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

Report Nos.: 50-438/86-09 and 50-439/86-09

Licensee: Tennessee Valley Authority
6N38 A Lookout
1101 Market Street
Chattanooga, TN 37402-2801

Docket Nos.: 50-438 and 50-439 License Nos.: CPPR-122 and CPPR-123

Facility Name: Bellefonte 1 and 2

Inspection Conducted: December 1, 1986 - January 31, 1987

Inspectors: A. Johnson for 3/2/87
J. W. York Date Signed

A. Johnson for 3/2/87
W. C. Bearden Date Signed

Approved by: A. J. Ignatonis 3/2/87
A. J. Ignatonis, Section Chief Date Signed
Division of TVA Projects

SUMMARY

Scope: This routine announced inspection was performed in the areas of safety-related pipe supports and restraints, instrumentation, electrical, structural steel welding, welding, fire prevention/protection, and employee concerns.

Results: One violation was identified in one area: Failure to control purchase of instrument panels.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*L. Cox, Construction Project Manager
*S. Johnson, Site Quality Manager
*B. Thomas, Site Quality Office
*D. Terrill, Site Licensing Manager
*J. Baxter, Site Licensing
*W. McCollum, IEB Supervisor
*E. Deason, DNE Principal Engineer
*L. Ford, Quality Improvement Evaluator
*K. Turner, Quality Improvement Evaluator
*T. West, Engineering Aid

Other licensee employees contacted included construction craftsmen, technicians, and office personnel.

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on February 2, 1987, with those persons indicated by an asterisk in paragraph one above. The licensee acknowledged the inspection findings with no dissenting comments. The licensee did not identify as proprietary any of the materials 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.

One violation was identified in one area: Failure to control purchase of instrument panels, paragraph 5b. One Inspector Followup Item was identified in one area: Tubing bending program, paragraph 5a.

3. Licensee Action on Previous Enforcement Matters (92702)

This subject was not addressed in the inspection.

4. Safety Related Pipe Supports and Restraints - Units 1 and 2 (50090C)

The inspectors observed the following supports/restraints (hangers) in various stages of fabrication:

- Hanger No. 1RE-MPHG-0194F R5
  Class of Hanger - SCAT 1 (Structural Category 1)
  Welder - FCHL
  Detailed Welding Procedure - SM-P-1
  Filler Metal Heat No. - 77061 (E 7018 electrode)
  Also, observed hanger QC reinspecting hanger.

- Hanger No. - 1CA-MPHG-0072 R8
  Class of Hanger - ASME Sec. III, Subsec. NF, Cl.3
  Observed QC inspection of hanger. IRN 1-14-87TB-1 written to document bottom plate holes too large

- Hanger No. 2VH-MPHG-0009F,0010F,0011F
  Class of Hanger - SCAT 1
  Welder - FCKJ
  Detailed Welding Procedure - SM-P-1
  Filler Metal Heat No. - 77061 (7018 electrode)
  Observed Welding and installation of hanger.

- Hanger Nos. - OVL-MPHG-0849F R1,0850F R1,0851F R1
  Class of Hanger - SCAT 1 (Structural Category 1)
  Welder - FCNT
  Detailed Welding Procedure - SM 11-B-3A
  Filler Metal Heat No. - 77061 (E7018)
  Observed welding QC's visual inspection of the welds on all three hangers.

- Hanger No. - OWD-MPHG-1333F R0
  Class of Hanger - SCAT 1
  Welder - FCJW
  Detailed Welding Procedure - SM-P-1
  Filler Metal Heat No. - 77061 (E 7018)
  Observed grouting under base plate and tightening of bolts to pull base plate down on concrete.

- Hanger No. - OWD-MPHG-1311F R0
  Class of Hanger - SCAT 1
  Welder - FCNT
  Detailed Welding Procedure - SM-P-1
  Filler Metal Heat No. - 77061
  Observed WQC visual inspection of welds.

The inspectors checked the fabrication and welding operations for compliance with documentation, welder qualification (when applicable), and nondestructive inspection requirements.

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

5. Instrumentation - Components and Structures - Units 1 and 2 (52153C)

   a. Tube Bending

      The inspectors visited the site measurement and test equipment (M&TE) issue room for the purpose of reviewing the licensee's program for qualification, certification, and control of instrumentation tubing bending equipment.

