



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

August 12, 2016

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 REPORT  
05000390/2016002, 05000391/2016002

Dear Mr. Shea:

On June 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Watts Bar Nuclear Plant, Unit 1 and Unit 2. On July 14, 2016, the NRC inspectors discussed the results of this inspection with Mr. Simmons and other members of the Watts Bar staff. Inspectors documented the results of this inspection in the enclosed inspection report. As described in Watts Bar Nuclear Plant, Unit 2 - Reactor Oversight Process Implementation and Partial Cornerstone Transition, applicable inspections for all cornerstones as required by the baseline inspection program for a dual unit site, as described in IMC 2515 "Light-Water Reactor Inspection Program - Operations Phase", are being implemented and documented as part of Unit 1 and 2 NRC Integrated Inspection Reports. Inspection activities associated with Unit 2 construction are being documented in separate Unit 2 Construction - NRC Integrated Inspection Reports.

NRC inspectors documented six NRC-identified and one self-revealed findings of very low safety significance (Green or SL-IV) that involved violations of NRC requirements. Additionally, NRC inspectors documented four Severity Level IV violations with no associated finding. The NRC is treating these violations as non-cited violations (NCVs) in accordance with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest these violations or significance of the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Watts Bar Nuclear Plant.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Watts Bar Nuclear Plant.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC 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 Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

***/RA/***

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

Docket Nos.:50-390, 50-391  
License No.: NPF-90, 96

Enclosure: NRC Inspection Report 05000390/2016002, 05000391/2016002  
w/Attachment: Supplemental Information

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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 Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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**/RA/**

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Letter to Joseph Shea from Alan Blamey dated August 12, 2016

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT  
05000390/2016002, 05000391/2016002

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RidsNrrPMWattsBar1 Resource

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No.: 50-390, 50-391

License No.: NPF-90, NPF-96

Report No.: 05000390/2016002, 05000391/2016002

Licensee: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Units 1 and 2

Location: Spring City, TN 37381

Dates: April 1 through June 30, 2016

Inspectors: J. Nadel, Senior Resident Inspector  
J. Hamman, Resident Inspector  
J. Jandovitz, Senior Resident Inspector  
G. Callaway, Reactor Technology Instructor  
L. Micewski, Reactor Operations Engineer  
N. Pitoniak, Senior Fuel Facility Project Inspector  
J. Eargle, Senior Reactor Inspector  
A. Lerch, Construction Project Inspector  
D. Dumbacher, Senior Resident Inspector, Browns Ferry  
S. Sanchez, Senior Emergency Preparedness Inspector  
C. Young, Senior Project Engineer  
D. Jones, Senior Reactor Inspector  
R. Fanner, Senior Reactor Inspector

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

Enclosure

## SUMMARY

IR 05000390/2016-002; 05000391/2016-002; April 1, 2016 – June 30, 2016; Watts Bar, Units 1 and 2; Triennial Fire Protection Inspection, Operability Evaluations, Surveillance Testing, Problem Identification and Resolution, Event Follow-up.

The report covered a three-month period of inspection by the resident and regional inspectors. Ten NRC-identified and self-revealed findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 6. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross Cutting Areas," dated December 04, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015.

### A. NRC-Identified Findings and Self-Revealed Findings

- SL IV. The NRC identified a Severity Level (SL) IV non-cited violation (NCV) of 10 *Code of Federal Regulations* (CFR) 50.73(a)(2)(i)(B) for the licensee's failure to notify the NRC that the technical specification (TS) limiting condition for operation (LCO) 3.5.2 required action and completion time were not met when the 1B-B centrifugal charging pump (CCP) was inoperable due to an inoperable room cooler. Subsequently, the licensee submitted LER 2016-006-00 for this event on June 30, 2016. This issue was placed in the licensee's corrective action program (CAP) as CR 1165380.

Since the failure to submit an event report within the time requirements may impact the ability of the NRC to perform its regulatory oversight function, this performance deficiency was dispositioned under traditional enforcement and the violation was assessed using Section 2.2.4 of the NRC's Enforcement Policy. Using the example listed in Section 6.9.d.9, "A licensee fails to make report required by 10 CFR 50.73," the issue was determined to be a SL IV violation. In accordance with IMC 0612, "Power Reactor Inspection Reports," dated May 6, 2016, traditional enforcement violations are not assessed for cross-cutting aspects. (Section 1R15)

- SL IV: The NRC identified a SL IV NCV of 10 CFR 50.73(a)(2)(i)(B) for the licensee's failure notify the NRC that the TS LCO 3.1.8 required action and completion time were not met when the analog rod position indication (ARPI) and the demand position indication system were not operable. Subsequently, the licensee submitted LER 2016-007-00 for this issue on June 20, 2016. This violation was placed in the licensee's corrective action program as CR 1163150.

Since the failure to submit an event report within the time requirements may impact the ability of the NRC to perform its regulatory oversight function, this performance deficiency was dispositioned under traditional enforcement and the violation was assessed using Section 2.2.4 of the NRC's Enforcement Policy. Using the example listed in Section 6.9.d.9, "A licensee fails to make report required by 10 CFR 50.73," the issue was determined to be a SL IV violation. In accordance with IMC 0612, "Power Reactor Inspection Reports," dated May 6, 2016, traditional enforcement violations are not assessed for cross-cutting aspects. (Section 40A3.6)

- SL IV. The NRC identified a SL IV NCV of 10 CFR 50.73(a)(2)(i)(B) for the licensee's failure notify the NRC that the TS LCO 3.6.3 required action and completion time were not met for an inoperable emergency raw cooling water (ERCW) containment isolation valve. Subsequently, the licensee submitted LER 2016-009-00 for this issue on July 15, 2016. This issue was placed in the licensee's corrective action program as CR 1174000.

Since the failure to submit an event report within the time requirements may impact the ability of the NRC to perform its regulatory oversight function, this performance deficiency was dispositioned under traditional enforcement and the violation was assessed using Section 2.2.4 of the NRC's Enforcement Policy. Using the example listed in Section 6.9.d.9, "A licensee fails to make report required by 10 CFR 50.73," the issue was determined to be a SL IV violation. In accordance with IMC 0612, "Power Reactor Inspection Reports," dated May 6, 2016, traditional enforcement violations are not assessed for cross-cutting aspects. (Section 40A2.3)

- SL IV. The NRC identified a SL IV NCV of 10 CFR 50.73(a)(2)(i)(B) for the licensee's failure to report, within 60 days of discovery, a condition which was prohibited by the plant's TS associated with recent performances of TS surveillance requirement (SR) 3.5.2.3 for verification that emergency core cooling system (ECCS) piping is full of water. Subsequently, the licensee submitted LER 2016-003-00 for this issue on May 10, 2016. This violation was placed in the licensee's corrective action program as CR 1166564.

Since the failure to submit an event report within the time requirements may impact the ability of the NRC to perform its regulatory oversight function, this performance deficiency was dispositioned under traditional enforcement and the violation was assessed using Section 2.2.4 of the NRC's Enforcement Policy. Using the example listed in Section 6.9.d.9, "A licensee fails to make report required by 10 CFR 50.73," the issue was determined to be a SL IV violation. In accordance with IMC 0612, "Power Reactor Inspection Reports," dated May 6, 2016, traditional enforcement violations are not assessed for cross-cutting aspects. (40A3.4)

- SL IV. The NRC identified a SL IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," at Watts Bar Unit 2 for the licensee's failure to follow procedure OPDP-8, Operability Determination Process and Limiting Condition for Operation Tracking, Revision 22. Specifically, the 2A-A motor-driven auxiliary feedwater pump (MDAFW) was potentially inoperable in mode 3 due to inadequate compensatory measures that were being controlled outside of the operability process. The issue was corrected and the pump returned to operable status on April 19, 2016. The issue was entered into the licensee's corrective action program as CR 1163431.

The performance deficiency was more than minor because it represented an improper or uncontrolled work practice that could impact quality or safety, involving safety-related SSCs. Specifically, failure to appropriately use the operability process when measures must be established to compensate for degraded or nonconforming conditions can lead to SSC inoperability. As described in IMC 2517, the significance of this issue was determined using traditional enforcement, because the cornerstone associated with this finding was not being assessed by the reactor oversight process (ROP). The inspectors determined this finding to be of very low safety significance, SL IV because it represented a failure to meet a regulatory requirement, specifically a quality assurance (QA) criteria to follow quality-related procedures, which had more than minor safety significance. The finding was assigned a cross-cutting aspect of Work Management in the Human Performance area because the minor maintenance work order created to compensate for the oil loss from the 2A-A MDAFW pump was never reviewed by operations, which could have identified the out of process error. [H.5]. (Section 1R15)

- SL IV. The NRC identified a SL IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," at Watts Bar Unit 2 for the licensee's failure to follow the surveillance test program procedure by making adjustments to the turbine-driven auxiliary feedwater (TDAFW) pump control system during the performance of a surveillance instruction. The licensee reperformed the surveillance instruction with satisfactory results. The issue was entered into the licensee's corrective action program as CR 1167102.

