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

Report Nos.: 50-259/84-17, 50-260/84-17, and 50-296/84-17

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

Docket Nos.: 50-259, 50-260 and 50-296

License Nos.: DPR-33, DPR-52, and DPR-68

Facility Name: Browns Ferry

Inspection Date: May 8 - 11, 1984

Inspection at Browns Ferry site near Decatur, Alabama

Inspectors: _____ 6/1/84
P. M. Madden Date Signed

_____ 6/1/84
W. H. Miller, Jr. Date Signed

Approved by: _____ 6-1-84
T. E. Conlon, Section Chief Date Signed
Engineering Branch
Division of Reactor Safety

SUMMARY

Area Inspected

This routine, announced inspection involved 52 inspector-hours on site in the area of fire protection/prevention.

Results

Of the area inspected, one apparent violation was found (Failure to follow fire prevention procedures for control of temporary fire loads - paragraph 5.d). No apparent deviations were found.

REPORT DETAILS

1. Persons Contacted

*J. R. Pittman, Asst. Plant Superintendent
*J. E. Swindell, Asst. Plant Superintendent
*J. B. Walker, Compliance
*J. R. Harkleroad, Fire Protection Engineer
*R. E. Thompson, Supervisor Fire Protection Engineer
*S. B. Logan, Safety
*C. J. Rozear, Compliance
D. Thompson, Electrical Maintenance
*R. Westbrook, Fire Protection Engineer
D. Ricketts, Instrumentation

NRC Resident Inspectors

*G. L. Paulk
*C. A. Patterson

2. Exit Interview

The inspection scope and findings were summarized on May 11, 1984, with those persons indicated in paragraph 1 above. The licensee acknowledged the following inspection findings:

a. Inspector Followup Item (259, 260, and 296/84-17-01) Deluge Valve Trim Set Discrepancies - paragraph 5.a.(1).

b. Inspector Followup Item (259, 260 and 296/84-17-02) Blocked Manual Deluge Valve Actuation Stations - paragraph 5.a.(2).

c. Inspector Followup Item (259, 260 and 296/84-17-03), Inadequate Deluge Valve Test Trip Pressure - paragraph 5.a.(3).

d. Unresolved Item (259, 260 and 296/84-17-04), Unsupervised Sprinkler System and Fire Pump Actuation Circuits - paragraph 5.a.(4).

e. Unresolved Item (259, 260 and 296/84-17-05), Unsupervised Carbon Dioxide System Actuation Circuits - paragraph 5.b.

f. Inspector Followup Item (259, 260 and 296/84-17-06), Diesel Driven Fire Pump Capacity Test - paragraph 5.c.(2).

g. Inspector Followup Item (259, 260, and 296/84-17-07), Licensee to Review Diesel Fire Pump Starting Contactors and IE Circular 79-13 - paragraph 5.c.(2).

h. Violation Item (259, 260 and 296/84-17-08), Failure to Follow Fire Prevention Procedures for Control of Temporary Fire Load - paragraph 5.d.

i. Unresolved Item (259, 260, and 296/84 17-09), Inadequate Onsite Foam Capabilities - paragraph 5.f.

3. Licensee Action on Previous Enforcement Matters

a. (Closed) Deviation Item (259, 260 and 296/81-01-05), Use of Unapproved Automatic Activated Deluge Valves in the HPCI Fire Protection Sprinkler Systems. Approved type deluge valves have been installed for the HPCI fire protection systems. This item is closed.

b. (Closed) Violation Item (259, 260 and 296/81-01-06), Failure to Follow Fire Protection Procedures. This violation involved the failure to meet site procedures for fire brigade drills and protection of electrical cables with a fire retardant coating. Previous inspection Report Nos. 50-259, 260 and 296/81-23 reviewed TVA's corrective action taken on the deficient fire brigade drills and found this action satisfactory. During this recent inspection, a review was made of a number of cable trays throughout the plant. The licensee stated that the plant policy is to limit the total number of uncoated cables per tray to not more than ten. Within the cable trays inspected, none contained more than ten uncoated cables and most cable trays contained all coated cables. Therefore, this item is closed.

c. (Open) Unresolved Item (259, 260 and 296/81-01-09), Corrective Action To Be Taken on Triennial Fire Protection Audit. Most of the maintenance and procedure change items in the audit have been corrected. A number of items requiring modifications are to be corrected during the modifications proposed to meet the requirements of 10 CFR 50 Appendix R. However, several items are not to be corrected. These include the following audit item numbers which are considered by the inspectors to be significant deficiencies:

- 4.2.3 Operability test is not to be conducted on fire dampers.