The inspector examined qualification records (Attachment E-16-3 of Quality Control Procedure (QCP) - 10.11, Rev. 13, Calibration of Measuring and Test Equipment) for tube bending equipment and noted that each bender lot was qualified by performance of a minimum of 3 sample bends on tubing of the same size and material specification as that used in the field, i.e., separate qualification records must exist for two different lots of tubing of identical dimensions but of different material. The test bends are then checked for visual condition, ovality, hardness, wall thickness, and liquid penetrant or magnetic particle testing performed to check for surface cracks or defects. The results are then compared to requirements which are based on sections NB3642.1 and NB4223.2 of the ASME Boiler and Pressure Vessel Code, 1974.

The inspector noted that no program presently exists for periodically checking the condition of benders in use in the field. The inspector determined from discussions with licensee employees that this item was previously identified under Corrective Action Tracking Document (CATD) 10700-NPS-03 for developing a program for maintenance of equipment qualification and had been referred to the Division of Nuclear Construction for resolution. This item is identified as Inspector Followup Item 438,439/86-09-02, Tube bending program.

b. Instrument Panels

As a result of an inspection trip to Watts Bar, the residents decided to inspect fabrication, inspection, and documentation of wall mounted local instrument panels fabricated at the Bellefonte site. The Watts Bar documentation, inspection, etc., problems, including lack of full penetration welds where called for on the drawing, were documented on Nonconformance Report (NCR) No. 6738.

The licensee had evaluated the generic implications at Bellefonte for NCR No. 6738 and found that the site fabrication drawings did not call for any full penetration welds and no problems existed in this area. The inspectors found that only one wall mounted local instrument panel, No. 0IX-IXPA-040, had been fabricated on site using welded joints. Reinspection of this panel revealed that it met drawing requirements.

The licensee identified 73 other wall mounted local instrument panels that were fabricated on site using bolting instead of welding. The four following panels from this category were reinspected and found to meet drawing requirements:

- Panels fabricated on site by bolting.

  Panel No. 0RF-IXPA-028
  Panel No. 0RF-IXPA-003
  Panel No. 0RF-IXPA-023
  Panel No. 2RF-IXPA-024

All four of these local instrument panels conformed to drawings.

The inspectors decided to inspect York Electro-Panel Control Co., Inc. (Vendor) supplied wall mounted instrument panels, since the majority of the panels were vendor supplied. The welding on the following eleven panels was reinspected:

- Panels issued but returned to warehouse.

  Panel No. 2IX-ILPR-060
  Panel No. 2IX-ILPA-147-D
  Panel No. 2IX-ILPA-148-F
  Panel No. 2IX-ILPR-032

- New panels unissued in the warehouse.

  Panel No. 000-ILPG-035
  Panel No. 000-ILPG-047

- Panels mounted in Reactor Building No. 1.

  Panel No. 1IX-ILPR-044-B
  Panel No. 1IX-ILPR-042-B
  Panel No. 1IX-ILPR-042-A

- Panels mounted in the Auxiliary Building.

  Panel No. 1IX-ILPA-186
  Panel No. 1IX-ILPA-198

TVA contract No. 86243-1 references vendor drawing No. D-8418 Rev. 6 as the weld information drawing. This drawing was used by the licensee welding QC inspector and the NRC inspector for reinspection of the welds on the 11 panels. The drawing calls for all of the fillet welds to be 1/4 inch in size. Using a sampling technique, i.e., not inspecting all the welds on each panel, the inspector found at least two undersized fillet welds on each of the 11 panels. Most undersized welds found would meet the 3/16 inch size fillet but some of the welds would only meet 1/8 inch fillet size. In addition, some of the weld joints were not per the drawing. Nonconformance Report No. 5131 Rev. 0 was written as a result of this reinspection. The failure of the panels to meet the approved drawings is a violation of 10 CFR 50, Appendix B, Criterion VII, and is identified as Violation 438,439/86-09-01, Failure to control purchase of instrument panels.

6. Electrical (Components and Systems) - Unit 1 (51053C)

The inspectors reviewed the documentation associated with the containment airlock electrical penetrations. During a generic review inspection (438, 439/86-11) conducted at the licensee's Division of Nuclear Engineering offices in Knoxville on December 15-19, 1986, an inspector noted that no evidence of generic review of conditions at Bellefonte existed for Browns

Ferry NCR BFNTDP8105. This NCR identified lack of documented evidence of containment airlock electrical penetrations being qualified to maintain containment integrity during possible accident environment. The electrical penetration installations were of mineral insulation (MI) type and were evaluated as not being suitable for primary containment service. The subject MI penetrations were to be replaced at Browns Ferry and had been previously replaced at the Sequoyah and Watts Bar sites but no information could be provided by DNE personnel as to the conditions at Bellefonte. This item was identified as part of URI 438,439/86-11-02.

