



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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May 9, 2008

Mr. William R. Campbell, Jr.
Chief Nuclear Officer and Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

**SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION
REPORT 05000259/2008002, 05000260/2008002 AND 05000296/2008002**

Dear Mr. Campbell:

On March 31, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Browns Ferry Nuclear Plant, Units 1, 2, and 3. The enclosed inspection report documents the inspection results which were discussed, on April 8, 2008, with Mr. Rusty West 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.

In addition to the routine Reactor Oversight Process baseline inspections for all three units, the inspectors continued to conduct augmented inspections on Unit 1 as delineated in NRC letters dated May 16 and December 6, 2007. These Unit 1 augmented inspections were conducted to compensate for the lack of valid data for certain Performance Indicators (PI). These additional inspections are only considered to be an interim substitute for the invalid Unit 1 PIs until complete and accurate PI data is developed and declared valid. However, since Unit 1 startup on May 22, 2007, the PI's in the Initiating Events and Barrier Integrity cornerstones, and the Safety System Functional Failure PI of the Mitigating Systems cornerstone, have since become valid as acknowledged by the Tennessee Valley Authority letter dated January 7, 2008. Consequently, the only PIs that remain invalid, and thereby subject to the augmented baseline inspection, are the Mitigating Systems Performance Index PIs.

Based on the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, 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 Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Rebecca L. Nease, 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: Inspection Report 05000259/2008002, 05000260/2008002 and 05000296/2008002
w/Attachment: Supplemental Information

cc w/encl.: (See page 3)

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Letter to William R. Campbell, Jr. from Rebecca L. Nease dated May 9, 2008

SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION
REPORT 05000259/2008002, 05000260/2008002 AND 05000296/2008002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 05000259, 05000260, 05000296

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

Report No.: 05000259/2008002, 05000260/2008002 and 05000296/2008002

Licensee: Tennessee Valley Authority (TVA)

Facility: Browns Ferry Nuclear Plant, Units 1, 2, and 3

Location: Corner of Shaw and Nuclear Plant Roads
Athens, AL 35611

Dates: January 1, 2008 through March 31, 2008

Inspectors: T. Ross, Senior Resident Inspector
C. Stancil, Resident Inspector
K. Korth, Resident Inspector
R. Rodriguez, Reactor Inspector
W. Lewis, Senior Reactor Inspector (1R17)
A. Rogers, Reactor Inspector (1R07, 1R08)

Approved by: Rebecca L. Nease, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000259/2008002, 05000260/2008002 and 05000296/2008002; 01/01/2008 – 03/31/2008; Browns Ferry Nuclear Plant, Units 1, 2 and 3; routine integrated report.

The report covered a three-month period of routine inspections by the resident inspectors and two announced inspections by regional reactor inspectors. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process, Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None

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REPORT DETAILS

Summary of Plant Status

Unit 1 operated at essentially full power the entire report period except for two downpowers. One, on January 6, 2008, when power was reduced to about 87%, due to elevated main generator hydrogen cooling system temperatures in which the unit was returned to full power the next day. And then again, on January 12, when power was reduced to about 67%, due to a major intrusion of fish on January 3 at the circulating cooling water intake that necessitated cleanout of the main condenser water boxes. Unit 1 was returned to essentially full power on January 14.

Unit 2 operated at essentially full power the entire report period except for an unplanned rapid downpower and several planned downpowers. On January 3, 2008, Unit 2 rapidly reduced power to approximately 50% due to an excessive fish (shad) run into the intake. The unit was returned to full power the next day. Subsequently, the unit reduced power to 70%, on January 6 and again on January 26, to clean main condenser waterboxes due to high differential pressure. The unit was then returned to full power the next day on both occasions. Unit 2 power was also reduced to 95% for one day on March 30, to implement leak repairs on the 2B reactor feedwater heaters.

Unit 3 began this reporting period in a shutdown condition following an automatic scram which occurred on December 31 due to a spurious actuation of the main generator output breaker phase discordant relay. Unit 3 achieved Mode 1 on January 6, 2008, but had to shutdown from 12% power due to main generator exciter synchronization problems. The unit was returned to full power on January 22 following exciter repairs, and remained at full power until its Spring refueling outage. On March 18, 2008, the unit shutdown to conduct the Unit 3 Cycle 13 (U3C13) refueling outage and remained shutdown throughout the rest of the report period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (Cold Weather Preparation)

.1 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On January 10, a Tornado Watch, and then a Tornado Warning (for an adjacent county - Lauderdale County) were declared. The inspectors reviewed the licensee's overall preparations and response for the expected onset of severe weather conditions and observed the licensee's implementation of abnormal operating instruction (AOI) 0-AOI-100-7, Tornado. The inspectors also reviewed and discussed the implementation of 0-AOI-100-7 with the responsible Unit Supervisor and Shift Manager. Furthermore, the inspectors witnessed the licensee's execution of evacuation orders of vulnerable areas and buildings outside the power block, and the termination of work and evacuation of the turbine building and refueling floor. The inspectors also verified adequate operator

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staffing and their accessibility to controls and indications for those systems required for safe control of the plant. This inspection satisfied one inspection sample for the onset of adverse weather.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

Partial System Walkdown. The inspectors performed nine partial walkdowns of the safety systems listed below to verify train operability, as required by the plant Technical Specifications (TS), while the other redundant trains were out of service or after the specific safety system was returned to service following maintenance. These inspections included reviews of applicable TS, operating instructions (OI), and/or piping and instrumentation drawings (P&IDs), which were compared with observed equipment configurations to identify any discrepancies that could affect operability of the redundant train or backup system. The systems selected for walkdown were also chosen due to their relative risk significance from a Probabilistic Safety Assessment perspective for the existing plant equipment configuration. The inspectors verified that selected breaker, valve position, and support equipment were in the correct position for system operation. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program.

- Common: Emergency Equipment Cooling Water (EECW) System per P&ID 1-47E885-1 and 0-OI-67, Emergency Equipment Cooling Water System
- Unit 1 Division 1 Core Spray (CS) System per P&ID 1-47E814-1 and 1-OI-75, Core Spray System
- Unit 1 High Pressure Coolant Injection (HPCI) System per P&ID 1-47E812-1 and 1-OI-73, High Pressure Coolant Injection System
- Unit 1 Reactor Core Isolation Cooling (RCIC) System per Drawing 1-47E813-1 and 1-OI-71, Reactor Core Isolation Cooling System
- Unit 1 Residual Heat Removal (RHR) System - Division I per P&ID 1-47E811-1 and 1-OI-74, Residual Heat Removal System
- Unit 1/2 Standby Emergency Diesel Generator (EDG) D per 0-OI-82, Standby Diesel Generator System, Attachments 1D, 2D, 3D and 4D
- Unit 1/2 EDGs A and B per 0-OI-82, Standby Diesel Generator System, Attachments 1A, 1B, 2A, 2B, 3A, and 3B
- Unit 1/2 EDGs C and D per 0-OI-82, Standby Diesel Generator System, Attachments 1C, 1D, 2C, 2D, 3C, and 3D
- Unit 2 RHR System - Division II per P&ID 2-47E811-1 and 2-OI-74, Residual Heat Removal System

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors conducted detailed equipment walkdowns of two systems as described below. Documents reviewed are listed in the attachment to this report.

