UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N. W. SUITE 818
ATLANTA, GEORGIA 30303

AUG 12 1976

In Reply Refer To:
IE:II:VLB
50-390/76-7
50-391/76-7

Tennessee Valley Authority
ATTN: Mr. Godwin Williams, Jr.
830 Power Building
Chattanooga, Tennessee 37401

Gentlemen:

This refers to the inspection conducted by Mr. V. L. Brownlee of this office on July 7-9, 1976, of activities authorized by NRC Construction Permit Nos. CPPR-91 and CPPR-92 for the Watts Bar Nuclear Plant, Units 1 and 2 facilities, and to the discussion of our findings held with Mr. J. C. Killian at the conclusion of the inspection.

Areas examined during the inspection and our findings are discussed in the enclosed inspection report. Within these areas, the inspection consisted of selective examination of procedures and representative records, interviews with personnel, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were disclosed.

We have also examined actions you have taken with regard to previously identified enforcement matters and unresolved items. The status of these items is identified in Sections II and IV of the summary of the enclosed report.

Two new unresolved items resulted from this inspection and are identified in Section III of the summary of the enclosed report. These items will be examined during subsequent inspections.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you believe to be proprietary, it is necessary that you submit a written application to this office requesting that such information be withheld from public disclosure. If no proprietary information is identified, a written statement to that effect should be submitted. If an application is

submitted, it must fully identify the bases for which information is claimed to be proprietary. The application should be prepared so that information sought to be withheld is incorporated in a separate paper and referenced in the application since the application will be placed in the Public Document Room. Your application, or written statement, should be submitted to us within 20 days. If we are not contacted as specified, the enclosed report and this letter may then be placed in the Public Document Room.

Should you have any questions concerning this letter, we will be glad to discuss them with you.

Very truly yours,

for: C. E. Murphy, Chief
Reactor Construction and Engineering
Support Branch

Enclosure:
IE Inspection Report Nos.
50-390/76-7 and 50-391/76-7

cc w/encl: Mr. J. E. Gilleland
Assistant Manager
of Power

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N. W. SUITE 818
ATLANTA, GEORGIA 30303

IE Inspection Report Nos. 50-390/76-7 and 50-391/76-7

Licensee: Tennessee Valley Authority
830 Power Building
Chattanooga, Tennessee 37401

Facilty Name: Watts Bar Nuclear Plant, Units 1 and 2
Docket Nos.: 50-390 and 50-391
License Nos.: CPPR-91 and CPPR-92
Category: A2/A2

Location: Spring City, Tennessee

Type of License: W PWR, 1160 Mwe

Type of Inspection: Routine, Unannounced, Construction

Dates of Inspection: July 7-9, 1976

Dates of Previous Inspection: May 25-28, 1976

Principal Inspector: V. L. Brownlee, Reactor Inspector
Projects Section
Reactor Construction and Engineering
Support Branch

Accompanying Inspector: E. J. Vallish, Reactor Inspector
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

J. J. Blake, Metallurgical Engineer
Engineering Support Section No. 2
Reactor Construction and Engineering
Support Branch

Other Accompanying Personnel: None

Principal Inspector: C.R.M. Farland for 8/12/76
V. L. Brownlee, Reactor Inspector Date
Projects Section
Reactor Construction and Engineering
Support Branch

Reviewed by: J. C. Bryant 5/12/76

J. C. Bryant, Chief
Projects Section
Reactor Construction and Engineering
Support Branch

Date

SUMMARY OF FINDINGS

I. Enforcement Items

None

II. Licensee Action on Previously Identified Enforcement Matters

76-4-A1(II) QA Program Breakdown - Documentation of Radiographs and Weld History (Units 1 and 2)

CB&I failed to implement established procedures and TVA's program procedure for field surveillance failed to identify CB&I's nonconformance to established procedures. This item remains open.

