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

Report No.: 50-390/87-19 and 50-391/87-19

Licensee: Tennessee Valley Authority
6N11 B Missionary Place
1101 Market Street
Chattanooga, TN 37402-2801

Docket No.: 50-390 and 50-391 License No.: CPPR-91 and CPPR-92

Facility Name: Watts Bar 1 and 2

Inspection Conducted: October 19, 1987 - October 30, 1987

Inspectors: _____ March 7, 88
G. Walton, Senior Resident Inspector Date Signed
Construction

_____ March 7, 88
J. York, Senior Resident Inspector, Date Signed
Bellefonte

NRC Consultants: M. Schuster
E. Martindale
W. Marino
C. Czajkowski

Approved by: _____ March 7/88
S. Elrod, Section Chief Date Signed
Office of Special Projects

SUMMARY

Scope: This special team inspection was conducted primarily in the Unit 2 North and South Valve Rooms, prior to the items being painted or insulated, in order to assess the construction quality of Watts Bar. The inspection areas included electrical, mechanical, instrumentation, housekeeping, preservation of equipment, and review of nondestructive examination results.

Results: Three Violations were identified (with numerous examples) involving failure to properly control in-place storage and preservation of equipment, failure to control installation activities in accordance with prescribed procedures and drawings, and failure to qualify and perform welding in accordance with requirements. This last violation applies to both Units 1 and 2. Four Unresolved Items were identified involving licensee review and

disposition of radiographic film, non-safety-related cable in contact with two division runs of safety related cable, non-safety-related cable in close proximity to safety related cable in electrical panels, and ends of loose non-terminated cable unprotected and exposed to the atmosphere.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*K. Ashley, Nuclear Engineer
*H. Bounds, Engineering Project Manager
*J. Cromer, Project Engineer
G. Curtis, Assistant Project Engineer
*T. Dean, Licensing
H. De Souza, Acting Plant Superintendent (Maintenance)
E. Ennis, Plant Manager
*J. Erpencbach, Project Manager
*D. Etzler, Principle Material Engineer
*J. Gibbs, Assistant Project Engineer
*R. Hanselman, Weld Unit Supervisor
*K. Hasting, Welding Engineer Supervisor
*T. Hayes, Procedures Supervisor
*L. Hebert, Quality Assurance
*T. Horst, Site Representative
*H. Johnson, Acting Site Quality Manager
M. Jones, Division of Nuclear Engineering
*D. Lake, Modifications Manager
*F. Laurent, Assistant Modification Manager
*K. Lawless, Weld Task Group
*M. Matthews, Task Forces
*M. Brickey, Lead Electrical Engineer
*J. McDonald, Licensing Manager
*M. Morawski, Licensing Engineer
J. Mulkey, Quality Assurance Manager
*V. Patuzzi, Quality Assurance
*B. Painter, Division of Nuclear Construction
R. Pedde, Nuclear Project Manager, Unit 2
L. Peterson, Quality Control Supervisor
*R. Schulz, Compliance Licensing Manager
*F. Smith, Construction Engineer
*R. Spiess, Principle Electrical Engineer
*S. Stagnolia, Weld Services Manager
*D. Stewart, Assistant Site Director
*S. Stout, Regulatory Engineering Supervisor
*J. Thompson, Construction Manager
R. Tolley, Assistant Nuclear Project Manager, Unit 2
G. Toto, Site Director

Other licensee employees contacted included engineers, technicians, nuclear power supervisors, and construction supervisors.

NRC Resident Inspectors

*G. Walton, Resident Inspector
*J. York, Resident Inspector
*G. Humphrey, Resident Inspector
*T. Powell, Resident Inspector

NRC Consultants

*C. Crajkwoski
*W. Marino
*E. Martindale
*M. Schuster

*Attended Exit Interview

2. Exit Interview

The inspection scope and findings were summarized on October 30, 1987, with those persons indicated in paragraph one. The inspectors described the areas inspected and discussed in detail the inspection findings listed below. Dissenting comments were not received from the licensee. Proprietary information is not contained in this report.

- Violation 391/87-19-01, "Failure to Follow Procedures For Installing Equipment in the North and South Valve Rooms" (Paragraph 5).

- Violation 391/87-19-02, "Failure to Preserve Equipment Installed in the North and South Valve Rooms" (Paragraph 5).

- Violation 390/87-19-01, 391/87-19-03, "Failure to Perform Welding In Accordance With the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Section IX" (Paragraph 6).

- Unresolved Item (URI) 390/87-19-02 "Interpretation of Radiographic Film" (Paragraph 7).

- URI 391/87-19-04, "Licensee's Review and Disposition Of Radiographic Film" (Paragraph 7).

- URI 391/87-19-05, "Non-safety-Related Cable In Contact With Two Division Runs Of Safety Related Cable" (Paragraph 5).

- URI 391/87-19-06, " Non-safety-Related Cable In Close Proximity To Safety Related Cable In Electrical Panels" (Paragraph 5).

