



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

April 30, 2014

EA-14-005

Mr. J.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, FINAL SIGNIFICANCE DETERMINATION OF WHITE FINDING AND NOTICE OF VIOLATION, 05000259/2014002, 05000260/2014002, AND 05000296/2014002

Dear Mr. Shea:

On March 31, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Browns Ferry Nuclear Plant, Units 1, 2, and 3. On April 4, 2014, the NRC inspectors discussed the results of this inspection with Mr. Polson and other members of the TVA staff. Inspectors documented the results of this inspection in the enclosed inspection report.

This letter provides you the final significance determination of the preliminary White finding discussed in NRC Integrated Inspection Report 05000259/2013005, 05000260/2013005, and 05000296/2013005, Preliminary White Finding and Apparent Violation dated February 14, 2014 (ADAMS Accession Number ML14045A320). The finding involved the failure to maintain plant emergency response staffing levels in accordance with NP-REP, Tennessee Valley Authority Nuclear Power Radiological Emergency Plan.

In a letter dated March 17, 2014, you provided a response to the NRC staff's preliminary determination regarding the finding. Your response indicated the Tennessee Valley Authority (TVA) did not contest the violation or the preliminary determination of significance.

After considering the information developed during the inspection and the additional information you provided in your letter dated March 17, 2014, the NRC has concluded that the finding is appropriately characterized as White, or as having low-to-moderate safety significance.

You have 30 calendar days from the date of this letter to appeal the staff's determination of significance for the identified White finding. Such appeals will be considered to have merit only if they meet the criteria given in the NRC Inspection Manual Chapter (IMC) 0609, Attachment 2. An appeal must be sent in writing to the Regional Administrator, Region II, 245 Peachtree Center Ave, NE, Suite 1200, Atlanta, GA 30303.

The NRC has also determined that the failure to maintain plant emergency response staffing levels in accordance with NP-REP, Tennessee Valley Authority Nuclear Power Radiological Emergency Plan was a violation of 10 CFR 50.54(q), Emergency Plans, as cited in the attached Notice of Violation (Notice). The circumstances surrounding the violation were described in detail in NRC Inspection Report Nos. 05000259/2013005, 05000260/2013005, and 05000296/2013005 (ADAMS Accession Number ML14045A320). In accordance with the NRC Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with a White finding.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

On February 19, 2014, the NRC assessed the performance of Browns Ferry Nuclear Plant Units 1, 2 and 3, as detailed in the Annual Assessment Letter For Browns Ferry Nuclear Plant Units 1, 2 AND 3 (NRC Inspection Reports 05000259/2013001, 05000260/2013001 and 05000296/2013001) (ADAMS Accession Number ML. ML14063A109). The NRC has considered the impact of this finding on the Action Matrix for all three units and determined that no change in Action Matrix applicability is warranted at this time.

The NRC will conduct a supplemental inspection (Inspection Procedure 95001) when you have notified us of your readiness for the NRC to review the actions taken to address this issue. This inspection procedure is conducted to provide assurance that the root and contributing causes for the performance issues are understood, to provide assurance that the extent of condition and extent of cause of the performance issues are understood, and to provide assurance that the corrective actions are sufficient to address the root and contributing causes and prevent recurrence.

NRC inspectors also documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements. Further, inspectors documented three licensee-identified violations which were determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited Violations (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest any of these violations or significance of these NCVs, 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 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.

Additionally, as we informed you in the most recent NRC integrated inspection report, cross-cutting aspects identified in the last six months of 2013 using the previous terminology were being converted in accordance with the cross-reference in Inspection Manual Chapter 0310. Section 4OA5 of the enclosed report documents the conversion of these cross-cutting aspects which will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the 2014 mid-cycle assessment review. If you disagree with the cross cutting aspect assigned, 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 Plant.

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). To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Sincerely,

/Williams Jones RA for/

Richard P. Croteau, Director
Division of Reactor Projects

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

Enclosure:

1. Notice of Violation
2. NRC Integrated Inspection Report 05000259/2014002,
05000260/2014002 and 05000296/2014002

cc distribution via ListServ

Additionally, as we informed you in the most recent NRC integrated inspection report, cross-cutting aspects identified in the last six months of 2013 using the previous terminology were being converted in accordance with the cross-reference in Inspection Manual Chapter 0310. Section 4OA5 of the enclosed report documents the conversion of these cross-cutting aspects which will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the 2014 mid-cycle assessment review. If you disagree with the cross cutting aspect assigned, 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 Plant.

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OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRS	RII:DRS	RII:DRS	RII:DRP
SIGNATURE	Via email	Via email	Via email	Via email	Via email	Via email	CRK /RA/
NAME	DDumbacher	LPressley	TStephen	MCoursey	RHamilton	WPursley	CKontz
DATE	04/21/2014	04/21/2014	04/21/2014	04/21/2014	04/21/2014	04/22/2014	04/22/2014
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	RII:EICS	RII:DRP					
SIGNATURE	CFE /RA/	WBJ /RA for/					
NAME	CEvans	RCroteau					
DATE	04/30/2014	04/30/2014			5/ /2014	5/ /2014	5/ /2014
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

J. Shea

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Letter to Joseph W. Shea from Richard P. Croteau dated April 30, 2014

SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION
REPORT, FINAL SIGNIFICANCE DETERMINATION OF WHITE FINDING AND
NOTICE OF VIOLATION, 05000259/2014002, 05000260/2014002, AND
05000296/2014002

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NOTICE OF VIOLATION

Tennessee Valley Authority
Browns Ferry Nuclear Plant
Unit 1, 2, and 3

Docket Nos. 50-259, 260, 296
License Nos. DPR-33, 52, 68
EA-14-005

During an NRC inspection completed on December 31, 2013, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 50.54(q) requires, in part, that a holder of a license under Part 50 shall follow and maintain the effectiveness of the emergency plan that meets the planning standards of 10 CFR 50.47. 10 CFR 50.47(b)(2) states, in part, that adequate staffing to provide initial facility accident response in key functional areas is maintained at all times. NP-REP, Tennessee Valley Authority Nuclear Power Radiological Emergency Plan, Appendix A, Figure A-1, Site Emergency Organization, Browns Ferry Nuclear Plant, defined the emergency plan staffing requirements for key functional areas including the staffing of a Shift Technical Advisor and Incident Commander.

Contrary to the above, from May 21, 2007, through October 30, 2013, the licensee failed to follow and maintain the effectiveness of an emergency plan that met the planning standards of 10 CFR 50.47 when the licensee did not ensure adequate staffing to provide initial facility accident response in key functional areas was maintained at all times. Specifically, the licensee's process for maintaining minimum emergency response shift staffing failed to ensure continuous staffing of emergency response roles as defined in NP-REP, Tennessee Valley Authority Nuclear Power Radiological Emergency Plan as evidenced by the following examples:

1. Failure to continuously staff the STA position beginning May 21, 2007
2. Failure to continuously staff the Incident Commander position beginning December 21, 2012

This violation is associated with a White significance determination process finding for Units 1, 2, and 3 in the Emergency Response cornerstone.

Pursuant to the provisions of 10 CFR 2.201, Tennessee Valley Authority is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; EA-14-005" and should include for each violation: 1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; 2) the corrective steps that have been taken and the results achieved; 3) the corrective steps that will be taken; and 4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an Order or a Demand for Information may be

Enclosure 1

issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 30th day of April 2014

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.: 05000259/2014002, 05000260/2014002, 05000296/2014002

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: January 1, 2014, through March 31, 2014

Inspectors: D. Dumbacher, Senior Resident Inspector
L. Pressley, Resident Inspector
T. Stephen, Resident Inspector
M. Coursey, Reactor Inspector
R. Hamilton, Senior Health Physicist
W. Pursley, Health Physicist
C. Kontz, Senior Project Engineer

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

SUMMARY

IR 05000259/2014002, 05000260/2014002, 05000296/2014002; 01/01/2014 – 03/31/2014; Browns Ferry Nuclear Plant, Units 1, 2 and 3; Operability Determinations and Functionality Assessment and Problem Identification and Resolution of Problems

The report covered a three month period of inspection by the resident inspectors and three regional inspectors. 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". All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated July 2013. 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 non-cited violation (NCV) of the T.S. 5.4.1.d, Fire Protection Program Implementation, was identified for the licensee's failure to control transient combustible materials in designated high risk areas in Unit 1 and Unit 3. The licensee's corrective action was to remove the combustible materials. The licensee entered this issue into their corrective action program as PER 845630 and 846184.

The performance deficiency was determined to be more than minor, because it was associated with the Protection Against External Factors attribute (Fires) of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, leaving unanalyzed transient combustibles in proximity to safety related equipment could affect the equipment's ability to perform its safety function during a credible fire scenario. The finding was characterized according to IMC 0609, Significance Determination Process (SDP), Appendix F, Attachment 1, Fire Protection SDP Phase 1 Worksheet dated September 24, 2013. This issue screened as low safety significance (Green), per Attachment 1 question 1.3 because it did not affect the ability of the reactor to reach and maintain safe shutdown. The cause of this finding was directly related to the Human Performance cross cutting aspect of Change Management. Plant leaders did not use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, the impact of the new procedures for transient combustible controls did not apply change management controls such as site wide communication and training to make workers aware of the new requirements. [H.3] (Section 4OA2)

Cornerstone: Barrier Integrity

- Green. An NRC identified non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XI, "Test Control," was identified for the licensee's failure to establish adequate written procedures for the test program to determine MSIV as-found leakage that met the requirements of 10 CFR 50, Criterion XI, Test Control. Specifically, Browns Ferry test procedure 3-SR-3.6.1.3.10 did not specify what suitable testing conditions were required to be established prior to testing. Additionally, the practice of allowing multiple valve strokes prior to testing was contrary to the procedure prerequisite of no allowed preliminary adjustments and constituted unacceptable preconditioning of the tested valves. The licensee's corrective action was to perform "as-left" leakage measurements under different conditions and enter the issue into the corrective action program as PER 847688.

The finding was more than minor because it adversely affected the Barrier Integrity cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the failure to determine as-found leakage reduced the ability of the licensee to provide reasonable assurance that the MSIVs would be able to perform their isolation function. The inspectors evaluated the finding using IMC 0609, Appendix A, the Significance Determination Process (SDP) for at-power findings, Exhibit 3 – Barrier Integrity Screening Questions, dated June 19, 2012, and determined the finding was of very low safety significance (Green) because it did not represent an actual open pathway in the physical integrity of reactor containment and did not involve an actual reduction in the function of the hydrogen igniters in the reactor containment. This finding has a cross-cutting aspect in the area of Human Performance, Documentation, because Browns Ferry's MSIV testing procedures were not complete in that they did not specify all required initial conditions and allowed preconditioning the valves. [H.7] (Section 1R15)

Licensee Identified Violations

- Three violations of very low safety significance that were identified by the licensee have been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at 100 percent of rated thermal power (RTP) except for 2 planned downpowers; one on March 21, 2014, for a rod sequence exchange and testing, the second on March 30, 2014, for a rod sequence exchange. On March 25, 2014, an unplanned power reduction to 75 percent occurred as a result of lowering main condenser vacuum due to a steam leak on a common miscellaneous feedwater heater drain line. The steam leak was repaired and the unit returned to 100 percent power on March 28, 2014. Power remained at 100 percent for the remainder of the quarter.

Unit 2 operated at 100 percent except for 2 planned downpowers; January 10, 2014, for rod sequence exchange and March 8, 2014, for rod sequence exchange and scram time testing. On January 4, 2014, an unplanned power reduction to 49 percent occurred as a result of a recirculation pump controller failure. The controller was replaced and two loop operations resumed later that day. On March 20, 2014, an unplanned downpower to 80 percent occurred due to the isolation of the "A" feedwater string due to a failure of a heater level control bus module. The bus module was replaced and the unit returned to 100 percent power later that day. Power remained at 100 percent for the remainder of the quarter.

Unit 3 operated at 100 percent except for a planned downpower on January 18, 2014, for final feedwater temperature reduction prior to the refueling outage. The unit performed a planned shutdown and entered its refueling outage on February 14, 2014. The unit completed the refueling outage and commenced a reactor startup on March 17, 2014. During the return to 100 percent power, the unit experienced a failure of the 3B2 Moisture separator level control valve which resulted in a turbine trip and unit scram. The level control valve was replaced and the unit was restarted on March 18, 2014, and returned to 100 percent power operation on March 27, 2014. Power remained at 100 percent for the remainder of the quarter.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

.1 External Flood Protection

a. Inspection Scope

The inspectors reviewed plant design features and licensee procedures intended to protect the plant and its safety-related equipment from external flooding events. The inspectors reviewed flood analysis documents including: Updated Final Safety Analysis Report (UFSAR) Section 2.4, Hydrology, Water Quality, and Marine Biology, Section 12.2 Principal Structures and Foundations and Appendix 2.4A, Probable Maximum Flood. The inspectors performed walkdowns of risk-significant areas which contained susceptible systems and equipment. The inspectors reviewed newly established programs and processes associated with the external flood protection program; specifically, the implementation of corporate procedure NPG-SPP-09.22, External Flood Protection Program, via local procedures, 0-TI-599, and 0-TI-600. This activity constituted one External Flood Protection sample.

b. Findings

No findings were identified.

.2 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

During the onset of cold weather conditions, the inspectors reviewed the licensee's implementation of 0-GOI-200-1, Freeze Protection Inspection, including applicable checklists: Attachment 1, Freeze Protection Annual Checklist; Attachment 2, Freeze Protection Operational Checklist; and as applicable, Attachments 3 through 12, Freeze Protection Daily Log Sheets for individual watch stations. The inspectors also reviewed the list of open FZ-coded Work Orders and Problem Evaluation Reports (PERs) to verify that the licensee was identifying and correcting potential problems relating to cold weather operations. In addition, the inspectors reviewed procedure requirements and walked down selected areas of the plant, which included the Residual Heat Removal Service Water (RHRSW) and Emergency Equipment Cooling Water (EECW) pump rooms, the Security Emergency Diesel Generator (EDG) and all EDG buildings, to verify that affected systems and components were properly configured and protected as specified by the procedure. The inspectors discussed cold weather conditions with Operations personnel to assess plant equipment conditions and personnel sensitivity to upcoming cold weather conditions. This constituted one Readiness for Seasonal Extreme Weather sample.

b. Findings

No findings were identified.