76-5-A1(II) Lack of Procedures Implementation (Units 1 and 2)

TVA's corrective actions and plans were found to be acceptable. Examination of site activities verified execution of the identification, corrective actions and plans. This item is closed. (Details I, paragraph 4.a)

III. New Unresolved Items

76-7/1 Separation of Containment Bottom Liner Plate Fill Slab from the Containment Base Slab (Unit 1)

This matter will be examined during subsequent inspections regarding reportability, corrective actions and repair. (Details I, paragraph 7)

76-7/2 Status of CB&I Welding Supervisor Qualifications (Units 1 and 2)

The training and qualification requirements and certifications for CB&I welding supervisors who conduct quality related inspections are maintained in the CB&I home office and have not been forwarded to the site. The question as to what are the training and qualification requirements and what is the qualification status of welding supervisors working at the site is considered to be an unresolved item. (Details II, paragraph 2)

IV. Status of Previously Reported Unresolved Items

74-5/1 Valve Wall Thickness Verification Program (Units 1 and 2)

TVA informed IE:II personnel of preliminary plans relative to the valve wall thickness program. TVA will submit a formal valve wall thickness verification program that meets Region II letters of June 30, 1972 and February 16, 1973. This items remains open.

76-2/1 Instrumentation Procedures (Units 1 and 2)

The Instrumentation Engineering Unit is being manned and instrumentation procedure requirements are being generated for incorporation into QC procedures. This item remains open. (Details I, paragraph 5)

76-4/1 QA Program Breakdown - Documentation of Radiographs and Weld History Records (10 CFR 50.55(e)) (Units 1 and 2)

TVA informed Region II of the QA program breakdown problem and reported it as a 50.55(e) item. Site investigative work is complete. Final report effort continues. This item remains open.

76-5/1 IE Bulletins and Licensee Responses

c. IE Bulletin No. 76-05 - Relay Failure. This item is not applicable to Watts Bar 1 and 2. This item is closed. (Details I, paragraph 5.b)

76-5/2 Documentation of Fabrication For Structural Steel Reactor Coolant System Supports (10 CFR 50.55(e))

TVA's final report was submitted on June 30, 1976. No hardware has been shipped from vendor's shop. This item remains open.

76-6/1 GE HFA Relays - Cracked Coil Spools (10 CFR 50.55(e)) (Units 1 and 2)

TVA informed IE:II that several relay coil spools have been found to be cracked and broken. TVA has identified this item to be reportable (10 CFR 50.55(e)). This item remains open.

V. Design Changes

None

VI. Unusual Occurrences

None

VII. Other Significant Findings

None

VIII. Management Interview

The exit interview was held on July 9, 1976, with Mr. J. C. Killian, Project Manager, members of his staff, and QA representatives of DED, DEC, OEDC. They were apprised of the findings of this inspection as noted in this report.

DETAILS I

Prepared by: C. R. McFarland Jr 8/10/76
V. L. Brownlee, Reactor Inspector Date
Projects Section
Reactor Construction and Engineering
Support Branch

Dates of Inspection: July 7-9, 1976

Reviewed by: J. C. Bryant 8/10/76
J. C. Bryant, Chief Date
Projects Section
Reactor Construction and Engineering
Support Branch

All information in Details I applies equally to Units 1 and 2 except where identified with a specific reactor.

1. Individuals Contacted

a. Tennessee Valley Authority (TVA)

J. C. Killian - Project Manager
T. B. Northern, Jr. - Construction Engineer
A. W. Rogers - Supervisor, QA Unit
J. H. Purdue - Electrical Engineering Unit Supervisor
T. W. Hayes - Instrumentation Engineering Unit Supervisor
H. S. Sheppard - Civil Engineering Unit Supervisor
R. L. Heatherly - QC and Records Unit Supervisor
F. Hawkins - Materials Engineer
L. Robinson - Warehouse Services
J. S. Colley - QA Engineer, DED
L. C. Northard - Welding Engineering Unit Supervisor
S. Johnson - Principal Mechanical Engineer
A. C. Richardson - Assistant Construction Engineer

2. Project Status

TVA has submitted a request for extension of Construction Permits: Unit 1 from August 1976 to June 1979; Unit 2 from May 1977 to March 1980.

The ASME site survey for demonstration of ASME capability was performed on June 29-30, 1976. The preliminary indications are that the survey was successful and the survey team recommendation will be favorable.

3. Organizational Changes - Site

a. Welding Engineering Unit (WEU)

Welding and NDE activities have been separated from the Mechanical Engineering Unit. L. C. Northard, previous Supervisor of the Site QA Unit, is the new Unit Supervisor. The previous Welding/NDE Supervisor has been promoted to Assistant Mechanical Engineering Unit Supervisor.

b. Site QA Unit (QAU)

A. W. Rogers replaces Northard as the QAU Supervisor. Rogers has previously worked in the Watts Bar QA Unit, but has been assigned to the Browns Ferry facility for the past year.

c. Instrumentation Engineering Unit (IEU)

T. W. Hayes has been promoted from the Electrical Engineering Unit to the position of Supervisor IEU. The IEU presently has eleven personnel assigned. Additional personnel are programmed to be added as the need arises.

