



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

October 30, 2009

Mr. Preston D. Swafford
Chief Nuclear Officer and Executive Vice President
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

**SUBJECT: WATTS BAR NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000390/2009004**

Dear Mr. Swafford:

On September 30, 2009, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Watts Bar Nuclear Plant, Unit 1. The enclosed integrated inspection report documents the inspection results which were discussed on October 7, 2009, with Mr. M. Skaggs 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.

This report documents two self-revealing findings of very low safety significance (Green). Two of these findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Watts Bar facility.

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 Watts Bar. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC 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. 50-390
License No. NPF-90

Enclosure: NRC Inspection Report 05000390/2009004
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Letter to Preston D. Swafford from Eugene Guthrie dated October 30, 2009

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000390/2009004

Distribution w/encl:

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RidsNrrPMWattsBar1 Resource

RidsNrrPMWattsBar2 Resource

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-390

License Nos: NPF-90

Report Nos: 05000390/2009004

Licensee: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Unit 1

Location: Spring City, TN 37381

Dates: July 1, 2009 – September 30, 2009

Inspectors: R. Monk, Senior Resident Inspector
M. Pribish, Resident Inspector
M. Coursey, Reactor Inspector, RII (1RO7)
H. Gepford, Senior Health Physicist, RII (2OS3)
R. Hamilton, Senior Health Physicist, RII (2PS1)
W. Loo, Senior Health Physicist, RII (2PS3)

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

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SUMMARY OF FINDINGS

IR 05000390/2009-004; 07/01/2009 – 09/30/2009; Watts Bar, Unit 1; Event Followup.

The report covered a three-month period of inspection by resident inspectors and announced inspections by three regional senior health physics inspectors and one regional reactor inspector. Two self-revealing Green findings, both of which were non-cited violations (NCVs), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). 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 Findings and Self-Revealing Findings

Cornerstone: Barrier Integrity

- Green. A self-revealing, non-cited violation (NCV) of 10 CFR 50 Appendix B, Criterion III, Design Control, was identified for failure to correctly translate the personal access door design basis into the specifications for the temporary ABSCE boundary doors installed to facilitate Unit 2 construction. As a result, the ABSCE boundary was disabled when the temporary doors (R002 and R003) failed during auxiliary building ventilation changes on May 27, 2009. The licensee entered the issue into the corrective action program as PER 172301, made door repairs to re-establish the ABSCE boundary, and took interim actions to minimize differential pressure across the temporary doors during auxiliary building ventilation changes.

The licensee's failure to utilize existing design criteria for doors R002 and R003 was a performance deficiency. The inspectors reviewed Inspection Manual Chapter (IMC) 0612 and determined that the finding was more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern, specifically for loss of the secondary containment boundary. Additionally, the finding was associated with the design control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers, such as the secondary containment boundary, protect the public from radionuclide releases caused by accidents or events. Using the phase I screening worksheet of IMC 0609, the inspectors determined that the finding was of very low safety significance (Green) because it only represented a degradation of the radiological barrier function provided for the auxiliary building. The cause of the finding had a cross-cutting aspect in the area of human performance associated with the resources component. It was directly related to maintaining long term plant safety by maintenance of the design margins aspect of the resources component [H.2(a)]. Specifically, the licensee did not utilize the existing design criteria for auxiliary building doors designated as air locks. (Section 4OA3.1.b.1)

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- Green. A self-revealing NCV of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, was identified for the licensee's failure take prompt corrective actions to preclude repetition of the failure of the temporary auxiliary building secondary containment envelope (ABSCE) boundary doors installed to facilitate Unit 2 construction. Following the previous failure of temporary ABSCE boundary doors R002 and R003 during auxiliary building ventilation changes, the licensee initiated PER 172301 to determine the cause of the door failure. In accordance with licensee procedure PIDP-4, Corrective Action Program Screening and Oversight, PER levels are assigned based on the consequences of the identified condition and also on the frequency or probability of issue occurrence. Based on the condition classification guidance in Appendix A of PIDP-4, the door failures were considered by the licensee to be a Significant Condition Adverse to Quality (SCAQ), which required the associated PER to be designated as an A-level PER. Accordingly, PER 172301 was assigned as an A-level (highest category) requiring a root cause analysis and corrective actions to prevent recurrence. Corrective actions to prevent recurrence developed by the root cause team were not incorporated into plant procedures, and as a result, temporary doors (R002 and R003) failed during auxiliary building ventilation changes on June 27, 2009. The licensee entered the issue into the corrective action program as PER 175160, made door repairs to re-establish the ABSCE boundary, and shut the Unit 2 reactor building access doors to provide an additional ventilation barrier.

The licensee's failure to take corrective actions to preclude the temporary door failure repetition was a performance deficiency. The inspectors reviewed IMC 0612 and determined that the finding was more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern, specifically for loss of the secondary containment boundary. Additionally, the finding was associated with the design control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers, such as the secondary containment boundary, protect the public from radionuclide releases caused by accidents or events. Using the phase I screening worksheet of IMC 0609, the inspectors determined that the finding was of very low safety significance (Green) because it only represented a degradation of the radiological barrier function provided for the auxiliary building. The cause of the finding had a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action program component. It was directly related to the licensee thoroughly evaluating problems such that resolutions address the problem's causes [P.1(c)]. Specifically, during the investigation of the May 27, 2009, ABSCE door failures, the licensee failed to address the inadequate design of temporary doors R002 and R003. (Section 40A3.1.b.2)

B. Licensee-Identified Violations

None

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REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near 100 percent rated thermal power until September 20, 2009, when it was shut down for a scheduled refueling outage and remained shutdown for the balance of the report period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 Partial Walkdowns

a. Inspection Scope

The inspectors conducted three equipment alignment partial walkdowns, listed below, to evaluate the operability of selected redundant trains or backup systems with the other train or system inoperable or out of service. The inspectors reviewed the functional system descriptions, Updated Final Safety Analysis Report (UFSAR), system operating procedures, and technical specifications (TS) to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system.

- 1A containment spray (CS) system with 1B CS out of service (OOS)
- 1B safety injection (SI) pump with 1A SI pump OOS
- 1A emergency diesel generator (EDG) OOS

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Protection - Tours

a. Inspection Scope

The inspectors conducted tours of the six areas important to reactor safety, listed below, to verify the licensee's implementation of fire protection requirements as described in the Fire Protection Program, Standard Programs and Processes (SPP)-10.0, Control of Fire Protection Impairments, SPP-10.10, Control of Transient Combustibles, SPP-10.11, Control of Ignition Sources (Hot Work). The inspectors evaluated, as appropriate, conditions related to: (1) licensee control of transient combustibles and ignition sources;

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(2) the material condition, operational status, and operational lineup of fire protection systems, equipment, and features; and (3) the fire barriers used to prevent fire damage or fire propagation.

- Auxiliary instrument room
- 1A-A EDG
- 2A-A EDG
- 1B-B EDG
- 2B-B EDG
- Intake pumping station

b. Findings

No findings of significance were identified.

