



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

Report Nos 50-390/81-09 and 50-391/81-09

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

Facility Name: Watts Bar

Docket Nos. 50-390 and 50-391

License Nos. CPR-91 and CPR-92

Inspection at Watts Bar

Inspectors:	<u><i>D R Quick</i></u>	<u>7/6/81</u>
	J. A. McDonald	Date Signed
	<u><i>D R Quick</i></u>	<u>7/6/81</u>
	T. L. Heatherly	Date Signed
Approved by:	<u><i>D R Quick</i></u>	<u>7/6/81</u>
	D. R. Quick, Section Chief	Date Signed

SUMMARY

Inspection on March 20 through April 20, 1981

Areas Inspected

This routine, announced inspection involved 196 inspector-hours on site in the areas of licensee action on previous inspection findings, independent inspection effort comparison of as-built plant to FSAR description, licensee event follow-up, and previous inspection findings, independent inspection efforts, comparison of as-built plant to FSAR description, licensee event follow-up and previous inspection findings.

Results

Of the five areas inspected, no violations or deviations were identified in three areas; six violations were found in two areas. (Failure to take appropriate corrective action, paragraph 5.1.; failure to have design control measures, paragraph 6.a.; failure to take appropriate corrective action, paragraph 5.b.; failure to follow NCR procedures, paragraph 5.c.; failure to follow drawing procedures, paragraph 5.d.; and failure to maintain adequate records, paragraph 5.d.; and failure to maintain adequate records, paragraph 5.e.).

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## DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. E. Wilkins, Project Manager
- \*S. J. Boney, Welding Engineering Supervisor
- \*T. R. Brown, Hanger Engineering Supervisor
- \*T. B. Bucy, Assistant Construction Engineer
- \*S. Dothard, Engineering Design
- \*K. G. Frazier, Mechanical Engineering Unit "A" Supervisor
- \*T. Hayes, Instrumentation Engineering Unit Supervisor
- \*L. J. Johnson, Mechanical Engineering Unit "E" Supervisor
- \*S. Johnson, Assistant Construction Engineer
- \*M. K. Jones, Preoperational Test Supervisor
- \*J. P. Knight, Office of Engineering Design & Construction
- \*J. E. Treadway, Construction Superintendent
- \*R. W. Olson, Construction Engineer
- \*A. W. Rogers, Quality Assurance Supervisor
- \*J. A. Thompson, Startup and Test Engineering Supervisor
- \*J. Weinbaum, Quality Control and Record Supervisor

Other licensee employees contacted included approximately twenty engineers.

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on March 16, 1981, with those persons indicated in Paragraph 1 above. The licensee acknowledged the findings. No commitments for resolution of the unresolved items discussed in the report were made by the licensee. The inspector will make a separate request for such commitments. The Assistant Construction Engineer, Mechanical, presented comments on apparent violation A cited in Appendix A. He stated that the Division of Engineering Design had again reviewed the decision for disposition of NCR 2793 to use-as-is and had again concluded that this was good engineering judgement. The inspectors took this under advisement, reviewed the licensee's position, and again concluded that this particular disposition, and the guidance provided for making dispositions was inadequate.

### 3. Licensee Action on Previous Inspection Findings

- a. (Closed) Infraction (390/80-21-02): Failure to complete instrument vent lines. The licensee has established improved administrative controls over the proper identification or construction status at the time of tentative transfer. The programs for drawing control, system walkdowns and work package control are designed to prevent recurrence and the examples cited have been corrected.

- b. (Closed) Infraction (390/80-21-04): Failure to establish controls for use of Graphoil Ribbon Tape (brand name) on stainless steel safety systems. The establishment of QCI-4.31 and a new procurement specification, PF-4951, provide adequate controls for procurement, handling, storage and use of this product.

Unresolved items identified during this inspection are discussed in paragraphs 6.b., 6.c., 6.d., and 7.

