



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

Report Nos.: 50-438/83-02 and 50-439/83-02

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

Docket Nos.: 50-438 and 50-439

License Nos.: CPPR-122 and CPPR-123

Facility Name: Bellefonte 1 and 2

Inspection at Bellefonte site near Scottsboro, Alabama

Inspector: P. E. Fredrickson  
 for J. D. Wilcox, Jr.

2/25/83  
 Date Signed

Approved by: P. E. Fredrickson  
 P. E. Fredrickson, Acting Section Chief,  
 Division of Project and Resident Programs

2/25/83  
 Date Signed

SUMMARY

Inspection on January 1-31, 1983

Areas Inspected

This routine, announced inspection involved 160 inspector-hours on site in the areas of construction surveillance, Quality Control Investigation Report (QCIR) review, QA audit review, licensee identified items (Units 1 and 2), housekeeping, Nonconformance Condition Report (NCR) review, welding performance qualification record review, licensee action on previous enforcement matters, work release review, training, controlled drawings, supports for remote operators, construction operating instructions, mounting electrical boxes, NRC Construction Appraisal Team inspection results review, and licensee action on previous inspection items.

Results

Of the 16 areas inspected, no violations or deviations were identified in 13 areas; violations were found in three areas (Control of installation of supports for remote valve operators - paragraph 15; Inadequate drawing control - paragraph 14, Inadequate construction operating instructions - paragraph 16).

## DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*L. Cox, Project Manager
- \*F. Gilbert, Construction Engineer
  - D. Freeman, Electrical Engineer Supervisor EEU
- \*T. Brothers, Hanger Engineer Supervisor
- \*F. Moses, Mechanical Engineer Supervisor
  - H. Johnson, Welding Engineer Supervisor WEU
- D. Smith, Assistant Construction Engineer
- \*J. T. Walker, Assistant Construction Engineer
  - F. Huffman, Assistant Construction Engineer
- J. Barnes, QA Unit Supervisor
- D. Bridges, Assistant Construction Engineer
- L. McCollum, Instrument Engineer Supervisor
- J. Olyniec, Civil Engineer Supervisor
- B. J. Thomas, Assistant Construction Engineer
- W. P. Chapley, IEU
- G. Greer, QA Unit
- \*K. Lawless, WEU
- \*A. Richards, EEU QC Supervisor
  - D. Gillies, Hanger Engineering Unit
- \*T. F. Newton, STCU Supervisor
- \*P. C. Mann, Nuclear Licensing Supervisor
- \*B. Sammons, Administrative Officer
  - B. A. Fisher, QCRU Supervisor
- D. E. Nixon, MTU
- \*P. McGraw, Assistant Electrical Supervisor
- \*J. Cromer, QC Civil Supervisor
- \*D. C. Smith, Compliance Supervisor
- \*T. McCollum, MEU Supervisor
- \*D. Thornton, Assistant MEU Supervisor
- \*R. Norris, Assistant OC and MEU Supervisor
- \*C. Adams, MEU QC Supervisor

Other licensee employees contacted included 10 construction craftsmen, 4 technicians, 2 mechanics, 2 security force members, and 10 office personnel.

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on January 31, 1983, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspection findings.

## 3. Licensee Action on Previous Enforcement Matters

- a. (Closed) Unresolved Item 438, 439/79-07-02, NCR 638.

The resident inspector reviewed Nonconforming Condition Report (NCR) 638 and the significant condition report processing sheet for NCR 638, dated April 17, 1979 (MEB 790419365). TVA determined that this NCR, originally reported as a potential significant deficiency under 10 CFR 50.55e, was not a reportable event. This item is closed.

- b. (Closed) Unresolved Item 438, 439/82-28-03, Structural Concrete at Intake Pumping Station. The resident inspector reviewed and found acceptable the corrective action for NCR 1969 which had been generated to resolve this matter. This item is closed.