2. Fire Protection - Drill Observation

a. Inspection Scope

On September 17, 2009, the inspectors observed an announced fire drill performed inside and outside the 1A safety injection pump room. The drill was observed to evaluate the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were: (1) specified number of individuals responding; (2) proper wearing of turnout gear; (3) self-contained breathing apparatus available and properly worn and used; (4) control room personnel followed procedures for verification and initiation of response; (5) fire brigade leader exhibited command and had a copy of the pre-fire plan; (6) fire brigade leader maintained control starting at the dress-out area; (7) fire brigade response timely and followed the appropriate access route; (8) control/command set up near the location and communications were established; (9) proper use and layout of fire hoses; (10) fire area entered in a controlled manner; (11) sufficient fire fighting equipment brought to the scene; (12) search for victims and propagation of the fire into other plant areas; (13) utilization of pre-planned strategies; (14) adherence to the pre-planned drill scenario and drill objectives acceptance criteria were met; and (15) fire fighting equipment returned to a condition of readiness to respond to an actual fire.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

Inspectors directly observed underground bunkers/manholes subject to flooding that contained cables whose failure could disable risk-significant equipment. Specific

attributes evaluated were: (1) the absence of submergence of cables in water; (2) the material condition of cables, cable splices and cable support structures; and (3) set points for dewatering device (sump pump) operation and level alarm circuits. Below is a list of bunkers/manholes inspected.

- 1E 6.9Kv manhole 9B
- 1E 6.9Kv manhole 20
- 1E 6.9Kv manhole 21
- 1E 6.9Kv manhole 25

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07T)

.1 Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed operability determinations, completed surveillances, vendor manual information, associated calculations, performance test results and cooler inspection results associated with the component cooling system (CCS) A Heat Exchanger 1-HTX-70-185 (Train A) and the main control room (MCR) Water Chiller B-B 0-CHR-031-096 heat exchanger/cooler. These heat exchangers/coolers were chosen based on their risk significance in the licensee's probabilistic safety analysis, their important safety-related mitigating system support functions and their relatively low margin.

For the CCS A Heat Exchanger 1-HTX-70-185 (Train A) and the MCR Water Chiller B-B 0-CHR-031-096, the inspectors determined whether testing, inspection, maintenance, and monitoring of biotic fouling and macrofouling programs were adequate to ensure proper heat transfer. This was accomplished by determining whether the test method used was consistent with accepted industry practices, or equivalent, the test conditions were consistent with the selected methodology, the test acceptance criteria were consistent with the design basis values, and reviewing results of heat exchanger performance testing. The inspectors also determined whether the test results appropriately considered differences between testing conditions and design conditions, the frequency of testing based on trending of test results was sufficient to detect degradation prior to loss of heat removal capabilities below design basis values and test results considered test instrument inaccuracies and differences.

For the CCS A Heat Exchanger 1-HTX-70-185 (Train A) and the MCR Water Chiller B-B 0-CHR-031-096, the inspectors reviewed the methods and results of heat exchanger performance inspections. The inspectors determined whether the methods used to inspect and clean heat exchangers were consistent with as-found conditions identified and expected degradation trends and industry standards, the licensee's inspection and cleaning activities had established acceptance criteria consistent with industry

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standards, and the as-found results were recorded, evaluated, and appropriately dispositioned such that the as-left condition was acceptable.

In addition, the inspectors determined whether the condition and operation of the CCS A Heat Exchanger 1-HTX-70-185 (Train A) were consistent with design assumptions in heat transfer calculations and as described in the final safety analysis report. This included determining whether the number of plugged tubes was within pre-established limits based on capacity and heat transfer assumptions. The inspectors determined whether the licensee evaluated the potential for water hammer and established adequate controls and operational limits to prevent heat exchanger degradation due to excessive flow induced vibration during operation. In addition, eddy current test reports and visual inspection records were reviewed to determine the structural integrity of the heat exchanger.

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

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

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

In addition, the inspectors reviewed condition reports related to the heat exchangers/coolers and heat sink performance issues to determine whether the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions. The documents that were reviewed are included in the Attachment to this report.

These inspection activities constituted two heat sink inspection samples as defined in IP 71111.07-05.

b. Findings

No findings of significance were identified.

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1R11 Licensed Operator Requalification

a. Inspection Scope

On July 7, 2009, the inspectors observed the simulator evaluations for Operations Shift Crew 2 per 3-OT-SRE0002B, Reactor Trip Followed by a Main Steam Line Break, Revision 0. The plant conditions led to a notification of unusual event level classification.

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

- Clarity and formality of communication
- Ability to take timely action to safely control the unit
- Prioritization, interpretation, and verification of alarms
- Correct use and implementation of abnormal operating instructions and emergency operating instructions
- Timely and appropriate emergency action level declarations per emergency plan implementing procedures
- Control board operation and manipulation including high-risk operator actions
- Command and control provided by the unit supervisor and shift manager

The inspectors also attended the critique to assess the effectiveness of the licensee evaluators and to verify that licensee-identified issues were comparable to issues identified by the inspectors.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the two performance-based problems listed below. The focus of the reviews was to assess the effectiveness of maintenance efforts that apply to scoped structures, systems, or components (SSCs) and to verify that the licensee was following the requirements of TI-119, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting 10 CFR 50.65, and SPP-6.6, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting 10 CFR 50.65. Reviews focused, as appropriate, on: (1) appropriate work practices; (2) identification and resolution of common cause failures; (3) scoping in accordance with 10 CFR 50.65; (4) characterization of reliability issues; (5) charging unavailability time; (6) trending key parameters; (7) 10 CFR 50.65 (a) (1) or (a) (2) classification and reclassification; and (8) the appropriateness of performance criteria for SSCs classified as (a)(2) or goals and corrective actions for SSCs classified as (a)(1).

- 6.9kv Shutdown Board (SDBD) Chiller a(1) Corrective Action Plan, Revision 3
- Thermal barrier booster pump a(1) to a(2) classification

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors evaluated, as appropriate for the four work activities listed below: (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and (4) that maintenance risk assessments and emergent work problems were adequately identified and resolved. The inspectors verified that the licensee was complying with the requirements of 10 CFR 50.65 (a)(4); SPP-7.0, Work Control and Outage Management; SPP-7.1, Work Control Process; and TI-124, Equipment to Plant Risk Matrix.

- Maintenance risk associated with work on the 737' penetration room cooler 2A-A with degraded essential raw cooling water (ERCW) pump couplings and power-operated relief valve (PORV) block valve closed
- Risk associated with emergent work on the D-common service station transformer; risk evaluation response WBN-1-09-048 R1
- Risk associated with emergent work on A 6.9kv SDBR chiller with degraded ERCW pump couplings, shut PORV block valve, and A-train hydrogen igniters OOS
- Risk associated with emergent work on the 1B emergency diesel generator (EDG) excitation circuit

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed four operability evaluations affecting risk-significant mitigating systems, listed below, to assess, as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether the compensatory measures, if involved, were in place, would work as intended, and were appropriately controlled; (4) where continued operability was considered unjustified, the impact on TS Limiting Conditions for Operation (LCOs) and the risk significance in accordance with the significant determination process (SDP). The inspectors verified

that the operability evaluations were performed in accordance with SPP-3.1, Corrective Action Program.

- Problem evaluation report (PER) 175160, Second failure of ABSCE due to Unit 2 temporary door failures
- PER 174721, Failure of BAT level transmitter to calibrate at the low end of the scale
- PER 175344, Failure of B main control room chiller circ water valve to pass its reverse flow closure test
- PER 177882, Validity of previous LLRT on 1-RFV-62-662 due to trapped water in relief line

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed four post-maintenance test procedures and/or test activities, (listed below) as appropriate, for selected risk-significant mitigating systems to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) tests were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and (8) equipment was returned to the status required to perform its safety function. The inspectors verified that these activities were performed in accordance with SPP-8.0, Testing Programs; SPP-6.3, Pre-/Post-Maintenance Testing; and SPP-7.1, Work Control Process.

