830 Power Building
TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

Central File
50-259
50-260

JUN 24 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 11, 1976, letter, IE:II:RFS 50-259/76-12, 50-260/76-12, 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

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

JUN 11 1976

In Reply Refer To:
IE:II:RFS
50-259/76-12
50-260/76-12

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 Messrs. H. A. Wilber and R. F. Sullivan of this office on May 6-7 and 10-13, 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 Messrs. J. E. Gilleland, H. J. Green and J. G. Dewease 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.

During the inspection, it was found that certain activities under your license appear to be in noncompliance with NRC requirements. This item and references to pertinent requirements are listed in Section I of the summary of the enclosed report. Enforcement correspondence relative to this noncompliance has been sent to you under separate cover from the Office of Inspection and Enforcement, Headquarters on June 8, 1976.

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

Enclosure:
IE Inspection Report Nos.
50-259/76-12 and 50-260/76-12

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

IE Inspection Report Nos. 50-259/76-12 and 50-260/76-12

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

Facility Name: Browns Ferry 1 and 2
Docket Nos.: 50-259 and 50-260
License Nos.: DPR-33, DPR-52

Location: Limestone County, Alabama

Type of License: 3293 Mwt, BWR (GE)

Type of Inspection: Special, Unannounced

Dates of Inspection: May 6-7, 10-13, 1976

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

Principal Inspector: R. F. Sullivan, Reactor Inspector (May 10-13, 1976)

Inspector-in-Charge: H. A. Wilber, Reactor Inspector (May 6-7, 1976)
Reactor Projects Section No. 1
Reactor Operations and Nuclear Support Branch

Accompanying Inspector: J. W. Hufham, Radiation Specialist
Environmental and Special Projects Section
Fuel Facility and Materials Safety Branch

Principal Inspector: _____ 6/3/76
R. F. Sullivan, Reactor Inspector — Date
Reactor Projects Section No. 1
Reactor Operations and Nuclear Support Branch

Reviewed by: _____ 6/3/76
W. C. Seidle, Chief — Date
Reactor Projects Section No. 1
Reactor Operations and Nuclear Support Branch

SUMMARY OF FINDINGS

I. Enforcement Items

Infraction

Contrary to Technical Specification 6.3.A procedures were not adhered to on May 4, 1976, as follows:

1. The procedures set forth in BFM 8 "Cutting, Welding and Open Flame Work Permit" were not followed in performing an area survey, removing or protecting combustible materials, or requesting a fire watch. (Details I, paragraph 2.g.)

2. The procedures defined in Section III of Radiation Control Instruction No. 1 were not followed in documentation of entry into and exit from the drywell of Unit 1. (Details I, paragraph 2.g.)

II. Licensee Action on Previously Identified Enforcement Matters

Not inspected.

III. New Unresolved Items

None

IV. Status of Previously Reported Unresolved Items

Not inspected.

V. Unusual Occurrences

None

VI. Other Significant Findings

None

VII. Management Interview

The interim inspection findings were discussed with Mr. Dewease on May 6, 1976, and the inspection results were discussed with Mr. Green and members of his staff on May 12, 1976.

On May 13, 1976, the inspection findings were reviewed with members of TVA management. (Details II)

DETAILS I

Prepared by: R. F. Sullivan, Reactor Inspector — 6/3/76 Date
Reactor Projects Section No. 1
Reactor Operations and Nuclear Support Branch

H. A. Wilber, Reactor Inspector — 6/2/76 Date
Reactor Projects Section No. 1
Reactor Operations and Nuclear Support Branch

J. W. Hufham, Radiation Specialist — 6/2/76 Date
Environmental and Special Projects Section
Fuel Facility and Materials Safety Branch

Dates of Inspection: May 6-7, and 10-12, 1976

Reviewed by: W. C. Seidle, Chief — 6/3/76 Date
Reactor Projects Section No. 1
Reactor Operations and Nuclear Support Branch

R. L. Bangart, Chief — 6/2/76 Date
Environmental and Special Projects Section
Fuel Facility and Materials Safety Branch

1. Persons Contacted

Tennessee Valley Authority (TVA)

H. J. Green - Plant Superintendent
C. Cantrell - Outage Director
T. P. Bragg - QA Staff Supervisor
J. Morgan - Safety Engineer
J. Bryant - Safety Engineer
B. Campbell - Boilermaker Foreman
T. Jordan - Assistant Shift Engineer
J. Glover - Training Coordinator
G. Brown - Assistant Shift Engineer
R. Carpenter - Assistant Unit Operator
A. Webb - Assistant Unit Operator
J. Putman - Fire Watch
J. G. Dewease - Assistant Plant Superintendent

