



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

July 30, 2010

Mr. R. M. Krich
Vice President, Nuclear Licensing
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION
REPORT 05000259/2010003, 05000260/2010003, 05000296/2010003,
05000259/2010501, 05000260/2010501, 05000296/2010501, AND
07200052/2010002

Dear Mr. Krich:

On June 30, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Browns Ferry Nuclear Plant, Units 1, 2, and 3. The enclosed inspection report documents the inspection results which were discussed, on July 9, 2010, with Mr. Keith Polson and other members of your staff.

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

In addition to the routine Reactor Oversight Process (ROP) baseline inspections for all three units, the inspectors have continued to apply the Augmented Inspection Plan (AIP) on Unit 1 as delineated in NRC letters dated May 16, 2007, December 6, 2007, and May 21, 2008. The Unit 1 AIP was conducted to compensate for the lack of valid data for certain Performance Indicators (PI). These additional augmented baseline inspections were only considered to be an interim substitute for the invalid Unit 1 PIs until complete and accurate PI data was developed and declared valid. However, following the second quarter of 2010, all Unit 1 PIs will now have sufficient past data and operating experience to be considered valid, and thereby end the need for any further augmented inspections. Consequently, beginning with the third quarter of 2010, the AIP is considered closed and all Unit 1 PI's, including the Mitigating Systems Performance Index PIs, will be reported, assessed, and inspected, in accordance with Inspection Manual Chapter (0305), Operating Reactor Assessment Program, and IMC 2515, Light Water Reactor Inspection Program - Operations Phase.

Based on the results of this inspection, the NRC has determined that two Severity Level IV violations of NRC requirements occurred. The NRC has also identified two additional findings that were evaluated under the risk significance determination process as having a very low safety significance (Green). The NRC has determined that violations of NRC requirements are associated with these findings. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and categorization as Severity Level IV, and because they were entered into your corrective action program, the NRC is treating these as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you wish to contest these non-cited violations, 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 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Browns Ferry Nuclear Plant. In addition, if you disagree with the characterization of any finding 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.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Eugene F. Guthrie, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket Nos.: 50-259, 50-260, 50-296, 72-052
License Nos.: DPR-33, DPR-52, DPR-68

Enclosure: Inspection Report 05000259/2010003, 05000260/2010003, 05000296/2010003,
05000259/2010501, 05000260/2010501, 05000296/2010501, AND 07200052/2010002
w/Attachment: Supplemental Information

cc w/encl. (See page 3)

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NAME	CStancil	KKorth	TRoss	HGepford	CKontz	EGuthrie
DATE	07/30/2010	07/30/2010	07/30/2010	07/30/2010	07/30/2010	07/30/2010
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TVA

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Letter to R. M. Krich from Eugene F. Guthrie dated July 30, 2010

SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC INTEGRATED INSPECTION
REPORT 05000259/2010003, 05000260/2010003, 05000296/2010003,
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Distribution w/encl:

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-259, 50-260, 50-296, 72-052

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Report No.: 05000259/2010003, 05000260/2010003, 05000296/2010003,
05000259/2010501, 05000260/2010501, 05000296/2010501, AND
07200052/2010002

Licensee: Tennessee Valley Authority (TVA)

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

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

Dates: April 1, 2010 through June 30, 2010

Inspectors: T. Ross, Senior Resident Inspector
C. Stancil, Resident Inspector
K. Korth, Resident Inspector
L. Miller, Senior Emergency Preparedness Inspector (1EP2, 1EP3,
1EP4, 1EP5, 4OA1, 4OA5)
J. Beavers, Emergency Preparedness Inspector (1EP2, 1EP3, 1EP4,
1EP5, 4OA1, 4OA5)
M. Speck, Resident Inspector (1EP2, 1EP4, 4OA1)
H. Gepford, Technical Assistant (2RS6, 4OA1, 4OA5)
W. Loo, Senior Health Physicist (2RS5)
R. Hamilton, Senior Health Physicist (2RS7)
A. Nielsen, Health Physicist (2RS8)

Approved by: Eugene F. Guthrie, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000259/2010003, 05000260/2010003, 05000296/2010003, 05000259/2010501, 05000260/2010501, 05000296/2010501, AND 07200052/2010002; 04/01/2010 - 06/30/2010; Browns Ferry Nuclear Plant, Units 1, 2 and 3; Refueling and Other Outage Activities, Event Follow-up and Other Activities.

The report covered a three month period of inspection by resident inspectors, reactor inspectors from the region, and an announced inspection of two emergency preparedness inspectors and one resident inspector. Four non-cited violations (NCVs) were identified. The significance of most findings is identified by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4, dated December 2006.

A. NRC Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR 26.207(a) for improper execution of the waiver process for authorizing waivers of the "72 hours in any seven day period" work hour limitation required by 10 CFR 26.205(d), for contractors performing risk significant maintenance activities during the Unit 3 refueling outage. These issues associated with the use of work hour control waivers were entered into licensee's corrective action program as problem evaluation reports 161418, 162360, and 162638. As part of their interim corrective actions, the licensee prohibited all future use of waivers without express approval of executive management.

This finding was determined to be more than minor because it was similar to examples 9.a and 9.b. of Inspection Manual Chapter (IMC) 612, Appendix E, Examples of Minor Issues. The significance of the finding was screened by regional management according to IMC 609, Appendix M, Significance Determination Process Using Qualitative Criteria. The finding was determined to be of very low safety significance (Green) based on no observed human performance errors due to worker fatigue which caused a consequential event or adversely affected any risk-significant structures, systems, or components. The cause of this finding was directly related to the cross-cutting aspect of procedural compliance in the Work Practices component of the Human Performance area because the licensee failed to comply with the administrative program requirements for processing waivers of the 10 CFR 26 work hour limitations [H.4(b)]. (Section 1R20.1)

- Green. A self-revealing non-cited violation of Unit 3 Technical Specifications (TS) Limiting Condition for Operation 3.5.3, Reactor Core Isolation Cooling (RCIC) System, was identified for the licensee's failure to comply with the TS required actions for an inoperable RCIC system. The RCIC system was inoperable due to missing critical parts in the electronic governor regulator (i.e., EG-R) hydraulic actuator for a period of greater than 14 days, during the time when TS 3.5.3 was

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applicable between March 14, 2006 and September 12, 2009, without the licensee taking the required TS actions. This issue was entered into the corrective action program as problem evaluation reports 200183 and 224614. The EGR was subsequently replaced and the RCIC system restored to an operable condition, following testing.

This finding was determined to be of greater than minor significance because it was associated with the Equipment Performance attribute 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. Specifically, the RCIC EG-R was missing internal parts that were important for maintaining stable and reliable RCIC flow during reactor pressure vessel (RPV) injection. According to IMC 0609.04, Phase I - Initial Screening and Characterization of Findings, this finding was determined to be of very low safety significance (Green) because the finding did not lead to an actual loss of safety function of the system, nor did it screen as potentially risk significant due to a seismic, flooding, or severe weather-initiating event. The cause of this finding was directly related to the cross cutting aspect of Thorough Evaluation of Identified Problems in the Corrective Action Program component of the Problem Identification and Resolution area, because the licensee did not adequately evaluate the operability of the RCIC system with large flow oscillations of plus/minus 300 gallons per minute during RPV injection [P.1(c)]. (Section 4OA3.2)

B. Licensee Identified Violations

One violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and the corrective action program tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at essentially full Rated Thermal Power (RTP) the entire report period except for two planned downpowers and one unplanned downpower. On May 11, 2010, and then again on May 12, 2010, two planned downpowers to 90 percent RTP were conducted to remove from service, and then restore, the 1A 480VAC unit board for reactor feed pump maintenance. The unit was returned to full RTP on May 11 and then again May 12, 2010. On June 21, 2010, an unplanned downpower to approximately 70 percent RTP was conducted when a recirculation pump runback was initiated due to an unexpected closure of the number 2 turbine control valve. After restoring the number 2 control valve, power was maintained at 70 percent RTP due to elevated river temperatures. Unit power was raised to 83 percent RTP on June 25, 2010, to conduct a control rod sequence exchange, and then returned to 100 percent RTP on June 26, 2010.

Unit 2 operated at essentially full RTP the entire report period except for one planned downpower and an automatic reactor scram. On May 16, 2010, a planned downpower was conducted to 92 percent RTP for routine control rod drive exercise and was returned to full RTP the same day. On June 9, 2010, an automatic reactor scram occurred from 100 percent RTP due to main steam isolation valve (MSIV) closure following an unexpected Group 1 isolation during 2B reactor protection system (RPS) transfer to its alternate power supply. The unit entered reactor startup (Mode 2) on June 10, 2010. Power escalation was held at 85 percent RTP on June 12, 2010, due to 2B condensate pump seal failure. The unit returned to full RTP on June 18, 2010.

Unit 3 operated at essentially full RTP the entire report period except for one unplanned downpower and one planned downpower. On May 9, 2010, an unplanned downpower was conducted to 96 percent RTP due to an automatic runback of 3A recirculation pump caused by failure of the 3A variable frequency drive C5 power cell. The unit returned to full RTP on May 10, 2010. On June 12, 2010, a planned downpower to 75 percent RTP was conducted for a routine control rod sequence exchange. The unit returned to RTP on June 13, 2010.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

Prior to and during the onset of hot weather conditions, the inspectors reviewed the licensee's implementation of 0-GOI-200-3, Hot Weather Operations, including Attachment 1, Hot Weather Operational Checklist. The inspectors also reviewed the Hot Weather Discrepancy Log (list of work orders designated with a focus code of HW); and discussed implementation of 0-GOI-200-3 with responsible Work Control and Operations

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personnel and management. Furthermore, the inspectors conducted walkdowns of potentially affected risk significant equipment systems relied on to cool the Unit 1, 2 ,and 3 480 VAC and 4KV VAC Shutdown Board Rooms. This activity constituted one inspection sample.

b. Findings

No findings were identified.

.2 Summer Readiness of Offsite and Alternate AC Power Systems

a. Inspection Scope

Prior to the summer season, inspectors reviewed electrical power design features; onsite risk and work management procedures; and corporate transmission and power supply procedures to verify appropriate operational oversight and assurance of continued availability of offsite and alternate AC power systems. Inspectors verified that communications protocols existed between the transmission system operator and Browns Ferry Nuclear Plant for coordination of off-normal and emergency events affecting the plant, event details, estimates of return-to-service times, and notifications of grid status changes. Inspectors also verified that procedures included controls to adequately monitor both offsite AC power systems (including post-trip voltages) and onsite alternate AC power systems for availability and reliability. Furthermore, inspectors interviewed onsite licensed operators and offsite transmission personnel to determine their understanding and implementation of the power monitoring and assessment process. Inspectors reviewed the material condition of offsite AC power systems and onsite alternate AC power systems for the plant, including the switchyard and transformers. This review included outstanding work orders affecting these systems, and a walkdown of the switchyard with Operations and Engineering personnel to ensure the systems will continue to provide appropriate “as designed” capabilities. This activity constituted one inspection sample.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

The inspectors conducted three equipment partial alignment walkdowns to evaluate the operability of selected redundant trains or backup systems, listed below, while the other train or system was inoperable or out of service. The inspectors reviewed the functional systems descriptions, Updated Final Safety Analysis Report (UFSAR), system operating procedures, and Technical Specifications to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of the systems to verify

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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 to this report.

- Unit 1/2 Emergency Diesel Generators (EDG) A and B
- Unit 2 Core Spray (CS) System - Division I
- Unit 3 Core Spray (CS) System - Division II

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors conducted a complete walkdown of the Unit 1 Reactor Core Isolation Cooling (RCIC) system using the applicable flow diagram (1-47E813-1), and the relevant operating instruction (OI), 1-OI-71, Reactor Core Isolation Cooling System, to verify equipment alignment, availability and operability. The inspectors also reviewed relevant portions of the UFSAR and TS. This detailed walkdown verified valve positions, electrical power lineup, configuration of applicable system instrumentation and controls, component labeling, pipe hangers and support installation, and associated support systems status. Furthermore, the inspectors examined the applicable System Health Report, outstanding WO's, open Problem Evaluation Reports (PERs), RCIC system control output signal parameters, and the most recent surveillance test to verify system alignment and operability. This activity constituted one inspection sample.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Fire Protection Tours

a. Inspection Scope

The inspectors reviewed licensee procedures, Standard Programs and Processes (SPP)-10.10, Control of Transient Combustibles, and SPP-10.9, Control of Fire Protection Impairments, and conducted a walkdown of the five 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. Also, the inspectors verified that selected fire protection impairments were identified and controlled in accordance with procedure SPP-10.9. Furthermore, the inspectors reviewed applicable portions of the Site Fire Hazards Analysis Volumes 1 and 2 and Pre-Fire Plan drawings to verify that the

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necessary fire fighting equipment, such as fire extinguishers, hose stations, ladders, and communications equipment, was in place.

- Unit 1 1B Electrical Board Room, EL 593' (FA-4)
- Unit 2 2B Electrical Board Room, EL 593' (FA 8)
- Unit 3 Electric Board Room 3A (FA-13)
- Unit 3 480v Shutdown Board Room 3A (FA-14)
- Unit 3 480v Shutdown Board Room 3B (FA-15)

b. Findings

No findings were identified.

.2 Annual Drill Observation

a. Inspection Scope

On June 3, 2010, the inspectors witnessed an unannounced fire drill in the Unit 2 Turbine Building at the Oil Purifier Room. The inspectors assessed fire alarm effectiveness; response time for notifying and assembling the fire brigade; the selection, placement, and use of fire fighting equipment; use of personnel fire protective clothing and equipment (e.g., turnout gear, self-contained breathing apparatus); communications; incident command and control; teamwork; and fire fighting strategies. The inspectors also attended the post-drill critique to assess the licensee's ability to review fire brigade performance and identify areas for improvement. Following the critique, the inspectors compared their findings with the licensee's observations and to the requirements specified in the licensee's Fire Protection report. This activity constituted one inspection sample.

b. Findings

No findings were identified.

1R07 Heat Sink Performance

.1 Annual Review

a. Inspection Scope

The inspectors examined activities associated with the Unit 1, 2, and 3 Emergency Diesel Generator (EDG) Heat Exchangers. The inspectors performed walkdowns of key components for the eight Unit 1, 2, and 3 diesel generator cooling water systems to verify material conditions were acceptable and physical arrangement matched procedures and drawings. The inspectors reviewed design basis documents, heat capacity and tube plugging calculations, heat exchanger inspection results, and flow-rate testing procedures and results for the past ten years to evaluate the licensee's program for maintaining safety related heat exchangers in accordance with the licensing basis

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and industry standards. The inspectors also reviewed EDG heat exchanger critical operating parameters, periodic and corrective maintenance records, and periodic heat exchanger inspections to verify that the licensee's maintenance methodology was in accordance with EPRI Report NP 7552, "Heat Exchanger Performance Monitoring Guidelines"; SPP-9.14, "Generic Letter (GL) 89-13 Implementation"; and O-TI-522, "Program for Implementing NRC Generic Letter 89-13". Furthermore, the inspectors reviewed PERs and associated corrective actions to verify that the licensee was identifying GL 89-13 issues and addressing them within the corrective action program. This activity constituted one inspection sample.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification

.1 Resident Inspector Quarterly Review

a. Inspection Scope

On May 3, 2010, the inspectors observed an as-found licensed operator requalification simulator examination for an operating crew according to Simulator Evaluation Guide OPL 177.064, RPS Low Level Instrument Failure, Fuel Failure, Main Steam Leak, RCIC Break, HPCI Inverter Failure, and CRD Failure.

