



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

November 9, 2015

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

**SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION
REPORT 05000259/2015003, 05000260/2015003, AND 05000296/2015003**

Dear Mr. Shea:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Browns Ferry Nuclear Plant, Units 1, 2, and 3. On October 16, 2015, the NRC inspectors discussed the results of this inspection with Mr. S. Bono and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one finding which was determined to be of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

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

In addition, if you disagree with the 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, RII, and the NRC Senior Resident Inspector at Browns Ferry Nuclear Plant.

J. Shea

2

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Alan Blamey, Chief
Reactor Projects Branch 6
Division of Reactor Projects

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

Enclosure:
NRC Integrated Inspection Report
05000259/2015003, 05000260/2015003
and 05000296/2015003

cc w/encl. Distribution via ListServ

J. Shea

2

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Alan Blamey, Chief
Reactor Projects Branch 6
Division of Reactor Projects

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

Enclosure:
NRC Integrated Inspection Report
05000259/2015003, 05000260/2015003
and 05000296/2015003

cc w/encl. Distribution via ListServ

PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE
ADAMS: Yes ACCESSION NUMBER: ML15313A352 SUNSI REVIEW COMPLETE FORM 665 ATTACHED

OFFICE	RII:DRP	RII: DRP		RII:DRP	RII:DRP	RII:DRP	
SIGNATURE	Via Email/RA/DED	Via Email/RA/TAS4		Via Email/RA/ AMR4	CRK1	AJB3	
NAME	D. Dumbacher	T. Stephen		A. Ruh	C. Kontz	A. Blamey	
DATE	11/05/2015	11/05/2015		11/05/2015	11/5/2015	11/06/2015	11/ /2015
E-MAIL COPY?	YES NO	YES NO		YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: G:\DRPI\RPB6\BROWNS FERRY\REPORTS\2015\15-003\BFN IR 15-03 FINAL.DOCX

J. Shea

3

Letter to Joseph W. Shea from Alan Blamey dated November 9, 2015.

SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION
REPORT 05000259/2015003, 05000260/2015003, AND 05000296/2015003

Distribution w/encl:

D. Gamberoni, RII

L. Gibson, RII

OE Mail

RIDSNRRDIRS

PUBLIC

RidsNrrPMBrownsFerry Resource

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.: 05000259/2015003, 05000260/2015003, 05000296/2015003

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: July 1, 2015, through September 30, 2015

Inspectors: D. Dumbacher, Senior Resident Inspector
T. Stephen, Resident Inspector
A. Ruh, Resident Inspector

Approved by: Alan Blamey, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

05000259/2015003, 05000260/2015003, 05000296/2015003; Browns Ferry Nuclear Plant, Units 1, 2 and 3; Problem Identification and Resolution of Problems.

The report covered a three-month period of inspection by resident inspectors. One NRC identified violation was identified. The significance of inspection findings are indicated by their color (i.e. Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP) dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Components Within the Cross Cutting Areas" dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. An NRC identified NCV of 10 CFR Part 50, Appendix B, Criterion XVI was identified for the licensee's failure to establish measures to promptly identify a condition adverse to quality involving the malfunction of the High Pressure Coolant Injection (HPCI) turbine exhaust system. Upon discovery of the malfunction, the licensee took action to determine that HPCI remained operable despite the degraded and nonconforming condition. The licensee is developing corrective actions to resolve the degraded and nonconforming condition. The licensee entered the violation into the licensee's corrective action program as CR 1098320.

The performance deficiency was more-than-minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the performance deficiency resulted in the HPCI system being operated with an unidentified degraded/non-conforming condition which degraded the system capability and challenged system operability. The inspectors determined the finding was Green because the finding was a deficiency affecting the qualification of HPCI, but based on the licensee's evaluations, operability was maintained. The inspectors determined that the finding had a cross-cutting aspect in the Problem Identification and Resolution area of Evaluation [P.2], because the licensee did not thoroughly evaluate an abnormal system condition to ensure that resolutions addressed causes commensurate with their safety significance. (Section 40A2)

B. Licensee-Identified Violations

No findings were identified.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at 100 percent of rated thermal power (RTP) except for 5 unplanned downpowers and 3 planned downpowers. A July 14, 2015 unplanned downpower to 99 percent power was performed due to entry into LCO 3.0.3 (EN 51231). July 19, 2015 and July 28, 2015 unplanned downpowers to 95 percent power were performed to maintain vacuum in the main condenser. An August 29, 2015 unplanned downpower to 42 percent and an August 31, 2015 unplanned downpower to 38 percent power were performed due to tripping of the 1B recirculation pump. The 3 planned downpowers occurred on July 22, 2015, July 24, 2015, and September 11, 2015, for maintenance.

