



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

July 30, 2014

Mr. Joseph W. Shea
Vice President, Nuclear Licensing
Tennessee Valley Authority
1101 Market Street, LP 3D-C
Chattanooga, TN 37402-2801

**SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION
REPORT 05000259/2014003, 05000260/2014003, AND 05000296/2014003**

Dear Mr. Shea:

On June 30, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Browns Ferry Nuclear Plant, Units 1, 2, and 3. On July 11, 2014, the NRC inspectors discussed the results of this inspection with Mr. K. Polson and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one NRC identified finding which was determined to be of very low safety significance (Green) in this report. This finding did not involve a violation of NRC requirements.

Further, inspectors documented one licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating this violation as a non-cited Violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Browns Ferry Nuclear Plant.

In addition, if you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC resident inspector at the Browns Ferry Nuclear Plant.

J. Shea

2

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," 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's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management 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/

Jonathan H. Bartley, 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 05000259/2014003,
05000260/2014003 and 05000296/2014003

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J. Shea

2

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J. Shea

3

Letter to Joseph W. Shea from Jonathan H. Bartley dated July 30, 2014

SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION
REPORT 05000259/2014003, 05000260/2014003, AND 05000296/2014003

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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.: 05000259/2014003, 05000260/2014003, 05000296/2014003

Licensee: Tennessee Valley Authority (TVA)

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

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

Dates: April 1, 2014, through June 30, 2014

Inspectors: D. Dumbacher, Senior Resident Inspector
L. Pressley, Resident Inspector
T. Stephen, Resident Inspector
C. Kontz, Senior Project Engineer
S. Sanchez, Senior Emergency Preparedness Inspector
C. Fontana, Emergency Preparedness Inspector
A. Nielsen, Senior Health Physicist
R. Kellner, Health Physicist

Approved by: Jonathan H. Bartley, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000259/2014003, 05000260/2014003, 05000296/2014003; 04/01/2014–06/30/2014; Browns Ferry Nuclear Plant, Units 1, 2 and 3; Flood Protection Measures.

The report covered a three month period of inspection by the resident inspectors, three regional inspectors and two emergency preparedness inspectors. One NRC identified finding was identified. The significance of most findings is identified by their color (Green, White, Yellow, and Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP); and, the cross-cutting aspects were determined using IMC 0310, "Components Within the Cross-Cutting Areas". Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 5, dated February 2014.

NRC Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. An NRC-identified finding was identified for the licensee's failure to adhere to TVA General Specification 40 (G-40) for Installation, Modification, and Maintenance of Electrical Systems, section 3.5.7, which required standing water in Handholes be kept below any safety related cables. Hand hole numbers 15 and 26 were discovered to have had standing water above several of the Residual Heat Removal (RHR) service water (safety related) power cables from January to May 2014.

The licensee's failure to adhere to TVA General Specification 40 (G-40) for Installation, Modification, and Maintenance of Electrical Systems, section 3.5.7, which required standing water in hand holes be kept below any safety related cables was a performance deficiency. Specifically, the licensee allowed hand hole numbers 15 and 26 to have standing water above several of the RHR service water (safety related) power cables. The performance deficiency was more than minor because if left uncorrected, it had the potential to lead to a more significant safety concern including cable degradation and increased likelihood of cable failure. This issue screened as having very low safety significance, Green, using IMC 0609 Appendix A, Exhibit 2, Mitigating Systems Screening Questions issued on June 19, 2012, because it affected the design or qualification of a mitigating SSC but the mitigating SSC maintained its operability. The finding had a cross cutting aspect of Problem Identification and Resolution: Resolution because the licensee failed to ensure that corrective actions addressed the cause of the power cable wetting and failure in 2007. (P.3) (Section 1R06.2)

Licensee Identified Violations

- One violation of very low safety significance that was identified by the licensee has been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program (CAP). The violation and corrective action tracking number are listed in Section 4OA7 of this report.

Enclosure

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at 100 percent of rated thermal power (RTP) except for one unplanned and two planned downpowers. The planned downpowers, each for rod sequence exchange and main condenser water box cleaning, occurred on May 9, 2014, and June 7, 2014. The unplanned downpower to 98 percent for four hours occurred on June 17, 2014, when the inoperability of both trains of the Control Room air conditioning system resulted in beginning preparations for a Technical Specifications required shutdown. The shutdown was averted when one train of the Control Room air conditioning system was restored prior to the expiration of the required action time (Event Number (EN) 50207). Power remained at 100 percent for the remainder of the quarter.

Unit 2 operated at 100 percent RTP except for two unplanned and three planned downpowers. The unplanned downpowers to 98 and 87 percent power occurred on May 10, 2014, (three days) and on June 15, 2014, due to lowering vacuum in the main condenser. The vacuum was affected by lower river flow, higher river temperature, and a partially stuck closed main condenser water box outlet valve. During the June 15 time period the unit also was impacted by the inoperability of two trains of Control Room air conditioning system (EN 50207). The unit returned to 100 percent power on June 26, 2014. The planned downpowers occurred on May 30, 2014, for repairs to the 2B Recirculation Pump Variable Frequency Drive (VFD), June 2, 2014, for rod sequence exchange, and June 27, 2014, for main condenser water box outlet valve repair. Power remained at 100 percent for the remainder of the quarter.

Unit 3 operated at 100 percent RTP except for two unplanned downpowers, an unplanned scram, and one planned downpower. On April 9, 2014, an unplanned downpower to 78 percent occurred to remove water from the 3A Condensate Booster Pump's oil system. Power was restored to 100 percent the next day. On May 6, 2014, an unplanned scram occurred while performing ATWS-RPT Analog Trip Unit testing. A failed power supply coupled with the test signal caused both recirculation pumps to trip and ATWS – ARI logic to insert all control rods. The resulting transient caused the unit to scram on low reactor water level. The unit returned to 100 percent power on May 12, 2014. The planned downpower occurred on June 6, 2014, for a rod sequence exchange and condenser water box cleaning. An unplanned downpower to 98 percent for four hours occurred on June 17, 2014, when the inoperability of both trains of the Control Room air conditioning system resulted in beginning preparations for a Technical Specifications required shutdown. The shutdown was averted when one train of the Control Room air conditioning system was restored prior to the expiration of the required action time. (EN 50207). Power remained at 100 percent RTP for the remainder of the quarter.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

.1 Actual Weather Event

a. Inspection Scope

On April 28, 2014, a tornado watch and then a warning was declared for Limestone County. The inspectors reviewed the licensee's overall preparations, personnel and equipment protection for the unexpected onset of severe weather conditions associated with the tornado watch that the plant was under. The inspectors reviewed and discussed the implementation of licensee Abnormal Operating Instruction 0-AOI-100-7, Severe Weather, with the responsible Unit Supervisors, Nuclear Security Supervisors, and the Shift Manager. The inspectors witnessed the licensee's suspension of higher risk activities and were informed of the relocation of personnel from vulnerable areas. The Inspectors toured the plant grounds for loose debris, which could become missiles during a tornado, and reviewed operator staffing and their accessibility to controls and indications required for safe control of the plant. This activity constituted one Adverse Weather Protection inspection sample.

b. Findings

No findings were identified.

.2 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

Prior to and during the onset of hot weather conditions, the inspectors reviewed the licensee's implementation of 0-GOI-200-3, Hot Weather Inspection, and the TVA procedure for determination of grid qualification, (TRO-EA-SOP 30.405). The inspectors discussed implementation of 0-GOI-200-3 with responsible Operations personnel and management. The inspectors walked down the licensee's switchyard to verify the physical condition of offsite power sources and reviewed the status of several work orders for offsite power sources. The inspectors monitored the status of risk significant equipment to cool the Unit 1, 2, and 3 control rooms and the status of the 7 cooling towers on site. This activity constituted one Readiness for Seasonal Extreme Weather inspection sample.

b. Findings

No findings were identified.

.3 Offsite and Alternate AC Power System Requirement

a. Inspection Scope

Prior to the summer season, inspectors reviewed electrical power design features, and onsite risk and work management procedures to verify appropriate operational oversight and assurance of continued availability of offsite and alternate AC power systems. Inspectors verified that communications protocols existed between the transmission system operator and Browns Ferry Nuclear Plant for coordination of off-normal and emergency events affecting the plant, event details, estimates of return-to-service times, and notifications of grid status changes. The inspectors verified that the changes made since June 2013 to the licensee's procedures addressing offsite AC power and onsite alternate AC power did not affect their availability and reliability. The inspectors walked down the licensee's switchyard to verify the physical condition of offsite power sources and reviewed the status of several work orders for offsite power sources. This activity constituted one Offsite and Alternate AC Power System inspection sample.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

The inspectors conducted partial equipment alignment walkdowns to evaluate the operability of selected redundant trains or backup systems, listed below, while the other train or subsystem was inoperable or out of service. The inspectors reviewed the functional systems descriptions, Updated Final Safety Analysis Report (UFSAR), system operating procedures, and Technical Specifications (TS) to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system. This activity constituted three Equipment Alignment Partial Walkdown inspection samples.

- Common Unit 1 and 2 Emergency Diesel Generators (EDG) A, C and D with B out of service for maintenance
- Unit 1 Residual Heat Removal (RHR) Loop I with RHR Loop II out of service for maintenance
- Unit 2 Residual Heat Removal (RHR) Loop II with focus on discrepancies related to system gas accumulation testing and results

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Fire Protection Tours

a. Inspection Scope

The inspectors reviewed licensee procedures for transient combustibles and fire protection impairments, and conducted a walkdown of the fire areas (FA) and fire zones (FZ) listed below. Selected FAs/FZs 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. The inspectors verified that selected fire protection impairments were identified and controlled in accordance with procedures. The inspectors reviewed applicable portions of the Fire Protection Report, Volumes 1 and 2, including the applicable Fire Hazards Analysis, and Pre-Fire Plan drawings, to verify that the necessary firefighting equipment, such as fire extinguishers, hose stations, ladders, and communications equipment, was in place. This activity constituted six Fire Protection Walkdown inspection samples.

- Intake Pumping Station, (Fire Area 25-1)
- Unit 1, Control Building, EL 593' Battery and Battery Board Room (Fire Area 17)
- Unit 2, Control Building, EL 593' Battery and Battery Board Room (Fire Area 18)
- Unit 2, Reactor Building, EL 593' North of Column Line R (Fire Zone 2-3)
- Unit 2, Reactor Building, EL 593' South of Column Line Q (Fire Zone 2-4)
- Unit 2, Reactor Building, EL 621' and EL 639' (Fire Zone 2-5)

b. Findings

No findings were identified.