- c. (Closed) Unresolved Item 438/81-14-01, Significant Nonconforming Condition Reports. The resident inspector reviewed completed NCRs 1435, 1434, 1426 and 1424. One NCR had been upgraded by design to a significant condition. TVA has upgraded their criteria for determination of significant NCRs. This criteria is contained in TVA's Program Requirements Manual OEDC 15 QAI-1, Rev 2, "Determining, Reporting and Correcting CAQ's". This action is satisfactory. This item is closed.

- d. (Closed) Violation 438, 439/82-09-06, Boric Acid Pump Room. The resident inspector reviewed the corrective action and the action to avoid further violations discussed in TVA's response dated May 21, 1982. The inspector verified that QCIR 13352 and QCIR 17774, which pertain to this violation were closed. The action is satisfactory. This item is closed.

- e. (Closed) Unresolved Item 438, 439/82-16-01, Drill Bits for Wedge Bolts. Since identification of this item the resident inspector has made an ongoing review of work releases issued by the Civil Engineering (CEU) and Hanger Engineering units (HEU). This review was to ensure that the required prework inspections to measure the drill bits were performed prior to drilling holes for installation of wedge bolts. The action performed by CEU and HEU is satisfactory. This item is closed.

- f. (Closed) Unresolved Item 438/82-12-12, Valve Cheater. The resident inspector reviewed TVA memo dated January 31, 1983 which stated that the subject tool was actually a pipe rolling device. This item is closed.

- g. (Closed) Unresolved Item 438, 439/83-02-06, Drawing Control. This item was identified by the Construction Appraisal Team inspection as discussed in paragraph 19. The inspector has reviewed this item and determined that this area is not in compliance with 10 CFR 50, Appendix B, Criteria VI and therefore, is identified as a violation discussed in paragraph 14.

#### 4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. Unresolved items identified during this inspection are discussed in paragraphs 17 and 19.

#### 5. Independent Inspection Effort - Construction Surveillance

The inspector spent considerable time in direct surveillance of hardware in the field which included witnessing activities in the following areas:

(Unit 1 Reactor Building) Erecting portions of steel in annulus area; installing decay heat removal, chemical addition and boron recovery, component cooling water, spent fuel cooling, core flooding, makeup and purification and waste disposal piping; installing main steam and feedwater piping whip restraints; installing exposed conduit and associated supports; installing local instrument panels in the instrument room; pulling and terminating cables; tensioning upper steam generator, pressurizer and reactor coolant pump supports; installing reactor coolant drains and vents; installing spray line piping; installing main fuel handling bridge crane; installing miscellaneous D-Ring platforms; installing shear bars on pressurizer; and installing decay heat removal sump valve room pipe restraints.

(Unit 2 Reactor Building) Installing portions of the core flooding, decay heat removal, reactor building spray, waste disposal, auxiliary feedwater, makeup and purification, main steam, feedwater, component cooling water, and spent fuel cooling piping; installing electrical penetrations; installing HVAC ductwork and associated hangers, cable trays and supports, and exposed conduit and supports; performing fitup of supports, shear bar and miscellaneous hardware for the pressurizer; installing reactor coolant drains and vents; placing rebar and formwork for secondary wall; installing supports and restraints on pressurizer surge and spray line piping and installing spray line piping.

(Auxiliary Building) Installing portions of chemical addition and boron recovery, component cooling, feedwater, main steam, auxiliary steam, auxiliary feedwater, spent fuel handling and reactor building spray piping; installing spent fuel cooling and decay heat removal hangers, piping and valves; installing pipe supports in Units 1 and 2 main steam valve room A; pulling and terminating cables and installing radiation monitors.

