



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA ST., N.W., SUITE 3100
 ATLANTA, GEORGIA 30303

Report Nos. 50-390/80-21 and 50-391/80-15

Licensee: Tennessee Valley Authority
 500A Chestnut Street
 Chattanooga, Tennessee 37401

Facility Name: Watts Bar Nuclear Plant

License Nos. 50-390 and 50-391

Inspection at Watts Bar Nuclear Plant near Spring City, TN.

Inspector: C. Julian for
 J. A. McDonald

8/14/80
 Date Signed

Approved by: HC Dance
 H. C. Dance, Section Chief, RONS Branch

8/14/80
 Date Signed

SUMMARY

Inspection on June 1-27, 1980

Areas Inspected

This routine, announced inspection involved 127 inspector-hours onsite in the areas of preoperational testing quality assurance, independent inspection effort and preparations for new fuel receipt.

Results

Of the three areas inspected, no apparent items of noncompliance or deviations were identified in one area; six apparent items of noncompliance were found in two areas (Four Infractions and two Deficiency - Failure to have or follow procedure paragraphs 5.a., 5.b., 5.c., 6.a., 6.b., and 6.c.)

DETAILS

1. Persons Contacted

Licensee Employees

- K. Acres, Nuclear Engineering Branch
- J. Ballard, Engineer, Mechanical Engineering Unit "B"
- *G. Curtis, Quality Assurance Engineer
- H. Dake, Engineer, Mechanical Engineering Unit "B"
- *R. Eidson, Startup and Test Supervisor
- *R. Forsten, Engineer, Instrument Engineering Unit
- R. Gray, Engineer, Startup and Test Unit
- *T. Hayes, Instrument Engineering Unit Supervisor
- *R. Heatherly, Quality Control and Records Supervisor
- L. Johnson, Mechanical Engineer Unit "B" Supervisor
- *S. Johnson, Assistant Construction Engineer, Mechanical
- *M. Jones, Pre-Op Test Section Supervisor
- M. Keen, Engineer, Mechanical Engineering Unit "B"
- *S. Martin, Engineer, Hanger Engineering Unit
- *C. Mason, Plant Superintendent
- *P. McCulley, Power Stores Unit Supervisor
- *L. Northard, Asst. Construction Engineer, Quality Assurance
- *W. Peacher, Engineer, Civil Engineering Unit
- *A. Rogers, Construction Quality Assurance Supervisor
- J. Smalley, Engineer, Mechanical Engineering Unit "B"
- *J. Treadway, Construction Superintendent
- G. Vest, Engineer, Mechanical Engineering Unit "B"
- *J. Wilkins, Project Manager
- *B. Willis, Power Quality Assurance Supervisor
- *C. Whittemore, Quality Assurance Coordinator

Other licensee employees contacted included seven construction craftsmen, three technicians and five office personnel.

NRC Resident Inspector

T. L. Heatherly

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on June 27, 1980 with those persons indicated in Paragraph 1 above. The licensee acknowledged the findings. No commitments for resolution of the open items discussed in the report were made by the licensee. The inspector will make a separate request for such commitments.

3. Licensee Action on Previous Inspection Findings

(Open) Infraction (50-390/80-08-01): Failure to Maintain System Cleanliness Protection. The inspector identified the following locations where system openings were not protected or attended:

- a. June 16, 1980, in 1BB Containment Spray Pump Room: disassembled discharge valve 1-ISU-72-529; 1-RTV-72-202A Boss and "to be" attached pipe not capped; 1-RTV-72-205A Union and "to be" attached pipe not capped; 1-DRV-72-513 Flange not capped, and 1-DRV-72-521 and taped pipe laying on the floor with one end of the pipe not covered.
- b. June 16, 1980, in 1AA Containment Spray Pump Room: 1-VTV-72-514 Vent not covered; 1-RTV-72-208A Pipe and valve not capped, and 1-DRV-72-520 Pipe not capped.
- c. June 16, 1980, in 1BB Safety Injection Pump Room: 1-DVT-63-512 Flange not taped; and 1-DRV-63-514 Flange not taped.
- d. June 16, 1980, in Unit 1 Reciprocating Charging Pump Room: 1-ISV-62A-520 Valve packing leak off line not taped; and 1-BVT-62A-511 Flange not taped.
- e. June 16, 1980, the CVCS Holdup Tank B Manway Cover was Removed
- f. June 26, 1980, the following reactor coolant system steam generator manway covers: both manways on #4 Steam Generator and one manway on #1, 2, and 3 Steam Generators

These continuing examples of the noncompliance indicate ineffectiveness in corrective actions. Under separate cover a supplemental response to this item has been requested.

5. Preoperational Testing Quality Assurance

- References:
- a. Watts Bar Nuclear Plant Quality Control Instruction (WBNP-QCI) 1.22, Transfer of Permanent Features to the Division of Nuclear Power, Revision 1, dated May 19, 1980.
 - b. Watts Bar Nuclear Plant Quality Control Procedure (WBNP-QCP) 3.5, Installation, Inspection, and Testing of Insulated Control, Revision 11, dated March 27, 1980.
 - c. Electrical Instruments and Controls Drawing 47W600-0-4, Revision 5, dated July 14, 1978
 - d. Electrical Instruments and Controls Drawing 47W600-276, Revision 3, dated March 13, 1980.

e. Wiring Diagrams, Miscellaneous Valves, Connection Diagrams 45N1630-57, Revision 0.

The inspector reviewed the licensee's system for conducting transfer of systems from the Division of Construction to the Division of Power Production in support of preoperational testing. The Unit 1 Upper Head Injection system tentative transfer was inspected, while in progress, to verify the implementation of administrative controls which assure the adequacy of construction status to support preoperational testing. The findings are detailed below.

a. Prior to the tentative transfer of a system to the Division of Nuclear Power, Section 6.3.11 of WBNP-QCI-1.22 requires the Responsible Engineering Unit Supervisors to verify that all appropriate quality assurance records are on file in the Quality Control and Records Unit. Provisions are made for noting any incomplete construction, incomplete design changes, uncorrected nonconformances or incomplete quality assurance record documentation of filing on the incomplete work item list. All the Responsible Engineering Unit Supervisors documented their verifications of the status of the Unit 1 Upper Head Injection system between June 13 and 19, 1980. After these verifications, the following work incompletions/deficiencies were noted to be missing from the incomplete work items list:

- (1) Air supplies bypassed the solenoid control valves 1-FSV-87-7A and 1-FSV-87-12.
- (2) UHI surge tank level transmitters 1-LT-87-1 and 1-LT-87-4 had no electric cable pulled or terminated at the instruments.
- (3) The coil to solenoid valve 1-FSV-87-7A was removed from the valve.
- (4) Electrical Conduit bodies without cover plates were located: approximately 4' from 1-FSV-87-7A; approximately 35' from 1-LS-87-23; approximately 4' from the OPEN and CLOSE limit switches on 1-FSV-87-5; and approximately 4' from the OPEN and CLOSE limit switches on 1-FSV-87-16
- (5) The electrical conduit bodies attached directly to the following solenoid control valves did not have cover plates installed and the wiring protruded approximately four inches beyond the conduit body: 1-FSV-87-5, 1-FSV-87-7A, 1-FSV-87-8A, 1-FSV-87-10, 1-FSV-87-11, 1-FSV-87-16, 1-FSV-87-13, and 1-FSV-87-15
- (6) Temporary piping supports were not removed near 1-CKV-87-563 and where the Upper Head Injection System nitrogen accumulator discharge line penetrates elevation 763 in the Auxiliary Equipment Building.