- URI 391/87-19-07, "Ends Of Loose Non-terminated Cable Were Unprotected and Exposed To The Atmosphere" (Paragraph 7).

3. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations.

Four Unresolved Items were identified during the inspection and are discussed in paragraphs five and seven.

4. Licensee Action on Inspector Identified Items (92701)

(Open) URI 390/86-17-04, "Field Weld Identification". The inspector reviewed the licensee's action on this item relative to demonstrating that all ASME Code welds that require radiography were radiographed and that records properly reflected the correct weld. The licensee is presently reviewing and reperforming radiography for approximately 400 welds. Identification is being verified. To date, the licensee has identified seven welds which were either mis-identified and/or not radiographed with the proper identification. The mis-identified weld problems are documented on four Condition Adverse to Quality Reports (CAQRs), numbers WBP 870469, WBP 870770, WBP 870554, and WBP 870467. These documents relate to field welds (FWs) 1-063B-D089-8A, 1-063B-D087-7A, 1-003B-D002-20, 1-003B-D002-07, discovered by the licensee's re-review and 1-003B-D372-07B, 1-003B-D372-07A and 1-003B-D372-37 disclosed during NRC inspection 87-09. Due to the mis-identification, one acceptable weld was repaired (1-003B-D002-20) and one rejectable weld was accepted (1-003B-D002-07). The rejectable weld is presently being repaired. The licensee has committed to document mis-identified welds on CAQRs. However, the licensee was unable to demonstrate that all mis-identified weld problems were being documented in this manner. For example, the licensee's present program requires the weld number on the part or documentation be corrected when mis-identified welds are found. Provisions for writing CAQRs are not evident. This item will remain open pending further review.

Within this area, no violations or deviations were identified.

5. Review Of Construction Activities In The Unit II North And South Valve Rooms

To assess the construction quality at the facility, the inspection team selected the Unit II North and South Valve Rooms with the objective of performing a detailed inspection of completed work prior to the piping and equipment becoming inaccessible due to painting or insulation. The following inspection tasks were established:

- Independent evaluation of mechanical (piping and structural), electrical, and instrumentation installations through field observations/walk-downs and review of appropriate installation documentation.

- Independent evaluation of welding through field observations and review of applicable installation and quality control documentation.

- Independent evaluation of nondestructive examinations through review of radiographic film and records.

- Observations of conditions such as general housekeeping, equipment protection and adherence to construction installation requirements.

a. Safety Related Components - Record Review (50075) Unit 2

Listed below are the inspection findings based on field inspections. All areas inspected were previously inspected and accepted by the Licensee's Quality Control staff during the construction period.

(1) Review of Documents and Drawings

Quality Control records and appropriate drawings were reviewed for adequacy and completeness on the following safety related, ASME Code items:

NORTH VALVE ROOM - MECHANICAL PIPING

Feedwater - 2-00EB-D213-5, 6 - SK-E2882-2021
(Feedwater Piping Assembly 03A-RW-51)

Main Steam - 2-001A-D006-06 - SKWBN-E-2881 IC-6

Main Steam Small Bore -2-001A-T029-SK400-1 SH121

Instrumentation - 2001B-T093-SK47W600-2-001-BD

Main Steam Small Bore - 2-001A-T027-SK400-1 SH 119

Instrumentation - 2-001A-T062 - SK47W600-W-2-001-AG

Main Steam - 2-041A- T003 - SK496-5 SH 9

Feedwater - 2-003B-D002-02A - WBN-E-2882-IC2

SOUTH VALVE ROOM - MECHANICAL PIPING

Main Steam - 2001A-D009 - SK-E-2881-54
(Main Steam Piping Assembly 01A-MS-54)

Feedwater - 2-003B-D003 - SK-E-2882-24
(Feedwater Piping Assembly 03A-FW-20)

Auxiliary Feedwater - 2-003C-D107 - SK-E2882-74B
(Auxiliary Feedwater Piping Assembly 03B-AF-68)

Auxiliary Feedwater Small Bore Piping - 2-003C-T072- SK-427-3SH 32-2-03B-PT-F

Steam Generator Blow Down -2-015A-T011 SK400-7 SH 2-3 R4

Steam Generator Blow Down - 2-015A-T003 SK400-7 SH 2-1
(includes orifice flanges)

B-001 Support ASME Code Class II Attachment -2-003C-T073-07
SK-423-3 SH 33

Shear Lug Support ASME Code Class II Attachment - 47A427-7-2
WBN-E-2882 IC-114 2-003C-D114

(2) Evaluation of Component Material Requirements

The following components were reviewed for conformation to ASME Code material Specifications:

- Valve Number 2-PCV-1-30, Main steam relief valve (ASME Code Section III Class 2). This valve was fabricated by Copes-Vulcan, Inc. Certified Material Test Reports (CMTRs) were reviewed for the following various components for this valve:

Serial # (S/N) And Component	Material	Heat #
Body S/N H623	ASME-SA-216 Gr. WCB	A9796
Bonnet S/N H631	ASME-SA-216 Gr. WCB	A9550
Nuts - Lot RS	ASME-SA-194 Gr 2H	B7228
Plug-S/N 76-4	ASME-SA479 Type 304	10314
Flanges	ASME-SA 105	216119

- Valve Serial Number 9-15159-02 (4" diameter ASME Code Section Class 2, gate Valve). This valve was fabricated by Atwood & Morrill Co., Inc. and Certified Material Test Reports were reviewed for the following components for this valve:

Component	Material	Heat #
Body	SA216, Gr. WCB	228784
Cover	SA216, Gr. WCB	225684
Loadkey	SA182, Gr. F6A, C1.2	8643000
Discs	SA515, Gr. 70	D4071
Intergate Pipe	SA106, Gr. B	160312

- Valve Serial # 11-15159-02 (4" diameter ASME Code Section III, Class 2, gate value). This valve was fabricated by Atwood & Morrill Co., Inc. and the following material test reports were reviewed. The other components for this valve had the same heat numbers as valve 9-15159-02.

Component	Material	Heat #
Cover	SA216, Gr. WCB	230984

- Valve Serial # 5-13824, Main Steam Isolation Valve (ASME Code Section III, Class 2). This valve was fabricated by Atwood & Morrill Co., Inc. Certified Material Test Reports were reviewed for the following components on this valve:

Component	Material	Heat #
Body	SA 216, Gr. WCB	88
Poppet	SA 105	216057
Cover	SA 105	216239
Pilot Poppet	SA 182, Gr. F-6	836067
Cover Stud	SA 540, Gr. B-23	115060
Cover Nut	SA 540, Gr. B-23	114908
1/2" Pipe	SA 106, Gr. B	M91512
45° Elbow	SA 105	L00281
2" Pipe	SA 106, Gr. B	L20864

- Valve Serial # 8-13824, Main Steam Isolation Valve (ASME Code Section III, Class 2). This valve was fabricated by Atwood & Morrill Co., Inc. Certified Material Test Reports were reviewed for the body and the poppet that were used for this valve.

Component	Material	Heat #
Body	SA 216, Gr. WCB	53
Poppet	SA 105	216870

(3) Document Review Results:

In general, construction documentation for piping, valves, hangers, civil and other areas reviewed was acceptable. The following items were noted:

- The licensee was unable to provide the weld documentation for instrument weld 2-001B-T093-01. On October 28, 1987, the licensee issued WBP 871105 which describes the missing documentation. The recommended corrective action was to "Cut out weld, rework and inspect to QCI 4.03". This item will be carried under previously identified URI 390, 391/86-24-03, "Record Adequacy".

- The inspector questioned the completion of code data reports and Code stamping of piping subassemblies by the vendor (Dravo) prior to the TVA system hydrostatic test. It was noted the code data forms (NPT) were completed but the hydrostatic test was not performed by the vendor. Since this is presently being reviewed by the code committee based on a code inquiry submitted by the NRC concerning containment penetration flued heads, no further action was taken on this item.

- Structural Attachments PD07-01, PD07-2, PD07-19, and PD07-028. The transfer of inspector's signature/initials was noted during review of these document packages. This practice is allowed in cases where the original inspector can no longer complete this function. The licensee has previously identified this concern on CAQR WBA 870026 D02 dated June 25, 1987. Therefore, no further action is necessary at this time. Similar items (record adequacy) were previously identified as URI 390, 391/86-24-03.

b. Structural Steel and Supports Records Review (48055) Unit 2

Listed below are the inspector findings based on field inspections. All areas inspected were previously inspected and accepted by the licensee's Quality Control Staff during the construction period.

(1) South Valve Room Hangers

- Strut 03B-2AFW-R155

  Two hangers were observed, one of which was disconnected, in the same general location and with the same identification. Per cognizant personnel and document review, the disconnected support was a deleted design and was treated as a temporary support which will be removed during system walk-downs prior to construction turnover. This item is acceptable.

- Spring Can 2-01B-172

  Sketch 2-01B-172, Rev. 901, "Blowdown System Hanger 2-01B-172", identifies the hanger cold setting to be at 682 lbs. The support identification tag was to be affixed by a 1/8 inch drilled hole or tack weld per details on drawing 47A050-1B2, "Mechanical Hanger Drawing General Notes". In addition, the spring can should contain 2 travel stop pins when the support is locked to prevent movement. Alternatively both pins (travel stops) are to be removed when the can is operational.

  Inspection of this support (Spring Can 2-01B-172) revealed the following conditions contrary to the above requirements:

  (a) Identification tag improperly installed, (b) hanger cold set at 717 lbs. (this exceeded installation requirements,) (c) only one travel stop had been removed. As a result of the inspector's findings, CAQR 87-1086 and CAQR 87-1087 were issued by the licensee. This is an example of Violation 391/87-19-01, "Failure to Follow Procedure's for installing equipment in the North and South Valve Rooms."