- c. (Closed) Deficiency (390/80-21-05, 391/80-15-01): Failure to conduct hydrostatic testing per procedures. The licensee has established more comprehensive procedural controls over the conduct of hydrostatic tests with the assurance of policy procedure QCT-4.37. Individual deficiencies noted in the citation were also corrected.
- d. (Closed) Infraction (390/80-23-05): Failure to maintain cleanliness of spool pieces. In addition to cleaning and storing the cited spool pieces, AOI-7 was revised to provide proper controls over storage and use of the various flood mode spool pieces.
- e. (Closed) Infraction (390/80-36-04): Failure to remove contamination from nondestructive examination. A plant tour revealed that the licensee has apparently taken effective corrective action for this repeat violation. Personnel are now effectively removing these NDE materials and a general cleanup has corrected the majority of previous work.
- f. (Closed) Deviation (390/81-01-05): Failure to review nonconforming condition reports (NCR) per commitment. The licensee has revised QCI-1.2, Addendum 1, and appears to have implemented the appropriate controls to assure proper review of the NCR's for generic and repetitive trends.
- g. (Closed) Unresolved item (390/81-01-01): Apparent discrepancy between FSAR commitment and diesel generator building design. Further investigation has revealed this discrepancy is a violation. See paragraph 6.a.
- h. (Closed) Unresolved item (390/80-20-09): Licensee lack of evaluation for Division of Nuclear Power procurement of spiral round gaskets. The licensee's current practices resulted in adequate gasket quality; however, appropriately improved specifications have been implemented.
- i. (Closed) Unresolved item (390/81-03-10): Licensee lack of demonstration for environmental qualification of Kopr-Shield and Permatex 3 (brand names). These sealants have been shown to not perform safety functions, therefore their qualification is not required.

#### 4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. New unresolved items identified during this inspection are discussed in paragraph 6.b., 6.c., 6.d., and 7.

#### 5. Independent Inspection Effort

The inspectors continued to review the Division of Construction corrective action program which is currently prescribed by QCI-1.2, Control of Non-conforming Items. Overall control of the establishment of a site quality assurance program was reviewed. Findings were acceptable except as follows:

- a. Partial flushing of the Component Cooling Water System (CCS) in Unit 1 was performed in 1978 and 1979. Apparently, neither operation satisfied the requirements of section 8.42 of Construction Specification G-39 which precluded the flushing of material from parts of the system into large, low velocity regions. In 1978, initial flushing of heat exchangers included the following relatively large heat exchangers: A and C Component Cooling Heat Exchangers, 1AA and 1BB Residual Heat Removal (RHR) Heat Exchangers. Also affected were the relatively small, low velocity 1AA and 1BB Safety Injection pump lube oil coolers. In 1979, initial flushing procedure, WBF1-M30, was performed on the same relatively large heat exchangers including the 1A and 1B Spent Fuel Pool Cooling Heat Exchangers. The deficient performance of the initial flushing operations in 1978 and 1979 was identified in December, 1980, by Non-conforming Condition Report (NCR) 2793. This NCR was processed on site per QCI-1.2 with the recommended disposition being to "use-as-is" with no corrective action. The final approval of this disposition was made by the Design Project under EN DES EP-1.26. Neither procedure gives appropriate guidance for determining the disposition of nonconformances. The disposition of this NCR, to use-as-is, was apparently made without any objective evidence with respect to contamination of the heat exchangers. None of the affected heat exchangers were inspected to establish the type, quantity or potential adverse consequences of contaminants remaining in the heat exchangers as a result of the improperly controlled flushing operations. The two controlling NCR procedures did not establish measures to assure corrective action for conditions adverse to quality and therefore constitute a violation (390/81-09-01).
- b. Nonconforming Condition Report (NCR) 2611R, initiated August 22, 1980, identified that 3/8" ITT-Phillips, "Redhead", Self Drilling Concrete Expansion Anchors (Catalog No. 538) had failed to meet minimum ultimate capacities during qualification testing in accordance with construction specification G-32. The NCR was submitted and approved by the unit supervisor, but was invalidated by the assistant construction engineer on January 13, 1981. Between initiation of the NCR and its invalidation, it was decided to transmit the information concerning test

