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

Report No.: 50-259/79-4, 506079-4 and 50296/79-4

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

Facility Name: Browns Ferry Nuclear Plant

Licensee Nos.: DPR-3, DPR-52 and DPR-8

Inspection at Browns Ferry Site
near Athens, Alabama

Inspector: D. S. Price for
R. F. Sullivan, Reactor Inspector — MAR 8, 1979 Date Signed

Approved by: H C Dance
H. C. Dance, Section Chief, RONS Branch — 3/19/79 Date Signed

SUMMARY

Inspection on January 2 - February 2, 1979

Areas Inspected

This inspection involved 124 resident inspector-hours in the areas of reportable occurrence review, plant operations, refueling and restart of Unit 1, plant tours and liquid radwaste processing.

Results

Of the six areas inspected, no apparent items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Employees

J. D. Dewease, Plant Superintendent
H. L. Abercrombie, Assistant Plant Superintendent
J. B. Studdard, Operations Supervisor
R. Hunkapillar, Assistant Operations Supervisor
J. A. Teague, Assistant Maintenance Supervisor, Electrical
M. A. Haney, Assistant Maintenance Supervisor, Mechanical
R. G. Metke, Results Section Supervisor
J. L. Harness, Quality Assurance Supervisor
J. R. Pittman, Instrument Engineer
G. T. Jones, Outage Director
S. G. Bugg, Health Physics Supervisor
W. C. Thomison, Chemical Engineer
A. L. Burnette, Shift Engineer
J. D. Glover, Shift Engineer
R. Cole, QA Site Representative, Office of Power

Others contacted included operators on duty in the control room, QA personnel, health physics technicians and staff engineers.

2. Management Interviews

Management interviews were conducted on January 5, 12, 22, 29 and February 5, 1979, with the Plant Superintendent and selected members of his staff. The inspector summarized the scope and findings of his inspection activities. The licensee was informed that no items of noncompliance or deviations were identified.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresoved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. A new unresolved item was identified during this inspection and is discussed in paragraph 5.

5. Reportable Occurrences Review

The licensee event reports listed below 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.

LER NO.	DATE	EVENT
259/7835	12/29/78	Inoperative Wheeler reservoir level switch
259/7836	12/27/78	A scram accumulation level switch was inoperative
260/7823	01/04/79	Setpoint on two reactor pressure switches out of limits
260/7824	01/15/79	Drywell air compressor suction valve failed to close
296/7834	01/12/79	Relief valve on standby liquid conrol pump opened outside limits.

Corrective action taken or implemented on the above events was determined to be satisfactory.

In addition the inspector reviewed in detail the circumstances of prompt report LER No. 259/791 which dealt with a low power scram from a fast period during a reactor startup on 1/18/79. The events preceeding and associated with the scram were as follows:

a. The reactor was started up 1/18/79, at 0530 following completion of a refueling outage. The reactor was made critical on the 10th notch of the 30th rod withdrawn in the approved withdrawal sequence. The moderator temperature was 192°F and the period was 78 seconds. Critical was within the predicted range.

b. The reactor was maintained in the heat up range,5% power, for startup testing until a scram occurred at 2041 due to turbine control valve problems.

c. Reactor restart was in progress when an IRM scram on the low range occurred at 2328 due to an unanticipated fast period. The reactor went critical on the 53rd rod at notch 18 with a period approaching five seconds. The moderator temperature was 360°F.

The operator had been withdrawing the 53rd rod on notch override and stopped at position 19 when he observed a fast period indication on the SRM period meters. He attempted to reinsert this rod but the flux reached the trip level before the rod was started in.

d. Before withdrawing the 53rd rod the operators had observed an increase from 20 to 600 cps on the SRM detectors and based on their experience and training, considered that the reactor was sufficiently subcritical to permit continued notch override withdrawals.

e. The 53rd rod was the first rod in a RWM Rod Group with an estimated worth of approximately 0.5% AK/k.

f. The Plant Superintendent was notified and gave instructions to operations to not attempt restart until a formal safety review was conducted. The NRC inspector was notified at 0110 on 1/19/79 of the event and decision to hold up restart.

The licensee concluded that additional administrative control was needed during the withdrawal of high worth rods.

Procedure revisions were made to require notch withdrawal of the first rod in each RWM Group prior to criticality. A PORC review was conducted and authorization for restart followed. The reactor was made critical at 1228 on 1/19/79, with a 76 second period and no problems encountered. Portions of this startup and a subsequent startup on 1/22/79, were observed by the inspector in which the revised procedure was in effect.

The inspector upon review of corrective action questioned whether further precautions to avoid high reactivity addition rates would be advisable. The Plant Superintendent indicated that more attention would be given this matter. The inspector designated this matter as an unresolved item (259/79-04-01).

6. Plant Operations

The inspector kept current on a daily basis of plant operating status and significant activities through discussions with the Plant and Assistant Plant Superintendent and members of the Operations Section. Selected portions of the various daily log books and control room data sheets were examined on at least a weekly basis during the report period.

