrievable by association with the selected components (i.e., concrete pours). Therefore, the plant walkdown portion of this inspection, which is normally conducted as a part of the records review, was omitted. Instead, the inspection team focussed on review of records (and the ASRR review of those records), which provided verification of the critical attributes listed on the record plans, and those records not listed on the plans which were classified by TVA as "Unique Elements" (See paragraph 6.a. Also see Appendix A for a list of "Unique Element" records reviewed). No deficiencies were observed by the inspection team concerning the retrievability or technical adequacy of these records.

d. **ASRR Deficiencies and Corrective Actions**

WBPER910189:

- The ASRR records quality review of record type "CMTRs for Steel Piling" identified discrepancies which were documented on PER WBPER910189. These discrepancies involved the loss of bend test result acceptability, due to these records not being centered during microfilming. A subsequent, more detailed review, was able to verify that the test reports documented acceptable test results.

The inspection team concluded that this disposition was appropriate for the identified deficiency.

RRSS-8:

- This RRSS identified numerous discrepancies regarding CMTRs for reinforcing steel which were subsequently divided into four groups:

Group A consisted of 7 discrepancies involving blanks on the CMTRs. The affected records, however, included all required technical information and caused no adverse technical impact on plant hardware. The RRT accepted these discrepancies as-is.

Group B initially consisted of 37 discrepancies involving CMTRs which were not authenticated (signed). Subsequently, TVA was able to retrieve all but 10 authenticated records. For the remaining 10 records, physical test reports were not retrieved but mill test reports were. The RRT determined that both mill and physical test reports were not required to verify the adequacy of the material because the mill test reports contain the same information as that contained on the physical test reports. Additionally, the mill test reports contain information regarding the material specification (grade) and chemical composition. The RRT accepted these discrepancies as-is.

Group C initially consisted of four discrepancies involving CMTRs which were not retrievable. Subsequently, TVA was able to retrieve mill test reports for all four discrepancies. The RRT accepted these discrepancies as-is.

Group D consisted of one discrepancy involving a CMTR which did not document a chemical analysis. Subsequently, TVA was able to retrieve a mill test report which documented the chemical analysis for the discrepancy. The RRT accepted this discrepancy as-is.

The inspection team concluded that this disposition was appropriate for the identified deficiencies.

RRSS-16:

- This RRSS identified discrepancies regarding reinforcing steel and reinforcing steel splice user's tensile test reports.

TVA was unable to retrieve any user's tensile test reports for reinforcing steel. Subsequent review resulted in the determination that user's tensile testing was not required or performed. TVA stated that the results of reinforcing steel tensile strength testing has been documented by the manufacturer (Knoxville Iron) on certified material test reports (CMTRs) and that this testing was witnessed by TVA on a random basis. Furthermore, these CMTRs were reviewed by the ASRR in RRSS-8 (discussed above). As a result, TVA stated that there was no reason for additional testing by the user (TVA).

Within the user's tensile test reports for reinforcing steel splices record type, one discrepancy was identified. This discrepancy involved a test report dated October 2, 1980 which did not have a unique identification number. TVA determined that this single instance was not significant for two reasons: 1) the report indicated that the specimen test results were accepted and signed by representatives of Singleton Materials Engineering Laboratory and 2) the test was performed on a "sister" splice (test only) and no field-installed splice is in question.

The inspection team concluded that this disposition was appropriate for the identified deficiencies.

RRSS-27:

- This RRSS identified a total of eight discrepancies regarding CMTRs for reinforcing steel splices.

One of the discrepancies involved a splice sleeve CMTR that was not notarized. However, a certification test report which references the same heat number as the CMTR was notarized. Based on this supporting documentation, the RRT accepted this condition as-is.

Two discrepancies involved missing data for yield strength and elongation. This missing data was determined not to be critical information and the discrepancies were accepted as-is based on the following. TVA demonstrated by reference to steel splice sleeve lot numbers and material heat numbers that the sleeve samples ultimate strengths exceeded the minimum required for both, rebar and sleeve material.

The remaining five discrepancies involved line throughs on laboratory reports without initial and date. The RRT determined that this condition was invalid because there was no requirement to initial and date line throughs at the time of the occurrence.

The inspection team concluded that this disposition was appropriate for the identified deficiencies.

RRSS-56:

- This RRSS identified numerous discrepancies regarding pile drive logs.

One discrepancy involved the lack of visual verification of a completed "j-hook" weld. This weld was provided to connect the top of H-pile to rebar so that uplift force from the base slab is transferred to the pile without separation between the concrete and steel pile. This discrepancy was

determined to have no adverse impact on the structural integrity of the pile foundation and was acceptable as-is for two reasons. The bond created between the concrete and pile alone was sufficient to overcome the calculated bond stress created by the upward lift. Additionally, TVA stated that even if the subject pile were totally disregarded the remaining piles would be able to carry the redistributed forces.

There were 41 discrepancies involving data sheets which documented the presence of a splice plate even though all supporting data indicated that no splice took place. This information was added at the top of the data sheets and was subsequently determined to have been added by site engineering for tracking system purposes only. The RRT accepted this discrepancy as-is.

Three discrepancies involved writeovers. These were accepted as-is by the RRT based on the fact that the items were still legible and had no technical impact on the documents.

Two discrepancies involved reference spaces which were not completed nor marked N/A. These discrepancies were determined not to have technical impact and were accepted as-is by the RRT.

Two discrepancies involved data sheets with multiple line outs but only one initial and date. These discrepancies were determined not to have technical impact and were accepted as-is by the RRT.

One discrepancy involved a pile driving inspection record for pile L-11 that could not be retrieved. The record was subsequently retrieved under pile designator K-11. This discrepancy occurred because the incorrect pile identifier was entered on the pile driving inspection sheet. Corrective action for this discrepancy was to replace the incorrect record in RIMS with the corrected record.

The inspection team concluded that the dispositions discussed above were appropriate for the identified deficiencies.

RRSS-34:

- This RRSS identified numerous discrepancies regarding reinforcing steel splice operator qualifications.

Forty six discrepancies involved line outs that were not initialed and dated. These were accepted as-is by the RRT since they had no technical impact.