The inspector determined that the containment airlock electrical penetrations at Bellefonte were not of the MI type but rather a Conax type solid metallic penetration with a Kapton type insulation material which the licensee has evaluated as being suitable for service. The electrical penetrations were provided under Wooley contracts 77K61-820979 and 75C61-85617-2 with the primary and secondary containment air locks. The Conax electrical penetrations are shown on Wooley drawings 35365 and 32534.

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

7. Structural Steel Welding - Unit 1 (55053C)

The inspectors observed the craft training session for training Module No. TM-051, Welder, Welding Operator and Peening Operator Qualification.

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

8. Welding - Units 1 and 2 (Modules 50090C, 55053C, 55063C 55073C and 55083C)

The inspectors reviewed two areas of welding which affected all current welding areas being inspected. These areas were (a) report (Phase I) of Bechtel QA audit of Bellefonte welding programs and (b) review of materials certifications for current site welding filler metal.

a. Results of Bechtel Quality Assurance Audit of Bellefonte Welding Programs

Because of welding problems identified at Watts Bar, TVA initiated an audit of the welding programs at Brown's Ferry, Bellefonte, and Sequoyah. Each audit is performed in two phases. Phase I is more of a programmatic audit and Phase II is a hardware audit.

The inspectors reviewed the licensee's report for Phase I evaluation of the Bellefonte welding program. The audit team from Bechtel Power Corporation independently conducted a formal quality assurance audit of the sites welding programs between March 28, 1986, and April 4, 1986. The audit addressed the welding programs as implemented during construction of Bellefonte and verified programs to be used by Nuclear Operations. Since little or no quality related welding has been performed under the Nuclear Operations Program, the audit in this area was very limited.

The audit covered the following areas:

Drawings
Welding procedures
Supporting records
Welder qualification records
Welder continuity records
Welding QC personnel qualifications
Use and control of welding filler metals
Evaluation of employee concerns regarding welding
Examination of six hardware welds.

There were no audit findings identified. Five observations (suggestions or recommendations) were identified. The report stated that the general consensus of the audit team was that quality activities relating to welding at Bellefonte are in compliance with the TVA programs and procedures and the applicable codes and standards. The report also stated that there were no findings relating to any of the employee concerns.

The Phase II of the welding program involving reinspection of some of the hardware is tentatively scheduled for April 1987.

b. Review of Weld Filler Metal Material Certifications

The inspectors recorded the following heat or lot numbers for the welding filler metal currently being issued by the site:

Shielded Metal Arc (SMAW)

- For Carbon Steel Welding

  E 7018 - Heat No. 9109
  E 7018 - Heat No. 8215
  E 7018 - Heat No. 77061
  E 7018 - Heat No. A60991

- For Low Alloy Steel Welding

  E 8018 B2 - Heat No. 0158 AL 43143

  E 8018 C3 - Heat No. 5N3C
  E 8018 C3 - Heat No. 411H 3192

  E 9018 B3 - Heat No. 1267C1 47143
  E 9018 B3 - Heat No. 2034A1 47144

- For Stainless Steel Welding

  E 308 - Heat No. 1J26E26
  E 308 - Heat No. G32E32

- For Stainless Steel Welding (Continued)

  E 309 - Heat No. 9D9C
  E 309 - Heat No. 9C16B

  E 309L - Heat No. 0D4C
  E 309L - Heat No. 0B3B

Gas Tungstan Arc (GTAW)

- For Carbon Steel Welding

  ER 70S3 - Heat No. 422T 7432

- For Stainless Steel Welding

  ER 308 - Heat No. 35838
  ER 308 - Heat No. 463730

  ER 308L - Heat No. A4340T308L
  ER 308L - Heat No. C4611R308L

  ER 309 - Heat No. 463701
  ER 309 - Heat No. 463699
  ER 309 - Heat No. A3465T309

  ER 316 - Heat No. J4002
  ER 316 - Heat No. E7636

- For Inconel Welding

  ER NICR3 - Heat No. C3371N382
  ER NICR3 - Heat No. D3142N382

Gas Metal Arc (GMAW)

- For Carbon Steel Welding

  E 70S6 - Heat No. 658C253

Flux Core (FCAW)

- For Carbon Steel Welding

  E 70T1 - Heat No. 1013A

The certified material test reports for the weld filler material were examined to determine if the material complied with ASME Code Section II, Part C, Welding Rods, Electrodes, and Filler Metals, and Section III, where applicable. Control of this weld filler material is

specified in ASME Section III, NB-4122 which requires traceability of the material but gives two methods from which to choose. One method requires traceability to each component, and the second method requires a control procedure to ensure that the specified material is used. Bellefonte's program uses both methods, i.e., traceability to the component for ASME fabrication and use of qualified or specified material for AWS, B 31.1, etc.