.3 Actual Weather Event

a. Inspection Scope

On February 20, 2014, a tornado warning was declared for northeastern Limestone County in an area approximately ten miles northeast of the power plant. 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 affecting the plant. Inspectors observed applicable contingency actions associated with Unit 3 in a refueling outage and elevation of the shutdown risk level to an Orange status. The inspectors also 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 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 Actual Weather Event 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, UFSAR, system operating procedures, and Technical Specifications 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 five Equipment Alignment Partial Walkdown inspection samples.

- Unit 1 Loop II Residual Heat Removal (RHR) system
- Standby Gas Treatment (SBGT) trains A and C while train B was inoperable following a failed post maintenance test
- Unit 3 Secondary Containment during operations with the Potential to drain the reactor vessel (OPDRV)

- Unit 3 Auxiliary Decay Heat Removal (ADHR) with both Divisions of RHR out of service during refueling outage
- Unit 3 Loop I RHR system (electrical) during U3R16 Outage with Loop II out-of-service

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors completed a detailed alignment verification of the common Unit 1 and 2 'A' EDG, using the applicable diagrams, 0-47E861-2A, 0-47E861-5, and 0-47E840-3, along with the relevant operating instructions, 0-OI-18 and 0-OI-82, to verify equipment availability and operability. The inspectors reviewed relevant portions of the UFSAR and Technical Specifications. This detailed walkdown also verified electrical power alignment, the condition of applicable system instrumentation and controls, component labeling, pipe hangers and support installation, and associated support systems status. The inspectors examined applicable System Health Reports, open Work Orders (WOs), and any previous PERs that could affect system alignment and operability. The inspectors also reviewed the licensee's chemistry control programs for diesel fuel for all the safety related diesel generators. This activity constituted one Equipment Alignment Complete Walkdown inspection sample.

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.

- Unit 1 480V Shutdown Board Room 1A, (Fire Area 6)
- Unit 1 480V Shutdown Board Room 1B, (Fire Area 7)
- Unit 3 Reactor Building 519' elevation, (Fire Area 3-2)
- Unit 2 Reactor Building 639' elevation, (Fire Area 2-6)
- Unit 3 Reactor Building 621' and 639' elevation, (Fire Zone 3-4)
- Unit 3 Reactor Building 480V Reactor Motor Operated Valve (RMOV) Board Room 3B, (Fire Area 12)

b. Findings

No findings were identified.

1R06 Flood Protection Measures

.1 Internal Flood Protection

Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could disable risk-significant equipment. The inspectors performed walkdowns of the following underground areas containing safety-related and/or risk-significant cables: Hand holes 15 and 26 located on the East side of the reactor building. These walkdowns were conducted to verify that safety related and/or risk-significant cables were not submerged in water, or water damaged; all cables and/or splices appeared intact; and the proper condition of associated cable tray support structures. As applicable, the inspectors verified proper operation of installed dewatering device (i.e., sump pumps) and level switches to ensure that affected cables would not be submerged. Where dewatering devices were not installed, the inspectors ensured that drainage was provided and was functioning properly.

The inspectors reviewed past preventative maintenance activities performed by the licensee to inspect plant manholes, valve pits, and cable tunnels; and check operability of applicable sump pumps. The inspectors reviewed the potential effects of a design basis flood on the hand hole 15 and hand hole 26 cables. This activity constituted one Underground Manhole Internal flooding inspection sample.

b. Findings

Two Unresolved Items (URI) were identified to determine if the performance deficiencies are More-than-Minor.

- i. RHRSW pump power cables submerged in water in hand hole 26 contrary to TVA General Specification G-40.

Introduction: The inspectors identified a URI for the licensee's failure to adhere to 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. Hand hole number 26 had standing water above several of the RHR service water (safety related) power cables.

Description: Browns Ferry has 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 number 26. A hand hole is an underground cable vault that is accessible from above ground by removing an access cover. Browns Ferry inspected the hand hole for standing water at least once per year as a license renewal commitment due to a history of power cable failures due to wetting. The most recent failure of these power cables occurred in 2007 which prompted the licensee to replace the power cables with a water impervious design built to the draft IEEE 1142-2009 standards.

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 as a result of low areas, surfaces designed to drain to other sumps, or surfaces designed for minimal water levels (i.e., hand holes) is acceptable as long as the water level in the hand holes containing safety related cables is below all cables and electrical devices." During a licensee inspection of hand hole number 26 on January 17, 2014, the licensee discovered that standing water covered several of the RHR service water power (safety related) cables. As of April 1, 2014, the standing water had not been removed. The licensee planned to remove the standing water under work order (WO) 115447734 as documented in PER 834650 and 836589. 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 opened to allow for an NRC verification of the power cable's rating for continuous submergence to determine if this performance deficiency is more than minor.

- ii. Inadequate Corrective Action for sump pump in hand hole 15 allowing RHRSW pump power cables to be submerged in water without the pump operating.

Introduction: The inspectors identified a self-revealing URI for the licensee's inadequate corrective action for PER 119954 action number 119954-001. The action was to modify the suction depth for a sump pump and add a warning light in hand hole number 15 to prevent standing water from covering RHR service water power cables. The modified sump pump and warning light did not prevent several power cables in hand hole number 15 from becoming wetted.

Description: Browns Ferry has 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 number 15. A hand hole is an underground cable vault that is accessible from above

ground by removing an access cover. Browns Ferry inspected the hand hole for standing water at least once per year as a license renewal commitment due to a history of power cable failures due to wetting.

The RHR service water power cables that are routed through hand hole number 15 were discovered to be covered in water in 2001. As part of their corrective actions, the licensee installed a sump pump to remove standing water prior to the power cables becoming wetted.

In 2007, the power cables in hand hole 15 failed, in part due to being wetted, and 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 becoming wetted. As part of their corrective actions under PER 119954, the licensee installed a new sump pump and lowered the pump suction depth to prevent power cable wetting and installed a warning light on the hand hole to provide a visual alert to rising water levels prior to power cables becoming wetted. The licensee also replaced the power cables with a water impervious design built to the draft IEEE 1142-2009 standards.

During a licensee inspection of hand hole number 15 on January 17, 2014, the licensee discovered that standing water covered several of the RHR service water power (safety related) cables. The new sump pump and sensor depth for the warning light were insufficient to prevent the safety related cables in hand hole 15 from becoming wetted revealing that the corrective actions from PER 119954 were ineffective. As of April 1, 2014, the standing water had not been removed. The licensee planned to remove the standing water under WO 115447734 as documented in PER 834650 and 836589. 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 opened to allow for a NRC verification of the power cable's rating for continuous submergence to determine if this performance deficiency is more than minor.

1R07 Heat Sink Performance (71111.07T)

Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed procedures, corrective action documents, drawings, performance test results, and cooler inspection results associated with the 3D1 and 3D2 EDG heat exchangers (HXs), the 3C RHR HX, the 1C RHR pump seal HX, and the Unit 1/2 Emergency Condensing Unit. All of these heat exchangers are directly cooled by service water systems. These heat exchangers/coolers were chosen based on their risk significance in the licensee's probabilistic safety analysis, their important safety-related mitigating system support functions, and their relatively low margin.

For the 3D1 and 3D2 EDG HXs, 3C RHR heat exchanger, 1C RHR pump seal HX, and the Unit 1/2 Emergency Condensing Unit, the inspectors determined whether testing, inspection, maintenance, and monitoring of biotic fouling and macrofouling programs were adequate to ensure proper heat transfer. This was accomplished by determining whether the test method used was consistent with accepted industry practices, or equivalent; the test conditions were consistent with the selected methodology; the test acceptance criteria were consistent with the design basis values; and reviewing results of heat exchanger performance testing. The inspectors also determined whether the test results appropriately considered differences between testing conditions and design conditions, the frequency of testing based on trending of test results was sufficient to detect degradation prior to loss of heat removal capabilities below design basis values, and test results considered test instrument inaccuracies and differences.

For the 3D1 and 3D2 EDG HXs, 3C RHR HX, 1C RHR pump seal HX, and the Unit 1/2 Emergency Condensing Unit, the inspectors reviewed the methods and results of heat exchanger performance inspections. The inspectors determined whether the methods used to inspect and clean heat exchangers were consistent with as-found conditions identified and expected degradation trends and industry standards, the licensee's inspection and cleaning activities had established acceptance criteria consistent with industry standards, and the as-found results were recorded, evaluated, and appropriately dispositioned so that the as-left condition was acceptable.

In addition, the inspectors determined whether the condition and operation of the 3D1 and 3D2 EDG HXs, 3C RHR HX, 1C RHR pump seal HX, and the Unit 1/2 Emergency Condensing Unit were consistent with design assumptions in heat transfer calculations, and as described in the Final Safety Analysis Report. This included determining whether the number of plugged tubes was within pre-established limits based on capacity and heat transfer assumptions. The inspectors determined whether the licensee evaluated the potential for water hammer and established adequate controls and operational limits to prevent heat exchanger degradation due to excessive flow-induced vibration during operation. In addition, eddy current test reports and visual inspection records were reviewed to determine the structural integrity of the heat exchanger.

The inspectors determined whether the performance of ultimate heat sinks (UHS), and their subcomponents such as piping, intake screens, pumps, valves, etc., was appropriately evaluated by tests or other equivalent methods, to ensure availability and accessibility to the in-plant cooling water systems.

The inspectors determined whether the licensee's inspection of the UHS was thorough and of sufficient depth to identify degradation of the shoreline protection or loss of structural integrity. This included determination whether vegetation present along the slopes was trimmed, maintained, and was not adversely impacting the embankment. In addition, the inspectors determined whether the licensee ensured sufficient reservoir capacity by trending and removing debris, or sediment buildup, in the UHS.

The inspectors reviewed the licensee's operation of the service water system and UHS. This included a review of licensee's procedures for a loss of the service water system or UHS and the verification that instrumentation, which is relied upon for decision making, was available and functional. In addition, the inspectors determined whether macrofouling was adequately monitored, trended, and controlled by the licensee to prevent clogging. The inspectors determined whether the licensee's biocide treatments for biotic control were adequately conducted and whether the results were adequately monitored, trended, and evaluated. The inspectors also reviewed strong pump-weak pump interaction and design changes to the service water system and the UHS.

The inspectors performed a system walkdown of the service water intake structure to determine whether the licensee's assessment of structural integrity and component functionality was adequate and that the licensee ensured proper functioning of traveling screens and strainers, and structural integrity of component mounts. In addition, the inspectors determined whether service water pump bay silt accumulation was monitored, trended, and maintained at an acceptable level by the licensee, and that water level instruments were functional and routinely monitored. The inspectors also determined whether the licensee's ability to ensure functionality during adverse weather conditions was adequate.

In addition, the inspectors reviewed condition reports related to the heat exchangers/coolers and heat sink performance issues to determine whether the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions. The documents that were reviewed are included in the Attachment to this report. This activity constituted six Triennial Review of Heat Sink Performance inspection samples.

b. Findings

No findings were identified.

1R08 Inservice Inspection (ISI) Activities (71111.08G, Unit 3)

a. Inspection Scope

Non-Destructive Examination (NDE) Activities and Welding Activities: From February 24, 2014 to February 28, 2014, the inspectors conducted an on-site review of the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system, emergency feedwater systems, risk-significant piping and components, and containment systems in Unit 3. The inspector's activities included a review of non-destructive examinations (NDEs) to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section XI (Code of record: 2001 Edition with 2003 Addenda) and Section V (Nondestructive Examination); and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of the ASME Code, Section XI, acceptance standards.

The inspectors directly observed the following NDE mandated by the ASME Code to evaluate compliance with the ASME Code Section XI and Section V requirements and, if any indications and defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement.

- Enhanced Visual Examination (EVT)-1 of Steam Dryer Surfaces 0 degree Dryer Bank End Plates for Tie-Bars 1/2 and 5/6, (Augmented BWRVIP Exam)
- EVT-1 of Jet Pump C Riser Brace Repair at 90 degree
- Ultrasonic Testing (UT) (Phased Array) Exam of Weld C-5-FLG Pressure Vessel Weld to Flange
- UT of N11A/N11B Feedwater nozzles to sparger piping

The inspectors reviewed associated documents for the welding activities referenced below in order to evaluate compliance with procedures and the ASME Code. The inspectors reviewed the work order, repair and replacement plan, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- Welding Package for Component 3-CKV-69-629
- Welding Package for Component HPCI-3-019-018

The inspectors reviewed the following examination records (volumetric or surface) with recordable indications that were analytically evaluated and accepted for continued service against the ASME Code Section XI or an NRC-approved alternative.

- RPV-WASH-3-50 – material deformation of the lower washer and top of the RPV Flange Head due to an entrapped foreign object during a VT-1 exam.

Identification and Resolution of Problems: The inspectors performed a sample review of ISI-related problems which were identified by the licensee and entered into the corrective action program as Problem Evaluation Reports (PERs). The inspectors reviewed the PERs to confirm the licensee had appropriately described the scope of the problem, and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. Documents reviewed are listed in the Attachment. This activity constituted one Inservice Inspection sample.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification and Performance

.1 Licensed Operator Requalification

a. Inspection Scope

On January 27, 2014, the inspectors observed a licensed operator training session for an operating crew according to Unit 2 Simulator Exercise Guide (SEG) OPL177.073, Anticipated Transient without Scram (ATWS), and Various Technical Specification entries.

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. Finding

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) (10 CFR 50.65) 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); 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 also compared the licensee's performance against site procedures. The inspectors also reviewed, as applicable, work orders, surveillance records, PERs, system health reports,

engineering evaluations, and MR expert panel minutes; and attended MR expert panel meetings to verify that regulatory and procedural requirements were met. This activity constituted two Maintenance Effectiveness inspection samples.