Unit 2 operated at 100 percent of RTP except for 2 unplanned and 3 planned downpowers. A July 14, 2015 unplanned downpower to 99 percent power was performed due to entry into LCO 3.0.3 (EN 51231). A September 21, 2015 downpower to 45 percent power was performed due to a bearing failure on the 2A Reactor Feed Pump Turbine (RFPT) while the 2B RFPT was out of service for repairs. The three planned downpowers occurred on August 20, 2015, August 21, 2015 and September 25, 2015, for maintenance.

Unit 3 operated at 100 percent of RTP except for 2 unplanned downpowers and 1 planned downpower. A July 14, 2015 unplanned downpower to 99 percent power was performed due to entry into LCO 3.0.3 (EN 51231). A July 19, 2015 unplanned downpower to 95 percent power was performed to maintain vacuum in the main condenser. The planned downpower occurred on August 28, 2015, for maintenance.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment (71111.04)

.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 subsystems were inoperable or out of service. The inspectors reviewed the functional systems descriptions, Updated Final Safety Analysis Report (UFSAR), system operating procedures, and Technical Specifications (TS) to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system. Documents reviewed are listed in the attachment. This activity constituted three Equipment Alignment Partial Walkdown inspection samples, as defined in Inspection Procedure 71111.04.

- Ultimate Heat Sink
- Unit 2 HPCI
- Unit 2 Reactor Core Isolation Cooling (RCIC) with focus on use of RCIC discharge cooling the oil cooler

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors completed a detailed alignment verification of the Unit 3 Spent Fuel Pool Cooling and Cleanup system.

Also, the relevant operating instruction, 0-OI-78 and several other licensee analyses were used to verify equipment availability and operability. The inspectors reviewed relevant portions of the Updated Final Safety Analysis Report (UFSAR) and TS. This detailed walkdown also verified electrical power alignment, the condition of applicable system instrumentation and controls, component labeling, pipe hangers and support installation, and associated support systems status. The inspectors examined applicable System Health Reports, open Work Orders (WOs), and any previous Problem Evaluation Reports (PERs) that could affect system alignment and operability. Documents reviewed are listed in the attachment. This activity constituted one Equipment Alignment Complete Walkdown inspection sample, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.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. Documents reviewed are listed in the attachment. This activity constituted five Fire Protection Walkdown inspection samples, as defined in Inspection Procedure 71111.05.

- Fire Area 3-1 Unit 3 Reactor Building, Elevation 519' – 565'
- Fire Area 22 Unit 3 Diesel Generator Building, Elevation 565.5' and 583.5', 4kv Shutdown Board Rooms 3EA and 3EB
- Fire Area 25-1, Common Unit Intake Pumping Station
- Fire Area 26, Radiological Waste Building
- Fire Area 26, Unit 1, Unit 2 and Unit 3 Turbine buildings

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

Internal Flooding

The inspectors reviewed related flood analysis documents and walked down the area listed below containing risk-significant structures, systems, and components susceptible to flooding. The inspectors verified that plant design features and plant procedures for flood mitigation were consistent with design requirements and internal flooding analysis assumptions. The inspectors also assessed the condition of flood protection barriers and drain systems. In addition, the inspectors verified the licensee was identifying and properly addressing issues using the corrective action program. Documents reviewed are listed in the attachment. This activity constituted one Internal Flooding inspection sample, as defined in Inspection Procedure 71111.06.

- Unit 1 A/C Equipment Room on elevation 606' of the Control Bay and Battery Room No. 1 on elevation 593' of the Control Bay

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification and Performance (71111.11)

.1 Licensed Operator Requalification

a. Inspection Scope

On August 3, 2015, the inspectors observed a licensed operator training session for an operating crew according to the Unit 2 Simulator Exercise Guide (SEG) OPL177(8).073, Power Reduction, Recirculation Pump Trip, Reactor Power Oscillations and Anticipated Transient Without SCRAM with Main Steam Isolation Valves open, Revision 0.

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 assess the performance of their licensed operators. The inspectors reviewed 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). Documents reviewed are listed in the attachment. This activity constituted one Observation of Requalification Activity inspection sample, as defined in Inspection Procedure 71111.11.

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, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine

a. Inspection Scope

The inspectors reviewed the specific structures, systems and components (SSC) within the scope of the Maintenance Rule (MR) (10CFR50.65) with regard to some or all of the following attributes, as applicable: (1) Appropriate work practices; (2) Identifying and addressing common cause failures; (3) Scoping in accordance with 10 CFR 50.65(b) of the MR; (4) Characterizing reliability issues for performance monitoring; (5) Tracking unavailability for performance monitoring; (6) Balancing reliability and unavailability; (7) Trending key parameters for condition monitoring; (8) System classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); (9) Appropriateness of performance criteria in accordance with 10 CFR 50.65(a)(2); and (10) Appropriateness and adequacy of 10 CFR 50.65 (a)(1) goals, monitoring and corrective actions. The inspectors compared the licensee's performance against site procedures. The inspectors reviewed, as applicable, work orders, surveillance records, PERs, system

health reports, engineering evaluations, and MR expert panel minutes; and attended MR expert panel meetings to verify that regulatory and procedural requirements were met. Documents reviewed are listed in the attachment. This activity constituted two Maintenance Effectiveness inspection samples, as defined in Inspection Procedure 71111.12.