#### 6. Quality Control Investigation Report (QCIR) Review

The resident inspector reviewed the description and recommended disposition of the following QCIR's:

<u>QCIR No.</u>	<u>Date</u>	<u>Title</u>
29168	1/6/83	1 EI-EMCC-61/B2-A, The Continuous Trip Set Screw is Broken
29169	1/6/83	1 EI-EMCC-61/HI-A, The Face Plate is Broken
29170	1/7/83	Rebar Damaged During Drilling of Concrete
29171	1/4/83	Control Line Labeled 3' South of A-4 Incorrect
29174	1/10/83	ORF-EMOT-003-Particles Found in Oil.

The above QCIRs were handled in accordance with Bellefonte's Quality Control Procedure BNP-QCP-10.4 Rev. 9.

No violations or deviations were identified.

#### 7. Nonconforming Condition Report (NCR) Review

The resident inspector reviewed the item description, noncompliance description, recommended disposition and action required to prevent recurrence for the following NCR's:

<u>NCR No.</u>	<u>Date</u>	<u>Title</u>
2154	1/4/83	Cables 2EG-ECA5-511-B and 2EG-ECA5-512-B Exceed Minimum Bend Radius.
2155	1/4/83	ERCW Pump 1B2-B Has Excessive Vibration
2156	1/5/83	Reinforced Steel Damaged by Core Drilling
2160	1/4/83	ASTM A19d, GR 8 (Type 304) Not Properly Marked

These NCR's were handled in accordance with Bellefonte's Quality Control Procedure, BNP-QCP-10.4 Rev. 9.

No violations or deviations were identified.

#### 8. Work Release Review

The resident inspector reviewed the type of work, description, engineering unit approval, and QA records affected for the following work releases (WR):

<u>WR</u>	<u>Date</u>	<u>Title</u>
40300	1/18/83	Install Wedge Bolts (1KE-MPHG-B 20d SI R5)
40301	1/18/83	Chip Concrete
40323	1/12/83	Chip Up to Allow Rework of Conduit
40350	1/15/83	Remove Pipe Sleeves

These work releases were handled in accordance with Bellefonte's Quality Control Procedure, BNP-QCP-10.6, Rev. 13.

No violations or deviations were identified.

9. Licensee Identified Items (LII)

a. The resident inspector reviewed with site and ENDES personnel the adequacy of licensee actions on the following LII's.

(1) (Closed) CDR 438/81-29, 439/81-32, "Temperature Switches in Auxiliary Power System" (NCR 1411): TVA submitted a final report on June 4, 1981. The resident inspector reviewed the corrective action specified in the final report and made a field check to verify completion of work. The work was performed satisfactorily. This item is closed.

(2) (Open) CDR 438/81-70, 439/81-69, "Uncoordinated Design Change" (BLN CEB 8109): TVA submitted a revised final report on January 17, 1983. The resident inspector reviewed the corrective action specified in the revised final report. During this review, the resident inspector noted that TVA committed to a training program for each branch and project within ENDES (NEB 820226255). The planned purpose of this training program is to develop and implement internal training on all engineering procedures (EPs) which govern ENDES work performance. Several program documents were unavailable for review by the resident inspector. This item remains open pending receipt of the missing documentation and subsequent review by the inspector.

b. The inspector reviewed the in-progress status of the following LII's:

<u>NCR #</u>	<u>CDR #</u>	<u>Title</u>
2082	438/82-79	Disruption and Collapse of Sodium Hydroxide Storage Tank
BLN MEB 8207	438/82-82 439/82-73	Delaval Problem with Starting Air Valve Assembly on Standby Diesels

2086	438/82-80	Raw Cooling Water Chiller Unit Flow Control Valve Deficiencies
2089	438/82-81	Over Pressurized Systems During Flushing
2053	438/83-01	Cable Bend Radius for Generator Control Cabinets
2102	438/83-02	Failure of Air Compressor Motor - General Electric
2120	438/83-03 439/83-01	Unqualified Welding on Cable Tray Supports
2129	438/83-04 439/83-02	Unauthorized Use of QA Stamp
BL-2-P	438/83-05	Uncontrolled Parts for Battery Chargers From Power
BLN BLP 8234	438/83-06 439/83-03	Handling of Design Change Reports

No violations or deviations were identified.

