



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

Report Nos. 50-390/79-23 and 50-391/79-19

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

Facility Name: Watts Bar Nuclear Station

Docket Nos. 50-390 and 50-391

License Nos. CPPR-91 and CPPR-92

Inspection at Watts Bar Dam, RHEA County, Tennessee

Inspector: *B. J. Cochran* 6/8/79  
B. J. Cochran Date Signed

Accompanying Personnel: N. Merriweather and M. Thomas

Approved by: *F. S. Cantrell* 6/8/79  
F. S. Cantrell, Section Chief, RCES Branch Date Signed

### SUMMARY

Inspection on April 30 - May 25, 1979

#### Areas Inspected

This routine, announced inspection involved one hundred and ninety one inspector-hours onsite in the areas of installation of security fencing, penetrations chipped thru battery room floor, installations of Unit 2 reactor internals, torquing of pipe flange bolts, pipe repair, outdoor and warehouse storage areas, verifying cable routing, pulling of cable, cable terminations, welding in safety related piping systems, installations of piping components in reactor pressure boundary piping and follow-up on an allegation related to installation of conduit.

#### Results

Of the twelve areas inspected, no apparent items of noncompliance or deviations were identified in eleven areas; one apparent item of noncompliance was found in one area (Failure to issue nonconformance report for obstructed conduit).

790021005/4

## DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*T. B. Northern, Jr., Project Manager
- \*S. Johnson, Assistant Construction Engineer
- \*A. W. Rogers, Supervisor QA
- \*C. O. Christopher, Assistant Construction Engineer (Civil)
- \*R. L. Heatherly, Supervisor, QC&R Unit
- \*J. H. Perdue, Supervisor, Electrical Engineering Unit
- \*J. M. Lamb, Supervisor, Mechanical Engineering Unit
- \*H. C. Richardson, Construction Engineer
- \*J. G. Shields, Assistant Construction Engineer
- J. E. Treadway, Construction Superintendent
- \*W. C. English, Assistant Construction Superintendent
- \*D. Wall, OEDC
- \*R. Morgan, OEDC

Other licensee employees included construction craftsmen, and technicians.

\*Attended exit interview

### 2. Exit interview

The inspection scope and findings were summarized on May 4, 11, 18 and 25, 1979 with those persons indicated in Paragraph 1 above. The resident inspector met with the licensee construction project manager and engineering supervisors each week to review the resident inspector's activities and findings. One item of noncompliance was discussed regarding failure to issue a nonconformance report on obstructed conduit. Refer to paragraph 13.

### 3. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item 50-391/79-04-02, "Maintenance and Inspection Records for Containment Spray Heat Exchangers." Licensee provided the inspector with copies of the WBNP-QCP-4.5 Attachment A, Equipment Storage and Maintenance Record Sheet for the Containment Spray Heat Exchangers. The records confirm that the periodic maintenance and inspection was performed according to procedures.

### 4. Unresolved Items

There were no unresolved items identified during this inspection.

## 5. Independent Inspection Effort

During this inspection period the following non-programmatic construction activities were inspected, observed or witnessed:

- a. Observed the setting of fence posts and placement of concrete between the two parallel security fences.
- b. Inspected rebar in hole chipped in floor of the 125 volt Vital Battery Board Room 1. No damage to rebar was identified. The inspector examined the civil engineering release for chipping according to procedure QCP 1.7 Attachment A.
- c. Witnessed the installation of the reactor internals inside the Unit 2 reactor vessel, and setting the head in place on the vessel. The reactor internals will be stored inside the reactor vessel while the reactor refueling cavity and transfer canal are cleaned by glass blasting.

During the lifting operations, the inspector confirmed the operations of the polar crane dynamometer.

