

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

Report Nos.: 50-390/84-90 and 50-391/84-61

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

Docket Nos.: 50-390 and 50-391

License Nos.: CPPR-91 and CPPR-92

Facility Name: Watts Bar 1 and 2

Inspection Conducted: December 21 - January 20, 1985

4.0 Inspectors: for M. B. Snythlock for W. E. Holland forC. W.

Accompanying Personnel: John York Approved by: S. P. Weise, Section Chief Division of Reactor Projects

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Date Signed

SUMMARY

Scope: This routine, unannounced inspection entailed 274 resident inspectorhours on site in the areas of licensee action on previous enforcement matters, followup on inspector identified items, followup on licensee identified items, welding of safety related piping, fire prevention and protection, preoperational test program implementation verification, review and followup of safety evaluation report, TMI action items, IE Bulletin followup, and independent inspection effort.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*W. T. Cottle, Site Director R. M. Pierce, OEDC Project Manager for Watts Bar *E. R. Ennis, Plant Manager G. Wadewitz, Construction Project Manager *B. S. Willis, Operations and Engineering Superintendent *H. B. Bounds, Maintenance Superintendent D. W. Wilson, Design Services Manager *R. Norman, Jr., Operations Supervisor T. L. Howard, Quality Engineering Supervisor R. C. Miles, Modifications Manager C. E. Wood, Jr., Electrical Maintenance Supervisor M. K. Jones, Engineering Supervisor R. A. Beck, Health Physics Supervisor J. S. Woods, Instrument Maintenance Supervisor C. J. Nelson, Mechanical Maintenance Supervisor *R. C. Sauer, Plant Compliance Supervisor W. L. Byrd, Preoperational Test Supervisor H. K. Fischer, Construction Engineer C. H. Jetton, General Construction Superintendent S. Johnson, Jr., Quality Manager - Construction T. W. Hayes, Nuclear Licensing Unit Supervisor L. C. Miller, Head, Plant Quality Engineering and Control Group H. L. Pope, Supervisor, Plant Quality Control Section L. J. Smith, Supervisor, Quality Surveillance Section S. M. Anthony, Plant Compliance Staff, Mechanical Engineer J. E. Englehart, Plant Compliance Staff, Nuclear Engineer *R. T. McCollom, Plant Compliance Staff, Instrument Engineer R. E. Yarbrough, Jr., Assistant Operations Supervisor R. E. Bradley, Assistant Operations Supervisor *R. C. McKay, Project Engineer, PMO

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

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on January 23, 1985, with those persons indicated by an asterisk in paragraph 1 above. The licensee acknowledged the inspection with no dissenting comments. The licensee did

not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection. At no time during the inspection period did the inspectors provide written material to the licensee.

3. Licensee Action on Previous Enforcement Matters (92702)

(Closed) Violation 390/84-77-01, Failure to Follow Procedure with Regard to Test Log Entries. The violation occurred because test engineers did not clearly understand the requirement of Administrative Instruction (AI) 6.2. This AI requires specific test log entries with regard to a review of plant conditions following a test interruption extending into the service working shift. Upon identification of the problem by the inspector, licensee management issued a letter to all preoperational section personnel identifying the requirements to make the proper test log entries after interruptions extending into the next working shift. The licensee also emphasized these requirements in the periodic training session held for test section personnel after the violation was identified.

The inspector reviewed the corrective action taken by the licensee and considers the actions are adequate to close this item. This area will be closely monitored by the inspectors during future preoperational testing.

4. Unresolved Items

Unresolved items were not identified during this inspection

- 5. Followup on Inspector Identified Items (92701)
 - a. (Closed) IFI 390/84-37-05, Annunciator Response System Operating Instruction (SOI) Deficiencies. The subject deficiencies were identified by the inspectors during a review of control room annunciator windows and SOI response to these annunciators as outlined in Inspection Report 390/84-37. The licensee conducted a review of annunciator SOIs and corrected all identified deficiencies. The inspector conducted a re-inspection of selected control room annunciator windows and SOIs and verified the corrective actions with regard to the subject deficiencies. During this re-inspection, no additional deficiencies were identified.
 - b. (Open) IFI 390/84-35-03, Essential Raw Cooling Water (ERCW) System Discrepancies. The subject discrepancies were identified by the inspector during a walkdown of the intake pumping station and the diesel generator portions of the ERCW system as outlined in Inspection Report 390/84-35. The licensee corrected the discrepancies identified except for the following:
 - (1) The ERCW discharge thermometer for diesel generator cooler 2B-2 was still oriented so that it was not visible to the operator.