- Work order (WO) 09-816725-000, STI-09-01, RB2 blast door post-maintenance test
- WO 09-816346, Packing adjustment on TDAFW pump
- WO 09-817643-000, MI-0.16, Maintenance guidelines for belt-driven equipment following emergent outboard bearing replacement
- WO 09-811750-000, 0-SI-30-7-B, ABGTS system pressure test Train-B

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors reviewed the outage risk control plan for the Unit 1 Cycle 9 (U1C9) refueling outage (RFO) to assess whether the licensee had appropriately considered risk, industry experience, and previous site-specific problems, and to also confirm that the licensee had mitigation/response strategies for losses of key safety functions.

The licensee began its U1C9 RFO on September 20, 2008. From that date through the end of the inspection period, the inspectors observed portions of the shutdown, cooldown, defueling, refueling, and maintenance activities to verify that the licensee maintained defense-in-depth (DID) commensurate with the outage risk plan and applicable TS. The inspectors monitored licensee controls over the outage activities listed below. In addition, the inspectors reviewed the licensee's corrective action program (CAP) to ensure that the licensee was identifying equipment alignment problems and that they were properly addressed for resolution. Documents reviewed are listed in the Attachment to this report.

- Licensee configuration management, including daily outage reports, to evaluate DID commensurate with the outage safety plan and compliance with the applicable TS when taking equipment out of service.
- Installation and configuration of reactor coolant instruments to provide accurate indication and an accounting for instrument error.
- Controls over the status and configuration of electrical systems and switchyard to ensure that TS and outage safety plan requirements were met.
- Decay heat removal processes to verify proper operation and that steam generators, when relied upon, were a viable means of backup cooling.
- Controls to ensure that outage work was not impacting the ability to operate the spent fuel pool cooling system during and after-core offload.
- Reactor water inventory controls including flow paths, configurations, alternative means for inventory addition, and controls to prevent inventory loss.
- Reactivity controls to verify compliance with TS and that activities which could affect reactivity were reviewed for proper control within the outage risk plan.

b. No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors witnessed six surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components (SSCs), listed below, to assess, as appropriate, whether the SSCs met the requirements of the TS; the UFSAR; SPP-8.0, Testing Programs; SPP-8.2, Surveillance Test Program; and SPP-9.1, ASME Section XI. The inspectors also determined whether the testing effectively demonstrated that the

SSCs were operationally ready and capable of performing their intended safety functions.

Routine Surveillance Tests:

- WO 09-812683-000, 0-SI-82-17-A, 184-day fast start and load test DG 1A-A
- WO 09-812770, 1A RHR pump quarterly performance test
- WO 09-813537-000, TI 50.48, Flood mode auxiliary charging pump 1A performance test
- WO 09-815884-000, 0-SI-82-12-A, Monthly diesel generator start and load test DG 2A-A

In-Service Test:

- WO 09-815964, 1-SI-3-902, TDAFW pump quarterly in-service test

Containment Isolation Valve Leak Test:

- WO 08-821103, 1-SI-90-701, Containment Isolation Valve Local Leak Rate Test Radiation Monitoring

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

On August 4, 2009, the inspectors observed a licensee-evaluated emergency preparedness exercise to verify that the emergency response organization was properly classifying the event in accordance with Emergency Plan Implementing Procedure (EPIP)-1, Emergency Plan Classification Flowchart, and making accurate and timely notifications and protective action recommendations in accordance with EPIP-2, Notification of Unusual Event; EPIP-3, Alert; EPIP-4, Site Area Emergency; EPIP-5, General Emergency; and the Radiological Emergency Plan. In addition, the inspectors verified that licensee evaluators were identifying deficiencies and properly dispositioning performance against the performance indicator criteria in Nuclear Energy Institute 99-02, Regulatory Assessment Performance Indicator Guideline.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

a. Inspection Scope

Radiation Monitoring Instrumentation: During tours of the auxiliary building, RCA exit point and training building, the inspectors observed installed radiation detection equipment including area radiation monitors, continuous air monitors, personnel contamination monitors (PCM), portal monitors (PM), small article monitors (SAM), and whole body counter (WBC) equipment. During the tours, the adequacy of the equipment's physical location and material condition were evaluated.

From a review of selected records and discussions with cognizant licensee personnel, the inspectors evaluated completion and adequacy of equipment calibrations and assessed system operability and reliability.

During equipment walk-downs, the inspectors observed functional checks of various fixed and portable radiation monitoring/detection instruments. The observations included source checks of PCM, PM, SAM, and WBC equipment. The inspectors reviewed calibration records and discussed the functional testing and testing intervals for selected PCM and PM equipment located at the RCA exit. PCM equipment detection capabilities were demonstrated using a low-level radionuclide source that was passed through the equipment. The operability and analysis capabilities of the WBC equipment were evaluated. WBC equipment operations were reviewed and discussed with cognizant licensee representatives.

For selected portable survey instrumentation used in field tasks, the inspectors observed HPT selection of survey instruments, completion of required performance and/or functional checks, and use of instruments. Availability of portable instruments for licensee use, provided by the licensee's calibration facility in Muscle Shoals, AL, was evaluated through observation of instruments staged for issue and discussion with licensee personnel. For select frisker and portable survey instruments used in the field, the inspectors noted operability and verified calibration dates. Calibration data for selected portable instruments staged or recently used for coverage of radiation worker were also reviewed.

Operability and reliability of selected radiation detection instruments were reviewed against 10 CFR Part 20; UFSAR Chapters 11 and 12; and applicable licensee procedures. Documents reviewed during the inspection are listed in Sections 2OS3 of the Attachment.

Self-Contained Breathing Apparatus (SCBA) and Protective Equipment: Selected SCBA units staged for emergency use in the Control Room and other locations were inspected for material condition and adequate air pressure. The inspectors also reviewed the

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previous maintenance records for vital components for selected SCBA units. In addition, certification records associated with supplied-air quality were reviewed and discussed.

Selected Control Room operators were interviewed to determine their knowledge of available SCBA equipment locations, including corrective lens inserts, masks of sizes other than medium, and spare bottles. In addition, respirator qualification records were reviewed for selected licensee personnel.

Licensee activities associated with maintenance and use of respiratory protection equipment were reviewed against 10 CFR Part 20; Regulatory Guide (RG) 8.15, Acceptable Programs for Respiratory Protection; American National Standards Institute (ANSI)-Z88.2-1992, American National Standard for Respiratory Protection; and applicable licensee procedures. Documents reviewed during the inspection are listed in Section 2OS3 of the report Attachment.

Problem Identification and Resolution: Selected CAP documents associated with instrumentation and protective equipment were reviewed and assessed. 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. 16. Documents reviewed are listed in Section 2OS3 of the Attachment.

The inspectors completed the nine specified line-item samples detailed in IP 71121.03.

b. Findings

No findings of significance were identified.

Cornerstones: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

Effluent Monitoring and Radwaste Equipment: During inspector walk-downs, accessible sections of the liquid and gaseous radioactive waste (radwaste) and effluent systems were assessed for material condition and conformance with system design diagrams. The inspection included various liquid radwaste tanks, mobile radwaste demineralizer equipment, waste disposal system effluent monitor 0-RE-90-122, essential raw cooling water effluent monitors 0-RE-90-133, 134, 140 and 141, turbine building sump effluent monitor 0-RE-90-212, auxiliary building ventilation effluent monitor 0-RE-90-101 and associated effluent sample lines. The inspectors interviewed chemistry supervision regarding radwaste equipment configuration requirements for representative sampling, and effluent monitor operation.