.2 Observe Fire Brigade

a. Inspection Scope

The inspectors witnessed a fire brigade response in the area between the Unit 2 and 3 cable spreading rooms on elevation 606 feet. The response was due to the smell of smoke that was coming from a failed power supply for a security system remote repeater. No actual fire occurred. The failed power supply was de-energized and replaced as documented in the licensee's CAP as Problem Evaluation Report (PER) 874890. The inspectors assessed fire alarm effectiveness; response time for notifying and assembling the fire brigade; the readiness of firefighting equipment; use of personnel fire protective clothing and equipment (e.g., turnout gear, self-contained breathing apparatus); communications; incident command and control; teamwork; and firefighting strategies. The inspectors also attended the post-event critique to assess the licensee's ability to review fire brigade performance and identify areas for improvement.

Following the critique, the inspectors compared their observations with the requirements specified in the licensee's Fire Protection report. This activity constituted one Fire Brigade response inspection sample.

b. Findings

No findings were identified.

1R06 Flood Protection Measures

.1 Internal Flood Protection

a. Inspection Scope

The inspectors reviewed a sampling of the licensee's corrective action documents with an actual flood-related item affecting the standby gas treatment building and Unit 1, 2 emergency diesel areas to verify that impact of a broken demineralized water line was being identified and corrected. The inspectors reviewed selected completed preventive maintenance procedures, work orders, and surveillance procedures to verify that actions were completed within the specified frequency and in accordance with design basis documents. This activity constituted one Internal Flood Protection inspection sample.

b. Findings

No findings were identified.

.2 Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

During the inspection period covered by Browns Ferry Inspection Report 05000259, 260, 296/2014-002, the inspectors conducted an inspection of underground manholes subject to flooding. As a result of the inspection, two Unresolved Items were opened. URI 2014-002-01, RHRSW pump power cables submerged in water in hand hole 26 contrary to TVA General Specification G-40, and URI 2014-002-02, Inadequate Corrective Action for sump pump in hand hole 15 allowing RHRSW pump power cables to be submerged in water without the pump operating. Their disposition is discussed below. No additional inspection samples were counted.

b. Finding

Introduction: An NRC-identified Green Finding (FIN) was documented for the licensee's failure to adhere to TVA General Specification 40 (G-40) for Installation, Modification, and Maintenance of Electrical Systems section 3.5.7 which required standing water in hand holes be kept below all safety related cables and electrical devices. Specifically, inspectors identified hand hole numbers 15 and 26 had standing water above several of the RHR service water (safety related) power cables.

Description: Browns Ferry had RHR service water pump power cables routed underground for protection from potential hazards. There are two divisions of RHR service water pumps. One division has power cables routed through hand hole numbers 15 and 26. A hand hole is an underground cable vault that is accessible from above ground by removing an access cover. TVA's guidance for electrical cable installation, modification, and maintenance in General Specification G-40 section 3.5.7 states, in part, that "hand holes shall be maintained free of standing water to the extent practical. Standing water is acceptable as long as the water level in the hand holes containing safety related cables is below all cables and electrical devices."

The RHR service water power cables that are routed through these hand holes were discovered to be covered in water in 2001. As part of the licensee corrective actions, a sump pump was installed in hand hole 15 to remove standing water prior to the power cables becoming wetted. In 2007, the power cables in hand hole numbers 15 and 26 failed, in part due to being wetted. The licensee replaced these failed power cables in 2007 with a water impervious design built to the draft IEEE 1142-2009 standards. Also, as part of the extent of cause review, the licensee determined that the installed sump pump suction was not low enough in the hand hole to prevent the power cables from being wetted. As part their corrective actions for PER 119954, the licensee installed a new sump pump and a warning light to provide a visual alert to rising water levels prior to power cables becoming wetted. The pump suction depth was lowered to try to prevent power cable wetting. However, the pump was not lowered enough.

During an inspection of hand hole numbers 15 and 26 on January 17, 2014, standing water was discovered covering several of the RHR service water power (safety related) cables. The licensee verified all water from the hand hole was removed on May 29, 2014. The licensee provided sufficient test results to demonstrate operability for one year but could not provide analysis that the cables were rated for continuous submergence. The inspector determined that the period of time that the cable was wetted was less than the as tested maximum allowed time.

The issue identified in Unresolved Item (URI) 05000259, 260, 296/2014-002-01, RHRSW pump power cables submerged in water in hand hole 26 contrary to TVA General Specification G-40, was determined to be a performance deficiency and is being closed out as a finding.

URI 05000259, 260, 296/2014-002-02, Inadequate Corrective Action for sump pump in hand hole 15 allowing RHRSW pump power cables to be submerged in water without the pump operating, was determined to not be a performance deficiency because the inspectors determined that the corrective actions to install the new sump pump and alarm were not actions necessary to restore compliance with General Specification G-40. Compliance was restored when the water was removed from the hand hole. Therefore, URI 05000259, 260, 296/2014-002-02 is being closed because no finding or violations of NRC requirements was identified.

Analysis: The licensee's failure to adhere to TVA General Specification 40 (G-40) for Installation, Modification, and Maintenance of Electrical Systems, section 3.5.7, which required standing water in hand holes be kept below any safety related cables, was a performance deficiency. Specifically, the licensee allowed hand hole number 15 and 26 to have standing water above several of the RHR service water (safety related) power cables. The performance deficiency was more than minor because if left uncorrected, it had the potential to lead to a more significant safety concern including cable degradation and increased likelihood of cable failure. This issue screened as having very low safety significance, Green, using IMC 0609 Appendix A, Exhibit 2, Mitigating Systems Screening Questions issued on June 19, 2012, because it affected the design or qualification of a mitigating SSC but the mitigating SSC maintained its operability. The finding had a cross cutting aspect of Problem Identification and Resolution: Resolution because the licensee failed to ensure that corrective actions addressed the cause of the power cable wetting and failure in 2007. (P.3)

Enforcement: This finding does not involve enforcement action because no violation of a regulatory requirement was identified. Because this finding does not involve a violation and is of very low safety significance, it is identified as a FIN 259, 260, 296/2014-003-01, RHRSW Pump Power Cables Submerged in Water. This Green finding closes URI 05000259, 260, 296/2014-002-01.

1R07 Heat Sink Performance

a. Inspection Scope

Unit 3 EDG 3B Heat Exchanger:

The inspectors examined activities associated with Unit 3 EDG 3B Heat Exchanger. The inspectors reviewed procedures used for testing flow rates; and reviewed design basis documents, calculations, test procedures, and results to evaluate the licensee's program for maintaining heat sinks in accordance with the licensing basis. The inspectors reviewed PERs and corrective actions to verify that the licensee was identifying issues and correcting them.

The inspectors performed walkdowns of key components of EECW systems to verify material conditions were acceptable and physical arrangement matched procedures and drawings. The inspectors reviewed the paperwork for the cleaning and inspection activities associated with the Unit 3 "3B" EDG heat exchanger. Inspectors reviewed licensee compliance to commitments made based on their response to the NRC Generic Letter 89-13 for service water system problems that could affect heat exchanger performance. Licensee corrosion and mollusk control chemical addition processes for heat exchangers were also reviewed. This activity constituted one Heat Sink Performance Inspection sample.

b. Findings

No findings were identified.

Enclosure

1R11 Licensed Operator Requalification and Performance

.1 Licensed Operator Requalification

a. Inspection Scope

On May 12, 2014, the inspectors observed a licensed operator training session for an operating crew according to Unit 2 Simulator Exercise Guide (SEG) OPL173S342, Power Reduction, Loss of the Reactor Protection System, Loss of a Steam Jet Air Ejector, and Anticipated Transient without Scram (ATWS).

The inspectors specifically evaluated the following attributes related to the operating crew's 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 procedures including Abnormal Operating Instructions (AOIs), Emergency Operating Instructions (EOIs) and Safe Shutdown Instructions (SSI)
- Timely control board operation and manipulation, including high-risk operator actions
- Timely oversight and direction provided by the shift supervisor, including ability to identify and implement appropriate technical specifications actions such as reporting and emergency plan actions and notifications
- Group dynamics involved in crew performance

The inspectors assessed the licensee's ability to administer testing and assess the performance of their licensed operators. The inspectors attended the post-examination critique performed by the licensee evaluators, and verified that licensee-identified issues were comparable to issues identified by the inspector. The inspectors 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). This activity constituted one Observation of Requalification Activity inspection sample.

b. Findings

No findings were identified.

.2 Control Room Observations

a. Inspection Scope

Inspectors observed and assessed licensed operator performance in the plant and main control room, particularly during periods of heightened activity or risk and where the activities could affect plant safety. Inspectors reviewed various licensee policies and procedures covering Conduct of Operations, Plant Operations and Power Maneuvering.

Inspectors utilized activities such as post maintenance testing, surveillance testing and other activities to focus on the following conduct of operations as appropriate;

- Operator compliance and use of procedures.
- Control board manipulations.
- Communication between crew members.
- Use and interpretation of plant instruments, indications and alarms.
- Use of human error prevention techniques.
- Documentation of activities, including initials and sign-offs in procedures.
- Supervision of activities, including risk and reactivity management.
- Pre-job briefs.

This activity constituted one Control Room Observation inspection sample.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

.1 Routine

a. Inspection Scope

The inspectors reviewed the specific 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, as applicable: 1) Appropriate 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 monitoring; 5) Tracking unavailability for performance monitoring; 6) Balancing reliability and unavailability; 7) Trending key parameters for condition monitoring; 8) System classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); 9) Appropriateness of performance criteria in accordance with 10 CFR 50.65(a)(2); and 10) Appropriateness and adequacy of 10 CFR 50.65 (a)(1) goals, monitoring and corrective actions. The inspectors compared the licensee's performance against site procedures. The inspectors 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. This activity constituted four Maintenance Effectiveness inspection samples.

- High Pressure Fire Pump maintenance rule scoping
- Liquid Radwaste system maintenance rule scoping
- Stator Water system
- Emergency Diesel Generator (a)(1) Plan and schedule to reach (a)(2) status

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

For planned online work and/or emergent work that affected the combinations of risk significant systems listed below, the inspectors examined on-line maintenance risk assessments, and actions taken to plan and/or control work activities to effectively manage and minimize risk. The inspectors verified that risk assessments and applicable risk management actions (RMA) were conducted as required by 10 CFR 50.65(a)(4) applicable plant procedures. As applicable, the inspectors verified the actual in-plant configurations to ensure accuracy of the licensee's risk assessments and adequacy of RMA implementations. This activity constituted five Maintenance Risk Assessment inspection samples.