As a consequence of recent Unit 1 HPCI System unplanned maintenance involving numerous components impacting separate HPCI functional aspects, inspectors completed a more thorough than normal detailed alignment verification and walkdown of the Unit 1 HPCI system. Specifically, the inspectors focused on a review and field walkdown of Problem Evaluation Reports (PERs) and Work Orders (WOs) (open and closed) from Unit 1 restart to present. In addition, inspectors evaluated corrective actions associated with the Unit 1 HPCI Maintenance Rule (a)(1) 10 Point Plan as they affect HPCI equipment condition. The inspectors also used applicable P&ID flow diagrams, along with electrical, valve, and panel checklists to verify equipment availability and operability. The inspectors reviewed relevant portions of the Updated Final Safety Analysis Report (UFSAR) and TS. This detailed walkdown also verified electrical power alignment, the condition of applicable system instrumentation and controls, component labeling, pipe hangers and support installation, and associated support systems status. Furthermore, the inspectors examined the applicable System Health Report and proposed Engineering design changes that could affect system alignment and operability.

Inspectors also completed a detailed alignment verification and walkdown of the Unit 3 4KV Shutdown Boards and Buses, using the applicable one line diagrams, along with the electrical, and panel checklists of procedures 0-OI-57A, Switchyard and 4160V AC Electrical System, 0-OI-57B, 480V/240V AC Electrical System, and 3-OI-82, Standby Diesel Generator System to verify equipment availability and operability. The inspectors reviewed relevant portions of the UFSAR and TS. This detailed walkdown verified electrical power alignment, the condition of applicable system instrumentation and controls, component labeling, and associated support systems status. Furthermore, the inspectors examined the applicable System Health Report, open WOs, proposed Engineering design changes, and outstanding PERs that could affect system alignment and operability.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Routine Walkdowns

a. Inspection Scope

Walkdowns. The inspectors reviewed licensee procedures, Standard Programs and Processes (SPP)-10.10, Control of Transient Combustibles, and SPP-10.9, Control of Fire Protection Impairments, and conducted a walkdown of the nine fire areas (FA) and fire zones (FZ) listed below. Selected fire areas/zones were examined in order to verify licensee control of transient combustibles and ignition sources; the material condition of fire protection equipment and fire barriers; and operational lineup and operational condition of fire protection features or measures. Also, the inspectors verified that selected fire protection impairments were identified and controlled in accordance with procedure SPP-10.9. Furthermore, the inspectors reviewed applicable portions of the Site Fire Hazards Analysis Volumes 1 and 2 and Pre-Fire Plan drawings to verify that the necessary fire fighting equipment, such as fire extinguishers, hose stations, ladders, and communications equipment, were in place.

- Unit 2 Reactor Building EL 593 East (FZ 2-3)
- Unit 2 Reactor Building EL 593 West (FZ 2-4)
- Unit 2 Reactor Building EL 621 and 639 North (FZ 2-5)
- Unit 3 Reactor Building EL 593 and RHR HX Rooms (FZ 3-3)
- Unit 1 Control Building, EL 593 (FA 16)
- Units 1/2/3 Control Building EL 606, Cable Spreading Rooms (FA 16)
- Units 1/2/3 Control Building EI 617 (FA 16)
- Unit 1 Control Building EL 593 (FA 17)
- Radiological Waste Processing Building (FA 25)

b. Findings

No findings of significance were identified.

1R07 Biennial Heat Sink Performance

a. Inspection Scope

The inspectors reviewed inspection records, test results, and other documentation to ensure that heat exchanger (HX) deficiencies that could mask or degrade performance were identified and corrected. The test procedures and records were also reviewed to verify that these were consistent with Generic Letter (GL) 89-13 licensee commitments, and industry guidelines. Risk significant HXs reviewed included the EDG cooling water HXs, and the RHR HXs.

The inspectors reviewed site and corporate HX program procedures, minimum flow requirements, testing and cleaning frequencies, corrective maintenance and condition report history for all selected HXs. In specific, the inspectors reviewed visual inspection records, differential pressure trends, inspection and cleaning procedures and work orders, tube plugging acceptance criteria, and eddy current testing reports for the RHR HXs. For the EDG cooling water HXs, inspection and cleaning procedures and work

orders, tube plugging acceptance criteria, minimum flow testing, and visual inspection records were reviewed. These documents were reviewed to verify inspection methods were consistent with industry standards, to verify HX design margins were being maintained, and to verify performance of the HXs under the current maintenance frequency was adequate.

The inspectors also reviewed general health of the EECW and RHR Service Water (RHRSW) systems via review of design basis documents, system health reports, intake structure diver inspections, corrosion monitoring procedures, corrosion coupon monitoring trends, raw water program strategic plans, work orders for dead leg flushes, and discussions with the EECW system engineer. These documents were reviewed to verify design basis were being maintained and to verify adequate EECW and RHRSW system performance under current preventive maintenance and inspection frequencies.

Corrective maintenance history and PERs were reviewed for potential common cause problems and problems which could affect system performance to confirm that the licensee was entering problems into the corrective action program and initiating appropriate corrective actions. In addition, the inspectors conducted a walk down of all selected HXs to assess general material condition and to identify any degraded conditions of selected components.

b. Findings

No findings of significance were identified.

1R08 In-service Inspection (ISI) Activities (71111.08)

.1 In-service Inspection activities

a. Inspection Scope

From March 24-28, 2008, the inspectors reviewed the implementation of the licensee's ISI program for monitoring degradation of the reactor coolant system (RCS) boundary and other risk significant piping system boundaries for Unit 3. The inspectors selected a sample of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI required examinations for review.

The inspectors conducted an on-site review of nondestructive examination (NDE) activities to evaluate compliance with TS and the applicable editions of ASME Section V and XI (2001 Edition / Up to and Including 2003 Addenda), and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of ASME Section XI acceptance standards.

Specifically, the inspectors observed and reviewed the NDE activities described below and reviewed the corresponding NDE procedures, NDE reports, equipment and consumables certification records, and personnel qualification records.