#### 10. Housekeeping

The resident inspector reviewed the following housekeeping deficiency reports for deficiencies identified and action taken to correct these deficiencies:

<u>Deficiency Report No.</u>	<u>Date</u>
823	1/6/83
824	1/10/83
825	1/12/83

These housekeeping inspections were handled in accordance with Bellefonte's Quality Control Procedure BNP-QCP-10.27, Rev. 6.

No violations or deviations were identified.

#### 11. Quality Audit Review

The resident inspector reviewed the following Quality Assurance Audits for accuracy and completeness:

<u>Audit No.</u>	<u>Title</u>	<u>No. of Deficiencies</u>
BN-W-82-10	Stud Welding	0
BN-G-82-16	Nonconformance Reporting	6
BN-G-82-15	Work Releases	5
BN-E-82-18	Equipment Installation	2

No violations or deviations were identified.

#### 12. Welding Performance Qualification Record

The resident inspector reviewed the following Welding Performance Qualification Records for completeness:

<u>Stamp No.</u>	<u>Welding Procedure No.</u>	<u>Test No.</u>	<u>Date</u>
BAEE	SM11-B-3-Rev 6	SM-4-B-3H	12/22/82
BAEZ	SM11-B-3 Rev 6	SM-4-B-3H	12/29/82
IAMD	SM18-B-1 Rev 5	SM-5-B-H	12/20/82
PADA	SM11-B-3 Rev 6	SM-4-B-3H	12/23/82

These welding performance qualification records were handled in accordance with Bellefonte's Quality Control Procedure BNP-QCP-10.24 Rev. 5.

No violations or deviations were identified.

#### 13. Training

On January 5, 1983, the resident inspector observed the following craft training sessions:

<u>QCP</u>	<u>Subject</u>	<u>Craft</u>
10.25 Rev. 5	Qualification of Welders	Iron workers
2.6 Rev. 5	Cadwelding Inspection	Iron workers
10.16 Rev 5	Bending of Partially Embedded Reinforcing Steel	Iron workers

These sessions were handled in accordance with Bellefonte's Quality Control Procedure BNP-QCP-10.30.

No violations or deviations were identified.

#### 14. Controlled Drawings

During the week of January 3, 1983, the resident inspector made a field check of craft controlled drawings. This drawing review included a detailed comparison of three (3) sets of controlled drawing in the possession of a steam fitter foreman to the QCRU's master sheets. The following is a listing of controlled drawings in the possession of the craft which were not up to date with the master revision:

<u>Craft Control Revision</u>	<u>Master Revision</u>
3BW 0619-NV-05 Rev 0	Rev 5
3BW 0619-NV-06 Rev 0	Rev 4
3BW 0619-NV-07 Rev 0	Rev 4
3BW 0619-NV-08 Rev 1	Rev 3
3BW 0656-KC-03 Rev 3	Rev 5
3BW 0601-CF-01 Rev 6	Rev 10
3BW 0612-ND-01 Rev 2	Rev 10
3BW 0614-NL-01 Rev 7	Rev 11
3BW 0615-NS-01 Rev 4	Rev 10
3BW 0619-NV-01 Rev 1	Rev 5
3GW 0670-RK-01 Rev 2	Rev 6

As can be seen from this listing, some of the controlled drawings are out of date by as much as eight revisions. This problem was also identified as a potential enforcement finding in Construction Appraisal Inspection 50-438/82-32, 50-439/82-32 (Appendix B, Quality Assurance, Paragraph 2 - Section II.B.6).

Bellefonte's Quality Control procedure, BNP-QCP-10.2 Rev. 9, "Drawing Control", states the following in paragraph 6.2.4: "All unit controlled drawing files shall be maintained current by the responsible unit, and all craft controlled drawings shall be maintained current by QCRU. Obsolete or superseded drawings shall be removed from the files and destroyed or they shall be prominently identified as obsolete or superseded."

