UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

January 18, 2002

Tennessee Valley Authority
ATTN: Mr. J. A. Scalice
Chief Nuclear Officer and
Executive Vice President
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT NOS. 50-259/01-04, 50-260/01-04, 50-296/01-04

Dear Mr. Scalice:

On December 22, 2001, the NRC completed an inspection at your Browns Ferry 1, 2, & 3 reactor facilities. The enclosed report presents the results of that inspection which were discussed on December 21, with Mr. Ashok Bhatnagar and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the inspectors identified one issue of very low safety significance (Green). The issue was also determined to involve a violation of NRC requirements. However, because the violation was of very low safety significance and because the problem was entered into your corrective action program, the NRC is treating the issue as a non-cited violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny the non-cited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Browns Ferry facility.

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories, and although the specific actions are not releasable to the public, they generally include increased patrols, augmented security forces and capabilities, additional

security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of the Tennessee Valley Authority's response to these advisories and Browns Ferry's ability to respond to terrorist attacks with the capabilities of the current design basis threat. From these audits, the NRC has concluded that the Browns Ferry security program is adequate at this time.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Paul E. Fredrickson, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket Nos. 50-259, 50-260, 50-296
License Nos. DPR-33, DPR-52, DPR-68

Enclosure: NRC Integrated Inspection Report
w/Attachment - Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-259, 50-260, 50-296
License Nos:	DPR-33, DPR-52, DPR-68
Report No:	50-259/01-04, 50-260/01-04, 50-296/01-04
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Browns Ferry Nuclear Plant, Units 1, 2, & 3
Location:	Corner of Shaw and Nuclear Plant Roads Athens, AL 35611
Dates:	September 23 - December 22, 2001
Inspectors:	W. Smith, Senior Resident Inspector J. Starefos, Resident Inspector P. Taylor, Senior Project Engineer D. Jones, Senior Health Physicist C. Payne, Senior License Examiner J. Blake, Senior Project Manager
Approved by:	P. E. Fredrickson, Chief Reactor Projects Branch 6 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000259-01-04, IR 05000260-01-04, IR 05000296-01-04, on 09/23-12/22/2001, Tennessee Valley Authority, Browns Ferry Nuclear Plant, Units 1, 2 and 3, Other Activities.

The inspection was conducted by the resident inspectors, a maintenance inspector, a health physicist, a license examiner, and a project engineer. The inspection identified one Green non-cited violation (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website.

A. Inspector Identified Findings

Cornerstone: Barrier Integrity

Green. The inspectors identified an NCV for failure to maintain a barrier door for the control room pressure envelope closed. The door was blocked open for over three hours, resulting in both trains of the control room emergency ventilation system being out-of-service in excess of the allowed TS outage time.

The finding affected the integrity of the control room envelope, but was considered to be of very low safety significance because it represented a degradation of the radiological barrier function provided for the control room only. (Section 4OA3.3).

Report Details

Summary of Plant Status

Unit 1 has been shut down since March 19, 1985, and has remained in a long-term lay-up condition, with the reactor defueled. In December 2001, the reactor vessel was opened and the internals ultrasonically and visually inspected for degradation.

Unit 2 operated at or near full power, except as noted, with brief reductions in power scheduled to adjust control rods and perform fuel suppression tests and other routine testing. On December 4, 2001, the unit was shut down to investigate and correct drywell unidentified leakage. By December 10, full power operation was restored.

Unit 3 operated at or near full power, except as noted, with brief reductions in power scheduled to adjust control rods and perform routine testing. On October 14, 2001, power was decreased to 85% for a few hours to perform maintenance on feedwater heaters.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors reviewed licensee General Operating Instruction, 0-GOI-200-1, Freeze Protection Inspection, used by plant operators to align plant systems, place freeze protection space heaters, and heat trace into service for equipment and components affected by cold weather conditions. In addition, the inspectors reviewed the below listed electrical preventive instructions (EPIs) used to conduct initial calibrations, periodic inspection, and preventive maintenance of components in the Freeze Protection Program (FPP):