4. Previously Identified Enforcement Matters

a. Lack of Procedures Implementation (Units 1 and 2) (75-5-A1(II))

TVA's letter of response dated June 10, 1976, was received, evaluated and found to be acceptable by IE:II.

Discussions with site personnel and review of the checklist, daily work plan, and logs confirm that the corrective actions identified in the letter of response are being executed.

IE:II has no further questions regarding this matter.

5. Action on Previously Reported Unresolved Items

a. Instrumentation Procedures - (Units 1 and 2) (76-2/1)

The Instrumentation Engineering Unit Supervisor position has been filled (see paragraph 3.c above). The Unit Supervisor is in the process of incorporating instrument procedure requirements into the electrical and instrumentation procedures for

handling, storage, installation, standard tests, inspections and documentation. Additionally, the Instrumentation Engineering Unit is being manned and personnel trained to certify the inspectors to the applicable procedures.

b. IE Bulletins and Licensee Responses

IE Bulletin No. 76-05 - Relay Failure (Units 1 and 2) (76-5/1.c)

TVA submitted the letter of response on June 7, 1976. No relays of the type and style described in the bulletin are being utilized in safety-related circuits. IE:II has no further questions regarding this matter.

6. Document Control - Drawings

WBNP-QCP-1.1 RO, "Print Room Procedure," specifies the methods to be used for the control, issue, and distribution of drawings.

Discussions with site QA and QC and records personnel, a selective examination of drawing transmittals, ledger cards and stick files verified that drawings were being received, logged and distributed in accordance with the control procedure. Physical checks of the civil, mechanical and electrical engieering unit stick files and selected examination of craft files in the field verified that drawings of the latest revision were being utilized.

The inspector reviewed previous QA Unit audit report findings relative to control of drawings. Control of drawings appears to be quite acceptable. No noncompliances were identified.

7. Separation of Containment Bottom Liner Plate Fill Slab from the Containment Base Slab - Unit 1

Several separations have been identified in the peripheral area where the containment cylinder transition section (knuckle section) and bottom liner plate join. The fill slab is approximately six inches thick and contains the "T" bar embedded grid for attaching the bottom liner plate. The separations extend approximately seventy per cent of the circumference of the fill slab. The separations measure from one quarter inch to three quarter inch and have depths that range to forty inches. TVA has documented this matter and Design is evaluating the problem. The matter is being reviewed relative to reportability (10 CFR 50.55(e)). Subsequent to the inspection, TVA informed the inspector that Design had determined that the adverse to quality condition was not of a significant nature. TVA has determined that the matter is not reportable in accordance with 10 CFR 50.55(e). This matter will be examined during subsequent inspection relative to reportability (10 CFR 50.55(e)) and the adequacy of corrective actions and repair.

DETAILS II

Prepared by: J. J. Blake 9/9/76
J. J. Blake, Metallurgical Engineer Date
Engineering Support Section No. 2
Reactor Construction and Engineering Support Branch

Dates of Inspection: July 7-9, 1976

Reviewed by: A. R. Herdt 8/9/76
A. R. Herdt, Chief Date
Engineering Support Section No. 2
Reactor Construction and Engineering Support Branch

All information in these Details applies equally to Watts Bar Units 1 and 2 except where information is identified with a specific reactor.

1. Persons Contacted

a. Tennessee Valley Authority (TVA)

J. C. Killian - Project Manager
T. B. Northern, Jr. - Construction Engineer
L. C. Northard - Welding & NDE Unit Supervisor
B. L. Majors - Construction Engineering Associate, Welding
A. W. Rogers - Supervisor, DEC Site QA Unit

b. Contractor Organization
Chicago Bridge and Iron (CB&I)

C. L. Spears - Project Welding and QA Supervisor
C. Rowe - QA Engineer

2. Containment Welding

At the time of this inspection the fabrication of the steel containment had progressed to the point where the second course had been set in place with the majority of the vertical seams welded and the welding of the horizontal girth between the first and second course started.