- Strut 2-01A-318

  The installation uses the reactor shield wall as the support base for process piping in the valve room. Design criteria requires a separation for seismic movement between the two buildings so that each building acts independently during a seismic event. Using the containment wall to support piping in the valve room conflicts with this design. This was identified previously in Inspection Report 391/87-13. The licensee had identified this problem on a Problem Identification Report (PIR), PIRWBN CEB 8603, prior to this inspection on September 25, 1986, and required the following corrective actions:

"All supports on piping with a detailed analysis and in close proximity to an interface between two or more seismic response spectra zones will be reviewed and if any are found attached to an incorrect seismic structure, they or the analysis will be revised per ECN 6208."

The following interface regions will be considered:

- North Valve Room to Shield Building wall.
- Shield Building wall to steel containment vessel.
- Steel containment vessel to interior concrete structure.
- Interior concrete structure to steam generators.
- Interior concrete structure to reactor pressure vessel.
- Shield Building wall to South Valve Room.
- Shield Building wall to Auxiliary Building.

The licensee has established the above activity to be accomplished by a contractor under the Hanger Analysis and Update Program (HAUP). This item is addressed in Inspection Report 87-13 and identified as an Unresolved Item.

- Conduit Support O-CSP-292-18684X

Drawing 47A056-55, "Mechanical Category 1 Support Conduit" and E56-55-765, Rev. 2, "Conduit and Support Variance" specifies the requirements for installation of this support.

The inspector identified (a) a saw cut in the base material, (b) incorrect weld symbol was shown on the drawing (c) incomplete weld, (d) overlap, and (e) weld splatter. The above conditions are contrary to the drawing requirements. The licensee subsequently issued CAQR WBP 87 1101 to address the above listed items. This is an example of Violation 391/87-19-01, "Failure to Follow Procedure For Installing Equipment in the North and South Valve Room".

- Snubber 47A496-6-75

  The inspector observed the following conditions which fail to meet the drawing requirements.

  Drawing 47A050-1B3, Rev. 7, "Mechanical Hanger Drawing General Notes", specifies: "Tack welds may be substituted for jam nuts where installation dimensions will not allow use of jam nuts." Inspection revealed that, contrary to this, the hanger clamp nut was tack welded to its Type 307 bolting material. There was sufficient room to install a lock washer or jam nut in accordance with installation requirements. This is an example of Violation 391/87-19-01.

- Restraint 2-01B-164

  Drawing 2-01B-164, Rev. 901, "Blowdown System Hanger 2-01B-164", specifies a fillet weld.

  Contrary to the drawing requirements, the welds from the shim plates to the structural steel were undersize in the wraparound area. Subsequent to this inspection, the licensee issued CAQR WBN 871087 to address the nonconforming condition. This is an example of Violation 391/87-19-01.

- Strut 2-01A-440

  Areas reinspected were found acceptable.

- Snubber 2-01A-439

  Area reinspected were found acceptable.

- Spring Can 2003B-03B

  Areas reinspected were found acceptable.

- Snubber 2AFW-V207

  Areas reinspected were found acceptable.

(2) South Valve Room - Structural

- Platform 48W 1707-06

  The inspector observed that the as-built configuration was not in accordance with drawing 48W 1707-6, Rev. 7, "Structural Steel Plan - South Main Steam Valve Room", detail G-24 to G-24. Also, undersize weld exists on the beam-to-imbed and beam-to-beam welds. The weld contained

overlap and slag which were unacceptable to the requirements specified in Quality Control Procedure (QCP) 4.13 Rev. 7, "Fitup and Visual Civil". This is an example of Violation 391/87-19-01.

- Platform Attachment PD07 26, Drawing 48 W1707-06, Rev. 7

  The inspector observed unacceptable undercut and insufficient root reinforcement on this weld - which is contrary to the requirements contained in QCP 4.13. This is an example of Violation 391/87-19-01.

- Platform Attachment PD07-040

  The inspector observed unacceptable weld overlap which is contrary to the requirements contained in QCP 4.13. This is an example of Violation 391/87-19-01.

- Platform Attachment PD07-041

  Areas reinspected were found acceptable.

- Platform Attachment PD07-28

  The inspector observed undersize welds, unacceptable overlap, lack of fusion and slag on this weld which was contrary to the requirements contained in QCP 4.13 and Drawing 48 W-1707-24, Rev. 6, "Structural Steel Sections and Details South Main Steam Valve Room". This is an example of Violation 391/87-19-01.

- Butt Beam Splice Adjacent to Spring Can

  Areas reinspected were found acceptable.

(3) North Valve Room - Hangers

- B-001 Valve Support 2-RTV-01A-290, 291A

  Pressure boundary attachment welds to process piping are painted with Amerlock 400. Painting is contrary to the licensee's requirements specified in WBNP CEP 1.60, "Work Control". On October 26, 1987, the licensee issued CAQR WBN 871088 to address this issue. This is an example of Violation 391/87-19-01.

- Spring Can 2-01A-386

  Areas reinspected were found acceptable. The welds were painted, however, the attributes reinspected were not affected by painting.