- 4.3.2 Standard fire pump controllers are not to be provided. Region II inspectors are concerned by the lack of supervised fire pump starting circuits.

- 4.3.4 Below grade key operated isolation valves are not to be replaced with direct indicating type valves.

- 4.3.17 Sprinkler, water spray and pre-action system control valves are not to be supervised in the correct alignment by sealing or locking valves in the correct position.

- 4.3.20 Pre-action type sprinkler systems with over 20 heads are not to be provided with air supervision.

Therefore, this item remains open, pending resolution by NRR.

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. 5.a.(4), 5.b., and 5.f.

5. Protection/Prevention Program (64704)

Presently, TVA has assigned a joint task force from several management groups which are reviewing the total Browns Ferry Fire Protection Program. The fixed fire protection systems are being evaluated to verify that these systems are in conformance with the "as constructed" drawings. The surveillance procedures for the fire protection systems are being evaluated to assure that these procedures are of sufficient detail and adequate to meet the full intent of the inspection, test and maintenance requirements of the Technical Specifications. The results of these reviews will be evaluated during subsequent NRC inspections of the licensee's fire protection program. However, during this inspection the following fire protection features were evaluated:

a. Water Spray and Pre-Action Sprinkler Systems

An inspection of cable tray water spray fire suppression system nos. 1-26-79N, 1-26-79P, 1-26-79Q, 1-26-74B, and 1-26-74C and pre-action sprinkler system no. 1-26-77, which compared the above installed systems to "as constructed" mechanical fire protection logic diagram no. 47W611-26-6 and fire protection and raw service water flow diagram nos. 47W850-4, 47W850-5, 47W850-6 and 47W850-7, was performed. The following items were identified:

(1) The installed water spray and pre-action deluge valve trim set assemblies are not in conformance with the design conditions of the "as constructed" drawings or the manufacturer's recommended trim set configuration. However, the installed water spray and pre-action deluge valve trim set assemblies should perform their intended design functions and meet the intent of the manufacturer's recommendations and NFPA requirements. However, consideration should be given to incorporate the following items into the Browns Ferry Systems Review Program presently being conducted:

- Verify that all water spray and pre-action deluge valve trim set and trim valve arrangements conform to manufacturer's requirements

- Revise the applicable "as-constructed" drawings to reflect the as installed system conditions

- Revise the water spray and pre-action sprinkler system surveillance procedures as necessary, to assure that all trim valves will be aligned in the correct position

The above items are identified as Inspector Followup Item (259, 260 and 296/84-17-01), Deluge Valve Trim Set Discrepancies.

(2) The manual deluge valve actuation stations associated with cable tray water spray fire suppression system nos. 1-26-74B and 1-26-74C are blocked by fire detection panel 1-25-281A in such a manner that if a cable tray fire were to occur and manual actuation of these systems were required the manual deluge valve actuation stations would not be readily accessible to plant operations and/or firefighting personnel. The inspectors suggested that the manual deluge valve actuation stations for the water spray and pre-action sprinkler systems be arranged so that these manual stations are readily accessible. This item is identified as Inspector Followup Item (259, 260, and 296/84-17-02), Blocked Manual Deluge Valve Actuation Stations.

(3) The surveillance procedures associated with the cable tray water spray fire suppression systems are currently testing the tripping of the deluge valves by utilizing air pressure. The licensee indicated that approximately 75 psi is used to perform the deluge valve trip test in lieu of the normal system water pressure of 140 psi. An evaluation of the air test method should be made by the licensee to determine if the test results utilizing this arrangement will duplicate the test results of a water test method utilizing a water pressure of 140 psi. This is identified as Inspector Followup Item (259, 260, and 296/84-17-03), Inadequate Deluge Valve Test Trip Pressure.