- Unit 2 RCIC Controller Unit 2 RCIC flow controller failure (SSFF) and MR function failure PER 807494
- Maintenance Rule Annual Goals and Monitoring Evaluation Report per 10 CFR 50.65 (a)(3)

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.

- Unit 3 Yellow risk in Mode 4 due to degraded offsite power while reactor coolant time to boil was 3 minutes.
- Unit 1 Yellow risk for emergency diesel generator (EDG) and standby gas treatment (SGT) maintenance. Unit 3 emergent Orange risk in Mode 5, Refueling, due to thunderstorms, high winds, with only one train of shutdown cooling and AC power.
- Unit 3 Yellow risk in Mode 5 during Control Rod Drive (CRD) exchange OPDRV with shutdown cooling unavailable due to planned local leak rate testing.
- Unit 3 Yellow risk in Mode 5 during the reactor vessel head installation. (This also constitutes a Smart Sample per OpESS 2007-03 for the Control of Heavy Loads).
- Unit 3 Yellow risk in Mode 5 during the elevated pressure test with one train of shutdown cooling and emergency AC power unavailable.

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 operability. The inspectors also reviewed applicable sections of the UFSAR to verify that the system or component remained available to perform its intended function. In addition, where appropriate, the inspectors reviewed licensee 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 nine Operability Evaluation inspection samples.

- Unit 1 RHR pump suction piping anchor frame tightened with less than full thread engagement, (PER 830862)
- RHRSW pump power cables submerged in water in Hand hole 15 and Hand hole 26, (PER 836589)
- C Emergency Diesel Generator Outboard Collector Ring Eccentricity is Above Acceptance Criteria, (PER 767839)
- Unit 3 MSIV leakage As-found leakage exceeded Technical Specification 3.6.1.3.10 surveillance requirement, (PER 851256)
- 3A Emergency Diesel Generator Lube Oil Leak and Prompt Determination of Operability, (PER's 786196, 808811)
- Caution order to leave valve, 3-FCV-73-35, de-energized due to non-locking actuator gear, (10 CFR 50.59 screening R06 140314 134)
- Reactor Water Cleanup suction inboard isolation valve, 3-FCV-69-001, Failure to acquire torque stem data, (PER 858627)
- Loss of In-Service Test (IST) data, for 3-CKV-75-580A, (PER 856517)
- Diesel Aux Board Fan, BFN-0-Fan-030-0072, out of service for greater than 5 days, (PER 730995)

b. Findings

Introduction: The NRC identified a Green NCV of 10 CFR 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to establish adequate written procedures for the test program to determine MSIV as-found leakage that met the requirements of 10 CFR 50, Criterion XI, Test Control. Specifically, Browns Ferry test procedure 3-SR-3.6.1.3.10 did not specify what suitable testing conditions were required to be established prior to testing. Additionally, the practice of allowing multiple valve strokes prior to testing was contrary to the procedure prerequisite of no allowed preliminary adjustments and constituted unacceptable preconditioning of the tested valves.

Description: On March 15, 2014, NRC inspectors observed that the Browns Ferry MSIVs local leak rate testing as-found results significantly exceeded the Technical Specification 3.6.1.3.10 requirement of 100 standard cubic feet per hour (scfh). Licensee troubleshooting required flooding the main steam lines and cycling open and closed the B and C, inboard MSIVs three times and D MSIV six times to obtain leak rates within required limits. The licensee corrective action program initiated a past operability evaluation, PER 847688, to determine what set of test data to be used as the official as-found results to meet the Technical Specification surveillance requirement. The conclusion of the PER 847688 evaluation was to use the as-left, final test data results as the as-found results.

The licensee's operability evaluation determined that a significant factor associated with the initial leak rate test results was the thermal gradients induced by variations in cooldown rates of the individual components of each MSIV. The first two tests were performed while the valves were hot and cooling. A second test factor cited in the licensee evaluation was the draw down on the air supply header used to assist in the closure of the valves. MSIVs use pneumatics plus a large spring to close the valves. No maintenance, only the multiple valve strokes, was performed on the MSIVs prior to achieving acceptable As-Left data on March 18, 2014.

NRC Inspection Manual, Part 9900, "Technical Guidance: Maintenance-Preconditioning of Structures, Systems, and Components (SSC) Before Determining Operability" addresses preconditioning of plant equipment prior to ASME Code and Technical Specification testing. Unacceptable preconditioning is defined as: The alteration, variation, manipulation, or adjustment of the physical condition of an SSC before or during Technical Specification surveillance or ASME Code testing to achieve acceptable test results. Such changes could mask the actual as-found condition of the SSC and possibly result in an inability to verify the operability of the SSC. The Browns Ferry test procedure 3-SR-3.6.1.3.10 had a precaution 3.0.M that stated that "No preliminary adjustments are allowed for 'as-found' leak rate testing."

Part 9900 provides a series of questions that NRC inspectors should consider when evaluating the acceptability of an activity that appears to involve preconditioning of a plant SSC. Those questions are, in part, as follows:

- Does the practice performed ensure the pump or valve will meet its testing acceptance criteria?
- Would the valve have failed the test without the preconditioning?
- Does the practice bypass or mask the as-found condition of the pump or valve?

According to Inspection Manual, Part 9900, an activity constitutes unacceptable preconditioning if an affirmative answer is determined in response to any of these questions. Without the additional valve strokes the MSIV as-found results would have failed to meet Technical Specification 3.6.1.3 requirements.

Analysis: The inspectors determined that the licensee's failure to establish adequate written procedures for the test program to determine MSIV as-found leakage that met the requirements of 10 CFR 50, Criterion XI, Test Control was a performance deficiency. Specifically, Browns Ferry test procedure 3-SR-3.6.1.3.10 did not specify what suitable testing conditions were required to be established prior to testing. Additionally, the practice of allowing multiple valve strokes prior to testing was contrary to the procedure prerequisite of no allowed preliminary adjustments and constituted unacceptable preconditioning of the tested valves. The finding was more than minor, because it adversely affected the Barrier Integrity cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the failure to determine as-found leakage reduced the ability of the licensee to provide reasonable assurance that the MSIVs would be able to perform their isolation function between tests. The inspectors evaluated the finding using IMC 0609, Appendix A, the Significance Determination Process (SDP) for at-power findings, Exhibit 3 – Barrier Integrity Screening Questions, dated June 19, 2012, and determined the finding was of very low safety significance, (Green), because it did not represent an actual open pathway in the physical integrity of reactor containment and did not involve an actual reduction in the function of the hydrogen igniters in the reactor containment. This finding has a cross-cutting aspect in the area of Human Performance, Documentation, because Browns Ferry's MSIV testing procedures were not complete in that they did not specify all required initial conditions and allowed preconditioning the valves. [H.7]

Enforcement: 10 CFR 50, Criterion XI, Test Control requires, in part, "Test procedures shall include provisions for assuring that all prerequisites for the given test have been met, that adequate test instrumentation is available and used, and that the test is performed under suitable environmental conditions." Contrary to the above, during Unit 3 MSIV as-found leak testing between March 15 and March 18, 2014, Browns Ferry test procedure 3-SR-3.6.1.3.10 did not include adequate provisions for assuring that all prerequisites for the given test had been met and testing was performed under suitable environmental conditions as evidenced by the following examples:

1. The test procedure did not specify requirements for thermal equilibrium across the valves,
2. The test procedure did not ensure adequate air supply for valve testing was available,
3. The test procedure did not provide provisions to ensure no preliminary adjustments (preconditioning) was met.

The licensee's immediate corrective action was to enter the issue into the corrective action program to evaluate the adequacy of the test procedure's ability to obtain as-found results. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. The violation was entered into the licensee's corrective action program as PER 847688. (NCV 05000296/2014002-03, Failure to Perform MSIV As-found Leakage Test Under Suitable Conditions)

1R18 Plant Modifications.1 Temporary Plant Modificationsa. Inspection Scope

The inspectors reviewed the temporary modification 3-TO-2014-082-001 to install a dynamic absorber device on the outboard end of the 3C EDG for temporary relief of High Axial Vibration. Inspectors verified regulatory requirements were met and implemented per licensee procedures. The inspectors also reviewed the associated 10 CFR 50.59 screening and evaluation and compared each against the UFSAR and Technical Specifications to verify that the modification did not affect operability or availability of the affected system. The inspectors walked down the modification to ensure that it was installed in accordance with the modification documents and reviewed post-modification testing to verify that the actual impact on permanent systems was adequately verified by the tests. This activity constituted one Temporary Plant Modification sample.

b. Findings

No findings were identified.

1R19 Post Maintenance Testinga. 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, and that the procedure had been properly reviewed and approved. The inspectors also 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 PMT activities were conducted in accordance with applicable WO instructions, or licensee procedural requirements. Furthermore, the inspectors verified that problems associated with PMTs were identified and entered into the Corrective Action Program (CAP). This activity constituted ten Post Maintenance Test inspection samples.

- EDG 3C testing following generator replacement and elevated vibration readings, (WO 115458540)
- Unit 1, 1A Reactor Protection System (RPS) following replacement of Auxiliary Electrical Contact 42TA, (WO 115500202)
- Unit 3, PM51050 of Core Spray low pressure relays following HFA relay replacements, (WO 114972729)

- Unit 3, Pressure Isolation Valve Leakage Test of RHR Shutdown Cooling Valves following maintenance per 3-SI-3.2.74(SDC), (WO 115070004)
- Unit 3, Modified Load Acceptance Retest of 480V Shutdown Board 3A following repairs to Breaker Secondary Contact, (WO 115525836)
- EDG 3A testing per 3-SR-3.8.1.1 (3A) after maintenance on fans and various load breakers, (WO 114846602)
- Unit 3, RHR Flow Testing per 3-SR-3.5.1.6(RHR I) following maintenance performed during Outage, (WO 115192618)
- Unit 3, RHR Loop One Injection Valve Override Switch post modification testing, (PMTI-70835-005)
- Unit 3, Reactor Vessel pressure test at rated pressure, (WO 114689655)
- Unit 3, High Pressure Coolant Injection (HPCI) Main and Booster Pump Set Developed Head and Flow Rate Test at 150 psig Reactor Pressure following outage maintenance per 3-SR-3.5.1.8, (WO 114695074)

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

.1 Unit 3 Refueling Outage (U3R16)

a. Inspection Scope

From February 14, 2014, through March 20, 2014, the inspectors examined the Unit 3 critical outage activities to verify that they were conducted in accordance with Technical Specifications, 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 Cold Shutdown (Mode 4) and Refueling (Mode 5). This activity constituted one Refueling and Other Outage Activities inspection sample. Some of the significant outage activities specifically reviewed and/or witnessed by the inspectors were as follows:

Outage Risk Assessment

Prior to the February 14, 2014, U3R16 refueling outage, the inspectors attended outage risk assessment team meetings and reviewed the Outage Risk Assessment Report. The inspectors reviewed the daily U3R16 Refueling Outage Reports, including the Outage Risk Assessment Management (ORAM) Safety Function Status, and regularly attended the daily outage status meetings. The inspectors frequently discussed risk conditions and protected equipment with operations and outage management personnel to assess licensee awareness of actual risk conditions and mitigation strategies.

Shutdown and Cooldown Process

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

Decay Heat Removal

The inspectors reviewed licensee procedures 3-OI-74, Residual Heat Removal System (RHR); 3-OI-78, Fuel Pool Cooling and Cleanup System; and Abnormal Operating Instruction 0-AOI-72-1, Alternate Decay Heat Removal System Failures; and conducted main control room panel and in-plant walkdowns of system and components to verify correct system alignment. During planned evolutions that resulted in increased outage risk conditions for shutdown cooling, inspectors verified that the plant conditions and systems identified in the risk mitigation strategy were available. In addition, the inspectors reviewed controls implemented to ensure that outage work was not impacting the ability of operators to operate spent fuel pool cooling, RHR shutdown cooling, and/or ADHR system.

Critical Outage Activities

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

- Walked down selected safety-related equipment clearance and associated with tagout numbers:
 - 1) 3-074-0002; Residual Heat Removal System Loop I outage
 - 2) 3-075-0004; Core Spray Pump 3D
 - 3) 3-075-0010; PSC system tank cleaning
 - 4) 3-211-0001A; 3EA Shutdown Board
 - 5) 3-211-0001B; 3EA Shutdown Board
- Verified Reactor Coolant System (RCS) inventory controls, specifically, the makeup methods used during operations with the potential to drain the reactor vessel (OPDRV's)
- Verified electrical systems availability and alignment
- Monitored important control room plant parameters (e.g., RCS pressure, level, flow, and temperature) and Technical Specification compliance during the various shutdown modes of operation, and mode transitions
- Evaluated implementation of reactivity controls
- Reviewed control of containment penetrations and overall integrity
- Examined foreign material exclusion controls particularly in proximity to and around the reactor cavity, equipment pit, and spent fuel pool

- Performed routine tours of the control room, reactor building, refueling floor and drywell
- Verified the licensee was managing fatigue by performing a sample review of fatigue assessments, schedules and work hours of outage personnel. There were no waiver requests or self-declarations performed during the outage.

Reactor Vessel Disassembly and Refueling Activities

The inspectors witnessed selected activities associated with reactor vessel disassembly, and reactor cavity flood-up and drain down in accordance with 3-GOI-100-3A, Refueling Operations (Reactor Vessel Disassembly and Floodup). On numerous occasions, the inspectors witnessed fuel handling operations during the two Unit 3 reactor core fuel shuffles performed in accordance with Technical Specifications and applicable operating procedures addressing refueling operations (in vessel), operations in the spent fuel pool, and fuel movement operations during refueling.

Drywell Closeout

On March 13, 2014, the inspectors reviewed the licensee's conduct of 3-GOI-200-2, Drywell Closeout, and performed an independent detailed closeout inspection of the Unit 3 drywell.