Twenty eight discrepancies involved records not signed by the inspector. TVA determined that the lack of the inspector's signature was not significant in that: there was no impact on plant hardware, the inspector was identified by name, the inspector's signature was required on related records. These discrepancies were accepted as-is by the RRT.

Three discrepancies involved an accept/reject block not marked as required by QCP-2.14. Two of these discrepancies were subsequently determined to be invalid. The remaining item was determined to be acceptable as-is since the civil engineering and material lab representatives' signatures indicated acceptable results.

The inspection team concluded that the dispositions discussed above were appropriate for the identified deficiencies.

RRSS-35:

- This RRSS identified discrepancies regarding pile loading test reports.

There were eight discrepancies involving pile loading test reports in the ERCW area that were not signed and dated by the test operator and the reports did not specify what type of pile cushion was used. These test reports were generated as a result of NCR CDB-79-3, which documented the use of hammer energy not conforming to the installation requirements on the design drawing, while driving piles for the ERCW pipe support slabs. As a corrective action, test piles were driven and load tests were performed in the vicinity of the support slabs. Completion and verification of these activities were documented in ENDES memos. ENDES analyzed the data provided by the load tests and concluded that the piles driven with the nonconforming hammer energy were structurally adequate to sustain the loads imposed by the ERCW slabs. TVA considers that the above alternate records provide documentation of test dates and authenticate that the data was obtained in accordance with the specified procedures. The RRT accepted these discrepancies as-is.

There were 10 discrepancies involving a loss of data from the data sheets as a result of punching holes in original data sheets, and copying data sheets that were not centered on copy machines. In all cases, the missing data was a loss of the time sequence on the pile loading test data sheet, but the technical results were unaffected. The RRT accepted these discrepancies as-is.

Two discrepancies involved blank data blocks. These discrepancies were accepted as-is because the missing information was available from duplicate data on the test record.

The inspection team concluded that the dispositions discussed above were appropriate for the identified deficiencies.

RRSS-44:

- This RRSS identified discrepancies regarding soil compaction test reports.

There were eight discrepancies involving blank information or data spaces. Six discrepancies involved incorrect changes and three more involved reference information added with no initials and date. All of these discrepancies were subsequently determined to be invalid by the RRT.

Twelve deficiencies involved blank information or data spaces, which were accepted as-is since they were administrative in nature and had no technical impact on the record.

Three deficiencies involved line outs not initialed and dated, which were accepted as-is since they were administrative in nature and had no technical impact.

The inspection team concluded that the dispositions discussed above were appropriate for the identified deficiencies.

ASRR Technical Content Review and Resolution
(Concrete Structures Ordered Review):

- This ordered review (016-052) evaluated the technical content of the concrete structure records associated with ANSI record types applicable to the installation of the Reactor Building Lower Crane Wall 1RBCC2AA. The review included the following record types:

- as-constructed and as-designed drawings
- design calculations
- concrete pour card

Within these record types, numerous attributes including location, configuration, material, dimensions, analysis techniques, and load combinations were considered. This review initially identified that the attribute for concrete location could not be verified because construction drawings indicating pour locations were not controlled. Further

review, however, determined that the drawings were retrievable (but not updated) in the WBN drawing system. TVA subsequently considered this to be an appropriate basis for verification of concrete location. One minor deficiency regarding the date on a concrete cylinder data sheet was also identified. This was determined to be an apparent clerical or administrative error, which had no technical bearing regarding the structural adequacy of the structure.

The inspection team found the concrete structures ordered review and results to be acceptable.

ASRR Technical Content Review and Resolution
(Foundations Ordered Review):

- This ordered review (017-066) evaluated the technical content of the foundation installation records associated with ANSI record types applicable to the installation of the Raw Service Water Tank foundation. The review included the following record types:

- as-constructed and as-designed drawings
- calculations
- concrete cylinder data sheet
- concrete pour card

Within these record types, numerous attributes including material, location/spacing, configuration, loads, loading, and stresses. All aspects of this ordered review were statused as "acceptable" by TVA.

The inspection team found the foundations ordered review and results to be acceptable.

ASRR Hardware Inspection Results and Resolutions:

- The ASRR inspection identified numerous discrepancies involving floor slab cracks, foundation corner cracks, wall cracks, excessively chipped surfaces, open anchor bolt holes, and hollow grout area. An engineering review determined the conditions to be acceptable as-is. The basis of acceptance was the structurally insignificant location of the cracks and holes or comparison to design criteria and American Concrete Institute (ACI) 224R-89 guidelines. DCN Q-18881-A was issued to cross reference the design acceptability of these conditions to the concrete drawings.

The inspection team found the hardware review and results to be acceptable.

7. Exit Interview

The inspection scope and findings were summarized on December 21, 1993 with those persons indicated in Paragraph 1. The team leader described the areas inspected and discussed in detail the inspection results. Dissenting comments were not received from the licensee. Proprietary information is not contained in this report.

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
390,391/93-86-01	Closed	NCV-Failure to follow procedures for valve motor installation (paragraph 4.c)
390,391/93-86-02	Open	URI-Resolve Adequacy of Sample Bounding for QA Records CAP (paragraph 5.a)
390,391/93-86-03	Open	IFI-Verification of TVA's Corrective Actions in WBP920070 (paragraph 5.d)

8. List of Acronyms and Abbreviations

ACI	American Concrete Institute
AFW	Auxiliary Feedwater
AHU	Air Handling Unit
AI	Administrative Instruction
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASRR	Additional Systematic Records Review
CAP	Corrective Action Program
CAQR	Condition Adverse to Quality Report
CCD	Configuration Control Drawing
CDR	Construction Deficiency Report
CEB	Civil Engineering Branch
CFR	Code of Federal Regulations
CID	Component Identification Diagram
CKV	Check Valve
CMTR	Certified Material Test Report
CPI	Construction Process Instruction
DCA	Design Change Authorization
DCN	Design Change Notice
DCRM	Document Control and Records Management
DG	Diesel Generator
DNE	Department of Nuclear Engineering
DRV	Drain Valve
DWG	Drawing
ECN	Engineering Change Notice
EDG	Emergency Diesel Generator
EMS	Equipment Management System
ENDES	Engineering Design