The inspectors specifically evaluated the following attributes related to each 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 Abnormal Operating Instructions (AOIs), and Emergency Operating Instructions (EOIs)
- Timely and appropriate Emergency Action Level declarations per Emergency Plan Implementing Procedures (EPIP)
- Control board operation and manipulation, including high-risk operator actions
- Command and Control provided by the Unit Supervisor (US) and Shift Manager (SM)

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

.1 Routine

a. Inspection Scope

The inspectors examined one specific equipment issue listed below for structures, systems and components (SSC) within the scope of the Maintenance Rule (MR) (10CFR50.65) with regard to some or all of the following attributes, 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) Charging 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 (a)(1) goals and corrective actions (i.e., Ten Point Plan). The inspectors also compared the licensee's performance against site procedure SPP-6.6, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting; Technical Instruction 0-TI-346, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting; and SPP 3.1, Corrective Action Program. The inspectors also reviewed, as applicable, work orders, surveillance records, PERs, system health reports, engineering evaluations, and MR expert panel minutes; and attended MR expert panel meetings to verify that regulatory and procedural requirements were met.

- Emergency Equipment Cooling Water (EECW) Pump excessive unavailability and unreliability

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 reviewed six maintenance risk assessments, and actions taken to plan and/or control work activities to effectively manage and minimize risk. The inspectors also 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 such as SPP-7.0, Work Management; SPP-7.1, On-Line Work Management; 0-TI-367, BFN Equipment to Plant Risk Matrix; SPP-

7.3, Work Activity Risk Management Process; and SPP-7.2, Outage Management. Furthermore, as applicable, the inspectors verified the adequacy of the licensee's risk assessments, implementation of RMAs, and plant configuration.

- Unit 2 RCIC Unplanned Inoperability with 2DN Low Pressure Coolant Injection (LPCI) Motor Generator (MG) Set (Residual Heat Removal (RHR) Division I) and 2B Raw Cooling Water (RCW) Pump Out of Service (OOS)
- U3 CS Division I, and 3B and 3E RCW Pumps OOS
- 3ED EDG, 3B Control Rod Drive (CRD) Pump, and 3A and 3B RCW Pumps OOS
- Shutdown Battery C and Unit 2 CS Division II OOS
- Unit 3 RHR Division I, 3B CRD, and 3C1 Reactor Protection System (RPS) Circuit Protector OOS
- Unit 1/2 D EDG, C1 Residual Heat Removal Service Water (RHRSW) pump, and EECW North Header (Unit 3) OOS

b. Findings

No findings were identified

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the three operability/functional evaluations listed below to verify technical adequacy and ensure that the licensee had adequately assessed TS operability. The inspectors also reviewed applicable sections of the UFSAR to verify that the system or component remained available to perform its intended function. In addition, where appropriate, the inspectors reviewed licensee procedure SPP-3.1, Corrective Action Program, Appendix D, Guidelines for Degraded/Non-conforming Condition Evaluation and Resolution of Degraded/Non-conforming Conditions, to ensure that the licensee's evaluation met procedure requirements. Furthermore, where applicable, inspectors examined the implementation of compensatory measures to verify that they achieved the intended purpose and that the measures were adequately controlled. The inspectors also reviewed PERs on a daily basis to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

- Lack of Preventive Maintenance on Safety Related Molded Case Circuit Breakers, Revision 4 (PER 209095)
- Suppression Pool Cooling (SPC) Inadequately Translated Design Criteria and Missing Probability Risk Assessment Model Input (PERs 218875 and 166798)
- 3D EDG Woodward Governor Low Oil Level and Leak (PER 229785)

b. Findings

No findings were identified

1R18 Plant Modifications

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the temporary modification listed below to verify regulatory requirements were met, along with procedure SPP-9.5, Temporary Alterations. The inspectors also reviewed the associated 10 CFR 50.59 screening and evaluation and compared each against the UFSAR and TS to verify that the modification did not affect operability or availability of the affected system. Furthermore, the inspectors walked down the modification to ensure that it was installed in accordance with the modification documents and reviewed post-installation and removal testing to verify that the actual impact on permanent systems was adequately verified by the tests.

- TACF 1-10-004-085, Unit 1 CRD Control Rod 34-51 Grouping Card Tape-Over to Clear Sealed-In Overtravel Alarm

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the seven post-maintenance tests (PMT) listed below to verify that procedures and test activities confirmed SSC operability and functional capability following maintenance. The inspectors reviewed the licensee's completed test procedures to ensure any of the SSC safety function(s) that may have been affected were adequately tested, that the acceptance criteria were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test and/or reviewed the test data, to verify that test results adequately demonstrated restoration of the affected safety function(s). The inspectors verified that PMT activities were conducted in accordance with applicable WO instructions, or procedural requirements, including SPP-6.3, Post-Maintenance Testing, and MMDP-1, Maintenance Management System. Furthermore, the inspectors reviewed problems associated with PMTs that were identified and entered into the CAP.

- Common: PMT for preventive maintenance on D1 RHRSW pump discharge check valve, air-release valve and motor breaker per WO 05-725340-000, 06-711448-015, 07-712156-000 and 09-710990-000
- Unit 1/2: PMT for replacement 0-FCV-086-0604D, EDG D Right Bank Air Starter Pilot Valve per WO 09-718492-001 and EPI-0-082-GDZ006, Diesel Generator D Redundant Start Test

- Unit 1: PMT for preventative maintenance on RHR Minimum Flow Inhibit Relay Division II, 1-RLY-074-10AK108B per Work Order 10585106 and 1-SR-3.6.1.3.5(RHR II), Quarterly RHR System Rated Flow Test Loop II
- Unit 3: PMT for Seal Weld on Leaking Excess Flow Check Valve 3-ECKV-3-817 per WO 110917707
- Unit 2: PMT for 2A Control Rod Drive Pump per WO 110931445
- Unit 1: PMT for Suppression Pool Level Transmitter (1-LT-64-54) per WO 08-712934 and 1-SR-3.6.2.2(A), Suppression Chamber Narrow Range Level Instrumentation Channel A Calibration
- Unit 3: PMT for RCIC flowrate setpoint change per WO 111054384 and 3-SR-3.5.3.3, RCIC System Rated Flow at Normal Operating Pressure

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

.1 Unit 3 Cycle 14 Refueling Outage

a. Inspection Scope

From February 27 through April 10, 2010, the inspectors examined critical outage activities associated with the U3C13 refueling outage and Unit 3 restart to verify that they were conducted in accordance with TS, applicable procedures, and the licensee's outage risk assessment and management plans. Refueling outage activities that occurred prior to April 1, 2010, were documented in NRC inspection report (IR) 05000296/2010002. Since April 1, the inspectors reviewed and examined selected refueling outage and power ascension activities to ensure they were performed in accordance with licensee procedures, TS requirements, and the licensee's outage risk control plan. Some of the more significant critical outage activities inspected were as follows:

- Monitored critical plant parameters, and operators control of plant conditions, during Cold Shutdown (Mode 4), Startup (Mode 2), and Power Operation (Mode 1) conditions
- Control and management of scheduled and emergent outage work activities, including impact on outage risk
- Reviewed and verified completion of selected items of 0-TI-270, Refueling Test Program, Attachment 2, Startup Review Checklist, and SPP-7.2.3, Plant Startup Review/Checklists
- Witnessed portions of reactor startup and power ascension activities per General Operating Instruction (GOI) 3-GOI-100-1A, Unit Startup, including rod withdrawal for criticality, reactor coolant system heatup, and power ascension to full power

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- Reviewed and verified reactor heatup rate in accordance with 3-SR-3.4.9.1(1), Reactor Heatup and Cooldown Rate Monitoring; and suppression chamber temperature control per 3-SR-3.6.2.1.1, Suppression Chamber Water Temperature Check

Corrective Action Program

The inspectors continued to review daily PERs generated during U3R14 RFO, especially those designated as “Restart”. Resolution and implementation of specific corrective actions of selected PERs were also reviewed by the inspectors and discussed with responsible outage management.

b. Findings

Introduction: Inspectors identified a Green Non-Cited Violation (NCV) of 10 CFR 26.207(a) for the licensee’s improper execution of the waiver process for authorizing contractors to exceed the “72 hours in any seven day period” work hour limitation during the U3C14 RFO.

Description: During the U3C14 RFO, the licensee initiated three waivers of the 10 CFR 26.205(d) work hour limitations using Standard Programs and Process (SPP) 1.5, Fatigue Management and Work Hour Limits. The inspectors found that two of the waivers were for two individual contractors who were conducting snubber testing. The third waiver was a blanket waiver for nine other contractors who were working to install Main Steam line strain gages in the Unit 3 drywell for data acquisition to support the Unit 3 Extended Power Uprate license amendment. All three waivers were used to authorize exceeding the work hour limitation of “72 hours in any seven day period” prescribed by 10CFR26.205(d)(1)(iii). The contractors were all working a 12 hour per day, six days a week schedule, with the seventh day off. The licensee stated that the intent of all three waivers was to defer the contractors’ normal day off until the next day in order to continue performing their planned outage work without interruption. As a result of these waivers, these contractors ended up working seven consecutive 12 hour days.

The inspectors reviewed the aforementioned waivers and identified several issues regarding the licensee’s execution of SPP-1.5, Section 3.5, Waivers, which was used to fulfill the requirements of 10CFR 26.207(a). These issues are described below.

The inspectors determined that all three of the reviewed waivers were approved without establishing an adequate basis that these waivers were “necessary to mitigate or prevent a condition adverse to safety”. Also, no justification was provided to explain why the circumstances that necessitated these waivers were reasonably beyond the control of the licensee.

Personal “face-to-face” fatigue assessments, in accordance with SPP-1.5, Appendix A, Section 4.0, Fatigue Assessment, were not conducted for any of the individuals involved with the three waivers. Responsible supervisors and managers only conducted informal, verbal discussions with the contractors in an attempt to verify they were fit from a fatigue perspective. Also, SPP-1.5 required the fatigue assessment to be completed no more

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than four hours prior to the beginning of the additional work covered by the waiver. The three waivers reviewed were approved more than a shift before the work covered by the waiver was to begin. The responsible supervisors and managers subsequently acknowledged to the inspectors their unfamiliarity with the waiver process, and agreed that informal talks did not constitute the detailed individual, face-to-face fatigue assessments required by SPP-1.5.

To address the issues identified by the inspectors and the apparent misunderstandings and breakdown of the SPP 1.5 waiver process, the licensee initiated several PERs and promptly prohibited and further use of waivers without the express approval of executive level management and above.

The inspectors also confirmed that no fatigue related human performance errors occurred during the work activities covered by the aforementioned waivers that resulted in a consequential event nor did errors adversely impacted any risk-significant structure, system or components (SSC's).

Analysis: The licensee's improper authorization of numerous individuals to exceed their work hour limitations was considered a performance deficiency. Specifically, the licensee authorized numerous individuals to exceed their work hour limitations for circumstances that could have been reasonably controlled and without conducting individual face-to-face fatigue assessments. This performance deficiency was considered to be more than minor, and therefore a finding, because it was sufficiently similar to examples 9.a and 9.b of IMC 612, Appendix E, Examples of Minor Issues. The finding was determined to be of very low safety significance (Green) by regional management review according to IMC 609, Appendix M, Significance Determination Process Using Qualitative Criteria, because it did not result in a consequential event or adversely affect risk-significant SSC's due to worker fatigue.

The cause of this finding was directly related to the cross-cutting aspect of Procedural Compliance in the Work Practices component of the Human Performance area because the licensee failed to follow their program guidance for processing and authorizing waivers of the 10 CFR 26 work hour limitations. [H.4(b)]

Enforcement: 10 CFR 26.207(a)(1) states, in part, that licensees may grant a waiver of the work hour controls required in 10 CFR 26.205(d) when the licensee determines the waiver is necessary to mitigate or prevent a condition adverse to safety (10 CFR 26.207(a)(1)(i)), and the affected workers are assessed individually, face-to-face, to determine whether there is reasonable assurance they will be able to safely and competently perform their duties during the additional work period (10 CFR 26.207(a)(1)(ii)). Contrary to the above, during the U3C14 RFO in March 2010, the licensee granted three waivers to allow 11 contractors to exceed the work hour limitation of "72 hours in any seven day period" without providing an adequate basis to demonstrate the waivers were necessary to mitigate or prevent a condition adverse to safety; and without conducting the required face-to-face fatigue assessments to establish reasonable assurance of worker competency to perform duties during the additional work period. However, because this finding was of very low safety significance and has been entered into the licensee's CAP as PERs 161418, 162360,

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and 162638, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy. This NCV is being identified as NCV 05000296/2010003-01, Inappropriate Use of Waivers to Exceed 10 CFR 26 Work Hour Limitations.

1R22 Surveillance Testing

a. Inspection Scope

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

Reactor Coolant System Leak Detection Tests:

- 2-SR-3.4.5.3, Drywell Floor Drain Sump Flow Integrator Calibration

In-Service Tests:

- 1-SR-3.5.1.6(RHR I), Quarterly RHR System Rated Flow Test Loop I

Routine Surveillance Tests:

- 1-SR-3.3.3.2.1(75 II), Backup Control Panel Testing
- 3-SR-3.8.1.8, 480V Load Shedding Logic System Functional Test

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System Evaluation

a. Inspection Scope

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

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The inspectors reviewed various documents which are listed in the Attachment. This inspection activity satisfied one inspection sample for the alert and notification system (ANS) on a biennial basis.

b. Findings

No findings were identified.

1EP3 Emergency Preparedness Organization Staffing and Augmentation System

a. Inspection Scope

The inspectors reviewed the licensee's Emergency Response Organization (ERO) augmentation staffing requirements and process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. A sample of training records of key ERO duty roster members verified that qualifications were current including respirator qualifications where appropriate. A sample of problems identified from augmentation drills or system tests performed since the last inspection was reviewed to assess the effectiveness of corrective actions.

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

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

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, Revisions 53 and 54 of the Emergency Plan were implemented based on the licensee's determination, in accordance with 10 CFR 50.54(q), that the changes resulted in no decrease in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspectors conducted a sampling review of the Plan changes and implementing procedure changes made between November 1, 2009, and April 30, 2010, to evaluate potential decreases in effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, "Emergency Action Level and Emergency Plan Changes." The applicable planning standard, 10 CFR 50.47(b)(4) and its related 10 CFR 50, Appendix E, requirements were used as reference criteria.

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

b. Findings

No findings were identified.

1EP5 Correction of Emergency Preparedness Weaknesses

a. Inspection Scope

The inspectors reviewed the corrective actions identified through the Emergency Preparedness program to determine the significance of the issues and to determine if repeat problems were occurring. The facility's self-assessments and audits were reviewed to assess the licensee's ability to be self-critical, thus avoiding complacency and degradation of their emergency preparedness program. In addition, the inspectors reviewed licensee self-assessments and audits to assess the completeness and effectiveness of all emergency preparedness related corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 05, "Correction of Emergency Preparedness Weaknesses." The applicable planning standard, 10 CFR 50.47(b)(14) and its related 10 CFR 50, Appendix E, requirements were used as reference criteria.

The inspectors reviewed various documents that are listed in the Attachment. This inspection activity satisfied one inspection sample for the correction of emergency preparedness weaknesses on a biennial basis.

Findings

No findings were identified.

2. RADIATION SAFETY (RS)

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS5 Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors reviewed the licensee's radiation monitoring instrumentation programs to verify the accuracy and operability of radiation monitoring instruments used to monitor

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areas, materials, and workers to ensure a radiologically safe work environment and to detect and quantify radioactive process streams and effluent releases.

Walkdowns and Observations: The inspectors walked down effluent monitoring systems, including the main stack radiation monitoring system (RM-90-147), process liquid radiation monitors (RM-90-130), and reactor building ventilation radiation monitoring systems (RM-90-249 and 250), evaluating material condition and verifying configurations were consistent with ODCM descriptions. The inspectors also evaluated the material condition and location of area radiation monitors (ARMs) RE-90-1, RE-90-8, RE-90-7, and continuous air monitors. For selected effluent monitors and ARMs, the inspectors verified in-field responses were consistent with readings obtained in the control room.

During plant tours and observations in the calibration lab, the inspectors assessed material condition and operability of portable survey instruments in addition to verifying calibration and source checks were current. The inspectors observed health physics technicians performing function/source checks on survey instruments prior to use and demonstration of daily response checks performed by calibration lab personnel on a Eberline Teletector-6112B; Bicron Surveyor 50, Microrem, and RSO-50; and an Eberline Model No. 177.