- d. Witnessed the torquing of bolts in the flanges of subassemblies (74-RHR-10 to 74-RHR-9) in RHR pump 1-BB suction line. The torquing and inspections were performed in accordance with the Flange Bolting Operation Sheet 1-74-F-5-53. Calibration of the torquing wrenches was also checked and found to be current.
- e. On off-shift, witnessed the fitup of replacement flange for FE-64-12 in sub-assembly 74-RHR-25. Cracks were found in the original flange during preparation for hydro of the Unit 1 RHR system (refer to licensee identified Item). The replacement flange was taken out of the Unit 2 system for the test.
- f. Inspected outdoor storage of stainless steel pipe, conduit, and construction material; storage of pipe hanger and restraints, stainless steel and carbon steel fittings and weldolets inside warehouse 21; and storage of spent fuel storage racks and motor operated valves in temporary storage sheds.
- g. Observed the fitup of flanges to the fuel pool cooling heat exchangers and inlet to Unit 1 charging pump 1-BB. In both cases the lines had to be cut and the flanges fitup prior to rewelding the pipe. Cut out sheets 1-62-F-7-34(2) and 0-78-F-3-26 and weld operations sheet 1-78-F-7-34 were examined.
- h. Observed the checking of cable routing in the 6.9 Kv shutdown system. Confirmation of cable routing in cable trays and conduit is being done by three teams of instrument mechanics on loan to the construction electrical engineering unit from Power Production.

i. The following Watts Bar QA audits were reviewed:

- Inspection and Documentation of Seismically Qualified Instrumentation Supports - WB-I-79-01.
- Calibration and Loop Testing of Permanent Plant Instruments WB-I-79-02.
- Inspection and Documentation Requirements of Mechanical Supports WB-M-79-04.
- Mechanical Sleeve Seals-WB-M-79-05.

No items of noncompliance or deviations were identified.

6. Licensee Identified Items

- a. (Closed) Item 390/79-08-01 and 391/79-05-01, "High Flow Alarm in ERCW Piping" (10 CFR 50.55(e)).

On January 29, 1979, TVA notified IE:II of a 50.55(e) item concerning an undetected pipe break in the ERCW system. The Construction Deficiency Report was submitted on February 28, 1979. The report has been reviewed and determined to be acceptable by IE:II.

- b. (Open) Item Nos. 390/79-23-02 and 391/79-19-02, "Hammers used on ERCW Pipe Piling" (10 CFR 50.55(e)). TVA notified IE:II of a (possible) 50.55(e) item concerning use of wrong sized hammers to drive piles in ERCW system.

- c. (Open) Item Nos. 390/79-23-03 and 391/79-19-03, (WB-M-79-06) "Insufficient Metal between flange face and Socket" (10 CFR 50.55(e)).

On May 16, 1979, TVA notified IE:II of a (possible) 50.55(e) item concerning insufficient metal between flange face and instrument socket to permit fillet weld.

- d. (Open) Item Nos. 390/79-23-04 and 391/79-19-04, "ERCW Supply to Aux FW Pumps" (10 CFR 50.55(e)).

On May 21, 1979, TVA notified IE:II of a (possible) 50.55(e) item concerning ERCW Supply to auxiliary FW Pumps too slow to prevent cavitation.

- e. (Closed ) Item Nos. 390/79-08-05 and 391/79-05-05, "Shutdown Board Room Air Conditioning."

TVA notified IE:II that a (possible) 50.55(e) item concerning the shutdown board room air conditioning was determined to be not reportable under the definition of a 50.55(e) item.

- f. (Open) Item Nos. 390/79-23-05 and 391/79-19-05 "Incorrect Valve Weights." TVA reported that they have found twelve (12) three-inch glove valves with weights which were different from those on the drawings provided by Velan Engineering Corporation. Five valves in each unit are located in the Chemical and Volume Control System and two valves are in the Reactor Coolant System.

7. Safety-Related Piping (welding) - Observation of Work and Work Activities (Unit 2)

Welding of four inch pipe in the Chemical Volume Control and Safety Injection systems was selected for this inspection activity. Welds in these systems are classified as TVA Class B and ASME Class 2.

The work being performed was the cutting out an eight inch section of the pipe, which was too short to make up, and replace it with a twelve inch section. The approved cutting procedure of sawing and grinding was done in accordance with the cutting operation sheet 2-63-F-5-15.

Welds 2-062A-D009-08 and 2-063A-D118-13 were made in accordance with weld operation sheets 2-62-F-7-08 and 2-63-F-5-13. The operation sheets confirmed that all the inspection hold points were made by the welding, mechanical engineering and authorized inspectors. Subassembly pieces were properly identified as to heat number and proper weld filler material specified. Further examination confirmed that the welder was qualified to the specified weld procedure.

The welds were accepted by final radiography inspection.

In the areas inspected no items of noncompliance or deviations were identified.

