



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

Report Nos.: 50-438/84-22 and 50-439/84-22

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 Conducted: October 9-12, 1984

Inspector:

[Signature]
 for W. P. Kleinsorge

10/26/84
 Date Signed

Approved by:

[Signature]
 J. J. Blake, Section Chief
 Engineering Branch
 Division of Reactor Safety

10/26/84
 Date Signed

SUMMARY

Scope: This routine, unannounced inspection entailed thirty-two inspector-hours on site in the areas of construction progress, spent fuel storage racks (50095) (Units 1 and 2), licensee identified items, and IE-Bulletin (IEB).

Results: Violation - "Failure to Establish Adequate Controls for Storage and Preservation of Piping Assemblies" - paragraph 5.

8502060097 841224
 PDR ADOCK 05000438
 G PDR

REPORT DETAILS

1. Licensee Employees Contacted

- *L. S. Cox, Project Manager
- *B. F. Painter, General Construction Superintendent
- *F. L. Moses, Supervisor, MEU-A
- *K. G. Lawless, Supervisor, WEU
- *P. C. Mann, Nuclear Licensing
- *K. Hastings, Engineer MEU

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

NRC Resident Inspector

J. W. York, Senior Resident - Construction

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on October 12, 1984, with those persons indicated in paragraph one above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee.

(Open) Violation 438, 439/84-22-01: "Failure to Establish Adequate Controls for Storage and Preservation of Piping Assemblies" - paragraph 5.

(Open) Unresolved Item 438, 439/84-22-02: "Criticality Multiplication Factor" - paragraph 6.a.(1)

(Open) Unresolved Item 438, 439/84-22-03: "Unavailable Westinghouse Procedures" - paragraph 6.a.(2)

(Open) Unresolved Item 438, 439/84-22-04: "Undersized Spent Fuel Storage Rack Welds" - paragraph 6.b

(Open) Inspector Followup Item 438, 439/84-22-05: "Spent Fuel Rack Drag Test" - paragraph 6.c

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

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. New unresolved items identified during this inspection are discussed in paragraph Nos. 6.a.(1), 6.a.(2) and 6.b.

5. Independent Inspection Effort

Construction Progress

The inspector conducted a general inspection of the power block construction site and outdoors storage areas to observe construction progress and construction activities such as welding, material handling and control, housekeeping and storage.

With regard to the inspection above, the inspector noted the following in the outdoors storage areas:

- Approximately ten examples of safety-related piping assemblies off the curbing and in contact with the ground. The above is contrary to ANSI N45.2.2-1972, "Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants (During the Construction Phase)", paragraph nos. 2.7.4(9) and 6.1.2.(4) which require piping assemblies to be stored up on curbing to avoid trapping water.
- Approximately forty examples of missing, damaged or deteriorated closures on piping assemblies. The above is contrary to ANSI N.45.2.2-1972, Paragraph 6.4.2 and Appendix A.3.5.2(2)(b) which require items in storage to have caps, covers, plugs or other closures intact and that tape be impervious to water and not subject to cracking or drying out if exposed to sunlight, heat, or cold.
- The approved tape for use on austenitic materials is silver gray in color, close to the color of austenitic stainless steel. The above is contrary to ANSI N45.2.2-1972, Appendix A.3.5.2(3) as amended by Regulatory Guide 1.38, paragraph C.2.d, which requires tape to be colored to contrast with materials on which they are used.

The above indicates that the licensee failed to establish adequate measures to control storage and preservation of piping assemblies. Failure to establish measures to control storage of materials and equipment to prevent damage is in violation of 10 CFR 50 Appendix B, Criterion XIII. This violation will be identified as 438, 439/84-22-01: "Failure to Establish Adequate Controls for Storage and Preservation of Piping Assemblies".

6. Spent Fuel Storage Racks (50095) (Units 1 and 2)

The inspector reviewed procedures, made a physical inspection of the Unit 1 installed and Unit 2 preinstalled spent fuel storage racks and reviewed quality records, to ascertain whether field activities, pertaining to the

installation of spent fuel racks, were accomplished in accordance with NRC requirements, applicable codes, standards and commitments.

a. Review of Procedures

The inspector reviewed the below listed documents to ascertain whether specifications, drawings, work instructions, and inspection procedures had been established to assure technical adequacy for the following activities, as they pertain to spent fuel storage racks: procurement, receipt inspection; storage; installation; audit program and; personnel qualification.