- Valve 1-CHV-73-45, HPCI to Feedwater check valve history of leak by and high temperatures.
- 2A Reactor Feed Pump Turbine failure.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

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) and 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. Documents reviewed are listed in the attachment. This activity constituted five Maintenance Risk Assessment inspection samples, as defined in Inspection Procedure 71111.13.

- Elevated risk due to an extended out of service for 2-year preventative maintenance on 3A Emergency Diesel Generator on July 26, 2015
- Reviewed Risk management actions associated with out of service to 1A Residual Heat Removal (RHR) train on August 5, 2015
- Reviewed risk management actions associated with 3E Shutdown Board, 3 Emergency Diesel Generator and C Standby Gas Treatment inoperable on August 21, 2015
- Elevated trip risk due to major switchyard work making Bus 2 unavailable on August 18, 2015
- Elevated risk due to maintenance window for Unit 3 HPCI system on September 9, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessment (71111.15)

a. Inspection Scope

The inspectors reviewed the operability/functional evaluations listed below to verify technical adequacy and ensure that the licensee had adequately assessed TS operability. The inspectors reviewed applicable sections of the UFSAR to verify that the system or component remained available to perform its intended function. In addition, where appropriate, the inspectors reviewed licensee procedures to ensure that the licensee's evaluation met procedure requirements. Where applicable, inspectors examined the implementation of compensatory measures to verify that they achieved the intended purpose and that the measures were adequately controlled. The inspectors reviewed PERs on a daily basis to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the attachment. This activity constituted seven total Operability Evaluation inspection samples, one being an Operator Work Around inspection sample, as defined in Inspection Procedure 71111.15.

- Unit 1 HPCI Steamline Inboard Injection Valve 1-FCV-73-2 closing stroke time exceeded Inservice Test limit (CR 1061051)
- Unit 2 RCIC system oil leaks (CR 1043271 and 1048485)
- Unit 1, 2, and 3 Emergency Diesel Generator (EDG) crankcase explosion relief valves (CR 1075458)
- EDG B 7 day tank level gauge reading incorrectly (CR 1059820)
- Unit 3 HPCI evaluation of potential water cannon effects on turbine exhaust line (CR 1071880)
- Dried concrete density for the Holtec International Storage Module (HI-STORM) Flood and Wind (FW) casks was less than the required range (CR 1049026)
- HPCI Operator Work Around (OWA) for auxiliary oil pump running.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

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

data, to verify that test results adequately demonstrated restoration of the affected safety function(s). The inspectors verified that problems associated with PMTs were identified and entered into the Corrective Action Program (CAP). Documents reviewed are listed in the attachment. This activity constituted seven Post Maintenance Test inspection samples, as defined in Inspection Procedure 71111.19.

- WO 117004985 0-SI-4.5.C.1(B3-COMP) – Emergency Equipment Cooling Water (EECW) Pump B3 In Service Testing (IST) Comprehensive Pump Test
- WO 115623682 1-SR-3.5.1.6(CS II) – Core Spray Flow Rate Loop II
- WO 117081832 Replace 1-1/2 inch Residual Heat Removal Service Water (RHRSW) piping downstream of BFN-1-SHV-023-0571, ASME Code Class 3
- WO 117089401 3D 4kV shutdown board normal feeder breaker tripped
- WO 116624970 Laser and Tach speed checks on 3A EDG following maintenance to install balancing shims
- WOs 11666097,115638101 Unit 3 HPCI PMT following calibration and troubleshooting on valve 3-LCV-73-8
- WO 117156796 Unit 3 3D EDG skid to floor mounting bolt torque adjustment

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. 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. Documents reviewed are listed in the attachment. This activity constituted two Surveillance Testing inspection samples: one routine test, and one in-service test, as defined in Inspection Procedure 71111.22.