8. Electrical (Cables and Terminations) Observation of Work and Work Activities (Unit 1)

Cable trays 4B2314, 4B2256, 4B2269, 4B2306, 4A2192, 3A2322, 4A2307, 3A2295, 3M2417, 3N2440 and 2N2230 located in the shutdown board area and cable spreading rooms were inspected. The trays were inspected for proper support, separation, identification, alignment, sharp edges and burrs, grounding, cleanliness and cable fill. Trays 3M2417, 3N2440 and 2N2230 were found to be near the fill capacity.

The inspector observed the pulling of cables 1-4PL-30-2862-B, a 3 conductor size 12ANG cable pulled from motor control center 1-MCC-214-B1/B to Fan Motor 1-MTR-30-248-G/B, and cable 1-4PL-30-2870-B, a 3 conductor size 12ANG cable pulled from motor control center 1-MCC-214-B1/90-B to fan motor 1-MTR-30-248E/B.

The inspector verified that the cable was routed according to the pull cards and was protected from cuts and abrasion.

The inspector examined cables installed in cable trays and confirmed that the cables were adequately protected from other construction activities, cable trays were free of debris and installed cables clean, cables entering and leaving trays were properly supported and proper bend radius was maintained.

The following cable terminations were witnessed; cable 1-3V-67-2161-B, a 9 conductor #14AWG in motor control center MCC-213; 1-3V-30-1259-A, a 12 conductor #14AWG in shutdown board panel 1-E-10; cable 0-3PP-82-550-B, a 19 conductor #14AWG in panel 0-PNL-82-M26/6; cable 0-3PP-82-552B, a 12 conductor #12 AWG in panel 1-PNL-211-B/3B; and cables 0-3PP-82-673-B and 0-3PP-82-672-B, both 12 conductors #14AWG terminating on panel 2-PNL-211-B/3B.

Cables were properly identified, termination slips agreed with termination drawings, crimping tools properly calibrated, and bending radius not exceeded.

In the areas inspected no items of noncompliance or deviations were identified.

9. Reactor Coolant Pressure Boundary Piping - Observation of Work and Work Activities - (Unit 1)

Replacement of flanges in the RHR system as referenced in Independent Inspection Activities Paragraph e. was selected for inspection. Flanges FE-74-12 and FE-74-24 were removed from Unit 2 RHR system and installed in the Unit 1 RHR system to replace the defective flanges identified at the start of the system hydro test.

The flanges were cut out by sawing and grinding under the approval of cutting Operational Sheets 1-74-F-7-58 and 1-74-F-7-60. Fit up and cut pass welding on the two flanges were witnessed. The inspector verified that subassembly 74-RHR-34 was welded to the 8 inch orifice flange by weld number 1-074-A-D049-06C and subassembly 74-RHR-25 was welded to the second 8 inch orifice flange by weld number 1-074-A-D048-06c. The field Weld Operation Sheets were examined and confirmed that the Material Verification and Prefitup Cleanliness was approved by the mechanical engineer, and that fitup, purge and preheat was approved by the welding engineer prior to release for welding by both engineers.

The qualifications of the welders, the mechanical engineer and the welding engineers were confirmed. The fitup was checked for cold spring.

In the area inspected no items of noncompliance or deviations were identified.

10. Electrical (Components and Systems) Observations of Work and Work Activities (Unit 2)

Inspection under this activity included inspection of electrical control and distribution panels, signal tracing of installed cables, observation of cable terminations and discussions with electricians. The 125V DC Vital Battery Board I (0-Bd-236-1-D), 120V AC Vital Instrument Power Board 1-I (1-Bd-235-1-D), 120V AC Vital Instrument Power Board 2-I (2-Bd-235-1-D),

