

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



Report Nos.: 50-390/94-09 and 50-391/94-09

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: January 3-28, 1994

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

2/23/94
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
Division of Reactor Projects

3/10/94
Date Signed

SUMMARY

Scope:

This special, announced inspection was conducted to review the QA records and the QA record plans for the Miscellaneous and Structural Steel, Cable Raceway, and HVAC Ducts and Equipment hardware elements of the Additional Systematic Records Review (ASRR) portion of the QA Records Corrective Action Program (CAP).

Results:

In the areas inspected no violations or deviations were identified. The inspection team concluded that the QA record plans for Miscellaneous and Structural Steel, Cable Raceway, and HVAC Ducts and Equipment were technically sound. Only minor administrative problems were found in the plans, which were immediately corrected by TVA. TVA was able to retrieve all records requested by the team. The records sampled provided adequate documentation of the

installation of the hardware; only minor problems were observed in the records. These problems were corrected during the inspection. Corrective actions for problems identified by ASRR were found to be adequate. The inspection team also reviewed and closed Unresolved Item 50-390,391/93-59-06, Resolve Intent of Valve Sampling Methodology in QA Records CAP.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. Adair, Lead Civil Engineering Manager
- *J. Baxter, Site Licensing
- *J. Christensen, Manager Construction QA
- *T. Dean, Licensing Engineer
- *W. Elliott, Engineering and Modifications Manager
- *T. Hale, NDE Specialist
- *D. Harrison, Project Manager
- *R. Johnson, Engineering Manager (Acting)
- *N. Kazanas, Vice President Completion Assurance
- *D. Koehl, Technical Support Manager
- *F. Laurent, QA Special Projects Manager
- *R. Lewis, Manager CAQ Group
- *D. Malone, QE Manager
- *W. Massie, Site Licensing
- *R. McIntosh, Project Manager
- *B. Milhiser, Vice President EBASCO
- *W. Museler, Site Vice President
- *D. Nunn, Vice President Nuclear Projects
- *P. Pace, Compliance Licensing Manager
- *G. Pannell, Licensing Manager
- *L. Peterson, QA Records Project Manager
- *G. Pitzl, Weld Special Projects Manager
- *J. Scalice, Vice President Site Operations
- *W. Smathers, Project 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

- *W. Bearden, NRC Inspector, RII
- *B. Crowley, NRC Inspector, RII
- *R. Gibbs, Project Engineer, RII
- *C. Julian, Chief Engineering Branch, RII
- *G. MacDonald, NRC Inspector, RII
- *R. Moore, NRC Inspector, RII

*G. MacDonald, NRC Inspector, RII
*R. Moore, NRC Inspector, RII
*M. Morgan, Resident Inspector (Farley Plant)

NRC Contractors

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

*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 Miscellaneous and Structural Steel, Cable Raceway, and HVAC Ducts and Equipment 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 Miscellaneous and Structural Steel (Revision 2), Cable Raceway (Revision 3), and HVAC Ducts and Equipment (Revision 3). 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 miscellaneous and structural steel, cable raceway, and HVAC ducts and equipment 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 miscellaneous and structural steel, cable raceway, and HVAC ducts and equipment 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 miscellaneous and structural steel, cable raceway, and HVAC ducts and equipment 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. Miscellaneous and Structural Steel - Inspection Results (TI 2512/28)

a. Record Plan Review

Review of the Miscellaneous and Structural Steel Record Plan (Rev. 2) resulted in the following observations and concerns (records and procedures discussed are further detailed in Attachment A):

- For Miscellaneous and Structural Steel, TI-2007, Engineering Walkdown of Main Structural Steel/Platforms/Miscellaneous Steel to Support the Civil Calculation Program, and Worst Case Platform Calculations, was listed on the record plan as the primary QA records for demonstrating qualification for those attributes applicable to platform steel frames in place as of September 1989. The attributes were as follows:

Configuration

- * ID Number
- * Location/Orientation
- * Member Size/Length/Type

Welds

- * Configuration
- * Size/Length

Bolting

- * Type/Size/Quantity
- * Locking Device/Thread Engagement
- * Hole Size/Washer/Bolt Tightness
- * Bolt Spacing and Edge Distance

Surface Mounted Plate Assemblies

- * Anchor Size/Location, Type, and Quantity
- * Plate Size/Edge Distance/Bolt Holes/Washers

Attachments

- * Location/Identification of Attachments

Embedded Plates (associated with platforms)

- * Plate Size
- * Location

WCG-1-496, Selection of Worst Case Platforms, conducted screenings, engineering walkthroughs, and engineering assessments to determine the worst case platforms to be evaluated in detail. Twenty one worst case platforms out of a total population of 138 platforms were identified by this

effort. The TI-2007 walkdown then collected detailed information on the 21 worst case platforms. This information was compiled in calculations WCG-1-815 through WCG-1-834 and used as design input for evaluation of the worst case platforms documented in calculations WCG-1-687, 751, 769, 770, 788, 789, 809, 865, 866, 876, 879, 881, 898, 899, 907, 908, 961, 962, and 2-50.

Note: Because of the way the 21 worst case platforms, discussed above, were grouped for further evaluation, only 20 compilation calculations and 19 evaluation calculations were generated.

The structural adequacy of the total population of 138 platforms was intended to be validated by the worst case platform calculations. However, because several overstress conditions were identified for some worst case platform evaluations, and due to the fact that TVA committed to assess the effects of all HAAUP attachments on platforms, the structural adequacy of the remaining population of platforms required further assessment.

Calculation WCG-1-1303 was generated to document the method and process of assessment of the remaining population of platforms. This calculation encompassed 110 platforms. This number was derived by subtracting the following from the 138 original platforms:

- 1) 21 worst case platforms already evaluated
- 2) 6 platforms that had their original calculations regenerated
- 3) 1 platform evaluated to resolve CAQR 870759.

Calculation WCG-1-1316, Document Acceptance of Remaining Population of Platforms, utilized the information contained in WCG-1-1303, in addition to drawings and previous calculation reviews, and field walkthroughs to evaluate the 110 platforms.

Following the completion of calculation WCG-1-1316, DCN-22735-A, Reactor and Auxiliary Building Platforms, was issued to revise the associated structural steel platform as-constructed drawings to include reference to the applicable platform acceptance calculations.

The inspection team reviewed TI-2007, WCG-1-496, WCG-1-1303, WCG-1-1316, DCN-22735-A, and a sampling of the compilation and worst case platform calculations and agreed that the procedure and calculations adequately addressed those attributes listed above. However, the inspection team noted that calculation WCG-1-1316 did not accept all 110 platforms included for evaluation. Twenty-four platforms required

further review or modifications prior to final acceptance. The calculations and DCN that accepted these 24 platforms were not referenced in calculation WCG-1-1316. DCN-22735-A, which provided reference to the associated platform acceptance calculations on structural steel platform drawings, assumed that calculation WCG-1-1316 provided acceptance of the 110 reactor and auxiliary building platforms within its scope. The inspection team was unable to determine what calculations accepted the 24 platforms that were not accepted by WCG-1-1316 and required further evaluation. This concern was presented to TVA for resolution. TVA responded that the Calculation Cross Reference Information System Calculation Log Selection List (CCRISCLSC) provided a cross reference to all the related calculations associated with calculation WCG-1-1316. This cross reference would provide a means to access the associated platform acceptance calculation. TVA admitted that accessing platform acceptance records would be greatly facilitated by referencing the applicable records for all 138 platforms on WCG-1-1316 and agreed to revise this calculation accordingly. Revision 2 of WCG-1-1316 was issued on January 13, 1994 to accomplish this task.

The inspection team reviewed WCG-1-1316, Rev. 2, and concluded that it adequately bounded the acceptance of the 110 platforms in the reactor and auxiliary building by actual calculation or reference to the associated acceptance calculation or DCN. Additionally, this revision included reference to the 21 worst case platform calculations, the six regenerated calculations, and the one calculation associated with CAQR 870759. The inspection team concluded that WCG-1-1316, Rev. 2 adequately accounts for all 138 acceptance calculations for platforms in the reactor and auxiliary building and considers this concern resolved.

- For the attribute "Bolting", subattributes "Locking Device/Thread Engagement" and "Hole Size/Washers/Bolt Tightness", MAI-1.9, Damaged, Loose, Or Missing Hardware, was listed on the Record Plan as a primary QA record which documents this attribute, along with TI-2007 as discussed above. As documented in NRC IR 50-390,391/93-78, the inspection team reviewed MAI-1.9 and concurs that this procedure adequately addressed this attribute, but the team also noted that implementation of this procedure was not complete. CAQR No.WBP890502 had been issued to track this activity to completion and requires verification that the work and records are complete. The inspection team concluded that this CAQR provides adequate assurance that records will be available to demonstrate qualification of this attribute.

- For the attribute "Welds", subattributes "Configuration", "Size/Length", and "Quality", Weld Evaluation Project (WEP) Closure Statement Evaluation Reports (Groups 247, E, 255, 256, 263, D, and 260), were listed as primary QA records for documenting this attribute, along with TI-2007 as discussed previously.

WEP Closure Statement Evaluation Reports for Groups 247, E, 255, 256 and 263 addressed safety-related civil welds fabricated and installed prior to February 13, 1981. Groups D and 260 addressed safety-related civil welds fabricated and installed subsequent to February 13, 1981.

The WEP Closure Reports for Groups 247, E, D, and 260 concluded that welds evaluated meet the applicable FSAR construction code, and concluded there were no generic problems associated with the unsampled population.

For Groups 255, 256 and 263, the WEP Closure Reports concluded that the welds evaluated will meet the applicable FSAR construction code upon completion of TVA committed corrective action.

Additionally, the WEP Closure Reports concluded with a high degree of confidence, that the unsampled components within the group boundaries also meet the applicable FSAR construction code.

The inspection team reviewed the WEP Closure Reports and verified that the corrective actions for WEP Groups 255, 256, and 263 were documented as complete. The inspection team concluded that reference to the WEP Closure Reports combined with reference to TI-2007 and associated calculations for the attribute "Weld" was adequate.