- Magnetic Particle Testing:
 - RCIC Lug to Pipe weld attachment #: 3-47B456-657-IA
 - RHR Lug to Pipe weld attachment #: RHR-3-H-146-IA

- Ultrasonic Testing:
 - Reactor Pressure Vessel Closure Head Studs 3-22 through 25
 - Reactor Pressure Vessel Nozzle to Cap weld #: N9-RCRD-3-33
 - Reactor Pressure Vessel Nozzle Inner Radius Weld #: N9-IR
 - Reactor Pressure Vessel Nozzle to Shell Weld #: N9
 - Reactor Pressure Vessel Nozzle to Vessel Weld #: N6A-NV, N6A-IR
 - Reactor Pressure Vessel Vertical Shell to Shell Weld #'s: RCH-3-1V, RCH-3-2V
- In-Vessel Visual Inspection:
 - Jet Pumps
 - Steam Dryer Tie Bars
 - Control Rob Guide Tubes

The inspectors reviewed welding activities performed during this outage and since the last refueling outage. The inspectors reviewed welding procedures, procedure qualification records, welder qualification records, and NDE reports for the following welds:

- Main Steam System Valve #: 3-FCV-001-0135
- Heater Drains and Vents System piping
- HPCI System Valve #: 3-CKV-073-0629

b. Findings

No findings of significance were identified

.2 Identification and Resolution of Problems

The inspectors performed a review of ISI related problems, including welding and NDE that were identified by the licensee and entered into the corrective action program. The inspectors reviewed the associated PERs to confirm that the licensee had appropriately described the scope of the problem and had initiated corrective actions. The inspectors performed this review to ensure compliance with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action requirements. The corrective action documents reviewed by the inspector are listed in the attachment to this report.

1R11 Licensed Operator Regualification

.1 Resident Inspector Quarterly Review

a. Inspection Scope

On February 14, 2007, the inspectors observed an as-left licensed operator operating simulator scenario for two crews per OPL173S271, RCS Flow Transmitter Failure, Loss of Isophase Bus Duct Cooling, and Main Generator Voltage Regulator Transfer to Manual. These abnormal operating events were designed to provide training and operations feedback at the end of a focused session on a significantly revised and rewritten Conduct of Operations procedure. The events led operators through a series

of operational decision making and abnormal procedure usage, TS implementation, plant stabilization, and finally an emergency downpower and in one case a reactor scram.

The inspectors specifically evaluated the following attributes related to the operating crews' performance:

- Clarity and formality of communication
- Ability to take timely action to safely control the unit
- Prioritization, interpretation, and verification of alarms
- Correct use and implementation of AOIs, and Emergency Operating Instructions
- Timely and appropriate Emergency Action Level declarations per Emergency Plan Implementing Procedures (EPIP)
- Control board operation and manipulation, including high-risk operator actions
- Command and Control provided by the Unit Supervisor and Shift Manager

The inspectors attended the post-examination critique to assess the effectiveness of the licensee evaluators, and to verify that licensee-identified issues were comparable to issues identified by the inspector. The inspectors also reviewed simulator physical fidelity (i.e., the degree of similarity between the simulator and the reference plant control room, such as physical location of panels, equipment, instruments, controls, labels, and related form and function).

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

.1 Routine

a. Inspection Scope

The inspectors reviewed the four specific equipment issues listed below for structures, systems and components (SSC) within the scope of the Maintenance Rule (MR) (10CFR50.65) with regard to some or all of the following attributes: (1) work practices; (2) identifying and addressing common cause failures; (3) scoping in accordance with 10 CFR 50.65(b) of the MR; (4) characterizing reliability issues for performance; (5) trending key parameters for condition monitoring; (6) charging unavailability for performance; (7) appropriateness of performance criteria in accordance with 10 CFR 50.65(a)(2); (8) system classification in accordance with 10 CFR 50.65(a)(1); and (9) appropriateness and adequacy of (a)(1) goals and corrective actions (i.e., Ten Point Plan). The inspectors also compared the licensee's performance against site procedure SPP-6.6, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting; Technical Instruction 0-TI-346, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting; and SPP 3.1, Corrective Action Program. The inspectors also reviewed, as applicable, work orders, surveillance records, PERs, system health reports, engineering evaluations, and MR expert panel minutes; and attended MR expert panel meetings to verify that regulatory and procedural requirements were met.

- Common RHRSW HX Outlet Valves Repetitive Electrical Failures
- Appropriateness of plant level performance criteria for certain scoped systems including Neutron Monitoring (System 92), Turbine Building Ventilation (System 30A), Hypochlorite (System 50) and Hydrogen Injection (System 4)
- 3EA EDG Overspeed Limit Switch Spurious Actuation Run Failure
- Unit 1 Turbine-Generator Electro-Hydraulic Control (EHC) System Corrective Actions (i.e., (a)(1) 10 Point Plan) for two Unplanned Manual Scrams due to EHC Leaks

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

For planned online work and/or emergent work that affected the risk significant systems as listed below, the inspectors reviewed six licensee maintenance risk assessments and actions taken to plan and control work activities to effectively manage and minimize risk. The inspectors verified that risk assessments and risk management actions (RMA) were being conducted as required by 10 CFR 50.65(a)(4) and applicable procedures such as SPP-7.1, Work Control Process; 0-TI-367, BFN Equipment to Plant Risk Matrix; and BP-336, Risk Determination And Risk Management. The inspectors also evaluated the adequacy of the licensee's risk assessments and the implementation of RMAs.

- C EDG and Unit 1 HPCI Out of Service (OOS)
- C EDG and 1B CS Pump OOS
- C2 RHRSW Pump with 3C RHR HX, 3B EDG, Unit 1 RCIC, and A Shutdown Board Battery OOS
- 3C EDG, B Standby Gas Treatment, 3A Control Rod Drive Pump, and Unit 2 Loop II Core Spray OSS
- B EDG, B Standby Gas Treatment, and 3A Control Rod Drive Pump OOS
- D EDG, 3A Control Rod Drive Pump, 3A/B Standby Liquid Control Pumps, and B2 RHRSW Pump OSS

b. Findings

No findings of significance were identified

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the seven operability/functional evaluations listed below to verify technical adequacy and ensure that the licensee had adequately assessed TS operability. The inspectors also reviewed applicable sections of the UFSAR to verify that the system or component remained available to perform its intended function. In addition, where appropriate, the inspectors reviewed licensee procedure SPP-3.1, Corrective Action Program, Appendix D, Guidelines for Degraded/Non-conforming

Condition Evaluation and Resolution of Degraded/Non-conforming Conditions, to ensure that the licensee's evaluation met procedure requirements. Furthermore, where applicable, inspectors reviewed implemented compensatory measures to verify that they worked as stated and that the measures were adequately controlled. The inspectors also reviewed PERs on a daily basis to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

- Units 1/2/3 EDG Mechanical Overspeed Limit Switch Common Cause as a Result of 3A EDG Overspeed Limit Switch Actuation (PER 136771)
- Unit 1/2 EDG Exhaust Stack Design (PER 137018)
- Units 1/2/3 RHRSW HX Inlet Check Valves Functional Failures (PER 116511)
- Unit 1/2 EDG High Vibration levels (PER 131700)
- Unit 1 High Pressure Coolant Injection Room Flooding (PER 137914)
- Unit 3 3ED EDG Output Breaker, 52STA Switch Failure (PER 140110)
- Units 1/2/3 Moderate Energy Line Break Analysis (PER 134462)

b. Findings

No findings of significance were identified.

