



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

Report Nos. 50-390/82-10, 50-391/82-08

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

Facility Name: Watts Bar

Docket Nos. 50-390, 50-391

License Nos. CPPR-91, CPPR-92

Inspection at TVA ENDES in Knoxville, Tennessee and at Watts Bar near Spring City, Tennessee

Inspector: A. R. Herdt 4/8/82  
for J. W. York Date Signed

Approved by: A. R. Herdt 4/8/82  
A. R. Herdt, Section Chief Date Signed  
Engineering Inspection Branch  
Division of Engineering and Technical Programs

SUMMARY

Inspection on March 8-9, 1982 (TVA ENDES); March 10-12, 1982 (Watts Bar Plant)

Areas Inspected

This routine, unannounced inspection involved 31 inspector-hours on site and at ENDES in Knoxville, Tennessee in the areas of nonconformance reports (NCR); follow-up on regional request; licensee identified items and previous inspection findings.

Results

Of the four areas inspected, no violations or deviations were identified.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. E. Wilkins, Project Manager
- \*J. J. Fischer, Assistant Construction Engineer
- \*S. T. Boney, Supervisor Welding Engineering Unit
- \*A. W. Rogers, QA Supervisor
- \*K. Jones, Nuc. Pr. Preoperations Section Manager
- \*W. Bird, Nuc Pr. Compliance
- \*R. C. Miles, OEDC, WBNP Staff
- \*T. Hayes, Supervisor NLU Const.
- \*T. Trail, NLU Const.
- J. Adair, Civil Engr., Civil Engineering 1, ENDES
- F. Levandowski, Section Supervisor, Civil Engineering 2, ENDES
- L. Katcham, Section Supervisor, Civil Engineering 1, ENDES
- J. Purkey, Section Supervisor, Mechanical Engineering 2, ENDES
- L. Chacon, Civil Engineer, Mechanical Engineering 2, ENDES
- A. Johnson, Civil Project Engineer, ENDES
- R. Rowe, Licensing, ENDES

#### NRC Resident Inspectors

- J. McDonald
- T. Heatherly

\*Attended exit interview on March 12, 1982

### 2. Exit Interview

The inspection scope and findings were summarized on March 12, 1982, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee.

### 3. Licensee Action on Previous Inspection Findings

- (a) (Closed) Violation - 390, 391/81-16-01, Inadequate Measures To Control Welding. TVA letter of response dated September 29, 1981 has been reviewed and determined to be acceptable by Region II. The inspector examined the repairs made on welds FW-09 of IC-6 and FW-08 of IC-8. An examination of twenty locked welding deposit bins was made. The welding bins were located in the following four areas: Auxiliary Building, Turbine Building, Additional Equipment Room and Post Accident Room. The inspector concluded that TVA had developed the necessary corrective actions and that these actions have been implemented.
- (b) (Closed) Violation - 390, 391/81-06-01, Failure to Follow Procedure, Weld Points Missed (delta ferrite not recorded). TVA letter of

response dated October 8, 1981 has been reviewed and determined to be acceptable by Region II. The inspector reviewed the survey and corrective actions taken for stainless steel welds whose material thickness was 1/4" through 1" and welds whose material thickness was greater than 1". The inspector also reviewed revision 1 of Addendum 2 of WBN QCI 1.8 which provides for the development of a document review check list by which all future and past submissions to the Quality Control and Records Unit will be given a detailed screening for accuracy and completeness. The inspector concluded that TVA had developed the necessary corrective actions and that these actions have been implemented.

- (c) (Closed) Violation - 390/81-10-02, Failure to Follow Procedure on Hanger Inspection (loose jam nut). TVA letter of response dated January 25, 1982 has been reviewed and determined to be acceptable by Region II. The inspector held discussions with responsible licensee personnel and examined corrective actions as stated in the letter of response. The inspector concluded that TVA had determined the full extent of the subject violation, performed the necessary follow-up actions to correct the present conditions and developed the necessary corrective actions to preclude recurrence of similar circumstances. The corrective actions identified in the letter of response have been implemented.
- (d) (Closed) Unresolved Item - 390, 391/81-15-07, Detailed Welding Procedure Specifications Revision Inconsistency. During an NRC inspection into welding activities involving Detailed Welding Procedures Specification SMU-1, it was found that some of the welders had Weld Material Requisitions (WMR) indicating the welding procedure as revision 2 and some of the welders had WMR's that indicated revision 4 for the same welding procedure. The licensee's program allows revision changes to welding procedures to reflect changes only in nonessential variables, therefore the characteristics of the weld metal deposit were unaffected. To assure that the welder uses the latest revision of the Detailed Welding Procedure Specification (DWPS), the area that issues the welding material has a copy of the latest revision numbers for the DWPS's and will issue the welding material to the welder only if the weld material requisition form has the latest revision number. This item is considered resolved.