- EPI-0-000-FRZ001, FPP for RHRSW Rooms, EDG Building and Cooling Tower Pump Station
- EPI-0-000-FRZ002, FPP for Condensate, Demineralize Water, and Caustic Storage Tanks
- EPI-0-000-FRZ003, FPP for Miscellaneous Yard Areas, Buildings and Systems

The inspectors walked down the residual heat removal service water (RHRSW) rooms, emergency diesel generator (EDG) building and condensate storage tank areas to verify that required cold weather protection measures were implemented for the safety-related systems and areas. The inspectors also reviewed corrective action program problem evaluation reports (PERs), nuclear assurance audits, and self-assessments to verify that the licensee was identifying freeze protection program problems, initiating corrective actions and resolving issues in a timely manner.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed a partial walkdown of the below-listed systems to verify redundant or diverse train operability while one train was out-of-service. Consideration was given to the operable trains' configuration as required by the applicable operating procedures.

- Unit 3 residual heat removal (RHR) Loop II while RHR Loop I was out-of-service for preventive maintenance on RHR Pump 3C and the pump room coolers
- Unit 2 reactor core isolation cooling (RCIC) while high pressure coolant injection (HPCI) was out-of-service for scheduled maintenance
- Unit 3 control rod drive (CRD) Pump 3B, HPCI and RCIC while CRD Pump 3A was out-of-service for preventive maintenance
- Standby Gas Treatment Trains A and C while Train B was out-of-service for scheduled maintenance

The inspectors also performed a complete walkdown of the Unit 2 reactor protection system (RPS) and the four Unit 3 EDGs. System diagrams were studied and compared with the actual installed systems, operating instructions were reviewed, and outstanding work orders were reviewed. Valve and switch configurations were sampled from the operating instructions and verified to be in the positions specified.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors toured the below-listed plant areas to evaluate, as appropriate, conditions related to: (1) licensee control of transient combustibles and ignition sources; (2) the material condition and operational status of selected fire protection systems, equipment and features; and (3) the fire barriers used to prevent fire damage or fire propagation. Acceptance standards for the above conditions are delineated in the licensee's Fire Protection Plan.

- Fire Area (FA) 10, Unit 2, 480 Volt Shutdown Boardroom 2A
- FA 11, Unit 2, 480 Volt Shutdown Boardroom 2B
- FA 25, Units 1, 2, and 3 turbine building North wall areas
- FA 16, Unit 1 control building El. 593 hallway and computer rooms
- FA 16, Units 1, 2, and 3 control building El. 606
- FA 16, Units 1, 2, and 3 control building El. 617

On October 10, 2001, the inspectors performed the annual inspection of fire drills. The simulated fire was located in the main battery No. 2 room in Unit 2. The readiness of licensee personnel to fight and prevent the spread of fire in a vital area was evaluated in terms of proper utilization of equipment needed to combat the fire, utilization of pre-planned strategies, effectiveness of communications, and meeting drill objectives. The inspectors attended the post-drill critique to confirm a satisfactory level of self-critical discussion.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities

.1 Reactor Pressure Vessel (RPV) Core Shroud and Core Spray Piping Ultrasonic Testing (UT)

a. Inspection Scope

The inspectors observed examinations and reviewed selected records for the UT examination of the Unit 1 RPV core shroud and the in-vessel core spray piping welds. The examinations and records were compared with the requirements of approved licensee and vendor procedures. The inspection results were compared with the requirements of industry-established performance criteria from the applicable NRC-approved BWR Vessel & Internals Project (BWRVIP) documents to verify compliance. Qualification and certification records for examiners and procedures for the above UT examination activities were reviewed.

b. Findings

No findings of significance were identified.

.2 RPV Invessel Visual Inspections (IVVI)

a. Inspection Scope

The inspectors observed examinations and reviewed selected records for the IVVI of accessible portions of the Unit 1 RPV. The inspection records were compared with the requirements of the licensee and vendor procedures as well as the requirements of the applicable BWRVIP documents governing IVVI. Qualification and certification records for examiners for the above IVVI examination activities were reviewed.

b. Findings

No findings of significance were identified.