- April 28, 2014, Unit 1, 2 and 3 risk and delay of associated maintenance on 'B' Emergency Diesel Generator (EDG) and 'B' Shutdown Board Battery due to impending adverse weather
- May 01, 2014, Heavy lift of 3C Circulating Water pump over RHRSW pumps while B EDG was out of service for maintenance
- May 08, 2014, Unit 1 Yellow Risk due to RHRSW and RHR Loop I out of service for scheduled maintenance
- May 14, 2014, Unit 1 Yellow Risk due to RHRSW and RHR Loop II out of service for scheduled maintenance
- May 20, 2014, Unit 3 Yellow Risk due to RHRSW and RHR Loop II out of service for scheduled maintenance

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessment

a. Inspection Scope

The inspectors reviewed the operability/functional evaluations listed below to verify technical adequacy and ensure that the licensee had adequately assessed TS operability. The inspectors 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 procedures to ensure that the licensee's evaluation met procedure requirements. Where applicable, inspectors examined the implementation of compensatory measures to verify that they achieved the intended purpose and that the measures were adequately controlled. The inspectors reviewed PERs on a daily basis to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. This activity constituted seven Operability Evaluation inspection samples.

- Standing Order OS-195, Technical Requirements Manual 3.7.6, Electric Board room air conditioning system not consistent with Technical Specifications
- Past Operability Evaluation of 3A 480V Load Shed Logic Function Failure During EDG 3A Load Acceptance Test (PER 847155)
- 3B EDG Heat Exchanger exceeded its acceptance criteria for fouling (PER 867001)
- Leak under RHRSW "D" Room door (PER 878297)
- Gas release identified on Unit 2 RHR spray loop I discharge piping in excess of the acceptance criteria (PER 892052)
- Leak of Reactor Building Closed Loop Cooling Water (RBCCW) into the Unit 2 drywell (PER 893276)
- Jet Pump Mismatch (PER 884538)

b. Findings

During the inspection of the Standing Order OS-195, the inspectors identified the below Unresolved Item (URI).

Introduction: The inspectors identified an URI for Technical Requirements Manual (TRM) allowances that conflict with the supported system requirements to maintain equipment operability as described in technical specifications (TS).

Description: On July 14, 1998, Browns Ferry received approval to use the Improved Technical Specifications (NUREG-1433) and develop a TRM by license amendment number 232 (Unit 1), 253 (Unit 2), and 212 (Unit 3) (ML020040291). The Browns Ferry Technical Specifications, Section 1.0, "Definitions," stated, in part, A system, subsystem, division, component, or device shall be operable when all necessary attendant instrumentation, controls, cooling, and other auxiliary equipment required for the component to perform its specified safety function are also capable of performing their related support function(s). The TRM is a licensee controlled document to control safety related equipment not covered by technical specifications (10CFR50.36) including: Reactor Zone Isolation Timers (TRM 3.3.2.2); Refuel Zone Isolation Timers (TRM

Enclosure

3.3.2.3); Low Pressure ECCS Area Cooler Instrumentation (TRM 3.3.3.2); EECW Pump Timers (TRM 3.3.3.7); Drywell Control Air System (TRM 3.6.3); and Electric Board Room Air Conditioning System (TRM 3.7.6). These TRM's, as written, potentially allowed the aforementioned attendant systems to become non-functional without causing the supported TS equipment to be declared inoperable. The licensee initiated PERs 846040 and 877729 to investigate and analyze these issues of concern. URI 05000259, 260, 296/2014-003-02, TRM Allowances Conflicting with Technical Specifications, is opened pending completion of licensee analysis and NRC inspection of this issue of concern to determine if a more than minor performance deficiency or violation exists.

1R18 Plant Modifications

.1 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed the Design Change Notice (DCN) and completed work package (WO 114173563) for DCN 70835. DCN 70835 was a modification to the low pressure coolant injection function of the RHR system to allow a manual override of the 450 psig interlock should that interlock not be cleared due to a circuit failure. The inspectors reviewed licensee procedures NPG-SPP-09.3, Plant Modifications and Engineering Change Control, and NPG-SPP-06.9.3, Post-Modification Testing, post-maintenance testing package (PMTI-70835-005) for the implementation of this modification to loop 1 of the Unit 3 RHR system. The inspectors reviewed the associated 10 CFR 50.59 screening against the RHR 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. This activity constitutes one Permanent Plant Modification sample.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors witnessed and reviewed post-maintenance tests (PMT) listed below to verify that procedures and test activities confirmed Structure, System, or Component (SSC) operability and functional capability following the described 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. The inspectors witnessed and/or reviewed the test data, to verify that test results adequately demonstrated restoration of the affected safety

function(s). The inspectors verified that problems associated with PMTs were identified and entered into the CAP. This activity constituted six Post Maintenance Test inspection samples.

- Replacement and post maintenance testing of 4KV Shutdown Board 3EB time delay relays, (WO 114709767)
- Post maintenance testing of 3B emergency diesel generator following lube oil pump modifications, (WO 114846676)
- Post maintenance testing of B Emergency Diesel Generator following 2-year maintenance window per 0-SR-3.8.1.1(B), (WO 115747250)
- Replacement and post maintenance testing of Analog Trip Unit A following Unit 3 Scram, (WO 115771962)
- Post maintenance testing of C2 RHRSW pump following impeller gap adjustment, (WO 115823524)
- Unit 3 Residual Heat Removal (RHR) Loop II Comprehensive pump test following scheduled maintenance, (WO 115240141)

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

a. Inspection Scope

Unit 3 Forced Outage

From May 6, 2014, through May 8, 2014, the inspectors examined the Unit 3 forced outage activities to verify that they were conducted in accordance with Technical Specifications (TS), applicable plant procedures, and the licensee's outage risk assessment and management plans. The inspectors monitored critical plant parameters and observed operator control of plant conditions through Hot Shutdown (Mode 3). Some of the significant outage activities specifically reviewed and/or witnessed by the inspectors were as follows:

Shutdown and Cooldown Process

The inspectors witnessed the shutdown and cooldown of Unit 3 in accordance with licensee procedures OPDP-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.

Restart Activities

The inspectors specifically observed the following:

- Unit 3 approach to criticality and power ascension per 3-GOI-100-1A, Unit Startup, and 3-GOI-100-12, Power Maneuvering
- Reactor Coolant Heatup/Pressurization to Rated Temperature and Pressure per 3-SR-3.4.9.1, Reactor Heatup and Cooldown Rate Monitoring

Corrective Action Program

The inspectors reviewed PERs generated during the forced outage and attended management review 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 reviewed for completeness.

This activity constituted one Forced Outage Activity sample.

b. Findings

No findings were identified

1R22 Surveillance Testinga. Inspection Scope

The inspectors witnessed portions of, and/or reviewed completed test data for the following surveillance tests of risk-significant and/or safety-related systems to verify that the tests met technical specification 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. This activity constituted four Surveillance Testing inspection samples: one in-service, one reactor coolant system leakage detection, and two routine tests.

In-Service Tests:

- 3-SI-4.4.A.1, Standby Liquid Control Pump Functional Test, (WO 115185883)

Reactor Coolant System Leakage Detection Tests:

- 2-SR-3.4.4.1, Manual Calculation of Unidentified, Identified, and Total Leakage, (WO 115683930)

Routine Surveillance Tests:

- 3-SR-3.5.1.6(CS II) Core Spray Flow Rate Loop II, (WO 114843923)
- 1-SR-3.5.1.6(RHR I) Quarterly Residual Heat Removal (RHR) System Rated Flow Test for Loop I, (WO 115123324)

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness (EP)

1EP2 Alert and Notification System Evaluation

a. Inspection Scope

The inspectors evaluated the adequacy of the licensee's methods for testing the alert and notification system in accordance with NRC Inspection Procedure 71114, Attachment 02, Alert and Notification System (ANS) Testing. The applicable planning standard, 10 CFR Part 50.47(b)(5) and its related 10 CFR Part 50, Appendix E, Section IV.D requirements were used as reference criteria. The criteria contained in NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Revision 1, were also used as a reference.

The inspectors reviewed various documents which are listed in the Attachment. Inspectors interviewed personnel involved with siren system maintenance and observed annual siren maintenance field activities. This inspection activity satisfied one inspection sample for the alert and notification system on a biennial basis.

b. Findings

No findings were identified.

1EP3 Emergency Preparedness Organization Staffing and Augmentation System

a. Inspection Scope

The inspectors reviewed the licensee's Emergency Response Organization (ERO) augmentation staffing requirements and process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. The qualification records of key position ERO personnel were reviewed to ensure all ERO qualifications were current. A sample of problems identified from augmentation drills or system tests performed since the last inspection was reviewed to assess the effectiveness of corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, Emergency Preparedness Organization Staffing and Augmentation System. The applicable planning standard, 10 CFR 50.47(b)(2), and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspectors reviewed various documents which are listed in the Attachment. This inspection activity satisfied one inspection sample for the ERO staffing and augmentation system on a biennial basis.

Enclosure

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, no changes have been made to the Emergency Action Levels. The licensee did make several changes to the Radiological Emergency Plan and emergency plan implementing procedures, and determined that, in accordance with 10 CFR 50.54(q), the changes made in these revisions resulted in no reduction in the effectiveness of the Plan, and that the Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspectors conducted a sampling of the implementing procedure changes made between June 2013, and January 2014, to evaluate for potential reductions in the effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, Emergency Action Level and Emergency Plan Changes. The applicable planning standards of 10 CFR 50.47(b), and its related requirements in 10 CFR 50, Appendix E, were used as reference criteria.

The inspectors reviewed various documents that are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

b. Findings

No findings were identified.

1EP5 Maintenance of Emergency Preparedness

a. Inspection Scope

The inspectors reviewed the corrective actions identified through the Emergency Preparedness program to determine the significance of the issues, the completeness and effectiveness of corrective actions, and to determine if issues were recurring. The licensee's post-event action reports, self-assessments, and audits were reviewed to assess the licensee's ability to be self-critical, thus avoiding complacency and degradation of their emergency preparedness program. Inspectors reviewed the licensee's 10 CFR 50.54(q) change process, personnel training, and selected screenings and evaluations to assess adequacy. The inspectors toured facilities and reviewed equipment and facility maintenance records to assess licensee's adequacy in

maintaining them. The inspectors evaluated the capabilities of selected radiation monitoring instrumentation to adequately support Emergency Action Level (EAL) declarations.

The inspection was conducted in accordance with NRC Inspection Procedure 71114.05, Maintenance of Emergency Preparedness. The applicable planning standards, related 10 CFR 50, Appendix E requirements, and 10 CFR 50.54(q) and (t) were used as reference criteria.

Documents reviewed are listed in the Attachment. This inspection activity satisfied one inspection sample for the maintenance of emergency preparedness on a biennial basis.

b. Findings

No findings were identified.