The performance deficiency was more than minor because making adjustments to the TDAFW pump control system during the performance of a surveillance instruction could invalidate the test and result in the TDAFW pump being inappropriately declared operable. As described in IMC 2517, the significance of this issue was determined using traditional enforcement, because the cornerstone associated with this finding was not being assessed by the reactor oversight process (ROP). The inspectors determined this finding to be of very low safety significance, SL IV, because it represented a failure to meet a regulatory requirement, specifically a QA criteria to follow quality-related procedures, which had more than minor safety significance. The finding was assigned a cross-cutting aspect of Conservative Bias in the Human Performance area because numerous individuals were aware the speed adjustment had been made while completing the surveillance instruction but did not question the appropriateness of that adjustment until prompted by NRC inspectors. [H.14] (Section 1R22)

- SL IV. A self-revealed Severity Level (SL) IV non-cited violation (NCV) of 10 Code of Federal Regulations (CFR) 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified at Watts Bar Unit 2 for the licensee's failure to follow procedure 0-MI-1.003, Disassembly, Inspection, and Reassembly of Auxiliary Feedwater Pump Turbine. Specifically, the valve stem spring coil gap was not set in accordance with procedure, causing the turbine-driven auxiliary feedwater (TDAFW) pump to trip on electrical overspeed when the level control valves (LCVs) were closed. This issue was corrected on May 30, 2016, when the proper spring coil gap was set and verified and the post maintenance test was performed satisfactorily. The issue was entered into the licensee's corrective action program as CR 1175968.



The performance deficiency was more than minor because it represented an improper or uncontrolled work practice that could impact quality or safety involving safety-related structures, systems, and components (SSCs). The finding was a SL IV violation because it represented a failure to meet a regulatory requirement, specifically a quality assurance (QA) criteria to follow quality-related procedures, which had more than minor safety significance. The finding was assigned a cross-cutting aspect of resources in the Human Performance area because the licensee failed to ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety. Specifically, the procedure that set the coil spring gap lacked sufficient detail and rigor to ensure that the coil gap would be set appropriately by the technicians. [H.1] (4OA3.1)

#### Cornerstone: Mitigating Systems

- Green: The NRC identified a Green NCV of 10 Code of Federal Regulations (CFR) 50, Appendix B, Criterion III, Design Control for the licensee's failure to specify nominal shaft size along with specific acceptance criteria for shaft tolerance measurements for the 1B-B centrifugal charging pump (CCP) room cooler fan shaft. The licensee repaired the room cooler by replacing the fan shaft and the finding was entered into the licensee's corrective action program as CR 1146474.

The performance deficiency was more than minor because it affected the equipment performance attribute of the mitigating system cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors determined that this finding required a detailed risk analysis since it represented an actual loss of function of a single train for greater than its TS-allowed outage time. The finding does not present an immediate safety concern because the licensee has verified current operability. A Senior Reactor Analyst evaluated the increase in core damage frequency due to the pump being non-functional over the exposure period and determined it was  $3.6E-7$ /year (Green). The dominant scenario was a loss of component cooling water, which combined with a loss of RCP seal injection causes a loss of coolant accident and leads to core damage. The risk increase was very low because of the limited exposure time, the availability of the opposite train pump, and the time dependent nature of the pump failing due to lack of room cooling. The inspectors determined that the finding had a cross-cutting aspect of design margin in the area of Human Performance because the licensee failed to carefully guard margins through a systematic and rigorous process. Specifically, the translation of shaft diameter from design documents into 0-MI-0.16 lacked rigor and allowed an undersized shaft to go undetected, leading to cooler failure. [H.6] (Section 1R15)

- Green: The NRC identified a Green NCV of Operating License Condition 2.F for the licensee's failure to ensure that a train of source range detection was available to monitor neutron population during the initial stages of a fire event on Unit 1. This issue was entered into the licensee's corrective action program as CR 1098240.

The licensee's failure to ensure a train of source range detection was free from fire damage was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems Cornerstone and it adversely affected the

cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to maintain the capability to monitor neutron population during the early stage of a fire event. In accordance with IMC 0609, Appendix F, "Fire Protection Significance Determination Process," the finding was determined to be of very low safety significance (Green) because the reactor would have been able to reach and maintain a stable plant condition. No cross-cutting aspect was identified for this issue. (Section 1R05)

- Green: The inspectors identified a Green NCV of TS 5.7.1.1.a, Procedures, for the licensee's failure to maintain procedure 1-SI-63-10.1-A, "ECCS Discharge Pipes Venting – Train A Inside Containment," Revisions 11-16, in accordance with the requirements of Regulatory Guide 1.33. Specifically, the procedure did not have provisions for quantifying accumulated gases during venting which allowed emergency core cooling system (ECCS) piping to be vented without being evaluated for potential adverse impacts on system operability. The licensee implemented manual ultrasonic testing (UT) of gas accumulation and entered this issue into their corrective action program as CR 1136359.

The performance deficiency was more than minor because, if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, if left uncorrected, the potential existed for an unacceptable void affecting ECCS operability to develop prior to the next scheduled surveillance. The inspectors screened the finding in accordance with NRC Manual Chapter IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power". Using IMC 0609 Appendix A, Exhibit 2 – Mitigating Systems Screening Questions, the inspectors determined that this finding was of very low safety significance (Green) because the finding did not represent an actual loss of function of a single train for greater than its TS allowed outage time. The inspectors determined that the finding had a cross-cutting aspect of Change Management in the area of Human Performance because the licensee failed to use a systematic process to implement changes to the ECCS venting procedure to ensure that Generic Letter 2008-01 commitments would continue to be met. [H.3] (Section 4OA3.5)

Cornerstone: Barrier Integrity

- Green: The NRC identified a Green NCV of TS for the failure to recognize and take the required actions in TS 3.6.3 for inoperable containment penetration flow paths. Specifically, the required actions of TS 3.6.3 applied on November 21, 2015, and were not taken until January 30, 2016. Upon discovery, on January 30, 2016, the affected containment penetrations were isolated by placement of a clearance, thereby satisfying the TS required actions. The licensee entered the violation into the CAP as CR 1172114.

The performance deficiency was more than minor because the ERCW supply and discharge containment penetrations for the 1D upper containment cooler were inoperable for longer than the TS allowed outage time. Because the 1D upper containment cooler ERCW containment penetrations were inoperable and resulted in the failure to satisfy TS LCO 3.6.3, reasonable assurance of the integrity of the containment design barrier was adversely affected. The inspectors determined the finding was of low safety significance (Green) because the upper containment

cooler ERCW penetrations are small lines (<1-2 inches in diameter) and IMC 0609, Appendix H "Containment Integrity Significance Determination Process" dated May 6, 2004, Table 4.1 states that "small lines (<1-2 inches in diameter) would not generally contribute to LERF." This finding had a cross-cutting aspect in the area of Human Performance, Conservative Bias, because the licensee failed to make the prudent choice to fully evaluate the unsuccessful surveillance test on November 15, 2015, and instead simply documented the issue in the corrective action program and deferred the solution, resulting in the TS violation six days later. [H.14] (Section 40A2.3)

B. Licensee-Identified Violations

None.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 started the reporting period at 100 percent rated thermal power and remained there until March 22, 2016, when the reactor tripped due to a main turbine trip caused by a governor valve circuit card failure. Unit 1 returned to 100 percent rated thermal power on March 28, 2016, and remained there until June 11, 2016, when power reductions were necessary to maintain main low pressure turbine #3 back pressure limits during warmer weather. Unit 1 operated between 89 and 97 percent power, as necessary to maintain main turbine backpressure limits, until June 25, 2016, when power was reduced due to turbine building sump overflowing, resulting from turbine building sump pump failures. The rising water level approached the running unit 1 #3 high pressure heater drain tank pumps. The licensee decided to secure the #3 high pressure heater drain pumps and, as a result, lowered unit 1 power. Power reduction continued to 60 percent on June 27, 2016, then increased over the next three days to 79 percent by the end of the reporting period.