2. Drywell Fire - Unit 1

At 11:00 a.m. on May 5, 1976, the licensee informed a Region II inspector by telephone, that a small fire had occurred in the drywell of Unit 1 at approximately 12 noon on May 4, 1976. The fire was declared out at approximately 12:40 p.m. Two Region II inspectors arrived on site at approximately noon on May 6, 1976.

a. Sequence of Events

The following sequence of events was developed from discussions with plant personnel and reviews of shift personnel logbooks and internal documents:

May 4, 1976

7:00 a.m.	A boilermaker foreman entered Unit No. 1 drywell to inspect work area 563' elevation prior to obtaining a cutting, welding and open flame work permit. He did not log his time of entry into or departure from the drywell (See paragraph 2.g., "Procedures"). He did not go to the level (549' elevation) below the work area to survey for combustible material. He did not say that he made a survey of the 585' elevation although the permit called for work at that elevation. (See paragraph 2.g., "Procedures")
8:00 - 11:45 a.m.	Workers were in the Unit 1 drywell at the 563' elevation modifying floor grating. At 11:45 a.m. the workers left the drywell.
Noon	The roving fire watch was informed by an unidentified person that there was smoke in the Unit 1 reactor building. He attempted to call the Shift Engineer (SE) and was unable to do so; he then called the Unit Operator (UO) for Unit 1 and requested help in locating the source of the smoke.

12:15 p.m.	Two Assistant Unit Operators (AUO) and an Assistant Shift Engineer (ASE) were in Unit 1 Reactor Building and established that the location of the fire was in the drywell. An AUO dialed the fire number that initiates the fire alarm but no voice contact could be established even though the code call for "fire" was sounded. The UO in the control room announced a false alarm.
12:18 p.m.	The AUO successfully initiated the fire alarm and established voice contact with the control room to define the location of the fire. At this time, another AUO and an ASE were in the drywell and the AUO had located the fire at the lower level of the drywell. The Unit No. 1 UO secured the Reactor Protection System (RPS) and the Rod Position Indicating System (RPIS) to remove electrical power in the area of the fire. The fire was first reported to be an electrical fire because there were two extension cords in the fire zone; these cords were disconnected from the electrical outlet by an AUO. The first person to the fire described it as hot embers with very little flames. The firefighting equipment used was 1 dry chemical extinguisher, 4 CO_2 units. The material was then dispersed with a plank, that was at hand, and the coals were quenched with demineralized water supplied through a section of 3" ventilation hose that was available. Regular fire hose had been laid outside the drywell for use if it was required; a total of 150 feet had been connected and a man was stationed at the fire header valve.
12:50 p.m.	All clear was sounded.

b. Immediate Licensee Action

The Plant Superintendent initiated a survey program to determine the extent of the deposit of combustion products. A preliminary survey showed chloride contamination levels higher than the plant limit of 0.08 mg/d2 and a cleanup procedure was implemented on May 5, 1976.

The Plant Superintendent directed the Safety Engineers at the site to investigate the fire. This investigation was started on May 4 and continued through May 5. On May 6, a team made up of TVA personnel from outside the plant was formed to investigate the fire. The Plant Superintendent then directed his in-plant group to discontinue their investigation effort.

The Plant Superintendent issued an interim order that a fire watch will be required for all cutting, welding and open flame work permits issued for work in the restricted operating areas of the plant.

c. Subsequent Action

The findings and recommendation of the off-site investigative group were not available at the conclusion of the inspection. These will be reviewed during a future inspection.

d. Cause of Fire

The findings of the Safety Engineers are that the fire was started by slag or hot metal from modification of floor grating at the 563' elevation of the drywell. This slag or hot metal slid down an I-beam onto a pile of airline respirator hoses and extension cords. The inspector requested that the residue from the fire be retained for possible analyses.

e. Damage from Fire

The damage from the fire consisted of deposition of the combustion products over a limited area of the interior of the drywell and melting and charring of the exterior coating on some flexible conduit that contained the leads of the equipment drain sump level sensors. The operation of the level sensors was not impaired.

f. Inspector Observation at Site of Fire

The area at the 563' elevation was viewed and the inspector observed scaffolding and wooden planks below the area defined

as the work area. The inspector was informed that this scaffolding was observed in this position immediately after the fire. The doorway where the fire occurred could not be seen from the defined work area on the 563' elevation. There was a cable tray with small, 2 to 5 inch, gaps in the cover plates under the work area.

