



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

Report Nos.: 50-259/88-16, 50-260/88-16, and 50-296/88-16

Licensee: Tennessee Valley Authority
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Docket Nos.: 50-259, 50-260, and 50-296

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

Facility Name: Browns Ferry Nuclear Plant

Inspection at Browns Ferry Site near Decatur, Alabama

Inspection Conducted: May 1 - June 11, 1988

Inspector: W. S. Little
G. L. Paulk, Senior Resident Inspector

9/9/88
Date Signed

Accompanied by: C. R. Brooks, Resident Inspector
E. F. Christnot, Resident Inspector
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Approved by: W. S. Little
W. S. Little, Section Chief,
Inspection Programs,
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9/9/88
Date Signed

SUMMARY

Scope: This routine inspection was in the areas of operational safety, maintenance observation, surveillance testing observation, restart test program, Q-List concerns, fuel reconstitution, seismic analysis of the Standby Gas Treatment Building, employee concerns program, Unit 2 drywell fire followup report, and licensee action on previous inspection findings.

Results: Inspector Followup Item (259,260,296/88-16-01): Control of systems while testing per the Restart Test Program (RTP) is in progress. (Restart Item)

Unresolved Item (260/88-16-02): Quality requirements for components not on the Q-List. (Restart Item)

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Violation (259,260,296/88-16-03): Six examples of failure to comply with procedures. (Restart Item)

Inspector Followup Item (260/88-16-04): Verify process to review ECP investigation reports for reportability. (Restart Item)

REPORT DETAILS

1. Licensee Employees Contacted:

- *I. G. Walker, Plant Manager
- P. J. Spiedel, Project Engineer
- *J. D. Martin, Assistant to the Plant Manager
- *R. M. McKeon, Operations Superintendent
- *T. F. Ziegler, Superintendent - Maintenance
- D. C. Mims, Manager - Technical Services Supervisor
- *J. G. Turner, Manager - Site Quality Assurance
- M. J. May, Manager - Site Licensing
- *J. A. Savage, Compliance Supervisor
- A. W. Sorrell, Site Radiological Control Superintendent
- R. M. Tuttle, Site Security Manager
- L. E. Retzer, Fire Protection Supervisor
- *H. J. Kuhnert, Office of Nuclear Power, Site Representative
- *T. C. Valerzano, Director - Restart Operations Center

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

*Attended exit interview.

2. Operational Safety (71707, 71710)

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

The inspectors made routine visits to the control rooms 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 operation; 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.

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; containment isolation alignments; instrument readings; housekeeping; proper power supply and breaker, alignments; radiation area controls; tag controls on equipment; work activities in progress; and radiation protection controls. Informal discussions were held with selected plant personnel in their functional areas during these tours.

Within this area no violations or deviations were found.

3. 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 tour: 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 the status of outstanding jobs and to assure that priority was assigned to safety-related equipment maintenance which might affect plant safety.

Within this area no violations or deviations were found.

4. Restart Test Program (RTP)

The inspector attended RTP status meetings, reviewed RTP test procedures, observed RTP Tests and associated tests performances, reviewed RTP Test results and attended selected Restart Operations Center (War Room) and Joint Test Group meetings. The following are the RTP activities and associated activities monitored and status of testing during this reporting period:

Observations were made of the LOP/LOCA tests for Unit 2 startup. Details of the observations will be covered in the next resident report.

Within this area no violations or deviations were found.

5. Quality Surveillance Report Reviews

The inspector reviewed the following Quality Surveillance Monitoring Reports:

- a. Report CHF-S-88-0436, dated May 12, 1988. The Quality Monitoring Inspector documented the fact that during Special Test 88-17,

Diesel Generator "B" was started with the cylinder vent valves being left open. The test was stopped approximately 45 to 50 seconds into the test. Operations generated critique report number 88-025 to address the vent valve problem.

- b. Report QBF-S-88-0455, Dated May 8-17, 1988. The Quality Monitoring Inspector documented the fact that during Special Test 88-17, Diesel Generator "B" was started the load limiter set at zero instead of maximum.

These two items are being tracked as an Inspector Followup Item (IFI) (259,260,296/88-16-01) pending review of the licensee's response to the reports.

6. Fuel Reconstitution (60710)

Fuel Reconstitution activities continued throughout the month. The inspector made weekly visits to the refuel floor to observe the reconstitution activities and conduct discussions with the inspection personnel. There have been some personnel errors during the initial inspection and reconstitution activities. These were detected either by the contractor supervision or licensee supervision during their reviews of the paperwork following reconstitution of fuel bundles. The problems can be categorized in three areas:

- a. Typographical or transcription errors. Rod transfers within the same bundle and from donor bundles have been erroneously documented on the fuel bundle Matrix Sheets and rod movement sheets. Changes have been made to the sequence of rod movement documentations in order to prevent recurring deficiencies of this type.
- b. Use of donor fuel rods which haven't been inspected. When the second donor bundle was selected, rods were used in the reconstitution process which had not been inspected. A reconstituted bundle was actually finished and replaced back into the storage racks with rods that were of unknown quality. This error was attributed to a lack of familiarity of the process by a contractor QC inspector. Retraining of the inspectors was conducted to prevent recurrence.
- c. Some rods which were determined to be Visual Standard 5 (VS-5) and unacceptable during the bundle inspection were not removed from the reconstituted bundle. This was attributed to an oversight by the contractor QC inspector who directed rod swaps. The three questionable bundles were reinspected and the QC inspectors reinstructed.