The inspectors evaluated material condition and observed performance of source checks on personal contamination monitors and small article monitors located at the RCA exit and portal monitors located at the protected area exit.

Calibration and Testing Program: The inspectors reviewed the last two calibration records for the following effluent, process, area radiation, and post-accident monitors: RM-90-147, RM-90-130, RM-90-249, RM-90-250, RE-90-1, RE-90-8, and RE-90-7. In addition to evaluating the calibration procedures, calibration geometry, functional tests, and calibration sources, the inspectors verified monitor setpoints were consistent with and/or changed in accordance with ODCM and/or site procedures.

Instrumentation used in the chemistry counting room was evaluated for material condition, operability, and use. Daily control charts for two high-purity germanium spectroscopy systems and one liquid scintillation counter (LSC) were reviewed. In addition, the inspectors reviewed the most recent calibration of one of the spectroscopy systems for various counting geometries and the most recent calibration of the LSC. The inspectors also reviewed the cross-check analysis results for the past year.

For the whole body counter, the inspectors reviewed the most recent calibration, assessed the isotope library, observed performance of daily QC checks, and verified appropriate check sources and calibration sources were used. In addition, the inspectors reviewed calibrations of, and observed performance of source checks on, the following instruments: PCM Nos. 2, 3 and 4, SAM Nos. 176 and 345, and Rados Clearance Monitor.

The inspectors reviewed, through direct observation, instrument source and response checks. However, instrument calibrations were conducted by the licensee's Western Area Radiological Laboratory and the inspectors reviewed selected instrument calibration records, assessment of the calibration range (calibration geometry, sources, etc.) and the annual Shepherd calibrator recertification. Portable instrument calibration records included an ion chamber instrument, high-range extendable Geiger-Mueller instrument, and frisker.

Problem Identification and Resolution: Selected corrective action program documents associated with radiation monitoring instruments, including condition reports and audits, were reviewed and assessed. This review of corrective action documents included evaluating the licensee's response to indications of degraded count room instrument performance. The inspectors verified that problems were being identified at an appropriate threshold and resolved in accordance with procedure SPP-3.1, Corrective Action Program.

Documents reviewed are listed in Section 2RS5 of the Attachment. The inspectors completed one sample as required by inspection procedure 71124.05.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment

a. Inspection Scope

Program Reviews: The inspectors reviewed the 2008 and 2009 Annual Radiological Effluent Release Report documents for consistency with the requirements in the Offsite Dose Calculation Manual (ODCM) and Technical Specifications. Unexpected results were followed up to determine the cause. Radioactive effluent monitor operability issues were discussed with plant staff. The inspectors reviewed the ODCM changes made since the last inspection against the guidance in NUREG-1301 and RG 1.109, RG 1.21, and RG 4.1.

Walk-Downs and Observations: The inspectors walked-down selected components of the gaseous and liquid discharge systems to ascertain material condition, configuration and alignment. To the extent practical, the inspectors observed the material condition of abandoned in place liquid waste processing equipment for indications of degradation or leakage that could constitute a possible release pathway to the environment. The inspectors also observed the collection and analysis of gaseous effluent samples (noble gas, iodine, particulates) from the plant stack. The inspectors walked-down the Standby Gas Treatment System, trains A, B, and C, to ascertain material condition, configuration, and alignment. In addition, the inspectors reviewed the most recent HEPA and charcoal filtration surveillance testing results for each train of the standby gas treatment system.

Sampling and Analyses: In addition to observing collection of gaseous effluent samples from the plant stack, the inspectors observed a chemistry technician verifying plant stack flow rates and closing/generating gaseous effluent release permits. The inspectors also verified performance of compensatory sampling during the period when the Unit 2 Residual Heat Removal Service Water monitor was inoperable for greater than thirty days in 2008. The results of the chemistry count room's inter-laboratory comparison program were reviewed and discussed with cognizant licensee personnel.

Dose Calculations: The inspectors reviewed two liquid release permits, several gas release permits, and monthly gaseous/liquid effluent dose calculation summaries. The magnitudes of the releases were determined to be a small fraction of the applicable limits. The inspectors determined that a change in calculated dose due to gamma emitters was readily explained by a leak from the condensate system into the raw cooling water. The inspectors also reviewed an abnormal release from a condensate storage tank. The inspectors reviewed the contributions to public dose from the abnormal releases. The site's 10 CFR 61 analysis was reviewed for expected nuclide distribution from the aspects of quantifying effluents, the treatment of hard to detect nuclides, determining appropriate calibration nuclides for instruments and whole body counting libraries. The inspectors also reviewed the licensee's most recent Land Use Census results and changes in the ODCM since the last inspection.

Ground Water Protection: The licensee's implementation of the Industry Ground Water Protection Initiative was reviewed for changes since the last inspection as well as in accordance with TI 2515/173 (Section 4OA5.1). Groundwater sampling results obtained since the last inspection were reviewed. Licensee response, evaluation, and follow-up to spills and leaks since the last inspection were reviewed in detail.

Problem Identification and Resolution: Selected corrective action program documents associated with the effluent monitoring and control program, including problem evaluation reports (PERs) and audits, were reviewed and assessed. The inspectors verified that problems were being identified at an appropriate threshold and resolved in accordance with procedure SPP-3.1, Corrective Action Program.

Documents reviewed are listed in Section 2RS5, 2RS6 and 2RS7 of the report Attachment. The inspectors completed one sample as required by inspection procedure 71124.06.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope

REMP Status and Results: The inspectors reviewed and discussed changes to the ODCM and results presented in the Annual Environmental Radiological Environmental Operating Report documents issued for calendar year (CY) 2008 and CY 2009. The

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inspectors also reviewed and evaluated REMP contract laboratory cross-check program results, and current procedural guidance for environmental sample collection and processing. The reports' environmental measurement results were reviewed for consistency with licensee effluent data and evaluated for radionuclide concentration trends. The inspectors reviewed detection level sensitivity requirements for selected environmental media analyzed by TVA's Western Area Radiological Laboratory.

Equipment Walk-down: The inspectors observed implementation of selected REMP monitoring and sample collection activities as specified in the current ODCM. The inspectors observed equipment material condition and verified operability, including verification of flow rates/total sample volume results, for the weekly airborne particulate filter and iodine cartridge change-outs at selected atmospheric sampling stations. The material condition and placement of environmental thermoluminescent dosimeters were verified by direct observation at select ODCM locations. Land use census results, actions for missed samples including compensatory measures, sediment sample collection/processing activities, and availability of replacement equipment were discussed with environmental technicians and knowledgeable licensee staff. In addition, calibration and maintenance surveillance records for the installed environmental air sampling stations were reviewed.

Procedural guidance, program implementation, quantitative analysis sensitivities, and environmental monitoring results were reviewed against 10 CFR Part 20; Appendix I to 10CFR Part 50; TS Sections 6.8 Procedures and Programs and 6.9, Reporting Requirements; ODCM, Rev. 15; RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment; and the Branch Technical Position, An Acceptable Radiological Environmental Monitoring Program - 1979. Documents reviewed are listed in Section 2RS7 of the report Attachment.

Meteorological Monitoring Program: The inspectors walked-down the meteorological tower and observed local data collection equipment readouts. The inspectors observed the physical condition of the towers and their instruments and discussed equipment operability, maintenance history, and backup power supplies with responsible licensee staff. The inspectors evaluated transmission of locally generated meteorological data to the main control room operators. For the meteorological measurements of wind speed, wind direction, and temperature, the inspectors reviewed applicable tower instrumentation calibration records and evaluated measurement data recovery for CY 2008 and CY 2009.

Licensee procedures and activities related to meteorological monitoring were evaluated against: ODCM; FSAR; RG 1.23, Meteorological Monitoring Programs For Nuclear Power Plants, and ANSI/ANS-2.5-1984, Standard for Determining Meteorological Information at Nuclear Power Sites. Documents reviewed are listed in Section 2RS7 of the report Attachment.

Problem Identification and Resolution: The inspectors reviewed selected PERs in the areas of environmental monitoring and meteorological monitoring. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with SPP 3.1, Corrective Action Program, Rev. 18. The

inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Documents reviewed are listed in Section 2RS7 in the Attachment.

The inspectors completed one sample as required by inspection procedure 71124.07.

b. Findings

No findings were identified.

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 2009 Annual Radiological Effluent Release Report and radionuclide characterizations from 2008 - 2009 for each major waste stream were reviewed and discussed with radwaste staff. For cleanup waste phase separator resin, reactor water cleanup 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. 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 a shipment of contaminated scrap metal and a shipment of contaminated laundry. 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. 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. Documents reviewed during the inspection are listed in Section 2RS8 of the report 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 SPP-3.1, Corrective Action Program, Rev. 18. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Licensee corrective action program documents reviewed are listed in Section 2RS8 of the report Attachment.

The inspectors completed one sample as required by inspection procedure 71124.08.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Cornerstone: Mitigating Systems

Safety System Functional Failures
Mitigating Systems Performance Indicator

a. Inspection Scope

The inspectors reviewed the licensee's procedures and methods for compiling and reporting the Performance Indicators (PI) listed below, including procedure SPP-3.4, Performance Indicator for NRC Reactor Oversight Process for Compiling and Reporting PIs to the NRC. The inspectors reviewed the raw data for the PIs listed below for the second quarter 2009 through the first quarter 2010 and discussed the methods for compiling and reporting the PIs with cognizant licensing, engineering, and maintenance rule personnel. The inspectors compared the licensee's raw data against graphical representations and specific values reported to the NRC for the first quarter 2010 PI report to verify that the data was correctly reflected in the report. The inspectors also reviewed the past history of PERs for any that might be relevant to problems with the PI program. The inspectors reviewed Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, to verify that industry reporting guidelines were applied. For the Mitigating Systems Performance Index (MSPI) PIs, the inspectors also independently screened maintenance rule cause determination and evaluation reports and calculated selected reported values to verify their accuracy. Although the Unit 1 MSPI PIs are not considered valid until the third quarter of 2010, the inspectors conducted the inspection described above for the Unit 1 data as part of the Unit 1 augmented baseline inspection plan described in NRC letter dated May 21, 2008. For the Safety System Functional Failures (SSFF) PIs the inspectors also specifically reviewed relevant Licensee Event Reports (LERS), and licensed operator chronological logs, for 12 month period mentioned above.

- Unit 1 Safety System Functional Failures
- Unit 2 Safety System Functional Failures
- Unit 3 Safety System Functional Failures
- Unit 1 Mitigating Systems Performance Index - High Pressure Coolant Injection
- Unit 2 Mitigating Systems Performance Index - High Pressure Coolant Injection
- Unit 3 Mitigating Systems Performance Index - High Pressure Coolant Injection
- Unit 1 Mitigating Systems Performance Index - Reactor Core Isolation Cooling
- Unit 2 Mitigating Systems Performance Index - Reactor Core Isolation Cooling
- Unit 3 Mitigating Systems Performance Index - Reactor Core Isolation Cooling

b. Findings

No findings were identified.

.2 Cornerstone: Emergency Preparedness

Drill/Exercise Performance
 Emergency Response Organization Drill Participation
 Alert and Notification System Reliability

a. Inspection Scope

The inspector sampled licensee submittals relative to the Performance Indicators (PIs) listed below for the period July 1, 2009 through Dec 31, 2009. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline", Revision 6, were used to confirm the reporting basis for each data element.

For the specified review period, the inspector examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. The inspector verified the accuracy of the DEP through review of a sample of drill and event records. The inspector reviewed selected training records to verify the accuracy of the ERO PI for personnel assigned to key positions in the ERO. The inspector verified the accuracy of the PI for ANS reliability through review of a sample of the licensee's records of periodic system tests. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment.

The inspector reviewed various documents which are listed in the Attachment. This inspection activity satisfied one inspection sample for each of the three (3) Emergency Preparedness PIs, i.e., DEP, ERO, and ANS, on an annual basis.

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

b. Findings

No findings were identified.

.3 Cornerstone: Public Radiation Safety

Radiological Control Effluent Release Occurrences

a. Inspection Scope

The inspectors sampled licensee data for the PI listed below. To verify the accuracy of the PI data reported during the period reviewed, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Rev. 6, were used to verify the basis for each data element.

The inspectors reviewed the Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences PI results from April 2009 through March 2010. The inspectors reviewed PERs, liquid and gaseous effluent release permits, effluent dose data, and licensee procedural guidance for classifying and reporting PI events. Reviewed documents are listed in Sections 2RS6 and 4OA5 of the Attachment.

The inspectors completed 1 of the required samples for IP 71151.

b. Findings

No findings were identified.

4OA2 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 Service Request (SR) reports and selected PERs, and periodically attending Corrective Action Review Board (CARB) and PER Screening Committee (PSC) meetings.

.2 Semiannual Review to Identify Trends

a. Inspection Scope

As required by Inspection Procedure 71152, the inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review included the results from daily screening of individual PERs (see Section 4OA2.1 above), licensee trend reports and trending efforts, and independent searches of the PER database and WO history. The review also included issues documented outside the normal CAP in system health reports, maintenance WOs, component status reports, site monthly meeting reports and MR documents. The inspectors' review nominally considered the six-month period of January 2010 through June 2010, although some PER database and WO searches expanded beyond these dates. Furthermore, the inspectors verified that adverse or negative trends identified in the licensee's PERs, periodic reports and trending efforts were entered into the CAP. In particular, the inspectors reviewed the licensee's Integrated Trend Review (ITR) program and the implementation of the program. Inspectors also interviewed the appropriate licensee management.

b. Findings and Observations

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Inspectors reviewed the licensee's ITR program and the implementation of the program according to SPP 3.1.11, PER Trending, and in SPP-3.1.12, Integrated Trend Review. The inspectors noted, as did the licensee, that the ITR for first quarter 2010 was completed late, for which the licensee initiated PER 230287. The ITR meetings were not always well supported by senior management in that only a few department managers were present. No representative from the Security organization was present at the meetings.

The inspectors conducted an independent review to identify potential negative trends, and identified the following observations:

- A previously NRC identified adverse trend for inadequate PMTs continued to exist with untimely corrective actions. In June 2009, PER 173055 was written to address an NRC identified adverse trend in inadequate PMTs (see inspection report (IR) 50-259, 260, & 296/2009-003). The corrective action plan for this PER was extended seven times, with the plan finally issued on February 9, 2010; but this PER was subsequently closed to PER 213116 with no actions taken. Then in December 2009, an inadequate PMT of the B3 EECW discharge check valve was identified by the inspectors for failure to verify check valve function in the closed direction (PERs 211854 and 2119939). These PERs were also closed to PER 213116. Then again, in April 2010, the NRC identified an inadequate PMT for the D1 RHRSW check valve maintenance (PER 226655). This was a repeat of the inadequate PMT for the B3 EECW pump. Untimely corrective actions from these previous PERs led to repetitive inadequate PMTs of the B3 EECW and D1 RHRSW discharge check valves. The corrective action plan for PER 213116 to form a PMT team and hold the first meeting was not completed until June 18, 2010. The scheduled action to develop a PMT team charter was still incomplete, and recently extended to July 22, 2010.
- A previously NRC identified adverse trend regarding maintenance rule program timeliness of Cause Determination Evaluations (CDE) documented in IR 50-259, 260, & 296/2009-005 was captured by PER 210091 but subsequently closed to PER 204894 with an action to brief Engineering supervisors. This adverse trend was not included in the licensee's ITR.
- A previously NRC identified adverse trend for incomplete WO packages continued to exist due to apparently ineffective corrective actions. This previously identified adverse trend was documented in IR 50-259, 260, and 296/2009005, and captured by PER 208517. However, during the review of ongoing maintenance work and worker practices in 2010, the inspectors also identified many additional incomplete and/or improperly implemented WO packages with numerous WO instruction, PMT and/or maintenance procedure steps not signed off (including second party verifications) until well after the work had been completed. At the time that these specific observations were made by the inspectors, the licensee initiated the following PERs: 215763, 217065, 218643, 219628, 219803, 219710, 219726, 222304, 222306, and 222482. Consequently, based on these additional observations, the licensee acknowledged that these issues was potentially a continuing adverse trend and initiated PER 239894.