Unit 2 started the reporting period in mode 3 and remained there until April 2, 2016, when it entered mode 4 for repairs to leaking safety injection check valves. The unit re-entered mode 3 on April 8, 2016, where it remained until April 17, 2016, when it re-entered mode 4 due to failure of the turbine-driven auxiliary feedwater pump (TDAFW) to meet mode 3 operability requirements. The unit re-entered mode 3 on May 1, 2016, where it remained until May 18, 2016, when it re-entered mode 4 for repairs to the solid state protection system. The unit re-entered mode 3 on May 20, 2016. The unit then entered mode 2 on May 23, 2016, and mode 1 on May 25, 2016, where it remained until May 28, 2016, when it re-entered mode 3 due to abnormal indications of foreign material in the main turbine when it was rolled at low speed for the first time. The unit re-entered mode 2 and mode 1 on May 31, 2016. The unit remained in mode 1 until June 5, 2016, when the #1 turbine governor valve failed full open, causing an automatic reactor trip and safety injection. The unit re-entered mode 2 and mode 1 on June 8, 2016. The unit remained in mode 1 until an automatic reactor trip caused by steam generator low level occurred on June 20, 2016. The reactor trip was the result of a secondary transient caused by the loss of the running main feedwater pump. The unit re-entered mode 2 on June 23, 2016, and re-entered mode 1 on June 24, 2016. The unit re-entered mode 2 on June 26, 2016, due to a high pressure steam leak and subsequent lifting of two main steam safety valves on the #4 steam generator. The unit re-entered mode 3 on June 26, 2016, to repair the steam leak and the safety valves. The unit remained in mode 3 through the end of the reporting period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01)

##### .1 Seasonal Readiness for Seasonal Extreme Weather Conditions (Summer)

###### a. Inspection Scope

The inspectors performed a review of the licensee's readiness for the onset of seasonal high temperatures. The review focused on the essential raw cooling water (ERCW) and the component cooling water system (CCS). The inspectors reviewed the updated final

safety analysis report (UFSAR), technical specifications (TS), control room logs, and the corrective action program (CAP) to determine what temperatures or other seasonal weather could challenge these systems and to ensure licensee personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including the station seasonal readiness procedure, the Watts Bar summer operation procedure, and applicable operating procedures for ERCW and CCS. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during hot weather conditions. Documents reviewed are listed in the Attachment. This activity constituted one Adverse Weather inspection sample, as defined in Inspection Procedure (IP) 71111.01.

b. Findings

No findings were identified.

.2 External Flood Protection Inspection

a. Inspection Scope

The inspectors evaluated the licensee's implementation of flood protection procedures and compensatory measures during impending conditions of flooding or heavy rains. The inspectors reviewed the UFSAR and related flood analysis documents to identify those areas containing safety related equipment that could be affected by external flooding and their design flood levels. The inspectors walked down flood protection barriers, reviewed procedures for coping with external flooding, and reviewed corrective actions for past flooding events. The inspectors verified that the procedures for coping with flooding could reasonably be used to achieve the desired results. For those areas where operator actions are credited, the inspectors assessed whether the flooding event could limit or preclude the required actions. This review constituted one inspection sample, as defined in IP 71111.01. Documents reviewed are listed in the Attachment.

The inspectors conducted a walkdown of the intake pumping station which contains risk significant structures, systems, and components (SSCs), which are located below flood levels, and required to stay dry during a flood.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

Partial System Walkdowns

a. Inspection Scope

The inspectors conducted the 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 (OOS). This also included that redundant trains were returned to service properly. The inspectors reviewed the functional system descriptions, the UFSAR, system operating procedures, and TS to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of

the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system. Documents reviewed are listed in the Attachment. This activity constituted three inspection samples, as defined in IP 71111.04.

- 2B train containment spray system while the 2A train was OOS for maintenance
- Unit 2 boric acid addition and recovery portion of the chemical and volume control system
- 2B-B emergency diesel generator emergency diesel generator (EDG) while the 2A-A EDG was OOS for a maintenance outage

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05AQ)

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. Documents reviewed are listed in the Attachment. This activity constituted nine inspection samples, as defined in IP 71111.05AQ.

- Control building elevation 772 vital battery room I
- Control building elevation 772 vital battery room II
- Control building elevation 772 vital battery room III
- Control building elevation 772 vital battery room IV
- Control building elevation 772 fifth vital battery and board room
- Control building elevation 772 480V Transformer Room 1A
- Control building elevation 772 480V Transformer Room 1B
- Control building elevation 772 480V Transformer Room 2A
- Control building elevation 772 480V Transformer Room 2B

b. Findings

No findings were identified.

1R05 Triennial Fire Protection Inspection (71111.05T)(Closed) Unresolved Item (URI) 05000290/2015010-01: 420 Minute Operator Manual Action to Provide Source Range Monitoring Capabilitya. Inspection Scope

During the 2015 Watts Bar Triennial Fire Protection Inspection, the team identified a URI for use of a 480 Minute operator manual action (OMA) to provide source range monitoring capability in procedure 1-AOI-30.2, C36, "Fire Safe Shutdown Room 737-A1A." The inspectors performed an in-office review of Watts Bar licensing bases documents and fire program documents to determine if the OMA was allowed. One non-cited violation was identified during the follow-up review and is described below. This URI is closed.

b. Findings

Introduction: An NRC identified Green NCV of Operating License Condition 2.F was identified for the licensee's failure to ensure that a train of source range detection was available to monitor neutron population during the initial stages of a fire event.

Description: Watts Bar's fire protection program (FPP) delineated 10 CFR, Appendix R, Section III.G.2 as the requirement for room 737-A1A. Section III.G.2 required that one train of systems be free of fire damage such that hot shutdown conditions could be achieved and maintained. The inspectors noted that Calculation WBN-OSG4-165, "Manual Actions for Safe Shutdown Following a Fire, dated May 1995," stated that a fire in certain areas (737-A1A, 737-A1B, 737-A1C, 737-A5, and 729-A14) could result in the loss of source range indication in both the control room and the auxiliary control room. The Calculation determined that a 480-minute operator manual action (OMA) would be credited for establishing source range monitoring capability. The OMA consisted of operators installing a portable flux monitor that required the termination of cables at a local station. The cables necessary to perform the OMA were contained in the ACR panel and the remote hookup location. The licensee could not locate any documentation to support the functionality of the cables in an operational configuration. The FPP did not validate the feasibility of the OMA because the required action time was greater than 120 minutes. Watts Bar's FPP, Part V, stipulated that a feasibility analysis would be performed for OMAs with a required time of less than 120 minutes. The OMA was listed as OMA 649 in Calculation EDQ00099920090016, "Appendix R – Unit 1 & 2 Manual Action, Rev. 4."

Procedure, 1-AOI-30.2-C36, "Fire Safe Shutdown Room, Rev. 5," stated that the necessary actions to regain source range indication should be initiated two hours after the onset of the fire; and had a required performance time of eight-hours. The inspectors noted that the site's FPP assumed that plant cooldown would be initiated at approximately 60 minutes which conflicted with the 480 minute operational time requirement for implementing the source range OMA. Additionally, Procedure 1-AOI-30.2, "Fire Safe Shutdown, Rev. 5," Step 5.3.15, stated that at least one channel of nuclear instrumentation indication must be available to monitor shutdown neutron population. Technical Specification 3.3.1.L required an operable source range neutron flux channel in Modes 3, 4, and 5; and stipulated that positive reactivity additions (such as plant cooldown) be suspended when the instrument was inoperable. A generic

document, Westinghouse Owners Group letter, WOG-05-36 (dated 01/28/2005), Section 6.2, Long Term Cold Shutdown Capability, stated that typical instrumentation to achieve a shutdown condition during Appendix R events included source range indication. Additionally, the inspectors noted that NUREG-0847, "Safety Evaluation Report, Watts Bar Nuclear Plant, Units 1 and 2, Supplement No. 18," did not discuss a source range repair activity or an associated OMA.

As a result, the inspectors concluded that Watts Bar failed to ensure a train of source range detection was free from fire damage; and that plant operation could occur without operators having the capability to monitor neutron population for up to 480 minutes. Additionally, since the FPP assumed plant cooldown would occur at approximately 60 minutes, the inspectors determined that an analysis was required to verify the feasibility of installing the source range within this time period. The deficiency impacted Unit 1 fire areas (737-A1A, 737-A1B, 737-A1C, 737-A5, and 729-A14) and FSSD procedures (1-AOI-30.2-C36, C38, C40, and C75). The licensee entered this issue into their corrective program as CRs 1077284 and 1098240.