EQ	Environmental Qualification
ERCW	Emergency Raw Cooling Water
FCV	Flow Control Valve
FIS	Flow Instrument
FLV	Flow Valve
FS	Flow Switch
FSAR	Final Safety Analysis Report
HTX	Heat Exchanger
IFI	Inspector Followup Item
ISIV	Instrument Isolation Valve
ISV	Isolation Valve
LCV	Level Control Valve
MAI	Modifications and Additions Instruction
MCC	Motor Control Center
MOV	Motor Operated Valve
MOVATS	Motor Operated Valve Acceptance Testing
NCR	Nonconformance Report
NCV	Non-cited Violation
NDE	Nondestructive Examination
NQA	Nuclear Quality Assurance
NRC	Nuclear Regulatory Commission
PAC/AQ	Program to Assure Completion and Quality
PAI	Plant Administrative Instruction
PCR	Personnel Certification Record
PER	Problem Evaluation Report
PNL	Panel
PORV	Power Operated Relief Valve
QA	Quality Assurance
QAI	Quality Assurance Instruction
QC	Quality Control
QCI	Quality Control Instruction
QCP	Quality Control Procedure
QCT	Quality Control Test
QMI	Quality Management Instruction
QR	Quality Related
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RIMS	Records Information Management System
RPS	Reactor Protection System
RRSS	Record Review Summary Sheet
RRT	Records Response Team
RTV	Root Valve
RWST	Refueling Water Storage Tank
SCA	Significant Corrective Action
SCR	Significant Corrective Action Report
SFSA	Suitability For Service Analysis
SPER	Supplemental Problem Evaluation Report
SP	Special Program
SSP	Site Standard Practice
TE	Temperature Element
TSOB	Temporary Storage Office Building

URI	Unresolved Item
VIO	Violation
VTM	Vendor Technical Manual
WB	Watts Bar
WBN	Watts Bar Nuclear
WBNP	Watts Bar Nuclear Plant
WBPER	Watts Bar Problem Evaluation Report
WBCA	Watts Bar Significant Corrective Action Report
WEP	Weld Evaluation Project
WO	Work Order
WR	Work Request
WP	Work Plan

ATTACHMENT A

RECORDS RETRIEVED FROM RIMS FOR THE INSPECTION TEAM

1. ELECTRICAL EQUIPMENT

A generic listing of electrical equipment records provided by TVA and reviewed by the inspection team was as follows:

- QCP-1.6 and 1.06, Receipt, Inspection, Storage, and Withdrawal of Permanent Material
- QCP-3.6, Electrical and Instrumentation Equipment Installation, Standard Tests, Inspections, and Documentation
- QCP-3.06-1, Overload Protection Verification
- QCP-3.06-7, Inspection of Electrical and Instrumentation Equipment Installation
- QCT-3.6, Electrical and Instrumentation Equipment, Standard Tests, and Documentation
- QCT-3.06-1, Insulation Tests for Electrical Equipment
- QCT-3.06-2, Torque and Limit Switch Adjustments for Motor-Operated Valves
- QCT-3.06-3, Primary Containment Electrical Penetration Test
- QCT-3.06-4, Control Circuit Functional Test
- QCT-3.06-5, Motor Rotation Verification
- QCP-1.42-4, Bolted Electrical Connections
- QCP-1.14, Inspection and Testing of Bolt Anchors Set in Hardened Concrete and Control of Attachments to Embedded Features
- ANSI/IEEE Std 43-1974, Recommended Practice for Testing Insulation Resistance of Rotating Machinery
- CAQR WBP871182, Defective Circuit Breaker Rotary Handles on 480V MCC
- NCR-W-311-P, Underrated DG Board Room Exhaust Fans
- WD-19, Integrated Interaction Program
- Equipment Seismic Qualification Corrective Action Program

Records for the following electrical equipment were requested by the inspection team and were provided by TVA:

- 1-MCC-213-A1-A, 480V Reactor MOV Board 1A1-A, and sub components: 1-BKR-063-0156A (breaker for SIS Pump Outlet Valve 1-FCV-63-156-A to RCS Loops 1 & 3 Hotleg) and 1-BKR-063-0026A (breaker for SIS Boron Injection Tank Shutoff Valve 1-FCV-63-26-A)
- 1-MCC-213-B2-B, 480V Reactor MOV Board 1B2-B, and sub components: 1-BKR-001-0018-B (breaker for Main Steam to Aux Feed Pump Turbine Isolation Valve 1-18-B) and 1-BKR-003-0047B (breaker for Feed Water Isolation Valve 3-47-B to Steam Generator #2)
- 1-BD-211-A-A, 6.9 KV Shutdown Board 1A-A and sub components: 1-BKR-062-0108-A (breaker for Centrifugal Charging Pump 1A-A) and 1-BKR-003-0118-B (breaker for Aux Feed Water Pump 1A-A)
- 1-BD-212-A1-A, 480V Shutdown Board 1A1-A
- 1-BD-212-B2-B, 480V Shutdown Board 1B2-B

- 1-OXF-212-A-A, 480V Shutdown Board Emergency XFMR 1A-A
- 1-OXF-212-B-B, 480V Shutdown Board Emergency XFMR 1B-B
- 1-ARB-082-B-1B, Diesel Generator 1B-B Protection Relay Panel 1
- 0-DPL-234-A1/SIS, SIS Distribution Panel A1
- 1-INV-235-0001-D, 120V AC Vital Invertor INV 1-1
- 0-BAT-236-0001-D, 125V DC Vital Battery 1
- 0-CHRG-236-0001-D, 125V Vital Battery Charger 1
- 1-MTR-063-0156A, 480V Motor for SIS Pump Outlet Valve to RCS Loops 1 & 3 Hotleg (Valve #1-FCV-63-156-A)
- 1-MTR-063-0015, 6.9 KV Motor for SIS Pump 1B-B
- 1-MTR-063-0072-A, 480V Motor for Containment Sump Valve to RHR Pump 1A-A (Valve #1-FCV-63-72-A)
- 1-PENT-293-0007B, Safety Related Containment Cable Penetration
- 1-PENT-293-0043D, Safety Related Containment Cable Penetration
- 1-PNL-099-R46 thru R48, Solid State Protection System portion of Main Control Board
- 1-PNL-278-M5, Main Control Board and sub components: 1-HS-068-0333A (handswitch for RCS Pressurizer Relief Flow Control), 1-HS-062-0108A-A (handswitch for Charging Pump 1A-A), and 1-TI-068-0060-K (RCS Loop 3 Cold Leg temperature indicator)