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- In July of 2009, NRC identified an adverse trend for the high number of inadequately closed PER actions being identified by the licensee's Closure Review Board, as documented in IR 50-259, 260, & 296/2009-003 and captured by PER 175822. The only action taken for PER 175822 was to brief the NRC on the trend, without addressing the organizational and programmatic aspects that led to the high number of over 70 inadequate PER actions for the first six months of 2009. A review of PERs since January 1, 2010, revealed 61 PER actions which were closed inappropriately. Corrective actions to reduce this trend have been marginally effective. However, the licensee had already recognized PER action closeout as a continuing problem and initiated PER 233394.
- Continuing adverse trends in the radiation protection areas of occupational dose, contaminated surface area, catch containments and hot-spots) have existed since 2008. The corrective actions to arrest these trends have not been effective. The continuing adverse trend was recognized by the Radiation Protection Department in the ITR but no PER was written. In response to the inspectors concern that the previous action plans to address these trends did not appear to be effective the licensee initiated PER 239896.

4OA3 Event Follow-up

.1 Unit 2 Automatic Reactor Scram

a. Inspection Scope

On June 9, 2010, Unit 2 automatically scrammed from full RTP due to main steam isolation valve (MSIV) closure. Just prior to the event, as part of scheduled maintenance, control room operators were in the process of transferring the 2B RPS bus to its alternate power supply. During this transfer, a Group 1 primary containment isolation system (PCIS) actuation occurred unexpectedly that resulted in the closure of all MSIVs and a reactor scram. The cause of the Group 1 isolation was preliminarily determined to be a potential failure of the 2A Outboard MSIV pneumatic control manifold block and associated solenoid valves during the 2B RPS power supply transfer which caused the 2A Outboard MSIV to close. Subsequent to the 2A Outboard MSIV closing, the resultant high steam flow (greater than 135%) sensed by instrumentation in the other three lines resulted in a Group 1 isolation signal that closed the MSIVs. Shortly after the scram, the reactor protection system (RPS) was reset by the operators. A full RPS actuation occurred when both the 2C and 2F Intermediate Range Monitors (IRM) experienced a momentary, but coincidental spike in their signal outputs. All control rods were already fully inserted during the second RPS actuation.

The resident inspectors responded to the control room and verified that the unit was in a stable Mode 3 (Hot Shutdown) condition. The inspectors confirmed that all safety-related mitigating systems and automatic functions operated properly. Furthermore, the inspectors evaluated safety equipment and operator performance before and after the event by examining existing plant parameters, strip charts, plant computer historical data displays, operator logs, and the critical parameter trend charts in the post-trip report.

The inspectors interviewed responsible on-shift Operations personnel and examined the

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implementation of applicable ARPs, AOIs, and EOIs, particularly 2-AOI-100-1, Reactor Scram. The inspectors also reviewed and verified that the NRC required notifications were made in accordance with 10 CFR 50.72.

After additional testing and troubleshooting of all MSIVs were completed, and repairs to the 2A Outboard MSIV were made, the licensee restarted Unit 2 on June 10. During the shutdown, Unit 2 remained in Mode 3 conditions and the drywell was not opened. The resident inspectors observed selected portions of the Unit 2 restart and power ascension activities in accordance with 2-GOI-100-1A, Unit Startup and Power Operation.

b. Findings

No findings were identified.

.2 (Closed) LER 05000296/2009-003, Reactor Core Isolation Cooling System Inoperable Longer Than Allowed by Technical Specifications

a. Inspection Scope

The inspectors reviewed the LER dated May 24, 2010, and the associated PER 200183, including cause determination and corrective action plans.

Following the Unit 3 reactor scram on August 24, 2009, the RCIC system auto-initiated as designed and injected into the reactor pressure vessel (RPV) restoring reactor water level. Subsequent review of RCIC system operating parameters revealed an unexpected level of instability in system flow and turbine control system response. RCIC flow was oscillating from approximately a minimum flow of 300 gallons per minute (gpm) to a maximum flow of 900 gpm. The licensee performed an operability evaluation and determined that the RCIC pump was operable even though the cause of the oscillations was not specifically determined. On August 26, 2009, Unit 3 entered Mode 2 and returned the unit to full power on August 28, 2009. On September 12, 2009, Unit 3 conducted a shutdown for unrelated maintenance and the RCIC turbine electric governor-remote (EG-R) hydraulic actuator was replaced. Post maintenance testing for the new EG-R included running RCIC in the injection mode and this was completed with no oscillations noted.

The inspectors questioned the licensee's operability determination, since the licensee had not determined the root cause of the flow oscillations, and opened an Unresolved Item (URI) 05000296/2009004-01, Reactor Core Isolation Cooling System Operability to continue inspection of this issue. To address the inspectors' questions, the licensee had the EG-R vendor conduct testing and inspection of the replaced EG-R to determine the cause of the oscillations. The vendor determined that the cause of the oscillations was due to a missing buffer piston and buffer spring in the EG-R. The licensee concluded that these components provided the integration function of the controller and that this condition would have caused the observed flow oscillations. Since the licensee had not conducted any internal maintenance on the EG-R, the licensee determined that the EG-R had been missing these components since the EG-R installation in 2006. The licensee revised their functional evaluation using this information and concluded that

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there was still adequate margin to each of the pump automatic trip setpoints for various parameters and that the pump would have fulfilled its safety function for the duration of its mission time and over the range of reactor pressures it was required to operate under.

On March 25, 2010, in response to additional questions from the NRC, the licensee determined that the installation of this EG-R had rendered Unit 3 RCIC system inoperable. Additionally, the licensee determined the condition was prohibited by TS since it had been inoperable beyond the allowed outage time of TS 3.5.3 and the unit had changed modes of operation without evaluating the impact on risk as required by TS 3.0.4.

b. Findings

This LER is considered closed with one self-revealing finding related to the reported event and one NRC identified finding related to the LER itself.

(1) Unit 3 RCIC System Inoperable Beyond the Technical Specifications Allowed Outage Time

Introduction: A Green self-revealing NCV of Unit 3 TS limiting condition for operation (LCO) 3.5.3, Reactor Core Isolation Cooling (RCIC) System, was identified for the licensee's failure to comply with the LCO required actions for an inoperable RCIC system.

Description: Following the Unit 3 reactor scram on August 24, 2009, the RCIC system auto-initiated as designed and injected into the RPV restoring reactor water level. However, RCIC flow was oscillating between approximately 300 gpm and 900 gpm. The licensee initiated PER 200183 to determine the cause of the flow oscillations. The licensee conducted a functional evaluation and determined that the RCIC pump was operable because the total flow averaged over time exceeded the TS required minimum flow of 600 gpm. The licensee also determined that oscillations on flow and turbine exhaust pressure were not increasing in amplitude or frequency while the turbine was in operation and adequate margin existed to various system parameter automatic trip setpoints. On August 26, 2009, Unit 3 entered Mode 2 and returned the unit to full power on August 28, 2009. On September 12, 2009, Unit 3 conducted a shutdown for unrelated maintenance and the RCIC turbine EG-R hydraulic actuator was replaced. Post-maintenance testing for the new EG-R included running RCIC in injection mode and this was completed with no oscillations noted.

The inspectors questioned the basis of the licensee's past operability determination which presumed that the flow oscillations would remain constant over a 24 hour mission time, and at different pressure conditions in the reactor vessel, without knowing the definitive cause of the oscillations. Unresolved item 05000296/2009004-01 was opened in inspection report IR 05000296/2009-004 to evaluate the operability of the system once the root cause of the oscillations was determined, and to further review the licensee's methodology used for determining whether the minimum TS 3.5.3 flowrate was met during the high frequency flow oscillations between 300 gpm and 900 gpm.

As part of the corrective actions for PER 200183, the licensee had the EG-R vendor conduct testing and inspection of the EG-R to determine the cause of the oscillations. The vendor determined that the root cause of the oscillations was due to a missing buffer piston and buffer spring in the EG-R. These components provided the integration function of the controller and this condition would have caused the observed flow oscillations. Since the licensee had not conducted any internal maintenance on the EG-R, the licensee determined that the EG-R had been missing these components since the EG-R installation in 2006. A contributing cause was that the oscillations did not occur during the normal condensate storage tank (CST) to CST surveillance flow path and only occurred during RPV injection. Similar flow oscillations had occurred following a unit trip on February 9, 2007. However, the licensee believed the condition had been corrected with repairs to the flow control circuit and the RCIC throttle valve because the PMT for the work did not include RPV injection and relied on CST to CST surveillance only.

On January 28, 2010, the licensee revised their functional evaluation using the root cause information and concluded that there was adequate margin to each of the pump automatic trip setpoints for various parameters and that the pump would have fulfilled its safety function for the duration of its mission time and over the range of reactor pressures it was required to operate under. However, on March 25, 2010, in response to questions from the NRC, the licensee determined that the installation of this EGR had rendered Unit 3 RCIC system TS inoperable even though it could fulfill its safety function. The NRC concluded that the TS requirement for a minimum flow of 600 gpm was for continuous flow and not an average flow over time. Therefore, the RCIC system had been TS inoperable from the time the faulty EG-R was installed in February 2006 and until it was replaced in September, 2009. The TS allowed outage time was exceeded on several occasions during that period. The licensee initiated PER 224614 to address the incorrect operability evaluation completed initially on August 26, 2009 and revised on January 28, 2010.

Analysis: The licensee's failure to adequately evaluate RCIC system TS operability with flow oscillations from 300 gpm to 900 gpm during RPV injection was a performance deficiency that resulted in RCIC system inoperability exceeding the TS allowed outage time. This finding was determined to be of greater than minor significance because it was associated with the Equipment Performance attribute 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. Specifically, the RCIC EGR was missing components that were needed to ensure stable and reliable RCIC flow during RPV injection. The inspectors assessed the finding using IMC 0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings", and determined the finding to be of very low safety significance (Green) because the finding did not lead to an actual loss of safety function of the system, nor did it screen as potentially risk significant due to a seismic, flooding, or severe weather-initiating events.

The cause of this finding was directly related to the cross cutting aspect of Thorough Evaluation of Identified Problems in the Corrective Action Program component of the Problem Identification and Resolution area, because the licensee did not adequately evaluate the operability of the RCIC system with flow oscillating to as low as 300 gpm during RPV injection [P.1(c)].

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Enforcement: Technical Specification 3.5.3, RCIC System, in part requires that the RCIC system shall be operable in Mode 1, and Modes 2 and 3 with reactor steam dome pressure greater than 150 psig, with an allowed outage time of 14 days or place the unit in Hot Shutdown (Mode 3) within 12 hours and reduce reactor pressure to less than or equal to 150 psig in 36 hours. Contrary to this requirement, the RCIC system was inoperable due to missing components in the EG-R for a period of greater than 14 days, during several occasions when TS 3.5.3 was applicable between March 14, 2006, and September 12, 2009, without the licensee taking the required TS actions. Because the finding was of very low safety significance and has been entered into the licensee's CAP as PER 200183 and PER 224614, this violation is being treated as an NCV consistent with Section VI.A of the Enforcement Policy. This NCV is identified as NCV 05000296/2010003-02, Unit 3 RCIC System Inoperable Beyond the Technical Specifications Allowed Outage Time.

(2) Failure to Provide Complete and Accurate Information in LER 0500296/2009-003-00

Introduction: A Severity Level IV NCV of 10 CFR 50.9, Completeness and Accuracy of Information, was identified by the inspectors regarding the licensee's LER 0500296/2009-003-00, Reactor Core Isolation Cooling System Inoperable Longer than Allowed by Technical Specifications, which was determined to not be accurate or complete in all material aspects.

Description: Following the Unit 3 reactor scram on August 24, 2009, the RCIC system auto-initiated as designed and injected into the RPV restoring reactor water level. Subsequent review of RCIC system operating parameters revealed an unexpected level of instability in system flow and turbine control system response. RCIC flow was oscillating between approximately 300 gpm and 900 gpm. The licensee conducted a functional evaluation and determined that the RCIC pump was operable even though the cause of the oscillations was not specifically determined. On August 26, 2009, Unit 3 entered Mode 2 and returned the unit to power. On September 12, 2009, Unit 3 conducted a shutdown for unrelated maintenance and the RCIC turbine EG-R hydraulic actuator was replaced. Post-maintenance testing for the new EG-R included running RCIC in RPV injection mode and this was completed with no oscillations noted.

The licensee had the EG-R vendor conduct testing and inspection of the replaced EG-R to determine the cause of the oscillations. The vendor determined that the cause of the oscillations was due to a missing buffer piston and buffer spring in the EG-R. These components provided the integration function of the controller and this condition caused the observed flow oscillations. It was determined that the EG-R was missing these components since it was installed in 2006.

Following the event and following the cause determination, the NRC staff, including NRR, Region II and the resident staff, questioned the accuracy of the operability determination for the RCIC system. On March 25, 2010, the licensee determined that the installation of this EG-R had rendered Unit 3 RCIC system inoperable and that the condition represented a condition prohibited by Technical Specifications since RCIC had been inoperable beyond the allowed outage time of TS 3.5.3 and the unit had changed

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modes of operation without evaluating the impact on risk as required by TS 3.0.4. The licensee initiated PER 224614 to determine the cause of the original incorrect operability determination following the event.

On May 24, 2010, the licensee submitted LER 05000296/2009-003-00. The LER attributed the root cause for the RCIC flow oscillations to be the missing components on the EG-R. However the LER did not mention when the EGR had been installed, and stated that RCIC had been inoperable from August 26, 2009, to September 12, 2009. Additionally it stated that during the time RCIC was inoperable HPCI was operable. These statements were not accurate in that the faulty EGR was installed on March 14, 2006, and RCIC was inoperable until the EG-R was replaced in September 2009. In actuality, RCIC had been inoperable for over three years, during which time HPCI had been inoperable on numerous occasions.

Also absent from the LER was any discussion of initial event on Unit 3 which revealed the RCIC flow oscillations during RPV injection following a reactor trip on February 9, 2007. Following this event, the licensee performed maintenance on a control system wiring terminal lug, adjusted the EG-R needle valve and replaced the turbine governor valve. However, the post maintenance testing did not include RPV injection and the licensee incorrectly determined that the flow oscillations had been corrected. The requirements of 10 CFR 50.73(b)(5) state that an LER shall contain reference to any previous similar events at the same plant that were known to the licensee. In NUREG-1022, Event Reporting Guidelines 10 CFR 50.72 and 50.73, it states that if any earlier events, in retrospect, were significant in relation to the subject event to discuss why prior corrective action did not prevent recurrence. This LER was incomplete in that it did not include any information on the 2007 trip or why corrective actions following that trip had not corrected the problem.

The licensee initiated PER 232688 to determine the cause of the inaccurate and incomplete information contained in the LER and to ensure the LER was supplemented with the required information. The process for submitting NRC correspondence is contained in Business Practice (BP) 213, Managing TVA's Interface with NRC. This BP required multiple levels of supervisory and management review and concurrence on submittals including LERs. Despite these multiple levels of review, supervisory oversight of the LER submittal process did not prevent the LER from containing inaccurate and incomplete information. Based on the extensive NRC involvement on the issue, the inspectors determined that the licensee's failure to provide complete and accurate information in the LER was not a willful attempt to withhold information, but rather a break down in the LER submittal review and approval process.

Analysis: Because violations of 10 CFR 50.9 are considered to potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process. The inspectors concluded that the licensee had reasonable opportunity to foresee and correct the inaccurate/incomplete information prior to the information being submitted to the NRC. As a result, this issue was considered a performance deficiency. The violation was more than minor since it had the potential to impact the NRC's ability to perform its regulatory function. Had the NRC relied on the information in the LER alone, the duration of the system inoperability would have been significantly reduced, the

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availability of redundant systems would have been misrepresented and prior opportunities for correction would not have been evaluated. Therefore the significance of the reported event may not have been accurately evaluated by the NRC which could impact the NRC's regulatory response to the event. However, because the NRC was aware of the circumstances involving this event and was able to accurately determine its significance, the violation was not considered to have a significant implication on public health or safety and did not result in a reconsideration of a regulatory position or in substantial further inquiry; and was determined to be of very low safety significance, based on Supplement VII, Example D.1 of the NRC Enforcement Policy. The significance of the performance deficiency associated with this violation was deemed to be minor, as such no finding was identified and no cross cutting aspect will be assigned.