The inspectors reviewed performance records and calibration results for selected radiation monitors, flowmeters, and air filtration systems. For liquid effluent radiation monitors 0-RE 90-212 and 0-RE 90-122 the inspectors reviewed the most recent loop calibration records. The most recent surveillances for the containment purge and

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auxiliary building gas treatment systems High Efficiency Particulate Air (HEPA) filtration and charcoal beds were also reviewed. The inspectors evaluated out-of-service effluent monitor logs and selected compensatory action data for the period of February 14, 2008 – July 14, 2009.

Installed configuration, material condition, operability, and reliability of selected effluent sampling and monitoring equipment were reviewed against details documented in the following: 10 CFR Part 20; RG 1.21, Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials In Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants; ANSI-N13.1-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities; and UFSAR, Chapters 11 and 12. Procedures and records reviewed during the inspection are listed in Section 2PS1 of the report Attachment.

Effluent Release Processing and Quality Control Activities: The inspectors observed the preparation and counting of particulate, iodine, and tritium samples from weekly gaseous and liquid releases. Chemistry technician proficiency in collecting, processing, and counting the samples, as well as preparing the applicable release permits was evaluated.

QC activities associated with gamma spectroscopy and beta-emitter detection were discussed with count room technicians and Chemistry supervision.

Selected parts of three procedures for effluent sampling, processing, and release were evaluated for consistency with licensee actions. One liquid and two gaseous release permits were reviewed against ODCM specifications for pre-release sampling and effluent monitor setpoints. The inspectors also reviewed the 2007 and 2008 annual effluent reports to evaluate reported doses to the public and to review ODCM changes.

The inspectors discussed the status of licensee corrective actions and evaluated the licensee's groundwater monitoring results. Licensee current capabilities and routine surveillances to minimize and to rapidly identify any abnormal leaks from systems, structures, and components associated with liquid radioactive waste tanks and processing lines, and spent fuel pools and associated equipment were discussed.

Observed task evolutions, count room activities, and offsite dose results were evaluated against details and guidance documented in the following: 10 CFR Part 20 and Appendix I to 10 CFR Part 50; ODCM; RG 1.21; RG 1.33, Quality Assurance Program Requirements (Operation); and TS Section 5. Procedures and records reviewed during the inspection are listed in Section 2PS1 of the report Attachment.

Problem Identification and Resolution: Nine problem evaluation reports (PERs) were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve selected issues in accordance with procedure SPP-3.1, Corrective Action Program, Rev. 16. Reviewed documents are listed in Section 2PS1 of the report Attachment.

The inspectors completed the three specified line-item samples detailed in IP 71122.01.

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b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program

a. Inspection Scope

REMP Implementation: The inspectors observed routine sample collection and surveillance activities as required by the licensee's REMP. The inspectors noted the material condition and operability of airborne particulate filter and iodine cartridge sample stations at selected monitoring locations. Selected environmental thermoluminescent dosimeters (TLDs) were checked for material condition and appropriate identification. In addition, automatic water samplers were inspected for material condition at selected river water locations and onsite groundwater locations. The inspectors determined the current location of selected air samplers, TLDs, water samplers, and dairy farm using NRC global positioning system instrumentation. Land use census results, changes to the Offsite Dose Calculation Manual (ODCM), and sample collection/processing activities were discussed with environmental technicians.

The inspectors reviewed calibration records for selected environmental air samplers. The inspectors also reviewed the 2007 and 2008 Radiological Environmental Operating Reports, results of the 2007 and 2008 interlaboratory cross-check program, and a procedure for environmental sample collection and processing. Selected environmental measurements were reviewed for consistency with licensee effluent data, evaluated for radionuclide concentration trends, and compared with detection level sensitivity requirements.

Procedural guidance, program implementation, and environmental monitoring results were reviewed against: 10 CFR Part 20; Appendix I to 10 CFR Part 50; Technical Specifications (TS) Section 5.0; ODCM; Regulatory Guide 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 2PS3 of the report Attachment.

Meteorological Monitoring Program: The inspectors observed the physical condition of the meteorological tower and discussed equipment operability and maintenance history with cognizant licensee representatives. The inspectors compared locally generated meteorological data with information available to control room operators. For selected meteorological measurements of wind speed, wind direction, and temperature, the inspectors reviewed calibration records for applicable tower instrumentation and evaluated measurement data recovery for 2007 and 2008.

Licensee procedures and activities related to meteorological monitoring were evaluated against: ODCM; FSAR Section 2.3; ANSI/ANS-2.5-1984, Standard for Determining Meteorological Information at Nuclear Power Sites; and Safety Guide 23, Onsite Meteorological Programs. Documents reviewed are listed in Section 2PS3 of the Attachment.

Unrestricted Release of Materials from the Radiologically Controlled Area (RCA): The inspectors observed surveys of material and personnel being released from the RCA using Small Article Monitor (SAM), Personnel Contamination Monitor (PCM), and Portal Monitor (PM) instruments. The inspectors also observed source checks of these instruments and discussed equipment sensitivity and release program guidance with licensee staff. To evaluate the appropriateness and accuracy of release survey instrumentation, radionuclides identified within recent waste stream analyses were compared with radionuclides used in current calibration sources and performance check sources. The inspectors also reviewed calibration records for selected SAM, PCM and PM instruments.

Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, Control of Radioactively Contaminated Material. Documents reviewed are listed in Section 2PS3 of the Attachment.

Problem Identification and Resolution: The inspectors reviewed selected Problem Evaluation Reports and audits in the areas of environmental monitoring, meteorological monitoring, and release of materials. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure SPP-3.1, Corrective Action Program, Rev. 16. Documents reviewed are listed in section 2PS3 in the Attachment.

The inspectors completed the ten specified line-item samples detailed in IP 71122.03.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verifications

a. Inspection Scope

The inspectors sampled licensee submittals for the five PIs listed below. To verify the accuracy of the PI data reported during the periods listed, PI definitions and guidance contained in NEI 99-02, Regulatory Assessment Indicator Guideline, Revision 5, were used to verify the basis in reporting for each data element.

Cornerstone: Mitigating Systems

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- Mitigating System Performance Index (MSPI) – High pressure injection system
- MSPI - Cooling water systems
- MSPI - Heat removal system
- MSPI – RHR system
- MSPI - Emergency AC power

b. Findings

No findings of significance were identified.

4OA2 Identification & Resolution of Problems

.1 Review of Items Entered into the Corrective Action Program

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished by reviewing daily PER summary reports and attending daily PER review meetings.

.2 Annual Sample: Corrective actions associated with NCV 05000390/2006003-01, Failure to Comply with Technical Specification Required Actions for Two Inoperable Containment High Range Radiation Monitors

a. Inspection Scope

The inspectors reviewed the plan and implementation of corrective actions for non-cited violation (NCV) 05000390/2006003-01, which were documented in PER 100095.

b. Findings and Observations

The corrective action plan for PER 100095 was based on cable testing performed by the licensee to determine the actual effect on high range radiation monitor (HRRM) readings based on containment temperature changes (transients) and extremes (steady state) during accident conditions. The licensee's testing utilized an actual measurement loop consisting of a radiation detector, representative cabling, and a radiation monitor. The test report concluded that the transient temperature effect on the HRRMs is short lived (less than one minute) and could be properly controlled by administrative means (procedures, training, placards, etc.). The test report also concluded that steady state temperature effects revealed during testing must be evaluated in the radiation monitor accuracy calculation.