(4) The cable tray water spray fire suppression systems are actuated by unsupervised circuits. The actuation circuit conductors between the fire detection/suppression system actuation control panel, the deluge valve release solenoid valve, and the fire pumps are not supervised for conductor integrity. NFPA-15, Water Spray Fixed System, Section 8-5, Arrangement and Supervision of Systems, paragraph 8-5.2 requires that "Water spray systems which depend for operation on electric thermostats, relay circuits, flammable gas detectors or other similar equipment shall be so arranged that such equipment is normally energized, or completely supervised in a manner that will result in positive notifications of an abnormal condition unless failure of the detection system results in the operation of the water spray system."

An abnormal condition in the water spray system actuation circuit or the fire pump start circuit conductors which interrupts the circuit integrity may render the affected water spray system inoperable. Surveillance of these circuits and conductors is presently being conducted on a yearly basis. This item is

identified as Unresolved Item (259, 260, and 296/84-17-04) Unsupervised Sprinkler System and Fire Pump Actuation Circuits, pending disposition by NRR.

b. Carbon Dioxide Fire Suppression System

An inspection of the Carbon Dioxide Fire Suppression System which protect the Units 1, 2, and 3 diesel generator rooms was made. This inspection compared the installed carbon dioxide fire suppression system to "as constructed" mechanical fire protection logic Diagram 47W611-26-4 and carbon dioxide storage, fire protection, and purging system flow Diagram 47W843-1 and the following item was identified:

- The fire detection or the alarm initiating circuits which actuates the appropriate diesel generator room carbon dioxide fire suppression system works on a two out of three heat detector zone logic. These alarm initiating circuits, which provide actuation input to the fire detection/carbon dioxide suppression system actuation panel and the actuation circuits from the panel to the affected carbon dioxide release solenoid valves are not electrically supervised for conductor/circuit integrity. In addition, the main system disarming switch for each diesel generator carbon dioxide is not electrically supervised or controlled by locking the switch in the automatic or "ON" position. The lack of proper electrical supervision for the alarm initiating circuits and the system actuation circuits could impact and reduce the reliability of the carbon dioxide system to perform its intended primary fire suppression function in the event of a fire condition. The licensee was requested to do an evaluation to determine if additional system surveillance is required in order to increase the reliability of the automatic carbon dioxide fire suppression systems. This is identified as Unresolved Item (259, 260 and 296/84-17-05), Unsupervised Carbon Dioxide System Activation Circuits. Disposition of this item is pending the results of the licensee's evaluation.

c. Surveillance of Fire Protection Systems

The inspectors reviewed the following surveillance inspection and test records for the dates indicated. The record data was satisfactory except where noted:

(1) SI 4.11.A.1.b, Motor Driven Fire Pump Operability Check (Monthly)

September 1983 through March 1984. Fire pump No. C was out of service from maintenance (Tag out No. 83-2201) from December 13, 1983 through April 1984; however, a sufficient number of pumps were operable to meet the Technical Specifications.

(2) SI 4.11.A.1.b.(a) Diesel Driven Fire Pump Operability Check (Monthly)

September 1983 through March 1984. The diesel engine for the pump was replaced in March 1984 by an engine from another TVA site. An operational full load capacity test was not conducted on this pump and engine assembly following this modification. The inspectors suggested that a capacity test be conducted on this pump as soon as practicable. This is identified as Inspector Followup Item (259, 260 and 296/84-17-06). Diesel Driven Fire Pump Capacity Test, and will be reviewed during a subsequent NRC inspection.

The replacement diesel engine is a Cumming engine. Some of these manufacturer's engines contained defective starting contactors which were reported by IE Circular No. 79-13. The inspectors suggested that the licensee investigate to determine if the circular is applicable to this replacement engine. This is identified as Inspector Followup Item (259, 260 and 296/84-17-07), Licensee to Review Diesel Fire Pump Starting Contactors and IE Circulars 79-13. Licensee's investigation will be evaluated during a subsequent NRC inspection.

