



830 Power Building
TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

Central File
50-259
50-260

June 23, 1976

Mr. Norman C. Moseley, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 818
230 Peachtree Street, NW.
Atlanta, Georgia 30303

Dear Mr. Moseley:

This is in response to F. J. Long's June 3, 1976, letter, IE:II:BJC 50-259/76-10, 50-260/76-10, which transmitted for our review an IE Inspection Report (same number). We have reviewed that report and do not consider any part of it to be proprietary.

Very truly yours,

J. E. Gilleland
J. E. Gilleland
Assistant Manager of Power



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

JUN 3 1976

In Reply Refer To:

IE:II:BJC

50-259/76-10

50-260/76-10

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

Gentlemen:

This refers to the inspection conducted by Mr. B. J. Cochran of this office on April 21-23 and April 28-30, 1976, of activities authorized by NRC Operating License Nos. DPR-33 and DPR-52 for the Browns Ferry Units 1 and 2 facilities, and to the discussion of our findings held with Mr. J. R. Hilding during 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 examined actions you have taken with regard to previously identified enforcement matters. These are identified in Section II of the summary of the enclosed report.

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



JUN 3 1976

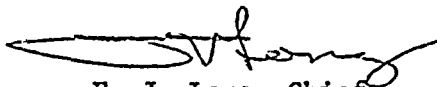
Tennessee Valley Authority

-2-

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,



F. J. Long, Chief
Reactor Operations and
Nuclear Support Branch

Enclosure:

IE Inspection Report Nos.

50-259/76-10 and 50-260/76-10



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

IE Inspection Report Nos. 50-259/76-10 and 50-260/76-10

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

Facility Name: Browns Ferry Units 1 and 2
Docket Nos.: 50-259 and 50-260
License Nos.: DPR-33 and DPR-52
Category: C/C

Location: Limestone County, Alabama

Type of License: GE, 1098 Mwe, BWR

Type of Inspection: Fire Damage Restoration

Dates of Inspection: April 21-23 and 28-30, 1976

Dates of Previous Inspection: April 5-9, 1976

Principal Inspector: B. J. Cochran, Reactor Inspector
Projects Section
Reactor Construction and Engineering
Support Branch

Accompanying Inspector: T. D. Gibbons, Reactor Inspector
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

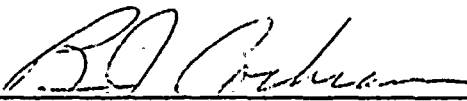
Other Accompanying Personnel: S. D. Ebnetter, Acting Section Chief
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch



IE Rpt. Nos. 50-259/76-10
and 50-260/76-10

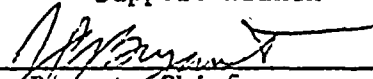
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Principal Inspector: _____


B. J. Cochran, Reactor Inspector
Projects Section
Reactor Construction and Engineering
Support Branch

5/13/76
Date

Reviewed by: _____


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

6/1/76
Date



SUMMARY OF FINDINGS

I. Enforcement Items

None

II. Licensee Action on Previously Identified Enforcement Matters

76-4-A1(II) Audits

Audit schedules were not updated at the required frequency, and there was no documented evidence that audits are conducted in accordance with an audit plan. This item is closed. (Details I, paragraph 3)

76-4-A2(II) Cable Minimum Bend Radius

A cable was installed in Unit 2 in violation of the minimum bend radius. This item is closed. (Details I, paragraph 4)

III. New Unresolved Items

None

IV. Status of Previously Reported Unresolved Items

None

V. Design Changes

None

VI. Unusual Occurrence

None

VII. Other Significant Findings

None

VIII. Management Interview

During this inspection period, the inspectors were in continuous communication with the Browns Ferry management and as there were no items of noncompliance or unresolved items identified, no exit interview was held.



DETAILS I

Prepared by:

B. J. Cochran
B. J. Cochran, Reactor Inspector
Projects Section
Reactor Construction and Engineering
Support Branch

5/12/76
Date

Dates of Inspection: April 21-23, 1976
April 28-30, 1976

Reviewed by:

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

6/1/76
Date

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

1. Individuals Contacted

Tennessee Valley Authority (TVA)

H. J. Green - Plant Superintendent
J. R. Hilding - Fire Restoration QA Manager
T. G. Campbell - Modification and Additions Unit Supervisor
J. E. Law - QA Engineer
D. Wright - Electrical Engineer
T. Ziegler - Mechanical Engineer

2. General

- a. Cleanup of major components and equipment from fire residue is essentially completed. Major effort in the Units 1 and 2 reactor building is centered around rebuilding of firestops and electrical penetrations, and applying Flameastic to exposed cables in open trays.
- b. As a result of inspection of installed SBM control switches TVA has discovered extensive failure of the cam follower and moving contact assembly.

There was no reported total failures that would render the switch inoperable but investigation has shown the plastic cam follower crazed and broken.