failure to Engineering Design (EN DES) via memo WBN 80 1017 010, dated October 17, 1980, which stated that the reduced ultimate capacities demonstrated during testing were not acceptable. This memo contained an attachment 1 which specified a suggested method for retest. This construction site, in response to EN DES WBN 8021230 004, dated December 30, 1980, stated that the site was compelled to pour concrete immediately and then wait approximately five months before performing the test. However, no pour was made. As an alternative, EN DES suggested locations within the Auxiliary Building walls which currently met concrete requirements for testing (SWP 81 0303 011, dated March 3, 1981). Discussion with mechanical and civil engineering supervision indicated that neither assignment of responsibility for retesting, nor preparations for retesting had been done. The use of memos to resolve nonconforming conditions is a technique not subject to formal tracking, QA review, or periodic QA auditing and therefore does not assure corrective action. Since QCI-1.2 provides authority for invalidation of NCR's without any required justification, this is a failure to establish measures to assure corrective action for conditions adverse to quality and constitutes a violation (390/80-09-02, 391/81-09-01).

It is noted that this practice also results in failure to satisfy 10 CFR 50, Appendix B, Criterion XV, requirements for identification and segregation of nonconformances.

- c. Discussions with electrical engineers revealed that during 1979 anchor testing "jacks" AT-1, AT-4, AT-5 and AT-6 were received on the construction site. The person in charge of the calibration room for the electrical engineering unit was unaware of the need to develop a specific pull chart for each ram using the ram piston area supplied by the TVA Central Lab report. Consequently, a test pressure pull chart was used from another anchor tester on the project, resulting in underpulling several lots of anchors. Incorrect pull charts were used with these rams for a period of approximately 10 months. When the problem was recognized a memo was sent to the Electrical Engineering Unit Supervisor. Subsequent discussions with the Construction Engineer apparently led to the decision to not write an NCR or even a memo. It was believed that a similar problem, but not the same, had been transmitted via memo to Engineering Design from the Civil Engineering Unit which would adequately address this nonconservative testing. EN DES response to CEU memo, SWP 80 0612 11, stated that a new revision to construction specification G-32 would be sent to the site and would supply expanded tolerances which should prevent a recurrence of the problem identified by CEU. The revision stated that if subsequent recalibration of a jack or gauge indicates that the actual proof loads were less than 90 percent of the required proof loads additional testing may be required. Instructions for additional tests were to be obtained from EN DES. A review by the on site calibration engineer indicated that some anchor lots had been underpulled by approximately 25 percent and yet no notification or NCR had been written to EN DES to procure instructions for additional tests by the electrical engineers. There was no mechanism to assure identification and correction of this

deficiency once an NCR was not written. The failure to follow procedures for NCR initiation constitutes a violation (390/81-09-03, 391/81-09-02).