Restart Activities

The inspectors specifically observed the following:

- Pressurization of Unit 3 reactor pressure vessel in accordance with 3-SI-3.3.1.A, ASME Section XI System Leakage Test of the Reactor Pressure Vessel and Associated Piping
- 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
- Unit 3, March 19 reactor scram response from 35 percent power and subsequent startup due to a failed moisture separator level controller

Corrective Action Program

The inspectors reviewed PERs generated during U3R16 and attended management review committee (MRC) meetings to verify that initiation thresholds, priorities, mode holds, operability concerns and significance levels were adequately addressed. Resolution and implementation of corrective actions of several PERs were also reviewed for completeness.

b. Findings

No findings 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 twelve Surveillance Testing inspection samples: two in-service, one reactor coolant system leakage detection, six routine tests and three containment isolation valves.

In-Service Tests:

- 0-SI-4.5.C.1 (COMP), B1 IST Comprehensive Pump Test
- 3-SR-3.5.1.6 (CSII) Core Spray Flow Rate Loop II

Reactor Coolant System Leakage Detection Tests:

- 1-SR-3.4.5.3, Drywell Floor Drains Sump Flow Monitoring System Calibration

Routine Surveillance Tests:

- 1-SR-3.5.1.7, HPCI Flow Rate Test at Rated Reactor Pressure
- 3-SR-3.8.1.9 (3B OL) 3B EDG Emergency Load Acceptance Test with Unit 3 Operating
- 3-SR-3.4.9.1(1) Reactor Heatup or Cooldown Rate Monitoring
- 3-SR-3.3.5.2.4 (FT) RCIC System Logic Functional Test
- 3-SR-3.3.6.1.6 (Group 1), Group 1 PCIS Logic test
- 3-SR-3.3.1.1.12, Reactor Protection System Mode Switch in Shutdown Scram and Logic System Functional Test, (WO 114691746)

Containment Isolation Valve Tests:

- 3-SR-3.6.1.3.10 (A and B), Unit 3 Primary Containment Local Leak Rate Test Main Steam Line (A and B)
- 3-FCV-69-0001, Unit 3 Reactor Water Cleanup Inboard Isolation Valve motor operated valve testing
- Unit 3, TI-360 cumulative 0.6La, Type B and C, leakrate review

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

During the report period, the inspectors observed an Emergency Preparedness (EP) Severe Accident Management Guidelines (SAMG) training drill that contributed to the licensee's Drill/Exercise Performance (DEP) and Emergency Response Organization (ERO) performance indicator (PI) measures on February 5, 2014. 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 also 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 Drill Evaluation inspection sample.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2RS1 Radiological Hazard Assessment and Exposure Control

a. Inspection Scope

Radiological Hazard Assessment: The inspectors reviewed a number of radiological surveys, including those performed for airborne areas, of locations throughout the facility including the Unit 3 (U3) drywell, Unit 1 (U1), Unit 2 (U2), and U3 reactor buildings and the turbine building. The inspectors also walked down many of the same areas and select radioactive material storage locations with a survey instrument, evaluating material condition, postings, and radiological controls. Of specific interest was the radioactive waste processing area work. The inspectors observed jobs in radiologically risk-significant areas including high radiation areas and areas with, or with the potential for, airborne activity. The inspectors evaluated the surveys in relation to the identified hazards for sufficient detail and frequency.

Instructions to Workers: During plant walk downs, the inspectors observed labeling and radiological controls on containers of radioactive material. The inspectors also reviewed radiation work permits (RWP) used for accessing high radiation areas and airborne areas, verifying that appropriate work control instructions and electronic dosimeter (ED) setpoints had been provided and to assess the communication of radiological control

requirements to workers. The inspectors reviewed selected ED dose and dose rate alarms, to verify workers properly responded to the alarms and that the licensee's review of the events was appropriate. The inspectors observed pre-job RWP briefings and health physics technician coverage of workers. The inspectors reviewed the various methods being used to notify workers of changing or changed radiological conditions.

Contamination and Radioactive Material Control: The inspectors observed the release of potentially contaminated items from the radiologically controlled area (RCA) and from contaminated areas such as the drywell. The inspectors also reviewed the procedural requirements for, and equipment used to perform, the radiation surveys for release of personnel and material. During plant walk downs, the inspectors evaluated radioactive material storage areas and containers, including satellite RCAs and the low level radwaste facility, assessing material condition, posting/labeling, and control of materials/areas. In addition, the inspectors reviewed the sealed source inventory and verified labeling, storage conditions, and leak testing of selected sources. The inspectors verified if Category 1 and 2 sealed sources had been appropriately reported to the National Source Tracking System and physically verified the presence and controls of these sources. The sources were verified to be physically present and in proper working order.

Radiological Hazards Control and Work Coverage: The inspectors evaluated licensee performance in controlling worker access to radiologically significant areas and monitoring jobs in-progress associated with the Unit 3 refueling outage. Established radiological controls were evaluated for selected tasks including equipment staging for control rod drive work, control rod drive removal, packaging and replacement. The inspectors evaluated the effectiveness of radiation exposure controls, including air sampling, barrier integrity, engineering controls, and postings through a review of both internal and external exposure results.

During walk downs with a radiation survey meter, the inspectors independently verified if ambient radiological conditions were consistent with licensee performed surveys, RWPs, and pre-job briefings; observed the adequacy of radiological controls; and observed controls for radioactive materials stored in the spent fuel pool. ED alarm set points and worker stay times were evaluated against area radiation survey results for drywell and refueling floor activities.

Risk-Significant High Radiation Area and Very High Radiation Area Controls: The inspectors discussed the controls and procedures for locked-high radiation areas (LHRAs) and very high radiation areas (VHRAs) with health physics supervisors and the radiation protection manager. During plant walk downs, the inspectors verified the posting/locking of LHRA/VHRA areas.

Radiation Worker Performance and Radiation Protection Technician Proficiency: The inspectors observed radiation worker performance through direct observation, via remote camera monitoring, and via telemetry. These jobs were performed in high radiation, airborne, and/or contaminated areas. The inspectors also observed health physics technicians providing field coverage of jobs and providing remote coverage.

Problem Identification & Resolution: Licensee CAP documents associated with radiation monitoring and exposure control were reviewed and assessed. This included review of selected PERs related to radworker and health physics technician performance. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure NPG-SPP-22.300, Corrective Action Program, Rev. 0. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Licensee CAP documents reviewed are listed in Section 2RS1 of the Attachment.

Radiation protection activities were evaluated against the requirements of Technical Specification Sections 5.4 and 5.7; 10 Code of Federal Regulations (CFR) Parts 19 and 20; and approved licensee procedures. Records reviewed are listed in Section 2RS1 of the Attachment.

The inspectors completed 1 sample, as described in Inspection Procedure (IP) 71124.01.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment

a. Inspection Scope

The inspectors followed up on a liquid effluent release that occurred on February 12, 2014, with an inoperable isolation channel. This activity is not sufficient to complete the baseline requirements of IP 71124.06. The remainder of this procedure is scheduled for June 16 to June 20, 2014.

b. Findings

One GREEN licensee-identified violation of Off Site Dose Calculation Manual 1.1.1 minimum operable channel requirements and failure to obtain required compensatory sample was identified. See Section 4OA7 for details.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

a. Inspection Scope

Waste Processing and Characterization: During inspector walk-downs, accessible sections of the liquid and solid radioactive waste (radwaste) processing systems were assessed for material condition and conformance with system design diagrams. Inspected equipment included floor drain tanks; phase separator tanks; resin and filter packaging components; and abandoned evaporator equipment. The inspectors discussed component function, processing system changes, and radwaste program implementation with licensee staff.

The 2011 and 2012 Annual Radiological Effluent Release Report and radionuclide characterizations for select waste streams from each major waste stream from 2013 were reviewed and discussed with radwaste staff. For cleanup waste phase separator resin, reactor water cleanup resin, Thermex resin, and dry active waste (DAW) the inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. Waste stream mixing and concentration averaging methodology for resins and filters was evaluated and discussed with radwaste staff. The inspectors also reviewed the licensee's procedural guidance for monitoring changes in waste stream isotopic mixtures.

Radwaste processing activities and equipment configuration were reviewed for compliance with the licensee's Process Control Program (PCP) and UFSAR, Chapter 9, "Radioactive Waste Control Systems." Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification (1983). Reviewed documents are listed in Section 2RS8 of the report Attachment.

Radioactive Material Storage: During walk-downs of radioactive material storage areas in the radwaste building and outdoor low-level storage yard, the inspectors observed the physical condition and labeling of storage containers and the posting of Radioactive Material Areas. The inspectors also reviewed licensee procedural guidance for storage and monitoring of radioactive material.

Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20. Reviewed documents are listed in Section 2RS8 of the report Attachment.

Transportation: The inspectors directly observed preparation activities for shipment containing two 20 foot Sea Lands and a high integrity container (HIC) of Tri-Nuke filters. The inspectors noted package markings and placarding, performed independent dose rate measurements, and interviewed shipping technicians regarding Department of Transportation (DOT) regulations.

Selected shipping records were reviewed for consistency with licensee procedures and compliance with NRC and DOT regulations as well. The inspectors reviewed emergency response information, DOT shipping package classification, waste classification, radiation survey results, and evaluated whether receiving licensees were authorized to accept the packages. Licensee procedures for opening and closing Type A shipping containers were compared to manufacturer requirements. In addition, training records for selected individuals currently qualified to ship radioactive material were reviewed.

Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71, 49 CFR Parts 172-178, as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H and the inspectors reviewed the 10CFR71.95 report submitted by the licensee in October of 2013. Documents reviewed are listed in the Attachment.

Problem Identification and Resolution: The inspectors reviewed PERs in the area of radwaste/shipping. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure NPG-SPP-22.300, Corrective Action Program, Rev. 0. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Cornerstone: Barrier Integrity

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 first quarter through fourth quarter of 2013. 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 also 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. Furthermore, 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 six Performance Indicator inspection samples.

- Unit 1, 2, and 3 Reactor Coolant System Activity
- Unit 1, 2, and 3 Reactor Coolant System Leakage Rate

b. Findings

No findings were identified.

.2 Occupational Radiation Safety Cornerstone

a. Inspection Scope

The inspectors reviewed PI data collected from January 2013 through February 2014, for the Occupational Exposure Control Effectiveness PI. For the reviewed period, the inspectors assessed CAP records to determine whether high radiation area, VHRA, or

unplanned exposures, resulting in Technical Specification or 10 CFR 20 non-conformances, had occurred during the review period. In addition, the inspectors reviewed selected personnel contamination event data, internal dose assessment results, and ED alarms for cumulative doses and/or dose rates exceeding established set-points. The reviewed data were assessed against guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline," Rev. 6. The reviewed documents relative to these PI reviews are listed in Sections 2RS1 and 4OA1 of the Attachment.

b. Findings

No findings were identified.

.3 Public Radiation Safety Cornerstone

a. Inspection Scope

The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from January 2013 through February 2014. For the assessment period, the inspectors reviewed cumulative and projected doses to the public contained in liquid and gaseous release permits and CRs related to Radiological Effluent Technical Specifications/ODCM issues. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution of Problems

.1 Review of items entered into the Corrective Action Program

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.

.2 Focused Annual Sample Review

a. Inspection Scope

The inspectors performed an in-depth review, as necessary, to verify that the licensee had taken corrective actions commensurate with the significance of the following issues. This activity constituted two focused annual problem identification and resolution inspection samples.

1. The inspectors observed and reviewed the Licensee corrective actions related to National Fire Protection standard NFPA 805 change to procedure NPG-SPP-18.4.7, Control of Transient Combustibles.
2. The inspectors observed and reviewed the corrective actions regarding excessive as-found local leak rates on the Unit 3 B, C, and D main steam isolation valves.

b. Observations and Findings

Introduction: A Green NRC-identified non-cited violation (NCV) of the T.S. 5.4.1.d, Fire Protection Program Implementation, was identified for the licensee's failure to control transient combustible materials in designated high risk areas in Unit 1 and Unit 3.

Description: On three separate occasions, January 22, February 12, and February 13, 2014, the inspectors identified transient combustible materials left unattended in the following designated high risk areas:

- 1) Unit 3, Fire Area 3-2 containing division II core spray pumps,
- 2) Unit 3, Fire Area 21 containing 3B EDG,
- 3) Unit 1, Fire Area 1-2 containing RHR heat exchangers B and D.

Procedure NPG-SPP-18.4.7, Control of Transient Combustibles, Section 3.2.2.G defined additional controls for safety-related / critical areas. Per section 3.2.2.G the introduction of transient combustibles in High Risk Areas was not allowed unless a Transient Combustible Evaluation was performed or the transient combustibles were continually manned by the working group until removed from the plant. This procedure had been recently revised to include these requirements to reflect new BFN NFPA 805/NRC commitment 115214465. The licensee did not clearly communicate or train most staff members on the new requirement. On the three occasions listed above, the NRC identified that transient combustibles such as multiple bags of contamination clothing, flashlights, herculite plastic, rubber floor matting, and bags of cables were left in unmanned designated high risk areas without the required transient combustible evaluation. The inspectors immediately notified the control room unit supervisor and the Fire Operations group which confirmed the lack of a combustible evaluation.

The inspectors determined that a credible fire scenario involving the identified transient combustibles could have affected equipment important to safety for each of the examples above. This issue was captured in the licensee's corrective action program (CAP) as PERs 845630 and 846184.