#### 4. Unresolved Items

Unresolved items were not identified during this inspection.

#### 5. Licensee Identified Item

- a. (Closed) Licensee Identified item 390/78-35-01 and 391/78-27-01, Deficient Installation of Seismic Pipe Hanger Anchors. This item involved, in several different cases, the failure to properly install anchor bolts which attach seismic pipe hanger base plates to concrete walls. Six instances of improper anchor bolt installation were found.

In a letter dated May 15, 1979 the licensee stated that hangers installed by the craftsman responsible for the improper installations were 100 percent inspected and the deficient anchor bolts were replaced. Also the inspection of anchor bolts was increased from one anchor per hanger to one anchor per plate. In addition, to prevent reoccurrence, additional instructions were provided for craftsmen installing pipe hanger anchor bolts in concrete.

This item is considered closed.

#### 6. Worker's Concerns

The inspector looked into the following worker's concerns:

- (a) Seismic analysis of all piping systems does not specifically address axial thrust as could be caused by water hammer. Forces in other plants are supposed to be calibrated conservatively enough to cover any axial thrust expected. The start up of the Spent Fuel Pool cooling pumps caused such great vibrations in late 1979 that observers thought the pipe would damage or destroy the supports.

A telephone conversation was held on March 11, 1982 with the licensee's design group (EN DES). The design group stated that the design of all piping systems does consider axial thrusts that could be caused by water and steam hammer upset or faulted conditions. In particular the Main Steam Line System is designed for steam hammer, and the Feedwater and the Pressurizer Safety Relief Systems are designed for water hammer.

The licensee stated that the startup vibration of the Spent Fuel Pool piping was caused by cavitation and not by water hammer. A similar problem occurred at Sequoyah when a butterfly valve was used in a throttling mode. However a modification similar to the one used at Sequoyah has been performed at Watts Bar. This modification consisted of placing an orifice in the two piping lines. The orifices did not eliminate the cavitation but placed it at a more design acceptable area. The vibration of the piping was within the design criteria of WB-DC-40-31.6, "Displacement Criteria for Vibration Qualification of Piping." The inspector examined a calculation for data point designated as point number 1 (data point in the area of flow restriction orifice). The vibrational amplitude along the "Z" axis was 40 thousands of an inch. The vibrational amplitude, according to calculations, could have been as much as 135 thousands of an inch.

The pipe supports in this system are being reinspected as part of the IE bulletin 79-14 program and the results of these reinspections will be reviewed. This item will be Inspector Followup Item 390/82-10-01, Reinspection of hangers in Spent Fuel Pool System.

In conclusion the worker's concern could not be substantiated.

- (b) The railroad hatch covers near the new fuel pit have been partially dropped due to system misalignments and this has deformed the hoist mounting brackets which are believed to have been underdesigned. The current resolution of adding more bolts to anchor the hoist brackets is questionable.

There are six railroad hatch covers at Watts Bar. These covers are pinned on one side and when a cover is in the raised condition, it has been rotated to a position five degrees past top dead center, resting against a stop support. When each individual cover is lowered the following takes place:

- (1) a pneumatic cylinder applies a force that pushes the cover past top dead center and then loses contact with the door,
- (2) then the hoist motor, by way of cables attached to the hinged cover controls the rate of descent.