Analysis: The licensee's failure to ensure a train of source range detection was free from fire damage as required by 10 CFR Appendix R, Section III.G.2 was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems Cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to maintain the capability to monitor neutron population during the early stage of a fire event. The finding was screened in accordance with NRC IMC 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," dated June 19, 2012, which determined that, an IMC 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, review was required because it fire safe shutdown finding. The finding was determined to be Green at Step 1.3.1.A because the reactor would have been able to reach and maintain a stable plant condition. A cross-cutting aspect was not identified because the issue did not reflect current performance.

Enforcement: Watts Bar Operating License Condition 2.F required that the licensee shall implement and maintain in effect all provisions of the approved fire protection program, as described in the Fire Protection Report for Watts Bar Unit 1, as approved in Supplements 18 and 19 of the SER (NUREG-0847). The Unit 1 and 2 As-Constructed Fire Protection Report, Table I-1, Summary Compliance Fire Protection, stated, in part, that Room 737-A1A complied with the requirements of 10 CFR Appendix R, Section III.G.2 which stated, in part, that one train of systems be free of fire damage such that hot shutdown conditions could be achieved and maintained.

Contrary to this requirement, since 1995, Watts Bar failed to ensure that one train was free of fire damage such that hot shutdown conditions could be achieved and maintained. Specifically, the licensee failed to ensure that a train of source range detection was available to monitor neutron population during the initial stages of a fire event. The licensee initiated CR 1098240 and planned to revise the procedures such that a plant cooldown would not be initiated until the source range monitoring capability was functional. Because the finding was of very low safety significance and it was entered in the licensee's corrective action program as CR 1098240, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. The violation is identified as NCV 05000390/2016002-01, Failure to Ensure that a Train



of Source Range Detection was Available to Monitor Neutron Population During a Fire Event.

1R06 Flood Protection Measures (71111.06)

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. Documents reviewed are listed in the Attachment. This inspection constituted one Underground Manhole Internal Flooding inspection sample, as defined in IP 71111.06.

- Manhole 25

b. Findings

No findings were identified

1R11 Licensed Operator Requalification and Performance (71111.11)

.1 Licensed Operator Requalification Review

a. Inspection Scope

On May 11, 2016, the inspectors observed the simulator evaluation for Operations Crew 4 per scenario 3-OT-SRT-SUP10, revision 1.

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 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 inspector. Documents reviewed are listed in the Attachment. This activity constituted one Observation of Requalification Activity inspection sample, as defined in IP 71111.11.

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 outage activities to focus on the following conduct of operations as appropriate. This activity constituted one Observation of Operator Performance inspection sample, as defined in IP 71111.11.

- 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 (71111.12)

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 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. Documents reviewed are listed in the Attachment. This activity constituted three Maintenance Effectiveness inspection samples, as defined in IP 71111.12.

- Condition Report (CR) 1148192, failure of positioner 1-POS-3-122 for 1A-A auxiliary feedwater pump discharge valve 1-PCV-3-122-A
- CR 1125332, unit 1 upper containment radiation monitor counts dropped to near zero then became erratic

Quality Control (QC) Sample

- Observed field work and QC check of work performed, as required by WO 115178123 QC hold points, associated with relay replacements on the 2B-B 6.9kV shutdown board

b. Findings

No findings were identified.

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

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. Documents reviewed are listed in the Attachment. This activity constituted four Maintenance Risk Assessment inspection samples, as defined in IP 71111.13.

- Risk assessment for work week 0411 with emergent work on safety injection check valve 2-CKV-063-0551-S due to seat leakage
- Risk assessment for work week 0418 with Unit 1 turbine-driven auxiliary feed water (TDAFW) pump OOS due to steam generator (SG) number 3 level controller failure.
- Risk assessment for work week 0425 with 2B motor-driven auxiliary feed (MDAFW) pump OOS for maintenance and 2A EDG OOS for surveillance.
- Risk assessment for work week 0516 with the loss of the 1B-B 6.9 kV shutdown board and 1B-B emergency diesel generator

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)a. Inspection Scope

The inspectors reviewed the operability evaluations affecting risk-significant mitigating systems listed below, to assess: 1) the technical adequacy of the evaluations; 2) whether continued system operability was warranted; 3) whether the compensatory measures in place, would work as intended, and were appropriately controlled; 4) the impact on TS 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. Additional documents reviewed are listed in the Attachment. This activity constituted five Operability Evaluation inspection samples, as defined in IP 71111.15.

- Immediate determination of operability (IDO) for CR 1162512, 2A-A MDAFW pump multiple water leaks
- Design Change Notice 66327-A Screening Review / 50.59 Evaluation, Reactor Coolant System Resistance Temperature Detector response times
- Past operability evaluation (POE) for CR 1163431, Unit 2 TDAFW pump failure to meet comprehensive test acceptance criteria during performance of 2-SI-3-923-S, Auxiliary feedwater pump 2A-S comprehensive pump test
- IDO/POE for CR 1163431, 2A-A MDAFW pump oil leak from vent cap and bubbler found empty
- POE for CR 1111791, 1B-B charging pump room cooler found not cooling with thrown belt and bearing damage (URI 05000390/2016001-08 Charging Pump 1B-B Room Cooler Fan Bearing Failure)

b. Findings.1 Failure to Translate Design Requirements into a Maintenance Procedure for the 1B-B Charging Pump Room Cooler (URI 05000390/2016001-08 Charging Pump 1B-B Room Cooler Fan Bearing Failure)

Introduction: The NRC identified a Green NCV of 10 CFR 50, Appendix B, Criterion III, Design Control, for the licensee's failure to correctly translate design requirements into procedures. Specifically, 0-MI-0,16, Maintenance Guidelines for Belt Driven Equipment, Revision 7, for the 1B-B centrifugal charging pump (CCP) room cooler shaft bearing did not specify nominal shaft size along with specific acceptance criteria for shaft tolerance measurements.

Discussion: The CCP room cooler at Watts Bar is a safety-related system that maintains adequate cooling for the 1B-B CCP pump room equipment and starts automatically on a CCP start signal. On December 4, 2015, the auxiliary building auxiliary unit operator reported to the main control room that the 1B-B room cooler was not moving air and that the belts came off their drive pulleys. The belts came off their pulleys because of a failure of the inboard flange bearing on the fan shaft of the cooler. The licensee entered TS LCO 3.5.2 for one train of the emergency core cooling system being inoperable due to the failure of the 1B-B CCP room cooler. The 1B-B CCP had been running for a cumulative total of approximately 40 days prior to the failure on December 4, 2015.

The licensee determined that the bearing failed due to an undersized fan shaft. The fan shaft outer diameter was found to be 1.185 inches, which is undersized per the design document, Drawing Change Authorization (DCA) 30113-77, which required 1.1875 inches, +0.0000 / -.0005 inches. The undersized shaft was not identified during maintenance since the replacement procedure 0-MI-0.16, Maintenance Guidelines for Belt Driven Equipment, Revision 7, for the 1B-B CCP room cooler shaft bearing did not specify nominal shaft size along with specific acceptance criteria for shaft tolerance measurements. The procedure required measuring and recording the shaft diameter, and then write-in the engineering document used to determine if the shaft diameter was in tolerance. Therefore, it was not possible to compare the measured shaft diameter to a nominal shaft diameter and verify that the measured diameter was within design tolerances.

The licensee's initial evaluation of the failure did not identify either the undersized fan shaft or the correct operability impact from the failure. Inspectors found this evaluation deficient and challenged the licensee on both the cause of the failure and its related impact on room cooler and CCP operability. The licensee subsequently performed a more detailed evaluation which documented the undersized shaft and the correct operability impact.