Analysis: Leaving combustible materials unattended in a High Risk area without performing a Transient Combustible Evaluations required by NPG-SPP-18.4.7, Control of Transient Combustibles, Section 3.2.2.G was a performance deficiency. Specifically, on three separate occasions, transient combustibles were found to be unattended in three separate areas designated as High Risk Area without the required combustible evaluations being performed. The performance deficiency was determined to be more than minor, because it was associated with the Protection Against External Factors

attribute (Fires) of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, leaving unanalyzed transient combustibles in proximity to safety related equipment could affect the equipment's ability to perform its safety function during a credible fire scenario. The finding was characterized according to IMC 0609, Significance Determination Process (SDP), Appendix F, Attachment 1, Fire Protection SDP Phase 1 Worksheet, dated September 20, 2013. This issue screens as low safety significance, (Green), per Attachment 1 question 1.3 because it did not affect the ability of the reactor to reach and maintain safe shutdown. The cause of this finding was directly related to the Human Performance cross cutting aspect of Change Management. Plant leaders did not use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, the impact of the new procedures for transient combustible controls did not apply change management controls such as site wide communication and training to make workers aware of the new requirements. [H.3]

Enforcement: Technical Specification 5.4.1.d required that written procedures for the Fire Protection Program shall be established and implemented. NPG-SPP-18.4.7, Control of Transient Combustibles, Section 3.2.2.G, stated that transient combustibles in High Risk Areas are not allowed unless a transient combustible evaluation is performed, or the transient combustibles are continually manned by the working group until removed from the plant. Contrary to the above, from January 22 to February 13, 2014, the licensee allowed unattended transient combustibles to reside in high risk areas of Unit 1 and Unit 3 without a transient combustible evaluation as evidenced by the following examples:

- 1) January 22, 2014, Unit 3, Fire Area 3-2 (multiple bags of anti-contamination clothing, flashlights, herculite plastic, oil pads and hoses),
- 2) February 12, 2014, Unit 3, Fire Area 21 (Four bags of tools, plastic sheets, over 300 square feet of rubber floor matting, and bags of cables),
- 3) February 14, 2014, Unit 1, Fire Area 1-2 (Four large bags of anti-contamination clothing and loose insulation).

The licensee promptly removed the transient combustibles from the restricted area in each case. Because this violation was of very low safety significance and it was entered into the licensee's CAP as PERs 845630 and 846184, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. This NCV is identified as (NCV 05000259, 05000296/2014002004-04, Failure to Control Transient Combustible in Designated High Risk areas).

4OA3 Follow-up of Events and Notices of Enforcement Discretion

.1 (Closed) Licensee Event Report (LER) 05000259/2009-006-01, Inoperable High Pressure Coolant Injection (HPCI) Pump due to Emergency Core Cooling System Inverter Failure

a. Inspection Scope

Inspectors reviewed LER 05000259/2009-006-01 revision which included additional information unknown at the time of initial issue.

The initial revision to this LER detailed events that occurred on September 1, 2009. Operators discovered a tripped breaker for the ECCS Division II Inverter on the Unit 1 reactor motor operated valve (RMOV) Board. Loss of power to this inverter caused the HPCI system to be declared inoperable. The licensee initiated PER 200863 to enter this issue into the CAP. The apparent cause of this event was a short in a metal-oxide varistor used as a surge suppressor. The inspectors reviewed the initial LER revision and closed the issue with no findings in Inspection Report (IR) 05000259, 260, 296/2009005.

The LER supplement provided additional analysis of the event and assessment of safety consequences given previously unknown information concerning the inoperability of other systems. Unit 1 RHR low pressure coolant injection (LPCI) valve; Unit 1 RHR pump '1C'; and common Unit 1 and 2 'A' EDG were analyzed for concurrent inoperability. The licensee concluded the concurrent inoperabilities posed a minimal reduction to safety or equivalent to low safety significance.

The Unit 1 RHR LPCI valve issue was reviewed and initially documented in IR 2010005 and received final disposition in IR 2011008. The Unit 1 RHR pump 1C issue was reviewed and received final disposition in IR 2010005. The Unit 1 and 2 'A' EDG issue was reviewed and received final disposition in IR 05000259, 260, 296/2011004.

b. Findings

No additional findings were identified. This LER is closed.

.2 (Closed) LER 05000259/2011-008-02, High Vibrations on High Pressure Coolant Injection Booster Pump Thrust Bearings

a. Inspection Scope

Inspectors reviewed LER 05000259/2011-008-02 for an event that occurred on July 20, 2011. Previous LER revisions reported the HPCI pump experienced increased vibration levels due to incorrectly installed bearings in the booster pump. The licensee initiated PER 408067 to enter this issue into the CAP. The licensee concluded that given the rate of bearing degradation and the as-found condition of the bearings that it was unlikely the pump would have been able to meet its mission time from May 20, 2011, until successful repairs on July 27, 2011.

This LER supplement provided updated information concerning the Extent of Condition. The Unit 2 and 3 HPCI booster pump bearings were verified to be installed in the correct configuration. The licensee initially determined that the Reactor Core Isolation Cooling (RCIC) pumps and Control Rod Drive (CRD) pumps for all three units were susceptible to the same failure. The LER supplement stated that the RCIC pump bearing cannot be installed in an incorrect orientation due to its design. The licensee confirmed this during the Unit 3 outage (U3R15) when the RCIC pump was disassembled and the design and orientation was verified. The CRD pumps share the bearing design configuration with the RCIC pumps and cannot be installed in an incorrect orientation. In addition, the CRD pumps have shown no signs of degradation in combination with significant run time.

b. Findings

One finding of significance related to LER 05000259/2011-008-00 was previously documented in IR 05000259, 260, 296/2011005, (see Section 4OA7, Licensee Identified Violations). Previous LER revisions were closed with no additional findings in IR 2012002, (see Section 4OA3.3, Event Follow-up). No additional findings were identified. This LER is closed.

.3 (Closed) LER 05000259/2013-007-00, High Pressure Coolant Injection System Declared Inoperable Due to an Inadvertent Actuation of the Primary Containment Isolation System

a. Inspection Scope

The inspectors reviewed LER 05000259/2013-007-00 dated December 16, 2013. This event was captured in PER 794807. The Unit 1 HPCI system was isolated on October 16, 2013, due to instrument maintenance technicians applying an incorrect Analog Trip Unit input current contrary to the surveillance test requirement. Due to this error a Group 4 isolation signal was generated which resulted in the HPCI system being isolated for 14 minutes. The licensee concluded that worker practice weaknesses of inadequate three-way communication, procedure use and adherence and place keeping contributed to the error.

b. Findings

One finding is documented in section 4OA7, Licensee Identified Violations. No additional findings were identified. This LER is closed.

.4 (Closed) LER 05000259/2010-004-02, Residual Heat Removal System Pump Motor Failure

a. Inspection Scope

Inspectors reviewed LER 05000259/2010-004-02 supplement for an event that occurred on October 27, 2010. Previous LER revisions reported that the 1C Residual Heat Removal (RHR) pump motor seized while in service for shutdown cooling during Unit 1's refueling outage (U1R8). The unit was in Mode 5 at the time. Operators subsequently

placed 1A RHR pump in service after the failure of the 1C RHR pump. The licensee initiated PER 274840 to enter this issue into the CAP. The 1C RHR pump motor was replaced and the failure was determined to be due to a bow in the rotor shaft and contact between rotating and stationary components.

The LER supplement provided additional analysis of the event and assessment of safety consequences given previously unknown information concerning the operability of other systems. This evaluation included a review of systems that were briefly unavailable at the time due to maintenance as well as longer term system inoperability unknown at the time. The Unit 1 RHR Loop II LPCI valve; and common Unit 1 and 2 'A' EDG Systems were the long term inoperable systems analyzed for concurrent inoperability. The licensee concluded the cumulative concurrent inoperabilities posed a minimal reduction to safety or equivalent to low safety significance.

The Unit 1 RHR LPCI valve issue was reviewed and initially documented in IR 2010005 and received final disposition in IR 2011008. The Unit 1 and 2 'A' EDG issue was reviewed and received final disposition in IR 2011004.

b. Findings

One finding related to LER 05000259/2010-004-02 was previously documented in IR 2010005, (see Section 1R20.1(2), Refueling and Other Outage Activities). Previous LER revisions were closed with no additional findings in IR 2011003, (see Section 4OA3.3, Event Follow-up). No additional findings were identified. This LER is closed.

.5 (Closed) LER 05000260/2013-002-00, High Pressure Coolant Injection (HPCI) System Declared Inoperable Due to an Unqualified Electrical Splice

a. Inspection Scope

On April 3, 2013, during work on the Unit 2 HPCI main pump minimum flow valve, an unqualified electrical splice was installed on the motor leads for valve. This condition was discovered during a records review conducted by the licensee on September 24, 2013. The licensee subsequently declared the HPCI system inoperable and replaced the unqualified electrical splice with one specified in the Browns Ferry Environmental Qualification Binder. The licensee's actions and extent of condition analysis were documented in their PER 784586 and its associated Past Operability Determination and Root Cause Analysis. The licensee identified the root cause as a lack of clear and specific guidance in their work control planning procedure relative to environmentally qualified (EQ) components and control of changes to work packages that contain EQ components.

b. Findings

One finding was documented in section 4OA7, Licensee Identified Violations. No additional findings were identified. This LER is closed.

.6 (Closed) LER 05000259/2013-004-00, High Pressure Coolant Injection (HPCI) System Declared Inoperable Due to Exceeding the Allotted Time Frame for Instrument Inoperability

a. Inspection Scope

The inspectors reviewed LER 05000259/2013-004-00 dated December 16, 2013. This event was captured in PER 756603. The Unit 1 HPCI system condensate header was being tested per surveillance test procedure 1-SR-3.3.5.1.3(D), High Pressure Coolant Injection System Condensate Header Low Level Switch Calibration and Functional Test, which prevents the auto swap feature that realigns HPCI suction from the condensate storage tank to the suppression pool. Operators were aware the test was in progress, were knowledgeable of the need to enter Technical Specification 3.3.5.1 condition D.1 should the maintenance surveillance exceed 1 hour, and did appropriately enter the Technical Specification condition once the surveillance exceeded 1 hour. Sixteen minutes later the auto swap feature was restored. This is an example of a non-significant time discrepancy. The auto swap feature was unavailable during the planned test. NUREG-1022, Event Reporting Guidelines and 10 CFR 50.73 state that removal of a system from service as part of a planned evolution for maintenance or surveillance testing when done in accordance with an approved procedure and the plant's Technical Specifications are generally not reportable under 10 CFR 50.73 (a)(2)(v). The licensee corrective action was to change the surveillance test procedure to direct entering the HPCI Technical Specification at the start of the maintenance test.

b. Findings

No findings were identified. This LER is closed.

.7 (Closed) LER 05000259, 260, 296/2013-005-00, and -01, Inadequate Shift Staffing to Support Implementation of the Safe Shutdown Instructions

a. Inspection Scope

The inspectors reviewed LER 05000259, 260, 296/2013-005-00, and -01, Inadequate Shift Staffing to Support Implementation of the Safe Shutdown Instructions dated December 02, 2013, and January 27, 2014, and the associated PER 790109, including the root cause analysis and corrective action plans. On September 6, 2013, the Tennessee Valley Authority (TVA) completed an evaluation of BFN minimum Operations shift staffing for response to a fire in the Control Bay that ultimately leads to entry into Appendix R Safe Shutdown Instructions (SSIs). This evaluation was performed in response to an NRC question. The result of this evaluation revealed that the minimum Operations shift staffing did not provide sufficient staffing to support both SSI required staffing levels and Emergency Response Organization staffing levels.

The licensee determined the direct cause to be an Operations shift staffing evaluation incorrectly concluding that a staffing level of three Unit Supervisors (USs), with one of these SROs holding a dual Shift Technical Advisor (STA) role, was adequate. The licensee determined that the root causes were: 1) there was no formal process available

that provided the necessary detail to ensure all appropriate source documents were considered for the Operations minimum shift staffing evaluation; and 2) ineffective implementation of the corrective action program.

b. Findings

Three apparent violations associated with this LER were documented in Section 1R11 of NRC IR 05000259, 260, 296/2013005 (ADAMS Accession Number ML14045A320). Two apparent violations (2013005-03 and 2013005-04) were adjudicated using the alternate dispute resolution process and will be dispositioned in future correspondence. The third apparent violation (2013005-02) was determined to have a low to moderate safety significance (White) and a notice of violation is included in the cover letter to this report. Therefore, (AV 05000259, 260, 296/2013005-02, Failure to Maintain Emergency Response Staffing Levels), is updated as (VIO 05000259, 260, 296/2013005-02, Failure to Maintain Emergency Response Staffing Levels), with a safety significance of White and a cross-cutting aspect of Evaluation in the Problem Identification and Resolution area because the licensee failed to ensure that issues potentially affecting nuclear safety were thoroughly evaluated. [P.2]

These LERs are closed.

4OA5 Other Activities

The table below provides a cross-reference from the 2013 and earlier findings and associated cross-cutting aspects to the new cross-cutting aspects resulting from the common language initiative. These aspects and any others identified since January 2014, will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the 2014 mid-cycle assessment review.

Finding	Old Cross-Cutting Aspect	New Cross-Cutting Aspect
05000259,260,296/2013004-01	H.4(b)	H.8
05000259,260,296/2013004-02	H.2(a)	H.6
05000296/2013004-04	P.1(c)	P.2
05000296/2013011-01	H.1(b)	H.14
05000260, 296/2013011-02	H.3(b)	H.5
05000260/2013011-03	H.1(a)	H.13
05000259, 260, 296/2013011-04	H.4(a)	H.12
05000259, 260, 296/2013011-05	H.4(c)	H.2
05000259, 260, 296/2013011-06	H.3(b)	H.4
05000259, 260, 296/2013011-07	H.4(b)	H.8
05000259, 260, 296/2013011-08	H.3(b)	H.5
05000259, 260, 296/2013011-09	H.4(b)	H.8
05000259, 260, 296/2013011-10	H.2(c)	H.7

05000259, 260, 296/2013011-11	P.1(c)	P.2
05000259/2013011-12	H.2(c)	H.7
05000259, 260, 296/2013011-14	P.1(c)	P.2
05000259, 260, 296/2013011-15	P.1(a)	P.1
05000259, 260, 296/2013011-16	P.2(b)	P.5
05000259, 260, 296/2013005-01	H.4(b)	H.8
05000259, 260, 296/2013005-05	P.1(a)	P.1

4OA6 Meetings, Including Exit

On April 4, 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.