Documents

TVA Specification 3740, "Spent Fuel Racks at Bellefonte Nuclear Plant Units 1 and 2"

TVA Purchase Requisition 824481

TVA Design Criterion No. N4-50-D721, "Auxiliary - Control Building Structures" dtd March 1, 1974

TVA-BNP-QCP-1.1, Rev. 13, "Receiving Inspection"

TVA-BNP-QCP-1.2, Rev. 13, "Storage"

TVA-BNP-QCP-1.3, Rev.6, "Maintenance"

W-2463A88, Rev. 2, "Installation Procedure for 10.5" Spaced Spent Fuel Storage Rack"

TVA-SCC-1-NF-14, "NF - Fuel Handling Spent Fuel Racks - Unit 1"

TVA-SCC-2-NF-15, "NF - Fuel Handling Spent Fuel Racks - Unit 2"

TVA-QCP-10.29, Rev. 6, "Quality Assurance Training and Certification Program for Quality Control Personnel"

TVA-PT-NF-01C, Rev. 0, "Fuel Handling Equipment Spent Fuel Racks (Drag and Indexing Test)"

TVA-PT-NF-01C1, Rev. 0, "Fuel Handling Equipment Spent Fuel Racks (Part I - Spent Fuel Racks Drag and Index Test)" (Three Racks only)

TVA-QESP-9, Rev. 0, "Administration and Conduct of Audit Process"

TVA-QESP 7.8, Rev. 0, "Verification Planning and Scheduling"

TVA-QESP 7.7, Rev. 0, "Administration and Conduct of Surveillance Process"

- (1) With regard to the examination above, the inspector noted that BLNP FSAR Section 3.1 -50 and 51 "Criteria No. 63" states, in part, "...spent fuel is maintained at a subcritical multiplication factor k_{eff} of less than 0.95 under all conditions." TVA Specification 3470 "Spent Fuel Racks at Bellefonte Nuclear Plant Units 1 and 2) paragraph 7.4 states in part "Criticality Requirements. Racks shall be designed to an effective neutron multiplication factor (k_{eff}), considering all uncertainties taken together of less than 0.90 dry, less than 0.95 fully submerged in pure unborated water, and less than 0.98 in conditions of optimum water moderation (i.e., somewhere in the range of 0.1 to 0.3 g/cc water density homogenously dispersed between and within the fuel assemblies)."

It could not be determined whether the racks were designed consistent with the FSAR k_{eff} of 0.95 max or the specification 0.98 max. In addition, it could not be determined whether TVA was aware of the difference between the FSAR and the specification and if so, whether actions had been taken prior to this inspection to the FSAR to reflect the specification departure. The inspector indicated that pending the resolution of the above matter, this issue would be identified as unresolved item 438, 439/84-22-02: "Criticality Multiplication Factor".

- (2) With regard to the examination above, the following W procedures were not available for review:

QIP-3107, Revision 5 - Dimensional Inspection Procedure
 QIP-3121, Revision 1 - Leveling Inspection
 QIP-3122, Revision 2 - Free Path Inspection Procedure

General Design Specification, DS-52, Revision 1
 Specific Design Specification, DS-57, Revision 1
 Design Report

GMAW/SA-566-1, Revision 2
 GMAW/SA-566-1, Revision 3
 GMAW/SA-566-1, Revision 4
 GMAW/SA-566-2, Revision 2
 GMAW/SA-566-2, Revision 3
 GMAW/SA-566-2, Revision 4
 GMAW/SA-566-3, Revision 2
 GMAW/SA-566-3, Revision 3
 GMAW/SA-566-3, Revision 4
 GTAW/MA-566-4, Revision 2
 GTAW/MA-566-4, Revision 3
 GTAW/MA-566-4, Revision 4
 GTAW/AV-555, Revision 5
 GTAW/AV-555, Revision 6
 GMAW/SA-4104-1, Revision 2
 GMAW/SA-4104-1, Revision 3

GMAW/SA-4104-1, Revision 4
GMAW/SA-4104-1, Revision 5
GMAW/SA-4104-1, Revision 6
GMAW/SA-4104-1, Revision 2
GMAW/SA-4104-2, Revision 3
GMAW/SA-4104-2, Revision 4
GMAW/SA-4104-2, Revision 5
GMAW/SA-4104-2, Revision 6
GTAW/MA-4104-3, Revision 6
DMP-15-4-300, Revision 12
QIP 8606, Revision 16
GTAW/MA-4105-1, Revision 1
QIP 3103, Revision 4
QIP 3106, Revision 3
QIP 8102, Revision 9
QIP 8104, Revision 10