1EP6 Drill Evaluation

.1 April 23, 2014, EP Radiological Emergency Plan (REP) training drill

a. Inspection Scope

The inspectors observed an EP REP training drill that contributed to the licensee's Drill/Exercise Performance (DEP) and Emergency Response Organization (ERO) performance indicator (PI) measures on April 23, 2014. This drill was intended to identify any licensee weaknesses and deficiencies in classification, notification, dose assessment and protective action recommendation (PAR) development activities. The inspectors observed emergency response operations in the simulated control room, Technical Support Center, and Operations Support Center to verify that event classification and notifications were done in accordance with EPIP-1, Emergency Classification Procedure, and licensee conformance with other applicable Emergency Plan Implementing Procedures. The inspectors attended the post-drill critiques to compare any inspector-observed weaknesses with those identified by the licensee in order to verify whether the licensee was properly identifying EP related issues and entering them in to the CAP, as appropriate. This activity constituted one EP training drill inspection sample.

b. Findings

No findings were identified.

.2 June 11, 2014, EP Radiological Emergency Plan (REP) simulator evaluation

a. Inspection Scope

The inspectors observed the simulator portion of an EP REP training drill that contributed to the licensee's Drill/Exercise Performance (DEP) and Emergency Response Organization (ERO) performance indicator (PI) measures on June 11, 2014.

Enclosure

This drill was intended to identify any licensee weaknesses and deficiencies in classification, notification, dose assessment and protective action recommendation (PAR) development activities. The inspectors observed emergency response operations to verify that event classification and notifications were done in accordance with EPIP-1, Emergency Classification Procedure, and licensee conformance with other applicable Emergency Plan Implementing Procedures. The inspectors attended the post-drill critiques to compare any inspector-observed weaknesses with those identified by the licensee in order to verify whether the licensee was properly identifying EP related issues and entering them in to the CAP, as appropriate. This activity constituted one EP simulator evaluation inspection sample.

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS6 Radioactive Gaseous and Liquid Effluent Treatment

a. Inspection Scope

Radioactive Effluent Treatment Systems: The inspectors walked-down selected components of the gaseous and liquid radioactive waste (radwaste) processing and effluent discharge systems. To the extent practical, the inspectors observed and evaluated the material condition of in-place waste processing equipment for indications of degradation or leakage that could constitute a possible release pathway to the environment. Inspected components included drain tanks, standby gas treatment systems, liquid waste processing equipment, and associated piping and valves. The inspectors interviewed licensee staff regarding radwaste equipment configuration and effluent monitor operation. The inspectors also reviewed surveillance testing records for standby gas treatment systems.

Effluent Sampling and Release: The inspectors observed the collection and processing of airborne effluent samples from the refuel floor, turbine building, and main plant stack. The inspectors reviewed recent liquid and gaseous release permits including pre-release sampling results, effluent monitor alarm setpoints, and public dose calculations. The inspectors reviewed the 2013 Annual Radioactive Effluent Report to evaluate reported doses to the public, to review any anomalous events, and to review Offsite Dose Calculation Manual (ODCM) changes. The inspectors also reviewed compensatory sampling data for time periods when selected radiation monitors were out of service. The inspectors reviewed the results of the 2012 radiochemistry cross-check program. The inspectors also reviewed effluent source term evaluation and changes to effluent release points. In addition, the inspectors evaluated recent land use census results and meteorological data used to calculate doses to the public.

Ground Water Protection: The inspectors reviewed the licensee's continued implementation of the industry's Ground Water Protection Initiative (Nuclear Energy Institute (NEI) 07-07) as part of Inspection Procedure 71124.07.

Enclosure

Problem Identification and Resolution: The inspectors reviewed Corrective Action Program (CAP) documents in the area of gaseous and liquid effluent processing and release. The inspectors evaluated the licensee's ability to identify and resolve the identified issues. The inspectors also reviewed recent self-assessment results.

Radwaste system operation and effluent processing activities were evaluated against requirements and guidance documented in the following: 10 CFR Part 20; 10 CFR Part 50 Appendix I; ODCM; Final Safety Analysis Report (FSAR) Section 9; Regulatory Guide (RG) 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants"; RG 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50 Appendix I"; and Technical Specifications (TS) Section 5. Procedures and records reviewed during the inspection are listed in the report Attachment.

This activity constituted one inspection sample for Radioactive Gaseous and Liquid Effluent Treatment.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope

REMP Implementation: The inspectors observed routine sample collection and surveillance activities as required by the licensee's environmental monitoring program. The inspectors noted the material condition and operability of airborne particulate filter and iodine cartridge sample stations and observed collection of weekly air samples at selected monitoring locations. The inspectors also checked environmental thermoluminescent dosimeters and water sampling stations for material condition at selected sites.

The inspectors reviewed calibration and maintenance surveillance records for the installed environmental air sampling stations. The inspectors also reviewed the 2012 and 2013 Radiological Environmental Operating Reports, the 2012 and 2013 Annual Radioactive Effluent Reports, recent results of the interlaboratory cross-check program for the environmental lab, and procedural guidance for environmental sample collection and processing. Selected environmental measurements were reviewed for consistency with licensee effluent data, evaluated for radionuclide concentration trends, and compared with detection level sensitivity requirements. In addition, the inspectors reviewed and evaluated land use census results, changes to the ODCM, and monitoring for hard-to-detect radionuclides.

Meteorological Monitoring Program: The inspectors walked-down the meteorological tower and observed local data collection equipment readouts. The physical condition of the tower and the instruments were observed and equipment operability and maintenance history were reviewed and discussed with responsible licensee staff. The transmission of locally generated meteorological data to the main control room operators was also evaluated. The inspectors reviewed applicable tower instrumentation calibration records for the meteorological measurements of wind speed, wind direction, and temperature, and evaluated measurement data recovery for 2012 and 2013.

Ground Water Protection: The inspectors discussed program guidance for spills, leaks, and unexpected discharges with licensee staff and reviewed recent entries into the 10 CFR 50.75(g) decommissioning file. The inspectors reviewed and discussed the licensee's program for monitoring of structures, systems, and components with the potential to release radioactive material to the environment. Potential effluent release points due to onsite surface water bodies were also evaluated. In addition, the inspectors reviewed recent groundwater sampling results.

Problem Identification and Resolution: The inspectors reviewed CAP documents in the areas of radiological environmental monitoring, meteorological tower maintenance, and groundwater monitoring. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with licensee procedures. The inspectors also reviewed recent self-assessment results.

REMP implementation, meteorological monitoring activities, and groundwater monitoring were reviewed against the guidance and requirements of 10 CFR Part 20; Appendices E and I to 10 CFR Part 50; TS Section 5; FSAR Chapter 2; ODCM Rev. 21; RG 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment"; RG 1.23, "Meteorological Monitoring Programs For Nuclear Power Plants"; ANSI/ANS-2.5-1984, "Standard for Determining Meteorological Information at Nuclear Power Sites"; Branch Technical Position, "An Acceptable Radiological Environmental Monitoring Program" – 1979; NEI 07-07, "Industry Groundwater Protection Initiative – Final Guidance Document"; and approved licensee procedures. Documents reviewed are listed in the Attachment.

This activity constituted one inspection sample for Radiological Environmental Monitoring Program.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Cornerstone: Mitigating Systems

a. Inspection Scope

The inspectors reviewed the licensee's procedures and methods for compiling and reporting the following Performance Indicators (PIs). The inspectors examined the licensee's PI data for the specific PIs listed below for the second quarter 2013 through first quarter of 2014. The inspectors reviewed the licensee's data and graphical representations as reported to the NRC to verify that the data was correctly reported. The inspectors validated this data against relevant licensee records (e.g., PERs, Daily Operator Logs, Plan of the Day, Licensee Event Reports, etc.), and assessed any reported problems regarding implementation of the PI program. The inspectors verified that the PI data was appropriately captured, calculated correctly, and discrepancies resolved. The inspectors used the Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, to ensure that industry reporting guidelines were appropriately applied. This activity constituted nine performance indicator inspection samples.

- Unit 1,2, and 3 Mitigating Systems Performance Index (MSPI) for High Pressure Injection System (HPCI)
- Unit 1,2, and 3 MSPI for Heat Removal System (RCIC)
- Unit 1, 2, and 3 Safety System Functional Failures

b. Findings

No findings were identified.

.2 Emergency Preparedness Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals relative to the PIs listed below for the period April 1, 2013, through March 31, 2014. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, was used to confirm the reporting basis for each data element.

- Emergency Response Organization (ERO) Drill/Exercise Performance
- ERO Drill Participation
- Alert and Notification System Reliability

For the specified review period, the inspectors examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. The inspectors verified the accuracy of the PI for ERO drill and exercise performance through review of a sample of drill and event records. The inspectors reviewed selected training records to verify the accuracy of the PI for ERO drill participation for personnel assigned to key positions in the ERO. The inspectors verified the accuracy of the PI for alert and notification system reliability through review of a sample of the licensee's records of periodic system tests. The inspectors also interviewed the licensee personnel who were responsible for collecting and evaluating the PI data. Documents reviewed are listed in the Attachment. This inspection satisfied three inspection samples for PI verification on an annual basis.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution of Problems

.1 Review of items entered into the Corrective Action Program:

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished by reviewing daily PER and Service Request (SR) reports, and periodically attending Corrective Action Review Board (CARB) and PER Screening Committee (PSC) meetings.

b. Findings

No findings were identified.

.2 Semi-annual Trend Review:

a. Inspection Scope

As required by Inspection Procedure 71152, the inspectors performed a review of the licensee's CAP and other associated programs and documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also included licensee trending efforts and licensee human performance results. The inspectors' review nominally considered the six-month period of January through June 2014, although some examples expanded beyond those dates when the scope of the trend warranted. Inspectors reviewed licensee trend reports for the period in order to determine the existence of any adverse trends that the licensee may not have previously identified. The inspectors' review also included the licensee's Integrated Trend Reports (ITR). The inspectors verified that

adverse or negative trends identified in the licensee's PERs, periodic reports and trending efforts were entered into the CAP. This inspection satisfied one inspection sample for Semi-annual Trend Review.

b. Observations and Findings

No findings were identified. In general, the licensee had identified trends and appropriately addressed them in their CAP. The inspectors observed that the licensee had performed a detailed review. The licensee routinely reviewed cause codes and utilized key words and system links to identify potential trends in their data. The inspectors compared the licensee process results with the results of the inspectors' daily screening. Trends that have been identified by licensee's trending program and the CAP included the following:

- Ineffective transient combustible controls related to the NFPA 0805 programs
- Adverse trend in tagging activities where the maintenance was not performed

A trend that had not been identified by licensee's trending program was one related to inadequate operator system operating instruction procedures resulting in configuration control events and inoperabilities that were considered minor issues.