No findings of significance were identified. However, the inspectors identified several observations which were discussed with the licensee. PER 100095 actions included revising emergency response procedures and annunciator response instructions, placing placards in the main control room adjacent to the HRRM monitors, and modifying the simulator to model the transient temperature effects. The licensee initiated PER 162319

to address whether steady state temperature effects would affect the radiation monitor accuracy calculation. The inspectors observed that a placard similar to those in the main control room were not located in the plant's simulator.

Planned corrective actions for PER 162319 include revising the HRRM accuracy calculations, revising emergency response procedures and annunciator response instructions, revising placards in the main control room and simulator, and modifying the simulator to model the steady state temperature effects.

The inspectors discussed the observations with the licensee. The licensee initiated PERs 162319 and 171992 to address the observations.

4OA3 Event Followup

.1 (Closed) Licensee Event Report (LER) 05000390/2009-001-00, Inoperability of Both Trains of Auxiliary Building Gas Treatment System (ABGTS) and Insufficient Surveillance Testing

The insufficient surveillance testing portion of the LER is discussed in Section 4OA7 of inspection report 05000390/2009003. The inoperability of both trains of ABGTS is discussed in the Description paragraphs below. The LER identified that the two key causes for the inoperability were an inadequate design and insufficient interim actions after the first event to prevent another failure. The inspectors verified that the corrective actions and extent of condition were consistent with the root cause(s). As documented below, two self-revealing NCVs were identified. This LER is considered closed.

a. Inspection Scope

The inspectors reviewed the circumstances surrounding the event described in the LER.

b. Findings

- (1) Introduction: A Green, self-revealing, non-cited violation (NCV) of 10 CFR 50 Appendix B, Criterion III, Design Control, was identified for failure to correctly translate the personal access door design criteria into the specifications for the temporary ABSCE boundary doors installed to facilitate Unit 2 construction.

Description: In order to facilitate Unit 2 construction, the licensee implemented design change notice (DCN) 52283 to remove the Unit 2 reactor building from the Unit 1 ABSCE boundary and added doors R001, R002, and R003. Door R001 was a metal rollup door that served as a fire barrier. Doors R002 and R003 were fabric doors that made up both sides of an airlock between the auxiliary building and the Unit 2 reactor building. The three doors were positioned in series for a single penetration to allow for equipment movement between the auxiliary building and the Unit 2 reactor building while maintaining the ABSCE boundary.

On May 27, 2009, while shutting down the auxiliary building ventilation fans, interim doors R002, and R003 failed due to excessive differential pressure across the doors.

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The failure of the two fabric doors caused a breach in the ABSCE boundary that exceeded the capability of the auxiliary building gas treatment system (ABGTS). As a result, the licensee entered TS 3.7.12 for two trains of ABGTS being inoperable. One fabric door was repaired and TS 3.7.12 was exited. The licensee initiated PER 172301 to determine the cause of the door failures.

Doors R002 and R003, installed by DCN 52283, were designed and installed as ABSCE boundary doors with a design differential pressure of 1.09 inches of water. This differential pressure was based on the results of licensee calculation EPM-WJK-041592, Instrument Safety Limits, Analytical Limits and Setpoints for the Auxiliary Building HVAC System. The calculation identified a condition where the automatic start of both trains of the ABGTS, combined with one vacuum relief damper failing shut, had the potential to draw down the ABSCE to a differential pressure of 1.09 inches of water.

Watts Bar design criteria WB-DC-40-59, Personnel Access Doors, Section 3.2.1.2 states, in part, that during normal operation of the reactor units, auxiliary building doors are subjected to slight operating pressures of not more than three inches of water. Doors designated as air lock components are also to maintain a negative pressure of not more than one psi (~27 inches of water) in the auxiliary building.

Analysis: The inspectors determined that the licensee's failure to utilize the WB-DC-40-59 design criteria of 27 inches of water pressure instead of 1.09 inches of water pressure for the design requirements of doors R002 and R003 was a performance deficiency. The inspectors reviewed IMC 0612 and determined that the finding was more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern, specifically for loss of secondary containment boundary. Additionally, the finding was associated with the design control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers, such as the secondary containment boundary, protect the public from radionuclide releases caused by accidents or events. Using the phase I screening worksheet of IMC 0609, the inspectors determined that the finding was of very low safety significance (Green) because it only represented a degradation of the radiological barrier function provided for the auxiliary building.

The cause of the finding had a cross-cutting aspect in the area of human performance associated with the resources component. It was directly related to the maintaining long term plant safety by maintenance of design margins aspect of the resources component [H.2(a)]. Specifically, the licensee did not utilize the existing design criteria for auxiliary building doors designated as air locks.

Enforcement: 10CFR50 Appendix B, Criterion III, Design Control, states in part, that the design basis for structures, systems and components is required to be correctly translated into specification, drawings, procedures and instructions. Contrary to the above requirement, the design change package, DCN 52283, did not translate existing design criteria from WB-DC-40-59, for auxiliary building doors designated as air lock doors. Consequently, on June 27, 2009, doors R002 and R003 failed during auxiliary building ventilation changes, rendering the Auxiliary Building secondary containment

boundary inoperable. The licensee entered the issue into the corrective action program as PER 172301 and made door repairs to re-establish the ABSCE boundary. Because this violation was of very low safety significance and was entered into the licensee's corrective action program, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000390/2009004-01, Failure to Incorporate Existing Design Criteria into Temporary Secondary Containment Boundary Doors.

- (2) Introduction: A Green, self-revealing NCV of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, was identified for the licensee's failure to take corrective actions to preclude repetition of the failure of the temporary ABSCE boundary doors installed to facilitate Unit 2 construction, which resulted in the ABSCE boundary inoperability.

Description: Following the May 27, 2009, failure of temporary ABSCE boundary doors R002 and R003 during auxiliary building ventilation changes, the licensee initiated PER 172301 to determine the cause of the door failure. In accordance with licensee procedure PIDP-4, Corrective Action Program Screening and Oversight, PER levels were assigned based on the consequences of the identified condition and also on the frequency or probability of issue occurrence. Based on the condition classification guidance in Appendix A of PIDP-4, the door failures were considered by the licensee to be a Significant Condition Adverse to Quality (SCAQ), which required the associated PER to be designated as an A-level PER. Accordingly, PER 172301 was assigned as an A-level (highest category) requiring a root cause analysis and corrective actions to prevent recurrence. Corrective actions taken by the licensee focused on the actions needed to start or secure the entire auxiliary building ventilation system without damaging the temporary ABSCE doors. System Operating Instruction (SOI) 30.05, Auxiliary Building HVAC Systems, Revision 40, did not provide guidance for starting or securing the entire auxiliary building ventilation system; it rather had separate sections for starting or securing individual fans. On May 27, 2009, operations standing order, ODM-1 SO 09-011, was issued which provided guidance in addition to SOI-30.05 for starting or securing auxiliary building ventilation. The standing order provided guidance to "promptly move from the supply fan section to the exhaust fan section" in order to minimize differential pressure across R002 and R003. In order to minimize the differential pressure across R002 and R003, the root cause team proposed a revision to SOI-30.05 to start pairs of supply and exhaust fans in rapid succession, i.e. within two to five seconds. The proposed revision to SOI-30.05 was not incorporated because operations management did not agree with the direction to start two fans in rapid succession without verifying proper system response before proceeding to the next fan.

