



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W.
 ATLANTA, GEORGIA 30323

Report Nos.: 50-259/84-48, 50-260/84-48, and 50-296/84-48

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 1, 2, and 3

Inspection Conducted: October 26, - November 25, 1984

Inspectors:	<u><i>[Signature]</i></u>	<u>12/17/84</u>
	G. L. Paulk, Senior Resident	Date Signed
	<u><i>[Signature]</i></u>	<u>12/17/84</u>
	C. A. Patterson, Resident	Date Signed
	<u><i>[Signature]</i></u>	<u>12/17/84</u>
	B. T. Debs, Inspector	Date Signed
Approved by:	<u><i>[Signature]</i></u>	<u>12/17/84</u>
	F. S. Cantrell, Section Chief	Date Signed
	Division of Reactor Projects	

SUMMARY

Scope: This routine, unannounced inspection entailed 95 inspector-hours in the areas of operational safety, maintenance observation, surveillance observation, reportable occurrences, and Unit 3 startup activities.

Results: VIOLATIONS - There was one violation of 10 CFR 50, Appendix B, Criterion 5 for failure to follow tag clearance procedures.

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REPORT DETAILS

1. Licensee Employees Contacted

J. A. Coffey, Site Director
G. T. Jones, Plant Manager
J. E. Swindell, Superintendent - Operations/Engineering
J. R. Pittman, Superintendent - Maintenance
J. H. Rinne, Modifications Manager
J. D. Carlson, Quality Engineering Supervisor
D. C. Mims, Engineering Group Supervisor
Ray Hunkapillar, Operation Group Supervisor
C. G. Wages, Mechanical Maintenance Supervisor
T. D. Cosby, Electrical Maintenance Supervisor
R. E. Burns, Instrument Maintenance Supervisor
A. W. Sorrell, Health Physics Supervisor
R. E. Jackson, Chief Public Safety
T. L. Chinn, Technical Services Manager
T. F. Ziegler, Site Services Manager
J. R. Clark, Chemical Unit Supervisor
B. C. Morris, Plant Compliance Supervisor
A. L. Burnette, Assistant Operations Group Supervisor
R. R. Smallwood, Assistant Operations Group Supervisor
T. W. Jordan, Assistant Operations Group Supervisor
S. R. Maehr, Planning/Scheduling Supervisor
C. R. Hall, Design Services Manager
W. C. Thomison, Engineering Section Supervisor
A. L. Clement, Radwaste Group Controller

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

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 21 and 30, 1984, with the Plant Manager and/or Assistant Plant Manager and other members of his staff.

The licensee acknowledged the findings and took no exceptions.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items*

Unresolved items were not identified during this inspection.

5. Operational Safety (71707, 71710)

The inspectors were 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; onsite and offsite emergency power sources available for automatic operations; purpose of temporary tags on equipment controls and switches; annunciator alarm status; adherence to procedures; adherence to limiting conditions for operations; nuclear instruments operable; temporary alterations in effect; daily journals and logs; stack monitor recorder traces; and control room manning. This inspection activity also included numerous informal discussions with operators and their supervisors.

Central 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; containment isolation alignments; instrument readings; housekeeping; proper power supply and breaker alignments; radiation area controls; tag controls on equipment; work activities in progress; radiation protection controls adequate; 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. Weekly verifications of system status which included major flow path valve alignment, instrument alignment, and switch position alignments were performed on the residual heat removal systems.

A complete walkdown of the accessible portions of the control room emergency ventilation system was conducted to verify system operability. Typical of the items checked during the walkdown were: lineup procedures match plant drawings and the as-built configuration, hangers and supports operable, housekeeping adequate, electrical panel interior conditions, calibration dates appropriate, system instrumentation on-line, valve position alignment correct, valves locked as appropriate and system indicators functioning properly.

a. TMI Action Item: II.K.3.16

NUREG-0737, Item II.K.3.16 required BWR licensee and BWR operating license applicants to investigate the feasibility of a number of actions and modifications to reduce challenges to SRVs. The objective of the task was to effect sufficient changes so as to substantially

reduce challenges to SRVs by an order of magnitude. This evaluation was performed by the BWR Owners Group (BWROG-8134).

NRR Reviewed the TVA response and concluded that, in total, the actions taken or committed to be taken will achieve the objective of NUREG-0737, Item II.K.3.16.

Therefore, this item is considered closed and resolved for Browns Ferry Units 1, 2 and 3.

b. Equipment Operability Determination

An inspection of the licensee's ability to determine equipment operability was conducted. The following specific items were checked:

- (1) Technical Specification (TS) definition of operability.
- (2) Program for determining operability for systems required to be operable by TS.
- (3) Sampling of TS limiting condition for operation requirements.
- (4) Supplement surveillance requirements to assure equipment operability.

The licensee has an adequate program to address all the above areas and if correctly implemented they should provide reasonable assurance of TS equipment operability.