- Snubber/Strut - Valve Supports 2-01A-354 and 2-01A-355

  The inspector observed a misaligned support clamp on these supports. The licensee subsequently issued CAQR WBN 871087 to address the nonconforming condition. This is an example of Violation 391/87-19-01.

(4) Structural

- Structural Attachment PD08-09

  These welds were painted but the attributes reinspected on these welds were not affected by painting. All areas reinspected were found acceptable.

- Structural Attachment PD08-08

  These welds were painted but the attributes reinspected on these welds were not affected by painting. All areas reinspected were found acceptable.

- Platform 48W1708-05 Detail C-6

  The inspector observed unacceptable lack of penetration on this weld which was contrary to the requirements specified in QCP 4.13. This is an example of Violation 391/87-19-01.

c. Electrical Components and Systems - Work Observation (51053)

Selected areas of Unit 2 North and South Valve Rooms were inspected to evaluate the construction adequacy of the electrical and instrumentation areas, including supports. The following conditions were noted.

- Conduit supports 0-CSP-292-1178 and 0-CSP-292-1179 attachment welds not in conformance with the welding detail on drawing 47A056-04, Rev. 4, "Mechanical Typical Seismic Conduit Supports". The detail requires a 1/4" fillet weld on all four sides, however, as installed, there are 1/4" fillets on three sides and a seal weld on the fourth side. The support is positioned too close to the edge of the structural supporting member to achieve the fourth 1/4" fillet weld. The welding on these supports had been accepted by Quality Control (QC) on November 29, 1984. This is an example of Violation 391/87-19-01.

- These same supports contained conduit support strap bolts with no markings on their heads, which places the material type of these bolts in question. Paragraph 2.2.4 of Specification G-53 requires that American Society of Testing and Materials (ASTM)

A-307 bolt heads shall be marked to identify the material manufacturer. This is an example of Violation 391/87-19-01.

- Safety related conduits 2VC-2954A (Division A) and 2 PM-7418B (Division B) were observed with less than the 1" of spatial separation required by Section 8.3.1.4.3 of the Final Safety Analysis Report (FSAR) and section 7.1.2.1 of procedure WBN-QCP-3.03, Rev. 21, "Inspection Of Electrical Conduit and Junction Boxes". This is an example of Violation 391/87-19-01.

The inspector also identified the following Unresolved Items.

- Conduit 2PM6931 (containing non-safety related cables) was observed in physical contact with conduit 2PM6929A (containing safety-related division A cables) and conduit 2PM6930B (containing safety related division B cables). Although the division A and B conduits are separated by approximately four feet, the concern is that a potential condition may exist where a fault or a fire in the non-safety related conduit could disable portions of both safety related trains. The possibility of the existence of this physical configuration is not addressed in either the FSAR or in site specifications, procedures, or drawings. Further review of this item will be tracked as URI 391/87-19-05, "Non Safety Related Cable In Contact With Two division Runs of Safety Related Cable".

  When a non-safety-related cable is routed in a raceway with safety-related cables of one division, the non-safety-related cable is classified as an "associated circuit". The routings of these associated circuits are then verified by a computer to assure that they are not subsequently routed with cables of the other safety-related division, thus creating the potential of disabling portions of both safety related trains due to a fault in the non-safety-related circuit. However, these actions are required only for cables in raceways, not for cables in panels, motor control centers, junction boxes, etc. The inspector observed both non-safety and safety-related Division B cables in physical contact with each other in panel 2-JB-1973. Since these cables enter the panel via separate conduits, the non-safety-related cables are not classified as associated circuits. Therefore, the potential exists for them to be in contact, or in close proximity with, division A cables elsewhere in their routing. A similar condition relating to "internal" panel wiring has been identified by the licensee and is documented on CAQR WBP-870927, which has been forwarded to Division of Nuclear Engineering (DNE) for resolution. However, this CAQR references only internal panel wiring and does not address the observed condition of field wiring. Further review of this item will be tracked as URI 391/87-19-06, "Non-Safety

Related Cable In Close Proximity To Safety Related Cable In Electrical Panels".

d. In-Plant Storage Of Equipment - North /South Valve Rooms (35065

During the inspections in the North and South Valve Rooms, the inspector noted the following deficiencies related to in-place storage, preservation of equipment, and general housekeeping:

- Open fittings on Bailey positioner for valve 2-PCV-1-12.

- A damaged instrument line adjacent to hanger 2-032-AB-000.

- Numerous instances of uncapped condulets with some rust visible in several of these condulets.

- A broken supply line fitting to valve 2-PCV-1-30.

  A temporary support was disconnected and jammed between the process pipe and valve 2-PCV-1-30.

- Hanger pins and other loose electrical parts were found lying in the valve rooms.

- Water had collected in a large beam pocket of structural steel.

- Corrosion was observed on devices and terminal points in electrical panel 2JB-292-1515A. This condition appears to have been caused by moisture entering the panel via a conduit with a missing condulet cover approximately three feet above the panel.