- For embedded plates not associated with structural steel platforms, the following TI's were listed on the Record Plan as providing the QA records that document the subattributes "Plate Size" and "Location":

- 1) TI-2014, Walkdown of Pipe Whip Protection Devices and Associated Embedded Plates
- 2) TI-2023, Walkthrough of Embedded Plates
- 3) TI-2024, Walkdown of Embedded Plates

The inspection team noted that these TI's recorded embedded plate as-built data but did not provide acceptance of this data. This issue was discussed with TVA. TVA responded that the Record Plan does reference the Design Baseline Verification Program (DBVP) and the Civil Calculation Program which includes acceptance calculations. Additionally, TVA provided the inspection team with a copy

of calculation WCG-1-1593, Rev. 1, Resolution of General Concrete Anchorage Deficiencies Identified by PER WBP890450. This calculation provided a summary of the programs and corrective actions taken to resolve anchorages and embedded plate deficiencies. TVA indicated that calculation WCG-1-1593, which was issued subsequent to the Record Plan, would be included as an enhancement to the Record Plan to provide a central reference to all the embedded plate programs and calculations.

The inspection team verified the revision to the record plan and agreed that TVA's action was adequate to resolve this issue.

- During a review of the Record Plan the inspection team noted that QCP-2.18, Inspection of Mechanical Doors, Hatches, and Manways, was not listed as a record for supporting the installation inspection for these items. Miscellaneous and structural steel drawings include doors, hatches, and manways as part of the population of items included in miscellaneous and structural steel. This issue was discussed with TVA. TVA responded that although doors, hatches, and manways are included on miscellaneous and structural steel drawings, they were considered an architectural feature. As such, they were not included as part of the miscellaneous and structural steel element. However, they were included as part of the QA Records Cap review (hardware review) for records.

Although the inspection team included some doors and an escape hatch as part of the miscellaneous and structural steel records review, the inclusion of QCP-2.18 on the Record Plan is not considered necessary. However, the specific hardware reviews performed by TVA on these components were included as part of this inspection (refer to section 4.d of this report). Additionally, the specific QCP-2.18 records were verified for the doors and escape hatch chosen for this inspection. The inspection team considered this issue resolved.

b. Retrievability

For the miscellaneous and structural steel items under review, construction records were retrievable or alternate records were provided.

c. Records Review

The inspection team requested TVA to provide the records for sixteen miscellaneous and structural steel items (see Attachment A). A detailed record review was conducted for all sixteen of these items including the retrieval of supplementary records as

considered appropriate. In addition this records review included plant walkdown of four of these items (see Attachment B). Specific observations resulting from this review are detailed below:

Embedded Plates, Mark Nos. 38, 39, and 48:

- During a review of the record package for embedded plates (Mark Nos. 18N305-38, 39 and 48) the Fabrication Inspection Records (QCP-2.04, Attachment G) could not be located. However, an engineering evaluation of the missing records had been performed in accordance with QCI-1.08. This evaluation accepted TVA Form 4139, Request for Shipment of Materials, and QCP-1.3, Attachment C, Shop Release of Fabricated Items, as acceptable alternate records to replace the Fabrication Inspection Records for these embedded plates.

The inspection team reviewed the alternate records and agreed that these records provided adequate documentation to support fabrication of embedded plates Mark Nos. 18N305-38, 39 and 48. However, a review of TVA Form 4139, Request for Shipment of Material for Mark No. 18N305-38, dated July 29, 1977, showed that this embedded plate's as-built configuration was different from that specified on drawing 18N305. This difference was associated with the location of the anchor stud on the embedded plate. The inspection team requested that TVA provide a record that documented the acceptability of this as-built configuration. TVA provided the inspection team with TVA Engineering Specification G-89 (R2), Requirements for Structural and Miscellaneous Steel, which authorized relocation of anchor studs on embedded plates. This specification bounded the difference between as-built embedded plate Mark No. 18N305-48 and drawing 18N305. The inspection team agreed with the resolution to this concern.

HVAC Cooler Unit 0-PMCL-30-0193-B Steel Support Framing, Mark Nos. 47A373-41:

- During the field inspection of Mark No. 47A373-41, the inspection team noted several support hangers attached to the steel support framing. These included HVAC duct supports and small bore pipe supports. HVAC Cooler Unit 0-PMCL-30-192-A steel support framing, Mark No. 47A373-41 was noted to have similar hanger attachments as documented in NRC IR 50-390/93-78. Design calculation, WCG-2-17, Auxiliary Building and Equipment Supports, had not been revised to take into consideration the additional loading caused by these attachments. The inspection team requested TVA provide the design and analysis calculation(s) that accounted for the addition of these attachments such that

any analysis of future attachments to these HVAC support frames would be performed to an adequate baseline. TVA responded that the population of HVAC cooler support equipment steel frames has been baselined as part of the recent Equipment Seismic Qualification (ESQ) CAP Program. Engineering walkthrough procedure, TI-2005, and Administration of Walkdown Documents, SSP-9.A, were used to perform field reviews and collect data. Since the critical attribute (weak link) of these support steel frames is their anchorage to concrete, the walkthroughs focused on anchorage outliers in order to bound the population.

Suspended frames at elevation 692', which supported cooler units 1-PMCL-30-182-B and 1-PMCL-30-183-A, were found to have anchorage outliers that bound units 0-PMCL-30-192-A and 0-PMCL-30-193-B. The suspended frame type configurations of these support steel frames were similar.

The bounding evaluation of HVAC cooler support framing is documented in system 30 ESQ calculation WCG-ACQ-0496. In order to ensure bounding of any load condition, a horizontal seismic acceleration factor of 2.94g was applied to the mass of the cooler unit (2500 lbs). For support steel frames 0-PMCL-30-192-A and 0-PMCL-30-193-B, the actual horizontal seismic zero period acceleration (ZPA) is 0.6g. In other words, the horizontal seismic load applied to the bounding case was conservative for 0-PMCL-30-192-A and 0-PMCL-30-193-B by a factor of five (2.94g divided by 0.6g). The horizontal loading is the most predominant load type since it induces the largest moments and overturning effects, and thus the most significant anchorage stresses. This conservatism adequately bounded any applied loads from existing attachments. Future attachments to steel support framing will be controlled through procedure EAI-8.07, Documentation and Evaluation for Attachments to Civil Features.

The inspection team reviewed the applicable portions of ESQ calculation WCG-ACQ-0496, Rev. 0, Walkdown Packages for 0-PMCL-30-192-A and 0-PMCL-30-193-B, and EAI-8.07, Rev. 1. The inspection team agreed that these documents bounded and baselined the cooler support framing, and provided adequate controls for future attachments to the cooler support framing. However, the inspection team noted that the Record Plan did not list the ESQ CAP and associated evaluations as a primary QA record to support qualification of anchorage for equipment steel support framing. TVA was requested to respond to this issue. TVA agreed that the Record Plan should reflect the ESQ CAP. Revision 3 of the miscellaneous and structural steel record plan was issued on January 28, 1994 which included the addition of the ESQ CAP and associated evaluations. The inspection team verified the

revision and concluded that TVA had adequately responded to this issue. The team agreed with the resolution to this item.

d. ASRR Deficiencies and Corrective Actions

RRSS-51:

- This RRSS initially documented six (6) primary and twenty six (26) secondary deficiencies associated with high strength bolt torquing reports. The secondary deficiencies were either determined to be invalid or were accepted use-as-is based on the minor significance of the discrepancies. The six (6) primary deficiencies (missing high strength bolt torquing reports) were dispositioned as follows:

- 1) One primary deficiency was determined to be invalid as the item in question was a manway cover and as such was not applicable to this type of record.
- 2) One primary deficiency was determined to be invalid. The item in question was a threaded rod with two ASTM A194 hex nuts. The inspection requirements for this type of connection was covered by QCP-1.42-2, data card for Bolt and Baseplate Gap Inspection. This data card was located and verified.
- 3) One primary deficiency was determined to be invalid as the panel bolting was required to be "snug tight". Proper fit-up was verified by QCP-2.4, Attachment H, Steel Acceptance Report record.
- 4) Two primary deficiencies were determined to be invalid as the records were determined to be retrievable.
- 5) One primary deficiency was determined to be invalid as the bolting operation was for erection purposes and provided fit-up for welding operations. The welding was qualified through ECN 6740.

The inspection team concluded that the actions taken to resolve the noted discrepancies were adequate.

RRSS-79:

- This RRSS identified nine (9) secondary deficiencies associated with the legibility of records. Legible records were subsequently retrieved from the DCRM system.

The inspection team considered the corrective action to be adequate.

RRSS-94:

- This RRSS initially documented a primary deficiency associated with the final inspection report for an embedded plate. As embeds were installed during concrete pour operations, the concrete pour card would have been the record documenting this installation. Concrete pour card CABCE140AA was initially determined to be the correct pour card and could not be retrieved. It was later determined that concrete pour card CABCF15 was the correct pour card. This pour card was retrieved successfully. The non-retrievable pour card deficiency associated with CABCE140AA was transferred to RRSS-142 for resolution.

The inspection team concluded that the actions taken to resolve this item were adequate.

ASRR Technical Content (ordered) Review for North Main Steam Valve Platform Elevation 740.97:

- This review evaluated the technical content of the following record types for the North Main Steam Valve Platform:
 - 1) as-constructed drawings
 - 2) as-designed drawings
 - 3) DNE civil standard drawings
 - 4) DNE calculations
 - 5) design change notice form
 - 6) design change authorization
 - 7) expansion shell anchor test summary
 - 8) expansion shell anchor measurement/test results
 - 9) bolt anchor inspection data card
 - 10) steel fabrication acceptance sheet
 - 11) steel acceptance report
 - 12) final steel acceptance sheet
 - 13) request for shipment of materials

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.

Hardware checklist 018-002 (ID 48N922):

- This review identified an undersized weld on a structural frame and possible missing identification tags on structural framing.

The undersized weld problem was resolved by reference to the Welding CAP Project which inspected a sampling of structural steel features for weld discrepancies. This project

concluded that for attributes such as undersized welds the allowable design stresses would still be met. The record of acceptance of this sample is retrievable through RIMS under the WEP Closure Statements for Groups D and E, which dealt with structural steel features. (Refer to Section 4.a of this IR for additional discussion on the WEP Closure Statements associated with civil welds)

The identification tagging concern was resolved by comparing the framing elevations and dimensions to the design drawing. This verified the framing in the field agreed with the framing on the drawing. Additionally, it was determined that the original inspection procedure did not require tagging identification of structural steel framing.

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

Hardware checklist 018-005 (ID 48W1703-03):

- This review identified minor dimensional discrepancies, and weld size and length not per the design drawing.

The minor dimensional discrepancies were resolved through issuance of a drawing deviation, DD 93-0659.

The weld size and length discrepancies were resolved in a similar manner to the weld discrepancy documented in hardware checklist 018-002 detailed in this inspection report.