- (7) The quality assurance records for the installation of hangers supporting solenoid valves 1-FSV-87-7A and 8A were not completed and the records for 1-FSV-87 -9; 10; 11 and 12 were completed, but not yet on file in the Quality Control and Records Unit.
- (8) The protective armor for one sensing line to 1-LT-87-1 was not properly fitted up to the instrument.
- (9) The limit switch actuating plates attached to the stems of 1-FCV-87-7 and 1-FCV-87-8 were not adjusted so that they would contact the rollers on the limit switch actuating arms.
- (10) The cable armor for the CLOSE limit switch for 1-FCV-87-5 was broken at the entrance of the conduit.
- (11) The air supplies to 1-FCV-87-5 and 1-FCV-87-16 were disconnected at the valve.
- (12) The sensing lines of Instruments 1-PI-87-5 and 1-FI-87-12 were disconnected near the instruments.

This failure to follow procedural requirements for documenting system status constitutes an item of noncompliance (50-390/80-21-01).

b. Electrical Instruments and Controls Drawings were not Followed in that:

- (1) Note 6 of Electrical Instruments and Controls Drawing 47N600-0-4 required that any high point vents in the Upper Head Injection (UHI) system have a drain line attached and routed to the closed drain system. The following high point vents in the UHI system water level instrumentation were not piped to the closed drain system:
 - (a) The sensing line vents for UHI water accumulator level switches 1-LS-87-21, 1-LS-87-22, 1-LS-87-23, and 1-LS-87-24.
 - (b) The vents off the two pots shown as detail B176 on 47N600-276.
- (2) Electrical Instruments and Control Drawing 47N600-276 required the four level instrument calibration connections near the UHI water accumulator to terminate as a threaded nipple; however these connections were unthreaded.

These examples of failure to follow drawings collectively constitutes an item of noncompliance (50-390/80-21-02).

c. Section 6.5.1 of WBNP-QCP-3.5 requires cable termination per the connection diagram. Cables 1-3V-87-3424-A and 1-3V-87-3434A were terminated in a conduit body adjacent to 1-FSV-87-7A and 8A respectively, a location not shown on wiring diagram 45N1630-57.

These examples of failure to follow procedures constitute an item of noncompliance (50-390/80-21-03). The inspector was shown a Design Information Request which recognized cable termination problems at some nonsafety-related equipment. The authorized termination for these problems was specifically stated to be not applied to safety-related equipment inside containment. 1-FSV-87-7A and 8A are classified as safety-related and are inside containment. This practice was apparently conducted with the concurrence of a supervisor in the Electrical Engineering Unit without requiring the generation of an approved resolution to the installation problem.

- d. Solenoid valves 1-FSV-87-7A and 1-FSV-87-8A receive safety grade electrical power from Panel 4 of 125 volt Vital Battery Board I. However, these valves regulate air supplied from the nonsafety-related Service Air and Non-essential Control Air system. Until the licensee reviews this apparent conflict in safety classification, this item remains open (50-390/80-21-07, 50-391/80-15-03).

6. Independent Inspection Effort

- References:
- a. Watts Bar Nuclear Plant Quality Control Procedure (WBNP-QCP) 4.10, Appendix D, Hydrostatic/Pneumatic Testing of Piping Systems and Subassemblies, Revision 23, dated February 26, 1980.
 - b. Watts Bar Field Instruction (WBFI), G-10, Disposition of Engineering Change Notices, Revision 2, dated September 5, 1979.
 - c. Drawing 47W432 Revision 1, Bill of Materials Units 1 and 2 Residual Heat Removal System Piping, dated April 3, 1974.

During a review of Licensee Action taken on a item of noncompliance 50-390/80-08-01 (see paragraph 3a) the inspector noted several areas of concern related to: The procurement, storage, handling and installation of spare parts used in safety-related systems; the design specifications used for installation of safety-related material and system testing; and the procedural implementation of engineering change notices (ECNs).