TVA has initiated an extensive investigation to determine the extent of the damage prior to establishing the corrective program.

3. Audits (76-4-A1(II))

During a previous inspection, it was determined that audit schedules were not updated at the required frequency and there was no documented evidence that audits were conducted in accordance with an audit plan.

An audit schedule identifying fire restoration activities was issued to be performed commensurate with the work activity.

The Office of Power Quality Assurance Procedure No. OP-QAP-18.1 issued March 3, 1976, now requires a written response within 30 days to audit reports which identify noncompliances by the audited organization.

Audit report OPQAA-76-SP-1-(3) performed on March 16-18, 1976, covering "Browns Ferry Nuclear Plant Fire Damage Repair and Return to Service Penetration Seals, Firestops and Application of Flameastic," was reviewed and found to be complete in all the areas previously identified as being deficient.

Based on the foregoing information the infraction response is considered to be adequate and the noncompliance closed.

4. Cable Minimum Bend Radius 76-4-A2(II))

Previous inspection revealed a cable installed in Unit 2 was in noncompliance with the minimum bend radius.

The licensee reported the infraction was corrected on March 2, 1976. In addition the licensee committed to initiate work plans to make final inspections and correct any noncompliances that may have resulted from work performed immediately following the fire.

This response is considered to be adequate and the noncompliance is closed.

5. TVA Restoration Plan Commitments

- a. In Part II, Section G of the Restoration Plan the QA and Audit staff is committed to conduct audits of each major phase in the plant recovery schedule.



Inspection has confirmed that audits are being performed and the TVA letter of March 15, 1976, provides the schedule for future audits of the recovery program.

- b. Part VIII, Section A.1 of the Restoration Plan provides procedure DED-EP 21.15, to establish a procedure for identifying and evaluating mechanical equipment which could have been exposed to unanticipated transient loadings resulting from maloperation of Units 1 and 2 equipment.

The Browns Ferry Mechanical Maintenance Instructions (MMI) 46 and 53 were implemented to inspect and evaluate corrosion damage to piping and mechanical components resulting from fire residue and to perform NDE of pipe and tubing.

The final reports of work performed and inspected in accordance with these instructions were inspected and found to be in order.

There are no further questions regarding these items at this time.

- c. In Part VIII, Section B.1, TVA committed to determine the temperatures in the fire zone and adjacent areas and effects on equipment.

In response to this commitment, Report No. CB-75-12 was issued identifying the approximate temperature zones as derived from an examination and analysis of physical evidence within the zones. As a result of this study six temperature zones were established.

Each zone was identified and inspected by the NRC inspector and physical evidence listed in the report was confirmed.

Information received as a result of this study was used to establish criteria for inspection and testing of structural members and equipment.

There are no further questions regarding this study at this time.

- d. The Restoration Plan includes criteria for (BFN-50-D-703) Evaluating Structural Steel Components/Evaluating Reinforced Concrete Structures (BFN-50-D704) and Evaluating Mechanical Piping, HVAC Ducting and Piping Components (BFN-50-D705).

On March 22, 1976, TVA issued the concluding report (CEB-76-7), "Program for Identification and Evaluation of Affected Structure and Mechanical Equipment." This report covers the identification, evaluation and restoration of such equipment as valves, pipes, hangers, restraints, HVAC ducts and supports, cable trays and supports, conduits, building features, penetration bulkheads and cooling equipment that were physically located within the fire zone or were affected by conditions resulting from the fire.

The report identifies the following equipment as being replaced: (1) cable trays; (2) tray supports; (3) pipe supports; (4) expandable bolt anchors; and (5) embedded steel anchor plates. The NRC inspectors observed work performed in each of the areas plus reviewed the embedded anchor test results.

The removal of concrete core and reinforcing steel samples plus the repair of the spalled concrete in accordance with the documented procedures was observed.

In addition to the above listed equipment the following equipment was replaced: (1) 6 inch aluminum spent fuel rod cleanup lines; (2) electrical conduit in fire zone; (3) portion of 36" x 36" HVAC exhaust duct; (4) uninsulated carbon steel floor drain; (5) 4 inch uninsulated carbon steel fire protection line; (6) 3 inch aluminum demineralized water line; (7) 3 inch carbon steel service air line; (8) 4 inch aluminum demineralized water line; and (9) all copper instrument lines in fire zone.

Based on information in this report plus inspection of records of work performed on the above listed equipment, there are no further questions regarding these items at this time.

- e. Part X, Section A of the Restoration Plan commits TVA to the removal of the remote indicating light circuits on both the AC and DC MOV boards. The removal of the lights was specified under Work Plans WP-4676 and WP-4682.

The work plans and inspection reports were inspected and determined to be complete.

- f. Part X, Section A of the Restoration Plan commits TVA to change the DC control power to the 4KV shutdown boards so only one supply is required for the board to be operational but a second supply will be available via manual transfer if needed.