- Several instances of broken flexible conduits and missing condulet covers were observed throughout the North and South Valve Rooms. Although a program had been formulated to repair these items prior to system acceptance and turnover, if allowed to remain in their present condition for an extended period, moisture could enter and damage critical equipment and devices.

- A wooden ladder was found bearing against the motor terminal box cover of valve 2-FCV-1-15 and the flexible conduit which exits this valve.

  Valve 2-PCV-1-12 was observed with a damaged air line from the operator diaphragm housing to the solenoid, frayed jackets on exposed wiring from the solenoid, and limit switches with missing covers and gaskets.

  The inspector observed a bent rod on Spring Can Support 47A427-3-9 which had not been previously identified by the licensee.

Covers were removed from the motor terminal boxes of several motor operated valves in order to examine the condition of the internal wiring and devices. The termination of field cables could not be evaluated at this time due to very few being installed and inspected. The conditions observed were found acceptable with the following two exceptions. Upon removing the covers for valves 2-FCV-3-033-A and 2-FCV-3-047-B, excessive corrosion and condensation were observed on the rotors, rotor housings, torque switches, wire terminals, and wiring.

Procedure CEP-1.36 "Housekeeping" paragraph 5.3 specifies the Assistant Construction Superintendents or their designee perform and document quarterly housekeeping inspections and deficiencies within their assigned area of responsibility.

A review of the licensee's last quarterly inspections for the main steam valve rooms revealed the licensee failed to note and record the above documented housekeeping deficiencies as required by CEP-1.36.

The above examples of failures to control the preservation of equipment and general housekeeping is a violation of 10 CFR 50 Appendix B, Criterion XIII and is identified as Violation 50-391/87-19-02, "Failure to Preserve Equipment Installed in the North and South Valve Rooms."

6. Welding (55085B) Units 1 and 2

Inspections

Various piping welds were selected at random in both the North and South Valve Rooms. These weld numbers were then used to locate the inspection packages for the weld. From the inspection package, the welder identification, qualification, and the procedure qualification, were verified. A total of 92 weld packages were reviewed which encompassed 29 welder qualifications are identified in Table I.

Inspection Findings:

During the inspection, it was noted that various welds on the main steam piping had been made using E70S-6 filler metal for the weld root passes. TVA Process Specification 1.M.1.2 (R5) dated May 22, 1987, page 8 of 20, paragraph 7.10, states: "When an electrode of the E70S-3 type is specified on the detail weld procedure, type E70S-6 may be substituted for use in applications not requiring impact testing. The E70S-6 shall have a certified chemical analysis per Section IX (.15 percent maximum carbon, 1.60 percent maximum manganese, and 1.00 percent maximum silicon). This substitution is not permitted in applications requiring impact testing."

Watts Bar Final Safety Analysis Report (FSAR) Paragraph 10.3.2.2 also states for the main steam lines: "The materials for piping and fittings in the TVA Class B Portion of the system are impact tested to plus (+) 40°F, as required by ASME Code Section III for Class 2 components, the test temperature of plus (+) 40°F is related to a minimum service temperature of plus (+) 70° (hydro test water temperature)." Welding of these lines is a violation of this specification.

The licensee had discovered this procedure violation and issued PIRBLNNEB8607 on November 26, 1986. Part of the corrective action in this PIR was the requalification of the procedures used with impact testing. Welding Procedure Qualification Records (PQRs) GT-SM11-0-2A, GT11-0-1, GT-SM11-0-3, and GT-SM11-0-3C, which had been requalified to resolve the above PIR were provided to the inspector. However, Process Specification 1.M.1.2, Rev. 5 was not revised to allow use of the E70-6 electrode.

a. Welding procedure qualifications were not performed for PQRs GT 11-0-1 and GT-SM11-0-3 for welding materials of P number 1, Group (Gr) number 2 (ASME Code, Section IX) to P number 1 group 2 or to P number 1, Group number 1 materials.

   Also, PQR GTSM11-0-2A was not qualified for a combination of P number 1 Gr 2 to P number 1 materials.

b. The same restrictions as in paragraph a. above would apply to the use of these procedures as identified in CAQR WBP 871081 dated October 26, 1987, to repair welds in Unit 1.

   The above examples of failure to properly qualify the welding procedures which require Charpy Impact testing is identified as a violation of 10 CFR 50 Appendix B, Criterion IX, 50-390/87-19-01 and 50-391/87-19-03, "Failure To Perform Welding In Accordance With ASME Code Section IX".

   The inspector reviewed the below listed attributes associated with the welds identified in Table I.

   Detail Weld Procedures

   Welding Procedure Qualification Records

   Welder Performance Qualification Records

   Process Specifications

   Welding Operations Sheets

   During a visual inspection in the North valve room, the inspector noted a galvanized chain welded to a valve casing (valve 2-03B-SB-ISV-869). The apparent intent of the chain was to lock the

manual operator in a preset position. The work activities on this valve were contained in work Plan NA003KZ and the welding was controlled by weld procedure SM11B3. The weld procedure qualifications for this detailed welding procedure were GT 1101A or GT-SM 1103B.