Enforcement: 10 CFR 50.9 requires, in part, that information provided to the Commission by a licensee shall be complete and accurate in all material respects. Contrary to the above, on May 24, 2010, the licensee submitted an LER involving the inoperability of the Unit 3 RCIC system, which was not complete and accurate in all material respects. Specifically, the LER inaccurately reported the duration in which the system was inoperable, inaccurately reported the availability of HPCI while the RCIC was inoperable, and did not report a previous event that occurred on the same unit with the same cause as required by 10 CFR 50.73. However, because this violation was of very low safety significance and it was entered into the licensee's corrective action program as PER 232688, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. This NCV is identified as NCV 05000296/2010003-03, Failure to Provide Complete and Accurate Information in LER 0500296/2009-003-00.

.3 (Closed) LER 05000296/2010-001-00, Safety Relief Valves As-Found Setpoints Exceeded Technical Specification Lift Pressure Values

a. Inspection Scope

The inspectors reviewed the LER dated June 21, 2010, and the applicable PER 226627, including associated apparent cause determination and corrective action plans. The inspectors also reviewed the fuel vendor's evaluation, "BFE3-14 ASME and ATWS Overpressurization Analysis With As-Tested Main Steam Relief Valve (MSRV) Setpoint Data," dated May 14, 2010.

Following the U3R14 RFO, the licensee removed and lift tested the 13 MSRVs that had been in service during cycle 14 operation. During this surveillance testing, the as-found U3C14 lift setpoints for eight of the 13 MSRVs exceeded the TS 3.4.3 allowed limit of plus 3 percent of the TS required setpoint. The cause of the MSRV as-found setpoints being above their TS limits was determined to be corrosion bonding between the pilot valve seat and disc, which was recognized as a generic industry problem. The licensee's corrective action plans included the use of platinum coated valves in the discs of all thirteen refurbished MSRV pilot cartridges that were installed in Unit 3 for cycle 15 operation.

The failure of these MSRVs to lift within the allowed setpoint limits constituted a condition prohibited by TS 3.4.3. To address the potential safety consequences, the

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licensee conducted a reactor vessel overpressure evaluation by re-running the U3R14 Reload ASME Overpressure and Plant Transient analysis using the as-found MSRV lift setpoint data. From the results of this evaluation, the licensee concluded that the as-found condition of the MSRVs from Unit 3 cycle 14 would have been sufficient to fulfill their overpressure relief safety function during design basis over-pressure transient events.

The licensee also conducted an anticipated transient without scram (ATWS) overpressure analysis for the most limiting event assuming the same as-found MSRV lift setpoint data. This analysis demonstrated compliance with the ASME Section III Service Level C Limit for emergency events.

b. Findings

One finding of significance was identified (see Section 4OA7 below). This LER is considered closed.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Findings

No significant findings were identified.

.2 Independent Spent Fuel Storage Installation

a. Inspection Scope

Under the guidance of IP 60855.1, the inspectors observed operations involving the independent spent fuel storage installation (ISFSI), interviewed personnel and reviewed the licensee's procedures regarding storing spent fuel to verify that ISFSI related programs and procedures fulfill the commitments and requirements specified in the Final Safety Analysis Report (FSAR), Certificate of Compliance (CoC), 10 CFR Part 72, the TS and 10 CFR 72.212(b) evaluations for general licensed ISFSIs.

b. Findings

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Introduction: A Severity Level IV, non-cited violation (NCV) of 10 CFR 72.212, Conditions of general license issued under §72.210, was identified by the inspectors for the licensee's failure to adequately control transient combustible material near the Independent Spent Fuel Storage Installation (ISFSI) in accordance with procedures.

Description: On May 25, 2010, while performing a routine walkdown of the ISFSI area, the inspectors observed several vehicles parked on or near the storage pad and questioned the licensee whether storage of these vehicles was in compliance with procedures that control transient combustible materials in the area.

SPP-10.10, Control of Transient Combustibles, stated that requirements and controls for handling and use of transient combustibles associated with the BFN ISFSI/Dry Cask Storage Pad are contained within drawings 0-47E201-1 and 0-47E201-2. Drawing 0-47E201-2, ISFSI Fire Hazards Analysis Compensatory Actions, required that equipment and/or vehicles brought within close proximity to the HI-STORM are expected to conform to the limitations contained in Tables 1, 2, 3 and 4 of the drawing and that for a selection of equipment or vehicles placed simultaneously and left unattended adjacent to the storage systems, their corresponding heat flux values shall be combined. Table 1 of the drawing contained the limits for diesel fuel including the requirement that no diesel fuel will be stored within 20 feet of the edge of a loaded HI-STORM and that a maximum of 11.88 gallons could be stored within 40 feet of a loaded HI-STORM. Following review of the administrative controls for storage of transient combustibles contained in Drawing 0-47E201-1 and -2, the inspectors determined that the licensee had stored combustibles (i.e., diesel fuel) in excess of the amount allowed. Specifically there were two aerial man lifts (JLGs) within 40 feet of a HI-STORM, each of which contained approximately 10 gallons of diesel fuel. These vehicles were being used for preparation of unloaded HI-STORMS for the upcoming ISFSI campaign and had only been in the area for the previous few weeks and were only left unattended at various locations on the pad overnight during this time. The licensee removed the vehicles to beyond the 40 foot limit, posted the entry gate with a temporary sign stating that vehicles must comply with the requirements of drawings 0-47E201-1 and 0-47E201-2 and initiated PER 231597 and PER (SR 187852).

Analysis: The Reactor Oversight Process (ROP) was not used for this issue because inspections of ISFSI activities that do not involve the operating reactor plant are not addressed by the reactor safety cornerstones in the ROP's Significance Determination Process (SDP). Therefore, this issue was evaluated as traditional enforcement as described in the NRC Enforcement Policy. This issue was greater than minor because it was associated with the protection against potential fire damage to the stored spent fuel and, if left uncorrected could become a more significant safety concern since the prolonged presence of combustible material in excess to the amounts allowed in the vicinity of the stored fuel increased the vulnerability of the casks to a fire and therefore increased the likelihood of fuel damage and/or release during a fire event. Because of the limited amount of combustibles in the area and the short duration of time they were stored in the vicinity of the casks, the violation was not considered as a substantial threat for potential exposures to or release of radiation and was determined to be of very low

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safety significance, based on Supplement VI, Example D.2 of the NRC Enforcement Policy. No crosscutting aspect was assigned because the ROP was not applicable.

Enforcement: 10 CFR 72.212, Conditions of general license issued under §72.210, section (b)(9) stated, in part, that the licensee shall “Conduct activities related to storage of spent fuel under this general license only in accordance with written procedures.” Procedure SPP-10.10, Control of Transient Combustibles, stated that requirements and controls for handling and use of transient combustibles associated with the BFN ISFSI/Dry Cask Storage Pad are contained within drawings 0-47E201-1 and 0-47E201-2. These drawings provided limits for the amount of combustibles that can be stored in proximity to a loaded HI-STORM. Contrary to the above, transient combustibles were stored on the dry spent fuel storage pad in excess of the amounts allowed. However, because this violation was of very low safety significance and it was entered into the licensee’s corrective action program as PER 231507, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. (NCV 05000259, 260, 296/2010-004)

.3 (Closed) URI 05000296/2009004-01, Reactor Core Isolation Cooling System Operability

a. Inspection Scope

Following the Unit 3 reactor scram on August 24, 2009, the RCIC system auto-initiated as designed and injected into the vessel restoring reactor water level. However, RCIC flow was oscillating between approximately 300 and 900 gpm. The licensee conducted a functional evaluation and determined that the RCIC pump was operable and the unit was returned to power. The inspectors questioned the basis of the licensee’s operability determination without knowing the definitive cause of the oscillations. The cause of the oscillations was later determined to be a missing buffer piston and buffer spring in the EG-R hydraulic actuator. On March 25, 2010, in response to questions from the NRC, the licensee determined that the installation of the faulty EG-R had rendered Unit 3 RCIC system TS inoperable. Therefore, the RCIC system had been TS inoperable from the time the faulty EG-R was installed in February 2006 until it was replaced in September 2009, which exceeded the TS allowed outage time on several occasions during that period. The licensee initiated PER 224614 to address the incorrect operability evaluation.

b. Findings

One finding of significance was identified (see Section 4OA3.3). This URI is considered closed

.4 (Closed) NRC Temporary Instruction (TI) 2515/173 Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative

a. Inspection Scope

The inspectors reviewed elements of the licensee's environmental monitoring program to evaluate compliance with the voluntary Groundwater Protection Initiative (GPI) as described in NEI 07-07, Industry Ground Water Protection Initiative – Final Guidance Document, August 2007 (ADAMS Accession Number ML072610036). The inspectors interviewed personnel and reviewed the following items:

- Records of the site characterization of geology and hydrology
- Evaluations of systems, structures, and or components that contain or could contain licensed material and evaluations of work practices that involved licensed material for which there is a credible mechanism for the licensed material to reach the groundwater. (Note: A preliminary assessment of SSCs has been performed by chemistry staff; a more in-depth review by engineering personnel is in progress.)
- Implementation of an onsite groundwater monitoring program to monitor for potential licensed radioactive leakage into groundwater
- Procedures for the decision making process for potential remediation of leaks and spills, including consideration of the long term decommissioning impacts
- Records of leaks and spills recorded, if any, in the licensee's decommissioning files in accordance with 10 CFR 50.75(g)
- Licensee briefings of local and state officials on the licensee's groundwater protection initiative
- Protocols for notification to the local and state officials, and to the NRC regarding detection of leaks and spills
- Protocols and/or procedures for thirty-day reports if an onsite groundwater sample exceeds the criteria in the radiological environmental monitoring program
- Groundwater monitoring results as reported in the annual effluent and/or environmental monitoring report
- Licensee and industry assessments of implementation of the groundwater protection initiative

Documents reviewed are listed in Sections 2RS6, 2RS7, and 4OA5 of the Attachment.

b. Findings

No findings contrary to the requirements of NEI 07-07 were identified. This TI is closed.

5. (Closed) NRC Temporary Instruction (TI) 2515/180, Inspection of Procedures and Processes for Managing Fatigue

a. Inspection Scope

The principal objective of this TI was to determine if the licensee had established appropriate procedures and processes to reasonably ensure the requirements specified in 10 CFR 26, Subpart I, Managing Fatigue, were being addressed. This TI applied to all operating nuclear power reactor licensees but was intended to be performed at only one site per utility. For the Tennessee Valley Authority utility (the licensee), the Browns Ferry Nuclear Plant was selected.

To fulfill the TI objective, the inspectors specifically reviewed SPP-1.5, Fatigue Management and Work Hour Limits, Revision 7. In addition to 10 CFR 26, Subpart I, the inspectors referred to Nuclear Energy Institute (NEI) 06-11, Managing Personnel Fatigue at Nuclear Power Reactor Sites, Revision 1, and Regulatory Guide (RG) 5.73, Fatigue Management for Nuclear Power Plant Personnel, March 2009, as guidance for reviewing SPP-1.5. The inspectors also reviewed applicable training materials related to fatigue Management. Furthermore, the inspectors interviewed responsible station staff familiar with SPP-1.5 and 10 CFR 26, Subpart I.

b. Findings and Observations

The inspectors concluded that SPP-1.5 was consistent with the requirements of 10 CFR 26, Subpart I, and the associated guidance documents of RG-5.73 and NEI 06-11, except as follows:

Per 10 CFR 26.207(a)(1)(i), the shift security manager was authorized to determine whether a waiver was necessary to maintain site security. This provision was not included in SPP-1.5, Section 3.5 for waivers. Also, SPP-1.5, Section 3.5, did not specifically mention that waivers of the work hour limitations may be necessary to ensure site security was maintained. Furthermore, neither SPP-1.5, Section 3.5 or Attachment 1, 10 CFR 26 Overtime Limits Waiver, clearly stated that pursuant to 10 CFR 26.207(a)(2) the only acceptable basis for using a waiver were for conditions adverse to safety or security where the circumstances were reasonably beyond the licensee's control .

Per 10 CFR 26.207(b), (c), and (d), for certain circumstances (e.g., Force on Force tactical exercises; Plant emergencies; and, Security), the licensee was allowed to exceed some of the requirements of 10 CFR 26.205 for minimum days off and/or work hour controls without a waiver. However, these specific exceptions were not recognized by SPP-1.5.

The licensee initiated PERs 161464, 161466, and 162621 to address these programmatic omissions.

40A6 Meetings, Including Exit

.1 Exit Meeting Summary

On July 9 and 30, 2010, the senior resident inspector presented the inspection results to Mr. Keith Polson and other members of the staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Annual Assessment Meeting Summary

On June 3, 2010, the NRC's Region II, Chief of Reactor Projects Branch 6 and Director of Reactor Projects, and the Resident Inspectors assigned to the Browns Ferry Nuclear Plant met with Tennessee Valley Authority (the licensee) executive management to discuss the NRC's Reactor Oversight Process (ROP) and the NRC's annual assessment of Browns Ferry's safety performance for the period of January 1 through December 31, 2009. The major topics addressed were the NRC's assessment program and the results of the Browns Ferry annual assessment. Attendees included Browns Ferry site management and personnel, and members of the media and public.

This meeting was open to the public. The presentation material used for the discussion and the list of attendees is available from the NRC's document system (ADAMS) as accession number ML102030059. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

.3 Exit Meeting Summary

On May 7, 2010, the lead inspector presented the inspection results of the EP inspection to Mr. Polson and other members of the plant staff. The inspector confirmed that proprietary information was not provided or reviewed during the inspection.

On June 18, 2010, the inspectors discussed results of the onsite radiation protection inspection with Mr. Jim Randich, General Manager of Site Operations, and other responsible staff. The inspectors noted that proprietary information reviewed during the course of the inspection would not be included in the documented report.

40A7 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 Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs.

