



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

April 30, 2015

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

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORTS
05000390/2015001 & 07201048/2015001

Dear Mr. Shea:

On March 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Watts Bar Nuclear Plant, Unit 1. On April 17, 2015, the NRC inspectors discussed the results of this inspection with Mr. Connors and other members of the Watts Bar staff. Inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors did not identify any findings or violations of more than minor significance.

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

Sincerely,

/RA/

Michael King, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket No.: 50-390, 72-1048
License No.: NPF-90

Enclosure: NRC Inspection Reports 05000390/2015001 & 07201048/2015001
w/Attachment: Supplemental Information

cc Distribution via ListServ

April 30, 2015

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

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORTS
05000390/2015001 & 07201048/2015001

Dear Mr. Shea:

On March 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Watts Bar Nuclear Plant, Unit 1. On April 17, 2015, the NRC inspectors discussed the results of this inspection with Mr. Connors and other members of the Watts Bar staff. Inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors did not identify any findings or violations of more than minor significance.

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

Sincerely,
/RA/
Michael King, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket No.: 50-390 & 72-1048
License No.: NPF-90

Enclosure: NRC Inspection Reports 05000390/2015001 & 07201048/2015001
w/Attachment: Supplemental Information

cc Distribution via ListServ

PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE

ADAMS: Yes ACCESSION NUMBER: _____

SUNSI REVIEW COMPLETE

FORM 665 ATTACHED

OFFICE	RII:DRP	RII:DRP	RII:DRS	RII:DRP	RII:DRP	
SIGNATURE	Via Email	Via Email	Via Email	Via Email	/RA/	
NAME	JNadel	JHamman	RCarrion	JQuinones-Navarro	MKing	
DATE	4/27/2015	4/27/2015	4/29/2015	4/29/2015	4/30/2015	
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES

OFFICIAL RECORD COPY
2015-001 - WBN.DOCX

DOCUMENT NAME: G:\DRP\IRPB6\WATTS BAR\REPORTS\2015\001\IR

J. Shea

2

Letter to Joseph Shea from Michael King dated April 30, 2015

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORTS
05000390/2015001 & 07201048/2015001

Distribution:

D. Gamberoni, RII

L. Gibson, RII

OE Mail

RIDSNNRRDIRS

PUBLIC

RidsNrrPMWattsBar1 Resource

RidsNrrPMWattsBar2 Resource

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-390 & 72-1048

License Nos.: NPF-90

Report Nos.: 05000390/2015001 & 07201048/2015001

Licensee: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Unit 1

Location: Spring City, TN 37381

Dates: January 1 through March 31, 2015

Inspectors: J. Nadel, Senior Resident Inspector
J. Hamman, Resident Inspector
R. Carrion, Senior Reactor Inspector (Section 4OA5)

Approved by: Michael King, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000390/2015001, 07201048/2015001; 01/01/2015 – 03/31/2015; Watts Bar, Unit 1; Integrated Inspection Report.

The report covered a three-month period of inspection by the resident inspectors and announced inspections by regional inspectors. No findings were identified during the inspection period. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 5.

REPORT DETAILS

Summary of Plant Status

The unit started the reporting period at or near 100 percent rated thermal power (RTP) and remained there until February 21, 2015, when it was shutdown due to a manual reactor trip caused by a loss of condenser vacuum due to a failed condenser expansion joint. It remained offline until March 4, 2015. The unit remained at or near 100 percent RTP through the end of the reporting period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

.1 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed licensee preparation for, and response to, actual freezing conditions and an ice storm warning on February 16, 2015. The inspectors reviewed licensee procedure 1-PI-OPS-1-FP, Freeze Protection, including associated checklist 1, Freeze Protection. Inspectors walked down selected components associated with the high-pressure fire pumps, outside diesel driven fire pump, and essential raw cooling water (ERCW) pumps. The inspectors also walked down compensatory freeze protection measures for the refueling water storage tank and the main feedwater flow sensing lines. The inspectors evaluated implementation of plant freeze protection, including the material condition of insulation, heat trace elements, and temporary heated enclosures. Corrective actions for items identified in relevant problem evaluation reports (PERs) and work orders (WOs) were assessed for effectiveness and timeliness. This activity constituted one Adverse Weather inspection sample.

b. Findings

No findings were identified.