- (2) ERCW pump motors for pumps A-A, C-A, E-B, and G-B were removed for maintenance; however, ERCW pump/motor repairs are being followed under Inspector Followup Item number 390/84-35-01 which was discussed in report number 390/84-85.
- (3) Valve 2-67-510A tagging discrepancy was corrected; however, valve 1-67-510B, 1-67-515B, 2-67-515A, and 1-67-515A which are the discharge isolation valves for DG coolers 1B1, 1B2, 2A2, and 1A2, respectively have label plates that state they are the discharge isolation valves for DG coolers 1B2, 1B1, 2A1, and 2A2, respectively.
- (4) Valve 1-67-510A has a broken (missing) label plate.

This item will remain open until discrepancies (1), (3), and (4) listed above are corrected.

- c. (Closed) IFI 391/84-35-01, Control Rod Breach Guide Screw Deficiency. The subject deficiency was addressed in Inspection Report 390/84-85. The IFI was incorrectly numbered and should have been numbered 391/84-57-01; however, the licensee submitted 10 CFR Part 21 reports to the NRC since the issue was addressed. The reports are numbered CDR 390/85-04 for Unit 1 and CDR 391/85-03 for Unit 2. This IFI is closed based on the identification of these items as CDRs by the licensee.
- d. (Closed) IFI 390/84-13-09, Verification (Through Preoperational Testing) of Analyses Regarding Conformance to BTP-PSB-1, (SER 8.3.1.2). The licensee completed Preoperational Test Instruction TVA-67 "Onsite Testing of the Auxiliary Power System and of the 120 Volt AC Vital Plant Control". This preoperational test was conducted to verify design calculation methods. The licensee's Engineering Design Group (EN DES) then performed analytical calculations using data obtained from TVA-67 to determine voltage values at selected 120 VAC locations. The inspector reviewed these calculations completed by EN DES, "120 VAC Vital Instrument Power Verification of Design Calculation Methods" EEB 841024923. The voltage values between the actual measured and calculated values were consistently less than 3% per BTP-PSB-1.

EN DES calculation per "Auxiliary Power Test and Verification Study" EEB 84083901 were also reviewed by the inspector. This study was divided into two parts. Part I examined train B power boards fed through 6.9 KV unit board 1C, 6.9 KV start bus A, and common station service transformer (CSST) B. Part II examined train B power boards that feed CSST C. Various current, load (kw) and voltage measurements were taken before, during, and after starting of a 6.9 KV load. During the first part of the test, non-class 1E component cooling water pump 1C was started and during the second part of the test, class 1E emergency raw cooling water pump E-B was started. The calculated voltages for each part were compared with the design study values and test measured data. The measured data was not more than 3% below the analytical data. Within the areas inspected, no violations or deviations were identified.