A review of the above referenced documents found neither procedure qualified the welding within the essential variables of ASME Code Section IX. Specifically, the qualification failed to consider the galvanized chain material.

Failure to properly qualify these welding procedures was a second example of Violation 390/87-19-01 and 391/87-19-03.

7. Nondestructive Examination - Review of Radiographic Film And Inservice Inspection Data (55183)

The inspector reviewed radiographic film for selected ASME Code field welds located in the Unit II North and South Valve Rooms. The welds selected and reviewed are identified in Table II. In addition, the inspector reviewed the radiographic film from two vendors. The welds selected and reviewed are identified in Table III.

A review of selected inservice inspection reports (identified in Table IV) were reviewed to assess the adequacy of the licensee's inservice inspection (ISI) program .

A selected sample (identified in Table V) of Unit 1 radiographic film was reviewed to further evaluate the adequacy of the licensee's weld and radiographic film identification system. This item is discussed in paragraph 4, "Licensee's Action On Inspector Identified Items".

A total of 51 welds, involving approximately 538 films, were selected from the North/South Valve Room isometric drawings representing various sizes of welds and class 1 and 2 systems. They were reviewed for compliance with applicable requirements. The inspector identified that weld FW2-041A-T003-04, has an indication resembling slag or weld concavity. This weld is being radiographed to obtain more data for evaluation. This weld is presently being investigated by the licensee's re-review team. This item is identified as Unresolved Item (URI) 50-391/87-19-04, "Licensee's Review and Disposition of Radiographic Film", pending licensee's re-review and disposition of the findings. Except for the URI identified above all areas reviewed were found acceptable.

The inspector selected a total of 29 shop butt welds involving approximately 250 films; two 4" Borg Warner valves involving approximately 20 films; and a partial review of seam welds on a Wyatt Industrial Inc. gas accumulator tank involving 37 films, representing approximately 45 feet of seam weld (Table III).

One weld, E2879-03B-AF-60-87E, was questioned by the inspector due to a linear indication present in the film. Further inspection revealed this weld has been removed from the system. All areas reviewed were found acceptable.

The inspector reviewed the radiographic film for Unit 1 welds. The 13 welds had received a re-review by two Level III contractors. Of the 13 welds (reference Table V), the inspector questioned an apparent surface indication and incomplete fusion in an unidentified second weld appearing on the radiographic film. The weld is identified as FW-1-072A-D059-01CA. The licensee plans to remove the insulation, re-radiograph the weld and perform additional interpretation of the film. This item is identified as URI 50-390/87-19-02, "Interpretation of Radiographic Film" pending further review. All other film received was found acceptable.

8. List of Abbreviations Unit 1 and 2

ASME Code	American Society of Mechanical Engineers Boiler and Pressure Vessel Code
ASTM	American Society of Testing and Materials
CMTR	Certified Material Test Report
DNE	Division of Nuclear Engineering
FSAR	Final Safety Analysis Report
FW	Field Weld
HAUP	Hanger Analysis and Update Program
ISI	Inservice Inspection
PIR	Problem Identification Report
QC	Quality Control
QCP	Quality Control Procedure
S/N	Serial Number
URI	Unresolved Item

TABLE I, Weld Packages Reviewed, Unit 2 and North and South Valve Rooms

WELDS	SIZE	THICKNESS
2-001B-T068-08	1/2"	0.147
2-001B-T068-09	1/2"	0.147
-T070-08	1/2"	0.147
-T070-09	1/2"	0.147
-T071-08	1/2"	0.147
-T071-09	1/2"	0.147
-T073-08	1/2"	0.147
-T073-09	1/2"	0.147
2-003B-D211-01A	6"	.432
-01B	6"	.432
2-003B-D003-06	16"	.844
2-003B-D214-06	6"	.432
-07	6"	.432
2-015A-T003-19	2"	.343
-20	4"	.337
-24	4"	.337
2-015A-T018-15	2"	.343
-16	4"	.337
-17	4"	.337
-18	4"	.337
-19	4"	.337
2-015A-T018-20	4"	.337
2-001A-D006-06	32"	1.75
2-001A-D009-06P	N/A	1"PLUG
2-003B-D213-06A	20"	.375
2-003B-D213-06	6"	.432
2-003B-D213-05	6"	.432
2-003B-D002-02A	4"	.843
2-001A-T062-14	1/2"	.095
-15	1/2"	.147
-16	1/2"	.147
-17	1/2"	.147
-18	1/2"	.147
-21	1/2"	.147
-22	1/2"	.147
-24	1/2"	.147
-25	1/2"	.147
2-001B-T097-07	1/2"	.147
2-001A-T029-01	1"	.179
-02	1"	.179
2-001A-T029-03	1"	.179
-04	1"	.179
-05	1"	.179
-06	1"	.179
-07	2 1/2"	.203
2-001A-T027-08	1"	.179