- a. As of June 27, 1980, no procedures existed for the current practice of installing Grafoil Ribbon Tape on spiral wound gaskets to be placed in safety-related systems. Discussions held with Construction Mechanical Engineers revealed that it had been common practice to install the tape on gaskets prior to tentative transfer of the system to Division of Power Production. The inspector noted from Nuclear Disassembly and Reassembly Operations Sheets, from valves CKV-63-643, 1-CKV-63-641, 1-ISV-74-525, and 1-ISV-74-524A that the tape had been installed. No procedures address procurement, storage and handling of installation of the tape or storage and handling of spiral wound gaskets. Discussions with the Power Stores Supervisor revealed that there are no special

procurement or storage requirements in effect for either the tape or spiral gaskets.

Compatibility of the tape and spiral gaskets and the handling of these materials during installation had not been evaluated for its potentially detrimental effects on cleanliness in class "B" grade systems. These examples of failure to have procedures to control repair materials constitutes an item of noncompliance (50-390/80-21-04).

b. Hydrostatic testing procedures were not followed in that:

- (1) Reference c states that the piping from the containment sump to the residual heat removal pump suction is designed for 50 psi, Reference a, Section 6.1.33 requires test pressure to be 1.25 times design pressure. Hydrostatic test operation sheet nos. 1,2,3, and 4 stated hydrostatic test pressures of 75 to 77 psig respectively were applied.
- (2) Reference a, Step 6.1.33 requires a minimum test gauge range of 1.5 times the hydrostatic test pressure. Hydrostatic test operation sheet no. 5 indicated that test gauges 900201 and PG-39 had ranges of 0-1000 psig vice the minimum required range of 0-1125 psig.
- (3) Reference a, Attachment A requires that the hydrostatic test boundaries be added to the attachment. Hydrostatic test operation sheet Nos. 5 and 6 did not indicate that 1-FCV-63-93 was a boundary system status at the time of the test dictated that this valve was a boundary and the engineer stated that the valve must have been shut to complete a successful test.

These examples of failure to follow hydrostatic test procedures collectively constitute an item of noncompliance (50-390/80-21-05 and 50-391/80-15-01).

c. Procedures Pertaining to disposition of Engineering Changes Notices were not followed in that:

- (1) Reference b, Step 5.2 requires the Quality Control and Records Unit to receive and file completed Engineering Change Notices. As of June 27, 1980 the Startup, Test and Coordination Unit was receiving completed ECN data packages and filing them in a relatively unprotected location.
2. Reference b, Step 6.1.5 Requires Responsible Engineering Units and Modifications and Additions personnel to update the ECN status monthly. The following ECN's had not been shown as completed on June 27, 1980, yet the associated nonconforming condition report (NCR) had been closed out for greater than one month. The closed NCR was indicative of completion of the appropriate ECN.

ECN No.	NCR No.	Date NCR Closed	NCR Description
2274	1940R	2-26-80	MS pipe not installed per endes drawing.
1948	1356	1-3-80	Repair 2-PCV-3-122 1-PCV-3-122 2-PCV-3-132 1-PCV-3-132
1965	1473	5-24-79	RegROUT Hangers
2275	1922	4-28-80	FCV-62-83 cannot be installed as shown on drawing 47W406-3
2426	2100R	4-28-80	CVCS pipe out of tolerance
1744	1221	12-27-78	Incorrect Weld
1824	1368	8-9-79	Incorrect CVCS hanger plates.

These examples of failure to follow procedure on the disposition of ECNs collectively constitutes an item of noncompliance (50-390/80-21-06 and 50-391/80-15-02).