1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed selected samples of evaluations to confirm that the licensee had appropriately considered the conditions under which changes to the facility, UFSAR, or procedures may be made, and tests conducted, without prior NRC approval. The inspectors reviewed evaluations for nine changes and additional information, such as drawings, calculations, supporting analyses, the UFSAR, and TS to confirm that the licensee had appropriately concluded that the changes could be accomplished without obtaining a license amendment. The nine evaluations reviewed are listed in the List of Documents Reviewed.

The inspectors reviewed samples of changes for which the licensee had determined that evaluations were not required, to confirm that the licensee's conclusions to "screen out" these changes were correct and consistent with 10CFR50.59. The 19 "screened out" changes reviewed are listed in the List of Documents Reviewed.

The inspectors evaluated engineering design change packages for nine material and design based modifications to evaluate the modifications for adverse effects on system availability, reliability, and functional capability. The nine modifications and the associated attributes reviewed are as follows:

DCN 66232, Replace Existing SPSV ASCO Type Valves with AVCO Type, 6/16/2006
(Initiating Events, Mitigating Systems)

- Energy Needs
- Materials/Replacement Components
- Control Signals
- Structural
- Failure Modes

DCN 69258, Install Tieback Support from HPCI 10" Header to Test Line Containing 1-TV-073-0563, 12/21/2007 (Mitigation Systems)

- Materials/Replacement Components
- Pressure Boundary
- Structural

DCN 60717, Remove Containment Isolation Valves 2-FCV-32-0062 and 2-FCV-32-0063 at Drywell Penetration X-48, 7/28/2006 (Barrier Integrity)

- Materials/Replacement Components
- Pressure Boundary
- Structural
- Failure Modes

DCN 66172, Pressure Switch Replacement and Set Points Change for EECW System Supply to the Reactor Building Closed Cooling Water (RBCCW) System, 1/19/06 (Mitigation Systems)

- Materials/Replacement Components
- Timing (Response Time and Duration)
- Control Signals
- Operations

DCN 65837, Replace 3A RHR Room Cooler Motor, 2/24/2006 (Mitigating Systems)

- Energy Needs
- Materials/Replacement Components
- Equipment Protection
- Licensing Basis

DCN 65177, Install Jumpers on RHRSW Running Aux Relay Contact, 5/4/2006 (Mitigating Systems)

- Operations
- Licensing Basis
- Failure Modes

WO 07-720611-000, Unit 1 Electrical Board Room Air Handling Unit, 7/11/2007 (Mitigating Systems)

- Energy Needs
- Materials/Replacement Components
- Licensing Basis

DCN 65786, BFN-2 Emergency Core Cooling System (ECCS) Ring Header Piping Modification, 2/28/2006 (Mitigating Systems)

- Materials/Replacement Components
- Structural
- Licensing Basis

CAR085A, Commercial Grade Dedication of Engine Lube Oil, 1/16/2008 (Mitigating Systems)

- Materials/Replacement Components
- Licensing Basis

Documents reviewed included procedures, engineering calculations, modification design and implementation packages, WOs, site drawings, corrective action documents, applicable sections of the living UFSAR, supporting analyses, TS, and design basis information. The inspectors additionally reviewed test documentation to ensure adequacy in scope and conclusion. The inspectors verified that all details were incorporated in licensing and design basis documents and associated plant procedures.

The inspectors also reviewed selected PERs and the licensee's recent self-assessment associated with modifications and screening/evaluation issues to confirm that problems were identified at an appropriate threshold, were entered into the corrective action process, and appropriate corrective actions had been initiated and tracked to completion.

b. Findings

No findings of significance were identified.

1R18 Plant Modifications

.1 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed the Engineering Design Change (EDC) and completed work package (WO 08-710866-000) for EDC 50505-A, Continuous Air Monitors & Primary Coolant Leak Detection Vacuum Pumps Replacement, including related documents and procedures for the replacement of 1-RM-90-256, Primary Coolant Leak Detection Vacuum Pump. The inspectors reviewed licensee procedures 0-TI-405, Plant Modifications and Design Change Control, and SPP-9.3, Plant Modifications and Engineering Change Control, and observed part of the licensee's activities to implement this design change made while the unit was online. The inspectors reviewed the associated 10 CFR 50.59 screening against the system design bases documentation to verify that the modifications had not affected system operability/availability. The inspectors reviewed selected ongoing and completed work activities to verify that installation was consistent with the design control documents.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the nine post-maintenance tests (PMT) listed below to verify that procedures and test activities confirmed SSC operability and functional capability following maintenance. The inspectors reviewed the licensee's completed test procedures to ensure any of the SSC safety function(s) that may have been affected were adequately tested, that the acceptance criteria were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test and/or reviewed the test data, to verify that test results adequately demonstrated

restoration of the affected safety function(s). The inspectors verified that PMT activities were conducted in accordance with applicable WO instructions, or procedural requirements, including SPP-6.3, Post-Maintenance Testing, and MMDP-1, Maintenance Management System. Furthermore, the inspectors reviewed problems associated with PMTs that were identified and entered into the CAP.

- Unit 1: PMT following routine maintenance of 1B CS pump in accordance with 1-SR-3.5.1.6 (CS II), Core Spray Flow Rate Loop II
- Unit 3: PMT for Replacement of 3-RTV-071-0005L, Root Valve to LS-071-0005H (RCIC Steam Supply Drain Pot Level Switch), in accordance with Post Modification Testing Instruction PMT-0-000-MEC001, Rev. 6 and WO 06-719454-001.
- Unit 2: PMT for 2C RHR Pump and associated Room Cooler per 2-SR-3.5.1.6 (RHR I), Quarterly RHR System Rated Flow Test Loop I and 2-TI-134, Core Spray and Residual Heat Removal Room Coolers Air Flow Determination.
- Unit 1/2: PMT for the D EDG Relay (STLO1) Replacement per WO 08-711354-000 and EPI-0-082-DGZ006, Diesel Generator D Redundant Start Test.
- Unit 3: PMT for RHR Pump 3D and Heat Exchanger per 3-SR-3.5.1.6 (RHR II), Quarterly RHR System Rated Flow Test Loop II.
- Unit 1&2: PMT following corrective maintenance on the B1 EECW cooler of the B EDG in accordance with 0-OI-82, Emergency Diesel Generator, and WO 08-711981-000
- Unit 3: PMT for Control Rod Drive Pump 3A per 0-OI-85, Control Rod Drive System.
- Unit 1: PMT for Turbine Control Valve #4 Fluctuations per WO 08-711443-000.
- Unit 3: PMT for 3ED EDG Output Breaker (Breaker 1836) STA Switch Adjustment per WO 08-712968-001 and EPI-0-000-BKR015, 4KV Wyle/Siemens Horizontal Vacuum Circuit Breaker (Type 3AF) and Compartment Maintenance.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