Routine Surveillance Test:

- 2-SR 3.5.3.3, RCIC System Rated Flow at Normal Operating Pressure (WO 115435510)

In-service Test:

- 2-SR-3.6.1.3.5(RCIC), RCIC System MOV Operability (WO 115435473 & 116965233)

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness (EP)

1EP6 Drill Evaluation (71114.06)

.1 EP Radiological Emergency Plan (REP) training drill

a. Inspection Scope

The inspectors observed an EP REP training drill that contributed to the licensee's Drill/Exercise Performance and Emergency Response Organization performance indicator (PI) measures on September 2, 2015. This drill was intended to identify any licensee weaknesses and deficiencies in classification, notification, dose assessment and protective action recommendation (PAR) development activities. The inspectors observed emergency response operations in the Technical Support Center (TSC) and the Operations Support Center (OSC) to verify that event classification and notifications were done in accordance with EPIP-1, Emergency Classification Procedure, and licensee conformance with other applicable Emergency Plan Implementing Procedures. The inspectors attended the post-drill critique 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. Documents reviewed are listed in the attachment. This activity constituted one EP evaluation inspection sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification (71151)

.1 Cornerstone: Mitigating Systems

a. Inspection Scope

The inspectors reviewed the licensee's procedures and methods for compiling and reporting the following PIs. The inspectors examined the licensee's PI data for the specific PIs listed below for the third quarter 2014 through second quarter of 2015. Additional data was also reviewed for the second quarter of 2014 for Safety System Functional Failures. The inspectors reviewed the licensee's data and graphical representations as reported to the NRC to verify that the data was correctly reported. The inspectors validated this data against relevant licensee records (e.g., PERs, Daily Operator Logs, Plan of the Day, Licensee Event Reports, etc.), and assessed any

reported problems regarding implementation of the PI program. The inspectors verified that the PI data was appropriately captured, calculated correctly, and discrepancies resolved. The inspectors used the Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, to ensure that industry reporting guidelines were appropriately applied. This activity constituted twelve PI inspection samples, as defined in Inspection Procedure 71151.

- Units 1, 2, and 3 Emergency AC power system
- Units 1, 2, and 3 Residual Heat Removal system
- Units 1, 2, and 3 Cooling Water systems
- Units 1, 2, and 3 Safety System Functional Failures

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution of Problems (71152)

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

a. Inspection Scope

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

b. Findings

1. Introduction: The NRC identified a Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XVI for the licensee's failure to establish measures to promptly identify a condition adverse to quality involving the malfunction of the HPCI turbine exhaust system. Specifically, on multiple occasions the licensee had indications of water entering the HPCI turbine casing following surveillance runs, but failed to recognize that the water intrusion was indicative of a degraded and nonconforming condition of the HPCI turbine exhaust system.

Description: On May 15th, 2014, September 15th, 2014 and March 12th, 2015, the licensee documented that the HPCI turbine casing needed to be manually drained following surveillance testing due to a high level alarm that would not clear. In each case, the actions of the annunciator response procedure were taken. This procedure required engineering to evaluate the condition; however, until March 12th, 2015, the amount of water drained from the turbine was not documented in order to support these evaluations. After the amount of water drained from the turbine was documented to be

an estimated 250 gallons, operators and engineering incorrectly evaluated the condition as being caused by water collecting due to abnormal amounts of steam condensation following turbine shutdown. It was later determined that exhaust steam condensation would only amount to approximately 1 gallon of water. Following questioning by the inspectors, the licensee performed additional troubleshooting on May 7th, 2015, which led to the discovery that 100 gallons of water were found in the turbine casing shortly following turbine shutdown. An engineering evaluation determined that the water was siphoned from the suppression pool due to the malfunction of the HPCI turbine exhaust system. Prior to the inspectors questioning, the licensee's actions were not sufficient to promptly identify the condition adverse to quality associated with the malfunctioning HPCI turbine exhaust system. On June 11th, 2015, following HPCI testing, the licensee discovered approximately that 190 gallons of water were present in the turbine casing upon turbine shutdown. Because the additional water was not within the bounds of a previous evaluation, the licensee declared the HPCI system inoperable between June 12th, 2015 and June 20th, 2015 while further analysis was being performed to evaluate system operation with approximately 190 gallons of water in the turbine casing.

The inspectors questioned the licensee on the potential of having a large volume of water in the HPCI turbine prior to turbine startup and whether the HPCI turbine exhaust piping would be subjected to water hammer forces that could render the equipment inoperable. With support from the system vendor, the licensee determined that potential water hammer forces would not be excessive, that system piping integrity would be maintained, that the turbine would not be damaged and that the turbine exhaust rupture discs would not be adversely affected. Based on these evaluations, the licensee concluded that, although degraded/non-conforming, the HPCI system maintained operability.

Analysis: The inspectors determined that the failure to promptly identify a condition adverse to quality associated with the HPCI turbine exhaust system, as required by 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, was a performance deficiency. Specifically, the licensee failed to identify that the HPCI turbine exhaust system was malfunctioning and causing water intrusion into the HPCI turbine casing following surveillance runs. The performance deficiency was more-than-minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the performance deficiency resulted in the HPCI system being operated with an unidentified degraded/non-conforming condition which degraded the system capability and challenged system operability. This finding was evaluated in accordance with NRC IMC 0609, Appendix A, Exhibit 2 "Mitigating Systems Screening Questions," dated June 19th, 2012. The inspectors determined the finding was Green because the finding was a deficiency affecting the qualification of HPCI, but based on the licensee's evaluations, operability was maintained. The inspectors determined that the finding had a cross-cutting aspect in the Problem Identification and Resolution area of Evaluation [P.2], because the licensee did not thoroughly evaluate an abnormal system condition to ensure that resolutions addressed causes commensurate with their safety significance.