Analysis: The failure to correctly translate design requirements as required by 10 CFR Part 50, Appendix B, Criterion III, was a performance deficiency. Specifically, 0-MI-0.16, Maintenance Guidelines for Belt Driven Equipment, Revision 7, for the 1B-B centrifugal charging pump (CCP) room cooler shaft bearing did not specify nominal shaft size along with specific acceptance criteria for shaft tolerance measurements. The performance deficiency was more than minor because it affected the equipment performance attribute of the mitigating system cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, after maintenance to replace a bearing, the room cooler was unable to fulfill its function to support the 100-day mission time of the 1B-B CCP as stated in the Design Basis Events Design Criteria, WB-DC-40-64, Revision 15. The inspectors performed an initial screening of the finding in accordance with IMC 0609, Appendix A, "The Significance Determination Process for (SDP) for Findings At-Power". Using IMC 0609 Appendix A, Exhibit 2 – Mitigating Systems Screening Questions, the inspectors determined that this finding required a detailed risk analysis since it represented an actual loss of function of a single train for greater than its TS allowed outage time. The finding does not present an immediate safety concern because the licensee has verified current operability. A Senior Reactor Analyst evaluated the increase in core damage frequency due to the pump being non-functional over the exposure period and determined it was 3.6E-7/year (Green). The dominant scenario was a loss of component cooling water, which combined with a loss of RCP seal injection causes a loss of coolant accident and leads to core damage. The risk increase was very low because of the limited exposure time, the availability of the opposite train pump, and the time dependent nature of the pump failing due to lack of room cooling. The inspectors determined that the finding had a cross-cutting aspect of design margin in the area of Human Performance because the licensee failed to carefully guard margins through a systematic and rigorous process. Specifically, the translation of shaft diameter from design documents into 0-MI-0.16 lacked rigor and allowed an undersized shaft to go undetected, leading to cooler failure. [H.6]

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control", requires, in part, that "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in section 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Contrary to the above, design requirements to ensure operability of the 1B-B CCP room cooler were not correctly translated into maintenance procedure 0-MI-0.16, Revision 7, and resulted in an undersized cooler fan shaft going undetected, which led to a bearing failure that caused the cooler to become inoperable. The licensee repaired the room cooler by replacing the fan shaft and the finding was entered into the licensee's CAP as CR 1146474. This violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. URI 05000390/2016001-08 Charging Pump 1B-B Room Cooler Fan Bearing Failure is closed. NCV 05000390/2016002-02, Failure to Translate Design Requirements into a Maintenance Procedure for the 1B-B Charging Pump Room Cooler.

.2 Untimely 10 CFR 50.73 Notification of an Inoperable 1B-B Charging Pump

Introduction: The NRC identified a Severity Level (SL) IV NCV of 10 CFR 50.73(a)(2)(i)(B) for the licensee's failure to report, within 60 days of discovery, a condition which was prohibited by the plant's TS. Specifically, the licensee failed to notify the NRC that the TS LCO 3.5.2 required action and completion time were not met when the 1B-B CCP was inoperable due to an inoperable room cooler.

Description: On December 4, 2015, the 1B-B CCP room cooler was found with a failed inboard flange bearing on the fan shaft of the cooler. The licensee entered TS LCO 3.5.2 for one train of the emergency core cooling system (ECCS) being inoperable due to the failure of the 1B-B CCP room cooler. The room cooler was repaired and returned to service on December 6, 2015.

The licensee performed a POE for this event which concluded that the room cooler had been operable from the time it had been returned to service following maintenance on October 15, 2015, until just before the discovery of the failed bearing on December 4, 2015. The POE was completed on January 26, 2016. No specific cause for the failed bearing was determined by the evaluation. The residents concluded that the evaluation was inadequate to support its conclusion that the room cooler was operable. Subsequently, the licensee performed an equipment apparent cause analysis (EACE) to determine the cause of the bearing failure. The EACE was completed on April 21, 2016. The conclusions of the EACE are discussed in NCV 0500390/2016002-02 in this report. The licensee tracked the reporting requirement for this issue from the completion of the EACE on April 21, 2016, with a licensee event report (LER) due date of June 20, 2016.

The inspectors reviewed the guidance in NUREG 1022, Event Report Guidelines 10 CFR 50.72 and 50.73, Revision 3. Section 2.5, Time Limits for Reporting, states, "the discovery date is generally the date when the event was discovered rather than the date when an evaluation of the event is completed... This guidance indicates that the evaluation should proceed on a time scale commensurate with the safety significance of the issue." Accordingly, the residents concluded that for an event which was discovered on December 4, 2015, June 20, 2016, did not meet the 60 day reporting requirement. The inspectors determined a LER should have been submitted within 60 days from the

date of discovery of the failure, by February 2, 2016. Subsequently, the licensee submitted LER 2016-006-00 for this event on June 30, 2016.

Analysis: The NRC determined this violation was not associated with a more-than-minor performance deficiency for disposition under the ROP. Traditional enforcement violations are not assessed for cross-cutting aspects. The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impeded the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance. This violation was dispositioned using Section 2.2.4 of the NRC's Enforcement Policy. Using the example listed in Section 6.9.d.9, "A licensee fails to make report required by 10 CFR 50.73," the issue was determined to be a SL IV violation.

Enforcement. 10CFR 50.73(a)(2)(i)(B) requires, in part, that licensees shall submit a LER within 60 days to the NRC after discovery of any operation or condition which was prohibited by the plant's Technical Specifications. Contrary to the above, the licensee failed to submit a LER within 60 days of discovery of a condition prohibited by technical specifications associated with the inoperability of charging pump 1B-B on February 3, 2016. Subsequently, the licensee submitted LER 2016-006-00 for this event on June 30, 2016. This issue was placed in the licensee's CAP as CR 1165380. This violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000390/2016002-03, Untimely 10 CFR 50.73 Notification of an Inoperable Charging Pump).

### .3 Failure to Follow Operability Procedure Results in Potential Inoperability of the 2A-A Auxiliary Feedwater Pump

Introduction: The NRC identified a SL IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," at Watts Bar Unit 2 for the licensee's failure to follow procedure OPDP-8, Operability Determination Process and Limiting Condition for Operation Tracking, Revision 22. Specifically, the 2A-A MDAFW was potentially inoperable in mode 3 due to inadequate compensatory measures that were being controlled outside of the operability process.

Description: The licensee's process for operability determination is governed by OPDP-8, Operability Determination Process and Limiting Condition for Operation Tracking, Revision 22. Section 3.3.6.I requires a number of actions if information in an immediate determination of operability determines that compensatory actions will be needed to achieve operability.

On March 29, 2016, the licensee wrote CR 1155231 to document that the AFW system engineer found the 2A-A MDAFW pump inboard oil bubbler empty. The IDO documented that the 2A-A MDAFW pump was inoperable due to the empty bubbler and the unknown leak rate associated with ongoing oil leakage from the pump that had been previously documented. On March 30, 2016, the licensee exited the tracking only LCO associated with the oil leakage on the 2A-A MDAFW pump based on approximately 24 hours of monitoring with no change in oil level. The operability determination was not revised or updated. The unit entered mode 3 from mode 4 later on March 30, 2016. On April 2, 2016, the licensee created a work order to add oil to the 2A-A MDAFW pump once a day in order to compensate for continued oil loss from the pump, the source of

which had not been fully identified at the time. Since no PDO had been requested, and no new IDO was performed since March 29, 2016, the compensatory action to add oil was occurring outside the operability process in violation of procedure OPDP-8. Operations did not review or approve the work order to add oil and many operators were unaware that the leakage on the 2A-A pump was significant enough to require daily oil additions. This issue was entered into the licensee's CAP as CR 1163431. The 2A-A MDAFW pump oil leak was corrected on April 19, 2016 by work order (WO) 117731139, which corrected a design deficiency associated with the inboard bearing vent cap that had been the major contributor to pump oil loss.

The failure to follow OPDP-8 requirements for compensatory measures needed to achieve operability was determined to be a performance deficiency. The performance deficiency was more than minor because it represented an improper or uncontrolled work practice that could impact quality or safety, involving safety-related SSCs. Specifically, failure to appropriately use the operability process when measures must be established to compensate for degraded or nonconforming conditions can lead to SSC inoperability. As described in IMC 2517, the significance of this issue was determined using traditional enforcement, because the cornerstone associated with this finding was not being assessed by the reactor oversight process (ROP). The inspectors determined this finding to be of very low safety significance, SL IV, in accordance with Section 6.1 of the Enforcement Policy. The finding was a SL IV violation because it represented a failure to meet a regulatory requirement, specifically a quality assurance (QA) criteria to follow quality-related procedures, which had more than minor safety significance. The finding was assigned a cross-cutting aspect of Work Management in the Human Performance area as defined in NRC IMC 0310, because the licensee failed to implement a process to plan, control, and execute work activities across different groups, in accordance with procedures, such that nuclear safety is the overriding priority. Specifically, the minor maintenance WO created to compensate for the oil loss from the 2A-A MDAFW pump was never reviewed by operations, which could have identified the out of process error. [H.5]

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, And Drawings," required, in part, that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings." Contrary to the above, since March 30, 2016, the licensee failed to accomplish activities affecting quality in accordance with procedures. Specifically, the licensee failed to follow procedure OPDP-8, Operability Determination Process and Limiting Condition for Operation Tracking, Revision 22 for the 2A-A MDAFW pump when compensatory measures to achieve operability were put in place outside the OPDP-8 requirements for such measures. The oil leak was corrected and the pump returned to operable status on April 19, 2016. The issue was entered into the licensee's CAP as CR 1163431. This finding was determined to be a SL IV violation using Section 6.1 of the NRC Enforcement Policy. This violation is being treated as an NCV consistent with section 2.3.2 of the Enforcement Policy. (NCV 05000391/2016002-04, Failure to Follow Operability Procedure Results in Potential Inoperability of the 2A-A Auxiliary Feedwater Pump)



1R19 Post-Maintenance Testing (71111.19)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. Documents reviewed are listed in the Attachment. This activity constituted six Post Maintenance Testing inspection samples, as defined in IP 71111.19.