2. INSTRUMENT LINE SUPPORTS:

A generic listing of the instrument line support records provided by TVA and reviewed by the inspection team was as follows:

- WBN-1-QCP-1.06 Rev. 0 - 6, Receipt, Inspection, Storage and Withdrawal of Permanent Material
- WBN-1-QCP-1.14 Rev. 8,9,11,12,13,and 21, Inspection and Testing of Bolt Anchors Set In Hardened Concrete and Control of Attachments To Embedded Features
- WBN-QCP-3.11 Rev. 5, Inspection and Documentation of Instrument Line Bending and Supports
- WBN WD-19 Rev. 1, WBNP Integrated Interaction Program Walkthrough Procedure
- NCR W334PSCA Rev. 5, Discrepancies Associated With Unit 1 Instrument Supports
- WEP Closure Statement Evaluation Reports for Groups G, H, 259, and 265.
- NCR 6416 Rev. 4, Use of Unmarked Bolting
- Drawing 47A050-1J Rev. 13, Mechanical Hanger Drawing General Notes
- Drawing 47A050-1J1 Rev. 2, Mechanical Hanger Drawing General Notes
- Drawing 47A050-1J2 Rev. 6, Mechanical Hanger Drawing General Notes
- Drawing 47A050-1J4 Rev. 0, Mechanical Hanger Drawing General Notes
- Drawing 46A050-1J5 Rev. 0, Mechanical Hanger Drawing General Notes
- Drawing 47A050-1N Rev. 10, Mechanical Hanger Drawing General Notes
- Drawing 47A050-1N1 Rev. 1, Mechanical Hanger Drawing General Notes
- Drawing 47A050-1N2 Rev. 4, Mechanical Hanger Drawing General Notes
- Problem Evaluation Report No. WPER920070 Rev. 1, Instrument Line Support Hardware Deficiencies
- Problem Evaluation Report No. WPER930183 Rev. 0, Lack of Bounding Condition Analysis In Calculation No. TEACEBEMG77

- Corrective Action Tracking Document No. 80407-WBN-01 Rev. 1, Employee Concern Regarding Sampling Methods
- Calculation No. TEACEBEMG77 Rev. 1, Sample Plan and Analysis For SCAR No. WBP900115SCA
- Calculation No. SD 3-023 Rev. 3, Sample Plan and Analysis For SCAR No. NCR W334PSCA

Records for the following instrument line supports were requested by the inspection team and were provided by TVA:

- FOS-129*, RHR Pump A-A Inlet and Outlet Pressure
- N1-072-0024*, Containment Spray Pump - A Discharge Pressure
- 1-ISLS-997-1904 A and B, Containment Spray Header B Flow Transmitter
- 1-ISLS-997-0898 A through D, SIS Pump A-A and B-B Outlet Flow Transmitter
- FOS-132, Excess Letdown Heat Exchanger/Sample Heat Exchanger Outlet Flow
- FOS-2800*, Reactor Coolant Pump I Outlet Flow
- 1062-A060-62-191, Excess Letdown Pressure
- 1-ISLS-997-1288 A and B, Steam Generator #3 Wide Range Level Transmitter
- 1-ISLS-997-1267 through 1269, Steam Generator Level Transmitter
- 1-ISLS-997-0049 A through D*, Emergency Diesel Heat Exchanger Discharge Flow
- 1-ISLS-997-3018 A through F*, 3019 A through F, 3020 A through F, Emergency Diesel Lube Oil, Fuel Oil, and Starting Air Pressure
- 1-ISLS-997-3044, Emergency Diesel Lube Oil Pressure
- FOS-010, ERCW Discharge Pump B Discharge Pressure
- 1-ISLS-997-1022 A through C*, ERCW Strainer DP
- FOS-9267*, ERCW Pumps Discharge Pressure

* Instrument Line Supports With Multiple Lines

3. CONCRETE STRUCTURES AND FOUNDATIONS:

A generic listing of the concrete structure and foundation installation records provided by TVA and reviewed by the inspection team was as follows:

- CEB Report 86-19, Concrete Quality Evaluation Program
- TI-2021, Walkdown of Concrete Features
- Calculations:
 - WCG-1-169, Rebar Cuts - Book I - Auxiliary and Associated Buildings
 - WCG-1-170, Rebar Cuts - Book II - Reactor, Control, DG, and ADG Buildings
 - WCG-1-217, Rebar Cuts - Book III - Reactor, Control, DG, ADG Buildings, and Intake Pumping Station
 - WCG-1-254, Program for Documenting Reinforcing Bar Cuts and Damage to Bars
 - WCG-1-585, Worst Case Concrete Feature Selection

- WCG-1-727, Selection of Worst Case Category I Heat Exchangers
- WCG-1-728, Selection of Worst Case Category I Tanks and Accumulators
- WCG-1-729, Selection of Worst Case Category I Pumps
- WCG-1-812, Selection of Worst Case Category I with no Known Deficiencies
- WCG-1-1419, Seismic/Civil Validation Program Methodology Summary Report
- QCP-2.02, Concrete Placement and Documentation

Additional records reviewed:

- QCP-1.06, Receipt Inspection of Safety-Related Items
- QCP-1.47, Concrete/Grout Preplacement Inspection
- QCP-2.01, Earthfill Placement, Inspection, and Documentation
- QCP-2.06, Granular Fill Placement, Inspection, and Documentation
- QCP-2.9, Splicing of Reinforcing Bars
- QCP-2.14, Cadweld Operator Performance Qualification
- QCP-2.17, Placement and Inspection of Pile Driving-Drawings:
 - 41N322-1,2,3,4, and 5
- FSAR Section 2.5
- WBPER 910189
- Design Criteria No. WB-DC-20-1, Concrete Structures, General
- DCN Q-18881-A, Resolution of ASRR Potentially Adverse Conditions Drawings:
 - 41N321-1,2, and 3
 - 41N322-1,2,3,4, and 5
 - 41N365-1 and 2
 - 41N483-1,2,3,4, and 5