1R04 Equipment Alignment

Partial System Walkdowns

a. Inspection Scope

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

The inspectors performed walkdowns of the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system. This activity constituted three Equipment Alignment Partial Walkdown inspection samples.

- 1B-B centrifugal charging pump (CCP) while 1A CCP OOS for maintenance
- B train of the auxiliary building gas treatment system (ABGTS) while A ABGTS was OOS for maintenance
- 2B-B EDG while the 2A-A emergency diesel generator (EDG) was OOS for maintenance

b. Findings

No findings were identified.

1R05 Fire Protection

Fire Protection Tours

a. Inspection Scope

The inspectors conducted tours of the areas important to reactor safety, listed below, to verify the licensee's implementation of fire protection requirements as described in the Fire Protection Program; Nuclear Power Group Standard Programs and Processes (NPG-SPP)-18.4.6, Control of Fire Protection Impairments; NPG-SPP-18.4.7, Control of Transient Combustibles; and NPG-SPP-18.4.8, Control of Ignition Sources (Hot Work). The inspectors evaluated, as appropriate, conditions related to: 1) licensee control of transient combustibles and ignition sources; 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. This activity constituted four Fire Protection walkdown inspection samples.

- Unit 1 reverse osmosis equipment room
- Auxiliary building, elevation (EL) 676
- Auxiliary building, EL 713
- Auxiliary building, EL 737

b. Findings

No findings were identified.

1R06 Flood Protection Measures

a. Inspection Scope

.1 Internal Flooding

The inspectors reviewed internal flood protection measures for the emergency diesel generator rooms. The features were examined to verify that they were installed and maintained consistent with the plant design basis. The inspectors also reviewed the licensee's flooding study calculation for determining maximum flood level in all rooms for piping failures in both the essential raw cooling water (ERCW) system and the fire protection system. The inspectors confirmed that flood mitigation features such as drains, curbs, and door seals were not degraded in such a manner as to adversely impact the conclusions of the study. This inspection constituted one Internal Flood Protection inspection sample.

b. Findings

No findings were identified.

.2 Cables in Underground Manholes

a. Inspection Scope

Inspectors directly observed, as listed below, the underground bunkers/manholes subject to flooding that contained cables whose failure could disable risk-significant equipment. Specific attributes evaluated were: the cables were not submerged in water; the cables and/or splices appeared intact and the material condition of cable support structures was acceptable; and dewatering devices (sump pump) operation and level alarm circuits were set appropriately to ensure that the cables would not be submerged or were in an environment for which they were qualified. Where dewatering devices were not installed, the inspectors ensured that drainage was provided and was functioning properly. This inspection constituted one Underground Manhole Internal Flooding inspection sample.

- Manhole 18
- Manhole 8A
- Manholes 2A, 2B

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification and Performance

.1 Licensed Operator Requalification

a. Inspection Scope

On March 3, 2015, the inspectors observed the simulator exam evaluation per scenario 3-OT-SRE-1046, Tcold instrument failure and LOCA through a stuck open pressurizer safety valve. The plant conditions led to a Notification of Unusual Event and Alert classification. Performance indicator credit was taken.

The inspectors specifically evaluated the following attributes related to the operating crews' 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 assessed the licensee's ability to administer testing and assessed the performance of their licensed operators. The inspectors attended the post-examination critique performed by the licensee evaluators and verified that licensee-identified issues were comparable to issues identified by the inspector. The inspectors reviewed simulator physical fidelity (i.e., the degree of similarity between the simulator and the reference plant control room, such as physical location of panels, equipment, instruments, controls, labels, and related form and function). This activity constituted one Observation of Requalification Activity inspection sample.

b. Findings

No findings were identified.

