



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA ST., N.W., SUITE 3100  
ATLANTA, GEORGIA 30303

Report Nos. 50-259/80-34, 50-260/80-27, and 50-296/80-28

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

Facility Name: Browns Ferry Nuclear Plant

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

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

Inspection at Browns Ferry Site near Athens, Alabama

Inspectors:	<u>G. A. Taylor for</u>	<u>9-30-80</u>
	R. F. Sullivan	Date Signed
	<u>G. A. Taylor for</u>	<u>9-30-80</u>
	J. W. Chase	Date Signed
Approved by:	<u>H. C. Dance</u>	<u>10-7-80</u>
	H. C. Dance, Section Chief, RONS Branch	Date Signed

SUMMARY

Inspection on August 1 to August 31, 1980

Areas Inspected

This routine inspection involved 130 resident inspector-hours in the areas of operational safety, IE Bulletin follow-up, IE Circular followup, reportable occurrences, reactor trip follow-up, plant physical protection, maintenance, fire protection, core physics and organization.

Results

Of the 10 areas inspected, no items of noncompliance or deviations were found in 8 areas; one apparent item of noncompliance and one apparent deviation was found in 2 areas (Infraction - failure to provide a continuous fire watch in the cable spreading rooms with the carbon dioxide system inoperable, paragraph 13; Deviation - failure to monitor scram discharge header level every 30 minutes as committed to in response to IEB 80-17 Supplement 1).

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## DETAILS

### 1. Persons Contacted

#### Licensee Employees

H. L. Abercrombie, Plant Manager  
J. L. Harness, Assistant Plant Manager  
J. B. Studdard, Operations Supervisor  
R. Hunkapillar, Assistant Operations Supervisor  
J. A. Teague, Maintenance Supervisor, Electrical  
M. A. Haney, Maintenance Supervisor, Mechanical  
J. R. Pittman, Maintenance Supervisor, Instruments  
R. G. Metke, Results Section Supervisor  
R. T. Smith, QA Supervisor  
R. J. E. Swindell, Outage Director  
B. Howard, Plant Health Physicist  
R. Cole, QA Site Representative Office of Power

Other licensee employees contacted included licensed senior reactor operators and reactor operators, auxiliary operators, craftsmen, technicians, public safety officers, QA personnel and engineering personnel.

### 2. Management Interviews

Management interviews were conducted on August 15, 22, and 29, 1980 with the Plant Manager and selected members of his staff. The inspectors summarized the scope and findings of their inspection activities. The licensee was informed that one apparent item of noncompliance and one apparent deviation was identified during this report period.

### 3. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (259/80-14-01): Incomplete High Pressure Coolant Injection (HPCI) system piping and restraints work. The inspectors have verified by review of records, observation of work performed and interviews with licensee representatives that the following actions have been taken on Unit 1 HPCI piping:

- a. IEB 79-14 re-inspection was performed.
- b. IEB 79-02 inspection of support RI was completed.
- c. The heated areas had been liquid penetrant tested.
- d. The heated areas had been ultrasonically tested.
- e. The welds adjacent to the heated areas had been magnetic particle inspected.
- f. A hardness test had been performed.
- g. A metallographic test had been performed on the heated areas.
- h. The piping had been hydrostatically tested.
- i. QA had written a corrective action report.
- j. QC coverage was provided for the repair activities, inspections and testing.

(Closed) Infraction (296/79-36-01): Failure to adequately lock mode switch in refueling position. By review of refueling procedures and observations, the inspectors found that when the mode switch is in the refuel position for refueling, the key for the mode switch is removed from the switch and stowed in the Shift Engineers office.

#### 4. Unresolved Items

Unresolved items were not identified during this report period.

#### 5. Operational Safety

The inspectors kept informed on a daily basis of the overall plant status and any significant safety matters related to plant operations. Daily discussions were held each morning with plant management and various members of the plant operating staff.

The inspectors made frequent visits to the control room such that each was visited at least daily when an inspector was on site. Observations included instrument readings, setpoints and recordings; status of operating systems; status and alignments of emergency standby systems; purpose of temporary tags on equipment controls and switches; annunciator alarms; adherence to procedures; adherence to limiting conditions for operations; temporary alternations in effect; daily journals and data sheet entries; and control room manning. This inspection activity also included numerous informal discussions with operators and their supervisors.