Enforcement: 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, states, in part, that measures shall be established to assure that conditions adverse to quality, such as malfunctions, are promptly identified. Contrary to the above, from May 15th, 2014 to May 7th, 2015, the licensee failed to maintain measures to promptly identify that the HPCI turbine exhaust system was malfunctioning. Upon discovery of the malfunction, the licensee took action to determine that HPCI remained operable despite the degraded and nonconforming condition. The licensee is developing corrective actions to resolve the degraded and nonconforming condition. The licensee entered the violation into the licensee's corrective action program as CR 1098320. This violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. (NCV 05000296/2015003-01, Failure to Promptly Identify a Condition Adverse to Quality Associated with HPCI Turbine Exhaust System).

40A3 Follow-up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report (LER) 05000259/2015-002-00 High Pressure Coolant Injection System Inoperable Due to Slow Containment Isolation Valve Closing Time

a. Inspection Scope

On July 22, 2015, the licensee was performing a valve timing surveillance on the HPCI inboard steam isolation valve. The closure time for the valve was in the high alert range and the licensee was unable to analyze the stroke time deviation within the TS 3.6.1.3 Primary Containment Isolation Valves time limit of 4 hours. The TS LCO 3.6.1.3 required closing the inboard steam isolation valve rendering HPCI inoperable. The licensee has reported a safety system functional failure for the High Pressure Coolant Injection (HPCI) system from July 22, 2015 until July 25, 2015. The time HPCI was inoperable was within the Technical Specification allowed outage time. The inspectors reviewed the licensee's reports and the CAP documents for this issue.

b. Findings

No findings were identified. This licensee event report is closed.

.2 (Closed) Licensee Event Report (LER) 05000296/2015-004-00 High Pressure Coolant Injection System Inoperable Due to Failed Pressure Switch

a. Inspection Scope

On May 12, 2015, the licensee performed a Steam Line Low Pressure Functional Test on the Unit 3 HPCI steam supply line pressure switches. Due to a spurious actuation of one switch, while testing was being done on a second switch, a Primary Containment Isolation System (PCIS) Group 4 isolation of the HPCI system occurred. The isolation resulted in the inoperability of the HPCI system. Operations reset the system isolation 21 minutes later and declared HPCI operable. The licensee has reported a safety system functional failure for the High Pressure Coolant Injection (HPCI) system. The

time HPCI was inoperable was within the Technical Specification allowed outage time. The inspectors reviewed the licensee's reports and the CAP documents for this issue.

b. Findings

No findings were identified. This licensee event report is closed.

These activities constituted completion of two event follow-up samples, as defined in Inspection Procedure 71153. Documents reviewed are listed in the attachment.

4OA5 Other Activities

1. Temporary Instruction 2515/190 – Inspection of the Proposed Interim Actions Associated with Near-Term Task Force Recommendation 2.1 Flooding Hazard Evaluations

The inspectors completed a verification that the licensee's interim actions would perform their intended functions for some beyond design basis flooding events. The inspectors reviewed licensee responses to specific Office of Nuclear Reactor Regulation areas of interest. The inspectors walked down specific flood control measures for the Diesel Generator buildings and the Intake Pumping Station. The inspectors also reviewed controls for the following activities to ensure sufficient guidance is available to successfully complete the tasks.

- Reactor Water Clean Up (RWCU) system line break internal flooding analysis and mitigate actions
- Watertight door seal inspection and maintenance program for the Diesel Generator Buildings, Intake Pumping Station, and the Radiological Waste Building
- Unit 1, 2, and 3 Diesel Generator Buildings flood mitigation strategy and required manual actions
- Diesel Generator seven day tank fill connection seals
- Re-evaluation of the design basis Local Intense Precipitation (LIP) event and required actions to verify watertight doors closed
- Preventative maintenance program to maintain Radiological Waste Building and Diesel Generator Building drains

There were no finding identified, however the inspectors made the following observations which were acknowledged by the licensee. The licensee did not maintain any portable dewatering equipment. The licensee's procedures require the use of installed sump pumps to remove flood water. The licensee's flooding procedure focuses on a response to external flooding and not internal flooding. Inspection associated with this TI is complete, as defined in Inspection Procedure TI 2515/190.