.2 Observation of Operator Performance

a. Inspection Scope

Inspectors observed and assessed licensed operator performance in the plant and main control room, particularly during periods of heightened activity or risk and where the activities could affect plant safety. Inspectors reviewed various licensee policies and procedures such as procedures OPDP-1, Conduct of Operations; NPG-SPP-10.0, Plant Operations; and GO-4, Normal Power Operation.

Inspectors utilized activities such as post maintenance testing, surveillance testing and refueling, and other activities to focus on the following conduct of operations as appropriate: This activity constituted one Observation of Operator Performance inspection sample.

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

b. Findings

No findings were identified

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the performance-based problems listed below. A review was performed 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 NPG-SPP-03.4, 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) characterizing reliability issues for performance monitoring; 5) tracking unavailability for performance monitoring; 6) balancing reliability and unavailability; 7) trending key parameters for condition monitoring; 8) system classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); 9) appropriateness of performance criteria in accordance with 10 CFR 50.65(a)(2); and 10) appropriateness and adequacy of 10 CFR 50.65 (a)(1) goals, monitoring and corrective actions. This activity constituted three Maintenance Effectiveness inspection samples.

- PER 937844, Failure of the 2A-A EDG exhaust fan during monthly testing
- PER 946856, Failure of the ERCW temperature control valve on the A main control room chiller
- PER 948571, Control room emergency ventilation system declared inoperable due to door C36 human performance errors

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, for the 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); NPG-SPP-07.0, Work Control and Outage Management; NPG-SPP-07.1, On Line Work Management; and TI-124, Equipment to Plant Risk Matrix. This activity constituted four Maintenance Risk Assessment inspection samples.

- Risk assessment for week 0105 with inclement weather
- Risk assessment for week 0223 while Unit 1 was in mode 3
- Risk assessment for work week 0302 with EDG 2B-B OOS and increased risk of switchyard centered loss of offsite power
- Risk assessment for week 0315 while EDG 1B-B was OOS for a three-day maintenance outage

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the 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 (LCO) and the risk significance in accordance with the Significant Determination Process (SDP). The inspectors verified that the operability evaluations were performed in accordance with NPG-SPP-03.1, Corrective Action Program. This activity constituted five Operability Evaluation inspection samples.

- Prompt determination of operability (PDO) for PER 937844, 2A-A Emergency diesel generator exhaust fan #2 failure to start
- Immediate determination of operability (IOD) for SR 979653, 1A-A safety injection pump oil sample results
- IOD for SR 979722, Increased leakage from 1A safety injection pump mechanical seal
- IOD for SR 980825, High filter D/P on main control room air handling unit 1B-B

- PDO for PER 984999, All EDGs with power factor less than technical specification requirement during 24 hour load test

b. Findings

No findings were identified.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed the permanent plant modifications listed below against the requirements of NPG-SPP-09, Temporary Modifications, Temporary Configuration Changes, and NPG-SPP-09.4, 10 CFR 50.59 Evaluation of Changes, Tests, and Experiments, and verified that the modification did not affect system operability or availability as described by the TS or the UFSAR. In addition, the inspectors determined whether: 1) the installation of the modification was in accordance with the work package; 2) adequate configuration control was in place; 3) procedures and drawings were updated; and 4) post-installation tests verified operability of the affected systems. This activity constituted one Plant Temporary Modification inspection sample.

- Temporary Modification WBN-1-2015-061-001, install a bypass loop in the ice condenser floor cooler line.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the 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 NPG-SPP-06.9, Testing Programs; NPG-SPP-06.3, Pre-/Post-Maintenance Testing; and NPG-SPP-07.1, On Line Work Management. This activity constituted five Post Maintenance Testing inspection samples.