- Technical Specification 5.4.1.a, "Procedures," requires, in part, that written procedures be established, implemented, and maintained as recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Paragraph 8 of Regulatory Guide 1.33, Appendix A, requires specific procedures for surveillance tests. Contrary to the above, on October 16, 2013, Procedure 1-SR-3.3.5.1.2 (ATU D), Core and Containment Cooling Systems Analog Trip Unit Functional Test, Revision 6, was not implemented correctly because the maintenance workers performing the test failed to complete step 7.10 [5] correctly. This resulted in a Unit 1, Group 4, High Pressure Core Injection (HPCI) system isolation. Immediate corrective action was to restore HPCI system alignment 14 minutes later. This finding was entered into the corrective action program as Problem Evaluation Report PER 794807. This finding was determined to be of very low safety significance because the procedure error did not result in a loss of operability for the High Pressure Core Injection system longer than Technical Specification 3.5.1, Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC) System, allowed outage time.
- 10 CFR Part 50.49l, states, in part, that "Replacement equipment must be qualified in accordance with the provisions of this section unless there are sound reasons to the contrary." In the licensee Environmental Qualification (EQ) Binder Qualification Maintenance Data Sheet (QMDS) 0-MOV-003 section A.8 revision 28, termination of motor leads to the incoming power cable may either be done by Raychem Splice or a Marathon 300 terminal block. The EQ binder QMDS 0-MOV-003 section 1 identified the Unit 2 HPCI main pump minimum flow valve (2-MVOP-073-30) as an EQ component. Contrary to this, from April 3, 2013 until September 25, 2013, the

motor leads for the Unit 2 High Pressure Coolant Injection (HPCI) main pump minimum flow valve were spliced with Scotch Electrical Tape resulting in a loss of EQ. This violation was entered into the licensee's CAP as PER 784586. This finding was determined to be of very low safety significance, (Green), because of the short time duration for which the Scotch Electrical Tape was applied did not result in the Unit 2 HPCI being inoperable until the proper EQ splice was applied.

- Browns Ferry Technical Specification 5.5.4 requires compliance with ODCM requirements. ODCM 1.1.1 requires that the radioactive liquid effluent monitoring instrumentation listed in Table 1.1-1 be OPERABLE with the applicability as shown in Tables 1.1-1 and 2.1-1.

ODCM 1.1-1 allows for a liquid effluent release to occur with less than the minimum channels OPERABLE requirement if the appropriate actions from Table 1.1-1 are taken. The applicable specific requirements from Table 1.1-1 are:

ACTION A

During release of radioactive wastes from the radwaste processing system, the following shall be met:

- (1) liquid waste activity and flowrate shall be continuously monitored during release and shall be set to alarm and automatically close the waste discharge valve before exceeding the limits specified in Control 1.2.1.1,
- (2) if this cannot be met, two independent samples of the tank being discharged shall be analyzed in accordance with the sampling and analysis program specified in Table 2.2-1 and two qualified station personnel shall independently verify the release rate calculations and check valving before the discharge. Otherwise, suspend releases via this pathway.

Contrary to the above stated requirements, on February 12, 2014, the licensee released approximately 38,000 gallons of water via Unit 3 discharge to CCW conduit valve 3-FCV-77-0061 without meeting condition (2) of Table 1.1-1 Action A. The valve that was supposed to provide the isolation function (3-FCV-77-0061) had been inoperable since June 17, 2013 (greater than 30 days out of service), for a missed channel functional test surveillance 3-SI-4.8.A.3. The valve had been danger tagged closed on June 18, 2013 and the tag was inadvertently removed on October 24, 2013 when a clearance for other work was removed. The licensee discovered the error upon review of the previous night's logs and documented the event in PER 849316. Post release data indicates that release was within ODCM limits.

The issue was evaluated using the Public Radiation Safety Significance Determination Process Inspection Manual Chapter 0609 Appendix D. The issue was determined to be, (Green), because it was an abnormal release to the environment which the licensee had sufficient data to assess dose to members of the public and the dose impact was substantially less than the dose values in Appendix I to 10 CFR 50 and 10 CFR 20.1301(e).

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Austin, Licensing Engineer
E. Bates, Licensing Engineer
S. Bono, General Plant Manager
D. Campbell, Assistant Ops Superintendent
P. Campbell, System Engineer
T. Cole, Radiation Protection Support Superintendent
D. Depriest, TVA Program Manager for Electrical Installations and Cables
D. Drummonds, Underground and Buried Piping Program and GL 89-13 Program Owner
J. Ferguson, Radiation Protection Manager
F. Forscello, ISI/ISO
D. Green, Licensing Engineer
G. Harrison, Environmental Qualification Program Manager
K. Harvey, Raw Water Systems Engineer
L. Hughes, Manager Operations
S. Jeffers, Health Physics Supervisor-Dosimetry
E. Johnson, System Engineer
J. Lacasse, System Engineer
B. McNutt, Ops Shift Manager
F. Nilsen, Site Engineer ISI/NDE
M. Oliver, Licensing Engineer
J. Paul, Nuclear Site Licensing Manager
K. Polson, Site Vice President
W. Rice, ASME Code Engineer
M. Roy, Maintenance Rule Coordinator
S. Samaras, Civil Design Engineer
T. Scott, Performance Improvement Manager
P. Steele, Radwaste Supervisor
J. Stone, Licensing
R. Swafford, Unit Supervisor
J. Wheat, System Engineer
D. Wilson, Motor Operated Valve Engineer
M. Wilson, Training Director
K. Woodard, Engineering Supervisor
A. Yarborough, System Engineer

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000259, 260, 296/2013005-02	VIO	Failure to Maintain Emergency Response Staffing Levels (Section 4OA3.8)
05000259, 260, 296/2014002-01	URI	RHRWSW pump power cables submerged in water in Hand hole 26 contrary to TVA General Specification G-40. (Section 1R06.1.b.i)
05000259, 260, 296/2014002-02	URI	Inadequate Corrective Action for sump pump in Hand hole 15 allowing RHRWSW pump power cables to be submerged in water without the pump operating. (Section 1R06.1.b.ii)

Opened and Closed

05000296/2014002-03	NCV	Failure to Perform MSIV As-found Leakage Test Under Suitable Conditions (Section 1R15)
05000259, 296/2014002-04	NCV	Failure to Control Transient Combustible in Designated High Risk areas (Section 4OA2.2)

Closed

05000259, 260, 296/2013005-02	AV	Failure to Maintain Emergency Response Staffing Levels (Section 4OA3.8)
05000259/2009-006-01	LER	Unit 1 Inoperable High Pressure Coolant Injection Pump due to Emergency Core Cooling System Inverter Failure (Section 4OA3.1)
05000259/2011-008-02	LER	Unit 1 High Vibrations on High Pressure Coolant Injection Booster Pump Thrust Bearings (Section 4OA3.2)

05000259/2013-007-00	LER	Unit 1 High Pressure Coolant Injection System Declared Inoperable Due to an Inadvertent Actuation of the Primary Containment Isolation System (Section 4OA3.4)
05000259/2010-004-02	LER	Unit 1 Residual Heat Removal System Pump Motor Failure (Section 4OA3.5)
05000260/2013-002-00	LER	Unit 2 High Pressure Coolant Injection System Declared Inoperable Due to an Unqualified Electrical Splice (Section 4OA3.6)
05000259/2013-004-00	LER	Unit 1 High Pressure Coolant Injection System Declared Inoperable Due to Exceeding the Allotted Time Frame for Instrument Inoperability (Section 4OA3.7)
05000259, 260, 296/2013-005-00	LER	Inadequate Shift Staffing to Support Implementation of the Safe Shutdown Instructions (Section 4OA3.8)
05000259, 260, 296/2013-005-01	LER	Inadequate Shift Staffing to Support Implementation of the Safe Shutdown Instructions (Section 4OA3.8)

Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

0-AOI-100-3, Flood Above Elevation 558', Rev. 38
0-AOI-100-7, Severe Weather, Rev 34
0-GOI-200-1, Freeze Protection Inspection, Rev 77
0-TI-599, External Flood Protection Program, Rev. 0
0-TI-600, External Flood Protection Program Bases Document, Rev. 0
Calculation CDQ0003032013000129, Documentation of NTTF 2.3 Flooding Walkdown Available Physical Margin, Rev. 0
Calculation CDQ004020040239, BFN Site Drainage Analysis, Rev. 7
Daily Outage report for Unit 3 Refueling Outage 16 dated February 20, 2014
DWG 3-41N590-1, Concrete Floors and Walls Outline, Rev. 0
DWG 3-47W587-1, Mechanical Drains & Embedded Piping, Rev. 3
EPI-0-000-FRZ001, Freeze Protection Program for RHRSW pump rooms and Emergency Diesel Generator (EDG) Building, Rev 20
EPI-0-000-FRZ003, Freeze Protection Program for Miscellaneous Yard Areas, Buildings, and Systems, Rev 25
Freeze Protection Inspection Appendix B updated as of January 22, 2014
Freeze Protection Inspection Attachment 4 dated January 22, 2014
Freeze Protection Inspection Attachment 8 dated January 22, 2014
LER 259/260/296-2013-001-01, Latent Design Input Inconsistencies Adversely Affect Probable Maximum Flood Analysis
MPI-0-000-INS001, Inspection of Flood Protection Devices, Rev. 15
MPI-0-260-DRS001, Inspection and Maintenance of Doors, Rev. 44
NPG-SPP-09.22, External Flood Protection, Rev. 1
Outage Risk Contingency Plan for Unit 3 due to inclement weather dated February 5, 2014
PER 799986, Diesel Generator Building Roofs Drains Clogged
PER 834519, Improvements Needed to 0-TI-599
PER 859424, External Flooding Improvements Needed to 0-AOI-100-3
Plan of the Day dated February 20, 2014
Risk assessment for Units 1, 2, and 3 dated February 20, 2014
SR 829083 EDG "C" Emergency Equipment Cooling Water (EECW) Temperature Low
SR 829354 NRC Identified-Ice on EECW piping in "D" Residual Heat Removal (RHR) service water room due to cold weather
SR 836261 Security Diesel Generator not covered by Freeze Protection Inspection procedure
SR 853767, NTTF 2.3 – Flood Walkdowns – U1, 2, 3 Flood Wall Small Margin
System Code FZ Discrepancy WO List dated January 22, 2014
Technical Requirements Manual, TR 3.3.6, Flood Protection Instrumentation, Rev. 0
UFSAR, Appendix 2.4A, Probable Maximum Flood (PMF), Amendment 25
UFSAR, Section 12.2, Principal Structures and Foundations, Amendment 25.1
UFSAR, Section 2.4, Hydrology, Water Quality, and Aquatic Biology, Amendment 25

Section 1R04: Equipment Alignment

0-GOI-200-1, Freeze Protection Inspection, Rev. 77
0-OI-18 Fuel Oil System, Rev 0054
0-OI-57A, Switchyard and 4160V AC Electrical System, Rev. 149
0-OI-57B/ATT-2C, 480V/240V AC Electrical System Panel Lineup Checklist, Unit 3, Rev. 179

0-OI-72, Auxiliary Decay Heat Removal System, Rev. 57
 0-OI-72/ATT-1, Auxiliary Decay Heat Removal System Valve Lineup Checklist, Rev. 55
 0-SR-3.6.4.3.4 SBGT System Decay Heat Discharge Damper Position Verification, Rev 6
 0-SR-3.8.3.3 Quarterly Fuel-Oil Quality Determination of Unit 0 Diesel Generator's 7-Day Storage Tank Supply, Rev 12
 0-TI-158 Representative/Bottom Sampling of the Diesel Generator 7-Day Tank Fuel Oil, Rev 25
 1-OI-74 RHR, Rev. 87
 1-OI-74/ATT-1 RHR valve lineup checklist, Rev. 77
 1-OI-74/ATT-3 RHR electrical lineup checklist, Rev. 77
 3-OI-74, Residual Heat Removal System, Rev. 114
 3-OI-74/ATT-3, Electrical Lineup Checklist, Rev. 90
 ACE for PER 562958
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 Browns Ferry UFSAR Appendix O
 Calculation NDQ 0999920011 Seismic Class I System Piping Boundaries, Rev 060
 CI-130 Diesel Fuel Oil Testing and Monitoring Program, Rev 0029
 Commitment Number NCO040006062, One time inspection of Emergency Diesel Generator (EDG) Tank wall thickness
 Corrective action status for PER 822199
 DWG 0-47E873-1, Flow Diagram Aux Decay Heat Removal System, Rev. 8
 DWG 0-47E873-2, Flow Diagram Aux Decay Heat Removal System, Rev. 7
 DWG 0-47W310-5 Mechanical Tanks (EDG 7 day tank), Rev 0000
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 DWG 1-47E1027-6
 DWG 1-47E1027-7
 DWG 1-47E1027-8
 DWG 1-48E1027-1
 DWG 1-48E1027-2
 DWG 1-48E1027-4
 EDG 7 day tank inspection results for EDG "A" dated June 11, 2008
 FSAR chapter 4.8, RHR system
 FSAR chapter 6.4 Low Pressure Coolant Injection system
 FSAR Section 5.3 Secondary Containment System
 PER 146665 Acceptance of Seven-Day Tank Weld Joint Underfill Area dated July 7, 2008
 PER 207876 Diesel Generator System - Re-status to Maintenance Rule a(1) status
 PER 562958 EDG Lube Oil Consumption Degraded Condition
 PER 577448 EDG degraded lube oil systems
 PER 604603 EDG heat exchanger cleaning required
 PER 819501 EDG lube oil modification has created multiple issues
 PER 822199 Unit 1 and 2 "A" Diesel Generator fuel oil leak - additional info on failure mode available
 PER 822199 Unit 1 and 2 EDG "A" fuel oil leak
 PER 830862 1B RHR pump suction piping anchor frame held down with less than full thread engagement
 PER 834196 Failure of inlet damper to close during Standby Gas Treatment (SBGT) train "B" post maintenance testing