.1 Unit 3 Forced Outage Due To Automatic Scram And Main Generator Exciter Failure

a. Inspection Scope

On December 31, 2007, Unit 3 entered an unplanned forced shutdown due to an automatic reactor scram (see Section 4OA3.1 of previous inspection report (IR) 05000296/2007005). Operators commenced restart of Unit 3 (i.e., entered Mode 2) on January 6, 2008, and increased power to 12%. However, due to main generator exciter synchronization problems the unit was subsequently shutdown from 12% power and cooled down to Mode 4 on January 9. Unit 3 was restarted on January 20 and returned to 100% power on January 22, 2008. During this forced outage the inspectors examined the conduct of critical outage activities pursuant to TS, applicable procedures, and the licensee's outage risk assessment and outage management plans. Some of the more significant outage activities monitored, examined and/or reviewed by the inspectors were as follows:

- Control of Hot Shutdown (Mode 3), Cold Shutdown (Mode 4) conditions, Startup (Mode 2), and Power Operation (Mode 1), including critical plant parameters
- Troubleshooting activities on Main Generator breaker, and associated protective relays
- Plant Oversight Review Committee event review and restart meeting on January 17, 2008
- Reactor startup and power ascension activities per General Operating Instruction (GOI) 3-GOI-100-1A, Unit Startup
- Outage risk assessment and management
- Control and management of forced outage and emergent work activities

Drywell Closeout

On January 18, the inspectors toured the Unit 3 drywell to inspect for evidence of leakage. In particular, the inspectors observed the continuing body to bonnet leakage from the pressure seal ring on reactor water cleanup suction isolation valve (69-500). The inspectors also reviewed the licensee's conduct of 3-GOI-200-2, Drywell Closeout, and performed an independent closeout inspection of the Unit 3 drywell.

Corrective Action Program

The inspectors reviewed PERs generated during the Unit 3 forced outage and attended Management Review Committee meetings to verify that initiation thresholds, priorities, mode holds, and significance levels were assigned as required.

b. Findings

No findings of significance were identified.

.2 Unit 3 Scheduled Refueling Outage

a. Inspection Scope

During March 18 to the end of the report period on March 31, 2008, the inspectors examined critical outage activities to verify that they were conducted in accordance with TS, applicable procedures, and the licensee's outage risk assessment and management plans through the end of the reporting period. Activities occurring after March 31, 2007 will be documented in the next inspection report. Some of the more significant inspection activities conducted by the inspectors were as follows:

Outage Risk Assessment

Prior to the Unit 3 scheduled 43 day U3C13 refueling outage that began on March 18, the inspectors attended outage risk assessment team meetings and reviewed the Outage Risk Assessment Report to verify that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing an outage plan that assured defense-in-depth of safety functions were maintained. During the outage, the inspectors also reviewed the daily U3C13 Refueling Outage Reports, including the Outage Risk Assessment Management Safety Function Status, and frequently attended the twice a day outage status meetings. These reviews

were compared to the requirements in licensee procedure SPP-7.2, Outage Management, the Outage Risk Assessment Report, and TS. The inspectors' reviews and walkdowns also verified that for identified high risk significant conditions (i.e., Orange), due to equipment availability and/or system configurations, that contingency measures and RMA's were identified and implemented by the overall outage and contingency response plan. Furthermore, the inspectors frequently discussed risk conditions and designated protected equipment with Operations and outage management personnel to assess licensee awareness of actual risk conditions and mitigation strategies.

Shutdown and Cooldown Process

The inspectors witnessed the shutdown and cooldown of Unit 3 in accordance with licensee procedures SPP-12.1, Conduct of Operations; 3-GOI-100-12A, Unit Shutdown from Power Operations to Cold Shutdown and Reduction in Power During Power Operations; and 3-SR-3.4.9.1(1), Reactor Heatup or Cooldown Rate Monitoring.

Decay Heat Removal

The inspectors reviewed licensee procedures 3-OI-74, Residual Heat Removal System; 3-OI-78, Fuel Pool Cooling and Cleanup System; and 0-AOI-72-1, Alternate Decay Heat Removal (ADHR) System Failures; and conducted a main control room panel and in-plant walkdowns of system and components to verify correct system alignment. In addition, the inspectors monitored licensee work controls to ensure that outage work would not adversely impact the ability of operators to operate spent fuel pool cooling, RHR shutdown cooling, and/or ADHR systems when these systems were required. Furthermore, the inspectors conducted several walkdowns of the ADHR system during operation with the fuel pool gates removed.

Critical Outage Activities

The inspectors examined outage activities to verify that they were conducted in accordance with TS, licensee procedures, and the licensee's outage risk control plan. Some of the more significant inspection activities accomplished by the inspectors were as follows:

- Verified RCS inventory controls, especially during the reactor vessel drain line modifications that involved an operation with the potential to drain the reactor vessel (OPDRV) controlled per procedure 2-POI-200.5
- Verified electrical systems availability and alignment
- Monitored important control room plant parameters (e.g., RCS pressure, level, flow, and temperature) and TS compliance during the various shutdown modes of operation, and mode transitions
- Examined implementation of reactivity controls
- Reviewed control of overall secondary containment integrity especially during the OPDRV
- Examined foreign material exclusion controls particularly in proximity to and around the reactor cavity, equipment pit, and spent fuel pool
- Routine tours of the control room, reactor building, refueling floor and drywell

Corrective Action Program

The inspectors reviewed PERs generated during U3C13, and attended the PER screening committee and Corrective Action Review Board (CARB) meetings to verify that initiation thresholds, priorities, mode holds, operability concerns and significance levels were adequately addressed. Resolution and implementation of corrective actions of several PERs were also reviewed for completeness.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors witnessed portions and/or reviewed completed test data for the following eight surveillance tests of risk-significant and/or safety-related systems to verify that the tests met TS surveillance requirements, UFSAR commitments, and in-service testing and licensee procedure requirements. The inspectors' review confirmed whether the testing effectively demonstrated that the SSCs were operationally capable of performing their intended safety functions and fulfilled the intent of the associated surveillance requirement.