The change was specified under Work Plan WP-4343.

The work plan and inspection reports were inspected and determined to be complete.

- g. Part X, Section A of the Restoration Plan commits TVA to reclassification of the 4KV feeders into Division I or Division II to provide separation in a tray or conduit for each normal 4KV supply to the four 480V shutdown boards 1A, 1B, 2A and 2B, and the two 480V diesel auxiliary boards A and B.

This change was specified under Engineering Change Notice 9047 and Work Plans WP-4688, WP4689, WP4691, WP4690, WP4716, WP4798, and WP4797. The work plans and inspection reports were inspected and determined to be complete.



DETAILS II

Prepared by:

T. D. Gibbons
T. D. Gibbons, Reactor Inspector

6/1/76
Date

Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

Dates of Inspection: April 21-23 and 28-30, 1976

Reviewed by:

T. E. Conlon
T. E. Conlon, Chief
Engineering Support Section No. 1
Reactor Construction and Engineering
Support Branch

6/1/76
Date

The discussion contained in this section of this report applies to Units 1 and 2 equally unless noted otherwise.

1. Persons Contacted

Tennessee Valley Authority (TVA)

J. Hilding - QA Restoration Manager, OPQA
E. Law - QA Engineer, OPQA
D. Alley - Electrical Engineer, DEC
B. Gant - Construction Engineer, DEC
D. Jent - Electrical Engineer, DEC

2. Installation of Flamemastic in the Reactor Buildings

The inspector observed the completed application of Flamemastic on the secondary containment areas in Units 1 and 2 on elevations 621 and 639. At elevations 621, Unit 1, tray segments inspected included trays TL, LE, AG, MN, MM and BB. At elevation 639, Unit 1, the three longest trays (FU, MO, NM) were inspected as typical. In Unit 2 at elevation 621 the following trays were typical of the total installation trays MN, NO, CL, GC, LF and TM. At elevation 639, Unit 2, the trays typifying the installation included FU, NN, BY and BJ. The installation on the trays appeared to conform to the requirements of procedure BF-206R, "Electrical Penetration Seal and Firestop Installation and Inspection (Units 1 and 2, Browns Ferry Nuclear Plant)," Rev. 0. Work is proceeding on elevation 593 in both units. TVA's QC is following the installation and data sheets are being signed. The inspector did not identify any noncompliances. Inspection of this work will continue.

3. Penetration Seals and Firestops

In Part X, Section A of the Browns Ferry Nuclear Plant Restoration Plan, TVA committed to a program using new material in all future seals, all breached seals (unless replacement would cause damage to the cables), and to upgrade existing penetrations to present design or replace with new material in accordance with design. The inspector observed 251 penetrations in various states of completion in the control rooms. Procedure BF206R and its data sheets controlled the work. The typical details for this area are D&E on drawing 45N830-27. The inspector observed the installation of the silicone foam in penetrations C92, C93 and C94. The relay room penetrations were installed in accordance with Figure E of 45N830-27 and sketches which were approved by DED. There were a total of 58 type E penetrations and 22 penetrations defined by ECN 9057. The latter 22 penetrations are used for the spare penetrations in the floor and include a steel plate to protect the seal from mechanical damage.

The inspector observed the installation of seals and firestops in various areas in the plant including nine Figure A types (C, H, I, J, K, L, V, X and Y) which were in various stages of construction. Additional seals and firestops were inspected throughout the plant; such as (A1, 4, 5, 16, 17, 26, 27, 28, 33, 34, B2, 10, 11, 12, 17, 18, 26). There were two firestops that had damaged Marinite boards, which the licensee's QA reported. These firestops were B12, elevation 621, and B26, elevation 639. In all cases a data sheet was signed for each step of repair. Step 7.1.1 and 7.4.3.1 of BF 206R requires removal of the urethane material to a level of acceptability. The inspector noted that conduits were being installed in most penetrations so that additional cable may be installed without breaking the seal. It was noted that the barrier plates and conduits in the penetration were given a 1/8-inch (dry) coating of Flamemastic. There were no items of noncompliance identified.

4. Rerouting of ESF Cables, Tray and Conduit Outside the Fire Boundary Zone

The inspector reviewed fifteen work plans which define the work and included the necessary details for work accomplishment, and the necessary signatures. The work plans reviewed were 4330, 4331, 4332, 4334, 4335, 4342, 4344, 4350, 4351, 4352, 4352R1, 4629, 4646, 4652 and 4395. These work plans were generated to incorporate the requirements of ECN L-9048. Approximately 125 cables and 26 conduits have been relocated. This work is almost complete. Construction and QC will make a final review of the installation. The IE:II inspector will review the work when it is completed.

5. Cardox Fire Extinguishing System

The inspector observed that the Cardox fire extinguishing system was available for use in the Units 1 and 2 spreading rooms. The inspector verified that there were no physical obstacles preventing the manual operation of the system.