The inspectors discussed all of these errors with the licensee's supervisor of Test Directors and the contractor manager in charge of

the reconstitution process. CAQR 880377 was written to document the problems and the corrective action taken. The problems are considered to be licensee identified and therefore no violations will be issued.

7. General Electric Contractor Recommendations

(Open) Unresolved Item (259,260,296/85-39-04) Licensee Resolution of GE Report Safety Related Items. The licensee had contracted with several outside consultants to perform various evaluations as part of the Regulatory Performance Improvement Program (RPIP). The RPIP was imposed by Confirmatory Order (EA 84-54) on July 13, 1984. In July 1985, the resident inspector followed up on the General Electric (GE) NSSS recommendations and documented the results in Inspection Report 259, 260, 296/85-39. Basically, the inspection found that the licensee had not developed a coordinated program for resolution of numerous deficiencies and recommendations identified by GE. Subsequent to this, in a NRC Request for Information pursuant to 10 CFR 50.54(f), dated September 17, 1985, the NRC asked for an evaluation and proposed disposition of contractor recommendations. TVA responded to this request in the Browns Ferry Nuclear Performance Plan (Volume 3) Appendix B, Evaluation of Contractor Recommendations.

A followup inspection of the implementation of the above commitments was conducted by the resident inspectors and documented in Inspection Report 259,260,296/87-20. During that reporting period the inspectors identified various problems with the licensee's program for resolution of the contractor recommendations. These problems included failure to classify items as restart, failure to include all contractor findings on computer tracking lists, failure of the Plant Operating Review Committee (PORC) to review recommendations, and the lack of timely resolution on items that had been tracked for extended time periods.

During this reporting period the inspector reviewed the status of the resolution of GE contractor recommendations. This program included items associated with 22 NSSS and safety related systems for Unit 2. The items were reviewed for applicability to Browns Ferry, desirability, and if a determination of requirement for restart was performed. As of May 30, 1988, there were a total of 676 items in the tracking program which were divided into 5 separate categories as shown below:

<u>Category</u>	<u>Assignment</u>	<u>Total Items</u>	<u>Completed</u>
A	Required for restart	49	22
B	Applicable/Desirable	459	260
C	Applicable/Not Desirable	42	---
D	Not Applicable	23	---
	Other	103	75
	Totals	676	357

The licensee stated that the computer tracking list and assignment of each category had been reviewed and approved by PORC. Additionally a system documentation file is prepared for the closeout of each item and will

receive management review after the resolution of each recommendation. This management review effort is approximately 25% complete.

Additionally, the licensee has committed in the Nuclear Performance Plan to perform a Quality Assurance Surveillance on the system review plan. The program is currently scheduled for completion by August 1, 1988. The licensee stated that the QA surveillance would be complete shortly thereafter.

The inspector reviewed licensee memos dated August 10, 1987 (R40 870810 976) and November 12, 1987 (R40 87110 997) which provided the criteria and additional guidelines for determining Category A (restart) items. The inspector feels that the guidance contained in the above two memos generally contains adequate detail to support the proper classification of each item. However, the following concerns exist:

GE recommendations concerning GE design specs are automatically classified as Category C (not desirable). The inspector questions the adequacy of this assumption without evaluating each item on a case by case basis.

Any item being worked/tracked/completed by another TVA program such as a drawing discrepancy or ECN is classified as Category E. The inspector questions the adequacy of this assumption especially when alternate tracking items such as ECNs can be cancelled.

The inspectors will look at these specific concerns and continue to follow the progress of resolution of contractor recommendations in the next reporting period. There still remains a considerable amount of effort to resolve the recommendations. This item will remain open pending further review by the inspectors.

Within this area no violations or deviations were found.

9. Q-List Program Implementation

The inspector reviewed the implementation of the Unit 2 Q-List program as identified in I.E. Inspection Reports 88-05 and 88-10. Follow-up management meetings with site program management indicated numerous program and procedural changes have been implemented to correct the inspector identified deficiencies.