.2 Operation of an Independent Spent Fuel Storage Installation (ISFSI) (60855.1)

a. Inspection Scope

The inspectors performed a walkdown of the onsite ISFSI and monitored the activities associated with the dry fuel storage campaign that is scheduled to be completed on October 23, 2015. The inspectors reviewed changes made to the ISFSI programs and procedures, including associated 10 CFR 72.48, "Changes, Tests, and Experiments," screens and evaluations to verify that changes made were consistent with the license or certificate of compliance. The inspectors observed the loading activities to verify that the licensee recorded and maintained the location of each fuel assembly placed in the ISFSI. The inspectors also reviewed surveillance records to verify that daily surveillance requirements were performed as required by technical specifications. Documents reviewed are listed in the attachment. This activity constituted one dry cask campaign inspection sample, as defined in Inspection Procedure 60855.1.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 16, 2015, the resident inspectors presented the quarterly inspection results to Mr. Steve Bono, 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.

ATTACHMENT: Supplementary Information

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Bono, Site Vice President
L. Hughes, General Plant Manager
P. Summers, Director of Safety and Licensing
J. Paul, Nuclear Site Licensing Manager
M. McAndrew, Manager of Operations
D. Campbell, Superintendent of Operations
L. Slizewski, Ops Shift Manager
M. Hunter, FIN Manager
M. Kirschenheiter, Assistant Director for Site Engineering
B. L. McCoy, Spent Fuel Storage Program Manager
M. Oliver, Licensing Engineer
E. Bates, Licensing Engineer
M. Acker, Licensing Engineer
M. Lawson, Radiation Protection Manager
J. Smith, System Engineer
P. Campbell, System Engineer
J. Kulisek, EP Manager
K. Skinner, System Engineer
L. Holland, System Engineer
D. Jackson, System Engineer
D. Ford, System Engineer

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000296/2015-003-01	NCV	Failure to Promptly Identify a Condition Adverse to Quality Associated with HPCI Turbine Exhaust System (Section 4OA2)
----------------------	-----	--

Closed

05000259/2015-002-00	LER	High Pressure Coolant Injection System Inoperable Due to Slow Containment Isolation Valve Closing Time (Section 4OA3.1)
----------------------	-----	---

05000296/2015-004-00	LER	High Pressure Coolant Injection System Inoperable Due to Failed Pressure Switch (Section 4OA3.2)
----------------------	-----	--

2515/190	TI	Inspection of Interim Actions of Near-Term Task Force Recommendation 2.1 Flooding Reevaluations (Section 4OA5.1)
----------	----	--

Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

0-GOI-300-1/ATT-5 Unit 1 Reactor Building Operator Logs, Rev 249
3-AOI-78-1, Fuel Pool Cleanup System Failure, Rev 23
3-ARP-9-3E, Panel 9-3 Alarm Response Procedure, Rev 30
3-ARP-9-4C, Panel 9-4 Alarm Response Procedure, Rev 36
3-OI-78, Fuel Pool Cleanup System Operation, Rev 60

Drawing

DWG 3-47E855-1 Unit 3 Spent Fuel Pool Cooling and Cleanup System, Rev 24

Other Documents

FSAR Section 10.3, Spent Fuel Storage, Amendment 25.3
FSAR Section 10.5, Fuel Pool Cooling and Cleanup System, Amendment 25.3
FSAR Section 14, Plant Safety Analysis, Amendment 25.3
OPL 171.052, Fuel Pool Cooling and Cleanup System (Operator Training Lesson Plan), Rev 13
TS 3.7.1 Basis, Amendment 254
TS 3.7.1 RHRSW system and Ultimate Heat Sink, Amendment 254
Ultimate Heat Sink bottom survey results from February 2008
Ultimate Heat Sink projected silt build up results from July 2015
Calculation CD-Q2078-881001 Pipe Stress Analysis for the Spent Fuel Pool Cooling and Cleanup System, Rev 3

Section 1R05: Fire Protection

Procedures

NPG-SPP 18.4.7 Control of Transient Combustibles, Rev 5
FP-0-000-INS001(C) Inspection of Portable and Wheel Type Fire Extinguisher Stations (CB, OB, SB, RW, & DG), Rev 19

Other documents

CR 1081912 NRC Identified Radwaste Fire Pre-Plan Issues
Fire Protection Report Volume 1, Rev 20
Fire Protection Report Volume 2, Rev 52

Section 1R06: Flooding Protection

Other documents

FSAR Section 10.12, Heating Ventilating and Air-Conditioning Systems, Amendment 22
FSAR Section 8.6, 250-V DC Power Supply and Distribution, Amendment 20
NDN-000-999-2007-0031 IF – BFN Probabilistic Risk Assessment – Internal Flooding Analysis, Rev 0

Section 1R11: Licensed Operator Regualification

Other documents

Unit 2 Simulator Exercise Guide (SEG) OPL177(8).073, Power Reduction, Recirculation Pump Trip, Reactor Power Oscillations and ATWS with MSIVs open, Revision 0