- Unit 3 Technical Specification 3.4.3, Safety/Relief Valves, required that twelve of thirteen main steam safety relief valves (MSRVs) lift at a setpoint within plus or minus three percent of a specified value. Contrary to this, during TS required surveillance testing following the Unit 3 Cycle 14 refueling outage, the licensee discovered that the lift setpoints of eight MSRVs exceeded the plus three percent TS allowed pressure band. This TS violation was entered into the licensee's CAP as PER 226627. The finding was determined to be of very low safety significance because the as-found lift setpoint conditions of the Unit 3 MSRVs were analyzed and determined to meet the design basis criteria for the most limiting over-pressurization events.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Austin, Licensing
S. Berry, Component Engineering Manager
J. Black, Chemistry Manager
O. Brooks, Operations LOR Supervisor
S. Bono, Director of Engineering
M. Button, Maintenance Manager
J. Colvin, Engineering Programs Manager
R. Conner, Work Control Manager
M. Durr, Design Engineering Manager
J. Emens, Site Licensing Supervisor
A. Feltman, Emergency Preparedness Manager
F. Godwin, Licensing Manager
B. Hargrove, Radiation Protection
J. Harris, Radiation Protection
D. Johnston, Manager Nuclear Transmission Services, Browns Ferry
J. Keck, Reactor Engineering Manager
R. King, System Engineering Manager
W. Lee, Corporate Emergency Preparedness Manager
D. Malinowski, Operations Training Manager
E. May, Radiation Protection
M. McAndrew, Operations Superintendent
J. McCarthy, Director Safety and Licensing
O. Miller, Operations Manager
J. Mitchell, Site Security Manager
J. Morris, Director Training
J. Morrison, Operations Procedures Supervisor
E. Quinn, Performance Improvement Manager
K. Polson, Site Vice President
J. Randich, Plant General Manager
R. Rogers, Director Project Management
P. Sawyer, Radiation Protection Manager
H. Smith, Fire Protection Supervisor
J. Underwood, Site Nuclear Assurance Manager
D. Vinson, Chemistry

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000296/2010003-01	NCV	Inappropriate Use of Waivers to Exceed 10 CFR 26 Work Hour Limitations (Section 1R20)
05000296/2010003-02	NCV	Unit 3 RCIC System Inoperable Beyond the Technical Specifications Allowed Outage Time (Section 4OA3.2)
05000296/2010003-03	NCV	Failure to Provide Complete and Accurate Information in LER 0500296/2009-003-00 (Section 4OA3.2)
05000296/2010003-04	NCV	Transient Combustibles Stored Near Independent Spent Fuel Storage Facility in Excess of Amount Allowed (Section 4OA5.2)

Closed

05000296/2009004-01	URI	Unit 3 Reactor Core Isolation Cooling Pump Flow Oscillations (Section 4OA5.3)
2515/173	TI	Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative (4OA5.5)
2515/180	TI	Inspection of Procedures and Processes for Managing Fatigue (4OA5.6)
05000296/2009-003-00	LER	Reactor Core Isolation Cooling Inoperable Longer Than Allowed by Technical Specifications (Section 4OA3.2)
05000296/2010-001-00	LER	Safety Relief Valves As-Found Setpoints Exceeded Technical Specification Lift Pressure Values (Section 4OA3.3)

Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

0-GOI-200-3, Hot Weather Operations, Rev. 10
SPP-7.1, On Line Work Management, Rev. 16
FSAR Section 10.12, Heating, Ventilating and Air-Conditioning Systems
PER 172898, Hot Weather GOI
PER 175644, 0-GOI-200-3 Hot Weather Operations
PER 177265, Freeze Protection/Hot Weather Assessment
PER 223652, Procedure 0-GOI-200-3 (Hot Weather Operations) is not compatible with MAXIMO
PER 225601, Recommendations from Assessment of Summer Readiness, QA-BF-10-008
PER 225603, Recommendations from Assessment of Summer Readiness, QA-BF-10-008
PER 225604, Recommendations from Assessment of Summer Readiness, QA-BF-10-008
QA Assessment Report QA-BF-10-008, Assessment of Summer Readiness
0-GOI-300-4, Switchyard Manual, Rev. 77
0-GOI-300-4, Attachment 1, General Information for Switchyard Operations, Rev. 73
ESP-SC-SPP-06.04-2, Substation and Switchyard Construction Standards-Electrical-Grounding, Rev. 0
FSAR Section 8.0, Electrical Power Systems, BFN-22
IGA-6, Policy and Organization Manual Intergroup Agreement Power System Operations, Rev. 12
PER 232711, Ground Mat in Switchyard and Transformer Yard
PER 232710, Switchyard Housekeeping
SR 189703, Re-bar and bricks lying at base of tower adjacent to spare U3 Main Transformer
SR 189708, Pallet of sandbags staged west of Security Diesel Building
SR 189711, Underground PVC phone cable conduit uncovered and broken
SR 189715, Galvanized electrical cable conduit uncovered
SR 189717, Transformer yard general housekeeping is poor
SR 189741, Fire Protection Valve Pit temporary sump pump extension cord routing
SR 189746, Thick, black rubber gasket material lying at base of 2B USST
SR 189749, Oil catch pan filled with rags at base of 3A Main Transformer
SR 189759, Storage of Spare Main Transformer conductors unkempt and disorganized
SR 189761, Scaffolding, tarps, sandbags staged east end Transformer Yard
TRO-TO-SOP-10.128, Browns Ferry Nuclear Plant (BFN) Grid Operating Guide, Rev. 10
TRO-TO-SOP-10.328, Nuclear Offsite Power Disqualification Notification and Call-Out Procedure, Rev. 6
TRO-VP-SPP-10.006, Loss of SCADA and/or EMS, Rev. 4
SPP-7.1, On-Line Work management, Rev. 16

Section 1R04: Equipment Alignment

0-OI-82, Standby Diesel Generator System, Rev 106 and Attachments 1A, 1B, 2, 2A, 2B, 3, 3A and 3B
0-47E861-1, Flow Diagram Diesel Standby Air System Generator A, Rev. 13
0-47E861-2A, Flow Diagram Diesel Standby Air System Generator B, Rev. 6

0-47E861-5, Flow Diagram Cooling System and Lube Oil System Standby Diesel A, Rev. 12
 0-47E861-6, Flow Diagram Cooling System and Lube Oil System Standby Diesel B, Rev. 9
 2-OI-75, Attachment 1, Core Spray System Valve Lineup Checklist, Effective Date: 3/19/07
 2-OI-75, Attachment 2, Core Spray System Panel Lineup Checklist, Effective Date: 3/19/07
 2-OI-75, Attachment 3, Core Spray System Electrical Lineup Checklist, Effective Date: 3/19/07
 Drawing 2-47E814-1, Unit 2 Flow Diagram Core Spray System, Rev. 52
 3-OI-75, Attachment 1, Core Spray System Valve Lineup Checklist, Effective Date: 8/28/08
 3-OI-75, Attachment 2, Core Spray System Panel Lineup Checklist, Effective Date: 4/8/08
 3-OI-75, Attachment 3, Core Spray System Electrical Lineup Checklist, Effective Date: 8/28/09
 Drawing 3-47E814-1, Unit 3 Flow Diagram Core Spray System, Rev. 34
 Drawing 1-47E813-1, Unit 1 Flow Diagram Reactor Core Isolation Cooling, Rev. 32
 1-OI-71, Attachment 1, Reactor Core Isolation Cooling System Valve Lineup Checklist, Effective Date: 12/12/2007
 1-OI-71, Attachment 2, Reactor Core Isolation Cooling System Panel Lineup Checklist, Effective Date: 5/26/2007
 1-OI-71, Attachment 3, Reactor Core Isolation Cooling System Electrical Lineup Checklist, Effective Date: 5/24/2007
 CDE #729, Functional Failure of 1-FCV-71-3, Outboard Steam Supply Isolation Valve
 CDE #730, 1-FCV-71-10, RCIC Turbine Control Valve Failed to Return Open
 1-SR-3.5.3.3, RCIC System rated Flow At Normal Operating Pressure, performed March 4, 2010
 RCIC System Health Report (10/1/2009 – 1/31/2010)
 Unit 1 RCIC Open PERs as of March 24, 2010
 Unit 1 RCIC Outstanding WO's as of March 24, 2010
 Weekly Dataware system monitoring parameters of the governor controls for BFN RCIC Systems - EGM, Ramp Generator Signal Convertor, and Flow Controller Output values from 12/24/09 to 5/14/10

Section 1R05: Fire Protection

Fire Protection Report, Volume 1, Fire Hazards Analysis Units 1/2/3, Revision 1
 Fire Protection Report, Volume 2, Sections IV.3, Pre-Plan No. RX1-593, Revision 8
 Fire Protection Report, Volume 2, Sections IV.6, Pre-Plan No. RX2-593, Revision 8
 Fire Protection Report, Volume 1, Fire Hazards Analysis, Section 2, Fire Areas 14 and 15
 Fire Protection Report, Volume 2, Section IV.9, Pre-Plan No. RX3-621
 Fire Protection Impairment Permit 09-1920, Roving Fire Watch Coverage for Appendix R Safe Shutdown Manual Actions
 Fire Protection Report, Volume 1, Fire Hazards Analysis, Section 2, Fire Area 13
 Fire Protection Report, Volume 2, Sections IV.9, Pre-Plan No. RX3-621, Revision 8
 Fire Drill Evaluation/Critique for Unannounced Drill on 6/03/10, dated 6/16/10
 Fire Protection Report Volume 1, Fire Area 25, Rev. 7
 Fire Protection Report Volume 2, Section IV.16, Pre-Plan No. TB2-557, Rev. 8
 SR 188992, Control Room Personnel Participation During Fire Drills
 SR 189030, Communications During Fire Drill Held On June 3, 2010
 SR 196935, New Fire Drill Critique Form

Section 1R07: Heat Sink Performance

0-OI-67/Attachment 1, Valve Lineup Checklist Unit 0, Rev. 83
 0-TI-522, Program for Implementing NRC Generic Letter 89-13, Rev. 0
 0-TI-389, Raw Water Fouling and Corrosion Control, Rev. 11
 0-TI-54, EECW System Operational Flush, Rev. 9
 0-TI-545, EECW System Individual Load Flow Measurements and Adjustments, Rev. 1
 0-SI-3.2.4(DG B), EECW Valve Test on Diesel Generator D, Rev. 1
 BFN Program Health Report – GL 89-13, dated May 2010
 Calculation MD-Q0067880201, Diesel Generator Heat Exchanger In Series Analysis, Rev. 4
 Calculation MD-Q0082-000016, Diesel Generator Jacket Water Cooler Capacity and Tube Pluggage, Rev. 1
 Drawing 1-47E859-1, Flow Diagram Emergency Equipment Cooling Water, Rev. 77
 Drawing BFN-VTD-Y021-0010, Jacket Water Cooler, Rev. 0
 EPRI NP-7552, Heat Exchanger Performance Monitoring Guidelines, December 1991
 Functional Evaluation 42709, Fouling of U0 C1 and C2 Diesel Generator Heat Exchangers
 FSAR Section 10.10, Emergency Equipment Cooling Water System, BFN-22
 Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment, dated July 18, 1989
 GL 89-13 Heat Exchanger Visual Inspection and Evaluation Forms (completed for U0 EDGs), dated 3/05/08, 6/11/08, 7/08/08, and 7/22/08
 GL 89-13, Supplement 1, Service Water System Problems Affecting Safety-Related Equipment, dated April 4, 1990
 NRC Letter to TVA accepting Licensee's Response to Generic Letter 89-13 Regarding Service Water Systems
 PER 79520, Failure to Meet Acceptance Criteria in 1-SI-3.2.4
 PER 147283, Fouling of U1/2 C1 and C2 DG Coolers
 PER 211737, Unit 3 DG Heat Exchanger Fouling
 PER 211842, Increased Monitoring on EECW Flow to 3D DG Heat Exchangers
 PER 213088, Low EECW Flow to 3A Diesel Generator
 SPP-9.14, Generic Letter (GL) 89-13 Implementation, Rev. 1
 TVA Letter to NRC providing Browns Ferry Response to GL 89-13, dated March 16, 1990

Section 1R12: Maintenance Effectiveness

SPP-6.6, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting - 10CFR50.65, Rev. 9
 0-TI-346, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting - 10CFR50.65, Rev. 34
 MREP Meeting Minutes dated 2/11/2009
 MREP Meeting Minutes dated 3/30/2009
 PER 143172, B3 EECW Upper Shaft Replacement
 PER 149088, A3 EECW Strainer Failure
 PER 166464, A3 EECW Pump Knocking Noise
 PER 161971, A3 EECW Pump Elevated Vibration
 PER 212581, B3 EECW Strainer Failure

PER 223543, All four EECW pumps classified as (a)(1) status by MREP
 PER 227425, Work Control Process Impacts on Maintenance Rule Unavailability

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

PRA Evaluation Response for 3ED DG Emergent Work, BFN-0-10-057, Rev. 1
 U3 Sentinel Risk assessment "What-If" for 05/17/10, performed independently by inspector
 U3 Sentinel Risk assessment "What-If" for Work Week 1020, performed by Work Week
 Manager
 BFN Plant Risk and Protected Equipment Report for 4/14/2010
 Unit 2 Sentinel report for 4/14/2010
 0-OI-57D, DC Electrical System, Rev. 129
 Drawing 0-45E724-3, Wiring Diagram, 4160V Shutdown BD C, Single Line, Rev. 31
 Drawing 1-45E729-2, Wiring Diagram, 480V Shutdown BD 1B, Single Line, Rev. 48
 BFN Plant Risk and Protected Equipment Report for 5/6/2010
 Unit 2 Sentinel report for 5/6/2010
 Unit 3 Daily Status Reports dated June 1 - 3, 2010
 PRA Evaluation Response, BFN-0-10-067, dated June 29, 2010

Section 1R15: Operability Evaluations

0-TI-395, Breaker Testing and Maintenance Program, Rev. 5
 ECI-0-000-BKR008, Testing and Troubleshooting of Molded Case Circuit Breakers and Motor
 Starter Overload Relays, Rev. 89
 EPRI Molded Case Circuit Breaker Application and Maintenance Guide, Rev. 2
 FSAR 8.6, 250 VDC Power Supply and Distribution, BFN-20
 PER 153450, INPO 2008 AFI-PM Program
 PER 209095, Lack of Preventive Maintenance on Safety Related Molded Case Circuit Breakers
 PER 210927, ECI-0-000-BKR008 Not Performed for Molded Case Circuit Breakers
 BFN-50-7074, General Design Criteria for Residual Heat Removal System, Rev. 19
 Calculation BFNEQ MOT-001, Tab E-11, Equipment Qualification –The maximum operating
 hours for RHR and Core Spray pump motors, Rev. 4
 Drawing 2-47E811-1, Flow Diagram Residual Heat Removal System, Rev. 66
 General Electric Design Specification 22A1345, Rev. 2
 NRC Engineering Evaluation AEOD/E309, The Potential for Water Hammer During the Restart
 of RHR Pumps at BWR Nuclear Power Plants, dated April 1983
 NRC Information Notice 87-10, Potential for Water Hammer During Restart of Residual Heat
 Removal Pumps
 PER 166798, Deficient PRA Model
 PER 218875, RHR Design Criteria has Inconsistent Information
 PER 226731, Dual Loop SPC Not in New PRA
 PER 227324, OI-74 Guidance Deficiency WRT Water Hammer During SPC
 PRA Evaluation Response BFN-0-10-069
 SR 169478, Deficiency in OI-74 with Respect to IN 87-10 Recommendation
 SR 166798, PRA Model does not contain gate described in the RHR system notebook
 1-OI-74, Residual Heat Removal System, Rev.69

Section 1R18: Plant Modifications

1-AOI-85-2, Uncoupled Control Rod, Rev. 1
 1-ARP-9-5A, Panel 9-5 1-XA-55-5A, Window 14, Control Rod Overtravel, Rev. 13
 Drawing 1-730E321, Reactor Manual Control System, Sheet 10, Rev.10
 Drawing 1-730E557, Elec Diagram RPIC Panel 9, Rev. 1
 Drawing 0-730E557, Elec Diagram Rod Position Info Cab, Sheet 2, Rev.3
 FSAR Section 3.4, Reactivity Control Mechanical Design, BFN-22
 FSAR Section 7.7, Reactor Manual Control System, BFN-22
 PER 221661, Control Rod Overtravel Annunciator
 SR 187674, Limit Switch for Full-In Overtravel In RPIS Probe 34-51 Made Up
 TACF 1-10-004-085, Unit 1 CRD Control Rod 34-51 Buffer Pin Tape-Over to Clear Overtravel Alarm, Rev. 0
 Technical Specifications and Bases 3.1.3, Control Rod Operability, Amendment 274
 Technical Requirements Manual and Bases 3.3.5, Surveillance Instrumentation, Rev. 67
 WO 110775807, Minor Maintenance Troubleshooting
 WO 110775807, Routine Maintenance TACF Installation