- d. While touring the auxiliary building, a number of safety-related drawings were found unattended in two different areas. A stick used to hold several drawings was found lying on a table adjacent to a work area. A review of the drawings indicated that all nineteen drawings were not the current revision. Another stick of drawings was located that contained eighteen drawings, six of which were not the current revision. The licensee, upon notification, retrieved the field drawings mentioned above and initiated steps to insure that other unauthorized drawings are not in the field. This failure to follow QCI-1.1 procedures for drawing revisions constitutes a violation (390/81-09-04).
- e. Hydraulic jack rams are used to transmit the force required to proof load self drilling anchors for their qualifications. These rams have an annual calibration requirement to insure accurate testing. A review of Quality Control Procedure (QCP) 1.14, which utilizes these rams in proof loading, revealed the ram calibration data was not required to be recorded on the Attachment A record. This failure to maintain a record of closely related data constitutes a violation (390/81-09-05).
- f. Quality Control Procedure (QCP) 2.18, Inspection of Mechanical Doors, Hatches and Manways, has been identified as having inadequate acceptance criteria and is currently under revision. Inspection has not yet been done using QCP 2.18. Until the licensee insures that adequate acceptance criteria is received and implemented into procedure QCP 2.18 this item is open (390/81-09-06).
- g. QCI 1.10, Section 5.1, assigns ACE-QA responsibility for identifying the need for QCI's/QCP's/QCT's. No definitive policy is established to prescribe the nature of activities which are to be governed by the QC series. Until the licensee reviews this and revises or issues guidance as appropriate this item is open (390/81-09-07).
- h. Quality Control Instruction, QCI-1.10, Preparation and Control of Watts Bar Nuclear Plant Quality Control Instructions, Procedures and Tests, requires that addenda be utilized to effect quick and/or small changes to quality procedures. However, criteria defining addenda content and required training on added or deleted addenda is not addressed. Until the licensee defines the responsibilities for defining addenda criteria and required training this item is open (390/81-09-08).
- i. A three day time requirement in QCI 1.2, Attachment D, ensures prompt identification of a suspected nonconforming condition to intermediate levels of management by initiation of an NCR. Another three day time requirement is to ensure prompt determination of significance. Recognition is made that the need for further investigation may be

required outside these time constraints for identification and determination of significance for reporting. However, current policies and vague procedural requirements have led to efforts to complete investigations of NCR's within the time frame for prompt identification. This thwarts efforts to provide a good quality investigative effort to support the determination of appropriate corrective action, especially when generic implications exist. The process appears further confused by the management practice of requiring engineers to rework and resubmit proposed corrective action, rather than provide an adequate area on the NCR form for the final management position or NCR cause and NCR corrective actions. Until the licensee reviews and revises appropriate NCR procedures, this item is open (390/81-09-09).

#### 6. Comparison of As-Built Plant to FSAR Description

The inspector continued to check the results of plant tours and drawing reviews against specific FSAR commitments as well as general code commitment in the FSAR. Findings were acceptable except as follows:

- a. Two previous NRC unresolved items (390/81-01-01 and 390/81-01-02) identified that measures had apparently not been established to assure that FSAR design basis commitments were translated into design specifications. Examples identified for investigation included: lack of a blowout wall in the diesel generator building for mitigating the consequences of a rupture of the carbon dioxide fire suppression units; and the manner of installation of the pressurizer relief valves, which differed from the FSAR description. A TVA information request, dated March 4, 1981, provided at NRC request, stated that the analysis of the diesel generator building showed that no structural damage would occur due to pressure differential, if the carbon dioxide suppression were to rupture. This information request also stated that the FSAR-documentation of an analysis justifying the design change could not be located. Apparently no measures were originally established to insure that all FSAR design bases were translated into design specifications. This failure to establish appropriate design control measures constitutes a violation (390/81-09-10).

The licensee has completed corrective steps for the cited diesel generator building example and described the appropriate evaluation in a TVA letter from L. M. Mills to James P. O'Reilly of NRC, dated March 4, 1981 (A27 810304 028). Also, appropriate corrective steps to avoid further violations have been initiated in the form of an investigation to determine the existence, extent, and significance of similar examples. This investigation is described in Section II.4 of TVA letter from L. M. Mills to James P. O'Reilly of NRC, dated April 3, 1981 (A27 810403 037). Therefore, in response to this item, the licensee need only address the following: admission or denial of the alleged violation, reason for the violation if admitted, and the date of full compliance.