An inspection was made of the following welds:

Vertical Seam 2K	Welding in progress
Vertical Seams 2D & 2E	Welding was essentially complete and the seams were being prepared for radiographic examination

Vertical Seam 3J	Root weld complete in the second course
Vertical Seam 3H	Root weld in process using CB&I wide GAP welding procedure

(NOTE: Weld Seams 3J and 3H are a part of the installation of penetration subassembly No. 48-A and these seams project into the third course.)

Girth Weld 1-2, 270^{o}-0^{o}	Fit-up established ready for root welding
Girth Weld 1-2, 180^{o}-270^{o}	Root welding in progress.

The inspector observed the work in progress and inspected fit-ups, weld appearance, and controls being exercised by CB&I to the requirements of CB&I QA Manual, Division 4.0. requirements.

After inspecting the work in progress, the inspector reviewed the documentation of the work that had been completed, and the qualifications of the welders, inspectors, and NDE personnel involved with the work.

During this review the inspector noted that the training records for CB&I welding supervisors who are charged with the responsibility for verifying weld fit-ups and inspection of in process welding had not been forwarded to the site. Review of the CB&I QA Manual, Division 4.0, Paragraph 1.5, "Training and Indoctrination" shows that training and indoctrination of personnel performing activities affecting quality shall be governed by Appendix 0 to the QA manual which is entitled "Training, Indoctrination and Qualification Program (TIP-1)." This appendix is identified as an internal CB&I procedure which is not furnished with the manual at the site.

The inspector informed CB&I and the licensee that without the training program and the training records, the status of the qualification of the welding supervisors would be considered as an unresolved item.

There were no items of noncompliance in this area of inspection.

3. NSSS Piping Components

An inspection was made of the licensee's receipt inspection and storage of NSSS piping components. This inspection included a review of applicable QC procedures, inspection of the storage conditions, and review of receipt inspection and material certification documentation.

The procedures reviewed were as follows:

WBNP-QCP 4.5 Rev. 3 dated 5/28/76 - "Handling, Storage, and Maintenance of Permanent Mechnical Equipment"

WBNP-QCP 1.6 Rev 2 dated 3/26/76 - "Receipt, Inspection, Storage, Withdrawal, and Transfer of Permanent Material"

The NSSS piping components which have been received to date are in storage in the controlled outside storage area at the site. The inspector noted that the components were all capped and supported by adequate dunnage to preclude contact with the ground which is consistent with the requirements of the QC procedures.

Review of the receipt inspection and certification documentation included the site receiving reports which included inspections for shipping damage, traceability to material certifications and assignment of storage conditions. The inspector also reviewed the NPP-1 Code Data Reports for the material which had been prepared by Southwest Fabricating and Welding Company. The documentation reviewed was for all items received to date which included eight hot leg, eight cold leg and four surge line piping assemblies.

There were no items of noncompliance in this area of inspection.

DETAILS III

Prepared by: T E Conlon for 8-5-76
E. J. Vallish, Reactor Inspector Date
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

Dates of Inspection: July 7-9, 1976

Reviewed by T E Conlon 8-5-76
T. E. Conlon, Chief Date
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

1. Persons Contacted

a. Tennessee Valley Authority (TVA)

R. L. Heatherly - Supervisor, QC & Records Unit
J. D. Shanlever - Mechanical Engineer
C. A. Curtis - Civil Engineer
J. A. Nicholls - Civil Engineer
L. D. Bates - Mechanical Engineer

b. Contractor Organizations

(1) Chicago Bridge and Iron Company (CB&I)

G. Rowe - Quality Assurance Engineer

(2) Westinghouse Electric Company (W)

L. Sorg - Welding Engineer

2. Containment Steel Structure - Review of QA Implementing Procedures - Unit 1

The QA Manual and PSAR were reviewed and found to contain appropriate and adequate procedures to assure that inspection (QC) and work performance will be controlled and performed in conformance with applicable codes and standards. Inspection procedures are required which direct receiving inspection to verify that these structural components are in conformance with the purchase requirements, are clean and properly protected or packaged and that reports of the receiving inspection are documented. These inspection procedures are also required to cover material identification and segregation, and the use of storage and issue records.

3. Containment Steel Structures - Observation of Work - Unit 1

Review was made of TVA construction drawing Series 48N (401, 403, 404, 405 and 406). Visual inspection of the partially completed work concerning the containment steel structure anchor details, envelope plates and some penetrations indicated that installation or erection was in conformance with the approved design drawings. The drawing details of each welded joined has the required NDE specified.