- WO 115978733, 0-FOR-32-1-B, Auxiliary air quarterly valve exercising/position indication test following diaphragm replacement

- WO 115966798, 1-SI-62.01 Centrifugal charging pump 1A-A quarterly performance test following routine planned maintenance
- WO 115922729, Manhole 2A light and pump activation test after switch replacement
- WO 116646007, EDG 1B-B ERCW supply valve pushbutton replacement after valve failure
- WO 116113213, A ABGTS post maintenance testing following maintenance

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors witnessed the surveillance tests and/or reviewed test data of selected risk-significant SSCs listed below, to assess, as appropriate, whether the SSCs met the requirements of the TS; the UFSAR; NPG-SPP-06.9, Testing Programs; NPG-SPP-06.9.2, Surveillance Test Program; and NPG-SPP-09.1, 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. This activity constituted nine Surveillance Testing inspection samples; four in-service, four routine tests; and one ice condenser sample.

In-Service Test:

- WO 116090745, 1A-A Component Cooling Water System (CCS) Pump Comprehensive Test
- WO 116091597, 1-SI-74-902-A, Quarterly Valve Full Stroke Exercising - RHR System (Train A)
- WO 116091587, 1-SI-71-901-A, Residual Heat Removal Pump 1A-A Quarterly Performance Test
- WO 116228366, 0-SI-67-902-B, Essential Raw Cooling Water Pump F-B and Pump H-B Performance Test

Other Surveillances

- WO 116090559, 0-SI-82-11-A, Monthly Diesel Generator Start and Load Test DG 1A-A
- WO 115610992, 0-SI-215-42-B, Diesel Generator 1B-B 18 Month Service Test and Battery Charger Test
- WO 116128042, TI-50.023 Intake Pumping Station Strainer Room B Sump Pump A Performance Test
- WO 116318900, 1-SI-68-28, Primary Radiochemistry Requirements

Ice Condenser Surveillance

- WO 116090714, 1-SI-0-2A-01, Shift and Daily Surveillance Log Mode One

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

On February 20, 2015, the inspectors observed a licensee-evaluated emergency preparedness drill from the simulated control room and the technical support center to verify that the emergency response organization was properly classifying the event in accordance with licensee 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, 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 (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline. The inspectors attended the post-drill critique to compare any inspector-observed weaknesses with those identified by the licensee in order to verify whether the licensee was properly identifying EP related issues and entering them in to the CAP, as appropriate. This activity constituted one EP training drill inspection sample.

b. Findings

No findings were identified.

4OA1 Performance Indicator (PI) Verification

The inspectors sampled licensee submittals for the four PIs listed below. To verify the accuracy of the PI data reported from January 1, 2014 through December 31, 2014. PI definitions and guidance contained in NEI 99-02, Regulatory Assessment Indicator Guideline, Revision 6, were used to verify the basis in reporting for each data element.

- Unplanned scrams
- Complicated Scrams
- RCS Specific Activity
- Unplanned power changes per 7000 critical hours

4OA2 Problem Identification and Resolution

.1 Review of Items Entered into the Corrective Action Program (CAP)

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: PERs 215224 and 665623 related to Failure to Evaluate Post-modification Test Results for Vital Board 2-III MANUAL Transfer Switch

a. Inspection Scope

The inspectors performed an in-depth review of the licensee's evaluation and corrective actions associated with PERs 215224 and 665623, which related to a failure to evaluate post maintenance test instruction (PMTI) results. During post-modification testing of vital inverter transfer switch 2-XSW-235-3, voltage versus time traces showed voltage gaps and spikes neither of which met standards for uninterruptable power supply transfers. The licensee documented this under PER 204038, but closed the PMTI and returned the inverter to service while replacement of the failed switch remained an open action under WO 09-819893-000. The licensee received a Green NCV for failing to replace the transfer switch as documented in NRC Inspection Report 05000390/2010-002. As a result of the NCV, the licensee wrote PER 215224 which addressed switch replacement, sending the switch off for failure analysis, and evaluating the results of the failure analysis. PER 215224 did not address the programmatic aspects of failure to evaluate the test results for adequacy prior to returning the system to service. The failure to address programmatic aspects of the PMTI closure was identified by the licensee and documented under PER 665623.