.3 List of Documents Reviewed

- GE-VT-204, Procedure for Invessel Visual Inspection (IVVI) of BWR 4 RPV Internals.
- GE-UT-503, Procedure for Automated Ultrasonic Examination of the Shroud Assembly Welds
- GE-UT-504, Procedure for Ultrasonic Examination of Jet Pump Beams in Boiling Water Reactors (BWR/4, 5,and 6)
- GE-UT-511, Procedure for the Automated Ultrasonic Examination of Core Spray Piping Welds Contained Within the Reactor Pressure Vessel.
- 386HA480,Certification of Nondestructive Test Personnel
- TVA 0-TI-365, Technical Instruction for Reactor Pressure Vessel Internal Inspection (RPVII) Units 1, 2, and 3

1R11 Licensed Operator Requalification

.1 Resident Inspector Quarterly Review of Testing and/or Training Activities

a. Inspection Scope

On November 26, 2001, the inspectors observed reactor operator and senior reactor operator requalification examination activities on the plant simulator. The subsequent evaluators' discussions and feedback to the crews were observed during the inspection to ensure that participants were self-critical and were made aware of weaknesses or areas for improvement in addition to notification that they had passed. The inspectors focused on the crews' selection and timeliness of declaring and reporting emergency action levels in accordance with the licensee's Emergency Plan. The inspection was also performed to evaluate licensee compliance with 10 CFR 55.59.

b. Findings

No findings of significance were identified.

.2 Biennial Review of Requalification Program

a. Inspection Scope

The inspectors reviewed the facility operating history since the last requalification program inspection for indications of licensed operator performance weaknesses. The inspectors also reviewed the biennial written examinations for several crews and evaluated their effectiveness in providing a basis for assessing operator knowledge of material covered in the requalification training program. Examination quality, licensee effectiveness in integrating industry, plant and student feedback into the requalification training program, and examination development methodology were evaluated as well.

The inspectors observed annual dynamic simulator examinations (four scenarios) for two operator teams to assess the adequacy of the licensee's evaluation of operator knowledge and abilities. During these observations, the inspectors assessed licensee evaluator effectiveness in pinpointing operator performance deficiencies requiring supplemental training. The inspectors also evaluated and observed portions of the walkthrough examination administered during this requalification segment to assess evaluator performance.

The inspectors reviewed and evaluated the licensee's remedial training program for operator deficiencies identified during the previous year. The inspectors also reviewed a sample of on-shift licensed operator qualification records, watchstanding records and medical records to ensure compliance with 10 CFR 55.59, Requalification, and 10 CFR 55.53, Conditions of License.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

For the equipment issues described below, the inspectors reviewed the licensee's implementation of the Maintenance Rule (10 CFR 50.65) to assess the effectiveness of the licensee's maintenance efforts that apply to scoped structures, systems, and components (SSCs):

- The Unit 3 emergency core cooling system (ECCS) analog trip unit inverter experienced a functional failure due to a blown fuse during transfer of the loads from the alternate to the normal power source
- The Unit 3 RCIC gland seal vacuum tank high level alarm time delay relay failed during surveillance testing
- The Unit 3 electric board room air cooling units 3A and 3B experienced a functional failure
- The Unit 3 steam jet air ejectors 3A and 3B experienced a functional failure, causing an unplanned capability loss
- On Unit 3, during surveillance testing, a leak was discovered at the inlet of the 3A standby liquid control pump accumulator. This rendered the 3A pump unavailable for 9.1 hours
- The Unit 2 C and D EDG intake plenum fire dampers were found closed and therefore a preventable functional failure existed on EDGs C and D
- The Units 2 and 3 RHR cross tie valve failed to open during the performance of the quarterly motor operated valve (MOV) operability surveillance

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors verified that risk assessments were being performed when and as required by 10 CFR 50.65(a)(4). The inspectors evaluated the adequacy of the licensee's risk assessments and the implementation of compensatory measures for the planned maintenance activities listed below. For the emergent work issues, the inspectors also verified that the licensee had taken the necessary steps to plan and control the resulting work activities to effectively manage and thus minimize the risk:

- Performance of preventive maintenance on RHR Pump 3C in accordance with WO 01-007551&2-000 thereby rendering RHR Loop I inoperable (Planned)
- Performance of RPS Surveillance Procedure 3-SR-3.3.1.1.8(5), main steam isolation valve closure RPS trip test (Planned)
- Control bay chiller 3A emergency equipment cooling water (EECW) leak and isolation (Emergent)
- Unit 2 unexpected RPS half-scram while stop valve testing (Emergent)
- RHRSW Pump D1 motor replacement (Emergent) concurrent with raw cooling water header outage (Planned) which had an impact on EECW pump availability
- Performance of preventive maintenance on CRD Pump 3A in accordance with WO 01-008735-000 (Planned)

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following operability evaluations affecting mitigating systems or barrier integrity to ensure that operability was properly justified as permitted by Generic Letter 91-18 (Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions), and that the SSC remained available or was addressed by plant technical specification (TS) or technical requirements manual limiting conditions for operation such that no unrecognized increase in risk occurred:

- EDG 3D emergency transfer switch not in normal position
- Reactor building flood gate seal not sealing properly following replacement
- Control bay chiller 3A EECW cooling water leak - ASME Code Class III piping
- HPCI 73-2 valve stroke time outside normal range

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds

a. Inspection Scope

The inspectors reviewed the status of operator workarounds for Unit 3 to determine if the functional capability of the system or operator reliability in responding to an initiating event was affected. This included evaluating the effect of the operator work-around on the operator's ability to implement abnormal or emergency operating procedures. A Unit 3, Priority 2 work-around was selected and reviewed in detail. This problem involved the non-functioning of the 3A reactor recirculation pump motor-generator temperature control valve for the motor cooling sub-system, requiring the operators to regulate the cooling water flow manually.

The inspectors also reviewed the cumulative effects of operator workarounds on both Units 1 and 2 that could increase an initiating event frequency or that could affect multiple mitigating systems. The review also considered the cumulative effects of operator workarounds on the ability of operators to respond in a correct and timely manner to plant transients and accidents.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors evaluated the following activities by observing testing or reviewing completed documentation to verify that the post-maintenance test (PMT) was adequate to verify system operability and functional capability following completion of associated work:

- PMT of EDG 3D emergency transfer switch after replacement
- PMT of RHR Pump 3C following preventive maintenance implemented by WOs 01-007551-000 and 01-007552-000 and in accordance with Operating Instruction 3-OI-074, RHR System Operation
- PMT of inside and outside reactor building equipment airlock door seal system after installation of Temporary Alteration 1-2001-001-032, supplementary nitrogen/air source, as implemented by WO 01-010168-000 & -001
- PMT of replacement EECW pipe supplying cooling water to the 3A control bay chiller as specified by WO 01-011409-000
- PMT of reactor coolant system ASME Class 1 decontamination piping and fittings in Unit 2 following identification of boundary leakage.
- PMT of Unit 2 low pressure coolant injection motor-generator 2EA after preventive maintenance activities in accordance with WO 01-004805-001

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

Unit 2 Outage to Repair Unidentified Drywell Leakage

On December 5, 2001, Unit 2 was shut down to investigate and repair leakage in the drywell that was reflected in the daily determination of unidentified leakage as required by TS. The licensee identified a weld leak in the reactor water cleanup 4-inch piping installed for reactor coolant system decontamination. In addition, the reactor head vent valve was leaking by its seat, as were other loop drain valves. The leaks were repaired as required by the ASME Code, where applicable, and Unit 2 was restored to power operation on December 9. Subsequent determinations of drywell unidentified leakage revealed no further leakage.

a. Inspection Scope

The inspectors observed portions of the shutdown of Unit 2, and focused on equipment and operator performance, and verified that TS requirements were followed. The inspectors monitored the licensee's repair activities during the outage and verified that ASME Code requirements were met during post-maintenance testing. The inspectors also observed portions of the startup and resumption of full power operation to ensure that the applicable operating instructions were being utilized and TS requirements were met.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors witnessed surveillance tests and/or reviewed test data of selected risk-significant SSCs, listed below, to assess, as appropriate, whether the SSCs met the requirements of TSs, the Updated Facility Safety Analysis Report (UFSAR), and licensee procedures, and to determine if the testing effectively demonstrated that the SSCs were operationally ready and capable of performing their intended safety functions:

- Surveillance Procedure (SP) 3-SR-3.8.1.1(3AR), Emergency Diesel Generator (EDG) 3A Operability Test (Appendix R)
- Surveillance Instruction (SI) 2-SI-4.4.A.1, Standby Liquid Control Pump Functional Test
- SP 2-SR-3.4.4.1-a, Calculation of Drywell Leakage Rates with Equipment Sump Overflowing into the Floor Drain Sump
- SP 0-SR-3.8.1.8(I), 480 Volt Load Shedding Logic System Functional Test (Division I)
- SP 2-SR-3-6-1-5-3(B), Reactor Building - Suppression Chamber Vacuum Relief Channel Calibration 2-PD-64-21
- SP 3-SR-3.5.1.6(RHR I), RHR Loop I Operability and Inservice Test.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors conducted a review of the list of active and pending temporary plant modifications, documented on temporary alteration control forms (TACFs) provided by the licensee. The following TACFs were selected because the systems were determined to be key systems from a probabilistic safety assessment perspective. The 10 CFR 50.59 screening and selected sections of the UFSAR and TSs were reviewed to verify that the alterations did not adversely affect the safety functions of important safety systems. Where practicable, the installed hardware was inspected to verify proper configuration and to ensure that there were no interferences with operable systems:

- TACF-1-2001-001-032, temporary backup nitrogen/air supply cylinders for reactor building large equipment airlock doors, completed November 16, 2001
- TACF-2-2001-015/016/017/018/019-068, injection of Furmanite sealant in selected valves and piping in the reactor drains to resolve excessive unidentified drywell leakage in Unit 2, completed December 8, 2001

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS3 Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors evaluated the accuracy and operability of radiation monitoring instruments used for the protection of occupational radiation workers and the adequacy of the program for providing workers with self-contained breathing apparatus (SCBA). The licensee's programs for radiation monitoring and SCBA were evaluated against the TS, implementing procedural requirements, and 10 CFR 20.

The inspectors reviewed calibration procedures and records for the most recent calibrations of four types of radiation monitoring instruments to determine whether the calibrations for the selected instruments were current. The selected instruments included a whole body counter, two high range containment radiation monitors, two portable ionization chamber radiation survey instruments, and an electronic dosimeter (ED). The inspectors observed the alarm set points for the two selected high range containment radiation monitors to determine whether the instruments were set to alarm as indicated by the most recent calibration records. The inspectors also used selected calibration sources and instrument calibration equipment to evaluate the accuracy of the instrument response for the selected whole body counter, the two survey instruments and the ED.

The inspectors toured the plant to determine whether SCBA were available at selected locations and whether equipment was available for refilling SCBA air bottles. The licensee's lesson plan for respiratory protection training was reviewed by the inspectors to determine whether it included provisions for training personnel in the use of SCBA, including air bottle change-out. The inspectors reviewed the training records for five individuals who were then currently on duty in the Unit 2 control room to determine whether the selected individuals had been trained and qualified in the use of SCBA in accordance with the lesson plan.

The inspectors also evaluated the effectiveness of characterization and resolution of selected radiation monitoring-related issues which had been entered into the licensee's corrective action program during the current calendar year.

The following licensee procedures were reviewed:

- RCI-8.1, Internal Dosimetry Program Implementation
- 2-SR-3.3.3.1.4,Containment High Range Radiation Monitoring Channel Calibration and Functional Test (2-RM-90-272A) Division I
- 3-SR-3.3.3.1.4, Containment High Range Radiation Monitoring Channel Calibration and Functional Test (3-RM-90-273A) Division II
- LSCP-0049, Calibration Procedure for Bicron Model RSO-5, RSO-50, & RSO-500 Survey Meters
- LSCP-0088, Calibration Procedure of RSO-50E
- LSCP-0078, Calibration Procedure for Merlin Gerin (MG) DMC-90, 100, & 2000 - Computer Assisted
- LSCP-0121, Procedure for Setting Windows on Radiation Check Sources
- HPT063.002, Self-Contained Breathing Apparatus (SCBA) Training

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

Licensee records were reviewed to determine whether the submitted PI statistics were calculated in accordance with the guidance contained in NEI 99-02, Regulatory Assessment Performance Indicator Guideline.