General plant tours were conducted on at least a weekly basis. Portions of the turbine building, each reactor building and outside areas were visited. Observations included valve positions and system alignment; snubber and hanger conditions; instrument readings; housekeeping; radiation area controls; tag controls on equipment; work activities in progress; vital area controls; personnel badging, personnel search and escort; and vehicle search and escort. Informal discussions were held with selected plant personnel in their functional areas during these tours.

On August 15, 1980 at approximately 11:00 a.m. the Residual Heat Removal (RHR) 2C heat exchanger for Unit 2 was declared inoperable in the Low Pressure Coolant Injection (LPCI) and containment cooling modes because of a possible leak from the primary side of the RHR heat exchanger to the service water side. At 1:27 p.m., about an hour following equipment surveillance, the effluent in-line monitor for the 2B RHR heat exchanger alarmed. The 2B RHR heat exchanger was not operating but was available for service. The chemical laboratory personnel were notified to obtain a sample of the 2B RHR heat exchanger service water and analyze for radioactivity in the water.

At 3:35 p.m., the chemical laboratory personnel reported that the sample showed 43 times maximum permissible concentration (MPC) predominately Iodine 131. At this time a liquid release alert was declared and an administrative hold was placed on the 2B RHR heat exchanger. The inspectors were notified by the licensee and came to the site to followup on the

alert. At 9:00 p.m. the inspectors were informed that a third sample showed activity levels to be 63 x MPC. The 2B RHR heat exchanger at this time was not tagged out and was still under an administrative hold. After the inspectors reviewed the event with the plant manager, the 2B RHR heat exchanger was declared inoperable in the containment cooling mode and tagged out (approximately 7 hours elapsed after the first sample confirmed the heat exchanger had a primary to service water leak). The licensee secured from the liquid release alert upon confirming that no activity had been discharged to the Tennessee River since the service water discharge valve from 2B RHR heat exchanger had been closed and surveys downstream of the valve showed no activity. Subsequently, the licensee stated that additional guidance would be provided to assist in determining system operability following such abnormal indications (260/80-27-02).

On August 21, 1980 the inspectors noted that the UT recorders for monitoring the level in the scram discharge volumes had not been reviewed for one hour and 15 minutes for all 3 units. This is contrary to TVA's commitment to the NRC in that TVA's response to IE Bulletin 80-17 Supplement 1 commits to reviewing the UT recorders data every 30 minutes.

On August 22, 1980, the inspectors informed the licensee that this was an apparent deviation from a commitment (259/80-34-02, 260/80-27-03, 296/80-28-02). The licensee accepted the findings and stated the following actions had been taken:

- a. The UT recorder data checks were returned immediately to 30 minutes intervals as per the commitment to the NRC. All Shift Engineers, Assistant Shift Engineers, Unit Operators, Auxiliary Unit Operators and student operators received a letter stressing the importance of reviewing the UT recorder data every 30 minutes.
- b. The Auxiliary Unit Operators monitoring the UT recorders did not have a specific person to report to while they were on duty. The Unit 3 Shift Engineer has now been designated as the person in charge of assuring the AUO gets his readings on the UT recorders.
- c. Full compliance to the commitment was achieved on August 22, 1980.

The inspectors had no further questions in this area and are satisfied with the licensee's response. Therefore deviation 259/80-34-02, 260/80-27-03 and 296/80-28-02 is closed.

#### 6. Reportable Occurrences

The below listed licensee event reports (LERs) were reviewed to determine if the information provided met NRC reporting requirements. The determination included adequacy of event description and corrective action taken or planned, existence of potential generic problems and the relative safety significance of each event. Additional inplant reviews and discussion with plant personnel as appropriate were conducted for those reports indicated by an asterisk.

<u>LER No.</u>	<u>Date</u>	<u>Event</u>
259/7925 Rev. 1	7/10/80	Main steam lines not isolated when required
259/8017	3/5/80	Seismic support of sump discharge line inadequate
*259/8026	8/8/80	HPCI stop valve failed to open fully
259/8053	8/1/80	Linear heat generation rate exceeded limit in three nodes.
259/8055	8/6/80	HPCI valve to condenser stuck closed.
*260/8028	7/28/80	Lost power to 2A 480V MOV board.
*260/8027	8/8/80	Main steam line isolation valve limit switch failed.
260/8028	8/13/80	Core spray discharge pressure switch outside limits.
260/8029	8/20/80	Reactor low water level switch outside limits
*296/8024 Rev. 1	7/18/80 7/28/80	Failure of 76 control rods to fully insert
*296/8026	8/11/80	RCIC minimum flow bypass valve failed to fully close.
*296/8027	8/18/80	D RHR pump tripped on overcurrent

Within the areas reviewed no items of noncompliance or deviations were identified.