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

9. Fire Prevention/Protection - Units 1 and 2 (42051C)

An inspector toured the Unit 1 Auxiliary, Reactor, and Diesel Generator Buildings, the Control Building and the Unit 2 Auxiliary Building to observe fire prevention and protection activities. The following conditions were verified to be in effect:

- equipment protective coverings were treated for fire retardancy
- wood scaffolding was treated with flame retardant
- there was no unnecessary accumulation of combustible forms, form lumber, shoring, or scaffolding
- fire extinguishers and fire hoses were located at designated places at each elevation
- access to suppression devices was not restricted by construction materials
- suppression devices indicated current inspection

Additionally, an inspector reviewed the licensee's program for inspection of fire extinguishers. Records held by the licensee public safety department were reviewed and selected fire extinguishers located in the plant were inspected to verify routine checks were being performed in accordance with the requirements as stated in Bellefonte Joint Fire Protection Plan. The inspector noted one fire extinguisher, number 464, located on the 649' elevation of the Unit 1 Reactor Building that had not received monthly checks for at least 7 months. However, this appeared to be an isolated case due to the remote location and the removal of temporary scaffolding which had provided access to the associated area. Public safety personnel were informed and determined that the fire extinguisher was no longer required and it was removed from service.

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

10. Employee Concerns

The inspectors had several discussions with the Bellefonte site employee concerns representatives, in regards to the program at this site. Following are some of the site statistics as of January 21, 1987:

° Concerns received 39

° Investigations completed 22

- Concerns closed 18
- Concerns referred to the Inspector General or to Watts Bar Employee Concern Task Group 4
- Safety-related concerns (out of 39 total) 12
- Concerns with confidentiality 3
- Concerns substantiated (out of 18) 5

Following is a breakdown of the concerns by category:

- Quality Assurance/Quality Control 3
- Material Control 2
- Management and Personnel 16
- Welding 3
- Construction 4
- Industrial Safety 5
- Engineering 5
- Intimidation, Harassment, and Wrongdoing 1

The one case of harassment, which has been investigated, did not involve a safety matter but an administrative area.

11. Followup of IE Bulletion (92703)

(Closed) 438;429/86-BU-03, Potential Failure of Multiple ECCS Pumps Due to Single Failure of Air Operated Valve in Minimum Flow Recirculation Line. The licensee responded to IEB 86-03 in a letter dated November 14, 1986. The licensee stated that the facility was not vulnerable to single-failure of the ECCS pumps minimum flow recirculation lines due to the following:

1. The DHR, RBS, and AFW systems are redundant (i.e., dual-trained) safety systems with separate miniflow lines for each system pump. There are no powered or air-operated valves in the miniflow lines. Manually-operated valves are installed in some miniflow lines; however, they are normally open and administratively-contolled. Therefore, these systems do not represent a concern in this area.

2. The MuP/HPI has two trains. Train A which is used for normal makeup and seal injection as well as emergency high pressure injection (HPI); has a motor-operated isolation valve in its minimum flow recirculation line which leads back to the makeup tank. Train B line, which is used

for HPI or to provide redundant RCP seal injection, has cross-trained motor operated isolation valves in its recirculation line which leads to the borated water storage tank (BWST). These valves serve an automatic isolation function when an engineered safety features actuation system (ESFAS) signal is generated. These valves can also be remote-manually operated from the main control room (MCR). On an ESFAS signal, these normally open valves will close. At this time, HPI must be maintained by the operator until he decides that he should override the isolation function and throttle or stop HPI flow.

3. Babcock and Wilcox (B&W) Plant Limits and Precautions document specifies that (1) the recirculation flowpath for each makeup pump should be open at all times except when operating in the HPI mode of operation, and (2) the minimum allowable makeup pump is 100 gallons per minute per pump. Each makeup pump's circulation line is equipped with a pressure switch located upstream of the recirculation isolation valve. This pressure switch is provided so that if recirculation flow is restricted within 60 seconds of pump start, and the stagnation pressure in the line increases, an alarm will be acuated in the MCR and the operating pump will shut off. However, in the event of an ESFAS signal, the high pressure trip will be overridden and the pump will run until it is manually shut off. This does not represent a challenge to the MuP/HPI pumps since the pump discharge pressure exceeds that required to open the RCS safety valves.

In summary, the single failure vulnerability discussed in the subject bulletin does not exist at BLN. This item is closed.