- 6. Followup on Licensee Identified Items (92700)
 - a. (Closed) LII CDR 390/84-26; 391/84-24, Main Control Room Pressurization Boundary Loss through Fire Protection Piping. The subject deficiency was identified by the licensee during a generic review of the main control room habitability zone pressure boundary. The corrective action taken by the licensee was to install an orifice and a seismically qualified check valve in the control air line as well as replacing the existing control air regulator with a seismically qualified one. The inspector reviewed the engineering change notice and the completed work plan which accomplished the work. Also, an inspection was made of the completed work. The inspector considers that all actions necessary to close this CDR have been completed.
 - b. (Closed) LII CDR 390/84-28, Deficient Catalyst Bed in Hydrogen Analyzers. The subject deficiency was identified to the licensee by NRC IE Information Notice 84-22 and by the vendor as required by 10 CFR 21. The corrective action taken by the licensee was to replace the deficient catalyst bed in each hydrogen analyzer with new catalyst beds designed to function in a post-LOCA containment atmosphere for a period exceeding 100 days. The inspector reviewed the engineering change notice and the completed work plan which accomplished the work. The inspector considers that all actions necessary to close this CDR have been completed.
 - c. (Closed) LII CDR 390/83-27 and CDR 391/83-27, Pump hotors Supplied Without Seismic Analysis or Operability Demonstrated. The subject discrepancy was identified to the NRC on April 28, 1983, as NCR WBN NEB 8304 with regard to the Spent Fuel Pool Cooling and Cleanup System (SFPCCS) pumps that were received from the manufacturer without seismic analysis or operability demonstrated. By final report dated August 29, 1984, the licensee stated that it has received documentation from Westinghouse which verifies that the SFPCCS pumps were supplied as ASME Code Section III class 3 components. In addition, the seismic operability qualification of the pumps and motors is in the McDonald Engineering Analysis Report ME-218, Addendum No. 2. Based on the above information, the licensee no longer considers restrictions necessary on the use of the existing pumps and motors and is downgrading the reportability of this CDR.
 - d. (Closed) LII CDR 390/84-41 and CDR 391/84-36, Active Components Procurement Deficiencies. The subject deficiency was identified to the NRC on July 23, 1984, as NCR WBN NEB 8429 was regard to components required to be active that were not procured as such. By final report dated September 14, 1984, the licensee stated that a review of all components listed as active has been performed and it has been determined that all valves required to be active which were procured as

nonactive are acceptable for use as-is. The licensee stated that, had this deficiency remained uncorrected, it could not have adversely affected the safety of the plant. Based on this, the licensee is downgrading the reportability of this CDR.

- e. (Closed) LII CDR 390/84-46 and CDR 391/84-41, Unacceptable Foam Plastic Insulation on Spent Fuel Cooling System. The inspectors reviewed the final report submitted by the licensee on October 19, 1984. The report contained the following information:
 - Foam plastic insulation (TVA class IV) was found to be installed on the Spent Fuel Pool Cooling and Cleanup System (SFPCCS) pumps A-A, B-B, and C-S, and heat exchangers (Hx) A and B. This is shown on TVA drawings 47W454-403 (R1), -405(R1), and -406(R1) for Watts Bar. The SFPCCS at WBN is a safety-related (TVA class C) seismic category I system per WBN FSAR section 9.1.3.3.1.
 - Insulation material installed on safety-related stainless steel (SS) piping must be certified to meet NRC Regulate Guide 1.36, "Nonmetallic Thermal Insulation on Austenitic Stainless Steel." This regulatory guide gives guidance on acceptance levels of chloride and fluoride contaminants in nonmetallic insulation, as well as acceptable concentrations of sodium and silicate which, in sufficient quantities, inhibit corrosion. Foam plastic insulation cannot meet the requirements of Regulatory Guide 1.36 because of the high chloride content.
 - TVA will revise the affected SFPCCS design drawings to specify that a mass type insulation which will conform to the requirements of Regulatory Guide 1.36 be used. The existing foam plastic insulation will be removed and the affected components will be cleaned per TVA General Construction Specification G-29M, "Process Specification for Welding, Heat Treatment, Nondestructive Examination, and Allied Field Fabrication Operations." New insulation will be installed per the revised drawings. This corrective action will be accomplished per engineering change notice (ECN) 5188.

The inspectors reviewed Engineering Change Notice No. 5188 and the appropriate changes to the insulation made to drawing nos. 47W454-403, -405, and -406. The inspectors performed a walk down inspection on the appropriate pumps, piping, and heat exchangers and noted that the correct insulation had been installed.

f. (Closed) LII CDR 390/83-70 and CDR 391/83-65, Control Room Pressurization Boundary Loss Through Floor and Equipment Drains. The inspectors reviewed the final report submitted by the licensee on April 6, 1984 with regards to floor and equipment drains and potable water (PW) lines that are designed without considering the need to prevent loss of Main Control Room Habitability System (MCRHS) pressure boundary. The inspectors reviewed the report which contained the following information:

- Floor and equipment drain lines have been redesigned and seismic supports provided to maintain both the MCRHS pressure boundary and water seals in the traps. These traps were moved from the Main Control Room floor slab and additional traps were designed in certain areas where it was determined necessary to guard against the affects of postulated Main Steam Line Break. The drains were then provided with seismic supports from the floor penetrations to a point just downstream of the traps where pipe anchors were provided to terminate the seismic analysis. A direct connection to the PW system was also designed to provide a continuous supply of water to the trap seals.
- PW system piping in the control room has been redesigned to include two check valves in the 2-inch PW supply line, a manually-operated butterfly valve in the 4-inch vent pipe at a location just below the ceiling slab at elevation 777.0', and two motor-operated plug valves in the 4-inch waste drain piping downstreams of the last tributary branch line. Seismic supports to assure pressure boundary integrity were then provided for the 2-inch PW supply line from the floor penetrations to the upstream check valve, for the 4-inch vent pipe from the ceiling slab to the butterfly valve, and for the waste drain piping from the Main Control Room floor slab penetrations to the downstream valve. In addition, the control panel for the two motor-operated plug valves was located within the habitability zone.

The inspectors selected the following sample of the seismic supports for reinspection:

- Support No. 1029-A702-1-08
- Support No. 1029-A702-1-27
- Support No. 1029-A702-1-35
- Support No. 0040-A060-40-3
- Support No. 0040-A480-2-27

All of these supports conformed to the drawing requirements established in Engineering Change Notice 4451. In addition, the inspectors walked down portions of the piping system and noted that configurations met the new revised drawings.

Within the areas inspected, no violations or deviations were identified.

7. Welding of Safety Related Piping - Units 2 (55083C)

The following welds were inspected at various stages of completion:

- Weld number 2-067C-T684-02 (socket weld) Class of weld - ASME Sec. III, cl. 3
 Welder - 6PWW
 Detailed welding procedure - GT-88-0-3, Rev. 1
 Observed in-process welding
- Weld number 2-067-T684-13 (socket weld) Class of weld - ASME Sec. III, cl. 3 Welder - 6PWW Detailed welding procedure - GT-88-0-3, Rev. 1 Observed in-process welding
- Weld number 2-068A-T055-06 (socket weld) Class of weld - ASME Sec. III, cl. 2
 Welder ~ 6RYY Detailed welding procedure - GT-88-0-1, Rev. 6
 Observed fit up
- Weld number 2-068A-T044-04 (socket weld) Class of weld - ASME Sec. III, cl. 2
 Welder - 6FFS
 Detailed welding procedure - GT-88-0-1, Rev. 6
 Observed QC visual and liquid penetrant tests

The inspectors checked these welding operations for visual (including gap and mismatch measurements), documentation, welder qualification, weld metal requisition, and NDE requirements.

Within the areas inspected, no violations or deviations were identified.

8. Fire Prevention and Fire Protection (42051)

During plant tours, the inspectors conducted observations of fire prevention and protection activities in areas containing combustible materials where ignition of these material could damage safety-related structures, system or components. The observations included verification that applicable requirements of Administrative Instruction (AI) 9.9 (Torch Cutting, Welding and Open Flame Work Permit), Standard Practice WB 12.6 (Fire Brigade Instructor's Guide and Fire Brigade Handbook), AI 1.8 (Plant Housekeeping) and WBNP Quality Control Instruction (QCI) 1.36 (Storage and Housekeeping) were being implemented with regards to fire prevention and protection.

The inspectors looked specifically at the Control Building and Turbine Building during this inspection period and noted a few discrepancies. One such discrepancy was found in the Unit 1 Cable Spreading Room where the inspectors found trash and combustible aerosol cans in safety-related cable trays. The inspectors discussed the status of cleanliness in Unit 1 with the licensee and its effect upon fire prevention. The licensee management stated that they would increase the housekeeping effort in Unit 1 commencing the week of January 20, 1985 and provide a list of discrepancies to the resident inspectors. The inspectors agreed to this program and will conduct their own inspections after the licensee's effort have been completed in an attempt to assess the licensee's performance.

The resident inspectors responded to a fire alarm to watch the licensee's response. The fire alarm was turned in to the Control Room by a fire watch who was observing welding operations in the Unit 2 Reactor Building. Personnel in the building at the time were evacuated and the fire brigade made a timely response along with appropriate operations and health physics personnel. The fire was quickly extinguished and no damage was noted.