- WO 117508885, A-A auxiliary control air system (ACAS) post maintenance test following essential raw cooling water (ERCW) valve replacement
- WO 117779687, 2-SI-3-925-B, Auxiliary feedwater pump 2B-B preservice pump test
- WO 117745731, 2-SI-0-903, Primary pressure boundary isolation valve leak test, following repairs to 2-CKV-63-545
- WO 117922376, 1-SI-61-6 Weekly Ice Condenser Intermediate Deck Doors Visual Inspection, pull-test conducted as post-maintenance test for doors 4, 7, and 8 that were found frozen
- WO 115897039, 2-SI-3-923-S, Unit 2 TDAFW pump comprehensive test following maintenance
- WO 117434209, Manhole 25 sump pump replacement

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)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. Documents reviewed are listed in the Attachment. This activity constituted seven Surveillance Testing inspection samples; four in-service; two routine; and one ice condenser, as defined in IP 71111.22.

In-Service Test:

- WO117250480, 0-SI-32-902-B, Auxiliary Air Compressor Cooling Water Inlet Valve Full Cycle Exercising During Normal Operation - Train B
- WO 117332666, 1-SI-72-902-B, Valve Full Stroke Exercising During Plant Operation Containment Spray (Train B)
- WO 117304008, Check Valve Testing During Operations - Containment Spray (Train A)
- WO 115897039, 2-SI-3-923-S, Unit 2 TDAFW pump comprehensive test following maintenance

Other Surveillances

- WO 117217571, 1-SI-99-10-A, 62 Day Functional Test of Solid State Protection System (SSPS) Train A and Reactor Trip Breaker A
- WO 117250409, 0-SI-82-11-B Monthly Diesel Generator (DG) Start and Load Test DG 1B-B

Ice Condenser

- WO 117922376, 1-SI-61-6 Weekly Ice Condenser Intermediate Deck Doors Visual Inspection

b. Findings

Introduction: The NRC identified a SL IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," at Watts Bar Unit 2 for the licensee's failure to follow the surveillance test program procedure by making adjustments to the TDAFW pump control system during the performance of a surveillance instruction.

Description: The TDAFW pump is used to provide a safe shutdown function in the event of a loss of main feedwater to the steam generators. In the case of a loss of main feedwater, (AFW is used to provide sufficient feedwater to remove energy from the primary system and the core. The AFW system has two electric motor-driven pumps and a turbine-driven pump.

Watts Bar's surveillance program is used to ensure that safety-related and important to safety SSCs will operate to fulfill test requirements established by the facility's license. Section 3.2.5.D of licensee procedure NPG-SPP-06.9.2, Surveillance Test Program, Revision 5 states that, "No adjustments shall be made to equipment during the performance of the Surveillance Instruction unless specifically allowed by the procedure."

Surveillance Instruction 2-SI-3-923-S, Auxiliary Feedwater Pump 2A-S Comprehensive Pump Test, Revision 2, provides instructions to verify, in part, the operational readiness of the TDAFW pump. This surveillance is performed to provide assurance that the TDAFW is operable in its current state. During performance of surveillance 2-SI-3-923-S on May 3, 2016, a pump speed stability adjustment was made to the TDAFW pump. This stability adjustment was performed due to a step in work order 117756657, not the surveillance procedure. The violation was entered into the licensee's CAP as CR 1167102, and the licensee reperformed the surveillance instruction with satisfactory results later the same day.

The failure to follow the surveillance test program procedure by making adjustments to the TDAFW pump control system during the performance of a surveillance was determined to be a performance deficiency. The performance deficiency was more than minor, because it represented an improper or uncontrolled work practice that could impact quality or safety, involving safety-related SSCs. Specifically, making adjustments to the TDAFW pump control system during the performance of a surveillance instruction could invalidate the test and result in the TDAFW pump being inappropriately declared operable. As described in IMC 2517, the significance of this issue was determined using traditional enforcement, because the cornerstone associated with this finding was not being assessed by the ROP. The inspectors determined this finding to be of very low safety significance, SL IV, in accordance with Section 6.1 of the Enforcement Policy. The finding was a SL IV violation because it represented a failure to meet a regulatory requirement, specifically a quality assurance (QA) criteria to follow quality-related procedures, which had more than minor safety significance. The finding was assigned a cross-cutting aspect of Conservative Bias in the Human Performance area as defined in NRC IMC 0310, because the licensee failed to use decision making practices that emphasize prudent choices over those that are simply allowable. Specifically, numerous individuals were aware the speed adjustment had been made while completing the surveillance instruction but did not question the appropriateness of that adjustment until prompted by NRC inspectors. [H.14].

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, And Drawings," required, in part, that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings." Contrary to the above, on May 3, 2016, the licensee failed to accomplish activities affecting quality in accordance with procedures. Specifically, the licensee failed to follow procedure NPG-SPP-06.9.2 by making adjustments to the TDAFW pump control system during the performance of a surveillance instruction that were not specifically allowed by the procedure. This finding was determined to be a SL IV violation using Section 6.1 of the NRC Enforcement Policy. The licensee reperformed the surveillance instruction with satisfactory results later the same day. The violation was entered into the licensee's CAP as CR 1167102. This violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. (NCV 05000391/2016002-05, Failure to Perform A TDAFW Surveillance In Accordance With Procedures.)

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed an emergency planning (EP) radiological emergency plan training drill that contributed to the licensee's drill/exercise performance and emergency response organization performance indicator measures on June 1, 2016.

This drill was intended to identify any licensee weaknesses and deficiencies in classification, notification, dose assessment, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and the technical support center to verify that event classification and

notifications were done in accordance with Emergency Plan Implementing Procedure (EPIP)-1, Emergency Classification Procedure, and licensee conformance with other applicable EIPs. 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 into the CAP, as appropriate. Documents reviewed are listed in the Attachment. This activity constituted one EP drill evaluation inspection sample.

b. Findings

No findings were identified.

OTHER AREAS

4OA1 Performance Indicator (PI) Verification (71151)

The inspectors sampled licensee submittals for the two PIs listed below. To verify the accuracy of the PI data reported from April 1, 2015 through March 31, 2016, 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. This activity constituted two performance indicator samples, as defined in IP 71151.

- Emergency power
- Heat removal

4OA2 Problem Identification and Resolution (71152)

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

a. Inspection Scope

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

b. Findings

No findings were identified.

.2 Annual Sample: CR 1156030, 1B-B safety injection pump relief valve lifted during pump testing

a. Inspection Scope

The inspectors conducted a detailed review of the above CR. The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner

- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

b. Findings and Observations

No findings were identified; however, the inspector identified several observations about the licensee's initial response to the issue and subsequent corrective actions. The CR was initially screened and closed to a low priority WO for testing or replacement as needed for only one of the three relief valves that could have lifted. Due to the piping arrangement, it was not possible to determine which valve lifted without a visual verification during the event, which did not occur. The CR details did document that all three relief valves needed to be investigated, but the WO created was only associated with one. The residents questioned the completeness and priority of the associated work order. The residents performed a historical CR review and identified similar instances of a safety injection pump relief valves lifting at both Watts Bar and more recently at Sequoyah nuclear plant. Critical thinking regarding the event and potential additional degradations that could have caused the relief valves to lift, such as air voids in the piping or setpoint drift, had been addressed in the historical events at both plants. However, CR 1156030 did not initially discuss or address these additional degradations. As a result of the inspector's concerns, a subsequent CR screening resulted in more critical thinking and causal information being documented, considerations for other degradation mechanisms, and corrective action WOs tied to the next refueling outage for all three valves.