- d. Issuance of Field Change Notices (FCN's) and Nonconforming Condition Reports (NCR's) on transferred systems frequently results in initiation of work plans. These work plans are used to ensure the satisfactory completion of required system work as well as a means for the ST&C unit to track the status of required system work. The ST&C unit does not receive copies of NCR's and FCN's. Until the licensee evaluates the need for the ST&C Unit to receive NCR's and FCN's to help assure accurate tracking of system work, this item is unresolved (50-390/80-21-11).
- e. Procurement procedures do not appear to assure the procurement of a spiral wound flexitallic gaskets whose potential for contamination release is compatible with the system in which they are to be installed. Until the licensee evaluates the spiral wound gasket procurement requirements this item is unresolved (50-390/80-21-09).
- d. Name plate data and the Bill of Material drawing indicate that valves 1-FCV-62-93 and 1-FCV-62-89 in the CVCS system are designed for 2735 psig at 200°F. Engineering Design Drawing 47W809-1, CVCS Flow Diagram, indicates that the process line design pressure should be 2800 psig at 200°F. Until the licensee evaluates the differences that exist between the component design and process line design criteria, this item is unresolved. (50-390/80-21-08)

- f. Drawing 47W810-1, Flow Diagram Residual Heat Removal System, indicates the line tapping off the pump discharge piping supply in the Safety Inspection System is designed for 600 psig, 400°F. Print 47W811-1 indicates the same line to be designed for 700 psi, 400°F. Until the licensee evaluates this discrepancy and resolves its affect on hydrostatic testing, this item is unresolved (50-390/80-21-10).
- h. QCP 4.10, Appendix D, Step 6.1.2.1, requires test pressure and design pressure to be specified on applicable design drawings. Engineering design drawings, including flow diagrams and bills of material, specify system design pressure but currently do not specify hydrostatic test pressure. Further the design pressure given on flow diagrams is not defined as to whether it is representative of a limiting component or if it is indicative of the pipes and fittings. Until the licensee revises his procedures to appropriately specify design and hydrostatic test pressures, this item will remain open. 50-390/80-21-12

7. Special Nuclear Material License Amendment

Reference: TVA-T-51, Criticality Analysis for the Watts Bar Nuclear Plant Spent Fuel Storage Racks, dated May 2, 1978.

The licensee had applied for Amendment 1 to Special Nuclear Material License No. 1861 which would allow storage of new nuclear fuel in spent fuel storage racks. The inspector evaluated the licensees on-going activities with the spent fuel racks. As rack #20 was scheduled for receipt of new fuel, its quality assurance records, test data and deficiencies were examined.

The inspector verified proper neutron poisoning of rack 20 by: reviewing the reference to the minimum Boron-10 concentration allowed in the commercial product Boraflex; reviewing vendor procurement specifications for Boraflex; and tracing certificates of compliance with these procurement specifications to seven (7) Bora Flex sheets installed in spent fuel rack #20.

The drag test data taken under TVA-6.2.B was reviewed and the inspector noted that all 88 cells in rack #20 met the drag acceptance criteria with a regular size fuel dummy.

Deficiencies in Welding, dents, cell base levelness and cell plumbness were reviewed. The inspector stated that the acceptance criteria for cell plumbness had been made less conservative, apparently based upon an evaluation of the spent fuel rack manufacturer. The licensee was questioned about the position of the fuel manufacturer and was told that the fuel manufacturer was not concerned with this condition.

Based upon the status of the licensees actions, the inspector recommended within NRC that the ammendment be approved. The amendment was approved and the licensee loaded sixty new fuel assemblies into spent fuel rack #20 during the period of the report.

The inspector identified no items of noncompliance or deviations.

8. Preoperational Test Procedures

A review of outstanding open items in the preoperational test procedure area addresses items 8.a through 8.i below the following new items are opened in 8.j through 8.n which are redesignated portions of old items.