To fulfill the commitments in the NPP Volume III, the BFN Unit 2 Phase I Q-List was implemented on February 26, 1988, listing nuclear safety-related components, systems, and structures. The Q-list was implemented by issuing design drawing #47A302-1, Unit 2 Phase I Q-List, and SDSP 3.10, Use of the Q-List, and deleting Unit-2 components from BF 1.11, Critical Structures, Systems, and Components (CSSC) List. Some system components are only required for the mitigation of abnormal operating transients and

special events and are not included in the Q-List because of the present Q-List definition. Components that were on the CSSC list that should have been included on the Q-list are standby liquid control system pumps, valves, tanks and controls; the vacuum breaking system; shutdown cooling mode components of the RHRS; and the fuel pool cooling system. The following steps were being taken to alleviate concerns regarding those components:

- (1) A review of the Q-List Design Review File, the BFN Safe Shutdown Analysis (SSA), and the associated System Requirements Calculations shall be performed to determine the operating modes (and components) not included in the Q-List because they were required to function in the mitigation of abnormal operating transients and special events.
- (2) For those systems which have operating modes (and components) for the mitigation of abnormal operating transients and special events that are determined not to be included on the Q-List because they are not safety-related, the system designations shall be compared to the BFN CSSC to determine that all systems originally specified on the CSSC are considered in this evaluation.
- (3) A comparative review and evaluation of components within the operating modes of steps 1 and 2 will be performed to reduce the total set due to any components that appear common to safety-related operating modes.
- (4) The set of components developed through step 3 will be added to the Q-List on a systematic revision basis with definition of limited QA program requirements.
- (5) A review of the general boundaries of the CSSC and the included operating modes of the SSA shall be performed to determine whether the Q-List for each system is enveloped by the CSSC. If not, CAQRs will be generated as appropriate.
- (6) Once all systems have been considered, as indicated in steps 1 through 5 above, Q-List procedures will be revised to indicate the Unit 2 Q-List will stand alone independent of the Unit 1 and 3 CSSC list.

TVA intends to do the following to resolve existing weaknesses in the Q-List and make the Q-List usable:

- (1) A training program is in progress and upper level management emphasis has been provided to the appropriate organizations. The interfacing requirements of SDSP-3.10 and BF 1.11 will be included in this training.

- (2) SDSP-3.10 was revised to provide direction to users when system components cannot be located on the Q-List.
- (3) SDSP-3.10 and PI 87.52, Development and Control of BFNP Unit 2 Phase I Q-List, were revised to clarify the language regarding adherence to 10 CFR 50, Appendix B.
- (4) In addition, an evaluation program of system operating modes (and equipment) for systems of special significance and limited QA requirements will be completed and components added to the Q-List as appropriate. This will eventually replace any dependence on BF 1.11 (and the CSSC listing).

On May 6, 1988, temporary change No. 10 was issued to BF 1.11 to reinstate the CSSC list for Unit 2. The failure of the Q-list to include components that were on the CSSC list is an unresolved item. (260/88-16-02) The licensee will be asked to respond to this item describing how they ensured that the quality control activities for the components that had been on the CSSC list but were not on the Q-list were properly specified and implemented from February 26, 1988 until May 6, 1988.

The inspector learned that the Q-List was prone to misuse and that training was required for Q-List end-users to alleviate the potential problems with the Q-List not being a stand alone document. The inspector attended one of the training classes conducted on May 19, 1988. The pitfall of "default classification" was stressed many times during the session. A default classification would be to assume that a component was not safety-related or not under the program of limited QA controls if it could not be found on the Q-List. Because the Q-List is not a stand alone document and it is being issued in a phased approach, this assumption cannot be made. The only thing that can be interpreted from the Q-List is that if a component is on the list, it is safety-related. If a component is not on the list, a request must be made to DNE to perform a component-specific classification. Part of the reason for this is that the Q-List was developed using DNE "as-designed" drawings. This was prior to the Design Baseline Verification Program (DBVP) which was to reconcile the deviations between the as-constructed and as-designed drawings. Thus there were known problems with the Q-List inputs and therefore a lack of confidence exists in the Q-List itself. The inspector found that the training could have been enhanced by use of several example cases where a component would be selected and the Q-List consulted for a safety classification. This feedback was provided to the instructor.

During a review of the Q-List Equipment Data Packages (QEDP), the inspector identified a noncompliance with the licensee's procedure. Section 5.7 of BFEP PI 87-52, Development and Control of the Browns Ferry Unit 2 Phase I Q-List, identifies the information required to be placed in the QEDP. This includes drawings, commitment/requirement data sheets, classification derivations, correspondence, design baseline program results, and other miscellaneous data. Step 5.7.3 of PI 87-52 requires that QEDPs

shall be controlled as QA Records upon completion. The inspector's review of the QEDP for System 001, Main Steam, detected a violation of the QA Records requirements in the Q-List Data Entry, Update and Input Sheets contained in Tab B1 Analysis Component Pickoff and the Tab B1/B2 Analyses Component Pickoff. The following examples expressly prohibited by Section 6.1, QA Records Administration, of the NQAM Part III, Section 4.1, Quality Assurance Records, were detected:

- a. A majority of the QA record was not in black ink (some entries were in light blue and red ink).
- b. A majority of the corrections were not made by marking a single line through the item to be changed, marking the new entry, and entering the dated initials of the person making the correction.
- c. There was no name or date included in the reviewer block on a majority of the input sheets, nor were these blocks marked as being not applicable (N/A).