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

Hardware checklist 018-003 (18N301), 018-004 (41W391-14), 018-010 (ID 48N967-1), 018-012 (48N1294-2), 018-014 (48W905-1), 018-016 (48W1211-2), 018-024 (38N1204), 018-033 (48W1227-5), 018-037 (18N307), 018-040 (48W1708-13), 018-041 (48W1708-12), 018-048 (48W1707-21), 018-053 (48N415), 018-056 (48N1327-1), and 018-064 (48N1210-17):

- These platform reviews identified various examples of incorrect section and details shown on the design drawing; various examples of dimensions out of tolerance from design drawing; various examples of weld configurations that did not conform to design drawings; and various examples of hardware discrepancies.

These items were resolved by reference to either one or both of the following programs:

- * Acceptance based on the platform reverification effort done as part of the Seismic/Civil Validation Program. (Refer to Section 4.a of this IR for discussion of TI-2007, platform acceptance calculations, and DCN-22735-A)
- * Acceptance based on the Welding CAP Project. (Refer to Section 4.a of the IR for discussions of the WEP Closure Reports on civil welds)

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

Hardware checklist 018-017 (48W1708-2 and 48W1708-11):

- This review identified a shim plate that was only partially welded/tack welded along the top side of the plate which appeared to be contrary to the drawing requirements. Further evaluation determined the as-constructed drawing showed the shims as not yet completely installed and referenced an Open Work Item (OWI) No. 1-PDO-M5056. The OWI referenced a memorandum from design engineering that did not require the shims to be installed prior to the initial assent to 100% power. The inspection team requested TVA to provide the open item tracking number that was tracking the completion of this item. TVA responded that open item 1-PDO-M5056 was renumbered as RWL-M5056 on the Master Tracking System. Additionally, WO C178299 was written against this open item to complete this installation. The inspection team concluded that the actions taken were adequate.

Hardware checklist 018-025 (18W314):

- This review documented an identification problem with a grill, bolt holes oversized and too close to the edge, and undersized welds.

The identification of the grill was completed by locating the grill based on grill detail locations shown on the drawing.

PER WBP930491 was written to address the oversized bolt holes and the edge tolerance discrepancies.

The undersized welds were acceptable based on the sampling evaluation performed on structural steel welds during the Weld CAP Project. (Refer to Section 4.a of the IR for discussions of the WEP Closure Reports on civil welds)

The inspection team agreed with the resolution to these items.

Hardware checklist 018-026 (44W269-1):

- This review identified that door locking hardware was not installed, and concrete anchors were not in agreement with the drawing.

DCN M-15745-A was written to address the door locking mechanism. This item was placed on the future projects/issues management list and will be worked after fuel load.

The concrete anchor bolt relocations were to avoid hitting rebar were acceptable per Note A on drawing 44W269-2.

The inspection team agreed with the resolutions to these items.

Hardware checklist 018-050 (44W359-1):

- This review identified a missing latching bar slot, partially missing door seal and caulking, door misalignment, and an undersized weld.

Drawing Deviation No. 93-0635 was written to resolve the missing latching bar slot.

Work Request No. C-242452 was written to address the door seal and alignment problems.

The undersized weld was acceptable based on the sampling evaluation performed on structural steel welds during the Weld CAP Project. (Refer to Section 4.a of the IR for discussions of the WEP Closure Reports on civil welds)

The inspection team agreed with the resolutions to these items.

Hardware checklist 018-051 (44N281-1):

- This review identified several missing or damaged hardware pieces for this hatch. Also, the locking mechanisms were either missing and/or damaged.

Work Request No. C-242451 was written to correct the missing and damaged hardware.

The inspection team agreed with the resolutions to these items.

Hardware checklist 018-055 (46W454-17):

- This review documented the fact that door #231 was not identified.

This was resolved based on the fact the door could be located using drawing 46W454-17 and 46W421-3. Additionally, QC records could be retrieved based on the door number on the drawings.

The inspection team agreed with the resolution to this item.

5. Cable Raceway - Inspection Results (TI 2512/28)

a. Record Plan Review

Review of the Cable Raceway Record Plan (Revision 3) resulted in the following observations and concerns (records and procedures discussed are further detailed in Attachment A):

- For Cable Raceway, several Corrective Action Programs (CAP's) were listed on the record plan as primary records. Following is a list of those CAP's:

Electrical Conduit and Conduit Support CAP
Cable Tray and Cable Tray Support CAP
Electrical Issues CAP
Cable Issues CAP
Fire Protection CAP

The inspection team reviewed the descriptions for the CAP's to determine if each CAP addressed the applicable record plan attributes. For the Electrical Issues CAP, the inspection team was unable to determine if the CAP adequately addressed the attribute "Separation". This was not due to any shortcoming in the record plan but rather to the general nature of the CAP description. A review of the implementing documents for the CAP, specifically Work Plans WP-39, WP-M-5696-1, and WP-M-5696-2, led the inspection team to conclude that the Electrical Issues CAP did not address tray to tray separation. This issue was presented to TVA for resolution. TVA responded by pointing out that the Electrical Issues CAP only addressed problems which had occurred regarding "field run" conduit. Installation of cable tray was in accordance with specific drawings and as a result, separation requirements were inherently satisfied during the installation process. This being the case, the installation records provide the documentation for the attribute "Separation" for cable tray. The inspection team noted that although the installation procedures were included on the record plan under the attribute "Separation", they were not denoted as primary documents.

TVA has included these installation procedures on the record plan as primary documents.

The inspection team agreed with this resolution to the concern. References to the other CAPs for the other attributes on the plan were found to be appropriate.

- The inspection team noted that for the attribute "Cover (Top and Bottom-Tray)", the record plan listed SCAR No. SCRWBNECB8601SCA as the primary record. The corrective action for this SCAR required "Verification that covers (Top &/or Bottom) in Seismic Category I structures are attached per the method(s) of DCN M-10472 and that cover placement is marked on the tray." This verification process is being implemented in accordance with MAI-1.9, Walkdown Verification For Modifications System/Area Completion and Damaged, Loose, or Missing Hardware.

The inspection team reviewed the implementing document and concluded that there is reasonable assurance that when completed, it will provide adequate records for this attribute.

- For the attribute "Pull Points", the record plan denotes MAI-13 and MAI-3.1 as the primary records. Those procedures include a restriction to limit a conduit run to no more than four 90 degree bends between pull points. The inspection team noted that these two procedures cover the period of time from September 5, 1986, when the pull point requirement was incorporated into Revision 3 of MAI-13, until the present. However, the record plan had no primary record identified to cover the period of time dating back to the mid-1970's, when conduit installation began. This shortcoming was pointed out to TVA for resolution.

TVA responded by stating that for work that was performed prior to the time when the site procedures incorporated the bend restrictions, the issue was addressed as part of the corrective action to SCAR WBP870135SCA. The SCAR performed a worst case analysis of the previously installed conduit. This was performed as part of the cable sidewall pressure issue, which is included as part of the Cable Issues CAP. This CAP is listed on the record plan but is not identified as a primary record. TVA revised the record plan to include the Cable Issues CAP as a primary document on the record plan for this attribute.

The inspection team reviewed the CAP and the SCAR and found that the corrective action adequately addressed this issue.

b. Retrievability

For the cable raceway under review, the inspection team found that the records required were retrievable or alternate records were provided.

- For cable tray 4A2548 and 4A2549, the records retrieved from the Record Information and Management System (RIMS) for QCP-3.7, Installation And Inspection of Electrical Penetration Pressure Seal, Fire-Stop Barrier and Flame Retardant Cable Coating, were computer input cards. There were no installation or inspection signatures on these cards to document that the work was conducted in accordance with site procedures. The inspection team learned that QCP-3.7 required a "release number" to be entered on the computer index card as a reference to locate the actual installation and inspection records. The inspection team requested the actual installation and inspection records by referencing the "release numbers" found on the computer input cards provided.

These records were retrieved by TVA and provided to the inspection team. Based on the documents provided, the inspection team concluded that they did satisfactorily document the installation process.

- For cable tray 3A3953 and 3A3954, no documentation could be retrieved for the installation of flame retardant cable coating. This was pointed out to TVA for resolution. TVA responded that flame retardant coating on cables is no longer a requirement except at cable-tray penetration seals. TVA provided a letter dated October 18, 1984 from L. M. Mills (TVA) to H. R. Denton (NRC) which deleted the requirement for flame retardant cable coatings as described above.

The inspection team reviewed the letter and concluded that since the coating is no longer required for the tray in question, the fact that the installation records could not be retrieved is of no consequence. The inspection team considers this item resolved.

c. Records Review

From the nineteen cable raceway items listed in Attachment A, a sample of nine was chosen for a detailed review of hardware and records. These nine items and the specific records reviewed are listed in Attachment B. Specific observations resulting from this review are detailed below:

Cable Tray No. 4A2549, Elevation 782, Pressurizer Heater
Transformer Room:

- The inspection team found that cable tray 4A2549 passed through wall penetration No. AA11792 but all of the fire barrier material had been removed. The inspection team discussed this with TVA and asked for a response. TVA responded by stating that deficiencies in the implementation of the sleeve sealing program had been identified by TVA in the past and are being addressed by Project Plan GW, a project to implement corrective action to assure that these seals will perform their sealing and isolation functions. As part of the corrective action, walkdown procedure WD-033, WBNP Fire and ABSCE [Auxiliary Building Secondary Containment Enclosure] Boundary, Electrical Penetration Seal Walkdown Procedure, Unit 1 and Common, has been issued to inspect and repair/replace, if necessary, all electrical conduits and cable tray slots in critical applications.
- The inspection team reviewed WD-033 and concluded that there is reasonable assurance that when implemented, this program will correct this and other similar fire barrier deficiencies.

Conduit No. 1VC 1134B, Conduit to Motor for RHR 1B-B Suction Valve
1-SCV-74-21, RHR Pump Room:

- During the inspection of conduit 1VC 6133B, the inspection team noticed that the fitting on an adjacent flexible conduit, conduit No. 1VC 1134B, was loose. The inspection team pointed this discrepancy out to TVA and asked for a response. TVA responded by stating that procedure MAI-1.9, Walkdown Verification for Modifications System/Area Completion and Damaged, Loose, or Missing Hardware, is designed to locate and correct discrepancies of this type.

The inspection team has reviewed MAI-1.9 and has concluded that there is reasonable assurance that when implemented, this walkdown program will correct discrepancies of this type.

Cable Tray No. 3A165/3A166, Cable Spreading Room Upper Level:

- The inspection team found that the upper cover for this tray was not properly secured in that the fasteners were loose or missing. However, as discussed earlier in this report, TVA will implement MAI-1.9 to resolve deficiencies of this type.