On June 27, 2009, while using the standing order and SOI-30.05, the operators were unable to operate the auxiliary building ventilation system without causing failure of doors R002 and R003, and again disabling the ABSCE boundary. The licensee again entered the issue into the CAP as PER 175160, made door repairs to re-establish the ABSCE boundary, and also shut the Unit 2 reactor building original equipment access doors to provide an additional ventilation barrier.

Analysis: The licensee's failure to implement corrective actions to preclude the temporary door failure repetition was a performance deficiency. The inspectors reviewed IMC 0612 and determined that the finding was more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern, specifically for loss of secondary containment boundary. Additionally, the finding was associated with the design control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective of providing reasonable assurance that physical design barriers, such as the secondary containment boundary, protect the public from radionuclide releases caused by accidents or events. Using the phase I screening worksheet of IMC 0609, the inspectors determined that the finding was of very low safety significance (Green) because it only represented a degradation of the radiological barrier function provided for the auxiliary building.

The cause of the finding had a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action program component. It was directly related to the licensee thoroughly evaluating problems such that resolutions address the problem's causes. [P.1(c)]. Specifically, during the investigation of the May 27, 2009, ABSCE door failures, the licensee failed to address the inadequate design of temporary doors R002 and R003.

Enforcement: 10CFR50 Appendix B, Criterion XVI, Corrective Action, states in part, that for significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to the above, the licensee failed to preclude repetition when on June 27, 2009, the R002 and R003 temporary doors failed a second time rendering the ABSCE boundary inoperable. On June 27, 2009, following the licensee's issuance of a standing order intended to correctly operate the auxiliary building ventilation as a corrective action, the operators were unable to operate the ventilation system without causing the temporary doors R002 and R003 to fail, causing a failure of the ABSCE boundary. The licensee entered the issue into the CAP as PER 175160, made door repairs to re-establish the ABSCE boundary, and also shut the Unit 2 reactor building original equipment access doors to provide an additional ventilation barrier. Because this violation was of very low safety significance and was entered into the licensee's corrective action program, this violation is being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000390/2009004-02, Inadequate Corrective Actions to Preclude Additional Temporary Secondary Containment Boundary Doors Failure.

40A5 Other Activities

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 review and inspection activities.

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

On September 4, 2009, the health physics inspectors discussed the results of the onsite radiation protection inspection with Mr. Mike Skaggs, Site Vice President, and other responsible staff. The inspectors noted that some personally identifiable information was reviewed during the course of the inspection and that it would be properly destroyed when no longer needed.

On September 18, 2009, the engineering inspectors presented the inspection results to Greg Boerschig, Plant Manager and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

The inspectors presented the inspection results to Mr. M. Skaggs and other members of licensee management at the conclusion of the inspection on October 7, 2009. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

B. Belvin, Radiation Protection Manager
G. Boerschig, Plant Manager
M. Brandon, Licensing and Industry Affairs Manager
J. Bushnell, Licensing Engineer
B. Eiford-Lee, Chemistry/Environmental Manager
G. Helton, NSSS System Engineer
W. Hooks, Radiation Protection
B. Hunt, Operations Superintendent
G. Mauldin, Site Engineering Manager
M. McFadden, Site Nuclear Assurance Manager
J. Milner, Radiation Protection
M. Pope, Licensing Engineer
A. Scales, Operations Manager
M. Skaggs, Site Vice President
C. Tudor, Engineering Programs Manager
D. Voeller, Maintenance and Modifications Manager
M. Welch, ISI Level III

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed

05000390/2009004-01	NCV	Failure to Incorporate Existing Design Criteria into Temporary Secondary Containment Boundary Doors (Section 4OA3.1.b.1)
05000390/2009004-02	NCV	Inadequate Corrective Actions to Preclude Additional Temporary Secondary Containment Boundary Doors Failure (Section 4OA3.1.b.2)

Closed

05000390/2009-001-00	LER	Inoperability of Both Trains of Auxiliary Building Gas Treatment System (ABGTS) and Insufficient Surveillance Testing (Section 4OA3.1)
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Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R07: Heat Sink Performance (71111.07T)

Plant Procedures

TI-79.000, Generic Letter 89-13 Heat Exchanger Test Program, Rev. 0010
N3-67-4002, ESSENTIAL RAW COOLING WATER SYSTEM, SYSTEM 67, Rev. 0024
TI-67.000, Raw Water Program, Rev. 0006
CHTP-108, Technical Chemistry Standards for SPP-9.7, Rev. 0005

Corrective Action Program Documents Reviewed

PER 127010, Several raw water components not flushed iaw 0-PI-OPS-28B
PER 127760, Self Assessment AFI; WBN-ENG-07-011, Ultimate Heat Sink
PER 130430, High Pressure fire protection header leak
PER 132763, 0-pi-ops-28a OCT performance
PER 134266, Class-G HPFP leak
PER 139309, ERCW Strainers
PER 139383, Clams In Containment Spray HX-1B
PER 139945, Raw Water Leak
PER 144527, Through -wall HPFP leak
PER 147871, System 026 leak
PER 153319, Containment Spray (CS) Hx 1A/1B Lay-up Status
PER 155491, RCW piping leak, 1A #7 HDTP
PER 156851, Components not flushed during 0-PI-OPS-28B
PER 158936, December performance of Ti-67.006
PER 162486, Clogging of the ERCW strainers prevents performance of 0-SI-67-918-A
PER 164904, Fish intrusion challenging ERCW system reliability
PER 165089, Partial Performance of TI-67.005
PER 165100, Shad Intrusion
PER 172656, Components not flushed during 0-PI-OPS-28-A Performance
PER 176668, Components Not Flushed During July 2009 0-PI-OPS-28B Performance
PER 176965, Revision of GL 89-13 Program Procedure

Audits, Assessments and Self Assessments

L18 050926 800, Eddy Current Inspection Results for Component Cooler CCS A, 03/05/2005
W/O 07-816398-000 TI 79.701, Component Cooler CCS A Heat Exchanger Performance Test,
4/11/2008
W/O 07-818976-000, Main Control Room Chiller B-B Clean and Inspect, Rev. 1

Drawing

Simplified ERCW Drawing, 2008

Section 1R20: Refueling and Outage Activities

O&SSDM-4.0, Operational Defense-In-Depth Assessment
Unit 1 Cycle 9 Outage Safety Plan
TI-68.002, Containment Penetrations and Closure Control
Calculation WBNOSG4-0233, WBN Midloop Design Information
Evaluation of Flow through the Diesel Generator Jacket Water Heat Exchangers

Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment

Procedures, Guidance Documents, and Manuals

0-FPS-510-SCBA, Monthly Cleaning/Sanitizing, Maintenance, Inspection, Storage and Inventory of SCBAs, Rev. 19
 EPIP-12, Emergency Equipment and Supplies
 SPP-5.1, Radiological Controls, Rev. 7
 SPP-5.10, Radiological Respiratory Protection Program, Rev. 4
 RCI-109, Radiological Control Portable Instrumentation, Rev. 16
 RCI-112, WBC Operation and Calibration, Rev. 15