The inspector made plant tours on the following dates: January 4, 12, 18, 23, 25, 26 and February 1, 1979. Selected areas of the turbine building, reactor buildings and outside areas were visited. The control rooms were visited on a more frequent and nonroutine basis than other portions of the plant. Observations included work activities in progress, instrument readings and recordings, valve positions, housekeeping and

status of operating systems and components. Informal discussions were held with operators and other personnel on work activities and status of equipment. Shift turnover was observed in the control room on three occasions which included a shift change on Unit 1 during subcritical rod withdrawal during startup on January 22, 1979. Questions developed by the inspector were satisfactoriy answered.

No items of noncompliance or deviations were identified by the inspector.

7. Unit 1 Startup from Refueling

Unit 1 was restarted on January 18, 1979, from the scheduled refueling outage which began November 26, 1978.

The Master Refueling Test Instruction which was prepared for the restart of Unit 1 was reviewed by the inspector on January 12, 1979, and subsequent dates preceeding and during initial startup testing to ascertain that test criteria were being met, reviews were being made and required approvals were being given as the testing proceeded. The inspector also reviewed the following individual Refueling Test Instructions (RTI):

RTI-3, Fuel Loading
RTI-4, Shutdown Margin Test
RTI-5, Control Rod Drive Tests

Portions of final fuel loading were observed by the inspector. Also, individual control rod drive scram testing at 23% power was witnessed on January 23, 1979. On January 25, 1979, APRM calibration was observed.

During his review of the Unit 1 refueling startup program the inspector did not identify any items of noncompliance or deviations.

8. Water Inleakage to Turbine and Reactor Buildings

The plant has a common underground drainage system which encircles the turbine and reactor buildings and includes two wells, each supplied with a 2500 GPM pump, to automatically control the level of ground water.

Both dewatering pumps were out of service on January 29, 1979, with "A" pump having a broken shaft and well casing damage. Excessive bearing wear made "B" pump inoperable. Repairs were made to "B" pump and it was returned to service on January 23, 1979. "B" pump became inoperable again on January 26 with alignment and bearing problems. Repairs were again made to "B" pump and it was returned to operating condition on January 27, 1979.

During the periods that both pumps were inoperative the inleakage through construction joints in the lower levels of the turbine and reactor buildings increased such that the normal capacity of the radwaste system to process liquid waste was exceeded. The system was relieved to some extent by temporarily rerouting low activity water from the turbine building directly to the condenser discharge water on a batch basis. No limits were exceeded. Water was allowed to overflow the sumps in the reactor buildings for part of the above period. Water reached the level of 6-8 inches in the basement level of Units 1 and 3. No water accumulated in the floor of Unit 2. None of the required safety systems were made inoperative.

By January 28, 1979, all water had been removed from basement floors and all sump pumps had been returned to automatic operation.

TVA has engaged a well contractor to repair and install a new casing in each of the existing wells and to sink a third well for additional redundancy. The contractor was scheduled to begin site work on February 5, 1979.

No noncompliance or deviations were identified; however, a procedure review revealed that there were no established action points based on levels of water reached in the basement area of the reactor building. The Plant Superintendent indicated he would consider the advisability of establishing such action levels. The inspector stated that he would consider this matter an open item for further followup (259/79-04-02).

9. Unreviewed Safety Question Determination

During the Unit 1 refueling outage a 3 ounce tube of silicon grease was dropped into the open reactor vessel and was not recovered.

TVA contracted General Electric to conduct an autoclave test of a 3 ounce tube of the same type (Versilube) grease at simulated reactor conditions. The report of test results was reviewed by the inspector. The test was performed for four hours at 540°F in 0.2 ppm O_2 water on January 9, 1979. All of the grease had dissolved and the tubing became embrittled such that it broke into small fragments when handled except for the threaded part which hadn't deteriorated to the extent of the rest of the tube. The report concluded that the water environment and duration of normal reactor heatup would sufficiently corrode and embrittle the tube so that it could be expected to disintegrate into fragments too small to cause a flow blockage.

TVA performed a safety evaluation in accordance with their Operational QA Manual, Part II, Section 1.4. The inspector reviewed the written safety evaluation. The evaluation considered potential flow blockage, chemistry affects and potential control rod drive interference. None

were considered to represent a safety problem. Their evaluation concluded that operation with the tube of Versilube in the reactor vessel did not constitute an unreviewed safety question as defined by 10 CFR 50.59.

The inspector had no unanswered questions after his review of the TVA safety evaluation.

10. NRC Meeting With Local Officals

On February 1, 1979, representatives of the Nuclear Regulatory Commission met with local officials at the Athens, Alabama, city hall to describe the mission of the NRC and discuss items of mutual interest. About 20 local officials attended the information meeting which included Mayor Garrett of Athens and Chairman Christopher of the Commissioners for Limestone County. Members of the City Council and representatives of various departments also attended. Questions for the most part centered on the safety of spent fuel and waste storage at Browns Ferry and the potential hazard to the surrounding community. The concerns were well expressed and interest level was keen.

NRC personnel who participated in addition to this inspector included:

F. J. Long, Acting Deputy Director, Inspection and Enforcement, Region II

H. C. Dance, Chief, Reactor Projects Section No. 1, Region II

J. Hufham, Chief, Environmental and Special Projects Section Region II

R. Clark, Project Manager, NRR

11. Plant Security Protection

The inspector observed on a nonroutine basis personnel badging, searching, escort and access control practices. Also the inspection of vehicles prior to plant entry and the escort and locking of vehicles were observed.

No items of noncompliance or deviations were identified in this area.