During the lowering of one of these covers, the operator first stated the hoist motor with the result that the cover did not move but the cable began to come off the drum. After running of a certain amount of cable, the operator noted that the cover was not moving. The operator then actuated the pneumatic cylinder which pushed the hatch cover past top dead center and the hinged cover began to free fall until it reached the end of the extended cable. This occurred approximately three to four feet above the fully down position. The cover was not damaged by the fall. However, a check of the supports holding the hoist motor showed some bending and distortion. An inspection of the frames supporting the other hoist motors also revealed some distortion due to normal operation. The licensee's design group (EN DES) redesigned the hoist motor supports by increasing the thickness of the steel frame from 1/2 to 3/4 inch, adding two gussets per frame side for stiffening and adding two additional 1 1/4 inch diameter bolts to each frame side. The licensee changed the control system so that hoist controls will not operate until the pneumatic cylinder is activated. This change in controls will prevent the uncontrolled dropping of the covers. The new hoist motor supports were put on all six of the cover systems and no more bending or distortion has occurred.

In conclusion the worker's concern could not be substantiated.

7. TVA Engineering Design Meeting (March 8-9, 1982)

Prior to the inspection at Watts Bar, a meeting was held with TVA Engineering Design in Knoxville, Tennessee with those EN DES personnel indicated in Section 1. The purpose of the trip was to discuss with the design and project personnel certain nonconformance reports (NCR) as they related to Watts Bar and other TVA nuclear plants.

(a) Watts Bar NCR 3659 Rev. 1 (CDR 81-99)

The licensee's description of this deficiency is as follows:

Several notes in general notes drawing series 47A050 and 47A058 permit Construction to make attachments or alterations to building and miscellaneous steel, cable tray supports, and baseplates for supports of all types. These notes specify loading criteria that must be complied with. The loading criteria did not clearly define the consideration of cumulative loads for construction application; and it was also misinterpreted by Construction.

The inspector reviewed the general notes that were being deleted from the above drawing series. A field survey or review has been initiated by EN DES of attachments to cable tray supports, building steel, and miscellaneous steel. The licensee presented an example of the ongoing survey and resultant calculations that were being performed at Watts Bar on platform number 905 shown in drawing no. 48N905. The licensee stated that the Sequoyah Plant had an EN DES group on site during construction (Watts Bar did not) and therefore this deficiency did not occur. The inspector reviewed the calculations that had been performed for the attachments to this same platform (platform number 905) at the Sequoyah site. These calculations were performed in 1977.

(b) Watts Bar NCR 3842R (CDR 82-014)

The deficiency involves the failure to promptly update WBNP-QCP-1.14, Production Lot Acceptance Test of Expansion Type Anchors, to conform to the requirements of Revision 6 to General Construction Specification G-32, Bolt Anchors Set in Hardened Concrete. Revision 6 to G-32 was effective February, 1981 but this revision was not implemented at Watts Bar until February, 1982. The licensee stated that G-32 was revised to enhance the concrete expansion anchor program and not because of any safety concern. If the revision had been made because of a safety concern, an NCR would have been written for Sequoyah and also evaluated for other TVA plants.

The subject NCR (3842R) has eight items listed and only one of the items could be related to both Watts Bar and Sequoyah. This is item no. 7 of the NCR and is stated as follows:

Table 353 of G-32 provides allowable spacing between anchors and embedded plates. Section 353 of G-32 in turn allows reduced spacing between anchors and embedded plates, provided no attachments are made to the embedded plate within 16 inches of the anchor. Control procedures and documentation for control of future attachments to embedded plates, as required by G-32 have not been implemented.

This licensee is conducting a sampling program at Watts Bar in order to evaluate this deficiency. A total of sixty sketches (samples) will be

made of areas in safety-related systems where this distance from an anchor to a support attached to an embedment is less than 18 inches. Design calculations and evaluations will then be performed based upon these as-built sketches. The licensee's time table for the sampling and evaluation of this item is as follows:

- (1) Completion of sampling and sketches by 3/27/82.
- (2) Analysis completed and sent to Civil Engineering Branch ENDES for evaluation 5/10/82.
- (3) Report on evaluation to Region II NRC by 6/15/82.

The licensee stated that the results of the evaluation of item no. 7 in NCR 3842R at Watts Bar should be the same for Sequoyah since the two plans are similar in design. Should the deficiency prove to be valid for Watts Bar then the licensee has committed to immediately issue an NCR for Sequoyah.