These problems were identified to the licensee's compliance organization as a violation of the NQAM during the first week of May 1988. These are considered to be examples of a violation of 10CFR 50, Appendix B, Criterion V, Instructions, Procedures and Drawings. (259,260,296/88-16-03).

9. Employee Concern Program (ECP)

The inspector reviewed the employee concern program at Browns Ferry to determine program adequacy and procedural controls. Site Director Standard 15.1, Employee Concern Program, and Site Director Standard Practice 15.5, Employee Concerns Handling Procedure, were reviewed for adequacy and adherence to regulatory requirements.

A generic deficiency was identified by the inspector that should be addressed by a program procedure change. SDSP 15.5 does not specifically address the review process required of ECP completed investigations to evaluate the findings for reportability requirements. This concern was thoroughly discussed with licensee program management. The licensee committed to review all issued (26) ECP investigation reports for reportability and correct SDSP 15.5 to address this concern. This item will be listed as an inspector followup item to verify completion of this task (260/88-16-04). This item was identified during the review of ECP Investigation Report 87-BF-B97-01.

Within this area no violations or deviations were identified.

10. Unit 2 Drywell Fire Followup Report

The NRC conducted a special inspection of the fire in the Unit 2 drywell of November 2, 1987. Details of the inspection are delineated in Inspection Report 87-43. Specific concerns identified in the inspection report

were responded to by the licensee. This followup report identifies violations identified by the NRC during the inspection, but held in abeyance until the final licensee Serious Accident Analysis Report of the fire was issued. The inspectors have reviewed the final issued Serious Accident Investigation Team Reports of December 7, 1987, and April 13, 1988. Management concerns identified during the inspection will be reviewed during management reviews required for Unit 2 restart.

The following violations were identified during the November 1987 inspection:

- a. A temporary alteration control form (TACF) was not used to authorize temporary connections through penetration EE for recirculation system valve controls and drywell blower controls performed under Maintenance Requests (MR) A793993 and A775468. Plant Managers Instruction (PMI) 8.1, Temporary Alterations, requires that long term alterations shall be controlled using a TACF in lieu of other mechanisms (such as an MR) which are approved for only short term alterations. These MRs were performed in May and October 1987, and should have been considered long term alterations. (See Report 87-43, Details, Section 8.a, page 12)
- b. Nuclear Quality Assurance Manual, (NQAM) Part III, Section 4.1, requires that QA Records shall have all blanks filled in or marked N/A. Many MRs were found with signatures and data missing. Examples of these were MR No. A775468 which was missing signature's for "Raychem acceptable" on 6 pages and signatures for "QC Verification of Standard Test 1." on 5 pages; and MR No. A822017 which was missing an entry on blocks 26 through 28 which should have documented work performed and cause of failure.
- c. PMI 6.2, Conduct of Maintenance, Section 4.4.13, requires that post-maintenance testing be performed on all plant process equipment following all corrective maintenance, and some preventive maintenance and troubleshooting activities that might have impaired proper functioning of the component.

No electrical checks of any nature were performed as post-maintenance testing following completion of the temporary electrical splices installed under MRs 793993 and 775468. This was attributed to inadequate controls in Modification/Addition Instruction MAI-45, Cable Terminating and Splicing for Insulated Cables up to 15,000 volts. Also, Electrical Maintenance Instruction (EMI) 7.2, Test Procedure for Initial Installation and Troubleshooting of Molded Case Circuit Breakers, was found to be deficient in that it failed to test the motor starter portion of the breakers. The starters contain the thermal overload elements which perform a necessary function for some modes of end-device failures.

- d. Three of the six fire brigade members who entered the drywell for fire fighting operations were not eligible for fire brigade duty due to failure to comply with the training and qualification requirements of FPP-1, Fire Protection Program Plan. Additionally, 67 of 126 fire brigade members assigned to five operating crews were ineligible for fire brigade duty for the same reasons. (See Report 87-43, Details, Section 9.a, page 16).

These concerns are considered further examples of the violation of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings (259, 260, 296/88-16-03).

11. Seismic Analysis of the Standby Gas Treatment Building

During a review by the resident inspector of the closure of Unresolved Item 259,260,296/87-27-03, it was noted that CAQR 87-180 had been issued in October 1987, relative to the concern that the Standby Gas Treatment Building seismic response spectra in the original plant design basis was underpredicted.

The inspector noted during the review process that this significant concern had not been reported to the NRC or adequately evaluated by the licensee. The inspector reviewed CAQR 87-180 to determine why no report was received. The following deficiencies were noted that violated the requirements of Site Director Standard Practice 3.7, Corrective Action.