This failure to control drawings is identified as violation 438, 439/83-02-01, Inadequate Drawing Control.

15. Supports for Remote Operators

During the week of January 3 and January 10, 1983, the resident inspector identified that supports for remote valve operators were being installed or had previously been installed by the millwright craft for safety-related valves 2NB-VDAC-105, ONB-VJAC-196-N, and ONB-VJAC-201-N without approved procedures, instructions or drawings. These Seismic Category IL supports were being built at HEU's verbal direction to suit the field configuration. TVA's Quality Assurance Program does not allow placement of these supports in this manner.

10 CFR 50, Appendix B, Criterion V requires that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and be accomplished in accordance with these instructions, procedures, or drawings.

TVA's QAPP 5, Rev 2, paragraph B.1 states the following: "Activities affecting quality including quality assuring and verifying shall be prescribed and accomplished in accordance with documented instructions, procedures, or drawings."

The installation of the remote operator supports without approved procedures, instructions or drawings is identified as Violation 438, 439/83-02-02, Supports for Remote Operators.

16. Construction Operating Instruction (COI)

The resident inspector reviewed the following construction operating instructions (COI) during this inspection period:

<u>Title</u>	<u>Instruction No.</u>
Essential Raw Cooling Water System, Unit 1	1KE-01 Rev 1
Make-up and Purification System 1NV-MPMP-001-A	1NV-01 Rev 2
Make-up and Purification System 1 NV-MPMP-002-A	1NV-02 Rev 1
Make-up and Purification System 1 NV-MPMP-003-A	1NV-03 Rev 2

COIs 1NV-01, 1NV-02 and 1NV-03 were checked against Babcock and Wilcox (B&W) Technical Document No. 67-1003781-00. The Limits and Precautions Section, paragraph 2.1-05 of the technical document, states the following: "Ensure

that the suction valve and bypass orifice isolation valves are open prior to startup... NOTE: Due to close internal tolerances, operation of this pump without suction for even a few seconds will destroy the pump internals."

This requirement is not included in COIs 1NV-01, 1NV-02 and 1NV-03. The site B&W representative was contacted by the NRC resident to determine if this requirement had to be met. The B&W representative stated it did.

COI 1KE-01 was checked against Weir Pump Limited Publication No. PSP 126 (Contract No: 77K35-820122). The pump running checks, paragraph 3.1 of the pump publication, is quoted as follows:

### 3.1 Hourly

- (1) Check that the following readings are normal and investigate any irregularities.
  - (a) Pump differential head.
  - (b) Motor bearing temperatures.
- (2) Adjust the flow of cooling water through the motor upper bearing as required to maintain a temperature below 130° F maximum.

WARNING: Stop the pump before adjusting the gland.

- (3) Observe the pump gland for excessive leakage and adjust as necessary.
- (4) Check the unit for any undue noise and/or vibration.
- (5) Check for water and/or oil leaks.
- (6) Check that the ammeter reading is normal.
- (7) Turn the stuffing box lubricator one revolution.

NOTE: The above mentioned checks can be extended to daily, weekly or monthly if provided satisfactory during running in period.

These requirements from the pump publication are not contained in COI 1KE-01.

10 CFR 50, Appendix B, Criterion V requires that: "Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

TVA's Quality Assurance Program Policy QAPP 5, Rev. 2, paragraph B.3 states the following: "Instructions, procedures, or drawings shall include appropriate quantitative acceptance criteria."

Also, the licensee's accepted QA Program commits to Regulatory Guide 1.116-1976 which endorses ANSI N45.2.8-1975. Section 2.9 of this standard requires that procedural engineering limitations for installation, inspection and test procedures include the engineering limitations and requirements from manufacturers' instruction manuals.