125V DC Vital Battery Board II (0-Bd-236-2-D), 120V AC Vital Instrument Power Board 1-I (1-Bd-235-2-D), and 120V AC Vital Instrument Power Board 2-II (2-Bd-235-2-D) were inspected for proper location, identification, workmanship, protective features, spacing, and cleanliness. All boards are energized with individual circuit breakers tagged to prevent the energizing of the circuits. The rooms and panel boards were clean and free from debris. The inspector observed the electrical engineers confirming the proper routing of installed cables in the 6.9Kv shutdown control systems. The cables and their routing thru conduit and trays were; 2-3PP-C8-822-B, 1/4c, from 2-Bd-211-B/20-B to 2-PNL-278-L 118/R; 2-3PP-62-C153-B, 1/3c, from 2-MCC-213-B1/14-B to 2-Bd-211-B/18-B; 2-3PP-62-569-B, from 2-Bd-211-B/18-B to 2-MCC-23-B/41-B; 2-3PP-62-567-B, 1/12c, from 2-Bd-211-B/18-B to 2-PNL-211-B/2-B; 2-3PP-63-615-B, 1/9c, 2-Bd-211-B/515-B to 2-PNL-278-MC/B1; and 2-3PP-63-617-B, 1/2c, 2-Bd-211-B/15-B to 2-PNL-99-B/51-B.

The cables were disconnected at both ends and a signal generator was connected to one conductor in each cable and the engineers confirmed the cable routing by locating the cable at each routing node point. After confirmation of the routing the retermination was inspected and properly documented.

Discussion with electricians confirmed that they had been instructed properly, such as pulling tension and minimum bend radius during cable pulling activities.

In the areas inspected no items of noncompliance or deviations were identified.

11. Safety-Related Piping - Observation of Work and Work Activities  
(Units 1 and 2)

Installation of a ten inch expansion joint in the line between the fuel pool cooling pump suction lines was selected for inspection. The work included removal of 3/4 inch from existing piping, by grinding, to permit the installation of the expansion joint in the line. The grinding was performed in accordance with instructions in the cutting operation sheet #0-78-F-7-35. Work was performed in accordance with Field Weld Operation Sheets (FWOS) 0-78-F-7-32 and 0-78-F-7-31 for welds 0-078A-D196-12 and 00-78A-D196-13. The welds were examined during fitup, root and intermediate pass. All inspection points were properly noted on the FWOS by qualified inspectors and the welds were all made by a qualified welder. The inspection included confirmation of the correct sub-assemblies and components according to the isometric sketch E-2879-1C-196R4.

In the areas inspected no items of noncompliance or deviations were identified.

12. Reactor Vessel Internals - Observation of Work and Work Activities  
Unit 2

This inspection effort included the observation of assembling the control rod guide structure and thermocouple thimbles on the reactor upper internals and storage of the core support barrel. The storage and work area was located in the refueling cavity area that had been sealed off to protect the internals from dust and other construction activities.

While work was being done on the upper internal section, the clevis support bracket inside the reactor vessel was being machined for final fitup of the core support barrel. With this activity completed, the core support barrel was installed into the reactor vessel and the clevis supports measured and found to be within acceptable tolerances. Then the upper internals were installed inside the core support barrel. Measurements confirm that all sections fit within the specified tolerances. The entire operation was done under supervision of Westinghouse Field Engineers and TVA's responsible Mechanical Engineer according to Westinghouse procedures.

On completion of the measurement checks, the internals were removed and returned to storage on the storage stands in the refueling cavity. The reactor vessel was covered with a tarpaulin.

The inspector confirmed that the polar crane's digital dynamometer was in operation during all lifts.

In the areas inspected no items of noncompliance or deviations were identified.

### 13. Follow-up on Allegation

TVA and Region II received a letter in which allegations were made regarding integrity of conduit embedded in concrete running underground from manholes 20, 21, 24 and 25 to the diesel generator building. The allegation stated that several conduits were obstructed with concrete, that cables pulled in the conduits were damaged, and TVA attempted to conceal it from the NRC.

Site records confirm that 23 out of 100 conduit run from the manholes to the diesel generator building were obstructed with concrete. Twenty two conduits were drilled out with jack hammers and cleaned by running brushes and cloth swabs thru them. One conduit was abandoned. Cables have been pulled in 13 of the 22 conduits. On examination of the outer sheaths of all cables pulled in the damaged conduits; no damage was identified. There was no evidence of TVA attempting to conceal this from the NRC.

TVA is cited with a deficiency for violation of their quality assurance program by failure to identify these items on a nonconformance report. This is identified as 50-390/79-23-01 and 50-391/79-19-01. TVA has since issued a nonconformance report (Report No. NCR-1507R), documented the corrective action and conducted training programs in the issuance of nonconformance reports. As a result of this action no written response to this item of noncompliance is required.