g. Procedures

Procedure BFM8, "Cutting, Welding, and Open-Flame Permit" requires that a survey of the work area shall be performed prior to obtaining a work permit. The foreman did not state that he surveyed the 585' elevation although this level was specified on the work permit. The foreman stated he did not survey the 549' elevation where the combustible material was located except to look down through the grating. He did not request a fire watch as required by Item 4 of the "Requirements - Division of Power Production" section of procedure BFM-8. These are considered examples of an item of noncompliance since he did not follow procedures as required by Section 6.3A of the Technical Specifications.

The foreman did not sign in or out on the Special Work Permit as required by Item 5c of the document entitled "Special Work Permit Procedures." Section III of Radiological Control Instruction No. 1 states "It is the duty of each employee to adhere to these procedures and protective measures...." This is another example of the item of noncompliance for not following procedures.

The foreman informed an inspector that he had never seen a complete copy of BFM8; he was aware of only the form that is required for welding, cutting, or open flame work. The licensee stated that, in the future, the foreman will be informed of procedures and practices in a more controlled manner rather than relying on the informal program that has been used in the past.

h. Review of Cutting, Welding and Open Flame Permits

The inspectors reviewed the cutting, welding and open flame permits required for work in the drywells to determine how many times a fire watch had been requested. The review covered the period from April 1, 1976 to May 4, 1976. Thirty permits were reviewed and twenty of them did not have a fire watch assigned. Of the nine supervisors identified, 4 always requested a fire watch, 4 never requested a fire watch and the remaining supervisor requested a fire watch for one time out of five different jobs.

Since May 5, all permits that were reviewed had fire watches assigned; this demonstrates adherence to the interim order issued by the Plant Superintendent.

i. Communications

Since the inspectors learned from interviews with licensee representatives that the telephone/fire alarm system did not function properly on the day of the fire, the inspectors made an attempt to determine the weakness in the system. The inspectors met with electrical technicians who had confirmed the operability of all "PAX" telephones that could have initiated the first fire alarm that was considered a false alarm. The inspectors were informed that of the four telephones that were checked out, one was inoperable due to a loose wire and another had a bad receiver. The inspectors expressed to management the need for a periodic performance check of the telephone system, especially since it is used to actuate the fire alarm. The licensee stated that the present conditions at the plant have resulted in a temporary overloading of the communications system. This overload condition will be alleviated when the construction forces leave the site.

j. History of Recent Fires

The Shift Engineer Journal (log) was examined for the period from March 22, 1975 through May 4, 1976, to review all entries of reported fires at the facility during restoration work. The appropriate Assistant Shift Engineer's Journal was also examined to obtain additional information relative to the identified fires. There is no other formal record of fire reporting, investigating or instituting corrective action. The above journal entries were brief and provided little information beyond the immediate response required to extinguish the fire and the required cleanup. The inspector was informed that the lack of formal reporting was not reflective of the considerable management involvement in the review of each fire.

Since the March 22, 1975 fire, there were 8 recorded small fires which could be considered associated with construction or restoration related activity on Units 1 and 2. The following lists those reported in the journals except the fire of 5/4/76 which is described in above sections in detail:

(1) 10/26/75 - Small trash fire in Unit 2 reactor building at elevation 593' caused by worker dropping cigarette on dry mop. Dry chemical fire extinguisher used to put out fire.

(2) 10/28/75 - Small fire in ring header in Unit 2 torus. Fire alarm was initiated. Pieces of scaffolding in header had ignited. (Inspector had been verbally informed that weld heat-treating was in progress). Scaffolding was extinguished and then removed.

(3) 11/1/75 - Rope and trash in the Unit 2 torus ignited from welding sparks. A can of dye penetrant exploded. Personnel in the torus used portable extinguishers to put out the fire. Trash was removed in a welding bucket.

(4) 11/17/75 - Smoldering rags observed near "D" RHR motor in Unit 1. Fire alarm sounded. Fire put out by personnel on the job. Cause attributed to hot metal from cutting work.

(5) 12/2/75 - Coveralls in Unit 1 drywell ignited by welder's sparks. Smoldering coveralls were removed from the drywell and doused with water.

(6) 12/9/75 - Smoldering fire located in Unit 1 drywell near B recirculation pump. Metal from cutting above ignited duct tape and plastic giving off bad odor.