.3 Annual Sample: CRs 1131256 and 1131257, Appendix B of 1-SI-67-813-B could not be completed for 1-CKV-67-580D on the 1D upper containment compartment cooler

a. Inspection Scope

The inspectors conducted a detailed review of the above CRs. The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

b. Findings

.1 Failure to Satisfy TS LCO 3.6.3

Introduction: The NRC identified a Green NCV of TS for the licensee's failure to take the required actions of TS 3.6.3, Containment Isolation Valves, for inoperable containment penetration flow paths. Specifically, from November 21, 2015 until January 30, 2016, the 1D upper containment vent cooler inside containment ERCW supply containment isolation check valve, 1-CKV-67-580D, was inoperable longer than TS allowed outage time without required TS actions being taken.

Description: On September 22, 2015, with Unit 1 in mode 5, the ERCW supply line coil in the 1A upper containment vent cooler failed. The licensee isolated the leak through placement of a clearance hold order which isolated the associated ERCW supply and discharge containment isolation valves.

On November 15, 2015, the licensee performed 1-SI-67-913B, Check Valve Testing of ERCW Supply to Upper Containment Vent Coolers (Train B) Quarterly Performance Test, Revision 11. The surveillance was not able to be completed for the 1D upper containment vent cooler inside containment ERCW supply containment isolation check valve, 1-CKV-67-580D, due to the clearance in place on the 1B cooler. The licensee wrote a CR documenting the problem and suggested a need to reschedule the performance of the surveillance within the 25 percent grace period, which expired on November 21, 2015. On January 30, 2016, at the next scheduled periodic performance of 1-SI-67-913B, it was discovered that the surveillance still had not been performed.

The licensee subsequently took action as required by TS 3.6.3, and isolated the 1D cooler and 1-CKV-67-580D by closing both associated outside containment ERCW supply and discharge containment isolation valves.

Analysis: The failure to take required actions associated with TS 3.6.3 for an inoperable containment penetration was a performance deficiency. Specifically, the 1D upper containment vent cooler inside containment ERCW supply containment isolation check valve, 1-CKV-67-580D, was inoperable in excess of TS allowed outage time without required TS actions being taken. The performance deficiency was more than minor because it associated with the barrier performance attribute of the barrier integrity cornerstone and adversely effected the cornerstone objective to provide reasonable assurance that physical design barriers, (i.e., containment), protect the public from radionuclide releases caused by accidents or events. Specifically, the ERCW supply and discharge containment penetrations for the 1D upper containment cooler were inoperable for longer than the TS allowed outage time due to this performance deficiency. This finding was evaluated in accordance with NRC IMC 0609, Appendix A, Exhibit 3, "Barrier Integrity Screening Questions" dated June 19, 2012. Because the finding represented an actual open pathway in the physical integrity of reactor containment valves, the finding required further screening by NRC IMC 0609, Appendix H "Containment Integrity Significance Determination Process" dated May 6, 2004. The finding was determined to be a 'Type B' finding because it was related to a degraded condition that had potentially important implications for the integrity of the containment, without affecting the likelihood of core damage. After an initial screening using Table 4.1 of the appendix, the inspectors determined the finding was Green because the upper containment cooler ERCW penetrations are small lines (<1-2 inches in diameter) and Table 4.1 states that "small lines (<1-2 inches in diameter) would not generally contribute

to LERF.” This finding had a cross-cutting aspect in the area of Human Performance, conservative bias, because the licensee failed to make the prudent choice to fully evaluate the unsuccessful surveillance test on November 15, 2015, and instead simply documented the issue in the CAP and deferred the solution, resulting in the TS violation six days later. [H.14].

Enforcement: TS LCO 3.6.3 requires that while the plant is in modes 1, 2, 3, and 4, each containment isolation valve shall be operable. The TS REQUIRED ACTION statements ‘A.1’, ‘A.2’, ‘F.1’, and ‘F.2’ require that, with “one or more penetration flow paths inoperable, isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange within 4 hours and verify the affected penetration flow path is isolated once per 31 days for isolation devices outside containment, or be in MODE 3 in 6 hours and MODE 5 in 36 hours.”

Contrary to the above, between November 21, 2015, and January 30, 2016, while the plant was in mode 1, the 1D upper containment cooler ERCW containment penetrations were inoperable because the associated containment isolation check valve 1-CKV-67-580D was inoperable due to the surveillance test not be completed within the required frequency in accordance with TS surveillance requirement 3.0.1.

Upon discovery, on January 30, 2016, the 1D upper containment cooler ERCW containment penetrations were isolated by placement of a clearance that closed the associated supply and discharge containment isolation valves, 1-FCV-67-141 and 1-FCV-67-142, thereby satisfying the TS required actions. The licensee entered the violation into the CAP as CR 1172114. This violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. (NCV 5000390/2016002-06, Failure to Satisfy TS LCO 3.6.3)

## .2 Untimely 10 CFR 50.73 Notification of Inoperable Containment Penetrations

Introduction: The NRC identified a SL IV NCV of 10 CFR 50.73(a)(2)(i)(B) for the licensee's failure to report, within 60 days of discovery, a condition which was prohibited by the plant's TS. Specifically, the licensee failed to submit a LER within 60 days of discovery of a condition prohibited by technical specifications associated with an inoperable ERCW containment isolation valve.

Description: On November 15, 2015, the licensee performed 1-SI-67-913B, Check Valve Testing of ERCW Supply to Upper Containment Vent Coolers (Train B) Quarterly Performance Test, Revision 11. The surveillance was not able to be completed for the 1D upper containment vent cooler inside containment ERCW supply containment isolation check valve, 1-CKV-67-580D, due to the clearance in place on the 1B cooler. The licensee wrote a CR documenting the problem and suggesting a need to reschedule the performance of the surveillance within the 25 percent grace period, which expired on November 21, 2015.

On January 30, 2016, the licensee discovered that 1-SI-67-913B, was not completed for the 1D upper containment vent cooler inside containment ERCW supply containment isolation check valve, 1-CKV-67-580D before November 21, 2015.

The licensee subsequently took action as required by TS 3.6.3, and isolated the 1D cooler and 1-CKV-67-580D by closing both associated outside containment ERCW supply and discharge containment isolation valves.

Watts Bar TS 3.6.3, Containment Isolation Valves, action A.1 requires the flow path for inoperable containment penetrations be isolated with an associated completion time of four hours. If this required action is not met, required actions F.1 and F.2 require entry into mode 3 and mode 5 within 6 hours and 36 hours, respectively. The last successful completion of 1-SI-67-913B was on July 29, 2015. Therefore, when the surveillance went late on November 21, 2015, the containment penetration flow path was inoperable and required action A.1 applied. Since required action A.1 was not taken until January 30, 2016, this represents a condition prohibited by TS and is reportable in a 60-day LER per the requirements of 10 CFR 50.73(a)(2)(i)(B).

The licensee reviewed this issue for reportability in CR 1131257 based on the January 30, 2016, discovery that the surveillance had not been performed. Initially, this review documented that SR 3.0.3, which allows extensions to TS surveillance requirements if it is discovered they are missed, could not be applied for the November 15, 2016 surveillance test since it was discovered that the test could not be performed prior to the expiration date. Later, during the LER development, the licensee determined the issue was not reportable because they considered the surveillance from November 2015 to be a missed surveillance and they applied the allowances of SR 3.0.3. NRC inspectors questioned this reassessment and concluded that the allowances of SR 3.0.3 were not appropriate for a surveillance that had been appropriately scheduled and performed but could not be completed.

The NRC determined the issue was reportable based on not meeting TS 3.6.3 required action A.1, as discussed above, and a LER should have been submitted within 60 days from the date of discovery of the failure, by March 30, 2016. The licensee subsequently determined that the condition was reportable and reported the event pursuant to 10 CFR 50.73(a)(2)(i)(B) on July 15, 2016 in LER 2016-009-00.

Analysis: The NRC determined this violation was not associated with a more-than-minor performance deficiency for disposition under the ROP. Traditional enforcement violations are not assessed for cross-cutting aspects. The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impeded the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance. This violation was dispositioned using Section 2.2.4 of the NRC's Enforcement Policy. Using the example listed in Section 6.9.d.9, "A licensee fails to make report required by 10 CFR 50.73," the issue was determined to be a SL IV violation.