The reviewed procedures are examples where site procedures do not include all of the appropriate quantitative requirements (i.e. precautions and limits) which are specified in the vendor's technical documents. This failure to include appropriate acceptance requirements in procedures is identified as Violation 438/83-02-04, Inadequate Construction Operating Instructions.

17. Mounting Electrical Boxes

During the inspection period, the resident inspector noted that there was some confusion as to the manner in which electrical boxes are to be mounted to concrete structures. The TVA specifications used to mount seismic Category I and IL boxes appear to be inadequate with respect to environmental and seismic requirements. In addition IEU mounts these boxes in one manner and EEU mounts them in another. At present ENDES personnel have been made aware of this problem and have decided to come to the site on March 22, 1983 to investigate and discuss the problem. In summary, assurance of environmental qualification and seismic qualification are of concern. Pending Completion of the ENDES investigation and subsequent review by the inspector, this matter is identified as Unresolved Item 438, 439/83-02-03, Mounting Electrical Boxes.

18. Licensee Action on Previous Inspection Items

(Closed) IFI 438/82-24-04, Pressurizer Relief Line Welds. The resident inspector reviewed NAVCO's code data package on the additional welds in the pressurizer relief line. This design is satisfactory. This item is closed.

19. Construction Appraisal Team (CAT) Inspection

Appendix B of Construction Appraisal Inspection 50-439/82-32, 50-439/82-32, transmitted in our letter dated January 13, 1983, identified 27 potential enforcement actions, based on CAT inspector observations. The items in Appendix B have been referred to Region II for review and necessary action. Subsequent inspections conducted by Region II will review all items identified in Appendix B. For tracking purposes, these 27 items will be identified as unresolved items, pending their subsequent review and disposition. The correlation of items is as follows:

<u>Appendix B Location</u>	<u>Unresolved Item No.</u>
<u>Quality Assurance</u>	
1. Measuring and Test Equipment	438, 439/83-02-05
2. Drawing Control	438, 439/83-02-06
3. Annual Construction Audits	438, 439/83-02-07
4. Audit of ITT-Grinnel	438, 439/83-02-08
<u>Design Change Controls and Corrective Action Systems</u>	
1. Use of Design Information Requests	438, 439/83-02-09
2. Disposition of Nonconformances	438, 439/83-02-10
3. Use of Rework Systems	438, 439/83-02-11
4. Engineering Review Procedures	438, 439/83-02-12
5. Concrete Pour Adequacy	438, 439/83-02-13
<u>Electrical and Instrumentation Construction</u>	
1. Installation Conformance Inspections	438, 439/83-02-14
2. Color Coding of Cable	438, 439/83-02-15
3. Battery Maintenance	438, 439/83-02-16
4. Inspection Record Adequacy	438, 439/83-02-17
<u>Welding, Nondestructive Testing</u>	
1. Control of Welding and NDE Testing	438, 439/83-02-18
2. QC Inspector Training Records	438, 439/83-02-19
<u>Mechanical Construction</u>	
1. Valve Orientation	438, 439/83-02-20
2. Anchor Bolts	438, 439/83-02-21

3. HVAC Acceptance Criteria	438, 439/83-02-22
4. Self-Drilling Expansion Anchors	438, 439/83-02-23
<u>Civil and Structural</u>	
1. Containment Tendon Grease Leakage	438, 439/83-02-24
2. Concrete Chipping Operations	438, 439/83-02-25
3. Post-Placement Concrete Inspection	438, 439/83-02-26
4. Batch Plant Operation	438, 439/83-02-27
5. Structural Steel Dimension Tolerances	438, 439/83-02-28
<u>QC Inspector Effectiveness</u>	
1. Certification of QC Inspectors	438, 439/83-02-29
2. QC Inspector Education and Experience Requirements	438, 439/83-02-30
<u>Procurement, Receipt and Storage</u>	
1. Control of Stored Equipment	438, 439/83-02-31