- 3-SR-3.5.1.7, HPCI Main and Booster Pump Set Developed Head and Flow Rate Test at Rated Reactor Pressure *
- 2-SR-3.5.1.7, HPCI Main and Booster Pump Set Developed Head and Flow Rate Test at Rated Reactor Pressure *
- 3-SR-3.3.3.2.1(75 II), Backup Control Panel Testing
- 3-SR-3.8.1.9(3B OL), Diesel Generator 3B Emergency Load Acceptance Test with Unit 3 Operating
- 2-SI-4.4.A.1, Standby Liquid Control Pump Functional Test*
- 1-SR-3.5.3.3, RCIC System Rated Flow at Normal Operating Pressure *
- 1-SR-3.4.5.2, Drywell Leak Detection Radiation Monitor Functional Test, 1-RM-90-256**
- 3-SI-4.7.A.2.g-2/FHa, Unit 3 Northwest Equipment Hatch Local Leak Rate Test (LLRT)* **

* Quarterly In-Service Test

** RCS leak detection

*** Primary Containment Isolation Leakage

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

On February 13, 2008, the inspectors observed an Emergency Preparedness drill that contributed to the licensee's Drill/Exercise Performance and Emergency Response Organization PI measures to identify any weaknesses and deficiencies in classification and notification activities. The inspectors observed emergency response operations in the Unit 2 simulated control room and certain Emergency Response Facilities (e.g., Technical Support Center) to verify that event classification and notifications were done in accordance with EPIP-1, Emergency Classification Procedure and other applicable EIPs. The inspectors also attended the licensee critique of the drill to compare any inspector-observed weakness with those identified by the licensee in order to verify whether the licensee was properly identifying weaknesses.

b. Findings

No findings of significance were identified.

4OA1 Performance Indicator Verification

.1 Cornerstone: Initiating Events

Unplanned Scrams and Power Changes

a. Inspection Scope

The inspectors reviewed the licensee's procedure and methods for compiling and reporting the following PIs in accordance with SPP-3.4, Performance Indicator and MOR Submittal Using INPO Consolidated Data Entry, and Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline. The inspectors specifically reviewed raw PI data for the Unit 1 PI's listed below for the fourth quarter of 2007. These PI's were considered valid and included in this inspection pursuant to NRC letter to TVA dated December 6, 2007, and TVA letter to NRC dated January 7, 2008. The Unit 1 data was reviewed from startup in May 2007 through the fourth quarter of 2007. The principal sources of information used by the inspectors to verify the licensee's raw data were Licensee Event Reports (LERs), operator logs, and actual witnessed events.

The inspectors compared the licensee's raw PI data against graphical representations and specific values reported to the NRC to verify that the data was accurately entered and reflected in the results. The inspectors also reviewed past PERs for any that might be relevant to problems with the PI program. Furthermore, the inspectors met with responsible plant personnel to discuss and go over licensee records to verify that the PI data was appropriately captured, calculated correctly, and discrepancies resolved.

- Unit 1 Unplanned Scrams
- Unit 1 Unplanned Power Changes

b. Findings

No findings of significance were identified.

.2 Cornerstone: Mitigating Systems

Safety System Functional Failures

a. Inspection Scope

The inspectors reviewed the licensee's procedure and methods for compiling and reporting PI's in accordance with SPP-3.4 and NEI 99-02. The Unit 1 PI for Safety System Functional Failures was considered valid pursuant to NRC letter to TVA dated December 6, 2007, and TVA letter to NRC dated January 7, 2008. The inspectors specifically reviewed the raw PI data from the time of Unit 1 startup in May 2007 through the fourth quarter of 2007.

The inspectors compared the licensee's raw data against graphical representations and specific values reported to the NRC to verify that the data was accurately entered and reflected in the results. The inspectors also reviewed past PERs for any that might be relevant to problems with the PI program. Furthermore, the inspectors met with responsible plant personnel to discuss and go over licensee records to verify that the PI data was appropriately measured, captured, and discrepancies resolved.

Unit 1 Safety System Functional Failures

b. Findings

No findings of significance were identified.

.3 Cornerstone: Barrier Integrity

RCS Activity and RCS Leakage

a. Inspection Scope

The inspectors reviewed the licensee's procedures and methods for compiling and reporting the PI listed below, including procedure SPP-3.4 and NEI 99-02 to verify that required reporting guidelines were applied. The Unit 1 PIs listed below were considered valid and included in this inspection pursuant to NRC letter to TVA dated December 6, 2007, and TVA letter to NRC dated January 7, 2008. The inspectors reviewed the raw data for the Unit 2 and 3 PI's for the first through fourth quarter of 2007 and the raw data for the Unit 1 PI's for the fourth quarter. The inspectors compared the licensee's raw data against graphical representations and specific values reported to the NRC in the fourth quarter 2007 PI report to verify that the data was correctly reflected in the report.

The inspectors also reviewed the past history of PERs for any that might be relevant to problems with the PI program. Furthermore, the inspectors met with responsible chemistry and engineering personnel to discuss and go over licensee records to verify that the PI data was appropriately captured, calculated correctly, and discrepancies resolved.

- Unit 1 RCS Activity
- Unit 1 RCS Leakage
- Unit 2 RCS Activity
- Unit 2 RCS Leakage
- Unit 3 RCS Activity
- Unit 3 RCS Leakage

b. Findings

No findings of significance were identified.

4OA2 Identification & Resolution of Problems

.1 Routine Review of Problem Evaluation Reports

a. Inspection Scope

The inspectors performed a daily screening of all PERs entered into the licensee's corrective action program. The inspectors followed NRC Inspection Procedure 71152, Identification and Resolution of Problems, in order to help identify repetitive equipment failures or specific human performance issues for follow-up.

b. Findings and Observations

No findings of significance were identified.

4OA3 Event Follow-up

.1 (Closed) LER 05000296/2007-004-00, Manual Isolation of High Pressure Core Injection due to Steam Leak

a. Inspection Scope

On November 30, 2007, during a planned shutdown on Unit 3, Operations isolated the Unit 3 HPCI steam supply in Mode 3, with the reactor at 950 psig. A previously identified steam leak on the packing of the HPCI steam line condensate inboard drain valve had increased. Subsequently, it was discovered that the ASME Class 2 piping near the valve had also developed a through wall leak due to flow accelerated corrosion wear at the associated socket weld at a piping tee. Because the volume of the leak had increased considerably, Operations closed the HPCI Steam Supply Isolation Valve which rendered HPCI unable to perform its safety function. Corrective actions were implemented, included repacking of the valve and replacement of the leaking piping. The inspectors have reviewed the applicable LER that was issued on January 28, 2008, and it's associated PER 134495.

b. Findings

No significant findings or violations of NRC requirements were identified. This LER is considered closed.

