



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

Report Nos. 50-259/79-37, 50-260/79-37 and 50-296/79-37

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

Inspected by: D. S. Price
D. S. Price

23 NOV 79
Date Signed

F. W. Chase
F. W. Chase

23 NOV 79
Date Signed

Approved by: H. C. Dance
H. C. Dance, Section Chief, RONS Branch

11/23/79
Date Signed

SUMMARY

Inspection on November 6-9, 1979

Areas Inspected

This routine, unannounced inspection involved 38 inspector-hours onsite in the areas of Inspection and Enforcement (IE) Bulletins, plant tour, plant operations, and system design changes.

Results

Of the four areas inspected, no apparent items of noncompliance or deviations were identified in three areas; one apparent item of noncompliance was found in one area (Infraction - failure by the Plant Operations Review Committee to review three design changes (259/79-37-01) paragraph 8).

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DETAILS

1. Persons Contacted

Licensee Employees

- *J. L. Harness, Assistant Plant Superintendent
- *R. G. Cockrell, Reactor Engineer
- *R. T. Smith, Quality Assurance Supervisor
- *J. A. Teague, Maintenance Supervisor, Electrical
- *C. Rozear, Quality Assurance Engineer
- D. Gent, Assistant Outage Director
- L. Bynum, Engineer, Power System Operations

USNRC

- *R. F. Sullivan, Lead Resident Inspector
- *J. W. Chase, Resident Inspector
- *C. A. Julian, Reactor Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 9, 1979 with those persons indicated in Paragraph 1 above. The licensee acknowledged the item of noncompliance covered in paragraph 8. He pointed out that whereas DCRs P-1858 and P-1889 were permanent changes, the purpose of DCR P-1840 was to make permanent a temporary alteration which had been installed since about May 1979.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. IE Bulletin Followup

The inspector reviewed licensee action on IE Bulletin 79-11, Faulty Overcurrent Trip Device in Circuit Breaker for Engineered Safety System. The review was made to ascertain that the licensee's written response was timely, reported the required information, and was accurate.

The inspector had no further questions.



6. Plant Tour

A tour was made of the Unit 1, 2 and 3 reactor buildings and the refuel floor. The loading of fuel into the Unit 3 reactor and a shift change on the refuel floor between the swing shift and the night shift were monitored.

No item of noncompliance or deviations were identified.

7. Plant Operations

The inspector investigated the circumstances surrounding an electrical system fault which was identified during testing of a low pressure coolant injection power supply modification to Unit 3. On October 30, 1979, while performing Surveillance Instruction 4.5.B.1.a, Residual Heat Removal (RHR) System simulated Automatic Actuation, an operator error caused the simultaneous starting of two RHR pumps powered from 4KV Unit board 3A. Browns Ferry Licensee Event Report number 50-296/79-18 documents that a current transformer winding ratio mismatch caused, in this instance, a protective trip of the 4KV Unit Board 3A output breaker and the the 4KV shutdown board 3EA and 3EB input breakers. The current transformers were verified by the licensee to be of the type specified by the applicable TVA drawing. A design change request had been initiated which will revise the drawings and result in matched current transformers being installed prior to the Unit 3 startup.

Following these breaker trips, the two deenergized 4KV shutdown boards should have been automatically reenergized by the normal auxiliary power supply as is described in the plants' Final Safety Analysis Report section 8.4.6. Instead, they were automatically reenergized by the second alternate power supply, the diesel generators. Investigation into the failure of the normal auxiliary power supply to automatically reenergize the two 4KV shutdown boards revealed the cause to be a relay coordination problem. In normal operation a transfer relay acts 4.5 seconds after a loss of voltage to shift the power supply to the normal auxiliary power supply. If power has not been restored within 5.0 seconds of an undervoltage condition, a degraded voltage relay will open the breaker to the normal auxiliary power supply to assure that the diesel generator is placed on a deenergized board. In this instance, the relay coordination problem occurred because the voltage drop which occurred when the two RHR pumps started caused the pickup of the degraded voltage relay on undervoltage. When power was subsequently lost and the transfer relay was picked up on no voltage the degraded voltage relay had already commenced timing. Thus, the degraded voltage relay acted ahead of the transfer relay and prevented the normal auxiliary power supply output breaker from shutting. The licensee has determined that this event is not reportable.

A second item which was considered during this investigation was the possibility that the relay coordination problem was due to back electromotive force (EMF) on the shutdown boards. This back EMF, present as the running RHR pumps coasted to a stop on loss of power, could have affected the relays by delaying their timing by different amounts such that the degraded voltage relay could again have acted before the transfer relay.



As corrective action to prevent future occurrences of this type the relay time setting for the transfer relay was changed from 4.5 to 4.3 seconds, thus allowing a larger time span between completion of the transfer and degraded voltage relays timing.

A third event occurred during trouble shooting of the above problem. While recreating the loss of voltage to the shutdown boards and failure of the normal auxiliary power supply to automatically reenergize the boards, the 3A diesel generator started but its output breaker failed to automatically close and reenergize the 3EA shutdown board. The problem was identified as a loose wire in the breaker close circuitry which prevented the breaker from automatically closing. The screw holding the loose wire, was subsequently tightened six of a total of eight turns. Inspection of other generator output breakers revealed no similar problems. The licensee determined that this event was not reportable.

The inspector had no further questions.

8. System Design Changes

The inspector reviewed three design change requests (DCRs) concerning proposed changes to the Unit 1 control bay air conditioning system. One change, DCR number P-1940, would replace the refrigerant purifier system on control bay chiller 1B with a large permanent reclaimer. A second change, DCR number P-1858, was to add a hand valve and an air relief valve to the Unit 1 control bay chiller oil cooler. The third change, DCR number P-1889, would replace a liquid indicator on piping going to the Unit 1 control bay chiller oil separator assembly with a check valve. These three DCRs were under review by the TVA Division of Engineering Design. A visual inspection of the Unit 1 chiller 1B revealed that these three modifications had been installed. The DCRs had identified these three changes as affecting critical systems, structures, and components (CSSC).

The Browns Ferry Operational Quality Assurance Manual, Part II section 3.2.2.1.2 states, in part, that a modification is safety-related if it is made to a CSSC and involves a change to a vendor's manual, a vendor's drawing, or a change to a material specification of a CSSC component. These three DCRs all involved one or more of the above changes to the original design specified by the Worthington Air Conditioning Company.

Browns Ferry Unit 1 Technical Specification 6.2.B.4.C requires that proposed changes to equipment or systems having safety significance be reviewed by the Plant Operations Review Committee (PORC). This is implemented for permanent changes by Browns Ferry Administrative Procedures 28, Plant Modification and work plans and for temporary changes by Browns Ferry Standard Practice 8.2, Temporary alterations. It was found that as of November 9, 1979, the PORC had not reviewed either a permanent or a temporary change on these three modifications prior to their installation. The licensee was informed that the failure of the PORC to review the three modifications prior to their installation was an item of noncompliance with Technical Specification 6.2.B.4.C. (259/79-37-01).