.3 Focused Annual Sample Review:

a. Inspection Scope

The inspectors reviewed the Licensee corrective actions related their failure to submit the results of their Unit 2 reactor pressure vessel surveillance capsule results in the amount of time required by 10 CFR 50 Appendix H. There was a shift in the operating pressure and temperature curves as a result of the testing performed on the surveillance capsule. The operating curve shift has been included in the licensee's shift operating orders and a change to the Unit 2 technical specification 3.4.9 is being prepared. This activity constituted one Focused Annual Corrective Action sample.

b. Findings

No findings were identified.

40A3 Follow-up of Events and Notices of Enforcement Discretion

.1 (Closed) Licensee Event Report (LER) 05000259/2013-006-01 and, 05000259/2013-006-02, 1B Standby Liquid Control Pump Inoperable for Longer than Allowed by Technical Specifications

a. Inspection Scope

The inspectors reviewed LERs 05000259/2013-006-01 and 05000259/2013-006-02 dated February 25, 2014, and April 16, 2014. Revision 00 to LER 05000259/2013-006 had been submitted December 3, 2013, by TVA. TVA had determined that 1B Standby

Liquid Control pump had been inoperable from December 1, 2012, to February 14, 2013, due to a piece of the motor breaker's arc chute that had become dislodged and relocated to between the breaker contacts. The original LER failed to recognize that the failure also resulted in a Safety System functional failure (SSFF) due to loss of the function of the Standby Liquid Control system to inject Boron 10 into the reactor coolant system or control suppression pool pH during a loss of coolant accident. Revision 01 documented the addition of the SSFF documentation. Following additional cause analysis, the licensee submitted revision 02 to the LER to document that the damaged arc chute was due to a human performance error caused during transport. The licensee had no requirement to inspect the arc chutes prior to installation to the breaker. The NRC inspectors reviewed the new information and confirmed the specified corrective actions were appropriate and were being implemented.

b. Findings

No additional findings or violations of NRC requirements were identified.

.2 (Closed) Licensee Event Report (LER) 05000296/2014-001-00, Automatic Reactor Scram due to Turbine Trip on high Moisture Separator Controller Level

a. Inspection Scope

Inspectors reviewed LER 05000296/2014-001-00. The licensee identified that the failed moisture separator level controller caused a turbine trip and the reactor protection system appropriately initiated the subsequent reactor scram. The licensee initiated PER 860625 to enter this issue into the CAP. The root cause of the scram was attributed to introduction of foreign material (metallic shaving) into the control arm area of the level controller control relay during original manufacture of the controller. The licensee corrective actions were to remove similar control relays from the plant and provide instructions to add cleaning instruction for future similar controller rebuilds. The NRC inspectors reviewed previous work history of the failed controller, verified there were no performance deficiencies, and confirmed the specified corrective actions were appropriate and were being implemented.

b. Findings

No findings or violations or NRC requirements were identified.

4OA5 Other Activities

.1 Independent Spent Fuel Storage Installation (ISFSI) Change Evaluations

a. Inspection Scope

Under the guidance of IP 60855, the inspectors reviewed the licensee's evaluations of the changes to the Independent Spent Fuel Storage Installation (ISFSI) in accordance with 10 CFR 72.48, Changes, Tests, and Experiments, as well as the licensee's procedure for implementing 10 CFR 72.48 evaluations. The review focused on the

Enclosure

changes that were implemented since the last inspection. The review determined that the evaluations were consistent with the requirements of 10 CFR 72.48 and the evaluations were documented in accordance with NPG-SPP-09.9, "10 CFR 72.48 Evaluations of Changes, Tests and Experiments for Independent Spent Fuel Storage Installation". The inspectors also reviewed any changes to 10 CFR 72.212, Report of Evaluations since the last inspection.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On July 11, 2014, the resident inspectors presented the quarterly inspection results to Mr. Keith Polson, Site Vice President, and other members of the licensee's staff, who acknowledged the findings. The inspectors verified that all proprietary information was returned to the licensee.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy, for being dispositioned as a Non-Cited Violation.

- 10 CFR 50, Appendix B, Criterion XI, Test Control, required in part that testing demonstrated that components perform satisfactorily in service and that test procedures incorporate the requirements and acceptance limits contained within applicable design documents. On May 4, 2012, modification DCN 69492, Stage 7 was implemented which replaced the 480V Shutdown Board 3A Normal Feeder Breaker (BFN-3-BKR-231-0003A/1C) with an updated model. Contrary to the above, breaker checkout and testing procedure, (ECI-0-000-BKR011), did not test all the required design functions of the newly installed breaker, specifically the secondary contact circuitry which provides control for the load shed function. Subsequent testing on February 17, 2014, of the Emergency Diesel Generator (EDG) in accordance with Surveillance 3-SR-3.8.1.9(3A), EDG Load Acceptance Test, identified that the 480V Shutdown Board 3A failed to load shed as designed. The licensee entered this issue into the CAP as problem evaluation report (PER) 847155. Troubleshooting determined the failure of the load shed function was due to a lack of continuity or adequate engagement of the breaker's secondary control contacts. Using inspection manual chapter 0609, Appendix A, Exhibit 2 (Mitigating Systems); this finding was determined to be of very low safety significance (green) because the EDG remained capable of meeting its design function even with the additional load induced by the failure of the 480V load shed function.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

M. Acker, Licensing Engineer
J. Addison, Manager of Drills and Exercises
T. Adkins, EP Systems Manager
E. Bates, Licensing Engineer
R. Beck, Manager of the Engineering Rapid Response Team
S. Bono, General Plant Manager
D. Campbell, Operations Superintendent
M. Clark, EP Specialist
T. Cole, Superintendent – Radiation Protection Support
R. Cox, System Engineer
D. Curtley, Maintenance Rule Coordinator (Sequoyah)
D. Green, Licensing Engineer
L. Grigsby, Chemist
K. Harvey, Raw Water Systems Engineer
L. Hughes, Manager Operations
E. Johnson, System Engineer
J. Kulisek, EP Manager
J. Lacasse, System Engineer
W. Lee, Corporate EP Manager
B. McNutt, Ops Shift Manager
M. Moebes, Unit Supervisor
S. Norris, Engineering Manager
M. Oliver, Licensing Engineer
J. Parshall, EP Program Planning and Implementation Manager
J. Paul, Nuclear Site Licensing Manager
K. Polson, Site Vice President
M. Rasmussen, Work Control Manager
M. Roy, Maintenance Rule Coordinator (Browns Ferry)
S. Samaras, Civil Design Engineer
T. Scott, Performance Improvement Manager
G. Smith, Unit Supervisor
S. Spears, Electrical Maintenance Supervisor
S. Taubuki, EP Specialist
B. Tidwell, EP Specialist
J. Wheat, System Engineer
J. Whitlock, Unit Supervisor
A. Yarborough, Assistant Director for Site Engineering
T. Young, Switchyard Systems Engineer
T. Young, Transmission Service Center Manager

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000259/260/296/2014003-02	URI	TRM Allowances Conflicting with Technical Specifications (Section 1R15)
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Opened and Closed

05000259/260/296/2014003-01	FIN	RHRWS Pump Power Cables Submerged in Water (Section 1R06.2)
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Closed

05000259/2013-006-01	LER	1B Standby Liquid Control Pump Inoperable for Longer than Allowed by Technical Specifications (Section 4OA3.1)
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05000259/2013-006-02	LER	1B Standby Liquid Control Pump Inoperable for Longer than Allowed by Technical Specifications (Section 4OA3.1)
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05000296/2014-001-00	LER	Automatic Reactor Scram due to Turbine Trip on High Moisture Separator Level (Section 4OA3.2)
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05000259, 260, 296/2014-002-01	URI	RHRWS pump power cables submerged in water in Handhole 26 contrary to TVA General Specification G-40. (Section 1R06.2)
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05000259, 260, 296/2014-002-02	URI	Inadequate Corrective Action for sump pump in Handhole 15 allowing RHRWS pump power cables to be submerged in water without the pump operating. (Section 1R06.2)
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Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

0-AOI-100-7 Severe Weather, Rev 34
0-GOI-200-3 Hot Weather Operations, Rev 13
EPIP-1, Emergency Classification Procedure, Rev. 49
NPG-SPP-09.11.1, Equipment Out of Service Management, Rev. 9
SR 866855 Leak on CSST A oil drain valve
SR 877712 NRC identified unsecured scaffold material in switchyard
TRO-EA-SOP-30.405 Nuclear Offsite Power Operating Requirements, Rev 0
WO 114375735 Replace 5250 MOD motor operator
WO 114376962 Repair Trinity #1 Coupling 5233
WO 114377250 Repair Unit 3 Coupling 5267
WO 114625685 Agastat Relay 62-1 in BCB 5248 Failed
WO 114814694 Leak on CSST A oil pump
WO 114998169 Replace 5264 "A" compressor
WO 115662484 4KV Common Board "B" breaker 5 tripped
WO 115664250 Run temporary power to 5258

Section 1R04: Equipment Alignment

0-OI-82, Standby Diesel Generator System, Rev. 149
1-OI-74, RHR System, Rev. 77
Active Tagouts: 0-PE-2014, Clearances: 0-082-0008, 0-082-0009, DG B
FSAR Section 4.5 and 6.4

Section 1R05: Fire Protection

Fire Operations Dispatch Report 14-048 dated April 17, 2014
Fire Protection Report Volume 1, Rev 18
Fire Protection Report Volume 2, Rev 52
FSAR Appendix O Section O.1.22, Fire Water System Program, Amendment 25
Impairment 14-4410 related to degraded thermolag at the intake pump area
NFPA Fire Protection Handbook, 20th edition
SR 872509 Updates required for Fire Protection Report Volume 2 for the Unit 1 Process
Computer Room
SR 872531 Unsealed asbestos insulation in Unit 1 Battery Room 1
SR 872533 Unsealed asbestos insulation in Unit 1 Auxiliary Instrument Room #1
PER 874890 Report of Smoke in Unit 3 Control Bay

Section 1R06: Flooding Protection

0-AOI-100-3, Flood above elevation 558'
Browns Ferry PM 67718 Evaluation for Sump Pump Check for Handholes 15 and 26 Manhole
26, Rev 0
Browns Ferry Preventative Maintenance (PM) 500103184 Operability Check for Manholes,
commitment dated July 30, 2011
DWG 0-410N318 Concrete Miscellaneous Foundations and Manholes Sheet 1, Rev 14
DWG 0-410N319 Concrete Miscellaneous Foundations and Manholes Sheet 2, Rev A
DWG 0-418N203 Miscellaneous Steel, Miscellaneous Frames, Grating and Covers, Rev A

FSAR Appendix O Section 1.3, Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49

NCO 040006053 Inaccessible Medium Voltage Cables not subject to 10 CFR 50.49

Environmental Qualification Requirements Program

NRC GL 2007-01 Inaccessible or underground power cable failures that disable accident mitigation systems or cause plant transients (ADAMS ML 070360665)