On November 26, 1984, the licensee informed the residents that during surveillance testing in conjunction with Unit 3 startup on November 23, 1984, the HPCI steam supply outboard isolation valve (FCV-73-3) failed to properly cycle. The HPCI system was declared inoperable. The licensee's investigation discovered that a pinion gear was improperly installed in the Limitorque motor operator. Although the operator worked in this configuration, failure eventually occurred due to excessive forces on the gear teeth causing about five teeth to wear away. The licensee also discovered that an open circuit existed in the shunt field circuitry of the motor operator which caused the valve to stroke in an abnormally short time of eight seconds. This event prompted a detailed review of MMI-87 and EMI-18 by the residents (refer to paragraph 6).

During a routine tour of the Unit 3 diesel generator rooms on October 30, 1984, the inspectors noted that similar maintenance was being performed on both the 3A and 3D diesel generator air compressors however, the local control switches to which protective tags were hung were in different positions. The 3A diesel air compressor #2 local control switch was in the "AUTO" position whereas the 3D diesel air compressor #1 was in the "OFF" position. The clearance sheet for the 3A diesel air compressor #1 (Hold Order No. 84-2364 dated October 28, 1984) did not list the required position of the local control switch.

The operator stated that the switch was not used as an isolation boundary (an open circuit breaker provided the necessary boundary) but was instead being used as an information type tag such that maintenance and operating personnel would realize that the air compressor had a clearance issued on it. It was further stated that the switch was being maintained in the "AUTO" position to prevent the occurrence of an alarm in the control room and to permit local starting of the diesel during monthly surveillance testing. The clearance sheet for the 3D diesel air compressor #1 (Hold Order No. 84-2302 dated October 7, 1984) listed the required position of the local control switch as the "OFF" position.

One additional concern was noted on Hold Order No. 3-84-2364. When the clearance was released on October 28, 1984, the return to normal position and the second person verification of the returned to normal position of the air compressor local control switch was recorded as "-". This is a failure to follow the clearance procedure (Standard Practice BF 14.25) which requires the valve or switch position to be recorded on the clearance sheet.

While touring the diesel rooms the inspector also noted that the protective tag for the 3D diesel generator No. 1 air compressor discharge valve 86-573-3D was not securely attached to the valve as required by BF 14.25 but was instead found on the floor in the vicinity of the valve.

The inspector reviewed additional clearances to determine if the identified problems were common practice. It appears that using a dash ("-") to record the required position of a valve or switch is common. Unit 2 Hold Order No. 84-1259 issued on October 31, 1984, did not have the required position of valve FCV-2-74-67 recorded. The protective tag which was hung on the valve handwheel was required to be in the "-" position. The operator stated that although the valve was required to be shut, the handwheel could not be placed in an open or shut position. Unit 3 Hold Order No. 84-1781 issued on October 20, 1984, did not have the required position of the Unit 3 generator breaker control switch recorded. According to plant personnel, the two position switch (Trip/Close) is spring returned to a neutral position. The clearance sheet restricts the required position to be recorded as either valve shut or switch open (S/O) and does not allow for a "neutral" or "normal" position to be recorded. Plant personnel therefore place a dash ("-") in the required position column. The particular clearance had been issued and released on numerous occasions and point out the inconsistency in the approaches by various individuals. On six occasions the control switch had been tagged in the "OFF" position and on four occasions the switch was tagged in the "-" position. These problems are examples of violation 50-260/296/84-48-01 (10 CFR 50, Appendix B, failure to follow procedure).

6. Maintenance Observation (62703)

Plant maintenance activities of selected safety-related systems and components were observed/reviewed to ascertain that they were conducted in accordance with requirements. The following items were considered during this review: the limiting conditions for operations were met; activities were accomplished using approved procedures; functional testing and/or calibrations were performed prior to returning components or system to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; proper tagout clearance procedures were adhered to; Technical Specification adherence; and radiological controls were implemented as required.

Maintenance requests were reviewed to determine status of outstanding jobs and to assure that priority was assigned to safety-related equipment maintenance which might affect plant safety. The inspectors observed the below listed maintenance activities during this report period:

- | | | |
|----|--------|--|
| a. | MMI-87 | Preventive and Corrective Maintenance of Limitorque Operators |
| b. | EMI-18 | Limit Switch and Torque Switch Setting Procedure for Motor Operators |
| c. | Unit 3 | Startup Activities |
| d. | Unit 2 | Refueling Activities |

The following deficiencies were noted with item a. above:

Although the instruction requires measuring and recording motor current during valve cycling, no acceptance criteria is specified in the procedure. This is an open item (259/84-48-02).

The following deficiency was noted with item b. above:

The instruction requires that the lubricant be changed to Exxon Nebula EPO or EPI if an oil leakage problem is found. There appears to be no control to prevent mixing potentially incompatible greases during the subsequent performance of MMI-87 which re-greases the operators with TVA's GP-0 grease. The licensee noted that EMI-18 is being revised to remove this problem. This is an open item (259/84-48-03).

7. Surveillance Testing Observation (61726)

The inspectors observed and/or reviewed the below listed surveillance procedures. The inspection consisted of a review of the procedure for technical adequacy, conformance to technical specifications, verification of test instrument calibration, observation of the conduct of the test, removal from service and return to service of the system, a review of test data, limiting condition for operation met, testing accomplished by qualified personnel, and that the surveillance was completed at the required frequency.