Section 1R19: Post-Maintenance Testing

Clearance 3-TO-2010-0001, Section 3-003-0005, Seal Weld 3-ECKV-3-817
 Drawing 3-47E803-5-ISI, ASME Section XI RPV Level Sensing Lines Code Class Boundaries, Rev. 2
 Drawing 3-47E600-733, Mechanical Instruments and Control RPV Nozzle 12A Water Level Sensing Lines
 Drawing 280619, Valve Assembly Flow Fuse
 ENERTECH Memorandum, Flow Fuse Functionality, dated 4/29/2010
 Engineering Work Request EWR-10-MEB-003-0041, Ensure Seal Welds Performed on BFN-3-ECKV-3-817 Valve Do Not Affect Functionality
 MMDP-10 Category I/II Weld Data Sheet, Marotta Valve 280619 Weld Nos. RFW-3-2-52 and 53
 SR 170716, 3-ECKV-3-817 Leak and LCO Entry
 Weld Identification 0002ReQFM
 WO 110917707, Seal Weld 3-ECKV-3-817
 WO 110914896, Troubleshoot Loss of Indication to Unit 3 Level Transmitters on Reference Leg to Condensing Pot 3-CPOT-003-0821
 WO 05-725340-000, Verify RHRSW Pump D1 52STA Switch Contact Configuration Changes State with Breaker Operation
 WO 06-711448-015, Disassemble and Inspect Check Valve 0-CKV-023-0565 per SOER 96-03
 WO 07-712156-000, Disassemble Air Release Valve and Inspect
 WO 09-710990-000, Perform Preventative Maintenance on Breaker and Cubicle for 4KV Shutdown Board 3ED, Compartment 6
 2-SI-4.5.C.1(3), RHRSW Pump and Header Operability and Flow Test, Rev. 109
 EPI-0-000-TST001, Bridge, Megger and High Potential Testing of Electrical Equipment, Rev. 58
 EPI-0-000-BKR015, 4KV Wyle/Siemens Horizontal Vacuum Circuit Breaker (Type-3AF) and Compartment Maintenance, Rev. 28
 MCI-0-000-ARV001, Generic Maintenance Instructions for Air Release Valves, Rev. 11
 MCI-0-000-CKV001, Generic Maintenance Instructions for Swing Check Valves, Rev. 30

PMT-0-000-MEC001, Leak Checks on Tube Fittings, Threaded, Flanged, Bolted or Welded Connections, Rev. 6
 PER 151031, PMT Program Gaps
 PER 170650, Flow test through 1-SHV-67-655
 PER 173055, Potential Adverse Trend for Post-Maintenance Testing
 PER 211854, PMT for B3 EECW Pump
 PER 211939, NRC Debrief Comments on PMTs
 PER 213116, PMT Not Performed
 Self-Assessment BFN-MNT-S-10-004, Post Maintenance Testing Planning
 WO 09-718492-000, Troubleshoot failure of d DG air start system #2
 WO 09-718492-001, Troubleshoot to repair DG right bank air start system per MMDP-3 and MPI-0-082-INS003
 EPI-0-082-GDZ006, Diesel Generator D Redundant Start Test, Rev. 27
 PMT-0-000-MEC001, Leak Checks on Tube Fittings, Threaded, Flanged, Bolted or Welded Connections, Rev. 6
 PER 174407, D DG Start Circuit Issues
 PER 201609, Scheduling Process Issues Leading to Untimely Problem Resolution
 PER 210994, D Diesel Generator Start Circuit Failure
 PER 217029, D Diesel Generator Right Bank Start System Non-Functional Since 6/16/2009 – Still in PMT Status
 PER 229195, Redundant Start D DG Unable to Perform Due to Right Air Bank
 PER 229577, D DG Redundant Start Test Delay
 WO 10585106, 1-RLY-074-10AK108B Buzzing Loudly
 1-SR-3.6.1.3.5(RHR II), Quarterly RHR System Rated Flow Test Loop II, Rev. 13
 ECI-0-000-RLY004, Replacement of HFA Relay Components and/or Calibration of HFA Relays
 Drawing 1-730E920-8, Elementary Diagram RHR System, Rev. 15
 Drawing 1-45E779-9, Wiring Diagram 480V Shutdown Auxiliary Power Schematic Diagram, Rev. 8
 TVA Service Request 198888
 Work Order 110931445
 System Operating Procedure, Control Rod Drive, 2-OI-85, Rev 124
 WO 08-712934, Troubleshoot and Rework Problems and Complete 1-SR-3.6.2.2(A)
 1-SR-3.6.2.2(A), Suppression Chamber Level Instrumentation Channel A Calibration
 WO 111054384, U3 RCIC EDC 69932, Flowrate Setpoint Change per 3-SR-3.5.3.3 to 620 gpm
 3-SR-3.5.3.3, RCIC System Rated Flow at Normal Operating Pressure

Section 1R22: Surveillance Testing

1-SR-3.3.3.2.1(75 II), Backup Control Panel Testing, Rev. 2
 0-SR-3.7.3.4, Control Bay Habitability Zone Pressurization Test, Rev. 10
 0-GOI-300-2, Electrical, Rev. 92
 0-OI-31, Control Bay and Off-Gas Treatment Building Air Conditioning System, Rev. 136
 0-TI-272, Control Bay Habitability Zone Penetration Breach Analysis, Rev. 11
 BFN Unit 2 Technical Specifications, Section 3.7.3, Control Room Emergency Ventilation (CREV) System
 BFN Unit 2 Technical Requirements Manual, Section 3.7.6, Electric Board Room Air Conditioning (AC) System
 BFN USFAR Section 10.12, Heating, Ventilation and Air Conditioning Systems

BFN USFAR Section 14.6, Analysis of Design Basis Accidents
 1-SR-3.5.1.6(RHR I), Quarterly RHR System Rated Flow Test Loop I, Rev. 13
 BFN Unit 1 Technical Specifications Section 3.5.1, ECCS Systems - Operating
 BFN USFAR Section 4.8, Residual Heat Removal System
 2-SR-3.4.5.3, Drywell Floor Drain Sump Flow Integrator Calibration, Rev. 9
 Drawing 0-47E610-77-1, Mechanical Control Diagram Radwaste System, Rev. 57
 Drawing 0-47W600-99, Mechanical Instruments and Controls, Rev. 3
 FSAR Section 4.10 Nuclear System Leakage Rate Limits, BFN-22
 Technical Requirements Manual TR 3.3.10 Reactor Coolant Leakage Detection
 Instrumentation, Rev. 44
 Technical Specifications and Bases 3.4.5 RCS Leakage Detection Instrumentation, Amendment
 244
 3-SR-3.8.1.8, 480V Load Shedding Logic System Functional Test, Rev. 6
 0-OI-57B, 480V/240V AC Electrical System, Rev. 186
 Dwg 3-45E749-5, Wiring Diagram 480V Shutdown Board 3A Single Line, Rev. 56
 Dwg 3-45E779-1, Wiring Diagram 480V Shutdown Auxiliary Power Schematic Diagram, Rev. 22
 BFN Unit 3 Technical Specifications Section 3.8.1, AC Sources - Operating
 BFN USFAR Section 8.5, Standby AC Power Supply and Distribution
 PER 229613, 3A 480V Shutdown Board De-energized During Panel Transfer
 PER 229610, Breaker Handswitch Allows Overtravel When Moving Handswitch
 WO 110963782, Breaker Handswitch Allows Overtravel When Moving Handswitch

Section 1EP2: Alert and Notification System Evaluation

EPFS-9, Inspection, Service, and Maintenance of the Prompt Notification System (PNS) at
 Browns Ferry, Sequoyah, and Watts Bar Nuclear Plants, Rev. 0003
 FEM-REP-10, Evaluation and Analysis of the Alert and Notification System for the Browns Ferry
 Nuclear Plant, Rev. Sept 1989
 EPDP-14, Evaluation of Changes to Alert and Notification System (ANS), Rev. 0000
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Section 1EP3: Emergency Preparedness Organization Staffing and Augmentation System

TRN-30, Radiological Emergency Preparedness Training, Rev. 15
 EPT-101.000, Shift Emergency Director Radiological Emergency Training, Rev. 13
 EPT-102.000, Technical Support Center Radiological Emergency Training, Rev. 12
 EPDP-10, Facilitation of the Alert Notification System and Pager Tests, Rev. 0000
 EPDP-2, Emergency Duty Officer Emergency Preparedness Staff and Operations Duty
 Specialist Notifications Procedures, Rev. 0000
 Various ERO Personnel Qualification and Training records
 ERO duty rosters for various dates
 3/25/2009 Drill Package
 4/07/2009 Drill Package
 7/16/2009 Drill Package

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Plant Operations Review Committee minutes of Meeting No. 8705, April 14, 2010
 PLP-201, Emergency Plan, Rev. 90 and 91
 EPIP-1, Emergency Classification Procedure, Rev. 45 and 46
 EPIP-7, Activation and Operation of the Operations Support Center (OSC), Rev. 27
 EPIP-16, Termination and Recovery Procedure, Rev. 7
 EPIP-13, Dose Assessment, Rev. 16
 EPDP-1, Emergency Classification Procedure, Rev. 45

Section 1EP5: Correction of Emergency Preparedness Weaknesses

SPP-1.6, NPG Self-Assessment and Benchmarking Program, Rev. 17
 SPP-3.1, Corrective Action Program, Rev. 19
 SPP-3.1.4, Corrective Action Program Screening and Oversight, Rev. 0000
 EPDP-8, Emergency Preparedness Quality Related Program, Rev. 0000
 0-TI-88, Procedure for Estimation of the Extent of Core Damage under Accident Conditions
 PER 217633, delayed isolation of steam leak
 PER 217150, missed classification during training drill
 PER 214026, multiple EAL entries on initial notification form
 PER 214021, maintenance not reporting minimum ERO staffing during shift turnover
 PER 214020, tracking of ERO impending training expiration
 PER 213725, estimation of ERO travel time
 PER 207160, radiation protection not assigned to all OSC field teams
 PER 207154, fuel failure determination
 PER 166989, Control Room to TSC information feed water status communication delayed
 PER 166916, Control Room to TSC information on top of active fuel level delayed
 PER 165549, inaccurate classification timeliness assessment
 PER 164236, Emergency Action Level labeling discrepancy
 PER 150288, SCBA management expectations
 PER 136474, inaccurate notification missed by an operation's training instructor
 October 17, 2008 letter to state and local governments as required by 10 CFR 50.54(t)
 Report NA-CH-0-002, 2009 Corporate Nuclear Assurance Assessment Report
 SSA0804, 2008 Browns Ferry, Sequoyah, and Watts Bar Nuclear Plants and Corporate Audit
 Report NA-CH-07-003, 2007 Corporate Nuclear Assurance Assessment Report
 SSA0603, 2006 Browns Ferry, Sequoyah, and Watts Bar Nuclear Plans and Corporate Audit
 BFN-EP-08-SS06, Emergency Dosimetry Packages, 04/09/08
 BFN-EP-08-SS07, BFN EPIP-1, Emergency Action Level 2.4-U, 4/10/08
 BFN-EP-08-SS08, Lessons Learned Communications, 4/20/08
 BFN-EP-08-SS09, 10 CFR 50.54(q), 4/14/08
 BFN-EP-S-08-010, Distribution and Verification of Revision Levels for EP provided Maps, 08/11/08
 BFN-EP-S-08-011, Semi Annual Review of SCBA Expectations at FNF, 08/11/08
 BFN-EP-S-09-SS01, Lessons Learned Communications Between Emergency Centers, 12/15/08
 BFN-EP-S-002, Drill/Exercise Performance – NEI-99-02 Performance Indicators data collection 02/28/09
 BFN-EP-S-09-003, Review on SOER 99-01, 07/27/09

BFN-EP-S-09-004, Assessment of CDE Data Entry, 07/27/09
 BFN-EP-F-10-001, Emergency Preparedness Focused Self Assessment 01/19/10
 03/25/2009 Drill Package
 04/07/2009 Drill Package
 07/16/2009 Drill Package
 11/04/2009 Graded Exercise Report Package

Section 2RS5: Radiation Monitoring Instrumentation

Procedures, Guidance Documents, and Manuals:

0-ODCM-001, BFNP Offsite Dose Calculation Manual, Rev. 20
 0-TI-15, Radioactive Gaseous Effluent Engineering Calculations and Measurements, Rev. 15
 0-TI-222, PASS Testing, Rev. 15
 1-TI-331, Post Accident Sampling Procedure, Rev. 6
 2-TI-331, Post Accident Sampling Procedure, Rev. 16
 3-TI-331, Post Accident Sampling Procedure, Rev. 16
 CCI-0-RE-00-117, Component Calibration Instruction, Eberline RM-14 Portable Radiation
 Ratemeters, Rev. 3A
 CCI-0-RE-00-237, Eberline Instrumentation Corporation PCM-1B Personnel Contamination
 Monitor, Rev. 18
 CCI-0-RE-00-238, Eberline Instrumentation Corporation PCM-2 Personnel Contamination
 Monitor, Rev. 6
 CCI-0-RM-90-100, Calibration of the Canberra Argos-5AB Personnel Contamination Monitor,
 Rev. 1
 CCI-0-RM-90-146, Area Radiation Monitors Calibration, Rev. 23
 CI-303.13, Energy Calibration and Daily Checks (Gamma Spectroscopy System), Rev. 10
 CI-303.15, Efficiency Calibration (Gamma-Ray Spectroscopy System), Rev. 14
 CI-902, Post Accident Sampling Procedure for Stack Effluents – Mid/High Range Noble Gas
 Sample from WRGERMS, Rev. 8
 OP-06, Operation of Liquid Scintillation Counting System, Rev. 3
 QC-18, Liquid Scintillation Background and Count Reproducibility Check, Rev. 5
 RCI-8.1, Internal Dosimetry Program Implementation, Rev. 42
 RCI-11.1, Radiation Protection Instrument Program Implementation, Rev. 70
 RCI-11.2, Radiation Protection Airborne Instrument Maintenance, Rev. 2
 RCI-11.3, Radiation Protection Radiation/Contamination Instrument Maintenance, Rev. 10
 RCI-34, Remote Monitoring, Rev. 9
 SII-0-XX-00-300, PM-7 Portal Monitor, Rev. 3

Records and Data:

0-SI-4.2.D.1, Liquid Radwaste Monitor Calibration/Functional Test, 02/12/10
 0-SI-4.2.D.1FT, Liquid Radwaste Monitor Functional Test, 12/28/09
 0-SI-4.2.K.1, Airborne Effluents – Main Stack Monitoring System Calibration, 10/25/09
 0-SI-4.2.K.1FT, Airborne Effluents – Main Stack Monitoring System Functional Test, 02/11/10
 0-TI-222, Pass Testing (08/18/09, 08/19/09, 10/15/09, 02/04/10, 02/14/10 and 04/16/10)
 1-SR-3.3.3.14(5A), Containment High Range Radiation Monitoring Channel Calibration and
 Functional Test (1-RM-90-272A) Division I, 04/14/09
 1-SR-3.3.3.14(5B), Containment High Range Radiation Monitoring Channel Calibration and
 Functional Test (1-RM-90-273A) Division II, 03/25/09