- a. The management reviewer is required to identify if operability at the nuclear unit could be potentially affected using criteria in Attachment 5 of the SDSP 3.7. One of the criteria states that any CAQR citing a plant/FSAR discrepancy shall be reviewed for operability. A plant/FSAR discrepancy is defined as a discrepancy between the as-built facility and the applicable description in the FSAR. A second criteria in Attachment 5 states that the technical specification required equipment must meet the operability definition in the technical specifications. The reviewer decided this item did not affect unit operability on the CAQR appropriate section. This was an incorrect evaluation.
- b. The Plant Operations Review Staff did not complete its evaluation of the CAQR for effect on operability. PORS had reviewed SCR 86-29 which originally identified this deficiency. PORS requested followup information from design in March 1987, in accordance with SDSP 15.2. No information has been forthcoming to present. No effective followup by PORS, required procedurally each quarter, was apparent.
- c. The responsible organization is required to evaluate the CAQR for significance in accordance with criteria in Section 4.12 of SDSP 3.7. The design organization determined that the CAQR was not significant and not reportable. The PORS group did not evaluate the CAQR. The specified criteria in Section 4.12 states that any event that could

prevent the fulfillment of the safety function of a system needed to control the release of radioactive material should be noted as significant. In fact, the basis of this CAQR was the transfer of this known deficiency from a previous licensee significant condition report (SCR 86-29) of February 1987.

Failure to conduct an adequate CAQR review and evaluation is another example of the violation against 10 CFR 50, Appendix B, Criterion V and Site Director Standard Practice 3.7 (260/88-16-03). In response to this violation TVA is requested to address their confidence that CAQR operability and reportability determinations have been properly made in the past.

12. Licensee Action on Previous Enforcement Matters (92802)

(CLOSED) Violation 259,260,296/85-45-02, Improper closeout of modification activity without the update of drawings. The licensee was unable to determine the reason for the violation; however, the drawings that were in error have been updated to reflect the as-built configuration. The inspector toured the area and performed a walkdown of the affected piping, valves, and components for drawing verification and found no further problems. This item is closed.

13. Followup of Open Inspection Items (92701)

(CLOSED) Unresolved Item (259,260,296/86-28-04) Labeling problems associated with shutdown board normal - emergency control power selector switch. The inspectors had identified a concern with adequate circuit breaker identification labeling in both the 3A and 3B 480 volt AC shutdown board rooms. The inspector reviewed maintenance request 859228 which corrected the specific discrepancies as described in the original inspection report. Additionally, the inspector toured the 4KV and 480 VAC shutdown board rooms in Units 2 and 3 and noted no apparent labeling discrepancies. Many new labels were noted which appeared to have adequate adhesive to prevent recurrence of the problem of many labels becoming loose. The inspector considers that the licensee's efforts with component identification walkdowns as part of the Design Baseline Verification Program (DBVP) has resulted in an improvement of the overall condition of labeling in this area. This item is closed.

(CLOSED) Unresolved Item (259,260,296/87-27-02), Transportation, control of contamination, and inadequate radiological surveys associated with a Carbon-14 Tracer used at the Browns Ferry Biothermal Research Facility. A followup inspection was conducted by NRC Region II on August 4, 1987, to evaluate this item. The details of the inspection are delineated in Inspection Report 01-16821-02/87-01 issued January 6, 1988, which satisfactorily closed this issue.

(OPEN) Unresolved Item (259,260,296/86-28-02), Discrepant scram valve opening times. In July 1986, the licensee discovered during the performance of Special Test 86-10, that several scram inlet and outlet valves

delayed opening for up to 20 seconds. The licensee researched GE Service Information Letters 441 and 373 and NRC Information Notice number 86-78 in an attempt to resolve the anomaly. Another special test (86-26) was performed on October 22, 1986, to determine the effect of rebuilding the scram pilot valves on scram valve opening times. The test determined that opening times improved by up to 15 seconds; however, the licensee's analysis of the data (RIMS R40 870407 930) which was presented to the Plant Operations Review Committee (PORC) documented that even after solenoid pilot valve rebuilding, the times remain up to "4 seconds greater than expected." The licensee considers the anomaly resolved; however, since General Electric representatives have indicated that four other plants have experienced similar delays, the anomaly was not specific to BFNPP. The inspector's review of the data and other reference material indicated that a potential problem exists with the spring tension adjustment of the scram inlet and outlet valves and a possible excessive pressure drop across the scram pilot valves. The following issues should be addressed in closing this item:

- a. Acceptance criteria for scram pilot valve timing upon scram air header blowdown should be addressed. The data already accumulated supports compliance with this time or perform followup tests to demonstrate compliance should be considered.
- b. Perform either single rod scram testing prior to plant startup or scram valve time tests prior to plant startup for each scram solenoid pilot valve that has been refurbished in accordance with the GE recommendations in SIL No. 441. This is to ensure HCU operability and to detect further anomalies.
- c. The licensee should check the adjustment of all scram valve opening air pressures which have indicated a potential for noncompliance with the recommended spring tension settings in GE SIL No. 373.