The inspection team concluded that there is reasonable assurance that the item will be corrected by the MAI-1.9 program.

Conduit No. PP2551A, Diesel Generator Building 1A-A:

- During the inspection, the team found that the flexible conduit between switchgear panel 1-XSW-82-A/3-A and the hard conduit did not have a grounding strap installed. This discrepancy was pointed out to TVA for resolution. TVA provided Work Order 93-23576-87 to the inspection team as documentation of work planned to correct this item.

The inspection team reviewed the work order and verified that the work instructions include a step to inspect conduit PP2551A for grounding straps at flexible conduit sections and to install straps if necessary. The inspection team found this corrective action plan satisfactory.

d. ASRR Deficiencies and Corrective Actions

RRSS-58:

- This RRSS dealt with the availability of codes and standards. NEMA Standard VE1-71, Cable Tray Systems, was not retrievable at the DCRM. For corrective action, the DCRM planned to purchase a hard copy and place it in the Temporary Storage Office Building Technical Information Center (TSOB TIC) for permanent retention. The inspection team verified that this corrective action is complete.

The inspection team agreed with TVA's resolution of this item.

RRSS-94:

- This RRSS dealt with a minor entry error on a conduit installation card. TVA concluded that the error was of no technical significance and dispositioned the item "accepted-as-is".

The inspection team agreed with TVA's resolution of this item.

RRSS-111 and RRSS-115:

- RRSS-111 identified fifteen installation documents which were not retrievable at the time of the ASRR review. Thirteen of these documents were later retrieved by personnel more familiar with the documents and the retrieval system. The remaining two items were resolved as follows: Cable tray 3A3620/3934 was determined not to be a segment of tray but rather a cable transitioning from one tray to another. This is called a "free air drop" and no tray installation sheet was required. Conduit PLC-3405S could not be located in the field. However, another conduit was

installed in its place. The records for the existing conduit were retrieved satisfactorily. Conduit PLC-3405S should have been deleted from the Cable Conduit Routing System (CCRS) database. RRSS-111 references RRSS-115 for the resolution of the CCRS database error. The inspection team verified that RRSS-115 did resolve the issue by requiring the deletion of conduit PLC-3405S from the CCRS database. This resolution is being tracked to completion by Significant Corrective Action Report (SCAR) WBSA910227.

The inspection team concluded that TVA's resolution of these items was adequate.

ASRR Technical Content Review and Resolution (Ordered Review):

- This ordered review evaluated the technical content of the cable raceway records applicable to the installation of conduit 1VC3068-A. The review included the following record types:
 - * As Constructed Drawings
 - * Calculations
 - * Design Change Notices
 - * Walkdowns
 - * Installation Documentation

Within those record types, numerous attributes were considered including identification, size, separation, routing, moisture seals, and fire barriers. All aspects of this ordered review were stasured as "acceptable". The inspection team reviewed all of the checklists, the verification bases and the results.

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

ASRR Technical Content Review and Resolution (Random Review):

- The random review evaluated the technical content of cable raceway records associated with record type "Installation Documents" for the installation of twenty randomly selected raceway items. The following attributes were considered: cable protection, physical damage, moisture seals, pressure seals, distance from hot pipes, flood protection, and weep holes (for junction boxes). The inspection team reviewed all of the checklists, the verification bases and the results.

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

Hardware checklist 02-13 (1PLC 3354B), checklist 02-14 (1NM 3293F), and checklist 02-20 (1VC 1934A):

- For these hardware items, the identification tags were missing (1PLC 3354B and 1NM3293F) or were not of the type specified in the design documents (1VC 1934A). In each case, work requests were issued to correct the deficiency. The inspection team queried TVA's Master Tracking System and learned that the work documents were being tracked and that the work descriptions provide adequate direction for correcting the deficiencies.

The inspection team concluded that TVA's resolution of these problems provided adequate assurance that the deficiencies will be corrected.

- Because there had been numerous deficiencies recorded on the ASRR Hardware Review Checklists due to missing and/or damaged identification tags on cable raceways, engineering had performed an evaluation to determine a logical cause for these deficiencies. Engineering concluded that because the hardware installation and inspection records had virtually no errors regarding identification numbers, it is likely that the identification tags were in place at that time. Therefore, the most likely explanation for missing tags is that they were originally installed as documented on the installation documentation but have been inadvertently torn away over the years due to post installation construction activities. Engineering concluded that there appeared to be no generic problem with respect to raceways not being initially tagged. Because SSP-2.52, Replacement and Upgrade of Plant Component Identification Tagging and Labeling, had been issued to outline a new program for replacement and upgrading of plant component identification tags, no additional corrective action was recommended.
- The inspection team reviewed the purpose and scope of SSP-2.52 and determined that conduit labeling is specifically excluded from the scope of the procedure. This was pointed out to TVA for resolution.

TVA acknowledged that SSP-2.52 had been revised and now excludes conduit labeling from the scope. TVA pointed out that for those instances where other programs such as routine inspections, maintenance activities and system turnover inspections have not replaced missing tags, additional methods of identification are available. The identification of installed conduit can be determined by referring to as-constructed drawings and to the Conduit Cable Routing System database. While physical identification of conduit is the preferred method to determine unique identification, use of design output

documents can provide an acceptable alternative. TVA has revised the resolution to this checklist item to reflect this new information.

The inspection team found TVA's response and resolution to this item to be satisfactory.

Hardware checklist 02-16 (1RM 528B):

- This review identified loose fittings on the flexible section of this conduit. It was also determined there were no grounding straps or cables across the flexible conduit. The resolution for these deficiencies pointed out that on a generic basis, the Electrical Issues CAP addresses flexible conduit installation deficiencies. The resolution stated that the implementation of the CAP will correct the deficiencies like those described above. For these specific items, Work Request C151343 was issued to correct the problems. The inspection team reviewed the Electrical Issues CAP and Work Plan 5696-1 which was written to resolve numerous deficiencies including those noted in the CAP with respect to flexible conduit.

The inspection team concluded that implementation of the Work Plan should provide adequate assurance that, deficiencies like those noted above will be corrected.

For the specific deficiencies of this checklist, the inspection team confirmed that Work Request C151343 properly addressed the problems and that the implementation was complete.

The inspection team concluded that TVA's corrective action was adequate to resolve the deficiencies.

Hardware checklist 02-16 (MC 433A):

- This checklist identified an example where the bonding strap or grounding cable was missing from a section of flexible conduit. Work Request C151347 was written to correct the deficiency. The inspection team confirmed that Work Request C151347 is being tracked in the Master Tracking System and that the work description provides adequate direction for correcting the deficiency.

The inspection team concluded that TVA's resolution to this deficiency provides reasonable assurance that adequate corrective action will be completed.

Hardware checklist 02-29 (3B 2142 2157):

- This checklist identified an example where the tray cover was missing from a tray located under a grating floor. The resolution cited Significant Corrective Action Report (SCAR) SCR WBNECB8601S to generically address problems regarding missing tray covers. Additionally, Work Request C151344 was written to correct the deficiency for this specific cable tray.
- The inspection team reviewed SCAR WBNECB8601S to verify that the issue of tray covers on cable tray located under grating is generically addressed. In the corrective action section of the SCAR, it stated as a required action the "Verification that covers are on the top of trays located beneath galleries and or gratings." The inspection team also confirmed that Work Order C151344 is being tracked in the Master Tracking System and that the work description provided adequate direction for correcting the deficiency.

The inspection team concluded that TVA's resolution to this problem provides reasonable assurance that this specific deficiency will be corrected.

6. HVAC Ducts and Equipment - Inspection Results (TI 2512/28)

a. Record Plan Review

Review of the HVAC Ducts and Equipment Record Plan (Rev. 3) resulted in the following observations (records and procedures discussed are further detailed in Attachment A):

General Observations:

- Regarding HVAC dampers, the inspection team questioned the use of the attributes balancing and alignment, maintenance, and operability since these attributes do not provide primary construction or installation records. 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. TVA stated that at one point in time the construction organization was responsible for these attributes up to the point of system transfer. As a result, construction records were generated that documented verification of the above attributes and, as such, were included in the record plan.

The inspection team did not disagree with this logic.

- Review of the HVAC ducts and equipment record plan identified several areas of overlap with the HVAC supports record plan for the following duct attributes:

- * Materials
- * Welding
- * Installation

The scope of the HVAC supports record plan consists of HVAC support installation attributes including duct installation attributes, such as accessories (including dampers), material, size, and span, that are necessary to evaluate support design loading. The scope of the HVAC ducts and equipment record plan consists of ducts and equipment (including dampers) installation attributes. Of concern to the inspection team were the differences between the two record plans in the presentation of the records which serve as the primary QA records for the duct attributes.

As discussed in NRC Inspection Report 50-390,391/93-78, review of the HVAC supports record plan indicated that TVA relies almost entirely on implementation of the HVAC CAP to establish the licensing basis record for HVAC ducts and supports. The CAP specified the development and implementation of a critical case evaluation methodology for acceptance of safety-related HVAC ducts and supports. Because of discrepancies contained in the design output documents and because they lacked information regarding loading of hardware accessories, such as grills and dampers, the critical case HVAC support evaluations were based on information obtained by walkthroughs and walkdowns.

As a result, the HVAC supports record plan illustrates reliance on the CAP walkthroughs and walkdowns for providing primary QA records. The HVAC ducts and equipment record plan, however, highlights original installation documents, such as QCP-4.27 test data sheets and corrective action documents, instead of the HVAC CAP walkthroughs and walkdowns as primary QA records.

The inspection team acknowledged that the HVAC ducts and equipment record plan recognizes the duplication of several duct attributes in the record plans, but asked TVA to explain the apparent inconsistency in the presentation of licensing basis QA records. Consequently, TVA revised the HVAC ducts and equipment record plan to eliminate the redundancy and, hence, the apparent inconsistencies between the two record plans. Details of the record plan review are discussed under specific observations below.

Specific Observations:

- The HVAC duct and equipment record plan attribute, duct materials, relies on both QCP-4.27 and HVAC CAP corrective action documents as primary QA records, while the same attribute in the HVAC supports record plan relies on HVAC

CAP corrective action documents only. When asked to explain this apparent inconsistency TVA stated that original installation records (QCP-4.27) are pertinent to flexible duct connectors only, which were not within the scope of the HVAC CAP. Further, TVA stated that a note in the HVAC ducts and equipment record plan remarks column refers to: 1) the replacement of flexible duct connectors which is intended to clarify the inclusion of QCP-4.27 and 2) the HVAC supports duct material attribute which provides additional information regarding pertinent records.

