



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

Report Nos. 50-259/80-24, 50-260/80-18 and 50-296/80-19

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

Facility: Browns Ferry Nuclear Plant

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

License Nos. DPR-33, DPR-52 and L-1-8

Inspection at Browns Ferry Site near Athens, Alabama

Inspectors: P. A. Taylor for 7-11-80
 R. F. Sullivan Date Signed

P. A. Taylor for 7-11-80
 J. W. Chase Date Signed

Approved by: C. Julian for 7/15/80
 H. C. Dance, Section Chief, RONS Branch Date Signed

SUMMARY

Inspection on May 3 to June 1, 1980.

Areas Inspected

This routine inspection involved 153 resident inspector-hours in the areas of operational safety, reportable occurrences, reactor trip followup, reactor level instrumentation, hydrogen sensors, plant physical protection and radiation safety.

Results

Of the 7 areas inspected no items of noncompliance were identified in 6 areas. One item of noncompliance was found in one area. (Deficiency - failure to use the latest revision of a surveillance intrusion data sheet, paragraph 5.)

8009300 081

DETAILS

1. Persons Contacted

H. L. Abercombie, Plant Superintendent
J. L. Harness, Assistant Plant Superintendent
J. B. Studdard, Operations Supervisor
R. Hunkapillar, Assistant Operations Supervisor
J. A. Teague, Maintenance Supervisor, Electrical
M. A. Haney, Maintenance Supervisor, Mechanical
J. R. Pittam, Maintenance Supervisor, Instruments
R. G. Metke, Results Section Supervisor
R. T. Smith, QA Supervisor
J. E. Swindell, Outage Director
A. L. Burnett, Shift Engineer
S. G. Bugg, Plant Health Physicist
R. E. Jackson, Chief, Public Safety
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 May 9 and 23, 1980 with the Plant Superintendent 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informed that one apparent item of noncompliance was identified during this report period dealing with the use of an outdated data sheet in a surveillance instruction located in the control room. The licensee stated that corrective action was implemented promptly.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

No unresolved items were identified during this inspection.

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 rooms 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 alterations 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.

During a routine daily tour of the control rooms on May 5, 1980, the inspector reviewed Surveillance Instruction 2, Instrument Checks and Observations, and noted that page 52 of the procedure was not the latest approved revision. This had been previously pointed out to the licensee by the inspectors on March 5, 1980 and the problem had been temporarily corrected, but not permanently. Failure to use the latest approved revision of the Surveillance Instruction was determined to be an apparent item of noncompliance (259/80-24-01, 260/80-18-01 and 296/80-19-01) with Technical Specification 6.3.A which requires that detailed written procedures shall be prepared, approved and adhered to. The licensee was informed of the inspectors findings on May 6, 1980. The licensee took prompt corrective action to destroy the outdated blank data sheets and set up additional administrative controls to prevent the future use of outdated data sheets.

During a discussing with control room operators on nitrogen consumption and storage of liquid nitrogen, it was determined by the inspector that Operating Instruction-76, Containment Inerting System, did not reflect current operating restrictions. Tennessee Valley Authority Engineering Design has determined that if the primary containment was purged while in hot standby or power operations concurrent with a loss of coolant accident, there is a potential for a loss of secondary containment. The licensee therefore has restricted purging only while shutdown and cooled down. (LER 259/80-11)

Operating Instruction 76 (OI-76) still allowed for purging 24 hours prior to shutdown. The licensee stated that they were awaiting Engineering Design's final report before changing OI-76 and in the meantime written temporary instructions had been issued to all operators citing the new requirements. The Assistant Plant Superintendent stated that OI-76 will be changed to reflect the new operating restrictions, and that the new change would be through the Plant Operations Review Committee by June 24, 1980.

6. Level Instrumentation

During a routine daily tour of the control rooms, the inspectors noted that the accident Yarways on the 9-5 panel for Units 1 and 2 were reading between 20 to 25 inches while the chart recorders (GE/MAC) were indicating 35 inches. The accuracy of the Yarways is ± 10.8 inches which puts the Yarways out of tolerance. A check of the other Yarways in the reactor building showed that most of the compensated Yarways on Units 1 and 2 were also out of tolerance by the same margin as the accident Yarways. The uncompensated Yarways are reading close to what the actual level is in the reactor vessel.

The disparity in the compensated Yarway indication was brought to the attention of the licensee by the inspectors. The licensee performed the following actions:

- a. Some of the Yarways which were reading low were recalibrated. The recalibration generally had little or no effect on the level indication.
- b. The differential pressure was measured across the Yarways and showed that the indicators were reflecting the actual pressure differential. The differential pressure was also measured across the GE/MAC (level control instruments) and they were shown to be accurate.
- c. The startup tests were also reviewed to verify previous agreement in Yarway and GE/MAC reactor water level indications. The agreement was confirmed.
- d. The values for calibration of the GE/MAC and Yarway indicator were recomputed and no discrepancies found.
- e. The licensee ensured that the sensing lines were back flushed and the Marotta valves functioned on unit 1 prior to startup.
- f. A General Electric consultant was brought to the site by TVA to review the problem and the conclusion reached were:

The straps which transfer heat from the variable leg section of the compensating column to the reference leg on the compensated Yarways had somehow become ineffective causing the reference leg to be colder than normal or, the variable leg in the compensating column which is a half inch line was getting clogged with corrosion products causing a blockage or restriction of flow through the variable leg thus less heat transferred to the reference leg.