Records reviewed which were classified by TVA as "Unique Elements":

- Contract Number 73054-65477, Requirement Contract for Deformed Steel Reinforcing Bars
- Quality Assurance Conditions and Requirements for Steel No. 65584
- Indefinite Quantity Term Contract for Carbon Steel No. 72-543371
- Indefinite Quantity Term Contract for Mechanical Connection Splice Material No. 75K70-61676
- Indefinite Quantity Term Contract for Rebar Splicing Materials No. 77K72-822237
- Purchase Contract for Bearing Pile No. 81K72-642272
- Transfer Requisition No. 644573 for Cadweld Material
- Transfer Requisition No. 623859 for Bearing Pile
- CMTRs for Reinforcing Steel
- Heat Numbers:
 - 72824-4
 - 72824-5
 - 200843
 - 200847
 - A 3703
 - A3711

- CMTRs for Reinforcing Steel Splice Material
 - Batch Numbers:
 - N-3971
 - N-3973
 - N-3977
 - N-3978
 - Sleeve Lot Numbers:
 - S-654
 - S-796
- CMTRs for Steel Piling
 - Heat Numbers:
 - H 01990
 - H 01991
 - H 02570
 - K 09988
 - I R2549
 - 18579
 - 18590
 - 23496
- Pile Drive Logs
 - Pile identifier:
 - Additional Diesel Generator Building
 - A-1
 - A-2
 - A-3
- Pile Loading Test Reports
 - Report Number:
 - Intake Pumping Station
 - IPS-1
 - IPS-2
 - IPS-3
 - IPS-4
- Reinforcing Steel Splice Operator Qualifications
 - QCP-2.14, dated 9/26/75
 - QCP-2.14, dated 10/31/75
 - QCP-2.14, dated 6/7/76
- Soil Compaction Test Reports:
 - 1) Underground Barrier - Trench A Station 3+25
 - 2) ERCW Intake Station 120' N.
 - 3) Cable Tunnel
- User's Tensile Test Reports on Reinforcing Steel Splices
 - Specification Number:
 - A-H-11-0007
 - A-H-11-0105
 - A-H-11-0127
 - A-H-11-0151
- Splice Data Sheet
 - Number:
 - 419
 - 797
 - 873
 - 946

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The concrete structures selected for review to verify retrievability of records were as follows:

- 6.9 kv shutdown panel 1A-A floor (pour AB-f3)
- Auxiliary Control Room floor (pour AB-f3)
- RCS loop #4 cubicle (pour RB1-D15)
- Pressurizer cubicle (pour RB1-R30)
- Auxiliary Building floor (pour AB-950)
- Unit 1 RWST (pour AB-5a)
- Control Room south wall (pour CB-D12)
- Control Room southwest stairwell @ elev 727-755 (pour CB-D19)
- Diesel Building 19' 6" east of A11 (pour IPS-H18)
- Diesel Building 1A board room floor (pour DG-S4g)
- ERCW Strainer 1A-A floor (pour IPS-G2)
- Containment Wall (pour RB1-B9C)
- Crane Wall (pour RB1-C14C)
- Control Building floor (pour CB-A36)
- Crane Wall (pour RB1-C2a)

The foundations selected for review to verify retrievability of records were as follows:

- Shutdown Board Room air handling unit 1-AHU-031-0045 (pour AB-f3)
- Aux Control Air Compressor 0-RFV-32-366 (pour AB-f68b)
- Unit 1 RWST (pour AB-d23)
- Diesel Generator 1A2 (pour DG-S4d)
- Reactor Building foundation (pour RB-A1)
- Control Room air handling unit B-B (pour CB-C24a)
- Centrifugal Charging Pump 1A-A (pour AB-c85)
- Safety Injection Pump 1A-A (pour AB-c86)
- Containment Spray Pump 1B-B (pour AB-b42)
- AFW Pump 1A-A (pour AB-c70)
- Containment (pour RB1-A8)
- Aux Building (pour CCBC121a)
- ITP (pour IPS-A2)
- Reactor Building Foundation (pour RB-D6)
- Crane Wall Foundation (pour RB-D14)

ATTACHMENT B

DETAILED LISTING OF RECORDS REVIEWED

1. ELECTRICAL EQUIPMENT:

Electrical board, 1-BD-211-A, 6.9 kv shutdown board 1A-A:

- QCP-3.6, Electrical & Instrumentation Equipment Installation Standard Tests, Inspections, and Documentation
 - 1) Test 6-25, Device Installation Inspection
 - 2) Test 6-26, Inspection of Welds on Electrical & I&C Equipment
 - 3) Test 6-61, Final Wiring Verification
 - 4) Test 6-64, Insulation Tests
- QCP-1.42-4, Test 62, Bolted Electrical Connectors
- QCP-3.06-2, Test 61, Internal Wiring Verification
- QCT-3.06-4, Test 75, Control Circuit Functional Test
- QCT-3.06-1, Test 64, Electrical Equipment Insulation Test
- QCT-3.06-1, Attachment E, Cable/Bus High Potential Test
- Form 209, Receiving Report WPNP-75-5355, Panel Boards Unit 109 and 110 for 6900 Volt Shutdown Board 1A-A
- TI-2005, Equipment Seismic Qualification Walkthrough for 1-BD-211-A-A
- Contract 74C2-84376, 6900 Volt Auxiliary Power Switchboard Specification 1765, 6900 Volt Auxiliary Power Switchboards
- Vendor Test Report for TVA Contract 74C2-84376
- TVA Inspection Report #16, 6900 Volt Auxiliary Power Switchboards
- ANSI C37.09-1964 (R1969), Test Procedure for AC High Voltage Circuit Breakers
- Seismic Simulation Test Report, 42868-1, Metalclad Switchgear
- TVA Letters dated 5/15/75 and 8/4/75, Approval of Seismic Test Report Documentation and Certification
- DCN-M-18300-A, Reinforcing Plate and Clip Angles for 6.9 KV Shutdown Boards
- WCG-ACQ-0056, Rev. 0, Elapsed Time Meter Position Retention Evaluation
- Work Order C 095147, Replacement of Missing Bolts on 6.9 KV Shutdown Board 1A-A
- WCG-ACQ-0421, Rev. 4, Seismic Qualification of 6900 Volt Shutdown Boards for Added Components and Attachments