#### 7. Maintenance Observation

While performing Unit 1 individual control rod scrams on July 19, 1980, the three gallon high level alarm failed to clear. This alarm is located on the Scram Discharge Volume Instrument Tank (SDVIT). A UT measurement of the SDVIT showed approximately 7 gallons of water being retained. This water was drained by removing a 3/4" drain plug on the instrument line to the 3-gallon alarm switch.

Two other instances of water being retained in the SDVIT occurred on August 1, and August 5. These instances were different from the July 19, occurrence in that no operations were conducted to account for water to accumulate in the SDVIT. The cause of water accumulating in the SDVIT was attributed to the Reactor Water Cleanup system maintenance valve leaking steam past its seat to the Reactor Building Equipment Drain System (RBED). The vents

lines from the Scram Discharge Volume (SDV) and the drain line from the SDVIT tie into the RBED system. This arrangement allowed the steam from the leaking valve to collect in the SDV. When the steam condensed a negative pressure was created and the condensate was retained in the SDVIT.

TVA conducted a test which showed that loop seals could be formed in the vent and drain piping. TVA's calculations indicated that a maximum of 14 inches of water could be retained in the SDVIT.

On August 7, TVA cut all the SDV vent lines that connect to the RBED system and has direct SDV vents to the open floor drains. The inspectors observed portions of the test procedure (STR 80-18), the cutting of the vent lines, reviewed the work package for rerouting of the vent lines. No further occurrences have occurred since this work was accomplished.

No items of noncompliance or deviations were identified within the areas inspected.

#### 8. Reactor Trips

The inspectors reviewed activities associated with the below listed reactor trips during this report period. The review included determination of cause, safety significance, performance of personnel and systems, and corrective actions. The inspectors examined instrument recordings, computer printouts, operations journal entries, scram reports and had discussions with operations, maintenance and engineering support personnel as appropriate.

On 7/27/80 at 2:01 a.m. Unit 2 manual reactor trip was performed from low power in accordance with requirement in IE Bulletin 80-17. Systems performed satisfactorily.

On 7/27/80 Unit 2 trip at 1:58 p.m. from low power in accordance with requirement in IE Bulletin 80-17. This was an automatic scram initiated by placing 2 Average Power Range Monitors (APRM) in the inoperable position. Systems performed satisfactorily.

On 7/28/80 Unit 2 manual trip was initiated at low power to effect repairs on the condensate system short cycle valve. Systems performed satisfactorily.

#### 9. Circular Review

Licensee action on the below listed circulars were reviewed to determine if the licensee evaluation and action taken was appropriate to satisfy the concerns described in the circulars. The review by the inspectors consisted of records, procedures and discussions with plant personnel. The circulars listed below are considered closed except for the one identified by an asterisk.

79-18	Proper Installation of target Rock Safety-Relief Valves
79-23	Motor starter and Contractors Failed to Operate
79-20	Type failure of GTE Sylvania Relay
79-19	Loose Lacking Devices on Ingersal-Rand Pump Impellers
79-22	Stroke Times for Power Operated Relief Valves
80-01	Service Advice for GE Induction Disc Relays
80-04	Securing of Threaded Devices on Safety Related Equipment

- \*80-08 Boiling Water Reactor (BWR) Technical Specification Inconsistency  
Reactor Protection System (RPS) Time Response. The inspectors  
review determined that there was no requirement to measure the  
time from sensor contact opening to and including scram solenoid  
relay contact opening. The inspector did find in the basis of  
the technical specification 290 milliseconds is allowed for this  
time period, yet the FSAR accident analysis is based on 200  
milliseconds. The inspectors informed the licensee that this  
circular will remain open pending resolution of this disparity.
- 80-15 Loss of Reactor Coolant Pump Cooling and Natural Circulation  
Cooldown

No items of noncompliance or deviations were identified by the inspectors  
in the above areas.

10. IE Bulletin Followup

A followup review was made of the licensee response to IE Bulletin 80-07,  
BWR Jet Pump Assembly Failure. The review consisted of examinations of  
Surveillance Procedures and records as well as discussions with outage  
personnel, nuclear engineers and operation personnel. The inspectors had  
no further questions on IEB 80-07, IEB 80-07 is closed.