(7) 1/28/76 - In the Unit 1 drywell a welding cable grounded causing a four inch section of insulation on the cable to burn. The fire alarm was sounded. No damage reported.

Not included in the above list was the auxiliary boiler stack fire of 9/18/75 which was the subject of an earlier TVA press release.

k. In-plant Quality Assurance Survey

The in-plant QA staff has conducted surveys of the implementation of the TVA procedures which established the fire watch patrols during the restoration program and the implementation of the added controls on welding and open flame work which were initiated 6/26/75. The implementation of these added controls were by Standard Practices BFS28, Fire Attendants, and BFM8, Cutting, Welding, and Open-Flame Work Permit.

Surveys (as distinguished from the audits conducted by the Office of Power QA staff) were performed as follows:

(1) BFS 28

9/8/75
1/26/76

(2) BFM 8

12/11/75
12/31/75
2/12/76
3/16/76
4/5/76

The records of the surveys were examined and discussions were held with three members of the QA staff involved in the surveys.

The first survey of the fire watch program identified some unsatisfactory areas in that personnel assigned fire watch detail were not performing all assigned duties nor were they always wearing the proper fire watch identification. The second survey showed considerable improvement and did not identify any unsatisfactory areas.

The first survey of implementation of BFM 8 (welding permit) performed on 12/11/75 indicated considerable deficiencies in the use of the welding permit as well as in the procedure itself. BFM8 was revised on 12/19/75, apparently as a result of this survey, to correct identified shortcomings. The revision required that the work location be specifically identified and limited the period of work authorization to a single shift with the provision that the permit could be extended one additional shift upon proper authorization. The revision also defined the duties and responsibilities of the fire watch more clearly.

A followup survey of BFM8 was made on 12/31/75, to check implementation of recent revisions and correction of identified deficiencies. The survey results indicated improvement but some provisions were still not being fully implemented. Another survey on 2/12/76 did not reveal any unsatisfactory areas in the use of the permits except for some laxity in the disposition of the paperwork. The surveys on 3/16/76 and 4/5/76 did not identify any unsatisfactory areas in the application of BFM8 procedures.

DETAILS II

Prepared by: R. F. Sullivan, Reactor Inspector — 6/3/76 Date
Reactor Projects Section No. 1
Reactor Operations and Nuclear Support Branch

Date of Management Meeting: May 13, 1976

Reviewed by: W. C. Seidle, Chief — 6/3/76 Date
Reactor Projects Section No. 1
Reactor Operations and Nuclear Support Branch

1. Persons Attending

TVA

J. E. Gilleland - Assistant Manager of Power
J. R. Calhoun - Chief, Nuclear Generation Branch
J. L. Currie - Supervisor, Safety Engineering Services

NRC

D. Thompson - IE, HQ
T. V. Wambach - DOR, HQ
N. C. Moseley - IE, Region II
F. J. Long - IE, Region II
W. C. Seidle - IE, Region II
H. A. Wilber - IE, Region II
R. F. Sullivan - IE, Region II

2. Management Meeting

Members of TVA management met with NRC representatives in the IE Region II office in Atlanta on May 13, 1976, to discuss findings of the IE inspectors relating to the Unit 1 drywell fire of May 4, 1976.

The results of the inspection were discussed as were the IE expressed concerns relative to the circumstances comprising the noncompliance and other identified weaknesses. The specific IE concerns included the following:

a. The noncompliance for failure to adhere to procedures based on the several examples noted by the inspectors.

b. Foreman and craft personnel not having adequate training in or familiarity with the contents and requirements of BFM8 and SWP procedures.

c. Apparent inconsistencies among foremen on whether or not a fire watch was required for cutting and welding work in the drywell. Some appeared to give inadequate attention to work area surveys prior to and after welding or cutting, the need to remove or cover flammable material and the use of qualified fire watch.

d. Lack of formal reporting and review procedures for fires, even though small.

e. Overload of the plant phone system during the balance of restoration work activities and plans to improve reliability when plant returns to operating status.

TVA's initial reaction was that shortcomings in the implementation of BFM8 had been recognized last December and that positive management action was taken and resulted in a great improvement. IE acknowledged that the improvement had taken place but felt there was need for further improvement relating to BFM8 and the other identified areas as evidenced by the inspector's findings. TVA stated that the IE concerns were understood and would receive prompt consideration and attention by TVA. IE indicated that prompt followup inspection and review would be made of actions taken to strengthen the areas discussed.