.2 (Closed) LER 05000296/2007-005-00, Automatic Reactor Scram Due to Main Generator Load Reject

a. Inspection Scope

On December 31, 2007, the Unit 3 reactor automatically scrammed from 100 percent power due to a power load unbalance that tripped the main turbine. The apparent cause of the scram was the spurious actuation of the main turbine generator (MTG) breaker phase discordant relay (20-7 relay) that tripped open the MTG output breaker which resulted in a power load unbalance signal. Subsequent to the event, the licensee determined that no phase discordance had occurred. And although no definitive cause for the 20-7 relay actuation was identified, the licensee evaluated and took corrective actions for all reasonably possible electrical and mechanical initiators. During and following the scram, all safety-related mitigating systems operated as designed, and all operator actions in response to the scram were deemed to be appropriate (see Section 4OA3.1 of IR 05000259/2007005). This LER, including its associated PER 135878 and root cause analysis, were reviewed by the inspectors. In addition, the inspectors interviewed principal members of the incident investigation team. Furthermore, the inspectors attended the CARB meeting root cause presentation by the incident investigation team.

b. Findings

No significant findings or violations of NRC requirements were identified. This LER is considered closed.

4OA6 Management Meetings

.1 Quarterly Integrated Inspection Report Exit Meeting Summary

On April 8, 2008, the resident inspectors presented the integrated inspection results to Mr. Rusty West, and other members of his staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection period.

.2 In-Service Inspection Debrief Meeting Summary

A debrief was conducted on March 28, 2008, to discuss the findings of the inspection. The inspector confirmed that proprietary information was not provided or examined during the inspection.

.3 Biennial Heat Sink Performance Debrief Meeting Summary

An exit was conducted on February 1, 2008, to discuss the findings of this inspection. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

.4 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications Debrief Meeting Summary

An interim exit with licensee management and staff was conducted on February 7, 2008, to discuss the results of this inspection. Proprietary information reviewed by the team as part of routine inspection activities was returned to the licensee in accordance with prescribed controls and is excluded from reference through this report input. A re-exit with Mr. Tony Langley and other members of the licensee staff was conducted on April 7, 2008.

.5 Annual Assessment Meeting Summary

Subsequent to the end of this inspection period, on April 16, 2008, the NRC's Deputy Regional Administrator, Chief of Reactor Projects Branch 6, and the Senior Resident Inspector assigned to the Browns Ferry Nuclear Plant met with the TVA to discuss the NRC's Reactor Oversight Process and the Browns Ferry annual assessment of safety performance for the period of January through December 2007. The major topics addressed were: the NRC's assessment program, the results of the Browns Ferry assessment, and NRC inspection activities. Attendees included Browns Ferry site management, members of site staff, and corporate management.

This meeting was open to the public. The presentation material used for the discussion is available from the NRC's document system (ADAMS) as accession number ML081290360. ADAMS is accessible from the NRC Web site at <http://www/nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Berry, Systems Engineering Manager
C. Boschetti, Electrical/I&C Design Engineering Manager
T. Brumfield, Site Nuclear Assurance Manager
P. Chadwell, Field Maintenance Superintendent
R. Davenport, Work Control and Planning Manager
S. Douglas, General Manager of Site Operations
A. Elms, Assistant General Manager Operations
J. Emens, Site Licensing Supervisor
D. Feldman, Interim Operations Manager
A. Feltman, Emergency Preparedness Supervisor
K. Harvey, System Engineer
J. Hopkins, Outage Scheduling Manager
L. Hughes, Operations Superintendent
W. Justice, Interim Engineering Manager
D. Langley, Site Licensing Manager
M. Lemon, Site Welding
D. Matherly, Training Manager
J. Mitchell, Site Security Manager
R. Rogers, Maintenance & Modifications Manager
W. Pierce, Radioactive Waste Manager
P. Sawyer, Radiation Protection Manager
E. Scillian, Operations Training Manager
C. Sherman, Radiation Protection Support Manager
R. Stowe, Nuclear Ops Support Superintendent
J. Underwood, Chemistry Manager
M. Welch, Inservice Inspection
J. Yarbrough, System Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

05000296/2007004	LER	Manual Isolation of High Pressure Core Injection due to Steam Leak (Section 4OA3.1)
05000296/2007005	LER	Automatic Reactor Scram Due to Main Generator Load Reject (Section 4OA3.2)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Detailed Equipment Alignment Walkdown

FSAR Section 6.4.1, High Pressure Coolant Injection System, BFN-22
FSAR Section 8.5 Standby A-C Power Supply and Distribution
Technical Specifications and Bases 3.5.1, ECCS – Operating, Amendment 268
Technical Specifications and Bases 3.8.1, AC Sources – Operating
Technical Specifications and Bases 3.3.8.1, Loss of Power Instrumentation
Technical Specifications and Bases 3.8.7, Distribution Systems – Operating
0-OI-57A, Switchyard and 4160V AC Electrical System Panel Lineup Checklist, Att. 2, 05/30/06
0-OI-57A, Switchyard and 4160V AC Electrical System Electrical Lineup Checklist, Att. 3
1-OI-73, Attachment 1, HPCI System Valve Lineup Checklist, 9/07/07
1-OI-73, Attachment 2, HPCI System Panel Lineup Checklist, 5/24/07
1-OI-73, Attachment 3, HPCI System Electrical Lineup Checklist, 5/24/07
3-OI-82, Standby Diesel Generator 3A Panel Lineup Checklist, Att. 2A, 03/05/07
3-OI-82, Standby Diesel Generator 3B Panel Lineup Checklist, Att. 2B, 03/05/07
3-OI-82, Standby Diesel Generator 3C Panel Lineup Checklist, Att. 2C, 03/05/07
3-OI-82, Standby Diesel Generator 3D Panel Lineup Checklist, Att. 3D, 03/05/07
3-OI-82, Standby Diesel Generator 3A Electrical Lineup Checklist, Att. 3A, 03/05/07
3-OI-82, Standby Diesel Generator 3B Electrical Lineup Checklist, Att. 3B, 03/05/07
3-OI-82, Standby Diesel Generator 3C Electrical Lineup Checklist, Att. 3C, 03/05/07
3-OI-82, Standby Diesel Generator 3D Electrical Lineup Checklist, Att. 3D, 03/05/07
Drawing 1-47E811-1, Flow Diagram High Pressure Coolant Injection System, Revision 29
Drawing 1-47E812-2, Flow Diagram HPCI Oil System, Revision 5
Drawing 3-15E500-3, Key Diagram of Normal and Standby Auxiliary Power System, Rev. 43
Drawing 3-45E724-6, Wiring Diagram 4160V Shutdown BD 3EA Single Line, Rev. 28
Drawing 3-45E724-7, Wiring Diagram 4160V Shutdown BD 3EB Single Line, Rev. 19
Drawing 3-45E724-8, Wiring Diagram 4160V Shutdown BD 3EC Single Line, Rev. 30
Drawing 3-45E724-9, Wiring Diagram 4160V Shutdown BD 3ED Single Line, Rev. 22
WO 07-723756-000, HPCI Exhaust Drain High Level Alarm Wouldn't Clear
WO 07-720164-000, 1-LS-73-56A Microswitch Corrosion Causing Sticking
WO 07-720164-001, 1-LS-73-56B Collapsed Float
WO 07-720164-002, 1-LS-73-56A Satisfactory Inspection of Float
WO 07-722711-000, HPCI Inboard Discharge Valve MOVATS
WO 07-723633-000, Fasteners on HPCI Main Pump to Speed Changer Coupling
WO 07-771827-000, HPCI Oil Tank Level Gauge Glass