Breaker 1-BKR-003-0118-A, Auxiliary Feedwater Pump 1A-A and Breaker 1-BKR-062-0108-A, Centrifugal Charging Pump 1A-A:

- QCP-3.6, Electrical & Instrumentation Equipment Installation Standard Tests, Inspections, and Documentation
 - 1) Test 6-25, Device Installation Inspection
 - 2) Test 6-75, Functional Test

Electrical penetration, 1-PENT-293-0043-D, nuclear instrumentation channel 1 electrical penetration:

- QCP-3.6, Electrical & Instrumentation Equipment Installation Standard Tests, Inspections, and Documentation
 - 1) Test 6-00, Receipt of Permanent Material
 - 2) Test 6-25, Device Installation Inspection
 - 3) Test 6-26, Inspection of Welds on Electrical & I&C Equipment
 - 4) Test 6-62, Inspection of Bolted Electrical Connections
 - 5) Test 6-64, Insulation Tests
- QCT-3.6, Electrical Equipment Standard Tests and Documentation
 - 1) Test 6-83, Primary Containment Electrical Penetration Test
 - 2) Appendix A, Electrical Penetration Leak Rate Documentation Record
- Weld 1-293-T001-85
 - 1) Weld Operation Sheets
 - 2) NDE Visual, Liquid Penetrant, and Ultrasonic Test data sheets
 - 3) Certification records of NDE examination personnel
 - 4) Welder qualification records
- TI-72, Field Verification of Electrical Devices
- QCT-1.6, Receipt, Inspection, Storage, Withdrawal, and Transfer of Material
- Form 209, Receiving Report, WBNP77-21
- Certificate of Conformance
- Material Test Reports
 - 1) header plate
 - 2) seamless pressure pipe (extension tube)
 - 3) stainless electrodes
- Tabulation of Materials Report
- Factory Test Data Certification
 - 1) ASME Pressure Test
 - 2) Helium Leak Test
 - 3) Nitrogen Pressurization Test
 - 4) Visual Inspection
 - 5) Continuity Check
 - 6) Dielectric Strength Test
 - 7) Insulation Resistance Test
- Form N-2, Manufacturers Data Report for Nuclear Part and Appurtenances
- Purchase Order 76K61-87064, Electrical Penetrations
- Design Specification, WBNP-DS-1805-2697-00, Electrical Penetrations
- WB-DC-40-66, Rev. 0, Design Criteria for Penetration Assemblies and Seals for Category I Structures
- Drawing, 45N860-3, Rev. 8, Conduit & Grounding
- Vendor Manuals
 - 1) VTM-C515-0100, Rev. 3, Electric Penetration Assemblies
 - 2) VTD-C515-0110, Rev. 2, and VTD-C515-0120, Rev. 1, Installation & Maintenance Manual for Electrical Penetration Assemblies

- Stress Report, IPS-209, Rev. B, Nuclear Electric Penetrations for TVA WBNP Units 1 & 2

Inverter, 1-INV-235-0001-D, 120 VAC Vital Inverter:

- QCP-3.6, Electrical & Instrumentation Equipment Installation Standard Tests, Inspections, and Documentation
 - 1) Test 6-25, Device Installation Inspection
 - 2) Test 6-26, Inspection of Welds on Electrical & I&C Equipment
 - 3) Test 6-62, Inspection of Bolted Electrical Connections
 - 4) Test 6-75, Electrical Functional Testing
- Contract No. 74C8-85264, Static Inverter System for Vital Contract No. 86KLC-838786, Services to Perform 120-V Vital Inverter Qualification Test
- Design Specification 2094, Static Inverter System (Vital Instrument 120-Volt AC Supply)
- Form 209, Receiving Report, WBNP75-7835, Vital Instrument AC Power Supply System
- Certificate of Compliance dated 5/14/75
- Certificate of Test dated 4/18/86
- Test No. 013186JDR, Rev. 0, 120-V Vital Inverter Qualification Test and Test Results
- Seismic Simulation Test Report No. 42854, Specimen Static Inverter Seismic and Environmental Test
- TVA Letter dated 6/5/75 accepting Seismic Simulation Test Report No. 42854
- WCG-ACQ-0433, Seismic Qualification of Equipment of System 235 and 236 for Added Components and Resolution of Concerns
- Work Order No. 93-03982-00, 7-year capacitor replacement for 120V vital inverter
- Vendor Technical Manuals
 - 1) VTM-S250-0010, Rev. 3, Solidstate Controls, Inc., Inverters
 - 2) VTD-S250-0020, Rev. 3, Inverter Instruction & Operating Manual
 - 3) VTD-S250-0040, Rev. 0, Recommended Maintenance Guide for Ferroresonant UPS Systems
 - 4) VTD-S250-0080, Rev. 0, Torque Requirements for Solidstate Controls, Inc. 120 V Vital Inverters

Transformer, 1-OXF-212-A-A, 480V shutdown board emergency transformer 1A-A:

- QCP-3.6, Electrical & Instrumentation Equipment Installation Standard Tests, Inspections, and Documentation
 - 1) Test 6-25, Device Installation Inspection
 - 2) Test 6-26, Inspection of Welds on Electrical & I&C Equipment
 - 3) Test 6-27, Doble Test for Bushings
 - 4) Test 6-29, Post Installation Assembly and Oil Fill
 - 5) Test 33, Doble Test for Transformers and Other Equipment
 - 6) Test 6-36, Transformer Ratio and Polarity Test