The inspection team concluded that this explanation provided adequate justification for the differences observed between the HVAC ducts and equipment and the HVAC supports record plans and that the records demonstrate qualification of these attributes.

- The HVAC ducts and equipment record plan attribute, welding, relies on HVAC CAP corrective action documents as primary QA records, while the same attribute in the HVAC supports record plan relies specifically on the resolution to a 10CFR50.55(e) report regarding safety-related HVAC duct welding. During this inspection period, TVA revised the HVAC ducts and equipment record plan to simply reference the HVAC supports record plan for the duct welding attribute.

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

- The HVAC ducts and equipment record plan attribute, installation, relies on both QCP-4.27 and HVAC CAP corrective action documents as primary QA records. The same attribute in the HVAC supports record plan is comprised of numerous sub-attributes which rely, with the exception of duct stiffener bolts, on HVAC CAP corrective action documents only. The duct stiffener bolts sub-attribute relies on QCP-4.27 since it was outside of the scope of the HVAC CAP. It was not apparent from review of the HVAC ducts and equipment record plan installation attribute that inclusion of QCP-4.27 as a primary QA document was intended for duct stiffener bolts only. When asked to explain this apparent inconsistency in the two record plans TVA revised the HVAC ducts and equipment record plan to simply reference the HVAC supports record plan for the duct installation attribute.

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

- MAI-1.9, Damaged, Loose, Or Missing Hardware, was listed on the HVAC ducts and equipment record plan a primary QA record. The inspection team previously reviewed MAI-1.9 in NRC Inspection Report 50-390,391/93-78 (on HVAC supports) and concurred that the procedure adequately addresses these attributes, but the team also noted that implementation of this procedure is not complete. Further inquiry during this inspection revealed that CAQR No.WBP890502 will track this activity to completion and will require verification that the work and records are complete.

The inspection team concluded that this provides adequate assurance that records will be available to demonstrate qualification of these attributes.

b. Retrievability

For the HVAC ducts and equipment under review, construction installation records or alternate records were generally retrievable.

- During the review of 1-030-RB-D-049, Hydrogen Collector Duct, the inspection team noted that NCR 3741R, Rev. 1 identified that inspection and leak tightness testing were not documented as required in accordance with QCP-4.27 and QCT-4.39, respectively. The disposition to NCR 3741R, Rev. 1 required the inspection of the hydrogen collector duct, which was subsequently determined to be satisfactory. Additionally, the NCR required the performance of flow rate testing in accordance with QCT-4.40. Satisfactory performance of this testing would satisfy the requirements of QCT-4.39, by verifying that no leakage was present which would adversely affect system performance. During the performance of flow rate testing, NCR 3831R was initiated to document two collectors which had flow rates below the minimum acceptable value. NCR 3741R, Rev.1 and NCR 3831 were closed as a result of the subsequent engineering review which accepted these flow rates as-is based on the conservatism factored into the original ventilation calculations.

The inspection team considered these actions satisfactory to resolve the identified concerns.

- During the review of 0-031-CB-ISD-4612, Emergency Supply to Shutdown Board Room Damper, the inspection team noted that the QCP-4.27 inspection card made reference to ECN 5523, and stated that configuration and location attributes were previously documented under ID 0-031-CB-XFD-78A. Review of ECN 5523 and associated inspection documentation verified acceptance of these attributes. ECN 5523 described the modification of fire/smoke damper 0-031-CB-XFD-78A to remove

the smoke actuation feature. Subsequently, this damper was re-identified as 0-031-CB-ISD-4612.

The inspection team considered these actions satisfactory to resolve the identified concerns.

c. Records Review

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

0-031-CB-ISD-4612, Emergency Supply to Shutdown Board Room Damper:

- During the field walkdown the inspection team identified that the subject damper had been permanently removed and blanks had been installed in the existing HVAC ducts. By reference to mechanical drawing 47W920-8, TVA subsequently retrieved DCN M-15802. This DCN eliminated the option of using the Control Building HVAC System as a standby emergency supply to the Shutdown Board Room Air Conditioning System. The interface between these two systems was identified as a potential leakage path which could have violated the pressurization and isolation requirements. To eliminate this potential leakage path TVA installed blank off plates as the most economical solution.

The inspection team reviewed the DCN and agreed with the resolution to this item.

d. ASRR Deficiencies and Corrective Actions

RRSS-111:

- This RRSS identified discrepancies involving four QCP-4.27 installation records initially thought to be unretrievable which were subsequently retrieved. It also identified four examples of QCP-4.27 records which contained "N/As" which were not initialed and dated. These discrepancies were determined to be invalid since, at the time, no requirement regarding the initialing and dating of "N/As" existed.

The inspection team found this resolution satisfactory.

RRSS-121:

- This RRSS identified two discrepancies involving calculations affecting dampers initially thought to be unretrievable which were subsequently retrieved.

The inspection team found this resolution satisfactory.

RRSS-129:

- This RRSS identified discrepancies involving the inability to retrieve as-built drawings for three components. These drawings were subsequently retrieved by reference to the respective vendor contract number and then to the drawing number.

The inspection team found this resolution satisfactory.

ASRR Technical Content Review and Resolution (HVAC Ducts and Equipment Ordered Review):

- This ordered review evaluated the technical content of the HVAC ducts and equipment records associated with ANSI record types applicable to the installation of 1-FCO-030-0106, Auxiliary Building General Supply Isolation Damper. The review included the following record types:

Vendor Technical Manual
Purchase Specification
System Design Criteria
Calculation

Within these record types, numerous attributes including size/dimension, rated flow/velocity, configuration, failure mode, materials, design temperature, mounting position, maintenance, classification, seismic qualification, and leakage rate were considered. This review initially identified that the attribute for the damper seal design temperature as identified in the vendor technical manual was low as compared to the calculated peak temperature of the affected area. Additionally, the vendor technical manual did not contain any damper maintenance requirements. Subsequent review, however, of a later revision (Revision 14) to the vendor technical manual identified the appropriate damper seal qualification temperature and maintenance requirements.

The inspection team reviewed all of the checklists, verification bases, results, and deficiency resolutions and found the ordered review of HVAC ducts and equipment to be acceptable.

ASRR Technical Content Review and Resolution (HVAC Ducts and Equipment Installation Records Random Review):

- This random review evaluated the installation records for the following HVAC ducts and equipment:

1-031-CB-ISD-3958
 1-030-DG-FCO-465
 0-031-CB-BLD-2137
 0-030-DA-ISD-648
 1-065-RB-BLD-506
 0-031-CB-BLD-4403
 0-065-AB-BKD-528
 0-031-AB-BLD-3278
 0-030-AB-D-219A
 1-031-AB-BLD-3008
 1-031-AB-FCO-291
 1-031-AB-BLD-3045
 0-031-CB-FCO-7
 0-031-CB-BKD-2001B
 1-031-AB-BLD-3105

All records (or alternate records) were reviewed by TVA with satisfactory results.

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

ASRR Technical Content Review and Resolution (HVAC Ducts and Equipment Performance Testing Records Random Review):

- This random review evaluated the performance testing records for the following HVAC ducts and equipment:

0-FCO-030-0332-S
 0-BKD-031-2162
 0-FCO-031-0033
 1-FCO-030-0124
 0-FCO-031-0337
 0-FCO-031-0001
 1-FCO-030-0459
 1-FCO-030-0447
 0-FCO-031-0091
 0-MCV-031-0176
 1-BKD-030-0581
 0-FCO-031-0029
 0-FCO-031-0011
 0-FCO-031-0026
 0-BKD-031-2001B
 2-FCO-030-0157A

In general, the records (or alternate records) were reviewed by TVA with satisfactory results. One exception was backdraft damper 0-BKD-031-2162 which had no documentation of closure on reverse flow. Further review identified that the corresponding A-train backdraft damper, 0-031-BKD-2163, was affected similarly. TVA subsequently revised test scoping document, TVA-10, to include testing of the dampers

for reverse flow. Additionally, TVA reviewed all HVAC designs to determine whether other similar configurations existed where a backdraft damper which performs a safety function was not properly tested. No other similar configurations were identified.

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

ASRR Hardware Inspection Results and Resolutions:

- Checklist 005-001 (1-031-CB-ISD-3958)

This review identified that the subject damper was in the closed position but was required to be open. Work Request No. C-151310 was initiated to correct the deficiency. Mitigating this problem is the fact that the deficiency would have been identified via system preoperational testing.

The inspection team concluded that the action taken by TVA to resolve this issue was adequate.

- Checklist 005-011 (1-031-AB-BLD-3008)

This review identified that the installation record (QCP-4.27, Rev. 2) recorded the wrong mark number. TVA initiated a supplemental QA record to document the correct mark number.

The inspection team concluded that the action taken by TVA to resolve this issue was adequate.

- Checklist 005-020 (0-031-CB-BLD-2127)

This review identified that the affected duct was not properly labeled and that a grille was not installed. Further review identified that work required by DCN P-02641-B was in progress which would, in part, replace the missing grille. TVA initiated a temporary tag request (T384617) to ensure proper labeling of the duct.

The inspection team concluded that the action taken by TVA to resolve this issue was adequate.

- Checklist 005-030 (1-065-RB-D-004)

This review identified that flow elements FE-65-78 and FE-65-79, which were being worked under MR A-643334, were reversed in the field. TVA initiated Work Request No. C-151321 to correct this condition.

The inspection team concluded that the action taken by TVA to resolve this issue was adequate.

7. Action on Previous Inspection Findings (92700, 92701, 92702)

(Closed) URI 390,391/93-59-06, Resolve Intent of Valve Sampling Methodology in QA Records CAP.

This item involved a concern as to whether the methodology for selection of the valves to be included in the ASRR QA Records CAP review met the intent of the sampling plan committed to in TVA Letter to NRC dated January 28, 1991. TVA committed to the use of a "graded sampling approach" which involved allocating a greater sampling effort to items of greater safety significance. This commitment was implemented by allocating a greater sampling effort (60% of the random sample) to safety related valves. Consequently, all safety related valves were given the same sampling effort without regards to the relative safety significance of the valve. The inspection team felt that the graded approach was intended to ensure that the more significant safety related valves, such as those required to function during an accident, would have been allocated a greater sampling effort.

The inspection team reviewed TVA's response dated November 30, 1993. In this response TVA defined safety related valves as either Vital or Non-Vital. Vital valves being those that perform an important accident mitigation function in addition to the normal pressure retaining function associated with the valve being classified as safety related. Non-vital valves being those safety related valves that do not perform a vital function. These valves are normally passive type valves.