b. Findings and Observations

No findings were identified. The inspectors noted that the licensee took the following corrective actions under PER 665623:

- Coached the developer of PER 215224 on the expectations for determining most likely causes
- Coached the responsible Test Director to ensure acceptance criteria are met prior to closing PMTIs.
- Evaluated the risk of not performing the recommended preventive maintenance on the transfer switches.
- Briefed system engineers to ensure that they verify that the test results met the acceptance criteria when they signed the NPG-SPP-06.9.3-1 post modification test instruction results package.
- Submitted the issue to the Engineering and Support Personnel Curriculum Review Committee for training evaluation.

4OA3 Event Follow-up

.1 Unit 1 Reactor Trip

a. Inspection Scope

The inspectors responded to a Unit 1 manual reactor trip and turbine trip that occurred on February 21, 2015, due to rapidly dropping main condenser vacuum. The inspectors

discussed the preliminary cause of the trip with the licensee and reviewed unit parameters and system response to verify that equipment responded to the reactor trip as designed. The inspectors also reviewed parts of the licensee's post-trip review. The inspectors reviewed the initial licensee event notification to verify that it met regulatory requirements.

b. Findings

No findings were identified.

.2 (Closed) LER 05000390/2014-003, Manual Reactor Trip Due to Automatic Feedwater Isolation

a. Inspection Scope

On July 13, 2014, licensee operators manually tripped the Unit 1 reactor due to automatic isolation of all low pressure feedwater heaters. All safety systems responded as designed. The need to manually trip the reactor was determined to be the result of two separate age-related failures associated with the control scheme of the #7 heater drain tank. The root cause of these failures was that replacement preventative maintenance (PM) tasks did not exist for these components. The components in question were replaced and corrective actions have been taken to generate replacement PMs for both components. Inspectors reviewed the event, PER 909612, the root cause evaluation, and licensee corrective actions taken. Inspectors noted that some corrective actions were not scheduled for completion until later in 2015.

b. Findings

No findings were identified.

.3 (Closed) LER 05000390/2013-004-01: Plant Trip on 500KV Transmission Line Fault

a. Inspection Scope

Inspectors reviewed LER 05000390/2013-004-01, which included updated causal information unknown at the time of the first LER submittal.

On June 28, 2013, an A-phase ground fault occurred on the Roane 500kV transmission line approximately 22 miles from Watts Bar Nuclear Unit 1 (WBN1). Concurrently, WBN1 experienced a reactor trip due to the actuation of the 1A Main Bank Transformer Feeder Differential Relay. The 500kV transmission line fault was caused by a tree that fell onto the A phase of the transmission line. The plant responded to the trip as designed with no complications noted. The cause of the event was determined to be an incorrectly determined current transformer neutral conductor that caused a differential relay imbalance in the summation circuit during the faulted conditions. The licensee entered this problem into their corrective action program as PER 747048 and performed a root

cause evaluation. Inspectors reviewed the event, the root cause evaluation, and licensee corrective actions.

b. Findings

One finding related to LER 05000390/2013-004-01 was previously documented in IR 05000390/2014003 (see Section 4OA3, Follow-up of Events and Notices of Enforcement Discretion). No additional findings were identified.

.4 (Closed) LER 05000390/2014-002: Non-Conservative Manual Actions Identified in Appendix R Analysis

a. Inspection Scope

On February 11, 2014, engineering and operations personnel discovered that non-conservative operator manual action times were credited in Appendix R analyses.