(3) SI 4.11.A.1.d, Motor Driven Fire Pump Capability Test (3 Year - Pumps A, B, and C)

January 19, 1979 and February 5, 1982

(4) SI 4.11.A.1.d.(a) Diesel Driven Fire Pump Capability Test (3 Year)

November 22, 1978 and January 12, 1982

Last test was within 25% grace period permitted by the Technical Specifications. However, pump should be retested at present time to verify that the pump with new engine will meet the required capacity rate. Refer to above paragraph 5.C.(2).

(5) SP-BF14.48, Fire Rated Door Inspection and Maintenance (Daily)

April 1 through May 8, 1984

(6) SI 4.11.E.1, Fire Door Semi-Annual Inspection

May 17, and December 2, 1983

(7) SI 4.11.E.2, Fire Damper Inspection (18 months)

May 18, 1983. This was only a visual inspection and did not include an operability test. Refer to above item 3.c.

d. Control of Combustibles

While touring the plant, the inspectors noted an accumulation of combustible packing materials associated with a new computer occupancy for Room 458 in the control building. This room is adjacent to the shutdown board room and battery room No. 1A. The storage of combustible within this area presents an exposure fire hazard to these rooms. TVA Standard Practice BF 14.19, Temporary Fire Loads, requires the control of temporary fire loads in the plant to assure protection of safety-related equipment, and facilities needed for generating capability. This procedure requires an evaluation to be made to assure that the temporary fire loads will not exceed the capability of the permanently installed fire protection systems. Temporary fire loads are only authorized after an evaluation has been made and Permit Form BF-35 has been posted in the area. On the date of this inspection, a temporary fire load evaluation had not been made for the storage of combustibles and equipment within Room 458. This is identified as Violation Item (259, 260 and 296/84-17-08), Failure to Follow Fire Prevention Procedures for Control of Temporary Fire Loads.

e. Calibration of Fire Protection Gages

A review was made of the calibration records for the gages on the carbon dioxide system fire suppression system for the Units 1 and 2 and Unit 3 diesel generator buildings. These gages are on a yearly calibration schedule. Units 1 and 2 gages PI 39-1 and LIS 39-2 were last calibrated in September 1983. Unit 3 gages PI 39-34 and LIS 39-33 were last calibrated in February 1983 but are scheduled to be recalibrated by the end of May 1984. This will fall within the maximum time permitted by the licensee's procedures. It appears that this program for the fire protection instruments is satisfactory.

f. Foam Fire Suppression Capabilities for Aboveground Diesel Fuel Storage Facility

In a December 30, 1981 letter from Mr. L. M. Mills of TVA to Mr. Harold R. Denton, Director, Office of Nuclear Reactor Regulation, TVA indicated that having a fully equipped fire department pumper onsite is equal or superior to having an aid agreement with an offsite fire department to supply fire fighting assistance. An inspection was made to determine if there was sufficient quantity of AFFF foam concentrate and if the required manual firefighting equipment necessary to control and suppress a fire involving the aboveground No. 2 diesel fuel storage facility was onsite.

The aboveground diesel fuel storage facility consists of two 27 ft. 6 in. diameter by 16 ft. high cone roof storage tanks. These tanks sit in a common dike having an area of approximately 7000 square feet. In order to control and suppress a fire which involves the dike area, a foam solution flow rate of 700 gpm would be required to be applied for a 50 minute duration. Therefore, to suppress a fire of this magnitude

would require approximately 1050 gallons of 3% AFFF foam concentrate and eight 95 gpm 1½ inch manual foam hose lines flowing their rated foam capacity for the foam discharge duration. The foam capabilities currently onsite consists of 75 gallons of 3% AFFF foam concentrate and three 95 gpm foam nozzles and compatible in-line foam inductors.

Without an offsite fire department agreement, it may be difficult for TVA to provide the adequate foam capabilities, firefighting equipment and sufficient trained manpower to control and suppress an aboveground diesel fuel tank/dike fire and protect adjacent exposed structures and equipment. This item is identified as Unresolved Item (259, 260, and 296/84-17-09), Inadequate Onsite Foam Capabilities, pending disposition by NRR.

Except as noted above, no additional violations or deviations were identified within the areas examined.