Cornerstone: Initiating Events

.1 Scrams with Loss of Normal Heat Removal

a. Inspection Scope

The inspectors verified the accuracy and completeness of the licensee's PI data on Scrams with Loss of Normal Heat Removal for the third quarter of 2001, for Units 2 and 3. Data reviewed included the operators' logs, the licensee's PI submittal to the NRC covering the third quarter 2000 through the third quarter 2001, the licensee's monthly operating reports, and licensee event reports.

b. Findings

No findings of significance were identified.

Cornerstone: Mitigating Systems

.2 Safety System Unavailability - High Pressure Injection System

a. Inspection Scope

The inspectors verified the accuracy and completeness of the licensee's PI data for HPCI on Units 2 and 3. The period covered was a 12-quarter period from October 1998 through September 2001. Records reviewed included operator logs, licensee event reports (LERs), corrective action program records, the licensee's maintenance rule database, and PI data appearing on the NRC web site.

b. Findings

No findings of significance were identified.

Cornerstone: Occupational Radiation Safety

.3 Occupational Exposure Control Effectiveness
RETS/ODCM Radiological Effluent Occurrence

a. Inspection Scope

The inspectors reviewed the licensee's records for the first three quarters of calendar year 2001 to determine whether the procedurally-specified sources of information for the above PIs were collected and whether potential or actual PI occurrences were accurately assessed for reportability. The inspectors also reviewed a listing of issues related to the Chemistry and the Radiation Protection programs which were entered into the licensee's corrective action program and an "RCA Access Alarm Report" to determine whether any of those issues should have been reported as Occupational or Public Radiation Safety PI occurrences and whether any individuals had incurred an unintended exposure in excess of 100 mrem during their entries into the RCA, respectively.

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up

.1 (Closed) LER 50-260/2001-002-00: Non-Conservative Analysis for Oscillation Power Range Monitoring Scram Setpoint for Unit 2 and Unit 3. On June 29, 2001, General Electric notified the licensee of a potential 10 CFR Part 21 condition related to the use of non-conservative parameters associated with the calculation of oscillation power range monitor (OPRM) upscale trip setpoints. The licensee confirmed applicability to Browns Ferry Units 2 and 3, declared the OPRMs inoperable, and implemented the appropriate TS action statement which involved initiation of the alternate method to detect and suppress thermal-hydraulic instability oscillations.

There was no impact on safety as a result of this event. Plant operating procedures did not allow operation of the units in regions of the power-flow map where thermal-hydraulic instability was known to exist. The operators were trained on dealing with instability before and after the OPRMs were placed in service. While the OPRMs were inoperable, the operators monitored for instability, as they had done before the OPRMs were installed by a plant modification. General Electric was in the process of generating revised setpoint calculations, which, subject to licensee review, was expected to restore the OPRMs to fully operable status.

Because this condition existed on Unit 2 since May 1999, and on Unit 3 since May 2000, the licensee reported operation in violation of the plant's TS, which required initiation of the alternate method within 12 hours, or be in Mode 2 within an additional four hours. The inspectors found no human performance issues with respect to the licensee. The inspectors determined that this TS violation did not have an actual or credible impact on

safety and should be characterized as minor, and thus is not subject to formal enforcement action.

.2 (Closed) LER 50-260/2001-003-00: Automatic Reactor Scram Due To A Turbine Trip During Routine Testing. On July 25, 2001, Unit 2 experienced an automatic reactor scram that was caused by a numerical error in the vendor-developed electro-hydraulic control system software that resulted in an inadvertent turbine trip. This event was previously documented in NRC Inspection Report 50-259,260,296/2001-03. The licensee determined that the root cause of this event was a weakness in the process for procurement of non-safety related systems, structures, or components (SSCs) that pose a risk to generation. The inspectors reviewed the LER and the associated planned corrective action and determined that the procurement issue had very low safety significance. The issue was placed in the licensee's corrective action program as PER 01-007487-000. Since the EHC system software is not a safety-related SSC, this event did not constitute a violation of NRC requirements. No additional issues were revealed by the LER review.