PEG Package No. 00827487-BFNG2 Testing Results for RHRSW cables in Handhole 15 and PER 836589 Water and Silt found in cable vaults on the East side of the Building

SR 894350 Water leak spraying out of conduit in Unit 1-2 diesel building

Trays and Boxes, Rev 17

TVA Electrical Design Guide DG-E13.1.5 Manhole and Handhole Systems, Rev 2

TVA response to NRC request for additional information dated January 18, 2005 for license renewal application (ADAMS ML 050180537)

TVA Specification G-40, Installation, Modification and Maintenance of Electrical Conduit Cable Valve Pits and Tunnels

Section 1R07: Heat Sink Performance

0-TI-389 Raw Water Fouling and Corrosion Control, Rev 18

ACE for PER 858274, Rev 1

CHTP-108 Technical Chemistry Standards for SPP-9.7, Rev 6

CI-137 Taw Water Chemical Treatment, Rev 22

FSAR Appendix O, Section O.1.16, Open-Cycle Cooling Water System Program, Amendment 25

Heat Exchanger Inspection Results for the 3B EDG Heat Exchanger dated 4/2/2014

NPG-SPP-09.14 Generic Letter 89-13 Implementation, Rev 3

NPG-SPP-09.7 Corrosion Control Program, Rev 5

PER 858274 BFN Raw Water Chemical Treatment has not been applied per procedural Requirements

Section 1R11: Licensed Operator Requalification

OPDP-1 Conduct of Operations, Rev 32

OPL 173S342 Scenario Guide, Rev 2

Radiological Emergency Plan, Rev 103

Section 1R12: Maintenance Effectiveness

0-TI-346 Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting – 10CFR50.65, Rev 47

Fire Protection Report Volume 1, Rev 18

Fire Protection Report Volume 2, Rev 52

NPG-SPP-03.4, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting – 10CFR50.65, Rev. 2

NUMARC 93-01, Rev 2 and 4A

FSAR Chapter 6.4 and 10.16, Amendment 25

Function 082-B Diesel Generator (a)(1) Plan, Revision 5, Effective 4/1/14

System 26 (High Pressure Fire Pump) system health report dated 5/2/2014

System 26 scoping history dated 9/5/2006

System 77 (Liquid Radwaste System) system health report dated 5/14/2014

WO 10526971 Unit 1 Simulated actuation of fire protection sprinkler systems
 WO 112075073 Electric Fire pump capability test (2011)
 WO 112075075 Diesel Driven Fire Pump Capability Test (2011)
 WO 113532489 Diesel Driven Fire Pump Capability Test (2012)
 WO 113636422 Electric Fire pump capability test (2012)
 WO 114002781 Unit 2 Simulated actuation of fire protection sprinkler systems
 WO 114609127 Diesel Driven Fire Pump Capability Test (2013)
 WO 114634762 Electric Fire pump capability test (2013)

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

0-AOI-100-7 Severe Weather, Rev. 34
 Browns Ferry Unit 1 Equipment Out Of Service Report dated 5/14/14
 Daily Plant Status Report dated 5/14/14
 Daily Plant Status Report for Units 1, 2 and 3 dated April 28, 2014
 EPIP-1, Emergency Classification Procedure, Rev. 49
 eSOMS Action Tracking dated 5/14/14
 eSOMS Action Tracking Status for Units 1, 2 and 3 on April 28, 2014
 eSOMS Narrative Logs dated 5/13-14/14
 High Hazard Lift Plan for May 1, 2014 lift of 3C CCW pump
 MSI-0-000-LFT001, Lifting Instructions for the Control of Heavy Loads, Rev. 65
 NPG-SPP-07.3, Work Activity Risk Management Plan, Rev. 15
 NPG-SPP-09.11.1, Equipment Out of Service Management, Rev. 9
 Operator's EOOS Input for Unit 1 on May 8, 2014
 Operator's EOOS Input for Unit 3 on May 20, 2014
 Operator's EOOS Input for Units 1, 2 and 3 on April 28, 2014
 Operator's Logs dated: April 27, 2014 to April 28, 2014
 Operator's Logs dated: May 6, 2014 to May 8, 2014
 PER 889720, PRA not evaluated for tagging shutdown cooling
 System Breakdown Schedule for System 074 RHR Loop II dated 5/14/14
 Tagout 0-PE-2014; Clearance Number 0-248-0002, Shutdown Boards 250V DC Battery SB-B
 Tagout 0-PE-2014; Clearance Number 0-82-000B, Diesel Generator B Engine
 TVA-TSP-18.721, Rigging, Rev. 9
 TVA-TSP-18.802 10, Requirement for the Safe Operations Cranes
 WO 115421699 High Risk Management Plan

Section 1R15: Operability Evaluations

Past Operability Evaluation for PER 847155
 PER 847155, Breakers Failed to Trip during Load Acceptance Test for DG 3A
 Standing Order OS-195
 WO 115525836, Breakers Failed to Trip during Load Acceptance Test for DG 3A
 WO 115525836 (Task 20), Modified LAT 3-SR-3.8.1.9(3A) for DG 3A, Revs. C, D
 0-TI-389 Raw Water Fouling and Corrosion Control, Rev 18
 3-SR-3.8.1.9(3A), Diesel Generator 3A Emergency Load Acceptance Test, Rev. 21
 ACE for PER 858274, Rev 1
 BFN NFPA-805 Project: Overload Analysis – Onsite Power System, dated 11/5/2012
 CDQ000020080054 Probable Maximum Flood Calculation for the Tennessee River Watershed,
 Rev 2

CDQ0303884856 Intake Pumping Station Design Basis Flood Calculation, Rev 4
 CDQ0408894846 Water Tight Equipment Access Lock and Personnel Doors for the Intake Pumping Station Calculation, Rev 3
 CHTP-108 Technical Chemistry Standards for SPP-9.7, Rev 6
 CI-137 Taw Water Chemical Treatment, Rev 22
 ECI-0-000-BKR011, Checkout, Test, and Installation of 480V AC Masterpact NW Circuit Breakers, Rev. 7
 Equipment Apparent Cause Evaluation (EACE) Report, Breaker BFN-3-BKR-231-0003A/1C Failed to Trip during 3A EDG Load Acceptance Test, Dated 3/31/2014
 FSAR Appendix O, Section O.1.16, Open-Cycle Cooling Water System Program, Amendment 25
 Heat Exchanger Inspection Results for the 3B EDG Heat Exchanger dated 4/2/2014
 Leak evaluation for PER 878297
 NEDP-27 Past Operability Evaluations, Rev 2
 NPG-SPP-06.3, Pre-/Post-Maintenance Testing, Rev. 1
 NPG-SPP-06.9, Testing Programs, Rev. 0
 NPG-SPP-06.9.3, Post-Modification Testing, Rev. 5
 NPG-SPP-09.14 Generic Letter 89-13 Implementation, Rev 3
 NPG-SPP-09.7 Corrosion Control Program, Rev 5
 PER 858274 BFN Raw Water Chemical Treatment has not been applied per procedural Requirements
 PER 867001 3B EDG HEX fouling criteria not met IAW NPG-SPP-09.14
 PER 878297 NRC Identified Leak under the D RHRSW Room Door
 PER 893276 RBCCW leak into the Unit 2 Drywell
 PER 884538, 2-SR-3.4.2.1 Jet Pump Mismatch and Operability Failed
 PER 885837, Evaluation for Acceptability of OI-68 Recirculation Pump RPM Splits in Reference to TS LCO 3.4.1
 2-SR-3.4.2.1, Jet Pump Mismatch and Operability, Rev. 37
 WO 114866666, 2-SR-3.4.2.1, Jet Pump Mismatch and Operability
 3-OI-68, Reactor Recirculation System, Rev. 87
 Technical Specifications and Bases, 3.4.1, Recirculation Loops Operating
 Dataware History for May 12, 2014 through May 14, 2014

Section 1R18: Plant Modifications

DCN 70835 Install Bypass Switches to Allow Manual Opening of RHR Injection Valves in LPCI
 FSAR Section 4.8, 6.1-6.6, 7.4, 14
 Mode in Case of Fire Damage to Control Circuits, Rev A
 WO 114173563 Implementation of stage 5 of DCN 70835
 WO 115121401, PMTI-70835-005 Testing of BFN-3-HS-074-0180, RHR Sys I Injection Valve Override Switch, Rev 0

Section 1R19: Post Maintenance Testing

0-OI-82, Standby Diesel Generator System, Rev. 149
 0-SR-3.8.1.1(B), Diesel Generator 'B' Monthly Operability Test, Rev. 58
 3-SR-3.5.1.6(RHR II-COMP), RHR Loop II Comprehensive Pump Test, Rev. 10
 3-SR-3.8.1.1(3BR), Diesel Generator 3B Operability Test (App R), rev 27
 DWG 3-45E670-25 ECCS Div I Analog Trip Units Schematic Diagrams Sh-1

DWG 3-45E670-26 ECCS Div I Analog Trip Units Schematic Diagrams Sh-2
 DWG 3-45E670-27 ECCS Div I Analog Trip Units Schematic Diagrams Sh-3
 DWG 3-45E670-28 ECCS Div I Analog Trip Units Schematic Diagrams Sh-4
 DWG 3-45E670-29 ECCS Div I Analog Trip Units Schematic Diagrams Sh-5
 DWG 3-45E670-30 ECCS Div I Analog Trip Units Schematic Diagrams Sh-6
 DWG 3-45E763-20 Wiring Diagram 4160V Unit Aux Power Schematic Drawing
 FSAR Chapter 14.5
 Scram Report for Unit 3 scram on 5/6/2014
 WO 114709767 4KV SHTDN BD 3EB COMP 12 Time Delay relays
 WO 115240141, 3-SR-3.5.1.6(RHR II-COMP), RHR Loop II Comprehensive Pump Test
 WO 115522470, Perform the Bi-Annual Inspection of DG B
 WO 115673277
 WO 115747250, 0-SR-3.8.1.1(B), Diesel Generator 'B' Monthly Operability Test
 WO 115751537, DG B Lube Oil Level <-2"
 WO 115771962 3-SR-3.3.5.1.2(ATU A) Core and Containment cooling system Analog Trip Unit
 Functional test