Records and Data Reviewed

Respirator Qualification Report by Department, Operations, 9/1/09
 System Health Summary Report – System 090 (Rad Monitors), FY 2007 Period 3 – FY 2009 Period 2
 0-SI-90-2, 18 Month Channel Calibration (Source Cal) of the General Atomic Fuel Pool Accident Radiation Monitor Loop 0-LPR-90-102 (12/18/07, 3/17/09)
 1-SI-90-1, 18 Month Channel Calibration (Source Cal) of Train A Containment Upper Compartment High Range Post Accident Area Radiation Monitor Loop 0-LPR-90-271 (11/8/07, 11/6/08)
 1-SI-90-3, 18 Month Channel Calibration (Source Cal) of Train A Containment Lower Compartment High Range Post Accident Area Radiation Monitor Loop 0-LPR-90-273 (11/1/06, 3/10/08)
 IMI-90.021, 18 Month Channel Calibration (Source Cal) of the Accident Radiation Monitor Outlet Personnel Entrance Radiation Monitor Loop 1-LPR-90-2 (7/13/07, 8/22/08)
 IMI-90.020, 18 Month Channel Calibration (Source Cal) of the Low Range Area Radiation Monitors, Spent Fuel Pit Area Monitor Loop 1-LPR-90-1 (5/25/05, 1/18/08)
 Calibration Records: PCM-2G, s/n 848501 (2/6/09, 7/25/09); PCM-2G, s/n 848502 (8/26/08, 2/26/09); PCM-2G, s/n 848503 (9/4/08, 2/26/09); PM-7, s/n 848216 (1/27/09, 5/6/09)
 Grade D Air Certification – Service Air Compressor, SCBA High Pressure Compressor (various dates, 2005-2009)

Corrective Action Program Documents

WBN-RP-F-09-04, Self-Assessment Report, Bioassay and Internal Dose Program, 06/09
 WBN-RP-F-09-03, Self-Assessment Report, Radiological Instrumentation and Monitoring, 03/09
 PER 140258, Inadequate procedural guidance for WBC identified contaminated personnel
 PER 132756, Radcon instrumentation failure
 PER 157876, Spent fuel pool area monitor failure
 PER 144306, System 90 unplanned LCOs

Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

Procedures, Guidance Documents, and Manuals

0-ODI-90-43, 18 Month Channel Calibration (Source Cal) Of The Waste Disposal System Liquid Effluent Radiation Monitor Loop 0-LPR-90-122, Rev. 8
 0-ODI-90-51, 18 Month Channel Calibration (Source Cal) Of The General Atomic Waste Gas Disposal System Radiation Monitor Loop 0-LPR-90-118, Rev. 8

1-ODI-90-57, 18 Month Channel Calibration of Shield Building Vent Radiation Monitor Loop 1-LPR-90-400, Rev. 26

1-ODI-90, 18 Month Channel Calibration Of Shield Building Vent Purge Air A Exhaust Flow 1-FE-90-400A, Rev. 10

1-SI-90-1, 18 Month Channel Calibration (Source Cal) Of the Train A Containment Upper Compartment High Range Post Accident Area Radiation Monitor Loop 1-LPR-90-271, Rev. 5

1-SI-90-3, 18 Month Channel Calibration (Source Cal) Of the Train A Containment Lower Compartment High Range Post Accident Area Radiation Monitor Loop 1-LPR-90-273, Rev. 4

1-SI-90-6, 18 Month Channel Calibration (Source Cal) Of the General Atomic Containment Purge Air Exhaust Radiation Monitor Loop 1-LPR-90-130, Rev.10

1-ODI-90-183, 92 Day Channel Operational Test of Shield Building Vent Flow Monitor Loop 1-LPF-90-400, Rev.26

0-ODI-90-82, 92 Day Flow Instrument Calibration of the General Atomic Liquid Radiation Monitor Flow Loop 0-LPR-90-122, Rev. 6

IMI-90.036, 18 Month Channel Calibration (Source Cal) Of the Component Cooling System Liquid Effluent Radiation Monitors, Rev. 7

1-ODI-90-80, 18 Month Channel Calibration of Shield Building Vent Purge Air B Exhaust Flow 1-FE-90-400B, Rev. 9

1-ODI-90-81, 18 Month Channel Calibration of Shield Building Vent ABGTS Flow 1-FE-90-400C, Rev. 11

1-ODI-90-82, 18 Month Channel Calibration of Shield Building Vent EGTS Flow 1-FE-90-400D, Rev. 14

1-ODI-90-83, 18 Month Channel Calibration Of Shield Building Vent Flow Monitor Loop 1-LPF-90-400, Rev. 24

0-ODI-40-01, Quantification of Nuclide Activity Released From Groundwater Sump, Rev. 0

0-ODI-90-3, Conditional Turbine Building Station Sump Release, Rev. 11

0-ODI-90-11, Monthly Dose Reports, Rev. 8

0-ODI-90-12, Monthly Analyses On Gaseous and Liquid Effluents, Rev. 19

0-ODI-90-1, Liquid Radwaste Tank Release, Rev. 32

0-ODI-90-4, Inoperable ERCW Radiation Monitors, Rev. 17

0-ODI-90-5, Waste Gas Decay Tank Release, Rev. 31

0-ODI-90-10, Quarterly Analyses On Gaseous and Liquid Effluents, Rev. 14

0-ODI-90-22, Weekly Auxiliary Building Exhaust Release, Rev. 26

0-PI-CEM-1.0, Quarterly Waste Disposal System Gas Sample Line Draining, Rev. 3

0-SI-30-9-A, Auxiliary Building Gas Treatment System Filter Train-A Test, Rev. 5

1-ODI-90-15, Containment Purge Release, Rev. 28

SOI-77.01, Liquid Waste Disposal, Rev. 62

1-ODI-90-25, Condenser Vacuum Exhaust Release, Rev. 26

1-ODI-90-2, Steam Generator Blowdown Release, Rev. 21

1-ODI-90-26, Weekly Sampling Of Unit 1 Shield Building Exhaust, Rev. 21

2-ODI-90-26, Weekly Sampling Of Unit 2 Shield Building Exhaust, Rev. 5

Chemistry Manual, Chapter 9.7.119, Condenser Vacuum Exhaust Gaseous Effluent Grab Sampling, Rev. 8

Chemistry Manual Chapter 9.7.2.400, U2 Shield Building Exhaust Effluent Monitor Grab Sampling and Filter Replacement, Rev. 0

Chemistry Manual, Chapter 9.99, Composite Sample Preparation, Rev. 12

Chemistry Manual, Chapter 9.73, Liquid Radwaste Tanks and Liquid Effluent Radiation Monitors Sampling Methods, Rev. 6
 Chemistry Manual Chapter 9.7.132, Service Building Exhaust Effluent Monitor, Rev. 1
 Chemistry Manual Chapter 9.7.101, Auxiliary Building Exhaust Effluent Monitor Grab Sampling and Filter Replacement, Rev. 10
 Chemistry Manual Chapter 9.7.1.400, U1 Shield Building Exhaust Effluent Monitor Grab Sampling and Filter Replacement, Rev. 0
 Chemistry Manual Chapter 9.02, Chemistry Countroom Quality Assurance and Control Program, Rev. 12
 Chemistry Manual, Chapter 9.61, Operation of the Liquid Scintillation Counter, Rev. 9
 Chemistry Manual, CM 9.33, I.G. Detector Quality Control Data Collection, Rev. 13
 SOI-77.02, Waste Gas Disposal System, Rev. 34
 0-PI-CEM-11.0, Monitoring Well Sampling and Maintenance, Rev. 2
 SPP-5.14, Guide for Communicating Inadvertent Radiological Spills/Leaks to Outside Agencies, Rev. 3