- 7) Test 6-43, Kelvin Resistance Test
- 8) Test 6-62, Inspection of Bolted Electrical Connections
- 9) Test 6-64, Insulation Tests
- Weld 1-OXF-212-A-A
 - 1) Certification records of NDE examination personnel
 - 2) Welder qualification record
- Form 209, Receiving Report, WBNP76-7244
- Purchase Order 74C2-84647, 480-Volt Switchgear and Transformers
- Specification 1775, 480-Volt Switchgear and Transformers
- Vendor Test Data for Transformers
 - 1) Pressure Test
 - 2) Cold Resistance Test
 - 3) Turn Ratio Test
 - 4) Polarity Test
 - 5) Exciting Current Test
 - 6) Excitation Losses Test
 - 7) Impedance Test
 - 8) Regulation Test
 - 9) Temperature Test
 - 10) Insulation Test
 - 11) Induced Potential Test
 - 12) Inerteen Quality Test
- WCG-ACQ-0460, Rev. 0, Equipment Seismic Evaluation of 480V Shutdown Board Transformers
- Drawing 8278D71, Rev. 5, Shutdown Board Transformer Items 9 and 11
- ANSI C57.12.10-1969, American National Standard Requirements for Transformers 138,000 Volts and Below
- Vendor Technical Manual
 - 1) VTM-W120-0160, Rev. 5, Vendor Technical Manual for Westinghouse DS 489 Volt Switchgear
 - 2) VTD-W120-2352, Rev. 0, Instructions for Westinghouse Rectangular Core and Coil Assembly Type SL Transformers
 - 3) VTD-W120-2354, Rev. 0, Instructions for Shipment, Installation and Storage of Westinghouse Small Power Transformers
 - 4) VTD-W120-2374, Rev. 1, Westinghouse Instruction for Handling Inerteen Insulating Fluid and Installation and Maintenance of Inerteen Transformers
- Panel 1-ARB-082-B-B, DG 1B-B protection relay panel:
 - QCP-3.6, Electrical & Instrumentation Equipment Installation Standard Tests, Inspections, and Documentation
 - 1) Test 6-25, Device Installation Inspection
 - 2) Test 6-75, Final Functional Test
 - TI-2005, Equipment Seismic Qualification Walkthrough for 1-ARB-82-B-B
 - WCG-ACQ-0526, Rev. 1, Seismic Qualification Calculation
 - Work Order No. C236809, Installation of 4 Missing Anchor Bolts on 1-ARB-82-B-B
 - Contract No. 74C8-85329, Relay Board for Diesel Generator

- Specification No. 2122, Relay Boards for Diesel Generators 1A-A, 1B-B, 2A-A, and 2B-B.
- Form 209, Receiving Report WBNP75-6639, Relay Boards for Diesel Generators
- Certificate of Compliance
- Inspection Report No. 1, Relay Board for Diesel Generator
- ANSI C37.20-1969, Switchgear Assemblies Including Metal-Enclosed Bus
- Vendor Test Data (Control Wiring Continuity and Insulation)
- Vendor Seismic Test Report
- TVA Ltr dated May 2, 1975, acceptance of test certification
- Vendor Technical Manual
 - 1) VTM-AS08-0010, Rev. 2, ASCO Delta Diesel Generator Switchboards
 - 2) VTD-AS08-0020, Rev. 0, ASCO Delta Vendor Drawings
- Drawing No. 45W1781-3, Rev. 12, Diesel Generator 1B-B Misc Panels Connection Diagrams
- Drawing No. D47495-1, Rev. 903, Relay Control Boards
- Drawing No. 18N302, Rev. 22, DG Building Miscellaneous Steel Frames, Covers, Grating and Ladders

Motor 1-MTR-063-0072-A (containment sump to RHR pump A-A valve motor):

- Work Order 91-00759-15, Replacement of 1-MTR-063-0072A
 - 1) Work Instructions
 - 2) Materials and M&TE Form
 - 3) Actual Work Performed Log
 - 4) Environmental Qualification Work Record
 - 4) Mechanical Inspection Records
 - 5) Electrical Inspection Records
 - 6) Limitorque MOV Inspection
 - 7) Location and Device ID Tag Information
 - 8) Nameplate Data
 - 9) Conduit and Cable Identification
 - 10) EQ Field Verification Data Sheet
 - 11) MI-0.16.04, Limitorque Motor Operator Adjustment and Repair
 - 12) Nuclear Storeroom Requisition Forms
- Contract No. 86XNQ-838100 (Procurement Package RD328858), purchase Limitorque motors and actuator parts
- Engineering Procurement Package Technical Data for Procurement Packages RD139585 and RD328858
- Certificate of Compliance for 1-FCV-063-0072-A)
- DCA No. P-01667-33 CN, Rev. 901, Motor Operated Gate Valve (page 64 of DCN-P01667-C)
- WBPER930502, Rev. 0, Problem Evaluation Report
- SSP-10.04, Material Issue, Control, and Return

Panel 1-PNL-099-R46 thru R48 (Solid State Protection System):

- QCP-3.6, Electrical & Instrumentation Equipment Installation Standard Tests, Inspections, and Documentation
 - 1) Test 6-25, Device Installation Inspection

- 2) Test 6-26, Inspection of Welds on Electrical & I&C Equipment
- 3) Test 6-61, Final Wiring Verification
- 4) Test 6-64, Insulation Tests
- 5) Test 6-62, Bolted Electrical Connectors
- 6) Test 6-75, Control Circuit Functional Test
- QCP-3.06-2, Test 61, Internal Wiring Verification
- TI-2005, Equipment Seismic Qualification Walkthrough for RPS panels
- WCG-ACQ-0462, Seismic Qualification of System 99
- Equipment Specification, 952152, Solid State Protection System, Safeguards Test Cabinets, and Auxiliary Relay Racks
- Form 209, Receiving Report WBNP75-2591, Reactor Protection and Engineered Safeguards Equipment
- Quality Release, 23025, Solid State Protection System
- Certificate of Compliance
- WBN-VTM-W120-2452, Vendor Technical Manual For Solid State Protection System Supplied by Westinghouse
- Test Data for Test Specification 2375A05

Panel 1-PNL-278-M5, Main Control Board:

- Form 209, Receiving Report WBNP75-6939, Main Control Board Panel 1M5
- Equipment Specification 952367, Main Control Board
- Quality Release 24716, 29003, and 30935, main control board panel 1M5 and individual handswitch modules
- Inspection Control Tag Assembly, Tag 1 of 2, for Panel 1M5
- TI-2005, Equipment Qualification Walkthrough package for panel 1M5
- WCAP-8540, Seismic Qualification of the Full Size Main Control Boards Sequoyah and Watts Bar Nuclear Plants
- WCG-ACQ-0488, Rev. 1, Seismic Qualification of System 68 Equipment

Temperature Indicator 1-TI-068-0060-K, RCS Loop 3 Cold Leg temperature indicator (Main Control Board sub component):

- QCP-3.6, Electrical & Instrumentation Equipment Installation Standard Tests, Inspections, and Documentation
 - 1) Test 6-25, Device Installation Inspection
- Workplan K-P02863A-1, Implementation of Control Room Design Review
 - 1) Data Sheet A, Panel or Component ID Tags

Handswitch 1-HS-068-0333A, RCS Pressurizer Relief Flow Control (Main Control Board sub component):

- Workplan K-P02863A-1, Implementation of Control Room Design Review
 - 1) Data Sheet A, Panel or Component ID Tags
 - 2) Data Sheet Z, Device/Component/Instrument Mounting Verification

Handswitch 1-HS-062-0108A-A, Charging Pump 1A-A Control (Main Control Board sub component):

- Workplan K-P02863A-1, Implementation of Control Room Design Review
 - 1) Data Sheet A, Panel or Component ID Tags

- 2) Data Sheet C, Device/Component/Instrument Mounting Verification
- 3) Data Sheet 1, Internal Wiring Installation

2. INSTRUMENT LINE SUPPORTS:

Support No. FOS-129, RHR Pump A-A Inlet and Outlet Pressure Support:

- WBNP-QCP-3.11 Attachment A, Support Fabrication Sheet No. FOS-129
- Drawing No. 47A051-12 Rev. 0, Instrument Sensing Line Support Typical
- WBNP-QCI-1.28 Attachment A, System No. I-51-12-3293, Support No. FOS-129, Support Variance Sheet
- Sketch IOS-1144 Rev. 0, Sheet 104, Instrument Support Installation Operation Sheet
- WBNP-QCP-3.11 Rev. 5, Attachment B, IOS 1144, Support Installation Operation Sheet, Test 52A
- WBNP-QCP-3.11 Rev. 5, Attachment B, IOS 1144 Rev. 1, Support Installation Operation Sheet, Test 52B
- Division of Construction Personnel Certification Record for Employee #410-04-7167

Support No. N1-072-0024, Containment Spray Pump A, Discharge Pressure Sensing Line Support:

- WBNP-QCP-3.11 Attachment A, Support Fabrication Sheet No. FOS-423
- Drawing No. 47A051-35A Rev. 1, Instrument Sensing Line Support Typical
- Sketch IOS-2738 Rev. 0, Sheet 1, Instrument Support Installation Operation Sheet
- WBNP-QCP-3.11 Rev. 5, Attachment B, IOS 2736, Support Installation Operation Sheet Test 52A
- Drawing No. 47W600-131 Rev. 19, Electrical Instruments and Controls

Support No. FOS-2800, Reactor Coolant Pump Outlet Flow Sensing Line Support:

- WBNP-QCP-3.11 Attachment A, Support Fabrication Sheet No. FOS-2800
- Drawing No. 47A051-42B Rev. 0, Instrument Sensing Line Support Typical
- Sketch IOS-2387 Rev. 2, Sheet 117, Instrument Support Installation Operation Sheet
- WBNP-QCP-3.11 Attachment B, IOS 2387, Support Installation Operation Sheet 52C
- Drawing No. 47A600-169 Rev. 14, Electrical Instruments and Controls
- WBNP-QCI-1.28 Rev. 0, Attachment A, System No. I-51-42B974, FOS-2800, Support Variance Sheet
- Division of Construction Personnel Certification Record for Employee #413-98-2039

Support No. 1062-A060-62-191, Excess Letdown Pressure Sensing Line:

- Modification Workplan No. D-16461-01, Installation of Support per DCN M-16461-A
- Calculation No. 47A06062191, Qualification of Support No. 47A060-62-191

Support No. 1-ISLS-997-0049A, Emergency Diesel Generator Heat Exchanger Discharge Flow Sensing Line:

- WBN-CPI-8.1.8-H-100 Rev. 1, Data Sheet B, Support Identification, Location, and Installation Data Sheet, Support No. 1-ISLS-997-0049A
- WBN-CPI-8.1.8-G-100 Rev. 0, Data Sheet A, Expansion Anchor Test Data, Lot 1-ISLS-997-0049A
- WBN-CPI-8.1.8-C-501A Rev. 1, Inspection of Bolted Connections, Bolted Connection Identification 1-ISLS-997-0049A
- Drawing 47A051-56 Rev. 1, Instrument Sensing Line Support Typical
- Sketch No. 600-113, Sheet 118 Rev. 9, Support Installation Operation Sheet

Support No. FOS-9267, Emergency Raw Cooling Water Pump Discharge Pressure Sensing Line Support:

- WBNP-QCP-3.11 Rev. 12, Attachment B, Subassembly No. 0-67-L202A-4, Support Installation Operation Sheet
- WBNP-QCP-3.11 Rev. 12, Attachment B, FOS-9267, Support Fabrication Operation Sheet
- Drawing No. 47A051-2A Rev. 1, Instrument Sensing Line Support Typical
- WBNP-QCP-1.14 Rev. 13, Attachment B, Lot No. I-5985, Expansion Shell Anchor Proof Test Summary
- Sketch No. IOS-567 Rev. 3, Support Installation Operation Sheet
- Drawing No. 47A600-38 Rev. 11, Electrical Instruments and Controls
- Drawing No. 47A050-1K1 Rev. 4, Mechanical Hanger Drawing General Notes
- Division of Construction Personnel Certification Record for Employee #408-80-6299
- Division of Construction Personnel Certification Record for Employee #409-76-5126