PER 853149, External Space Heater at ADHR Unplugged During Cold Temperatures
 Root Cause for PER 822199
 Prompt Determination of Operability (PDO) for PER 830862
 Purchase documentation for EDG 7 day tanks dated October 8, 1969
 Technical Specification 3.6.4.3 SBTG
 WO 06-717598-000 Inspection of EDG "A" 7 day tank
 WO 115445036 Failure of inlet damper to close during B SBTG testing

Section 1R05: Fire Protection

Browns Ferry Nuclear Plant Fire Protection Report, Volume 1, Revs. 16, 18
 Browns Ferry Nuclear Plant Fire Protection Report, Volume 1A, Rev 16
 Browns Ferry Nuclear Plant Fire Protection Report, Volume 2, Revs. 51, 52
 Fire Protection Impairment Permit 13-4171
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 NPG-SPP-18.4.6, Control of Fire Protection Impairments, Rev. 4
 NPG-SPP-18.4.7, Control of Transient Combustibles, Rev. 5
 PER 783950, Question on 3EA 4kV Shutdown Board Room
 PER 855194, Identified Items Unattended
 PER 857141, Door 811 Was Found Half Open
 SR 855304, Door 824 Electronic Hold Device Not Working Properly
 WO 115592369, Door 824 Electronic Hold Device Not Working Properly

Section 1R06: Flooding Protection

Browns Ferry PM 67718 Evaluation for Sump Pump Check for Handholes 15 and 26
 Browns Ferry Preventative Maintenance (PM) 500103184 Operability Check for Manholes,
 Valve Pits and Tunnels
 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 Environmental Qualification Requirements Program
 NCO 040006053 Inaccessible Medium Voltage Cables not subject to 10 CFR 50.49
 commitment dated July 30, 2011
 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
 Manhole 26, Rev 0
 PER 836589 Water and Silt found in cable vaults on the East side of the Building
 TVA Electrical Design Guide DG-E13.1.5 Manhole and Hand Hole 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
 Trays and Boxes, Rev 17

Section 1R07: Heat Sink Performance

Corrective Action Documents

PER 370714, Possible through wall leak, dated 5/17/2013
 PER 721623, Trend in EECW through wall leaks, dated 05/03/2013
 PER 776627, NRC identified leak on 3D diesel generator, dated 09/06/2013
 Root Cause Analysis Report for PER 750848, Heat Exchangers for the RHR and EDG Systems
 Experience Persistent Fouling, Rev. 01
 SR 830162, U1/2 Emergency Condensing Unit Flow Testing, NRC identified, dated 1/8/2014

Drawings

DWG 1-47E859-1-ISI, ISI Boundary Drawing, Rev. 12

Procedures

0-GOI-200-1, Freeze Protection Inspection, Rev. 76
 0-OI-31, Control Bay and Off-Gas Treatment Building Air Conditioning System, Rev. 142
 0-TI-154, Coupons and Monitoring for Corrosion Deposit Control, Rev. 09
 0-TI-389, Raw Water Fouling and Corrosion Control, Rev. 17
 0-TI-522, Program for Implementing Generic Letter 89-13, Rev. 03
 0-TI-561, Underground Piping and Tanks Integrity Program (UPTI), Rev. 14
 0-TI-562, RHRSW Pump Pit Inspection Recommendations, Rev. 02
 0-TI-611, Monitoring Program for Carbon Steel Subject to Raw Uncontrolled Water, Rev. 00
 0-TI-616, Aging Management Program Basis Document Open-Cycle Cooling Water System
 Program, Rev. 00
 1-SI-3.2.4, EECW Check Valve Test, Rev. 28
 CHTP-108, Technical Chemistry Standards for SPP-9.7, Rev. 06
 CI-137, Raw Water Chemical Treatment, Rev. 21
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 EPI-0-000-FRZ001, Freeze Protection Program for RHRSW Pump Rooms, Rev. 20
 NPG-SPP-09.7, Corrosion Control Program, Rev. 05
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Other Documents

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 BFN-50-7067, Emergency Equipment Cooling Water System, Rev. 19
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 FSAR Section 10.12.5.3 - Control Building HVAC, Rev. 24
 L44-900316-801, Browns Ferry Nuclear Plant (BFN) – Response to Generic Letter (GL) 89-13
 Service Water System Problems Affecting Safety-Related Equipment
 PM # 500102030, Unit 1 and 2 Emergency Condensing Unit Inspect and Clean Tubes, Rev. 2
 WO 113535959, DCN 69265 Cut Opening in RHRSW Pump Room Floor

Section 1R08: Inservice Inspection (ISI) Activities (71111.08G, Unit 3)Corrective Action Documents

PER 538810, RESTART NOI U3RF15-002: Reactor Pressure Vessel (RPV) Head material deformation due to foreign object, dated 4/19/2012
 PER 697608, U2 RHR DRPUMP A DISCH SOV bonnet bolts rust, dated 3/18/2013
 PER 718311, Torus Exterior Coating and surface deficiencies, dated 4/27/2013
 PER 744065, MCI-0-000-HEX001 references incorrect procedure, dated 6/21/2013
 PER 779993, 3C RHRSW inlet piping leakage, dated 9/15/2013

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WPS 08-08-TS-001, Welding Procedure Specification, Rev. 6
 WPS-01-01-T-304, Welding Procedure Specification, Rev. 1
 N-UT-76, Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds, Rev. 09
 N-MT-6, Magnetic Particle Examination for ASME and ANSI Code Components and Welds, Rev. 34
 N-UT-64, Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds, Rev. 13
 ISwT-PDI-AUT5, Automated Inside Surface Ultrasonic Examination of Pressure Vessel Welds Using Phased Array, Rev. 01
 54-ISI-363-007, Remote Underwater In-Vessel Visual Inspection of Reactor Pressure Vessel Internals, Components, and Associated Repairs in Boiling Water Reactors, Rev. 07
 GT-SM11-0-1-N, G-29 Detailed Welding Procedure Specifications ASME/ANSI – GWPS 1.M.1.2, Rev. 01
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 PDI-UT-1, Generic Procedure for the UT Examination of Ferritic Pipe Welds, Rev. E

Other Documents

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 Areva Inc., NDE Certificates of Qualification
 Welding Services Inc. (WSI), ASME Section IX Welder Performance Qualifications
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 TVA Inspection Services (ISO) Certificate of Method Qualification
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 Carbon Steel Sizing Block Certification for S/N SQ-115, dated May 14, 2002
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 Certificate of Calibration for USN 60 S/N 0132M9, dated August 14, 2013
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Section 1R11: Licensed Operator Requalification

NP-REP, Tennessee Valley Authority Nuclear Power Radiological Emergency Plan, revision 100

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0-TI-346, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting – 10CFR50.65, Rev. 46

Maintenance Rule 9th Periodic Report (January 2012 to December 2013), Rev 0
NUMARC 93-01, Rev 4A

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

2/20-21/2014, Operators Daily Logs and EOOS Profiles

2/20-21/2014, Plan of the Day

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BFN-ODM-4.18, Protected Equipment, Rev. 16

NPG-SPP-07.2.11, Shutdown Risk Management, Rev. 4

NPG-SPP-09.11.1, Equipment Out of Service Management, Rev. 9

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PER 849393, ORAM Risk Change

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Section 1R15: Operability Evaluations

50.59 Applicability Determination screening for 3-FCV-73-35 actuator non-locking gearing.

Browns Ferry PM 67718 Evaluation for Sump Pump Check for Handholes 15 and 26

Browns Ferry Preventative Maintenance (PM) 500103184 Operability Check for Manholes, Valve Pits and Tunnels

Calculation MDQ0999910034 NRC Generic Letter 89-10 Motor Operated Valve Evaluation, Rev 17

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DWG 1-48E1027-1

DWG 1-48E1027-2

DWG 1-48E1027-4

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

50.49 Environmental Qualification Requirements Program

FSAR chapter 4.8, RHR system

FSAR chapter 6.4 Low Pressure Coolant Injection system

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 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 Manhole 26, Rev 0
 PER 734067, 3A EDG has Lube Oil Seeping from Base of Diesel
 PER 786196, Oil on Floor beneath 3A Diesel Generator Platform
 PER 808811, PDO Request for PER 786196
 PER 830862 1B RHR pump suction piping anchor frame held down with less than full thread engagement
 PER 836589 Water and Silt found in cable vaults on the East side of the Building
 Prompt Determination of Operability (PDO) for PER 830862
 TVA Electrical Design Guide DG-E13.1.5 Manhole and Hand Hole Systems, Rev 2
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 PER 809225, Approximately 5 Oz of Fuel Oil on EDG 3A
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 PER 856517 Lost In-Service Testing (IST) data for 3-CKV-75-580A
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 UFSAR Chapter 6 Emergency Core Cooling Systems
 WO 05-719895-001 Diagnostic testing of 3-FCV-69-0001
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 NPG-SPP-9.3, Plant Modifications and Engineering Change Control;
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 3-SR-3.5.1.8, HPCI Main and Booster Pump Set Developed Head and Flow Rate Test at 150 psig Reactor Pressure, Rev. 15
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 3-SR-3.8.1.9(3A), Diesel Generator 3A Emergency Load Acceptance Test, Rev. 21
 DCN 70835 Install Bypass Switches to Allow Manual Opening of RHR Injection Valves in LPCI Mode in Case of Fire Damage to Control Circuits, Rev A
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 Past Operability Evaluation for PER 847155
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 PER 855023, 3A1 Drywell Blower Failed to Trip During Load Acceptance Test
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 WO 113417607, Verify No Leaks at System Pressure
 WO 114216412, Verify No Leaks at System Pressure
 WO 114691503, ASME Section XI Pressure Test (3-SI.3.3.1.A)
 WO 114694064, DW Spray Header Air Test
 WO 114694094, Torus Nozzle Test
 WO 114695074, 3-SR-3.5.1.8, HPCI 150# Test
 WO 114709808, System Leak Check
 WO 114751440, External Leak Check
 WO 114838764, Room Cooler Thermostat Functional Test
 WO 114844199, Monthly Valve Verification
 WO 114972729, HFA relay K23A
 WO 115070004, 3-SI-3.2.74(SDC) AS-LEFT – Pressure Isolation Valve Leakage Test of RHR Shutdown Cooling Valves
 WO 115121401, PMTI-70835-005 Testing of BFN-3-HS-074-0180, RHR Sys I Injection Valve Override Switch, Rev 0
 WO 115192618, Quarterly RHR System Rated Flow Test - Loop I
 WO 115500202, 1A RPS Transfer Switch Failed to Close to RPS MG Set
 WO 115500202, Attachment A, WO Instructions, BFN-1-XS-099-001A, Replace Aux Contact
 WO 115512491, PMT Switch
 WO 115512492, PMT Switch
 WO 115525836 (Task 20), Modified LAT 3-SR-3.8.1.9(3A) for DG 3A, Revs. C, D
 WO 115525836, Breakers Failed to Trip During Load Acceptance Test for DG 3A
 WO 115583193, 3A1 Drywell Blower Failed to Trip During Load Acceptance Test

Section 1R20: Outage

10 CFR 26 Subpart I Managing Fatigue
 3-AOI-100-1, Reactor Scram, Rev. 62
 3-GOI-100-12A Unit Shutdown from Power Operations to Cold Shutdown and Reductions in Power During Power Operations, Rev 0057
 3-POI-200.5 Operations with Potential for Draining the Reactor Vessel/Cavity, Rev 13
 Clearance Tagout 3-075-0004, Core Spray Pump 3D
 Clearance Tagout 3-211-0001A, 3EA Shutdown Board
 Clearance Tagout 3-211-0001B, 3EA Shutdown Board
 Daily Outage Reports dated February 14, 2014 through March 20, 2014
 EGM 11-003, Enforcement Guidance Memorandum for Boiling Water Reactor Operations with Potential for Draining the Reactor Vessel (OPDRV), Rev 1
 NPG-SPP-03.21 Fatigue Management and Work Hour Limits, Rev 14
 NPG-SPP-09.11.1 Equipment Out of Service Management, Rev 9
 PER 857707, Reactor building crane trip
 TVA routing of RIS 2012-09 Endorsement of NEI guidance for use of Alternative Method to Manage Cumulative Fatigue dated August 14, 2012
 WO 114699809, 3-SR-3.4.9.1(1) Reactor Heatup or Cooldown Rate Monitoring
 Work schedules for Operators, Reactor Physics technicians, and maintenance personnel performing covered work under 10 CFR 26 between 2/14/2014 and 3/20/2014

Section 1R22: Routine Surveillance

0-TI-106, General Leak Rate Test Procedure (3-FCV-71-2 & 3 flowpath)
 0-TI-298, Diesel Generator Operating Data Acquisition
 0-TI-360, Containment Leak Rate program, Rev. 37
 3-SR-3.3.1.1.12, Reactor Protection System Mode Switch in Shutdown Scram and Logic
 3-SR-3.3.6.1.6 (Group 1), Group 1 PCIS Logic, revision 10
 3-SR-3.6.1.3.10 (A) and (B), Primary Containment Local Leak Rate Test Main Steam Line A (and B), revision 10
 3-SR-3.8.1.9(3B OL) 3B EDG Emergency Load Acceptance Test with Unit 3 Operating
 Calculation MDQ0999910034 NRC Generic Letter 89-10 Motor Operated Valve Evaluation, Rev 17
 Calculation MDQ3069920391 MOV 3-FCV-69-0001 Operator Requirements and Capabilities, Rev 6
 DWG 0-47E610-77-1 Radwaste Mechanical Control System
 Figure 4.10.1 of FSAR Drywell Leakage Detection System
 FSAR chapter 4.10 Drywell Leakage Detection System
 FSAR chapter 6.2, 6.3
 Mechanical Design Standard DS-M18.2.22 MOV Design Basis and Joint Owners Group (JOG) Review Methodologies, Rev 5
 NETP-115, Motor Operated Valves (MOV) Program, Rev 6
 SR834131 Inboard bearing gage on Unit 1 HPCI has low oil level
 SR834417 Flow totalizer failed to read out in tenths
 SR834432 Procedure change request for MSI-0-079-DCS300.5 Rev 4
 System Functional Test, Rev. 16
 Unit 3 Technical Specification 3.3.5.2, RCIC System Instrumentation
 Unit 3 Technical Specification 3.4.9, Reactor Coolant System Pressure and Temperature Limits