1-TI-331, Post Accident Sampling Procedures, 08/18/09 and 02/14/10
 2-SI-4.2.D-2B, RHR Service Water Radiation Monitor (2-RM-90-134D) Calibration and Functional Test, 12/10/09
 2-SI-4.2.K.2, Reactor Building Vent Exhaust Radiation Monitor Calibration and Functional Test 2-RM-90-250, 05/26/10
 2-SI-4.2.K.3A, Turbine Building Vent Exhaust Radiation Monitor Calibration and Functional Test 2-RM-90-249, 02/26/10
 2-TI-331, Post Accident Sampling Procedure, 08/19/09 and 02/04/10
 3-TI-331, Post Accident Sampling Procedure, 10/15/09 and 04/16/10
 Air Sample Calibration Sheets, Sampler Type LV-1, TVA Tag No. 003052, 09/09/09 and 03/04/10
 Analytics, Certificates of Calibration, Standard Radionuclide Sources: Ba-133 Button Sources, S/Ns 22695-135, 22696-135, and 22697-135 (02/12/87) and Co-60 Button Sources, S/Ns 22688-135 and 22689-135 (02/12/87)
 Browns Ferry Nuclear Plant (BFNP) – ABACOS Plus Whole Body Counting System, Fastscan #2 Whole Body Geometry Calibration, 06/08/94
 Calibration of the Western Area Radiological Laboratory (WARL) High Level CS-137 Source Range, 07/13/09
 Calibration Certificates, J L Shepherd and Associates, Amersham x.8 Type Capsule, S/N 8812GM and Model 6810, S/N 83Cs-25, 04/30/84; and J L Shepherd and Associates, Type 6810 Capsule, S/N 0307GY and New England Nuclear Type G316B Capsule, S/N KR-4099, 04/22/92
 Calibration Data Sheets, Bicon/Micro-Rem, TVA Tag No. 568088, 08/26/08 and 05/12/10
 Calibration Data Sheets, Bicon/Surveyor 50, TVA Tag No. 841963, 10/22/09 and 05/10/10
 Calibration Data Sheets, Bicon Surveyor M-X, TVA Tag No. 562898, 07/21/09 and 04/13/10
 Calibration Data Sheets, Eberline RO20, TVA Tag No. 860372, 09/22/09 and 05/11/10
 Calibration Data Sheets, Eberline Teletector, TVA Tag No. 860389, 05/04/09 and 01/04/10
 Calibration Data Sheets, Ludlum 12-4 (10), TVA Tag No. 860560, 05/27/09 and 02/04/10
 Calibration Data Sheet, Rados Clearance Monitor, TVA Tag No. 860439, 04/09/09 and 03/03/10
 Certificate of Gamma Standard Source, Cs-137, Source No. 177-29-3, 08/01/86
 CCI-0-PX-90-093, Area Radiation Monitor Power Supply Calibration, 08/04/09
 CCI-0-RM-90-146, Area Radiation Monitors Calibrations (08/05/09, 08/06/09, 08/09/09, 08/11/09, 08/12/09, 08/13/09, 08/18/09, and 08/19/09)
 CCI-0-RM-90-250, Eberline Air Particulate CAM Calibration with Control Room Communication Interface, 11/02/09
 CI-1101, Quality Assurance/Quality Control, Lower Limit of Detection Determination and Efficiency Calibration (Gamma-Ray Spectroscopy System), 12/21/01 and 12/26/01
 Energy Calibration Check, Gamma Spectroscopy, 06/14/10
 Instrument # 285 Liquid Scintillation Background and Count Reproducibility Checks, 06/14/10
 New Values of Neutron Calibration Points, Calibration of 10 Ci PuBe Neutron Source, 06/03/98
 Report of Calibration, Electroplated Alpha Source, Plutonium-239, 07/15/80
 Response Acceptance Windows for: Bicon Micro-Rem Survey Instruments, Dated 09/05/08; Bicon Surveyor M-X Survey Instruments, 03/23/09; Ludlum 12-4 Survey Instruments, 06/29/09; RO20 Survey Instruments, 03/23/09; RSO-50 Survey Instruments, 09/09/09; and Teletector Survey Instruments, 09/24/09

Whole Body Counting (WBC) Measurement Quality Assurance – Fall 2009 Performance Test Results, 12/15/09

WBC Report, QA Record, QCC, Energy Cal Check, 06/16/10

Corrective Action Program Documents:

Focused Self-Assessment Report, Assessment No. BFN-RP-F-10-001, RP Public Radiation Protection – June 14-18, 2010 NRC Inspection Readiness, 03/04/10

PER 143184, 1-RM-090-132D was declared inoperable

PER 176093, 2-RM-090-132D Raw Cooling Water Effluent Radiation Monitor inoperable due to pump tripping and would not restart

PER 179306, Potential adverse trend exists with failures of the liquid effluent radiation monitors

PER 192723, CAM 1-RM-90-55 on RX1 593 shows “Check Source Failure”, CAM out of service

PER 192986, Unit 1 Rx Zone CAM, 1-RM-90-250 did not test satisfactory and declared inoperable until 0-SI-2.1-2 could be completed

PER 195856, Check sources used to calibrate process monitors in the plant do not have NIST certification

PER 208654, Corrective actions for adverse trend determination in PER 179306 on liquid effluent radiation monitors

PER 209207, 1-RM-90-133D radiation monitor inoperable

Section 2RS6: Radioactive Gases and Liquid Effluent Treatment

Procedures, Guidance Documents, and Manuals

0-ODCM-001, Offsite Dose Calculation Manual, Rev. 18

2008 Radiological Effluent Release Report

2009 Radiological Effluent Release Report

0-SI-4.8.B.2-8, Airborne Effluent Analysis – Stack Noble Gas, Rev. 12

0-SI-4.8.A.1-1, Liquid Effluent Permit, Rev. 71

CI-421, Well Sampling and Maintenance, Rev. 1

CI-738, Sampling Effluent Monitors (CAMs) for Tritium and Gamma Isotopics, Rev. 29

CI-720, Determining Vent Flow, Rev. 12

CI-714, Particulate and Charcoal Filter Sampling and Analysis, Rev. 27

CI-716, Processing Gaseous Permits from Charcoal/Particulate, Rev. 12

Records and Data Reviewed

BFNP Well Water Tritium Analysis (4/29/08-4/29/10)

Report: Unplanned Release of Radioactive Material, Condensate Storage Tank 5, June 7, 2010

0-SR-3.6.4.3.2(A VFTP), Standby Gas Treatment Filter Pressure Drop and In-Place Leak Tests – Train A, 9/30/09

0-SR-3.6.4.3.2(B VFTP), Standby Gas Treatment Filter Pressure Drop and In-Place Leak Tests – Train B, 7/29/09

0-SR-3.6.4.3.2(C VFTP), Standby Gas Treatment Filter Pressure Drop and In-Place Leak Tests – Train C, 7/9/09

0-SR-3.6.4.3.2(A), Standby Gas Treatment System – Iodine Removal Efficiency, 7/13/09

0-SR-3.6.4.3.2(B), Standby Gas Treatment System – Iodine Removal Efficiency, 7/21/09

0-SR-3.6.4.3.2(C), Standby Gas Treatment System – Iodine Removal Efficiency, 7/6/09

Gaseous Release Permits: 100373.030.018.G, 100383.041.029.G, 100384.042.029.G, 100377.034.019.G, 100376.033.016.G

Liquid Release Permit: 100014.002.004.L
 Cross-Check Analysis Data: 1st Quarter 2009, 2nd Quarter 2009, and 3rd Quarter 2009
 Land Use Census, 2009

CAP Documents

PER 142731, 2-RM-90-133D declared inoperable and has exceeded 30 days best effort to RTS
 PER 148128, Missed off-gas effluent grab sample required by ODCM
 PER 162203, Abnormal liquid release
 PER 169611, Delays in LDT-B release affected post permit calculations
 PER 1699792, Abnormal liquid release (RHR into RHRSW)
 PER 169593, Activity detected in Loop II RHRSW
 PER 216389, Activity found in Unit 2 Station Sump
 PER 218437, Apparent 3B Injection Water Pump Seal Cooler Leak
 PER 224366, CST #5 had water flowing from valve near top of tank
 PER 228198, Tunnel seals compromised, possible tritium to environment flow path
 PER 228328, 3B injection water pump (3-PMP-003-0069) seal cooler leak

Section 2RS7: Radiological Environmental Monitoring Program (REMP)

Procedures and Guidance Documents

Browns Ferry Nuclear Plant UFSAR Chapter 2.6 Environmental Monitoring Program
 0-ODCM-001, Browns Ferry Nuclear Plant Offsite Dose Calculation Manual, Rev. 20
 SPP 3.1, Corrective Action Program, Rev. 0018
 SPP-5.14, Guide for Communicating Inadvertent Radiological Spills/Leaks to Outside Agencies, Rev. 0005
 SPP 5.15, Fleet Ground Water Protection Program, Rev. 0000

Records and Data Reviewed

Browns Ferry Nuclear Plant Annual Radiological Environmental Operating Report (AREOR), January Through December 2008
 Browns Ferry Nuclear Plant Units 1, 2, and 3- Annual Radiological Environmental Operating Report -2009
 White Paper, Browns Ferry Nuclear Plant Effluent and Waste Disposal Annual Report Summary of Abnormal/Unplanned Releases 2009
 Calibration Data Sheet Radiological Environmental Air Sample Gas Meter, LM-1BF-A, 9/29/09
 Calibration Data Sheet Radiological Environmental Air Sample Gas Meter, LM-2BF, 9/29/09
 Calibration Data Sheet Radiological Environmental Air Sample Gas Meter, LM-3, 9/29/09
 Calibration Data Sheet Radiological Environmental Air Sample Gas Meter, LM-4A, 9/29/09
 Calibration Data Sheet Radiological Environmental Air Sample Gas Meter, LM-4B, 9/29/09

CAP Documents

PER 139923, Meteorologist review of BFN meteorological tower on March 7, 2008 identified questionable 10 meter wind direction data.
 PER 146712, Routine weekly inspection of meteorological tower on 5/22/08 by the SIM revealed that the 10 meter aspirator light was indicating low flow for air temperature aspiration.

PER 151870, Meteorologist review of BFN meteorological tower data on August 28, 2008 identified a suspect 46 m temperature data after the passage of the remnants of tropical storm Fay.

PER 205823, Data package was not retrievable in EDMS.

Section 2RS8: Radioactive Material Processing and Transportation

Procedures, Manuals, and Guides

RWTP-100, "Radioactive Material/Waste Shipments", Rev. 6

RWTP-101, "10 CFR 61 Waste Characterization", Rev. 1

RWTP-102, "Use of Casks", Rev. 2

RWI-111, "Storage of Radioactive Waste and Materials", Rev. 17

0-OI-77G, "Duratek Procedure FO-OP-32, Set Up and Operating Procedure for the RDS-1000 Unit at TVA Browns Ferry", Rev. 1

0-SI-4.8.A.1-1, "Liquid Effluent Permit", Rev. 71

Process Control Program Manual (PCP), Rev. 3

SPP-3.1, "Corrective Action Program", rev. 18

Tennessee Radioactive Material License Number R-73008-C14, Duratek Services, Inc.

Shipping Records and Radwaste Data

Shipment 100424, Condensate Demineralizer Filters, Low Specific Activity

Shipment 090802, Condensate Resin, >Type A Low Specific Activity

Shipment 100327, Control Rod Drives, Type A

Shipment 100608, Scrap Metal, Low Specific Activity

Shipment 100514, Dewatered Resin, Low Specific Activity

Shipment 090409, Dewatered Resin, Low Specific Activity

Shipment 100603, DAW, Low Specific Activity

Radiological Survey 030810-32, Control Rod Drive 06-35

10 CFR Part 61 Analyses, DAW 2008 and 2009; CWPS 2008 and 2009; RWCU 2007 and 2009

CAP Documents

BFN-RP-F-09-003, Focused Self-assessment Report, Shipping and Transportation of Radioactive Materials

SR 195228, Evaluate current waste stream characterization methodologies for radioactive shipping

SR 194272, Review procedures for faxing emergency response information to Emergency Response Center in Chattanooga

PER 200502, Contamination deposited on cask and HIC during shipment preparation

PER 218388, Sealand needs repair

PER 218653, Failure rate of "green" trash is unacceptable

PER 178892, Resin sample for Part 61 analysis not collected in a timely manner

PER 178885, Shipment checklist in procedure RWTP-100 needs clarification

Section 4OA1: Performance Indicator Verification

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 6

SPP-3.4, Performance Indicator for NRC Reactor Oversight Process for Compiling and Reporting PIs to the NRC, Rev. 10

Unit 1 Mitigating System Performance Index (MSPI) Basis Document, Revision 5
 Unit 2 Mitigating System Performance Index (MSPI) Basis Document, Revision 4
 Unit 3 Mitigating System Performance Index (MSPI) Basis Document, Revision 4
 Unit 1, 2 and 3 First Quarter 2010 PI Summary Sheet
 Unit 1, 2 and 3 MSPI Derivation Report for Unreliability and Unavailability Index for High Pressure Injection and Heat Removal System for the first quarter 2010.
 Maintenance Rule Spreadsheets for Unreliability and Unavailability for HPCI and RCIC
 DEP opportunities documentation for 3rd and 4th Quarters 2009
 Drill and exercise participation records of ERO personnel 3rd and 4th Quarters 2009
 Siren test data 3rd and 4th Quarters 2009
 Various ERO Personnel Qualification and Participation records
 PER 200662, Document Errors Found in MSPI Basis Document
 PER 225054, Development of Quarterly MSPI Data Delayed Due to Changes in PRA
 PER 226183, PRA Outputs not provided in a Timely Manner
 EPIP-1, Emergency Classification Procedure, Rev. 46
 EPDP-11, Emergency Preparedness Performance Indicators, Rev. 0001
 2009 and 2010 LERs
 Consolidated Data Entry forms for SSFF PIs for 2nd quarter 2009 thru 1st quarter 2010

Section 40A2: Identification and Resolution of Problems

Semi-Annual Trend Review

SPP-3.1.11, PER Trending, Rev. 0
 SPP-3.1.12, Integrated Trend Review, Rev. 0
 Browns Ferry Nuclear Plant Integrated Trend Report (ITR) for January to March 2010

Section 40A5: Other Activities

Certificate of Compliance for Spent Fuel Storage Casks for Holtec HI-STORM 100 Cask System, Docket 72-1014, Amendment 5, including Appendix A (Technical Specifications), Appendix B (Approved Contents and Design Features)
 Browns Ferry Nuclear Plant 10 CFR 72.212 Report of Evaluations, Rev. 1
 Final Safety Analysis Report for the Holtec HI-STORM 100 Cask System, Rev. 7
 Drawing 0-47E201-1, Dry Storage Implementation Notes, Rev. 4
 Drawing 0-47E201-2, ISFSI Fire Hazards Analysis Compensatory Actions, Rev. 1
 SPP-10.10, Control of Transient Combustibles, Rev. 5
 3-OI-71, Reactor Core Isolation Cooling System, Rev. 42
 PER 119628, RCIC Flow Oscillations during Unit 3 Scram
 PER 168144, SSA0903 Audit PER on RCIC Degraded Condition
 PER 200183, RCIC Flow Oscillations during Unit 3 Scram
 BFN Unit 3 Technical Specifications Section 3.5.3, RCIC System
 BFN USFAR Section 4.7, Reactor Core Isolation Cooling System
 BFN-50-7071, Design Criteria, Reactor Core Isolation Cooling System, Rev. 15
 NEI 06-11, Managing Personnel Fatigue at Nuclear Power Reactor Sites, Revision 1
 RG 5.73, Fatigue Management for Nuclear Power Plant Personnel, March 2009
 SPP-1.5, Fatigue Management and Work Hour Limits, Revision 7
 Two SPP-1.5, Attachment 1, 10 CFR 26 Overtime Limits Waiver, dated 3/23/10

SPP-1.5, Attachment 1, 10 CFR 26 Overtime Limits Waiver, dated 3/9/10
10 CFR 26 Gap Training Lesson Plan (FFDGAP)
General Employee Training Lesson Plan - Fitness For Duty (FFD010, Revision 12)

Temporary Instruction 2515/173 – Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative

CRP-TPR-S-009-003, Self-Assessment: NEI 07-07 Groundwater Protection Initiative Compliance, Dec. 1-5, 2008
BFN-RP-S-10-001, Self-Assessment: Groundwater Protection, Jan. 14-15, 2010
NEI Peer Assessment Report, NEI 07-07 Ground Water Protection Initiative, 1/14/2010
0-ODCM-001, Offsite Dose Calculation Manual, Rev. 0020
2009 Annual Radiological Environmental Operating Report
SPP-5.14, Guide for Communicating Inadvertent Radiological Spills/Leaks to Outside Agencies, Rev. 5
SPP-5.15, Fleet Ground Water Protection Program, Rev. 0
RCDP-11, Protocol for Remediation of Inadvertent Spills or Leaks of Contaminated Liquids, Rev. 0
CI-420, Collection of Radiological Environmental Monitoring Samples, Rev. 1
CI-421, Well Sampling and Maintenance, Rev. 1
PER 210124, Assessment CRP-TPR-S-09-003 identified sections 1.2a, b, c, d, and f of the NEI 07-07 checklist were not complete

LIST OF ACRONYMS

ADAMS	Agencywide Document Access and Management System
ADS	Automatic Depressurization System
ANS	Alert and Notification System Reliability
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
DEP	Emergency Response Organization Drill/Exercise Performance
EECW	emergency equipment cooling water
EDG	emergency diesel generator
EP	Emergency Preparedness
ERO	Emergency Response Organization Readiness
FE	functional evaluation
FPR	Fire Protection Report
FSAR	Final Safety Analysis Report
IMC	Inspection Manual Chapter
LER	licensee event report
NCV	non-cited violation
NEI	Nuclear Energy Institute
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
TS	Technical Specification(s)
UFSAR	Updated Final Safety Analysis Report
URI	unresolved item
WO	work order