Preliminary Westinghouse transient analysis calculations of WBN Unit 1 fire protection features revealed that there was less time than previously credited to perform certain operator manual actions to prevent pressurizer overfill during certain Appendix R fire scenarios. The Westinghouse analysis assumed that the time required to isolate the normal charging path, secure the second charging pump, and isolate the emergency charging path was approximately 12.5 minutes. Watts Bar Unit 1 procedures were found to be non-conservative in that they allow these actions to be completed in 18 minutes. Subsequently, on November 26, 2014, TVA sent a letter to the NRC canceling LER 2014-002. Westinghouse completed a transient analysis and found that the original procedure times were feasible to complete the necessary actions to prevent pressurizer overfill. The residents reviewed the updated analysis and licensee actions to validate the manual action times.

b. Findings

No findings were identified.

4OA5 Other Activities

Onsite Fabrication of Components and Construction of an Independent Spent Fuel Storage Installation (Inspection Procedure 60853)

a. Inspection Scope

The inspectors conducted a review of licensee and vendor activities of early processes related to the planned construction of the plant's Independent Spent Fuel Storage Installation (ISFSI). Specifically, the inspectors observed construction activities to mitigate the effects of liquefaction during a seismic event on the ISFSI pad, upon which the Holtec International Storage Module (HI-STORM) Flood and Wind (FW) System will be sited to house spent fuel generated by the licensee. The inspectors walked down the construction area of the planned ISFSI pad, the crawler building, and fabrication pad. The inspectors also discussed the route and construction plans for the haul path from the Auxiliary Building to the ISFSI pad. The inspectors discussed the licensee's Design

Change Notices (DCNs) 63842 and 64175 to upgrade the Auxiliary Building crane to single-failure-proof status, prior to using it to move a transfer cask (HI-TRAC VW) loaded with a multi-purpose canister (MPC). This was done to evaluate compliance with the requirements of NUREG 0554, Single-Failure-Proof Cranes for Nuclear Power Plants, and NUREG 0612, Control of Heavy Loads at Nuclear Power Plants.

The inspectors evaluated the licensee's quality assurance (QA) program to ensure that it satisfied the requirements of 10 CFR Part 72, subpart G, Quality Assurance, and reviewed selected issues which have been processed through the program to date.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

On April 17, 2015, the resident inspectors presented the quarterly inspection results to members of the licensee staff. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

G. Arent, General Manager, Watts Bar Licensing
L. Belvin, QA Manager
R. Bevil – QA Manager, WBN ISFSI Project
M. Bottorff, Operations Superintendent
M. Casner, Site Engineering Director
D. Charlton – Site Licensing
J. Cofield – ISFSI Storage Pad Task Manager
S. Connors, Plant Manager
T. Detchemendy, Emergency Preparedness Manager
K. Dietrich, Engineering Programs Manager
W. Hooks, Radiation Protection Manager
L. Houck – ISFSI Contract Administrator
B. Jacques – Security Upgrade Task Manager
J. James, Director Maintenance
Z. Martin – TVA Corporate ISFSI Manager
E. McCoy – 125T Crane Upgrade Task Manager
M. McDowell – WBN ISFSI Senior Project Manager
R. Montgomery – Auxiliary Building Modifications Task Manager
J. O'Dell, Site Licensing Supervisor
R. Powell – TVA Corporate ISFSI Project Engineer
K. Stephens, Chemistry Manager
R. Stroud, Site Licensing
M. Taggart, Director Work Management

ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

05000390/2014-003	LER	Manual Reactor Trip Due to Automatic Feedwater Isolation (Section 4OA3.2)
05000390/2013-004-01	LER	Plant Trip on 500KV Transmission Line Fault (Section 4OA3.3)
05000390/2014-002	LER	Non-Conservative Manual Actions Identified in Appendix R Analysis (Section 4OA3.4)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