TVA indicated there are more types of records that apply to vital valves than to non-vital valves since their size and ASME classification require additional NDE during manufacture. Also, since these valves are often motor or pneumatically operated, there are additional performance testing requirements by the vendor and the installation often required additional work operations and related records to connect cables, raceways, instrument, instrument lines, air lines, and additional structural support.

TVA stated that these additional types of records covering the features that distinguish vital valves from non-vital valves have been reviewed using samples selected by the methods established in the ASRR program. In many cases, the additional records were sampled under different element categories, including cables, raceways, instruments, instrument lines, etc. Consequently, for those record types which are common to both vital and non-vital valves, the quality of the individual records within each type are expected to be the same irrespective of the valve classification, since the procedures involved in generating records for both types of valves were the same. Also, the same personnel performed the work and generated the records. TVA concluded that based on the above, the quality of the records for either valve classification can be

judged using a sample randomly drawn from the two combined populations for each common record.

TVA further indicated that for those types of records that do not exist for non-vital valves, the ASRR sample could only be drawn from the vital valve population. Certain manufacturer NDE records and performance test records are examples of these types of records. A large number of records which pertain to vital valves have been reviewed by TVA in order to satisfy the requirements of the approved ASRR program for sampling each ANSI record type.

TVA concluded that the methodology for sampling QA records is being implemented as prescribed in the approved QA Records CAP, and an adequate number of record types that are applicable to the manufacture and installation of vital valves have been reviewed.

The NRC accepted this response in a letter to TVA dated December 21, 1993. The inspection team concluded TVA's response adequately addressed NRC's concern. This item is closed.

8. Exit Interview

The inspection scope and findings were summarized on January 28, 1994 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>
390,391/93-59-06	Closed	URI-Resolve Intent of Valve Sampling Methodology in QA Records CAP (paragraph 7)

9. List of Acronyms and Abbreviations

ABSC	Auxiliary Building Secondary Containment Enclosure
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASRR	Additional Systematic Records Review
ASTM	American Society for Testing Materials
CAP	Corrective Action Program
CAQR	Condition Adverse to Quality Report
CCRISCLSC	Calculation Cross Reference Information System Calculation Log Selection List
CCRS	Cable Conduit Routing System
CDR	Construction Deficiency Report
CEB	Civil Engineering Branch
CFR	Code of Federal Regulations
CRDM	Control Rod Drive Mechanism
CPI	Construction Process Instruction
DBVP	Design Baseline Verification Program

DCA	Design Change Authorization
DCN	Design Change Notice
DCRM	Document Control and Records Management
DD	Drawing Deviation
DG	Diesel Generator
DGB	Diesel Generator Building
DNE	Department of Nuclear Engineering
EAI	Engineering Administrative Instruction
ECN	Engineering Change Notice
EDG	Emergency Diesel Generator
EGTS	Emergency Gas Treatment System
EMS	Equipment Management System
FSAR	Final Safety Analysis Report
HAAUP	Hanger and Analysis Upgrade Program
HVAC	Heating Ventilation and Air Conditioning
IR	Inspection Report
MAI	Modifications and Additions Instruction
MCV	Motor Control Valve
MEB	Mechanical Engineering Branch
NCR	Nonconformance Report
NDE	Nondestructive Examination
OWI	Open Work Item
NRC	Nuclear Regulatory Commission
PAI	Plant Administrative Instruction
PER	Problem Evaluation Report
QA	Quality Assurance
QAI	Quality Assurance Instruction
QC	Quality Control
QCI	Quality Control Instruction
QCP	Quality Control Procedure
QCT	Quality Control Test
QE	Quality Engineering
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RIMS	Records Information Management System
RRSS	Record Review Summary Sheet
SCR	Significant Corrective Action Report
SPER	Supplemental Problem Evaluation Report
SP	Special Program
SSP	Site Standard Practice
TSOB	Temporary Storage Office Building
URI	Unresolved Item
VSR	Vertical Slice Review
WB	Watts Bar
WBN	Watts Bar Nuclear
WBNP	Watts Bar Nuclear Plant
WBPER	Watts Bar Problem Evaluation Report
WBSCA	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. MISCELLANEOUS AND STRUCTURAL STEEL

A generic listing of miscellaneous and structural steel records provided by TVA and reviewed by the inspection team was as follows:

NOTE: The material records for miscellaneous and structural steel and the material attribute on the miscellaneous and structural steel record plan were not reviewed during this inspection, due to the fact that material used to fabricate these items is not traceable from purchase to the point of installation. The lack of traceability was previously identified and resolved as a part of the action taken on NRC Unresolved Item 50-390, 391/92-21-01.

- QCP-1.06, Receipt and Inspection of Safety Related Items
- QCP-1.3, Fabrication and Inspection of Quality Assurance Miscellaneous Steel
- QCP-1.14, Inspection and Testing of Bolt Anchors Set in Hardened Concrete and Control of Attachments to Embedded Features
- QCP-1.42-2, Bolt and Gap Inspection for Bolt Anchor Assemblies
- QCP-1.42-3, Structural and Miscellaneous Bolted Connections
- QCP-1.50, Material Verification and Validation
- QCP-2.4, Fabrication, Erection, and Inspection of Structural and Miscellaneous Steel
- QCP-2.7, Inspection and Documentation for Erection of Miscellaneous Steel
- QCP-4.03, Weld Surveillance
- QCP-4.13, Nondestructive Examination
- TI-2014, Walkdown of Pipe Whip Protection Devices and Associated Embedded Plates
- TI-2023, Walkthrough of Embedded Plates
- TI-2024, Walkdown of Embedded Plates
- MAI-1.9, Damaged, Loose, or Missing Hardware
- WB-DC-20-21, Miscellaneous Steel Components for Category I Structures
- WCG-1-1316, Document Acceptance of Remaining Population of Platforms
- WCG-1-1303, Assessment of Remaining Population of Platforms
- WCG-1-496, Selection of Worst Case Platforms
- TI-2007, Engineering Walkdown of Main Structural Steel/Platforms/Miscellaneous Steel to Support the Civil Calculations Program
- DCN-22735-A, Addition of Notes to Platform Drawings Identifying Specific Seismic/Civil Acceptance Calculations

Records for the following miscellaneous and structural steel were requested by the inspection team and were provided by TVA:

- embedded plate mark 18N305-38, 39, and 48
- anchor bolt assembly mark 48N929-7
- diesel generator building door 1B-B

- escape hatch mark 44N280-1
- spent fuel pool gate mark 44N331-1
- control building door C52
- reactor building pipe support quad beam Az 41
- beam mark 48N1225-8D
- lower pressurizer support mark 49N419-17
- anchor bolt assembly 48N751, item D-D
- feedwater lines pipe rupture restraints 48W1352-3, sections A3-A3 and B3-B3
- pressurizer ladder 48W905-4, type A1
- RCP fire protection skirts 48W991-1, marks 1 and 2
- pressurizer relief panels on reactor shield wall mark 1, 2, and 3
- HVAC cooler equipment support framing mark 47A373-40
- residual heat removal - containment spray platform 48N1210-24PFOIUI

2. CABLE RACEWAY

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

- WBN-QCP-1.55, Seals, Firestops, and Cable Coatings
- WBN-QCP-3.3/3.03, Inspection of Electrical Conduit and Junction Boxes
- WBN-QCP-3.7, Installation and Inspection of Electrical Penetration Pressure Seal, Fire-Stop Barrier and Flame Retardant Cable Coating
- MAI-1.9, Walkdown Verification For Modifications System/Area Completion and Damaged, Loose, or Missing Hardware
- MAI-3.1, Installation of Electrical Conduit Systems and Conduit Boxes
- MAI-3.4A, Installation of Moisture Intrusion Seals
- MAI-3.4B, Cable Tray and Sleeve Seals
- MAI-3.9, Installation of Cable Tray, Cable Tray Supports and Cable Tray Covers
- MAI-13, Installation of Conduit and Junction Boxes
- WBN-QCP-3.4/3.04, Inspection and Documentation of Cable Tray Systems
- CPI-8.1.8-H-400, Installation and Documentation of Electrical Conduit and Conduit Supports
- SCAR No. SCRWBNECB8601SCA, Resolve Tray Cover Deficiencies
- CAQR WBP890421, Routing of Electrical Cable Below Postulated Flood Levels
- WP-51, Engineering Walkthrough Procedure for the Conduit and Conduit Support Critical Case Evaluation
- TI-2006, Engineering Walkthrough and Evaluation of Plant Conduit and Conduit Supports
- WD-24, WBN Cable Tray Walkdown Procedure, Unit 1 and Common
- TI-2004, Engineering Walkthrough for the Cable Tray and Cable Tray Support Critical Case Evaluation
- WD-47, Cable Support In Vertical Conduit
- Remaining Work Items List, WP M-5695-01 through -16

Records for the following cable raceway were requested by the inspection team and were provided by TVA:

a. Cable Trays

- 3A165 3A166 Cable spreading room upper level
- 3B336 3B335
3B334 Cable spreading room upper level
- 3AZ45 Cable spreading room upper level
- 3B342 3B341
3B340 Cable spreading room upper level
- 4A2548 4A2549 Elevation 782, pressurizer heater transformer room
- 3A3951 3A3952
3A3953 3A3954 DGB 1A-A
- 3B3963 3B3957
3B3956 DGB 1B-B
- 5B3521 5B3522 Intake pumping station, electrical board room, elevation 711

b. Conduit

- 1PP2183A Conduit to motor for containment spray pump 1A-A, CS pump room
- 1VC11A Conduit to motor for valve 1-FCV-72-22, RWST to containment Spray suction valve, 676 pipe chase
- 1VC6133B Conduit to motor for RHR 1B-B suction valve 1-SCV-74-21, RHR pump room
- 1PP2190B Conduit to motor for SIS pump 1B-B, SIS pump room
- 1VC1132B Conduit to motor for 1-FCV-72-45, containment sump to containment spray pump 1B-B suction valve, elevation 692 vault
- 1VC786A Conduit to junction box for open/close buttons for RHR to cold leg 2&3 injection isolation valve, 713 pipe chase
- 1PP2285B Conduit to motor for auxiliary feedwater pump 1B-B, elevation 713 A3 & S line

- PP2551A Conduit run in DGB 1A-A
- IPLC20A Conduit to motor for ERCW header A isolation valve 1-FCV-67-22, lower level intake pumping station
- c. Splice boxes
 - OJB2905990A Cable spreading room upper level
 - OJB2905979A Cable spreading room upper level