WO 07-727306-000, New Tie-Back Support on HPCI Test Line
 WO 01-009885-000, Board and Bus Inspections
 WO 02-011719-000, ECCS Logic Changes to U3
 PER, 127547 1-LS-73-56B Float Collapse
 PER, 128268 1-LS-73-56A Microswitch Corrosion
 PER, 125574 Oil Cooler Pressure Control Valve 1-PCV-73-43 Leakage
 PER, 125425 HPCI Failure to Develop Required D/P
 PER, 125555 1-PCV-73-43 Programmatic Issues
 PER, 125608 ASME Code Class 2 Leak on Test Connection
 PER, 126633 Gland Seal Condenser Leak Missing Clamps
 PER, 126658 Gland Seal Condenser Leak Wrong Size Clamps
 PER, 128951 OE Review of Current Flow Control Settings
 PER, 128951 Foreign Material in Steam Trap 1-TRP-73-8
 PER, 130696 1-TRP-73-8
 PER, 130744 HPCI Turbine Exhaust Drain Pot Level High
 PER, 133370 Maintenance Rule (a)(1) Corrective Actions
 PER, 134463 Test Connection Vibrations
 DCN 69258 HPCI Tie-Back Support to Test Line Containing 1-TV-73-563, Revision A
 System 73-B (a)(1) 10 Point Plan
 System Health Report Unit 1 System 73, HPCI, FY2007 – P3
 System Health Report Unit 0 System 575, 4k VAC, FY2007 – P3
 Cause Determination Evaluation (CDE) 595, Unit 1 HPCI Exceeded Unavailability PC
 CDE 626, Unit 1 HPCI Exceeded Unavailability PC and Moved into MR (a)(1), 09/27/07
 PER, 129871 0-SR-3.8.1.A.1 Does Not Appear to Verify Tech Spec Requirements are Met
 PER, 135171 A Single Failure Could Inop Both Divs ECCS While Aligned to an Alternate
 Control Power

Section 1R07: Biennial Heat Sink Performance

0-TI-63, RHRSW Flow Blockage Monitoring, Revision 0023
 0-TI-522 Program for Implementing NRC Generic Letter 89-13, Rev 000
 CI-137, CHEMICAL INSTRUCTION RAW WATER CHEMICAL TREATMENT, Revision 17
 CI-137.5, Raw Water Chemical Treatment Molluscicide Control, Revision 0027
 CI-13.1, Chemistry Program, Revision 0029
 SPP-9.7, Corrosion Control Program, Rev. 0014
 PER, 128858, During a walk down of RHRSW with the NRC, it was identified that the screen
 wash pumps are spraying water on the RHRSW pump columns
 PER, 135243, Corrosion was observed on the bottom of the cable tray supports in the cable
 tunnel going from the turbine building to the intake pumping station
 PER, 96133, On 1/25/06 The Browns Ferry Nuclear Plant (BFNP) Daily Scheduling Work Cycle
 Mgr Learned From Engineering And Operations That The D2 RHRSW Pump Was On
 Double Test.
 PER, 122218, Due to increased stroke timing of 2-FCV-23-52, the valve was disassembled and
 found to have a sheared stem and extreme erosion of the body internally.
 PER, 133639, During the October/November 2007 performance of 3-SI-3.2.4, the 3A RHR
 pump seal heat exchangers as found DP was 8 inches of H₂O on the north and south
 header
 PER, 05-711558, RHRSW Pump Pit Inspection
 BFNP - Engineering Evaluation Of Residual Heat Removal Heat Exchanger 20 Performance
 Test

Calculation For Tube Plugging Analysis Md-Q0023-980143
 Browns Ferry Nuclear Plant Closed Cooling Water Chemistry Strategic Plan, Revision 1

Section 1R08: In-Service Inspection Activities

54-ISI-850-06, Manual Ultrasonic Examination of BWR Reactor Vessel Nozzle Inner Radius Regions and Nozzle to Shell Welds (inner 15%), Rev. January 11, 2007
 N-UT-78, PDI Generic Procedure for the Manual Ultrasonic Examination of Reactor Pressure Vessel Welds. PDI-UT-6. Rev. 4
 54, ISI-363-04, Remote Underwater In-Vessel Visual Inspection of Reactor Pressure Vessel Internals, Components, and Associated Repairs in Boiling Water Reactors, Rev February 11, 2008
 N-MT-6, Magnetic Particle Examination for ASME and ANSI Code Components and Welds, Rev. 30
 54-ISI-30-06, Written Practice for the Qualification and Certification of the NDE Personnel, Rev. 0
 QAPM 9.2 Addenda 1, Qualification and Certification of Visual Examination Personnel, Rev 9
 QAPM 9.2, Qualification and Certification of Visual Examination Personnel for ASME Section XI Applications, Rev 9
 PER 99649, Weld discrepancy
 PER 117585, PT procedure discrepancy in recorded indications
 PER 126439, Generic Letter 88-01 component listing neglected to include 2 welds
 PER 121003, A manual ultrasonic examination of weld RCRD-2-52 detected a planar indication in the circumferential direction
 PER 121878, Visual inspection acceptance criteria in not met.
 PER 113545, Historical Issue: Water leakage is causing corrosion of the Drywell to Torus vent pipe exterior and Torus shell exterior and supports.
 PER 122017, The fabrication radiographs of the RPV CRD Return Line (capped) N9 Nozzle to Shell Weld (W029-025) were reviewed on 03/19/07 as part of the NDE evaluation of an Ultrasonic (UT) examination.

Section 1R11: Licensed Operator Requalification

OPL173S271, Simulator Exercise/Evaluation Guide for RCS Flow Transmitter Failure, Loss of Isophase Bus Duct Cooling, and Main Generator Voltage Regulator Transfer to Manual, Revision 0
 OPL171.071, Conduct of Operations (OPDP-1) Lesson Plan, Revision 14
 OPL171.012, Reactor Feedwater Control System (RFWCS) Lesson Plan, Revision 13
 OPDP-1, Conduct of Operations, Revision 9
 Annunciator Response Procedure 2-ARP-9-7A, Panel 9-7 2-XA-55-7A, Revision 20
 2-OI-47, Turbine-Generator System, Revision 138
 BFNP Simulator PR 4746, Transmitter Malfunction Power/Flow Map Response
 BFNP Simulator PR 4675, Generator Voltmeter Phase Select Handswitch Software Mapping
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 DCN 64122, Install Generation Metering for the Unit 1 Generator Step-Up (GSU) Transformers, 5/26/2006
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4OA3: Event Followup

LER 05000296/2007-004

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