- a. (Closed) Open item (50-390/79-06-03): Inadequacies of Residual Heat Removal (RHR) Pump and Related Injection System Performance Test procedure (W-3.1.E). A review of the procedure left three aspects uncorrected. These are discussed in paragraph 8.j and 8.k below.
- b. (Closed) Open item (50-390/79-21-01): Failure to include Vibration Monitoring Program in Preoperational Test W-3.1B, W-3.1A(1) and W-3.1C. The revised W-3.1C contains the appropriate vibration monitoring program. The remaining concerns are discussed in paragraph 8.l.
- c. (Closed) Open item (50-390/79-29-03): TVA-14D had not included completion of test steps, recording of data within limits, or verify battery capability at 80% initial charge. Section 8.3.2. of the FSAR has been amended to test per section 4.1 and 4.2 of IEEE-450-1975. TVA-14D has been revised to agree with IEEE-450-1975 as well as its format is now appropriate.
- d. (Closed) Open item (50-390/79-36-01): W-1.4 gave conflicting data taking requirements. W-5.2 did not verify control rod speed performance. W-5.4 did not evaluate individual vs. group rod position indication. W-5.3 did not define the measurements of Rod Release Time. Revisions to W-1.4, W-5.4 and W-5.3 corrected the appropriate concerns. W-5.2 has not been revised and this remaining concern is redesignated in paragraph 8.m.
- e. (Open) Open item (50-390/79-46-01): W-2.1 did not specify stroke times for five CVCS valves. The inspector reviewed surveillance instruction SI-4.0.5.62.b as referenced in the revised W-21; however, the surveillance instruction had not been revised to specify the stroke times.
- f. (Closed) Open item (50-390/79-46-02): In W-9.5 the technical manuals and data Sheet No. 1 were not clearly referenced. The issued procedure has corrected these concerns.
- g. (Closed) Open Item (50-390/80-01-01): Administrative deficiencies in W-10.7A. The revised procedure now addresses the installation of air test equipment and has required approvals. A new concern was identified as 50-391/80-15-05 discussed in paragraph 8.n.
- h. (Closed) Open Item (50-390/80-01-02): Procedural approved signatures and step performance signature for TVA-7A appear misleading. The licensee has clarified the test cover sheet and provided adequate notation in the test documentation to clarify the significance of the signoffs in question.

- i. (Closed) Open Item (50-390/80-01-03): Improper documentation of procedure reviews by licensee. The licensee has correlated the required approvals, all of which were in existence at the required time. Procedure cover sheets have been revised and approvals are now shown as required.
- j. The acceptance criteria for valve timing are not given in W-3.1.E, Residual Heat Removal (RHR) Pump and Related Injection System Performance Test, as required by Appendix C of Regulatory Guide 1.68, Section 4.1 of Part II to TVA Operational Quality Assurance Manual, and ASME III Article IWV-3000. This item is open (50-390/80-21-13).
- k. The testing of the RWST Lo-Lo level and containment sump level functions associated with SI switchover from injection to recirculation are not yet addressed in an approved procedure. They are planned to be tested under test W-7.3. This item is open (50-390/80-21-14).
- l. The inspector reviewed draft copies of W-3.1B and W-3.1A(1) for conformance to the vibration monitoring program requirements of FSAR Section 3.9.2.1. The program was not present and the licensee stated that vibration monitoring would be added. This item is open (50-390/80-21-15).
- m. W-5.2, Rod Control System Test, Rev. 0, 4-25-78 does not verify that the control rods can be withdrawn and inserted at the maximum and minimum speeds specified in FSAR section 7.7.1.2.1. Also the acceptance criteria should require evaluation of whether the bank overlap sequencing (data sheet 5.2) occurs within 1 step of the values entered into the counters in step 5.10 as required by FSAR section 7.7.1.2.1. This item is open (50-390/80-21-16).
- n. W-10.7A, Containment Spray System, Revision 2, dated January 16, 1980 uses initial valve lineups and valve operations which need to be updated to reflect the addition of more vent and drain isolation valves under Engineering Change Notice 2162 (72-569, 575, 580 and 582). These corrections did not affect the validity of the test performance on Unit 1; however, need to be addressed prior to test performance on Unit 2. This item is open (50-391/80-15-04).