- g. The licensee also concluded that the level instruments which are uncompensated and control the level in the reactor vessel and low water level scram are indicating correctly.

The compensated Yarways, which are indicating low, are used for indication during an accident and actuation of certain emergency core cooling equipment on decreasing water level. Since these Yarways are indicating low, they are in the conservative direction which means they would come on sooner than expected. The plant staff reviewed what effect the Yarways would have by reading low and recommended to their management that if the disparity between the compensated Yarways and GE/MAC got to 20 inches or greater they should thoroughly clean and inspect the Yarway sensing lines and reference columns. The 20 inches was chosen to prevent unnecessary challenges to safety systems. The license plans to inspect the heat transfer straps on the variable legs and the reference legs at the next outages on all three units and also flush the variable leg of the compensating columns if necessary. The inspectors will continue to follow activities in this area.

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

7. Reportable Occurrence Review

The below listed licensee event reports (LER's) 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.

LER No.	Date	Event
259/80-01 Rev. 1	4/18/80	Diesel generator 3A inoperable
259/80-14 Rev. 1	5/9/80	Scram accumulator level switch damaged
*259/80-27	4/18/80	RHRSW pump timer out of limits
*259/80-29	5/6/80	HPCI rupture disc failed
*259/80-31	5/14/80	Electrical fault in normal feed to 480 v shutdown board
259/80-32	5/13/80	Radiation monitor inoperative
259/80-35	5/22/80	B recirculation pump removed from service
259/80-36	5/21/80	B recirculation MG set tripped during power source transfer
*259/80-37	5/1/80	RCIC rupture disc failure
*260/79-26	1/21/80	Drywell to torus pressure differential indicator inoperative
260/80-11 Rev 1	5/9/80	480V MOV board 2B failed to transfer

260/80-18	4/18/80	2A recirculation MG set tripped
260/80-20	5/20/80	Reactor high pressure switch setpoint out of limits
*296/80-09	5/2/80	Relay failure caused group 6 isolation valves to fail closed
*296/80-10	5/8/80	Yarway switches failed to operate on test

The inspectors had no further questions in this area.

8. 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. The inspectors noted that individual doors were manned by Public Safety Officers when they were taken out of service for change over to the new key card system.

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

9. Reactor Trips

The inspectors reviewed all reports associated with the below listed reactor scrams during this report period. The review included determination of cause, safety significance, performance of personnel and systems, and corrective action. 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 5/6/80 Unit 1 reactor trip during routine surveillance testing of the turbine combined intermediate valves. While testing one valve another one unexpectedly went closed which produced a load imbalance. Control valve closure resulted in a reactor trip and isolation. Main steam isolation valves, main steam relief valves and high pressure coolant injection performed as intended.

On 5/7/80 Unit 1 reactor trip when inverter supplying power to "A" level in the feedwater control system experienced a blown fuse. The failure caused both feed pumps in service to increase to full speed which produced a turbine trip and subsequent reactor trip. The 10 amp fuse was replaced and no overload condition was identified. The feedwater control system and reactor protection system performed as designed.

On 5/15/80 Unit 3 reactor trip due to a turbine trip. A ground in the generator field initiated the turbine trip. A craftsman was taking shaft voltage measurements and may have intentionally caused a short to ground. Systems performed as designed.

On 5/21/80 Unit 3 reactor trip during surveillance testing of the high steam flow isolation actuation. While testing "B" line one of the "C" line

isolation valves unexpectedly went closed. This resulted in a reactor trip and isolation of all main steam lines. The isolation was promptly reset and no relief valves operation or high pressure injection resulted. Systems performed as designed. Cause of the unexpected "C" isolation valve closure was not definitely determined.

On 5/27/80 Unit 1 reactor trip occurred during breaker operation in the 500KV switchyard. A breaker (5218) to a 500KV bus from the Unit 1 main transformer was being restored. The trip was apparently caused when the operator inserted a PK block in the transformer differential relay out of normal sequence. The imbalance resulted in opening the transformer high-side breakers and tripping the turbine. The reactor protection system performed as designed with no safety system problems.

The inspectors did not identify any items of noncompliance or deviations in the above area.

10. Containment Atmospheric Monitoring Hydrogen Sensors

A question on the post-accident qualifications of the existing hydrogen sensors located in the drywell and torus was raised when TVA received notification from GE by letter dated May 2, 1980 that sensor performance at temperatures greater than 200 F had not been demonstrated. The plant staff received a copy of this letter on May 7, 1980 and formally reported (LER 259/80-39) the matter to the NRC on the same day.

As recommended by GE, as an interim measure, plant procedures were revised to require initiation of the Containment Atmospheric Dilution system within 30 minutes of a loss of coolant accident (LOCA) to ensure that the hydrogen concentration would not exceed 4%. Another revision required recalibration if the temperature of the sensor environment changed more than 27 F.

Subsequent information received by TVA and submitted to NRR on May 21, 1980 provided additional qualification information on the sensors which alleviated concern about their performance in the accident environment. A proposed Technical Specification change which had been submitted to NRR was withdrawn with the concurrence of NRR. NRR will issue a Safety Evaluation Report on this item.

The inspectors had no further further questions at this time.