0-PI-OPS-1-FP, Freeze Protection
SR 990779
PER 990655
WO 115810876

Section 1R04: Equipment Alignment

1-SOI-62.01, CVCS Charging and Letdown Valve Checklist 1-62.01-1V, Rev. 0000
WBN-VTD-W120-2974, Rev. 0
1-PI-OPS-1-AB/RW, Rev. 10
0-SOI-31.01, Control Building HVAC system, Rev. 0005
0-SOI-31.01 ATT 1D, CB HVAC damper checklist 0-31.01-1D
0-PI-OPS-17.0, Rev, 0063, 18 month locked valve verification
0-SOI-82.04, Diesel Generator (DG) 2B-B, Rev. 0004
0-SOI-82.04 ATT 1P, Power Checklist 82.04-1P, Rev. 0000
0-SOI-82.04 ATT 1V, Checklist 82.04-1V, Rev. 0000
SOI-30.06 ATT 1P, Auxiliary Building Gas Treatment System Power Checklist 30.06-1P, Rev. 0031
SOI-30.06 ATT 1V, Auxiliary Building Gas Treatment System Power Checklist 30.06-1V, Rev. 0031
WBN-SDD-N3-30AB-4001, Auxiliary Building Heating, Ventilation, Air Conditioning System (30, 31, 44)

Section 1R05: Fire Protection

Fire Hazard Analysis, Fire Area 25
Fire Protection Impairment Permit C15-0016
Prefire Plan (PFP) No.: AUX-0-676-01, Rev. 03
PFP No.: AUX-0-737-02, Rev. 1
PFP No.: AUX-0-729-01, Rev. 2
PFP No.: AUX-0-713-02, Rev.3
PFP No.: AUX-0-713-01, Rev. 1

Section 1R06: Flood Protection Measures

WO 116532744
WO 116510775
Watts Bar Controller's Package 02/20/2015
SRs: 991923, 991926, 991927, 991929, 991930, 991934, 991937, 991941, 991949, 993505, 993507, 993510, 993512, 993514, 993517, 993592, 993593
Procedure WB-DC-40-61, Equipment and Floor Drainage System
Procedure WB-DC-40-31.51, Evaluating the Effects of Flooding Due to Moderate Energy Pipe Failures Inside and Outside Containment
Calculation WBNOSG4103, MELB Safe Shutdown Analysis
Calculation WBNOSG4099, Moderate Energy Line Break Flooding Study
SRs 987260, 1000027, 982973

Section 1R11: Licensed Operator Requalification Program

1-SI-0-11, Estimated Critical Position, Rev. 0020
 1-GO-2, Reactor Startup, Rev. 0005
 1-SOI-85.01, Control Rod Drive and Indication System, Rev. 0002
 1-TI-7.032, ICRR Monitoring, Rev. 0000

Section 1R12: Maintenance Effectiveness

1-ARI-102-108, NVAC & CVCS, Rev. 0000
 Maintenance Rule Cause Determination and Evaluation (CDE) 1343, 1189, 1346 and 1336
 0-TI-119, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting –
 10CFR50.65, Rev. 0001
 NPG-SPP-03.4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting
 – 10CFR50.65, Rev. 0003
 SR 946831
 PER 937844

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Operator's risk report dated 1/5/15
 Operator's risk report dated 2/27/15
 Operator's risk report dated 3/2/15
 Operator's risk report dated 3/15/15

Section 1R18: Plant Modifications

WBN-1-2015-061-001, U1 Glycol Bypass to Floor Circulation Pumps
 PER 975451

Section 1R19: Post Maintenance Testing

WO 116113213
 WO 115606592
 WO 116113639
 WO 116113355
 WO 115696528
 WO 116646007
 WO 115966798
 WO 115922729
 PER 976297

Section 1R22: Surveillance Testing

WO 116090559
 0-SI-82-11-A, Monthly Diesel Generator Start and Load Test DG 1A-A, Rev. 44
 SRs 979549, 980286, 980303
 0-SOI-82.01, Diesel Generator (DG) 1A-A, Rev. 2
 WO 115610992
 0-SI-215-42-B, Diesel Generator 1B-B 18 Month Service Test and Battery Charger Test, Rev.
 15
 WO 116090745
 1-SI-74-902-A, Quarterly Valve Full Stroke Exercising – RHR System (Train A)
 WO 116228366