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|----|------------------------|--|
| a. | S.I. 4.3.B.3.c | Rod Worth Minimizer Sequence Verification |
| b. | S.I. 4.6.E.1 | Jet Pump Operability |
| c. | GOI 100-1 | Reactor Startup General Operating Instructions |
| d. | S.I. 2 | Operator Logs |
| e. | S.I. 4.2.F.20 - Unit 3 | Torus Water Level |

Deficiencies noted with items a-c are noted in special inspection report I.E. 259/260/296/84-45.

During the conduct of item e. the licensee noted that the upper root valve to level indicator LT-64-159A was shut. This instrument is used for indication of torus water level only. The redundant LT-64-159b was also found to be inoperable due to being out of calibration. Other torus water level instrumentation was operable: LI 64-52A and LI 64-66.

The licensee identified this item and made the necessary reports.

8. Reportable Occurrences (90712, 92700)

The below listed Licensee Event Reports (LERs) were reviewed to determine if the information provided met NRC requirements. The determination included: adequacy of event description, verification of compliance with Technical Specifications and regulatory requirements, corrective action taken, existence of potential generic problems, reporting requirements satisfied, and the relative safety significance of each event. Additional in-plant reviews and discussion with plant personnel, as appropriate, were conducted for those reports indicated by an asterisk. The licensee event report was closed:

<u>LER No.</u>	<u>Date</u>	<u>Event</u>
*296/84-10	October 10, 1984	Inadvertent start of diesel generator 3B/3D

9. Unit 3 Startup Activities (B. T. Debs)

On November 19, 1984, two NRC Region II based inspectors observed Browns Ferry Unit No. 3 startup to criticality at 11:45 p.m. (local time) and subsequent heatup.

The inspectors observed that the conduct of licensee operators and management in the control room during the reactor startup was formal. The conduct of operations was in accordance with licensee procedure BF GOI 100-1 governing reactor startup and power operations. The aforementioned procedure was referred to by the shift members for each step of the startup evolution. Additionally, copies of the Master Refueling Test Instruction (MRTI) which is performed in conjunction with GOI 100-1 was being referred to and followed by the shift engineer.

The inspector found adequate on site management overview of the startup evolution. The plant superintendent provided plant senior management overview in the control room. Another member of licensee management provided overview of technical specification and licensee procedure compliance outside the control room. Control room access was strictly enforced during the startup with all personnel requesting permission to enter from the Lead Reactor Operator. The inspector found that both management and operators to be fully cognizant of plant status relative to procedure step. One negative observation that was made was the utilization of an unofficial pencil control room log sheet to be transferred to the official logbook at a later time. During normal observations, all log entries should be on a real time basis in the official logbook. This item will be reviewed on subsequent inspections and will be Inspector Followup Item 50-259/260/296/84-48-04.

The inspectors observed shift turnover at approximately 2300 hours (local time) on November 19, 1984. The inspectors observed the turnovers to be complete and professional. The inspectors also observed that the turnovers included a walkdown of the control panels by the oncoming and offgoing shift engineers.

The inspectors observed that the performance of certain steps contained in the MRTI are performed under certain plant conditions established by GOI 100-1; however, GOI 100-1 does not reference the performance of the MRTI. The inspectors expressed concern to licensee management that performance of the MRTI relies solely on the cognizance of the shift engineers. Licensee management indicated that GOI 100-1 is a generic startup procedure and that a MRTI is specifically used in conjunction with GOI 100-1 for a startup from a refueling outage.

On November 20, 1984, Unit 3 experienced a manually initiated scram. The manual scram was performed by the operator who observed reactor vessel water level dropping below the automatic scram set point of eleven inches. The manual scram was initiated at approximately eight inches by instrument indication. The plant computer indicated a reactor vessel low level automatic scram signal approximately seven seconds after the manual scram. The cause of the decreasing reactor vessel level was the unsuccessful attempt to start condensate booster pumps from the control room during the performance of safety relief valve surveillance tests. The licensee's post trip review identified the cause as the inability to start the condensate booster pump as a "safe-stop" button had been depressed at the pumps local controller. This button must be manually reset at the local controller, otherwise any subsequent pump start signals are disabled. This pump start lockout is not indicated in the control room. Inspector reviews of last performed maintenance restoration procedures and prestartup checklist indicated that no checks exist to ensure the "safe-stop" feature has been reset. Additionally, the two pumps which would not start were not locally inspected prior to the start attempt.

The licensee stated that the post trip review also indicated that although the reactor vessel level transmitters indicated eight inches, the separate transmitters associated with the reactor protection logic were generating a level signal of approximately 13 inches, taking into account pressure, temperature and instrument calibration data. The licensee determined that actual reactor vessel level was approximately 17 inches. The inspector requested the calibration data associated with these level instruments. The inspectors informed licensee management that the level variations will be considered an Inspector Followup Item while the NRC evaluates the indicated level differences. (50-259/260/296/84-48-05).