Section 1R22: Routine Surveillance

2-SR-2, Instrument Checks and Observations, Rev. 77
 2-SR-3.4.4.1, Manual Calculation of Unidentified, Identified, and Total Leakage, Rev. 11
 3-SR-3.1.7.1, Conditional for SLC Solution Level Check, Rev 8
 3-SR-3.5.1.6(CS II) Core Spray Flow Rate Loop II, Rev. 44
 PER 868326, Monitor of Flow Recorder is Blank and does not display information for Drywell
 Inleakage Calculation
 PER 877743, Core Spray Pump 3D Vibration in Alert Range
 TS 3.1.7 SLC
 TS Bases 3.1.7
 WO 114843923, 3-SR-3.5.1.6(CS II) Core Spray Flow Rate Loop II
 WO 115123324, 1-SR-3.5.1.6(RHR I) RHR Flow Rate Loop I
 WO 115185883, 3-SI-4.4.A.1 SLC Pump Functional Test
 WO 115683930, 2-SR-3.4.4.1
 WO 115683931, Repair Flow Recorder
 1-SR-3.5.1.6(RHR I), Quarterly RHR System Rated Flow Test Loop I, Rev. 25

Section 1EP2: Alert and Notification System Evaluation

Procedures and Reports

EPDP-8, Emergency Preparedness Quality Assurance, Rev. 3
 EPDP-10, Facilitation of the Alert and Notification System and Notification Tests, Rev. 6
 EPDP-14, Evaluation of Changes to Alert and Notification Systems (ANS), Rev. 0
 EPDP-16, Designated Emergency Response Equipment (DERE), Rev. 2
 EPDP-17, NPG Emergency Plan Effectiveness Review (10 CFR 50.54(q)), Rev. 4
 EPFS-9, Inspection, Service, and Maintenance of the Prompt Notification System (PNS) at
 Browns Ferry, Sequoyah, and Watts Bar Nuclear Plants, Rev. 8

Records and Data

Documentation of Quarterly siren maintenance for 1st – 4th quarter 2013 and 1st quarter 2014
 Documentation of bi-weekly siren tests and maintenance for 1st – 4th quarter 2013 and 1st quarter 2014
 Siren Annual Maintenance records: 2013 and 1st quarter 2014
 2014 Browns Ferry Emergency Planning Calendar mailer to members of the public in the 10-mile EPZ

Corrective Action Documents

PER 721566, EP records not classified and controlled as QA records
 PER 566341, Direct observation to confirm all sirens functionality
 PER 597895, Evaluation of historical meteorological data on ANS coverage
 PER 821153, Two sirens failed monthly tests
 PER 832917, Lawrence county sirens did not report to CECC

Section 1EP3: Emergency Preparedness Organization Staffing and Augmentation SystemProcedures

EPDP-3, Emergency Plan Exercises and Preparedness Drills, Rev. 11
 EPIP-6, Activation and Operation of the Technical Support Center (TSC), Rev. 34
 EPIP-7, Activation and Operation of the Operations Support Center (OSC), Rev. 30
 CECC EPIP-9, Emergency Environmental Radiological Monitoring Procedures, Rev. 51

Records and Data

Selected Qualification Records for Key Position ERO Personnel
 2012 and 2013 Quarterly drill reports
 2012 and 2013 Unannounced pager test results
 Weekly Duty List from 6/10/2014 07:00 to 6/17/14 07:00
 Various EP staff and ERO member training records

Corrective Action Documents

PER 599303, Fire Ops was not paged for the REP drill through the normal process
 PER 675342, Evaluate the emergency dosimetry in the security guard towers (BREs)
 PER 698276, NEI 12-01 On-Shift Staffing Analysis – Phase 1, ERO Personnel
 PER 718400, Some unannounced notification tests were determined not to be “outside normal working hours”
 PER 827691, Qualifications for ERO Positions
 PER 873497, The ERO continues to experience issues with late and missed TEENS test responses

Section 1EP4: Emergency Action Level and Emergency Plan ChangesProcedures

NP-REP, Radiological Emergency Plan (Generic Part), Revision 103
 NP-REP, Radiological Emergency Plan Appendix A, Browns Ferry Nuclear Plant, Revision 103
 EPIP-1, Emergency Classification Procedure, Revision 49

Change Packages

BFN-2013-003, Effectiveness Evaluation of Revision BFN EPIP-2, Notification of Unusual Event, Rev. 31

BFN-2013-003, Screening Evaluation for Revision of BFN EPIP-2, Notification of Unusual Event, dated 6/24/13

BFN-2013-007, Effectiveness Evaluation of Revision BFN EPIP-12, Emergency Equipment and Supplies, Rev. 11

BFN-2013-007, Screening Evaluation of Revision BFN EPIP-12, Emergency Equipment and Supplies, dated 7/24/13

BFN-2013-010, Screening Evaluation of Revision BFN EPIP-12, Emergency Equipment and Supplies, dated 11/13/13

Corrective Action Documents

PER 568729, Revise EPIP-7, Appendix B to indicate OSC minimum staffing

Section 1EP5: Maintenance of Emergency PreparednessProcedures

EPDP-1, Procedures, Maps, and Drawings, Rev. 9

EPDP-16, Designated Emergency Response Equipment (DERE), Rev. 2

EPDP-17, NPG Emergency Plan Effectiveness Review, Rev. 4

NPG-SPP-18.3, Emergency Preparedness, Rev. 1

NPG-SPP-22.307, PER Effectiveness Reviews, Rev. 1

REP, Radiological Emergency Plan, (Generic Part), Rev. 103

REP, Radiological Emergency Plan, (Appendix A - BFN), Rev. 100 and Rev. 103

SPP-3.1, Corrective Action Program, Rev. 4

Records and Data

Drill and exercise reports, 2012, 2013, and 2014

BFN Self-assessment BFN-EP-S-10-001, B5B Commitments

BFN Self-assessment BFN-EP-S-11-001, Effectiveness Reviews

BFN Self-assessment Program, NPG-SPP 3.1.11, Rev. 2

BFN Self-assessment BFN-EP-F-14-001, NRC inspection readiness review

10CFR50.54(q) Evaluation of TSC Renovation

10CFR50.54(q) Evaluation of TEENS augmentation hardware addition

NPG-SPP-22.304, PER Trending, Rev. 1

NP-REP, Appendix A, page A-122, Site Emergency Organization, Rev. 103

NP-REP, Appendix A, page A-1, TVA Nuclear Power Radiological Emergency Plan, Current Emergency Action Levels, Rev. 103

NPG-SPP-22.038, Corrective Action Program (CAP) Health Monitor, Rev. 2

NPG-SPP-22.304, Problem Evaluation Report (PER) Trending, Rev. 1

NPG-SPP-22.305, Apparent Cause Evaluation, Rev. 2

NPG-Self Assessment Program, Rev. 2

Corrective Action Documents

PER 569374, Simulator malfunction during exercise

PER 639090, Requires evaluation of operations minimum staffing reviews

PER 792140, Dose Assessors staffing fell to minimum levels

PER 783122 and 738664, Identified critique challenges

Section 1EP6: Drill Evaluation

2-EOI Appendix-11A, Alternate RPV Pressure Control Systems MSRVs, Rev. 5
 2-EOI Appendix-1D, Insert control Rods Using Reactor Manual Control System, Rev. 7
 2-EOI Appendix-1F, Manual Scram, Rev. 6
 Browns Ferry Training Drill Controllers Package Dated April 23, 2014, Rev. 0
 Browns Ferry Training Drill Controllers Package Dated June 11, 2014, Rev. 0
 Drill Report Browns Ferry Training Drill, Dated 4/24/2014
 PER 876876, During 4/23/14 Training Drill Issues were identified with Dose Assessment
 PER 878720, Dose Assessment procedure Omissions cause errors
 PER 879836, Simulator Crew did not notify the State Control Center of the Correct EAL
 REP Drill Log, Dated April 23, 2014
 Snap Shot Self-Assessment for BFN April Training Drill Number CRP-EP-S-14-005
 Snap Shot Self-Assessment for BFN June Training Drill Number CRP-EP-S-14-007
 SR 898417 June 11, 2014 REP Drill Emergency Center Staffing Improvement Opportunity
 SR 898421 June 11, 2014 REP Drill Classification Improvement Opportunity

Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment**Procedures and Manuals**

Offsite Dose Calculation Manual, Rev. 21
 CI-737, Preparation of the Eberline Continuous Air Monitor (CAM) Iodine and Particulate Filter Holder, Rev. 5
 CI-714, Particulate and Charcoal Filter Sampling and Analysis, Rev. 36
 0-SI-4.8.B.2-1, Airborne Effluent Analysis – Particulate and Charcoal Filter Analysis, Rev. 41
 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate, Rev. 56
 0-SI-4.8.B.3, Appendix I Dose Calculations – Airborne Effluents, Rev. 25
 NPG-SPP-22.300, Corrective Action Program, Rev. 1

Records and Data

Annual Radioactive Effluent Release Report, 2013
 Effluent Monitor Out-of-service List, June 2012 – May 2014
 WO 111637218, In-Place Test - Standby Gas Treatment Train A, 6/10/11
 WO 113150722, In-Place Test - Standby Gas Treatment Train A, 5/31/12
 WO 111863885, In-Place Test - Standby Gas Treatment Train B, 6/8/11
 WO 113816413, In-Place Test - Standby Gas Treatment Train B, 10/11/12
 WO 111486477, In-Place Test - Standby Gas Treatment Train C, 11/2/11
 WO 114313192, In-Place Test - Standby Gas Treatment Train C, 1/18/13
 CI-1101, Data Sheet 1101-20.14, 12/19/11
 EWR13CEB420004, Evaluate placement of drain tanks near radwaste building, 1/4/13
 Gaseous Radioactive Waste Release Permit no. 140473.046.027.G
 Gaseous Radioactive Waste Release Permit no. 140472.045.016.G
 Gaseous Radioactive Waste Release Permit no. 140462.030.026.G
 Gaseous Radioactive Waste Release Permit no. 140317.032.024.G
 Liquid Radioactive Waste Release Permit no. 140022.006.006.L
 Liquid Radioactive Waste Release Permit no. 140023.005.008.L
 Results of Radiochemistry Interlaboratory Cross-Check Program, 1st Quarter – 3rd Quarter, 2012

CAP Documents

BFN-RP-F-14-001, Public Radiation Protection Baseline Inspection, Rev. 1
 PER 900243
 PER 718101
 PER 732596
 SR 897191
 PER 763270
 PER 624360
 PER 619986

Section 2RS7: Radiological Environmental Monitoring Program (REMP)Procedures and Guidance Documents