WELDS	SIZE	THICKNESS
-09	1"	.179
-10	1"	.179
-11	1"	.179
-12	1"	.179
-13	1"	.179
-14	2 1/2"	.203
2-001B-T017-08	2"	.218
2-001A-T020-01	1"	.179
2-001A-D003-10	32"	1.175
2-001B-T093-02	1/2"	.147
-03	1/2"	.147
-04	1/2"	.147
-05	1/2"	.147
2-001A-T020-07	2 1/2"	.203
2-003B-D212-05	6"	.432
-06	6"	.432
2-001A-D006-06P	N/A	1"PLUG
2-041A-T003-11	1"	.337
-12	1"	.179
-13	1"	.179
-01	4"	.337
-02	4"	.337
-03	4"	.337
-04	4"	.337
2-041A-T003-05	4"	.337
-06	4"	.337
-07	4"	.337
-08	4"	.337
-09	4"	.337
2-001A-D009-08	32"	1.175
2-001A-D003-09	32"	1.175
2-001A-D006-10	32"	1.175
2-001A-D006-11	32"	1.175
2-001A-D009-09	32"	1.175
2-041A-T005-04	4"	.337
-02	4"	.337
-03	4"	.337
-01	4"	.337
2-003C-D107-14	4"	.337
-13	4"	.337
2-003B-D212-03	6"	.432
2-003B-D003-02	18"	.938
-03	16"	.844
2-003B-D212-02B	6"	.432
-02A	6"	.432
-02	6"	.432

TABLE II ASME Code Welds Radiographs Reviewed, Unit 2 North and South Valve Rooms

2-003B-D001-10A	2-003B-D211-09-C1
2-003B-D001-10	2-003B-D211-10
2-003B-D001-03	2-003B-D211-08
2-003B-D001-02	2-001B-D001-05
2-003B-D001-12R2	2-001A-D001-03
2-003B-D001-7R1	2-001A-D001-04R3
2-003C-D007-15R1	2-003B-D214-07
2-003C-D007-06	*2-003B-D001-11A
2-003B-D003-11	2-003B-D211-13A
2-003B-D214-16	2-015A-T003-19
2-003B-D214-17	2-015A-T003-20
2-115A-T003-24	2-001A-D001-05
2-015A-T018-14	2-003B-D214-06
2-015A-T018-15	2-001A-D009-02
2-015A-T018-16	2-001A-D009-09R1
2-015A-T018-17	2-003B-D001-10A
2-015A-T018-18	2-003B-D213-06
2-015A-T018-19	2-003B-D213-05
2-015A-T018-20	2-041A-T003-05
2-003B-D211-01AR1	*2-041A-T003-04
2-003B-D211-01B	2-041A-T003-02
2-003B-D003-06	
2-003B-D214-07	
2-041A-T003-01	
2041A-T003-03C1	
2-001A-D006-06	
2-001A-D009-08	
2-001A-D00E-09	
2-001A-D006-11	
2-001A-D006-10	

*Open for further review

TABLE III Radiographic film reviewed from Vendors

|List of shop welds from Dravo|

E-2879	62A-CVCS-15 G and J
E-2879	62A-CVCS-7 C and D
E-2879	6AA-CVCS-18 C and D
E-2879	03BAF-60-87E
E-2879	03BAF-73-100 G and H
E-2879	62A-CUCS-123-867-B
E-2879	62A-CVCS-123-867-D
E-2879	62A-CVCS-141-885 B, D and G
E-2879	62A-CVCS-141-855 H, J, L and M
E-2879	03A-FW-8-12-G
E-2879	03A-FW-10-14 B
E-2879	03A-FW-18-22 C
E-2879	03A-FW-21-25 D and E
E-2878	01A-MS-29A
E-2878	01A-MS-4-4 C, D and E
E-2878	62A-CVCS-56 A and C

|List of Dravo Valves - Borg Warner|

E-6336-1-24 - - 77K51-8225-98-6 and
S/N78389-2N88
List of partial Dravo - Wyatt Ind. Inc. gas accumulator tank approximately 45 inches of seam welds on number WAT-SIATUI-02

546-CAS-185064-BN (Westinghouse S/O 5225 N Seam A, B, C, Ring #1 and extension weld N-A

TABLE IV Inservice Inspection Reports reviewed

Report Nummber	
1-001A-D006-05	1-074A-D047-08
1-001A-D009-04	1-074A-D049-08
1-063B-T059-02A	1-074A-D051-03B
1-068B-W002-01	1-074A-D047-06

TABLE V List of Unit 1 welds re-reviewed

Weld Number
1-063A-D074-08A
1-063A-D074-08B
1-062A-D024-25
1-062A-D024-06
1-063A-D080-02
1-063A-D080-07
1-063A-D080-08
1-063B-D082-01A
1-072A-D059-01C *
1-072A-D059-06
1-072B-D061-06
1-074B-D045-08A
1-062A-D022-06

*Open for further review