Records and Data

0-SI-30-9-A, Auxiliary Building Gas Treatment System Filter Train-A Test, Rev. 5
 0-SI-30-9-B, Auxiliary Building Gas Treatment System Filter Train-B Test, Rev. 5
 0-SI-31-7-A, Control Room Emergency Ventilation System Filter Train-A Test, Rev. 4
 0-SI-31-7-B, Control Room Emergency Ventilation System Filter Train-B Test, Rev. 3
 0-SI-65-8-A, Emergency Gas Treatment System Filter Train-A Test, Rev. 11
 1-SI-30-11-A, Containment Purge Air Cleanup System Train-A Test, Rev. 7
 1-SI-30-11-B, Containment Purge Air Cleanup System Train-B Test, Rev. 7
 Monthly dose report 6/1/09
 Monthly dose report 5/2/09
 Self Assessment: CRP-TPR-F-09-001, ERM&I Radioanalytical Lab Analyses, May 18-Jun 5, 2009
 Results of Radiochemistry Crosscheck Program for 3Qtr2007, 4Qtr2007, 2Q2008, 3Qtr2008, 4Qtr2008, 1Qtr2009 and 2Qtr2009

Corrective Action Documentation

PER 168799 A liquid release was delayed on 4/11/09 due to not having 2 MIG technicians available to adjust the setpoint of 0-RM-90-122.
 PER 169177 On 4/17/09 particulate channel on 0-RM-90-101 went into alarm. Iodine 133 was found but no other gamma emitters were identified.
 PER 172054 The compensatory sample for radiation monitor 0-RE-90-133/140 being inoperable was not analyzed within the 12 hour (+- 25%) time frame as defined in the ODCM and 0-ODI-90-4. The sample was collected on time but a malfunction in the Countroom computer server prevented timely analysis.
 PER 173071 Monthly LRW Curies released goal exceeded due to processing of HUT 'A' in prep for SFP filling.
 PER 175549 Trend review determined that there was a trend of rate meter failures.
 PER 175722 During weekly ODI-90-22 performance on 7/7/09 it was noticed that the flow through the particulate sample was reversed.
 PER 176732 Daily RCDT sample was not collected on 7/17/09 since sample point was isolated for maintenance.

PER 177072 1-RE-90-121 has been spiking high over the last few weeks, this causes blowdown to realign and has to be reset by operations.

PER 177283 Waste Decay Tanks (WGDT) 'E' and 'H' were released without meeting 60 day decay time.

Section 2PS: Radioactive Environmental Monitoring Program and Radioactive Material Control

Procedures, Instructions, Guidance Documents, and Operating Manuals

0-ODI-10-22, 6 Month Channel Calibration Meteorological Monitoring Instrumentation, Rev. 5

0-PI-CEM-12.0, Collection of Radiological Environmental Monitoring Samples, Rev. 2

EPFS-3, Servicing of Meteorological Equipment at Environmental Data Stations, Rev. 13

EPFS-4, Environmental Data Station Meteorological Sensor Exchange, Rev. 15

EPFS-12, Repair and Preventive Maintenance Procedure for Radiological Environmental Monitoring Air Sampling System, Rev. 0

G-03, Gamma Analysis by Germanium Spectroscopy, Rev. 6

I-01, Iodine-131 Activity Determination in Environmental Samples, Rev. 11

Instruction No. 450.01-005, Calibration of Air Temperature Sensors – Nuclear, Rev. 1

Instruction No. 450.01-011, Calibration of Temperature Channel Calibrators, Rev. 1

Instruction No. 450.01-019, Calibration of Vaisala WAS425 Ultrasonic Wind Sensor - Nuclear, Rev. 1

RCDP -8, Radiological Instrumentation/Equipment Controls, Rev. 1

RCI-102, Contamination and Hot Particle Control, Rev. 12

RCI-103, Radioactive Material Control, Rev. 29

RCI-130, Personnel Monitor Alarm Response and Personnel Contamination, Rev. 12

RCI-132, Calibration and Operation of Eberline Personnel Monitor (PM-7), Rev. 7

RCI-146, Calibration and Operation of Eberline Small Article Monitor (SAM-11), Rev. 2

RCI-150, Calibration and Operation of the ThermoEberline PCM-2G Contamination Monitor, Rev. 2

SC-03, Calibration Procedure for Radiological Environmental Monitoring Air Sampler System Gas Meter, Rev. 4

SP-01, Sample Preparation, Rev. 7

SPP-3.1, Corrective Action Program, Rev. 16

SPP-5.1, Radiological Controls, Rev. 7

TLD-0018, Environmental Dosimetry Procedure, Rev. 10

Records and Data Reviewed

Calibration Data Sheet, Radiological Environmental Monitoring Air Sampler Gas Meter, Stations LM1, Dated 04/15/09; LM2A, Dated 04/15/09; LM3, Dated 04/15/09; LM4, Dated 04/15/09; PM2, Dated 04/15/09; PM3, Dated 04/15/09; PM4, Dated 04/15/09; PM5, Dated 04/15/09; RM3, Dated 04/15/09; RM2-A, Dated 04/15/09; and RM2-B, Dated 04/15/09

Meteorological Monitoring Program Including Sensor Problems, Tower Unavailability and Data Transmission/Display Discrepancies for 2009 YTD

Meteorological Sensor Exchange Forms, Dated 01/11/08, 06/05/08, 06/11/08, 06/27/08, 06/29/08, 09/03/08, 11/20/08, 11/24/08, 04/12/09, 04/15/09, and 05/07/09

PCM-2G Calibration Data Sheets, TVA Nos. 848501, Dated 07/06/09 and 07/25/09; 848502, Dated 08/26/08 and 02/24/09; and 848503, Dated 09/04/08 and 02/26/09

PM-7 Calibration Data Sheets, TVA No. 848216, Dated 01/27/09 and 05/06/09

Radiological Environmental and Meteorological Instrumentation Committee (REMIC) Meeting
Minutes of July 16, 2009
SAM-11 Calibration Data Sheets, TVA Nos. 843451, Dated 12/09/08 and 06/17/09; and 843453,
Dated 01/28/09 and 07/13/09
Watts Bar Nuclear Plant (WBNP), Offsite Dose Calculation Manual (ODCM), Revision 22
WBNP Unit 1, Annual Radiological Environmental Operating Reports – 2007 and 2008

Corrective Action Program (CAP) Documents

Focused Self Assessment Report, Assessment Number (No.) CRP-TPR-F-09-001,
Dated 07/02/09

PER No. 128817, Sample from MW #1 was missed due to the sample pump not having power
PER No. 136596, A multi-site self assessment was conducted by the Manager of ERM&I on
REMP

PER No. 146069, List of recommendations from the Focused Self-Assessment

WBN-RP-08-006 for enhancement of handling and controlling RAM in the RCA

Radiation Protection, Focused Self-Assessment Report, Assessment No. WBN-RP-F-09-003,
Radiological Instrumentation and Monitoring, Dated 05/28/09

Self-Assessment Report, Assessment No. CRP-TPR-06-003, REMIC (Meteorological
Monitoring – Configuration, Environmental Radiation Monitoring), Dated 09/19/06

Snapshot Self-Assessment Report, Assessment No. CRP-TPR-SS-08-002, Performance of
Radiological Environmental Monitoring Program (REMP) Sample Collection, Dated 02/08/08

TVA Nuclear Assurance – Nuclear Power Group (NPG) Wide – Radiological Protection and
Control Programs - Audit Report SSA0702, Dated 02/15/08