Browns Ferry Technical Requirements Manual, Section TR 3.3.7, Meteorological Monitoring Instrumentation, Revision 33
 CHEM-002, Strategic Plan for Groundwater Protection, Revision 3
 CI-420, Collection of Radiological Environmental Monitoring Samples, Revision 4
 CI-421, Well Sampling and Maintenance, Revision 11
 ENVR-1, Preparation of Annual Radiological Environmental Operating Reports, Revision 11
 ENVR-5, Land Use Surveys, Revision 10
 EPFS-03, Servicing of Meteorological Equipment at Environmental Data Stations, Rev 15
 EPFS-06, Calibration of Environmental Data Station Data Logger and Sonic Channels, Rev 16
 EPFS-8, Servicing of Radiological Water Samplers, Revision 2
 EPFS-12, Repair and Preventive Maintenance Procedure for Radiological Environmental Monitoring Air Sampling System, Revision 1
 NPG-SPP-04.14, Guide for Communicating Inadvertent Radiological Spills/Leaks to Outside Agencies, Rev. 3
 NPG-SPP-05.15, Fleet Ground Water Protection Program, Revision 4
 NPG-SPP-22.300, Corrective Action Program, Rev. 0
 0-ODCM-001, TVA Browns Ferry Nuclear Plant Offsite Dose Calculation Manual, Rev. 21
 0-SI-4.2.I-1, Meteorological Monitoring Instrumentation Channel Calibration, Revision 28

Records and Data Reviewed

Annual Radiological Environmental Operating Report 2012 & 2013
 Annual Radiological Effluent Release Report 2012 & 2013
 Browns Ferry Nuclear Plant 10 CFR 50.75(g) Summary, 6/18/2014
 Browns Ferry Nuclear Plant Risk Analysis of Systems, Structure and Components and Work Practices That Involve a Credible Mechanism for Licensed Material to Impact Groundwater, March 23, 2011
 Browns Ferry Nuclear Plant Conceptual Site Model, Revision 0, March 2013
 Environmental Radiological Monitoring Field Collection Sheets for Browns Ferry Week 25 Environmental Run, June 16, 2014
 EPFS-6, Calibration of Environmental Data Station Data Logger and Sonic Channels, Data Sheet 1, 2, and 3, 9/18/2013 and 3/9/2014
 Excel Spreadsheet, Groundwater-Tritium – DSN & Sewage, 5/5/2011 to 1/31/2014
 Excel Spreadsheet, BFNP Tritium, 1/16/2001 to 4/23/2014
 Excel Spreadsheet, Groundwater-Tritium, 11/30/2011 to 4/30/2014
 Excel Spreadsheet, Groundwater-Water Depth, 7/23/2012 to 4/30/2014
 File, List of Non-Radioactive Systems that have become Contaminated since June 18, 2012

Files, Summary of Abnormal/Unplanned Releases in 2012 and 2013
 Letter to Mr. Stuart A. Richards, Groundwater Protection - Data Collection Questionnaire for Browns Ferry, Sequoyah, and Watts Bar Nuclear Plants [ML062280598], 8/4/2006
 Radiological Environmental Monitoring Air Sampler Gas Meter Calibration Data Sheets for Gas Meter Serial #s 1030568, 1030570, 1030571, 1030580, and 1030581, 9/10/2012 and 9/11/2013
 Report of Analysis L58014, Sample ID 20140109_11, [2014 DAW], 3/28/2014
 2013 BFN Land Use Census Datasheets, May 2013
 2012 Annual Summary of QC Results, 5/28/2014
 2013 Annual Summary of QC Results, 5/28/2014

CAP Documents

Assessment BFN-CEM-S-13-002, BFN Groundwater Program Health, 4/15/2013
 Assessment BFN-CEM-S-13-007, BFN REMP Sampling/Instrumentation, 9/16/2013
 Assessment BFN-CEM-S-14-001, Public Radiation Protection Baseline Inspection, 5/28/2014
 Benchmarking Report BFN-CEM-I-12-BM02, Chemistry Department Benchmark Of Brunswick Nuclear Plant (BNP), 7/24/2012
 Benchmarking Report BFN-CEM-F-13-BM02, Groundwater Tritium- Review of Indian Point Nuclear Plant's implementation of NEI 07-07 and Departmental Interface Strategy, 8/26/2013
 PER615882
 PER696773
 PER707641
 PER707649
 PER707675
 PER711273
 PER711275
 PER711276
 PER790043
 PER830901
 PER836593
 PER851977
 PER851998
 PER869822
 PER882245
 PER885869
 PER896689
 PER897997

Section 40A1: Performance Indicator (PI) Verification

Consolidated Data Entry, ROP Parent Process Data Review for Safety System Functional Failures for Units 1, 2 and 3
 MSPI Input data for HPCI from April 2013 until March 2014
 MSPI Input data for RCIC from April 2013 until March 2014
 NEI 99, Regulatory Assessment Performance Indicator Guideline ,Rev. 6
 NPG-SPP-02.2, Performance Indicator Program, Rev. 6
 PER 707721 Unit 2 RCIC 1" Exhaust line blocked
 PER 718287 Indication on 6" carbon steel pipe for Unit 2 RCIC
 POE for PER 707721
 System Health Reports for Unit 1, 2, and 3 HPCI dated May 2, 2014

TS 3.5.1 ECCS Operating
 TS 3.5.3 RCIC
 UFSAR Chapter 6 ECCS, Amendment 25
 Unit 1 MSPI Basis Document, Rev 14
 Unit 2 MSPI Basis Document, Rev 13
 Unit 3 MSPI Basis Document, Rev 12
 WO 114580050 for PER 707721
 WO 114633022 for PER 718287

Section 40A1: Performance Indicator Verification

Procedures

EPDP-11, Emergency Preparedness Performance Indicators, Rev. 6
 EPIP-2, Notification of Unusual Event, Rev. 32
 EPIP-3, Alert, Rev. 35
 EPIP-4, Site Area Emergency, Rev. 34

Records and Data

Documentation of DEP opportunities for 2nd quarter 2013 – 1st quarter 2014
 Documentation of ANS tests for 2nd quarter 2013 – 1st quarter 2014
 Documentation of drill and exercise participation for 2nd quarter 2013 – 1st quarter 2014
 Various ERO Personnel Qualification and Participation records

Corrective Action Documents

PER 749576, SQN analysis of staffing requirements

Section 40A2: Identification and Resolution of Problems

ASME Section XI Appendix E Evaluation of Unanticipated Operating Events, Rev 2013
 Operator Work Around 2-068-OWA-2013-0157 Adjustment to Unit 2 P/T curves for operation
 PDO for PER 816957
 PER 816957 Evaluation of the Unit 2 Pressure/Temperature (P/T) curve shift
 BFN Operation's Shift Orders dated December 2013
 Report No. 1301489.4.2.R0 Discussion to Support BFN2 Operability Evaluation dated
 December 17, 2013
 Unit 2 TS 3.4.9 RCS Pressure and Temperature Limits, Amendment 253
 Unit 2 TS 3.4.9 Basis, Amendment 253

Section 40A3: Event Follow-up

Browns Ferry ENS #49928
 LER 296-2014-001-01
 LER 259-2013-006-01
 LER 259-2013-006-02
 PER RCA 860625, revision 0
 SR 306058 – WO 1111816827, High level dump controller 3-LIC-006-0072B failed
 SR 860677, Unit 3 Scram due to Turbine Trip

Section 40A5: Other Activities

NPG-SPP-09.9, 10 CFR 72.48 Evaluations of Changes, Tests and Experiments for Independent Spent Fuel Storage Installation, Rev. 2

10 CFR 72.212, Report of Evaluations, Rev. 5.1 dated 9/4/2012

10 CFR 72.48 Screening Review, DCN 70980, Rev. A, Transition from Holtec HI-STORM 100 to the Holtec HI- STORM FW dry cask storage system

10 CFR 72.48 Screening Review, 0-GOI-100-3B, Rev. 55 TN 56, Refueling Bridge Handwheels

10 CFR 72.48 Screening Review, 0-GOI-100-3B, Rev. 53 TN 54, Refuel Platform Manual Operation

10 CFR 72.48 Screening Review, 0-SR-DCS3.1.2.1 R0014 TN0015, Addition of new casks

10 CFR 72.48 Screening Review, 0-SR-DCS3.1.2.1 R0013 TN0014, Addition of new casks

10 CFR 72.48 Screening Review, 0-SR-DCS3.1.2.1 R0012 TN0013, Addition of new casks

10 CFR 72.48 Screening Review, 0-SR-DCS3.1.2.1 R0010 TN0011, Addition of new casks

10 CFR 72.48 Screening Review, 0-SR-DCS3.1.2.1 R0009 TN0010, Addition of new casks and other minor changes

10 CFR 72.48 Screening Review, MSI-0-079-DCS200.2 R28 TN029, MPC Loading and transport

10 CFR 72.48 Screening Review, MSI-0-079-DCS200.2 R27 TN027, MPC Loading and transport

10 CFR 72.48 Screening Review, MSI-0-079-DCS200.2 R26 TN027, MPC Loading and transport

10 CFR 72.48 Screening Review, MSI-0-079-DCS300.10 Rev.3, Forced Helium dehydration system operation

10 CFR 72.48 Screening Review, MPI-0-111-CRA001 Rev. 39, Reactor Building Crane

10 CFR 72.48 Screening Review, WO 115216161, 114008851, Installation of modular buildings

10 CFR 72.48 Screening Review, WO 113165560, FHD Condenser fan motor replacement

LIST OF ACRONYMS

ADAMS	-	Agencywide Document Access and Management System
ADS	-	Automatic Depressurization System
ARM	-	area radiation monitor
CAD	-	containment air dilution
CAP	-	corrective action program
CCW	-	condenser circulating water
CFR	-	Code of Federal Regulations
CoC	-	certificate of compliance
CRD	-	control rod drive
CS	-	core spray
DCN	-	design change notice
EECW	-	emergency equipment cooling water
EDG	-	emergency diesel generator
FE	-	functional evaluation
FPR	-	Fire Protection Report
FSAR	-	Final Safety Analysis Report
HPCI	-	high pressure coolant injection
IMC	-	Inspection Manual Chapter
LER	-	licensee event report
NCV	-	non-cited violation
NRC	-	U.S. Nuclear Regulatory Commission
ODCM	-	Off-Site Dose Calculation Manual
PER	-	problem evaluation report
PCIV	-	primary containment isolation valve
PI	-	performance indicator
RCE	-	Root Cause Evaluation
RCIC	-	reactor core isolation cooling
RCW	-	Raw Cooling Water
REMP	-	Radiological Environmental Monitoring Program
RG	-	Regulatory Guide
RHR	-	residual heat removal
RHRSW	-	residual heat removal service water
RTP	-	rated thermal power
RPS	-	reactor protection system
RWP	-	radiation work permit
SDP	-	significance determination process
SBGT	-	standby gas treatment
SLC	-	standby liquid control
SNM	-	special nuclear material
SRV	-	safety relief valve
SSC	-	structure, system, or component
TI	-	Temporary Instruction
TIP	-	transverse in-core probe
TRM	-	Technical Requirements Manual
TS	-	Technical Specification(s)
UFSAR	-	Updated Final Safety Analysis Report
URI	-	unresolved item
WO	-	work order