- b. Fifteen examples were found where check valves had been installed vertically in safety-related systems. The Westinghouse and Kerotest Technical Manuals and drawings for these valves specifically state that these valves shall be installed horizontally. Nine other examples of vertically mounted check valves were found, but technical manuals were unavailable for reference. Manufacturers included Atwood-Morrell and Walworth. Until the licensee provides an evaluation of the adequacy of installation for these valves that includes valve operability and the effects on system operation this item is unresolved (390/81-09-12).
- c. ASME and B31.1 codes require that tanks, pumps and piping downstream of reducer valves be afforded adequate overpressure protection. These codes also require that piping downstream of one or more relief valves be sized to accommodate adequate flow to prevent excessive relief valve backpressure. Several locations in the Waste Disposal System piping appear to have inadequate design to meet these referenced codes. Until the licensee reviews the code requirements and investigates the adequacy of design for the Waste Disposal System this item is unresolved (390/81-09-13).

#### 7. Licensee Event Followup

On February 18, 1981 a small electrical fire occurred in Electrical panel 1-DPL-82-A-A. The results of the licensee investigation were reported March 2, 1981, by the Acting Plant Superintendent (L54 810302 819). The investigation did not determine the following: whether protection breaker #3 performed satisfactorily; whether responsibility was properly established for conducting adequate post maintenance checks prior to panel energization; and whether adequate instructions for labeling lifted leads were provided. Until the licensee further reviews the implications of the control panel fire this item is unresolved (390/81-01-14).

#### 8. Previous Inspection Findings

- a. (Closed) Open Item (390/80-21-11): Licensee evaluation of the need for ST&C Unit to receive copies of NCR's and FCN's. The newly implemented work package program provides the necessary controls over on-going work.
- b. (Closed) Open Item (390/80-21-14): Preoperational Test W-7.3 did not address auto switchover from injection to recirculation. This logic is now tested in the approved preoperational test procedure.
- c. (Closed) Open Item (390/80-23-08): Tentative transfer and work plan procedures not coordinated. Revisions to NUC PR procedures AI-8B and CONST procedures QCI 1.30 and 1.22 have resolved the inconsistent guidance in these interfacing procedures.
- d. (Closed) Open Item (390/80-23-09, 391/80-17-06): Procedure revision to ensure instrumentation wiring prior to tentative transfer. Instrument loop testing per QCP 3.6 is prerequisite to transfer and

wiring is prerequisite to this calibration, therefore this problem has been corrected.

- e. (Closed) Open Item (390/80-23-11, 391/80-17-08): Licensee requirement to revise control over spool pieces. This concern was adequately corrected in conjunction with the infraction discussed in paragraph 3.c.
- f. (Closed) Open Item (390/80-23-14, 391/80-17-10): Licensee requirement to revise procedures to prevent inadvertent lifting of RFV-74-505. Revisions to COI, No. 1, do not allow operations at a pressure within the setpoint tolerance of this relief valve.
- g. (Closed) Open Item (390/80-30-07, 391/80-23-06): Licensee revision to procurement practices associated with byproduct nuclear material. These revisions appear to provide the positive controls to prevent procurement of isotopic material of activity greater than authorized by the Byproduct Material License.
- h. (Closed) Open Item (390/80-35-06, 391/80-22-05): Licensee implementation to Construction Specification N3E-885 for protection of instrumentation. QCP 3.13 has been issued and routine implementation initiated to resolve this licensee identified concern.
- i. (Closed) Open Item (390/80-35-11, 391/80-22-07): This item was similar to that discussed in paragraph 8.h and the implementing procedure resolves both concerns.
- j. (Closed) Open Item (390/81-01-04): Licensee upgrading of security access list controls for new fuel handling. Upgraded controls to assure a more current listing and the immediate removal of personnel subject to certain personnel actions have been implemented.
- k. (Closed) Open Item (390/81-03-05): Licensee prescribing guidance for the detection of dropped control rodlets. Revision of TI-33 now provides complete vendor guidance on flux map evaluation to detect dropped rodlets.
- l. (Closed) Inspector Followup Item (390/79-03-03): Diesel generator test did not satisfy FSAR and Regulatory Guide 1.108 requirements. The revised and implemented test, TVA-14E, contains preheat system testing and provisions for a heat run of at least 22 hours at continuous rated load followed by two hours at the two hour load rating.