.3 (Closed) LER 50-260/2001-004-00: Inoperable Control Room Emergency Ventilation System Due to a Door Being Blocked During Maintenance Activities. The licensee failed to maintain the CREV system operable while in Mode 1, as required by TS. Consequently, the plant was operated in a condition prohibited by TS for over two hours.

During Unit 2 power ascension on July 27, 2001, the inspectors found door 642, access to the 2A electric board room, blocked open. Door 642 was a boundary for the control room habitability envelope, and the breach caused by blocking a boundary door open would render both trains of CREV inoperable unless compensatory measures were implemented. This door was also a fire barrier requiring a fire impairment permit so that fire protection compensatory measures (fire watch) could be implemented. Upon questioning the operators in the control room, the inspectors found that the operators were not informed that the door was to be blocked open for painting. In addition to the procedural requirements to obtain the appropriate permits to block the door open, there was a sign on the door requiring operations permission to block the door open.

The operators closed the door without delay. However, the door being blocked open for over three hours, resulted in both trains of CREV being out-of-service in excess of their allowed TS outage time. The licensee initiated B-Level PER 01-007591 in the corrective action program and determined the apparent cause to be failure of the foreman to ensure that the appropriate permits were obtained. Facilities Maintenance personnel also failed to identify the work to repair the door as a scope change, which would require Planning to revise the work order and perhaps recognize that the door would have to be blocked open, thereby affecting CREV.

This issue had a credible impact on safety, because it affected the integrity of the control room envelope. However, it was possible that the security officer stationed near the door would have closed the door in order to secure the station and attend to higher priority issues. This finding was considered to be of very low safety significance (Green), because the issue only represented a degradation of the radiological barrier function provided for the control room.

TS 5.4.1 requires procedures to be implemented that are recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Appendix A, Paragraphs 1.l and 3.p recommends procedures for plant fire protection and control room ventilation, respectively. Blocking door 642 open without obtaining breach permits constituted a violation of Procedure 0-TI-412, Work Permits (for control bay habitability zone breaching permit) and Procedure SPP-10.9, Control of Fire Protection Impairments and appropriate compensatory measures were not put in place. However, because of the very low safety significance of the issue and because the licensee has included this problem in their corrective action program (PER 01-007591-000), this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy, and is identified as NCV 50-260,296/01-04-01, Failure to obtain required permits to block open restricted doors.

4OA6 Management Meetings

The inspectors presented the inspection results to Mr. Ashok Bhatnagar, and other members of licensee management on December 21, 2001. Proprietary materials were examined during this inspection period and were returned to the licensee.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

T. Abney, Licensing Manager
A. Bhatnagar, Site Vice President
L. Clardy, Site Quality Assurance Manager
J. Corey, Radiation Protection and Chemistry Manager
T. Cornelius, Emergency Preparedness Supervisor
W. Hargrove, Radcon Supervisor
R. Jones, Plant Manager
G. Little, Operations Manager
T. Niessen, Jr., Site Support Manager
J. Rupert, Unit 1 Project Manager
D. Sanchez, Maintenance and Modifications Manager
M. Scaggs, Assistant Plant Manager
T. Trask, Acting Site Engineering Manager
J. Valente, Unit 1 Project Engineering Manager

NRC

R. Bernhard, Region II Senior Reactor Analyst

LIST OF ITEMS OPENED AND CLOSED

Opened and Closed

50-260,296/01-04-01	NCV	Failure to obtain required permits to block open restricted doors (Section 4OA3.3).

Closed

50-260/2001-002-00	LER	Non-conservative analysis for OPRM scram setpoint for Units 2&3 (Section 4OA3.1).
50-260/2001-003-00	LER	Automatic reactor scram due to a turbine trip during routine testing (Section 4OA3.2).
50-260/2001-004-00	LER	Inoperable CREV system due to a door being blocked during maintenance (Section 4OA3.3).

Attachment