CB&I's Specification SHP-72-4333/34-4B titled, "Field Handling and Storage Class MC Nuclear Material Components and Parts" was reviewed. This document specified receipt inspection and storage of containment plates and traceability to the heat numbers of the material.

4. Containment Steel Structures - Review of Quality Records - Unit I

A quantity of CB&I documents titled, "Material Heat Number Sheets" and "Shop Release for Shipment Check Lists" were reviewed. These were certifications of material tests and vendor manufacturing and inspection. Also on file were the TVA Inspection and Testing Branch (I&T) shop releases which were in accordance with TVA WBNP QCP-4.6 titled, "Surveillance of Field Erection of Containment Vessels and Contractor's Quality Assurance Programs". Also reviewed were the field files containing Attachment A of WBNP QCP-4.6 titled, "Weekly Surveillance Report - Containment Vessel Erection". This file indicates a weekly surveillance inspection covering materials, nonconformance reports, packing of materials, segregation of materials, calibration of tools, drawing and procedure control, alignment and tolerances, welding and post weld heat treating, visual inspection of welds, NDE cleaning and testing, documentation checks, checks of CB&I forms and weldor certifications.

Containment structure erection is being performed by CB&I in accordance with the CB&I QA Manual, Section III, Division 4 titled, "Construction;" with material receiving and storage controlled by Section 4 of the QA Manual titled, "Material Control".

5. Containment Steel Supports - Review of QA Implementing Procedures - Polar Crane Anchors - Unit 1

Review of the licensee's PSAR Appendix A2 indicates that QC inspections are required to verify that structural steel components are in conformance with purchase specifications, and that cleanliness and packaging be inspected during receipt and appropriate reports made.

6. Containment Steel Supports - Observation of Work and Record Review Polar Crane Anchors - Unit 1

The polar crane track anchors were installed as indicated on drawing 48 N 913-9 R6 titled, "Miscellaneous Steel - Crane Wall Embedded Parts."

The crane anchors were received from Inland Ryerson and TVA Form 209, "Receiving Report", Number WBNP-76-6896 was documentented. TVA form "QC Checklist and shipping Release No. 16 (Final)" certifies procurement document compliance for material certification, welding, personnel qualification, NDE, NDE personnel qualification, cleanliness, dimensions and visual inspection by the I&T Branch. Inland Ryerson also performed a final shipping inspection. Records indicate the material as A-36 from heat number T84108 W 92753.

Signoff for proper installation was signified on form "Concrete Pour Card" for pour numbers RB1 - C17 a and b, RB1 - C17 c and d, elevation 819.63. QC verified the quality requirements as indicated on those pour cards. The QC personnel were trained in accordance with WBNP-QCP 2.4. Interviews with the applicable QC personnel indicated they were trained and knowledgeable of the requirements of QA/QC.

7. Control Rod Drive Mechanism - Observation of Work - Unit 1 and 2

The control rod drive mechanisms for both units are being assembled on the reactor vessel cover in a specially constructed high-bay building located away from the main stream of construction activity. The building is maintained under negative pressure with the inlet air filtered. Electric heating is provided. Practically continuous monitoring of the assembly is carried on by the TVA QC Mechanical Engineer and a technical representative of the vendor. Four nonconforming components have been identified and are recorded on Nonconformance Reports 354R, 361R, 428R and 429R. Planned dispositions appeared timely and adequate and processing is underway.

Procedure WBNP QCP 4.12 titled, "Assembly and Installation of Reactor Pressure Vessel Head and Control Rod Drive Mechanisms was reviewed. This procedure is being used for the assembly of the units with final QC signoff by the mechanical, electrical and welding engineers on the Appendix 3 check sheet of WBN QCP 4.12, titled "MJ-CRDM Installation Check Sheet." The Operation Sheet contains material verifications.

The welding operation was prescribed and recorded on form "TVA WBNP - Field Weld Operation Sheet" which is used for Code welding

operations. The specified weld procedure was GTA 88-C-3 RO for a GT automatic process using the "Dyna Surge Automatic Welding System," as produced by the Liquid Carbonic Corporation. The weld procedure qualification records and records of the three qualified weldors were reviewed.

8. Findings

Within the areas examined there were no items of noncompliance identifed.