Pending NRC review of the above documents this matter will be identified as unresolved item 438, 439/84-22-03: "Unavailable Westinghouse Procedures".

b. Observation of Work and Work Activities

The inspector examined preinstalled and installed spent fuel storage racks and reviewed related records to verify that procedural requirements had been met in the following areas: adherence to receipt inspection procedures; adequacy of storage; configuration of spent fuel racks; structural welds; racks free of obvious defects; nonconforming items; availability of trained personnel; availability of approved drawings; proper location and orientation; seismic restraints; no apparent damage; required installation welds and performance of specified NDE; required bolting shimming and torquing of fasteners; QC coverage adequate; and corrosion test specimens are properly installed (if required).

With regard to the examination above, the inspector noted four undersized welds on spent fuel storage rack serial Nos. 67795 and 67794. This is documented in TVA NCR No. 3590. Pending NRC review of the above NCR resolution for safety significance, this matter will be identified as unresolved item 438, 439/84-22-04: "Undersized Spent Fuel Storage Rack Welds".

c. Review of Quality Records

The inspector reviewed receiving inspection records, material certification documentation, fabrication records, installation records, NCR(s) and audits to verify that procurement, receipt inspection and installation of the spent fuel storage racks were consistent with NRC requirements, applicable codes, standards and commitments.

With regard to the inspection above, the inspector noted that spent fuel rack drag test had only been performed on three racks in the Unit 2 spent fuel pool. The above was done to permit the temporary storage of new fuel. To date no testing has been accomplished in Unit 1. Discussions with the licensee and PT-NF-01C1 Unit 2, "Test Summary Report" indicate that the licensee was unable to meet the initial drag force acceptance criterion of 50 lbs. force above or below the moving weight of the fuel assemblies as indicated in a dillon load cell under dry conditions. Readings as high as 80 lbs. were noted. The licensee changed the acceptance criterion to 100 lbs. and accepted the tests based on a B&W letter that indicated that, under wet conditions, 225 lbs. below, and 325 lbs. above would be acceptable. Further, the licensee indicated that the high results 80 lbs. drag (above or below) might be the result of misalignment of inner and outer masts and rotation of approximately 1.5° of a spent fuel rack assembly. At this point in time the licensee has realigned the masts, but has not attempted to correct the rotation of the fuel rack assembly. The licensee has not provided justification for the increase of the drag force acceptance criterion or the correlation between the B&W wet condition values and the dry drag test being performed. This matter will be identified as inspector followup item 438, 439/84-22-05: "Spent Fuel Rack Drag Test".

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

7. Licensee Identified Items

(Closed) Item 438/CDR-83-27 and 439/CDR-83-22 "QA Program on Tube-Line Materials Supplied by Capitol Pipe" (10 CFR 50.55(e)).

On March 29, 1983, the licensee notified IE, Region II of a 50.55(e) item concerning nonconforming materials supplied by Tube-line Corp. The final report was submitted on November 22, 1983. The report has been reviewed and determined to be acceptable by IE, Region II. The inspector held discussions with responsible licensee representatives, reviewed supporting documentation, and observed representative samples of work to verify that the corrective actions identified in the report have been completed.

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

8. IE Bulletin (IEB)

- a. (Closed) IEB No. 83-06: "Nonconforming Items Supplied by Tube-line Facilities", Units 1 and 2

The inspector has reviewed TVA letters of November 22, 1983 and February 2, 1984, and determined that the requested actions of the bulletin have been acceptably addressed. The inspector held discussions with the responsible TVA engineer, reviewed supporting documentation and observed representative samples of work to verify that the actions identified in the letter of response have been completed.

- b. (Closed) IEB No. 83-07: "Apparently Fraudulent Materials Sold by Ray Miller Inc.", Units 1 and 2

The inspector has reviewed TVA letter of March 22, 1984, and determined that the requested actions of the bulletin have been acceptably addressed. The inspector held discussions with the responsible TVA engineer, reviewed supporting documentation and observed representative samples of work to verify that the actions identified in the letter of response have been completed.

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