11. Plant Physical Protection

During the course of routine inspection activities, the inspectors made  
observations of certain plant physical protection activities. These included  
personnel badging, personnel search and escort, vehicle search and escort,  
communications and vital area access control.

No items of noncompliance or deviations were identified within the areas  
inspected.

12. Plant Organization

On August 1, 1980, Mr. B. Howard relieved Mr. G. Bugg as Plant Health  
Physicist. Mr. G. Bugg has been transferred to TVA's Muscle Shoals Health  
Physicist Headquarters. The inspectors reviewed the qualification of  
Mr. B. Howard and find them to be compatible with Reg. Guide 1.8.

13. Fire Protection

On August 5, 1980 the facilities carbon dioxide (CO<sub>2</sub>) system was isolated  
for repair of a solenoid valve. This deactivated the automatic CO<sub>2</sub> protec-  
tion system throughout the plant with the exception of Unit 3 diesel rooms.  
At 1100 hours on August 5, the inspectors toured Units 1, 2 and 3 cable  
spreading rooms to ensure that the licensee was complying with Technical  
Specification 3.11.B.4 which requires a continuous fire watch if the CO<sub>2</sub>  
system is inoperative. The inspectors could find no continuous fire watch  
posted in or around the cable spreading rooms. At approximately 11:30 a.m.,  
the inspectors and a Senior Reactor Operator (SRO) toured the cable spreading  
rooms and no continuous fire watch could be found.

The SRO stated that because laborers do not have key cards to enter the cable spreading rooms, he notified Public Security Officer (PSO) to perform the fire watch. The PSO personnel interpreted this to mean that they had to look in the cable spreading rooms every 20 to 30 minutes. The SRO immediately had the PSO personnel start continuous surveillance of the cable spreading rooms.

In addition, the inspectors discussed with a posted fire watch his duties when the CO<sub>2</sub> system is inoperative. The fire watch stated that he was to monitor the equipment rooms on the IC level to detect smoke coming out of the rooms and then turn in the fire alarm if any smoke is detected. Technical Specification 3.11.E.2 requires that if the automatic initiation logic is inoperable, a patrolling fire watch with portable fire equipment shall be established to ensure each area where protection is lost is checked hourly.

The fire watch had the portable fire equipment available but these would be of no use to him since he did not have a card key in which to enter the rooms if a fire existed. This was identified to the licensee by the inspectors and immediate action was initiated to issue the fire watch a key card.

Failure to provide a continuous fire watch in the cable spreading rooms with the CO<sub>2</sub> system inoperative is an apparent item of noncompliance (259/80-34-01, 260/80-27-01, 296/80-28-01) with Technical Specification 3.11.E.4 which requires a continuous fire watch to be posted if CO<sub>2</sub> fire protection is lost to the cable spreading rooms. The licensee was informed of the inspectors findings on August 5. The licensee took prompt corrective action to provide a continuous fire watch in the cable spreading rooms and to issue key cards to the posted fire watches.

#### 14. Unit Two Fuel Exposure

Plant nuclear engineers discussed on August 11, 1980 that one node in a fuel bundle had exceeded an average planar exposure of 30,000 Mwd/t which is the upper boundary given in the Technical Specifications for determining the maximum average planar linear heat generation rate (MAPLHGR). New values for exposures to 40,000 Mwd/t which had been provided by GE were incorporated in the process computer on August 12. Also on the same date the plant staff forwarded to the TVA Chattanooga office a proposed Technical Specification change for transmittal to NRR.

On August 11 a nuclear engineer started preparing a potential licensee event report which he considered to be in the 30 day report category. On the morning of August 13, 1980 the Assistant Plant Manager first became aware of the event and promptly notified the resident inspector and his management since he realized the current Technical Specifications did not cover exposures greater than 30,000 Mwd/T. Consultation with the Regional Office and NRR revealed that the GE data had previously been evaluated by NRR for another licensee and that continued operation while a Technical Specification change was being processed did not present a safety concern.

When licensee management became aware of the event, they took prompt corrective action including formal notification to NRC (LER 50-260/80-31) and submission of a Technical Specification change to the NRC. Management met with personnel involved in the event and established a set routine for determining average planar exposure to prevent recurrence. Subsequent calculations using the revised data showed no MAPLHGR limits had been exceeded since the time fuel exposure went beyond 30,000 Mwd/T.

The inspectors had no further questions.