Section 1R12: Maintenance EffectivenessProcedure

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

Other documents

Condition Reports 944108, 333656, 1009788, 1002801, 568670 and 1038235 related to degraded conditions on 1, 2, and 3-CKV-73-45
 Condition Report Screening packages and Plant Screening Committee minutes from August 25, 2015 and September 14, 2015

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

NPG-SPP-09.11.1 Equipment Out of Service Management, Rev. 10
 NPG-SPP-07.3.4 Protected Equipment, Rev. 2

Other documents

eSOMS Action Tracking Status for Units 1, 2 and 3 on August 21, 2015
 eSOMS Narrative Logs dated August 21, 2015

Section 1R15: Operability EvaluationsDrawings

DWG 2-47E813-1 Unit 2 RCIC, Rev 59
 DWG 2-47E813-1 Unit 2 RCIC, Rev 59

Other documents

Certificate of Compliance for Spent Fuel Storage Casks number 1014, amendment July 15, 2002
 Core Operating Limits Report (COLR) for Unit 2 cycle 18
 CR 1043271 Unit 2 RCIC oil leaks
 CR 1048485 Unit 2 RCIC Turbine Governor End Oil Drain Temperature Element oil leak
 CR 1049026 HI-STORM lower than expected concrete density
 CR 1059820 EDG B level gauge reading incorrectly
 CR 1061051 PDO for 1-FCV-73-0002, HPCI Steamline Inboard Isolation Valve
 CR 1071880 PDO Addressed in CR#1039036 Inadequate
 CR 1075458 EDG crankcase explosion relief valves
 DCN 70980 ISFSI transition to HOLTEC HI-STORM FW cask system, Rev A
 EPRI TR-106438 Water Hammer Handbook for Nuclear Plant Engineers and Operators
 EWR 09-MEB-999-023 Mission Times for Various SSCs, Rev 3
 FSAR Section 4.7, RCIC, Amendment 25.3
 NRC ENS notification EN# 51250
 Past Operability Evaluation for CR 1048485
 Prompt Determination of Operability for CR 1043271
 WO 117000185 EDG B tank vent inspection

Section 1R19: Post Maintenance TestingOther documents

0-TI-449 NDE Matrix/Welding Engineering Guide, Rev 5
 CR 1072397 Through wall leak on RHRSW ASME Section XI code class 3 piping
 CR 1073157 3D 4kV shutdown board lost power during 3D RHR pump testing
 CR 1073350 60 dpm leak on 1D CS pump seal water piping discovered during Post Maintenance Testing
 CR 1073359 Procedure Change Request for the PMT for Unit 1 CS Loop II testing
 Operator logs for August 20, 2015
 WO 115623682 1-SR-3.5.1.6(CS II) Core Spray Flow Rate Loop II
 WO 115638101, HPCI surveillance run following maintenance.
 WO 116566153 Adequate EECW flow for 3A EDG
 WO 116566153 Verify adequate EECW flow through 3A Emergency Diesel
 WO 116624970 Disassemble and reassemble 3A Emergency Diesel per EPI-3-082-DGZ03A
 WO 116624970 Strobe and Laser Tach readings for 3A EDG
 WO 116643036 Perform leak check of all mechanical seals for 3A Emergency Diesel
 WO 116643036 Priming concerns for 3A EDG fuel oil pumps
 WO 116660977, Calibration and troubleshooting level switch and valve 3-LCV-008
 WO 116725839 3-SR-3.8.1.1 (3a) Monthly Operability
 WO 117081832 Replace 1-1/2 inch piping downstream of BFN-1-SHV-023-0571, ASME Code Class 3
 WO 117089401 3D 4kV shutdown board normal feeder breaker tripped
 WO 117156796 3D EDG skid to floor mounting bolt torque adjustment
 WO 1171568920 3-SR-3.8.1.1(3D) Diesel Generator 3D monthly operability test

Section 1R22: Routine SurveillanceOther documents

CR 1048914 Procedure error during RCIC MOV testing
 WO 115435510, 2-SR 3.5.3.3 RCIC System Rated Flow at Normal Operating Pressure
 WO 115435473, 2-SR-3.6.1.3.5(RCIC), RCIC System MOV Operability
 WO 116965233, 2-SR-3.6.1.3.5(RCIC), RCIC System MOV Operability

Section 1EP6: Drill EvaluationOther documents

Pre-job briefing for participants in the September 2, 2015 Emergency Preparedness Drill
 September 2, 2015 Emergency Preparedness Drill package
 Drill Report for the September 2, 2015 EP Training Drill, dated September 28, 2015