(CLOSED) Inspector Followup Item (259,260,296/86-25-02), Control room emergency ventilation walkdown deficiencies. This IFI was opened to track numerous deficiencies discovered during a walkdown of the CREV system. All of the items except two were corrected and dispositioned in Inspection Report 259, 260, 296/87-46. The remaining concerns were; 1) operator knowledge of damper locations which were required to be checked shut upon a control room isolation and 2) accessibility of dampers for manual operation. The licensee revised OI-31 and AOI-31, Control Bay Emergency Pressurization Operating Instructions and Abnormal Operating Instructions, to provide damper locations to the operator. The licensee also evaluated the necessity for remote reach-rod linkages to the dampers but concluded that since the actuators are not expected to fail by remote operation, no need existed for manually operated reach rods. This IFI is closed.

(CLOSED) Unresolved Item (259,260,296/85-28-09), Secondary containment blowout panel deficiencies. The licensee discovered that an unauthorized modification had been made to some secondary containment blowout panels that would have prevented them from relieving at 26 pounds per square foot

differential pressure. Thus, secondary containment and various other safety systems could have been compromised in the event of a tornado depressurization or a steam break outside primary containment. The licensee repaired the blowout panels and inspected all other blowout panels for similar problems. An engineering evaluation was performed in order to evaluate the as-found deficient condition. The evaluation concluded that failure of certain block walls could have occurred during a tornado depressurization resulting in failure of one of the Emergency Equipment Cooling Water (EECW) headers. This together with a single failure on the other EECW header could have resulted in a total loss of EECW. Since the problem was licensee identified and corrective action has been completed with periodic inspections to prevent recurrence included, this item is closed.

(OPEN) Inspector Followup Item (259,260,296/86-32-03) Reactor protection system (RPS) calibration frequency. This item concerned a discrepancy identified by the inspector between the safety analysis which supported Technical Specification changes for the new RPS Analog Transmitter and Trip Units (ATTU) and actual plant practice. The licensee assembled a documentation package on this concern which would resolve it to their satisfaction. The inspector noted; however, that QIR EEB BFN 88070, which was contained in the package, still reported that "present Technical Specifications have an 18 month calibration cycle. This is not supportable for the TOBAR transmitters." The package also noted that calculations for the calibration frequency of PT-68-95 and PT-68-96 are not yet completed but will be issued prior to restart of Unit 2. A licensee representative was informed that this IFI will remain open pending resolution of these outstanding discrepancies.

(OPEN) Inspector Followup Item (260/87-33-00) Post-modification testing of drywell electrical penetrations. This concern related to a failure to require an inspection of the electrical penetration welds during the containment integrated leak rate tests (CILRT) to be performed prior to restart. A licensee representative stated that it was planned to perform a soap-bubble leak inspection of the new welds while the containment was pressurized for the CILRT. This item remains open pending completion of the planned inspection.

(CLOSED) Unresolved Item (260/87-02-02), (OPEN) Unresolved Item (259, 296/87-02-02), Limitorque Gear Ratios. The inspectors documented a concern that the Unit 2 High Pressure Coolant Injection (HPCI) system steam isolation valve, 2-FCV-73-2, may not have been able to close against design differential pressure due to improper Limitorque Operator gear ratio. The operator had a 33:1 ratio rather than the required 60:1 ratio.

The licensee had identified the incorrect gear ratio during review of valve requirements for IE Bulletin 85-03. As part of the corrective actions for this item, the licensee has performed an evaluation to determine any additional valves with unexplained timing differences which could be due to other errors in gear ratios. In addition to 2-FCV-73-2, valves

3-FCV-69-2 and 3-FCV-69-12 were found to have different timing and gear ratios.

ECN E-2-P7054 has been worked to change the gear ratio on the valve 2-FCV-73-2 to provide a 60:1 ratio. Since no other Unit 2 valves were identified which had errors in operator gear ratio the inspector concluded that the licensee has taken adequate corrective actions to address the original concerns associated with Unit 2. However, this item associated with Units 1 and 3 will remain open pending review of corrective actions to correct any other valves with identified gear ratio errors. This item is closed for Unit 2 only.

(OPEN) Unresolved Item (259,260,296/87-27-03) Standby Gas Treatment System (SGTS) Blower - Train C Seismic Qualification. The SGTS Blower - Train C is mounted on a steel frame and held by six vibration isolator spring mounts. The resident inspector identified that the unit had no lateral support. TVA evaluated the mounting configuration of the Blower-Train C and discovered that the Blower was not adequately supported to prevent damage during a seismic event. Design change notice B00033C was issued to correct this deficiency. The inspector reviewed the design change notice, the associated Work Plan 3303/88, the associated USQD, and the Bechtel calculation package J.N. 19106. No deficiencies were noted. The field installation was observed by the inspector. One of the neoprene pads added during the seismic modification was noted to be defective during the field walkdowns. The glue used to attach the neoprene pads had lost its adherence on one of the six supports. A CAQR was initiated to address this deficiency (CAQR 88-385). This unresolved item will be evaluated for possible enforcement action.