SR 9894101

1-CM-6.24, Sampling CVCS Mixed Bed Demineralizers, Rev. 0002

1-SI-68-28, Primary Radiochemistry Requirements, Rev. 0024

1-CM-6.20, Sampling the Reactor Coolant System, Rev. 0001

SR 978213

Evaluation Document SR / PER Number: 974404, Rev. 1

1-TI-61-138, Site Engineering Setpoint and Scaling Document

IMI-151, Backup Ice condenser Temperature Monitoring, Rev. 5

Section 4OA2: Problem Identification and Resolution

PER 215224

PER 665623

PER 632940

WO 09-819893-000

NPG-SPP-03.1.7, PER Analysis Actions, Closures, and Approvals

NPG-SPP-22.303, PER Analysis Actions, Closures, and Approvals

Section 4OA3: Event Follow-up

EN 50839

SR 990857

SR 990888

SR 990970

SR 990999

SR 991138

SR 992023

SR 992035

Section 4OA5: Other Activities

Calculations

CDQ0006912014000571, Liquefaction Analysis for Proposed WBN ISFSI Pad, HI-2135836

Corrective Action Documents - Problem Evaluation Reports

PER 791649, Vendor facility not on the ASL for Safety-related dry storage cask fabrication

PER 894715, Holtec document deliverables contain numerous errors and incomplete information

Quality Assurance Observations

64032, Generation/Construction QA Review of WBN Dry Cask Storage Activities

64127, Generation/Construction QA Review of WBN Dry Cask Storage Activities

64283, Generation/Construction QA Review of WBN Dry Cask Storage Activities

64289, Generation/Construction QA Review of WBN Dry Cask Storage Activities

64302, Generation/Construction QA Review of WBN Dry Cask Storage Activities

64901, Generation/Construction QA Review of WBN Dry Cask Storage Activities

65368, Generation/Construction QA Review of WBN Dry Cask Storage Activities

65583, Generation/Construction QA Review of WBN Dry Cask Storage Activities

65750, Generation/Construction QA Review of WBN Dry Cask Storage Activities

65891, Generation/Construction QA Review of WBN Dry Cask Storage Activities

66797, Generation/Construction QA Review of WBN Dry Cask Storage Activities

66967, Generation/Construction QA Review of WBN Dry Cask Storage Activities
67534, Generation/Construction QA Review of WBN Dry Cask Storage Activities
67746, Generation/Construction QA Review of WBN Dry Cask Storage Activities
67997, Generation/Construction QA Review of WBN Dry Cask Storage Activities
69339, Generation/Construction QA Review of WBN Dry Cask Storage Activities
69425, Generation/Construction QA Review of WBN Dry Cask Storage Activities
69997, Generation/Construction QA Review of WBN Dry Cask Storage Activities
70930, Generation/Construction QA Review of WBN Dry Cask Storage Activities
70956, Generation/Construction QA Review of WBN Dry Cask Storage Activities
71076, Generation/Construction QA Review of WBN Dry Cask Storage Activities
72172, WBN ISFSI Project Site Nuclear Assurance Manager Review of Dry Cask Storage Activities

US Wick, Inc. Documents

Drawings

VSC-1, General Notes, US Wick Drain, Inc., Revision 0
VSC-2, VSC Layout Plan, US Wick Drain, Inc., Revision 0
VSC-3, VSC Sections and Details, US Wick Drain, Inc., Revision 0

Specifications

Supplemental Specifications for Vibro Stone Columns by US Wick Drain, Revision 0

Other Documents Reviewed

Means & Methods Submittal for Vibro Stone Columns by US Wick Drain, Revision 0
QA/Testing Submittal for Vibro Stone Columns by US Wick Drain, Revision 0