Within this area inspected, no violations or deviations were noted.

9. Preoperational Test Program Implementation Verification (71302)

The inspectors conducted routine tours of the facility to make an independent assessment of equipment conditions, plant conditions, security, and adherence to regulatory requirements. The tours included a general observation of plant areas to determine if fire hazards existed, observation of other activities in progress (e.g., maintenance, preoperational testing, etc.) to determine if they were being conducted in accordance with approved procedures, and observation of other activities which could damage installed equipment or instrumentation. The tours also included evaluation of system cleanliness controls and a review of logs maintained by test groups to identify problems that may be appropriate for additional followup.

Within this area inspected, no violations or deviations were identified.

10. Review and Followup of Safety Evaluation Report (92718)

(Open) 390/84-90-01, Verification of Completion of the Modification to Assure Compliance with NUREG/CR-0660 (SER 9.5.4.1). The inspector reviewed the recommendations listed in Table 9.1 of NUREG 0847 and verified completion of the outstanding items as listed below.

- Moisture in the Air Starting System the inspector verified that air dryers have been installed in the Air-Starting Systems for each emergency diesel.
- (2) Turbocharger Gear Drive Assemblies the inspector verified that heavy duty turbocharger drive gear assemblies have been installed on each emergency diesel by reviewed the applicable documentation.

- (3) Automatic Prelube the inspector verified that the manufacturer's modification, EMD MI-9644, has been installed on each emergency diesel.
- (4) Fuel Storage and Handling the inspector verified that the missile protection has been installed for the fuel oil storage tank vent lines.
- (5) Test Loading, No-Load and Low-Load Operation the inspector reviewed the emergency diesel generator operating procedures and determined that the precautionary statement as written in the Safety Evaluation Report Section 9.5.4.1 had not been incorporated into system operating procedures. The inspector identified this concern to the licensee and was informed that the procedures would be revised. This item will remain open until the revised procedures are reviewed.

Within the area inspected, no violations or deviations were noted.

11. TMI Action Items (25401)

(Closed) TMI Action Item II.B.2.3, Plant Shielding Modifications. The subject item was addressed in Inspection Report 390/84-41. The report stated in part that no additional shielding was required since the plant was specifically designed to mitigate major design basis events without requiring access outside the main control room. Based on the conclusion that no corrective actions are required, plant shielding modifications will not be necessary.

12. Electrical - Cables and Terminations - Unit 2 (51063C)

The inspectors observed four terminations being performed in Junction Box No. 2-JB-293-491A. The junction box was in the system for Reactor Motor Operated Valve No. BD 2A1-A. The electrical craft were using drawing No. 45W2766-3, Rev. 7. The wire size was number 14 and the serial number for the crimping tool was 138. The crimping tool had been calibrated within the required time period and the inspector also verified the following items were properly performed:

- Cable identification
- Log entries
- Cable entry to terminal point

Condition of wire

Within the area inspected, no violations or deviations were identified.

13. IE Bulletin Followup (92703)

(Closed - Units 1 and 2) IE Bulletin 79-15: Deep Draft Pump Deficiencies. The subject bulletin is being evaluated by the NRC staff (NRR) as part of the licensing review. No further Region II action is known or anticipated on this bulletin.

14. Independent Inspection Effort (92706)

- a. The inspector conducted a review of the Watts Bar retraining package and found it to be incomplete. The licensee is currently preparing the retraining package and it will be reexamined upon completion. This item will be identified as Inspector Followup Item 390/84-90-02.
- b. During discussions with the licensee management, the inspectors stated that they would conduct a general plant walkdown of Unit 1 and common areas to assess the operational readiness of the facility. The walkdowns would address housekeeping, system condition, support equipment, electrical equipment protection, and fire prevention and protection as previously mentioned. The licensee management informed the inspectors that plant personnel would also be conducting the same operational readiness walkdowns as of the week of January 20, 1985. This item will be addressed in the inspection report next month.
- c. The licensee has been working on a program to document how they have addressed all IE Bulletins. The inspectors have followed this activity and think that work can be completed by mid-February 1985.