3. HVAC DUCTS AND EQUIPMENT

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

- QCP-1.52, Rev. 10, Preventive Maintenance Inspection
- QCP-3.18, Rev. 5, Inspection of Fluid-Operated Control Valves, Solenoid Valves, and Dampers
- QCP-4.27, Rev. 3, Inspection and Documentation of Ductwork
- QCP-4.7, Rev. 4, Mechanical Equipment Installation Standard Inspection and Documentation
- QCT-4.39, Rev. 1, Testing of HVAC Systems
- QCT-4.40, Rev. 2, Balancing of HVAC Systems
- MAI-1.9, Rev. 3, Walkdown Verification for Modifications System/Area Completion and Damaged, Loose, or Missing Hardware
- MAI-4.3, Rev. 7, HVAC Duct Systems
- SMP-4.0, Rev. 9, Transfer of Jurisdiction
- TI-2010, Rev. 2, Engineering Walkthrough for HVAC Duct and Duct Supports

Additional records reviewed:

- MEB-WBN-31, Evaluation of HVAC Supply Air Grille
- CAQR WBP880571
- NCR WBNSWP8217
- WB-DC-40-36.1
- VSR DR 17
- NRC IR 50-390/93-42
- PER WBP890040
- SCAR WBP880775SCA
- WCG-E-085, Evaluation of DR No. 17
- EPM-RBM-060890, Evaluation of HVAC Grille Mounting
- WCG-ACQ-0353, Seismic Qualification of Mounting Detail for HVAC Damper
- WCG-ACQ-0395, Seismic Qualification of Various Types of Mounting Details for HVAC Manual Dampers
- DCN-M-15143-A, Installation Details for Insert Mounted Balancing Dampers
- DCN-M-8871-A, Nine HVAC Grille Discrepancies
- DCN-M-9973-A, Several HVAC Grille Discrepancies

- DCN-S-26179-A, Louver Discrepancy
- WR C-177152

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

- | | | |
|---|-------------------|--|
| - | 1-030-AB-D-065 | EGT room exhaust duct |
| - | 1-030-AB-FCO-159 | General exhaust fan 1A damper |
| - | 1-030-DG-FCO-445 | DGB room 1B-B intake damper |
| - | 1-030-RB-D-016 | CRDM cooling duct |
| - | 1-030-RB-TCO-081 | CRDM balance damper |
| - | 1-030-RB-D-049 | Hydrogen collector duct |
| - | 1-031-AB-ISD-3797 | SIS pump room exhaust damper |
| - | 1-031-CB-ISD-3958 | Auxiliary instrument room exhaust damper |
| - | 1-065-RB-BLD-504 | EL 702 EGTS annulus supply damper |
| - | 0-030-AB-D-131 | EL 737 fuel handling exhaust duct |
| - | 0-030-DG-D-019 | Fan 2B1-B exhaust duct |
| - | 0-030-DG-ISD-603 | DG room 1A-A supply isolation damper |
| - | 0-031-AB-FCO-276 | Shutdown board room pressure fans damper |
| - | 0-031-CB-BKD-2104 | Main control room AHU B-B supply damper |
| - | 0-031-CB-ISD-4612 | Emergency supply to shutdown board room damper |

ATTACHMENT B

DETAILED LISTING OF RECORDS REVIEWED

1. MISCELLANEOUS AND STRUCTURAL STEEL:

Note: Only those miscellaneous and structural steel components listed below marked with an asterisks were walked down in the plant.

Embedded Plate (Mark 38, 39 and 48):

- QCP-1.3, Attachment C, Shop Release of Fabricated Items (Mark 38 and Mark 39)
- QCI-1.08, Attachment B, Engineering Evaluation
- TVA Form 4139, Request for Shipment of Materials (Mark 38 and 48)
- Miscellaneous Steel Frames, Covers, Gratings and Ladders drawings
 - 18N302, Rev. 22,
 - 18N305, Rev. 12
 - 18N304, Rev. 11

Anchor Bolt Assembly (Mark 7):

- QCP-2.4, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment C, Addendum 2, Steel Fabrication Acceptance Sheet
- TVA Form 4139, Request for Shipment of Materials
- Miscellaneous Steel Frames, Grating, and Embedded Parts E1 756.63 drawing
 - 48N929, Rev. 4
- DNE Calculation WCG-2-43, Rev. 4, Reactor Building Miscellaneous Steel, Frames, Grating, and Embedded Parts for 48N926 through 48N929

*DGB Door 1B-B:

- QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment E, Steel Acceptance Report
 - Attachment C, Addendum 2, Steel Fabrication Acceptance Sheet
- QCP-2.18,
 - Attachment A, Mechanical Door Inspection Data Sheet
- TVA Form 4139, Request for Shipment of Materials
- Door and Bulkhead drawings
 - 44N226, Rev. 0
 - 44N225, Rev. 3
 - 44N227, Rev. 0
- NDE Report for door 1B-B (visual and magnetic particle)

Escape Hatch (Mark 1):

- QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment H, Steel Acceptance Report
- QCP-2.18,
 - Attachment A, Mechanical Door Inspection Data Sheet
- Escape Hatches drawing

- 44N280, Rev. 4
- NCR 2375R, Cable Tray Supports, Conduit Supports, and Miscellaneous Steel
- Spent Fuel Pool Gate (Mark 44N331-1):
 - QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment H, Steel Acceptance Report
 - Attachment G, Steel Fabrication Acceptance Sheet
 - NCR 4943, Rev. 0, Fuel Pool Gate Section A-A Non-Conformance
 - Spent Fuel Pool Fuel Pool Gate Arrangements drawing 44N330, Rev. 7
- Powerhouse Door C-52:
 - QCP-2.18,
 - Attachment B, Door Inspection Sheet (C-52 in room C13 and C15)
 - Door Certification Letter dated 10/7/81 for Contract 75K52-86100-1
 - Architectural Door and Hardware Schedule drawings
 - 46W543-13, Rev. 13
 - 46W454-1, Rev. 47
 - 46W454-9, Rev. 21
 - Architectural Plan - E1 729.0 and 755.0 drawing 46W402-2, Rev. 3
- Pipe Support Quad Beam Azimuth 41:
 - QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment H, Steel Acceptance Report
 - Attachment A, Steel Inspection Report
 - Attachment E, Steel Acceptance Report
 - QCI-1.08, Attachment A, Engineering Evaluation
 - TVA Form 4139, Request for Shipment of Materials
 - Plans and Details for Supplemental Framing for Pipe Supports in Quads I through IV drawing 48N938-1, Rev. 9
- Beam (Mark 8D):
 - QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment A, Structural Steel Acceptance Report (fit-up only)
 - Attachment A, Structural Steel Acceptance Report (weld inspection and bolted connections)
 - Attachment G, Steel Fabrication Acceptance Sheet
 - Miscellaneous Steel Embedded Parts drawings
 - 48N1225-1, Rev. 4
 - 48N1225-8, Rev. 6

***Lower Pressurizer Support (Mark 17):**

- QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet (baseplate gaps and bolted connections)
 - Attachment J, Final Steel Acceptance Sheet (installation and grouting)
 - Attachment A, Structural Steel Acceptance Report (fit-up)
- NCR 4341R, Rev. 1, Heat Number not Traceable to Installation
- QCP-2.2, Attachment O, Concrete Pour Card (grouting for lower pressurizer support)
- Structural Steel Equipment drawings
 - 48N410, Rev. 15
 - 48N419, Rev. 14,
- WCG-2-42, Rev. 4, DNE Calculation - Reactor Building Containment Vessel, Equipment Supports - Reactor and Other Equipment (Upper and Lower Pressurizer Support)

Anchor Bolt Assembly (Item D-D):

- QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment H, Steel Acceptance Report
- QCI-1.08, Engineering Evaluation
- QCP-2.2, Concrete Pour Card for CB-B16 and CB-B15
- Structural Steel Framing drawing
 - 489751, Rev. 13
- Concrete Pour Designation and Progress Chart drawing
 - 41N10059-2B, Rev. 0

Feedwater Lines Pipe Rupture Protection Beam Reinforcement (Section A3-A3 and B3-B3):

- QCP-2.4, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment H, Steel Acceptance Report
 - Attachment G, Steel Fabrication Acceptance Sheet
- TVA Form 4139, Request for Shipment of Materials (Nos. 7811 and 7812)
- Feedwater Lines Pipe Rupture Protection Restraints drawings
 - 48W1352-1, Rev. 3
 - 48W1352-2, Rev. 12
 - 48W1352-3, Rev. 12

Pressurizer Ladder:

- QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment H, Steel Acceptance Report
 - Attachment G, Steel Fabrication Acceptance Sheet
- QCP-1.14, Inspection and Testing of Bolt Anchors Set in Hardened Concrete and Control of Attachments to Embedded Features

Attachment B, Expansion Shell Anchor Proof Test Summary
Attachment E, Expansion Shell Anchor Measurement and Test Results

Attachment F, Bolt Anchor Inspection

- QCI-1.08, Engineering Evaluation
- Miscellaneous Steel drawing
48W905-4, Rev. 3

RCP Fire Protection Skirts (Mark 1 and 2):

- QCP-2.4, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment H, Steel Acceptance Report
 - Attachment G, Steel Fabrication Acceptance Sheet
- TVA Form 4139, Request for Shipment of Materials (Mark 1 and 2)
- Miscellaneous Steel Fire Protection RC Pump drawing
48W991-1, Rev. 10

Pressure Relief Panels (Mark 1 and 2):

- QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment H, Steel Acceptance Report
- QCP-2.4, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment A, Steel Inspection Sheet
 - Attachment A, Steel Acceptance Report
- QCI-1.08, Engineering Evaluation for QCP-2.4 and QCP-2.04, Attachment J
- TVA Form 10363, NDE Surface Evaluation Data Sheet Nos. 50198 and 46815 (visual and liquid penetrant)
- TVA Form 4139, Request for Shipment of Materials Nos. 7910, 8304, 8491, 8510, 8684, 8689, 8743, 8801, 9451, 9455, 9499, 9539, 9509, 9539, 9579, 9622, 10,564, 10,592, 10,691, and 10,706
- Miscellaneous Steel Pressure Relief Panels and Frames drawing
48N942, Rev. 17

*HVAC Cooler Unit O-PMCL-30-193-B Steel Framing, Mark No. 47A373-41:

- QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet
 - Attachment H, Steel Acceptance Report
 - Attachment G, Steel Fabrication Acceptance Sheet
 - Attachment A, Structural Steel Inspection Report
- QCP-1.14, Inspection and Testing of Bolt Anchors Set in Hardened Concrete and Control of Attachments to Embedded Features
 - Attachment C, Wedge Bolt Test Data
 - Attachment F, Bolt Anchor Inspection
- NCR 2375R, Cable Tray Supports, Conduit Supports, and Miscellaneous Steel
- Miscellaneous Steel Tanks and Equipment Supports drawings
48N1231-1, Rev. 18

- 48N1231-2, Rev. 15
- WCG-2-17, Rev. 10, DNE Calculation - Auxiliary Building Tank and Equipment Supports
- *RHR - Containment Spray Platform (48N1210-24PF01U1):
- Miscellaneous Steel Access Platforms drawings
 - 48N1210-1, Rev. 13
 - 48N1210-3, Rev. 22
 - 48N1210-24, Rev. 4
- DCN 22735-A, Addition of Notes to Drawings Identifying Specific Seismic/Civil Validation Calculations for Platforms
- WCG-1-834, Rev. 2, Walkdown of Elevation 726.0 Platform on Drawing 48N1210-24
- WCG-1-962, Rev. 0, DNE Calculation - Evaluation of Platform at Elevation 726.0
- QCP-2.04, Fabrication, Erection, and Inspection of Miscellaneous and Structural Steel
 - Attachment J, Final Steel Acceptance Sheet (barrier for FCV-74-32)
 - Attachment H, Steel Acceptance Report (barrier for FCV-74-32)
 - Attachment G, Steel Fabrication Acceptance Sheet (barrier for FCV-74-32)
 - Attachment J, Final Steel Acceptance Sheet (platform in RHR 1A room and RHR 1B room)
 - Attachment J, Final Steel Acceptance Sheet (Supplement, platform in RHR 1A room)
 - Attachment H, Steel Acceptance Report (RHR 1A room and RHR 1B room)
 - Attachment C, Steel Fabrication Acceptance Sheet (RHR 1A room and RHR 1B room)
- QCP-1.14, Inspection and Testing of Bolt Anchors Set in Hardened Concrete and Control of Attachments to Embedded Features
 - Attachment C, Wedge Bolt Test Data (RHR 1A room and RHR 1B room)
 - Attachment F, Bolt Anchor Inspection (RHR 1A room and RHR 1B room)
- TVA Form 4139, Request for Shipment of Materials (30 forms for RHR 1A and 1B room platforms)

2. CABLE RACEWAY:

Note: All of the Cable Raceway and Junction Boxes listed below were walked down in the plant.

Tray Nos. 3A165 3A166, Cable Spreading Room, Upper Level:

- Construction Drawings
 - 45N880-8, Rev.6
 - 45N880-10, Rev. 9
 - 45W880-10A, Rev. 3
 - 45W886-12, Rev. 5

- Workplan No. E-6093-1 Rev. 0
- Computerized Cable Routing System Query for Tray Nos. 3A165 and 3A166, Updated 2/26/92
- QCP-3.4, Test No. 25A Dated 8/23/76
- QCP-3.04, Inspection No. 13 Dated 4/11/84 (for 3A166)
- QCP-1.55, Test 35A Dated 3/6/84 (for 3A166)
- Division of Construction Quality Assurance Certification Record for Employee # 412-96-0564

Tray No. 3AZ45, Cable Spreading Room, Upper Level:

- Construction Drawings
 - 45N880-1, Rev. 8
 - 45N880-8, Rev. 6
 - 45N880-10, Rev. 9
 - 45W880-10A, Rev. 3
 - 45N880-23, Rev. 9
- Computerized Cable Routing System Query for Tray No. 3AZ45, Updated 9/13/89
- QCP-3.4, Test No. 25A Dated 9/9/76
- QCP-3.04, Inspection No. 13 Dated 4/11/84
- QCP-1.55, Test No. 35A Dated 3/31/83
- Division of Construction Personnel Certification Record for Employee # 254-04-1568

Tray Nos. 3A3951, 3A3952, 3A3953, and 3A3954:

- Construction Drawings
 - 15W814-2, Rev. T
 - 15W888-1, Rev. 2
 - 15W888-2, Rev. 0
 - 15W888-3, Rev. 0
- Computerized Cable Routing System Query for Tray Nos. 3A3951, 3A3952, 3A3953, and 3A3954, Updated 4/26/89
- QCP-3.4, Test No. 25B Dated 3/28/78 (for tray 3A3951)
- QCP-3.4, Test No. 25B Dated 3/28/78 (for tray 3A3952)
- QCP-3.4, Test No. 25B Dated 3/28/78 (for tray 3A3952)
- QCP-3.4, Test No. 25B Dated 3/28/78 (for tray 3A3952)
- QCP-1.55, Test No. 35A Dated 3/23/84 (for tray 3A3951)
- QCP-1.55, Test No. 35A Dated 8/8/84 (for tray 3A3952)
- Division of Construction Quality Assurance Personnel Certification Record for Employee # 587-50-5920

Tray Nos. 4A2548 and 4A2549:

- Construction Drawings
 - 45N880-1, Rev. 8
 - 45W880-13, Rev. A
 - 45W880-17C, Rev. A
 - 45W888-65, Rev. 1
- Computerized Cable Routing System Query for Tray Nos. 4A2548 and 4A2549 Updated 4/21/89
- QCP-3.4, Test No. 25A Dated 5/31/78
- Division of Construction Personnel Certification Record for Employee # 412-92-8249

Conduit No. 1VC6133B:

- Construction Drawing
45W820-8, Rev. M
- Design Change Notice No. M-10511-A
Computerized Cable Routing System Query For Conduit No. 1VC6133B
Updated 5/26/93
- Workplan No. D-10511-09
- Stone & Webster Engineering Corporation Certificate of
Qualification for Employee #168-46-7022

Conduit No. 1PP2190B:

- QCP-3.3, Test No. 25A Dated 4/28/82
- QCP-1.55, Test No. 35A Dated 6/8/84
- Work Plan No. A-5116
- Computerized Cable Routing System Query For Conduit No. 1PP2190
Updated 5/26/93

Conduit No. 1VC1132B:

- Construction Drawings
45N822-3, Rev. E
45N822-4, Rev. E
- Computerized Cable Routing System Query For Conduit No. 1VC1132B
Updated 11/28/88
Work Plan No. A-5116
- QCP-3.3, Test No. 25A Dated 7/31/79

Conduit No. PP2551A:

- Construction Drawings
15W814-2, Rev. T
45W883-1, Rev. D
45W883-2, Rev. F
- Computerized Cable Routing System Query For Conduit No. PP2551A
Updated 10/18/90
- QCP-3-3, Test No. 25A Dated 1/10/85

Junction Box No. 0-JB-290-5979-A:

- Construction Drawing
45W814-10, Rev. F
- DCN No. P-07271-C
- CPI-8.1.8-H-400, Data Sheet 7, Conduit Box Installation

3. HVAC DUCTS AND EQUIPMENT:

Note: Only those HVAC components listed below marked with an asterisks were walked down in the plant.

1-030-AB-D-065, EGT room exhaust duct:

- QCP-4.27, Rev. 4
- Leak Tightness Test Packages:
1-065-AB-LC-2
0-030-AB-LC-060
- TI-2010 Walkthrough Package AB-29

- Drawings:
 - 47W920-8H
 - 47W920-16H
 - 47W920-24H

- *1-030-AB-FCO-159, General exhaust fan 1A damper:
 - QCP-4.27, Rev. 1
 - NCR 4482
 - Drawing:
 - 47W920-10

- *1-030-DG-FCO-445, DGB room 1B-B intake damper:
 - QCP-4.27, Rev. 7
 - NCR 4482
 - FCR A-20077
 - Drawing:
 - 17W910-1
 - 17W910-2

- 1-030-RB-D-016, CRDM cooling duct:
 - QCP-4.27, Rev. 1
 - Leak Tightness Test Packages:
 - 1-030-RB-LC-16
 - 1-030-RB-LC-17
 - ECN 3783
 - Drawings:
 - 47W915-2
 - 47W915-3
 - TI-2010 Walkthrough Packages:
 - RB-37, 38, 40, 44, and 45

- 1-030-RB-TCO-081, CRDM balance damper:
 - QCP-4.27, Rev. 1
 - NCR 4482

- 1-030-RB-D-049, Hydrogen collector duct:
 - QCP-4.27, Rev. 1
 - NCR 3741R
 - ECN 2917
 - WP-32 Walkdown Packages:
 - 30HAAUP001
 - 30HAAUP002
 - 30HAAUP003

- *1-031-AB-ISD-3797, SIS pump room exhaust damper:
 - QCP-4.27, Rev. 1
 - NCR 5036
 - Drawing:
 - 47W920-2

- 1-031-CB-ISD-3958, Auxiliary instrument room exhaust damper:
 - QCP-4.27, Rev. 1

- NCR 4482
- FCR M-6500

- 1-065-RB-BLD-504, EL 702 EGTS annulus supply damper:
 - QCP-4.7, Rev. 4
 - NCR 4482

- *0-030-AB-D-131, EL 737 fuel handling exhaust duct:
 - QCP-4.27, Rev. 1
 - Leak Tightness Test Package:
 - 0-030-AB-LC-025
 - Drawings:
 - 47W920-6 and 6H
 - 47W920-7 and 7H
 - 47W920-23 and 23H
 - TI-2010 Walkthrough Packages:
 - AB-24, 26, and 28

- 0-030-DG-D-019, Fan 2B1-B exhaust duct:
 - QCP-4.27, Rev. 3
 - Leak Tightness Test Package:
 - 0-030-DG-LC-002
 - ECN 4112
 - Drawing:
 - 17W910-2
 - TI-2010 Walkthrough Package DGB-1

- *0-030-DG-ISD-603, DG room 1A-A supply isolation damper:
 - QCP-4.27, Rev. 3
 - NCR 5036
 - NCR 4482
 - Drawing:
 - 17W910-1
 - 17W910-2

- 0-031-AB-FCO-276, Shutdown board room pressure fans damper:
 - QCP-4.27, Rev. 1
 - NCR 4482

- 0-031-CB-BKD-2104, Main control room AHU B-B supply damper:
 - QCP-4.27, Rev. 1
 - NCR 4482

- *0-031-CB-ISD-4612, Emergency supply to shutdown board room damper:
 - QCP-4.27, Rev. 7
 - DCN M-15802-A
 - ECN 5523
 - Drawing:
 - 47W920-8