(OPEN) Unresolved Item (260/87-46-04), Update on Adequacy of Heat Tracing For the Residual Heat Removal Service Water And (RHRSW) Emergency Equipment Cooling Water (EECW) Systems. A meeting was held between the resident inspectors and the BFN Plant Manager on December 7, 1987, at BFN to identify NRC concerns dealing with the heat tracing system/components for the RHRSW/EECW systems located in the intake pumping station. The inspectors feel that the heat tracing in question should be considered important to safety-related due to TVA's commitment to I.E. Bulletin 79-24.

There are several instruments located in the pumping station that are required for accident mitigation and whose functions would be impaired if the small lines providing their inputs were to freeze. Pump discharge pressure switches PS-67-001, 005, 008, and 011 actuate at a system pressure of 20 psig upon pump actuation to energize the strainers (0-STN-67-A, B, C, and D) and open the corresponding strainer backwash valves (0-FCV-67-001, 005, 008, and 011). Pressure differential switches PDS-67-001, 005, 008, and 011 do not perform a safety function, but their failure could prevent the pressure switches from operating. This information was derived from three main sources: The Master Component Electrical List (MCEL), Baseline's System Requirements Calculation, and the Q-List.

All these documents include the above mentioned items as "safety-related". The MCEL and the Q-List classify the heat tracing temperature switches TS-23-70, 71, 72, and 73 as safety-related, but are being revised under CAQR 870018 to remove these switches. The Q-List receives its information from the MCEL for these switches.

Upon a visual inspection of the equipment located in the intake pumping station, it was observed that the piping and instrument lines (as well as the strainers themselves) were protected with heat tape and controlled by thermostats. All lines appeared to be insulated. The possibility of these lines freezing is the subject of MEB Calculation BWR-M2-751-1. It has been determined by this calculation that the possibility of the large diameter (greater than 14 inches) pipes freezing when the pumps are running does not exist, but the smallest instrument lines could conceivably freeze if subjected to extreme cold. This is a credible event since the pumps, piping, equipment, and specialties are essentially located in an outdoor environment. This calculation is being revised under the corrective action for CAQR BFP870018. The revision was prompted by concerns that the parameters used in the calculation were overly conservative or improper (incorrect temperature gradients, no credit taken for insulation, etc.). Therefore, it is questionable whether the small instrument lines would be subject to freezing, especially with one or more of the pumps in each compartment running--contrary to the conclusions of the existing MEB calculation. The results of the revised calculation will reveal whether or not freezing of any instrument lines will occur, and the significance of this freezing (i.e., loss of EECW flow, room flooding, etc.).

Special precautions have been taken by TVA to annunciate the condition of the heat tracing in the control room for proper operator actions to occur. The heat trace automatically initiates at a temperature of 39°F. At a temperature of 35°F, annunciators TA-23-70, 71, 72, and 73 for pumps A, B, C, and D respectively inform the operator that the heat tracing equipment in the pumping station has failed to prevent the piping from reaching potential freezing conditions. The operator then takes action according to the Browns Ferry Alarm Response Procedures (BFARP) for panel 9-20. The actions that are prescribed include a visual inspection of the equipment. This would allow maintenance to identify any freezing/rupture problems that may exist or have the potential to develop. If the cause of the failure cannot be determined, the field personnel are instructed to refer to GOI-200-1 (Browns Ferry General Operating Instructions), and to issue a Maintenance Request (MR) on any affected equipment or instruments that are found to be frozen due to inoperative heat tracing. GOI 200-1 in turn guides the operator to the Electrical Maintenance Instructions (EMI-46). Corrective actions to prevent/correct freezing of piping in the pumping station could then be initiated.

No specific actions are described by the BFARP for panel 9-20 other than writing an MR against affected equipment. It is left to the discretion of field personnel/shift supervisor to determine what corrective actions are appropriate. In this respect, the existing response procedures are

deficient and should be revised to provide more explicit corrective actions when freezing situations are encountered.

The RHRSW/EECW heat tracing system is basically comprised of thermostats set at predetermined setpoints that regulate the protected piping. In order to ensure reliable service from this rather simple configuration, certain features have been incorporated into the system and a preventative maintenance plan devised. The system receives Class 1E power from the 480V Diesel Auxiliary Boards. Failure of the heat tracing is annunciated in the control room, as previously mentioned, when the thermostats fail to actuate at the desired temperature and an Assistant Unit Operator (AUO) is summarily dispatched. The operator can then monitor the heat tracing system on a 24 hour basis if necessary. The heat tracing is inspected annually by implementation of the EMI-46 Freeze Protection Program as part of the Preventative Maintenance schedule performed by Electrical Maintenance. TVA feels their program commitment to NRC Bulletin 79-24, regarding the heat tracing for the RHRSW/EECW systems, is currently being met with the existing freeze protection programs in existence.

The heat tracing comprises an important part of the freeze prevention program for the RHRSW/EECW systems. However, TVA feels credit can be taken for operator actions during an emergency since the time frame involved regarding freezing and possible rupture of RHRSW/EECW related lines is of an extended nature. As mentioned earlier, no specific actions are delineated by procedures once a potential freezing situation arises. TVA considers no portions of the heat tracing system to be safety-related. However, the inspector regards the system as important-to-safety and operational procedures are required to more specifically instruct the operator on the necessary corrective actions that would need to be taken to preclude freezing of RHRSW/EECW lines.