Section 4OA1: Performance Indicator (PI) VerificationOther documents

Emergency AC Performance Indicator Information from July 1, 2014 to June 30, 2015
 FAQ for NEI 99-02 Regulatory Assessment Performance Indicators as of September 1, 2015
 NEI 99-02 Regulatory Assessment Performance Indicator Guideline, Rev 7
 PER 660235
 PER 665217
 PER 990793

Section 4OA2: Identification and Resolution of ProblemsOther documents

CR 1025994 Level 2 Evaluation for Unit 3 HPCI Exhaust Drain Pot
 CR 1032843 CR to Track PDO Revision
 CR 1038747 U3 HPCI Drain Pot Full
 CR 1039036 Unit 3 HPCI Exhaust Water
 CR 1042150 Water Level Monitoring in Unit 3 HPCI Turbine Exhaust Line
 CR 1043410 Water Level Monitoring in Unit 3 HPCI Turbine Exhaust Line
 PER 1018316 NRC Identified Concern with HPCI Turbine Exhaust Drain Pot Levels
 PER 885945 HPCI Turbine Drain Pot Level High
 PER 933630 HPCI Turb Exhaust Drain Pot is Not Draining Through Normal Path
 PER 999196 U3 HPCI Possible Water Hammer Situation

Section 4OA3: Event Follow-upOther documents

CR 1024825 Unit 3 HPCI Isolation During Performance Testing
 CR 1061051
 CR 1061074
 EACE for CR 1024825
 LER 05000259/2015-002-00 HPCI Inoperable
 LER 05000296/2015-004-00 HPCI Inoperable Due to Failed Pressure Switch

Section 4OA5: Other ActivitiesProcedures

0-AOI-100-3 Flood Above Elevation 558', Rev 43
 0-AOI-100-9 Turbine Building Internal Flooding, Rev 1
 0-ARP-5-17A 0-LPNL-925-0017 Alarm Response Procedure, Rev 14
 0-GOI-300-1/ATT-13 Radwaste Building Tour and Turnover Checklist, Rev 213
 0-GOI-300-1/ATT-5 Unit 1 Reactor Building Operator Round Logs, Rev 250
 0-GOI-300-1/ATT-6 Unit 1 Turbine Building Operator Round Logs, Rev 241
 1-AOI-64-2a Group 3 Reactor Water Cleanup Isolation, Rev 2
 1-AOI-64-2B Group 4 High Pressure Coolant Injection Isolation, Rev 1
 1-AOI-64-2c Group 5 Reactor Core Isolation Cooling Isolation, Rev 1
 1-ARP-9-22B Panel 1-9-22 Alarm Response Procedure, Rev 17
 1-ARP-9-4C Panel 9-4 Alarm Response Procedure, Rev 26
 1-ARP-9-7C Panel 9-7 Alarm Response Procedure, Rev 27
 1-EOI-3 Secondary Containment Control Flow Chart, Rev 4
 CI-130 Diesel Fuel Oil Testing and Monitoring Program, Rev 32

Drawings

Drawing 0-47W585-1 EDG Building Embedded Piping Bill of Material
 Drawing 0-47W585-2 Mechanical Drains and Embedded Piping for the EDG Building, Rev 4

Other documents

Browns Ferry Letter to the NRC dated September 3, 2015 (ML 15240A183)
 Calculation CDQ000002014000249 Fukushima NTF Recommendation 2.1 Browns Ferry LIP Analysis, Rev 1
 Certificate of Compliance for ISFSI, amendment 5
 CFSAR for HI-STORM 100, Revision 7

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
CR	-	condition report
CRD	-	control rod drive
CS	-	core spray
DCN	-	design change notice
EECW	-	emergency equipment cooling water
EDG	-	emergency diesel generator
FE	-	functional evaluation
FPR	-	Fire Protection Report
FSAR	-	Final Safety Analysis Report
HPCI	-	high pressure coolant injection
IMC	-	Inspection Manual Chapter
LER	-	licensee event report
NCV	-	non-cited violation
NRC	-	U.S. Nuclear Regulatory Commission
ODCM	-	Off-Site Dose Calculation Manual
PER	-	problem evaluation report
PCIV	-	primary containment isolation valve
PI	-	performance indicator
RCE	-	Root Cause Evaluation
RCIC	-	reactor core isolation cooling
RCW	-	Raw Cooling Water
REMP	-	Radiological Environmental Monitoring Program
RG	-	Regulatory Guide
RHR	-	residual heat removal
RHRSW	-	residual heat removal service water
RTP	-	rated thermal power
RPS	-	reactor protection system
RWP	-	radiation work permit
SDP	-	significance determination process
SNM	-	special nuclear material
SR	-	service request
SSC	-	structure, system, or component
TI	-	Temporary Instruction
TS	-	Technical Specification(s)
UFSAR	-	Updated Final Safety Analysis Report
URI	-	unresolved item
WO	-	work order