Unit 3 Technical Specification 3.5.3, RCIC System
 WO 05-719895-001 Diagnostic testing of 3-FCV-69-0001
 WO 114221545,
 WO 114691746, 3-SR-3.3.1.1.12 – RPS Mode Switch in Shutdown Scram and Logic System
 Functional Test
 WO 114693561 Reactor Core Isolation Cooling (RCIC) System Logic Functional Test Rev. 0016
 WO 114699809, 3-SR-3.4.9.1(1) Reactor Heatup or Cooldown Rate Monitoring
 WO 114783055 1-SR-3.4.5.3, Drywell floor drain sump flow monitoring system calibration
 WO 114787409 1-SR-3.5.1.7 HPCI flow rate test at rated Reactor Pressure

Section 1EP6: Drill Evaluation

BFN SAMG Training Drill, Controllers Package, dated February 5, 2014, Rev. 1
 CRP-EP-S-14-002, Snap Shot Self-Assessment BFN Feb. REP Training Drill
 Browns Ferry Drill Report dated February 21, 2014
 PER 848571 (SR 847574) Communications Issues Identified During the Drill

Section 2RS1: Radiological Hazard Assessment and Exposure Control

Procedures, Guidance Documents, and Manuals

NPG-SPP-22.300, Corrective Action Program, Rev. 0
 RCI-1.1, Radiation Operations Program Implementation, Rev. 158
 RCI-1.2, Radiation, Contamination and Airborne Surveys, Rev. 22
 RCI-17, Control of High Radiation Areas and Very High Radiation Areas, Rev. 76
 RCI-26, Radiation Protection Department Standards and Expectations, Rev. 22
 RCI-33, Diving Operations on the Refuel Floor, Rev. 9
 RCI-34, Remote Monitoring, Rev. 15
 RCI-43, Radioactive Material Control, Rev. 4
 RCI-46, Radiation Protection Department Outage Preparation, Rev. 4
 RCI-47, Diving Operations in the Radiologically Controlled Area, Rev. 1
 RCI-9.1, Radiation Work Permits, Rev. 73
 RCI-40.0, RP Actions for Operation's Unit 0 (Common) Procedural Hold Points, Rev. 22
 RCI-40.1, RP Actions for Operation's Unit 1 Procedural Hold Points, Rev. 31
 Browns Ferry Technical Specification 5.7 Administrative Controls-High Radiation Area

Records and Data

0-TI-540, Storage of Material in the spent Fuel Storage Pool (SFSP) and Transfer Canal
 (U1/U2), Rev. 3
 (Annual Inventory Of Non-Fuel SNM and Other Items (Trash) In Unit 1, 2 And 3 Spent Fuel
 Pools Performed 7/9-16/2013.)
 NSTS Confirmation Form 2014 Annual Inventory Reconciliation [Browns Ferry 1 AmBe Source],
 Dated 1/21/2014
 NSTS Confirmation Form 2014 Annual Inventory Reconciliation [Browns Ferry 3 Cs-137
 Sources], Dated 1/21/2014
 Nonexempt Byproduct and Source Material Source List, 2/7/2014

Radiation Work Permits

RWP 1438-0408, Unit 3 -3R16 Outage Drywell: CRD Exchange Activities, Rev. 1

Radiation Surveys

Survey M-20140226-26, CRD Assembly, 2/26/2014
 Survey M-20140225-28, CRD Assembly, 2/25/2014
 Survey M-20140214-27, Turbine Room Down post Survey at 42% Power, 2/14/2014
 Survey M-20140226-14, Unit 3 Turbine 617 General Area, 2/26/2014
 Survey M-20131220-7, Unit 3 TB 586' -634' Quarterly Routine Survey, 12/20/2013
 Survey M-20140222-8, Unit 2 TB 586'-634' Quarterly Routine Survey, 2/22/2014
 Survey M-20131030-12, Unit 2 TB 557' Condenser Bay, 10/30/13
 Survey M-20131209-14, Quarterly Routine of U2 TB 535'-575'(Condenser Bay), 12/9/2013
 Survey M-20140215-6, Quarterly Routine of U2 TB 535'-575'(Condenser Bay), 2/14/2014
 Survey M-20140111-7, Unit 1 RXB 565' General Area, 1/11/2014
 Survey M-20140213-1, Unit 2 RXB 565' General Area, 2/13/2014
 Survey M-20140225-15, U3 RXB 565' DW Bullpen/RCA Survey, 2/25/2014
 Survey 14-20064, Air Sample Data for 2/19/2014
 Survey 14-20057, Air Sample Data for 2/17/2014 to include isotopic analysis on sample from airborne tent where turbine diaphragms were being blasted.
 Job coverage surveys associated with Rad Waste Building Decon to include airborne radioactivity and elevation radiation and contamination levels.

Corrective Action Program (CAP) Documents

PERs 719126
 PER 712688
 PER 719126
 PER 752526
 PER 767683
 PER 768877
 PER 769629
 PER 791326
 PER 825355

Section 2RS6: Radioactive Gaseous and Liquid Effluent TreatmentRecords

0-SI-4.8.A.1-1, Liquid Effluent Permit (Work Order 1155165930, 2/12/2014
 Batch Liquid Effluent Permit 140001.006.001L, 2/12/2014
 Clearance Coversheet Tagout: 3 TO 2013-001 Clearance: 3-077-0012 Component: 3FCV-077-0061 Rad Waste Discharge Valve Unit 3 Discharge Conduit. 2/27/2014
 PER 849316 Rad Waste river release performed through inoperable 3-FCV-077-0061
 Browns Ferry Technical Specification 5.5.4 Administrative Controls- Radioactive Effluent Control Program
 Browns Ferry Off-Site Dose Calculation Manual Sections 1.1 and 2.1

Section 2RS8: Radioactive Material Processing and TransportationProcedures, Manuals, and Guides

Energy Solutions Procedure, SD-OP-091, "Operating Procedure for Energy Solutions Multi-Size Battery Operated Remote Controlled Liner Grapple, Rev. 7
 Energy Solutions Cask Book for Model CNS 8-120, Rev. 22
 NPG-SPP-05.9.1, "Radioactive Waste Shipments", Rev. 0000
 0-OI-77E, "Solid Radwaste", Rev 0046

Radioactive Material Shipment Manual (RMSM), Volume II, Rev. 42
 RWI-001, "Administration of the Radioactive Material and Radwaste Packaging and Transportation Program", Rev 9
 RCI-43, "Radioactive Material Control", Rev 0004
 RWTP-100, "Radioactive Material/Waste Shipments", Rev. 0007
 RWTP-101, "10 CFR 61 Waste Characterization", Rev. 0002
 RCDP-1 Rev 0005, "Conduct of Radiological Controls, Rev 0005
 RWI-111, "Storage of Radioactive Waste and Materials", Rev. 19
 RWI-112, "Container Markings", Rev. 2
 RWI-156, "Packaging Radioactive Material and Radioactive Waste, Rev. 0001
 0-OI-77E, "Solid Radwaste", Rev 0046
 0-PCP-001, "Process Control Program Manual (PCP)", Rev. 4
 NPG-SPP-22.300, "Corrective Action Program", Rev.0
 NPG-SPP-22.301, "Service Request Initiation", Rev. 0001

Shipping Records and Radwaste Data

10CFR71.95 Report of Non-Compliance with Certificate of Compliance #9168 – Cask 8-120, Dated 10/13/2013
 Certificate of Compliance No. 9168 for the Model No. 8-120B, 5/25/12
 Certificate of Compliance No. 9204 for the Model No. 10-160B, 5/25/12
 Inventory of Radioactive Material Stored in LLRW, Dated 09/13/2013
 List of Radioactive Material Storage Areas [Spreadsheet]
 Liquid Radwaste System (System 077) Health Status Report, Dated 02/27/2014
 Shipper Training Certifications to, "NRC/DOT Radioactive Waste Packaging, Transportation and Disposal Training", for BFN Shippers, Completed 09/12/2013
 Radioactive Material Shipping logs for the period 01/01/2014 to 2/26/2014
 Radiological Survey M-20140225-11, Pre-Shipment Survey on 2 Sealand Container #RB156 and RB048
 Radiological Survey M-20140224-32, Pre-Shipment of 20' Sealand RB156
 Radiological Survey M-20140223-24, Pre-Shipment of 4 Totes of Dirty Gloves.
 Radiological Survey M-20140223-14, Pre-Shipment of 20' OREX Sealand
 Flow Diagram Radwaste, Drawing No. 0-47E830-3
 Shipment 120814, Plant Waste (1 Metal Box), Low Specific Activity (LSA II)
 Shipment 130322, Spent Resin (1 Type A Shielded Cask), LSA II
 Shipment 130226, Spent Resin (1 Type A Shielded Cask), LSA II
 Shipment 140119, 8-120 HIC of TriNuc Filters for Shredding, Type A
 Shipment 140102, 8-120 HIC of TriNuc Filters for Shredding, Type A
 Shipment 140218, UN3321, Contaminated Clothing (1 Metal Box), Low Specific Activity (LSA II)
 Shipment 140219, 8-120 HIC of TriNuc Filters for Shredding, Type A
 10 CFR Part 61 Analyses, DAW 2013; CWPS 2013; RWCU 2013 and 2013 Thermex

CAP Documents

BFN-RP-S-14-001 Snapshot Self-Assessment Report, "Radiation Hazards and Transportation Inspection, Dated 11/21/2013
 PERs for Last 12 Month's Generated by Shippers, Dated 02/27/2014
 PER 629209
 PER 767000
 PER 769161

PER 778239
 PER 778747
 PER 782515
 PER 829472

Section 4OA1: Performance Indicator (PI) Verification

Browns Ferry Consolidated Data Entry Data inputs for first through fourth quarters of 2013
 Browns Ferry Daily Chemistry Logs January 1, 2013 through December 31, 2013
 NPG-SPP-02.2, Performance Indicator Program, Rev. 6
 RCI-39, Radiation Protection Cornerstones, Rev. 11

Records and Data Reviewed

Semiannual Radioactive Effluent Release Report -2014 Gaseous Effluents Summation of All releases, 1/1/2014 to 2/28/2014
 Semiannual Radioactive Effluent Release Report -2014 Liquid Effluents Summation of All releases, 1/1/2014 to 2/28/2014
 Semiannual Radioactive Effluent Release Report -2014 Doses to a member of the public due to liquid releases, 1/1/2014 to 2/28/2014
 Semiannual Radioactive Effluent Release Report -2014 Doses to a member of the public due to radioiodines, tritium, and particulates in gaseous releases, 1/1/2014 to 2/28/2014
 Semiannual Radioactive Effluent Release Report -2013 Gaseous Effluents Summation of All releases, 1/1/2013 to 6/30/2013
 Semiannual Radioactive Effluent Release Report -2013 Gaseous Effluents Summation of All releases, 7/1/2013 to 12/31/2013
 Semiannual Radioactive Effluent Release Report -2013 Liquid Effluents Summation of All releases, 1/1/2013 to 6/30/2013
 Semiannual Radioactive Effluent Release Report -2013 Liquid Effluents Summation of All releases, 7/1/2013 to 12/31/2013

Section 4OA3: Event Follow-up

LER 05000259/2010-004-01, Residual Heat Removal System Pump Motor Failure
 LER 05000259/2010-004-02, Residual Heat Removal System Pump Motor Failure
 LER 05000259/2011-008-01, High Vibrations on High Pressure Coolant Injection Booster Pump Thrust Bearings
 LER 05000259/2011-008-02, High Vibrations on High Pressure Coolant Injection Booster Pump Thrust Bearings
 LER 259, 260, 296/2011-003-02, Loss of Safety Function (SDC) Resulting from Emergency Diesel Generator Output Breaker Trip
 LER 259/2009-006-00, Inoperable High Pressure Coolant Injection (HPCI) Pump due to Emergency Core Cooling System Inverter Failure
 LER 259/2009-006-01, Inoperable High Pressure Coolant Injection (HPCI) Pump due to Emergency Core Cooling System Inverter Failure
 LER 259/2010-003-03, Failure of a Low Pressure Coolant Injection Flow Control Valve
 LER 259/2010-004-02, Residual Heat Removal Pump Motor Failure
 LER 05000260/2013-002-00, Unit 2 High Pressure Coolant Injection System Declared Inoperable Due to an Unqualified Electrical Splice
 NRC RG 1.89 Environmental Qualification of Certain Electrical Equipment important to Safety for Nuclear Power Plants

Past Operability Evaluation for PER 784586
PER 147337, PMF Generic Review
PER 158381, Errors in Codes Used for PMF
PER 200863, Unit 1 ECCS Div II Inverter Failure
PER 212253, Hydrology – Overtopping Dam Rating Curve Changes
PER 274840, 1C RHR Pump Trip
PER 378921, High Vibrations Identified on U1 HPCI Main and Booster Pump
PER 405165, HPCI Vibration Point in Alert
PER 408067, Unit 1 HPCI Booster Pump Outboard Bearings Found Installed Incorrectly
PER 568846, RCW Pump Bearing Failure Adverse Trend
PER 682212, Increase in PMF due to Dams Overtopping
PER 784586 Motor leads for 2-MVOP-073-0030 taped vs. Raychem spliced
QMDS MOV-003 DC Actuators Outside Containment Limitorque
RCA for PER 784586

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
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
RCW	-	Raw Cooling Water
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
UFSAR	-	Updated Final Safety Analysis Report
URI	-	unresolved item
WO	-	work order