The following need to be addressed prior to closing this item:

- a. Procedures should be upgraded to reference operator actions required if a freezing event occurs.
- b. The system must be evaluated in light of the Q-List program for applicability to IMPORTANT-TO-SAFETY and/or LIMITED QA components.
- c. Calculation MEB-BWR-M2-751-1 and associated results should be reviewed for credibility.

(CLOSED) Unresolved Item (259/260/296/86-25-03), Heavy Loads in the vicinity of the intake structure. The licensee, in response to the delineated concern, responded b:

- a. Evaluating placement of a fully loaded crane over the point of minimal earth cover and the resulting surface loading;
- b. Calculation of the transmission of that load to the conduit structure;

- c. Summation of the crane's load along with the other loads including dead load, hydraulic gradient, earth pressure, etcetera;
- d. Demonstration that the load imposed on the structure is less than the allowable stresses;
- e. Calculation of the maximum live load that may be placed on the surface and which the conduit structures will support along with the margin of safety associated with that load;
- f. Delineation of the area boundaries appearing on drawing 37N200 between the pumping station and the oil storage tanks to which that maximum live load applies;
- g. Identification of any other sub-grade structures, conduits or piping which are more limiting within that area.

Design charge 3473 was conducted to address these concerns. The inspector reviewed the calculation package and action items completed by the licensee. Calculations revealed that load limits could be increased at the intake from 35 ton to 150 ton. Also, the recommended loading distance from the intake well was increased from 3 feet to 10 feet. A FSAR change was submitted to update the FSAR to the correct amounts. This item is closed.

(CLOSED) Unresolved Item (259,260,296/81-37-03), Containment atmosphere dilution system valve identification and Technical Specification discrepancies. It was identified by the licensee that valves FSC-84-8A, 8B, 8C, 8D are containment isolation valves; however, they are not PCIS group 6 isolation valves. They receive no logic input for automatic closure as a result of a PCIS group signal. The use of these valves is administratively controlled. They are normally closed valves. The only time these valves are open is for the injection of nitrogen into primary containment for combustible gas control after a LOCA has occurred. Therefore, there is no reason to perform a closure time test on these valves.

FCV-84-19 does not close on a group 6 containment isolation signal. This outboard valve is normally closed, and its use is administratively controlled by the shift supervisor with a keylock switch. Venting containment for pressure control during normal operation is accomplished via FCV-84-20, per OI-64. When operated with HS-64-35 as specified in OI-64, FCV-84-20 will close upon receipt of a PCIS group 6 containment isolation signal. Furthermore, to vent through FCV-84-19 would require either FCV-64-29 or FCV-64-32 to be open; however, these valves are interlocked closed with the mode switch in the run position.

FCV-84-19, -20, 8A, -8B, -8C, -8D are cycled monthly in SI 4.7.G.1.A, CAD system operability test. FCV-84-20 is tested for closure time in SI 4.7.D.

TVA has submitted to Site Licensing a proposed change to the Technical Specification tables for containment isolation valves in response to inspector followup item 86-40-07. The proposed change would delete Tables 3.7.B - 3.7.H, and revise table 3.7.A to include all containment isolation valves including those specified above. Table 3.7.A was originally intended to identify only those valves which were part of a specific PCIS group logic. TVA has committed to revise and update Technical Specification 3.7.A prior to startup of Unit 2. PORC approval is scheduled for June 1988, with NSRB approval by July 14, 1988. Therefore, this item will be closed and tracked under IFI 86-40-07.

(CLOSED) Unresolved Item (259,260,296/87-26-04), Special Nuclear Material shipment deficiencies noted. On June 18, 1987, the licensee reported an irregularity involving a shipment of Special Nuclear Material (SNM) to another licensed facility. The licensee shipped what was thought to be five intermediate range monitors (IRM), each containing 1 milligram of Uranium-235 to Peach Bottom Nuclear Station on June 16, 1987. Peach Bottom personnel informed Browns Ferry via telephone on June 18, 1987, that a sixth IRM was received in the shipment. A followup inspection by Regional inspectors was conducted on July 27-29, 1987, as detailed in I.E. Report 87-29. Violations of regulatory requirements were identified. Therefore, this item will be closed out and tracked under the open items listed in I.E. Report 87-29.

14. Exit Interview

The inspection scope and findings were summarized on June 10, 1988, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings listed below. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Description and Reference</u>
259,260,296/88-16-01	IFI - Control of Systems while testing per the Restart Test Program (RTP) is in progress, paragraph 5.
260/88-16-02	Unresolved item - Quality requirements for components not on Q-list, paragraph 8.
259,260,296/88-16-03	Violation - Six examples of failure to comply with procedures, paragraphs 8, 10 and 11.
260/88-16-04	IFI - Verify the process for reviewing ECP investigations reports for reportability, paragraph 9.