Enforcement. 10CFR 50.73(a)(2)(i)(B) requires, in part, that licensees shall submit a LER within 60 days to the NRC after discovery of any operation or condition which was prohibited by the plant's TS. Contrary to the above, the licensee failed to submit a LER within 60 days of discovery of a condition prohibited by technical specifications associated with TS 3.6.3 requirements for containment isolation valves on March 31, 2016. Subsequently, the licensee submitted LER 2016-009-00 for this issue on July 15, 2016. This issue was placed in the licensee's CAP as CR 1174000. This violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy:



(NCV 05000390/2016002-07, Untimely 10 CFR 50.73 Notification of Inoperable Containment Penetrations).

4OA3 Event Followup (71153)

.1 Unit 2 Shutdown from Mode 2 to Mode 3 Due to an Abnormal Noise in the Main Turbine

a. Inspection Scope

The inspectors reviewed the shutdown that occurred on May 28, 2016, due to an abnormal noise in the main turbine. On May 28, 2016, 12:12 a.m., operators tripped the Unit 2 main turbine due to an abnormal noise in the main turbine near the turning gear. At 1:30 a.m., operators completed a brief to shut down Unit 2 to Mode 3. The shutdown proceeded in accordance with procedure 2-GO-5, and Unit 2 entered Mode 3 by a manual reactor trip at 1:54 a.m. Intrusive inspections by the licensee showed evidence of impingement from a metallic piece of foreign material in the area of the coupling guard but no foreign material was found. The licensee concluded that the foreign material migrated into the turbine drain system was therefore not a concern. Unit 2 re-entered Mode 1 on May 31, 2016, and no abnormal noises, or other evidence of foreign material intrusion, occurred while the Unit 2 turbine operated during the remainder of the reporting period.

b. Findings

Introduction: A self-revealed SL IV NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified at Watts Bar Unit 2 for the licensee's failure to follow procedure 0-MI-1.003, Disassembly, Inspection, and Reassembly of Auxiliary Feedwater Pump Turbine. Specifically, the valve stem spring coil gap was not set in accordance with 0-MI-1.003 resulting in sluggish governor response to speed control demands, which caused the TDAFW pump to trip on electrical overspeed when the level control valves (LCVs) were closed.

Description: On May 28, 2016, at 12:12 a.m., operators tripped the Unit 2 main turbine due to an abnormal noise in the main turbine near the turning gear. At 1:30 a.m., operators completed a brief to shut down Unit 2 to mode 3. The shutdown proceeded in accordance with procedure 2-GO-5, and Unit 2 entered mode 3 by a manual reactor trip at 1:54 a.m.

Following the trip, operators closed the LCVs for the TDAFW pump. At 2:02 a.m., the control room received an electrical overspeed trip alarm for the TDAFW pump. The licensee declared the pump inoperable and entered the applicable technical specification limiting condition for operation (TS LCO) (3.7.5). Troubleshooting revealed that the spring setting on the governor was found out of tolerance (0.005 in gap between coils instead of the .0312 gap required by procedure). The improper setting resulted in sluggish governor response to speed control demands, which caused the TDAFW pump to trip on electrical overspeed when the LCVs were closed. The spring was re-adjusted and subsequent runs exhibited proper operation and speed control. The TDAFW pump was returned to service operable following post maintenance tests on May 30, 2016.

The maintenance activity for the U2 TDAFW pump that included spring adjustment was last done in November 2015, using procedure 0-MI-1.003, Disassembly, Inspection, and Reassembly of Auxiliary Feedwater Pump Turbine. Section 6.5.3, step 22, directs turning an adjustment nut to compress the valve stem spring coils to approximately 1/32 (0.0312) inch gap between coils, ensuring coils do not bind. After the overspeed trip, the gap was found to be 0.005 inches. The licensee concluded that the smaller gap resulted in a larger force required to close the throttle valve, and that the governor could not generate that force in time to respond to the rpm increase resulting from the LCV closure thereby causing the overspeed trip.

The failure to set the correct coil gap for the valve stem spring coils in accordance with procedure 0-MI-1.003 6.5.3 [22] was a performance deficiency. The performance deficiency was more than minor because it represented an improper or uncontrolled work practice that could impact quality or safety involving safety-related SSCs. Specifically, failing to set the valve stem coil correctly led to an SSC inoperability. As described in IMC 2517, the significance of this issue was determined using traditional enforcement, because the cornerstone associated with this finding was not being assessed by the ROP. The inspectors determined this finding to be of very low safety significance, SL IV, in accordance with Section 6.1 of the Enforcement Policy. The finding was a SL IV violation because it represented a failure to meet a regulatory requirement, specifically a QA criteria to follow quality-related procedures, which had more than minor safety significance. The finding was assigned a cross-cutting aspect of resources in the Human Performance area as defined in NRC Inspection Manual Chapter (IMC) 0310, because the licensee failed to ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety. Specifically, the procedure that set the coil spring gap lacked sufficient detail and rigor to ensure that the coil gap would be set appropriately by the technicians. [H.1].

Enforcement: 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that, activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, on November 13, 2015, the licensee failed to accomplish TDAFW pump maintenance, an activity affecting quality, in accordance with step 22 of 0-MI-1.003, Revision 1. Specifically, the valve spring coil gap was set to 0.005 inches after maintenance instead of the .0312 inches required by step 22 of 0-MI-1.003, Revision 1. This issue was corrected on May 30, 2016, when the proper spring coil gap was set and verified and the post maintenance test was performed satisfactorily. The issue was entered into the licensee's corrective action program as CR 1175968. This violation is being treated as an NCV consistent with Section 2.3.2 of the Enforcement Policy. (NCV 05000391/2016002-08, Failure to Follow Maintenance Procedure Results in overspeed trip of the 2A-S Turbine Driven Auxiliary Feedwater Pump")

## .2 Unit 2 Automatic Reactor Trip and Safety Injection Actuation on June 5, 2016

### a. Inspection Scope

The inspectors responded to a Unit 2 automatic reactor trip that occurred on June 5, 2016, due to a rapid opening of the main turbine governor valve #1. The unit was at approximately 12.8 percent power in mode 1 at the time of the failure. The governor

valve failed due to a failed linear variable differential transformer. The resultant steam pressure transient caused a reactor trip on steam header rate of change prior to reaching the low steam pressure trip setpoint. An automatic safety injection signal was initiated after the trip.

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 and the licensee's authorization for re-start. The inspectors reviewed the initial licensee event notification to verify that it met regulatory requirements.

b. Findings

No findings were identified.

.3 Unit 2 Automatic Turbine Trip and Reactor Trip on June 20, 2016

a. Inspection Scope

The inspectors responded to a Unit 2 automatic turbine trip and reactor trip that occurred on June 20, 2016, due to a loss of the running 2B main feedwater pump with the unit at 32 percent power. The turbine driven 2B main feedwater pump tripped due to low vacuum on its associated condenser. The low vacuum condition was caused by ongoing work activities on the 2A main feedwater pump associated with draining its condenser. The feedwater pump trip caused a turbine trip and a main feedwater isolation. This resulted in a primary transient that caused an automatic reactor trip on low steam generator water level.

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 trip as designed. The inspectors also reviewed parts of the licensee's post-trip review and the licensee's authorization for re-start. The inspectors reviewed the initial licensee event notification to verify that it met regulatory requirements.

b. Findings

No findings were identified.

.4 (Closed) LER 05000390/2016-003-00: Technical Specification Surveillance Requirement Not Met During Emergency Core Cooling System Venting

a. Inspection Scope

On May 10, 2016, the licensee submitted a LER documenting the discovery of a condition prohibited by TS associated with ECCS venting. Review of a December surveillance test indicated that the procedure used contained neither adequate methodology for venting of ECCS gas voids nor acceptance criteria to fulfill TS requirements. As a result, the licensee could not demonstrate that TS surveillance requirement 3.5.2.3 was met from March 2012 through December 2015.

The inspectors performed a detailed review of the information related to the LER. Inspectors reviewed documents, and discussed the event with plant personnel to gain an understanding of the event. The inspectors assessed the licensee's compensatory measures and corrective actions to determine if they were adequate.

b. Findings

See section 4OA3.5 of this report for the updated NRC evaluation of the apparent violation related to LER 05000390/2016-003-00.

Introduction: The NRC identified a SL IV NCV of 10 CFR 50.73(a)(2)(i)(B) for the licensee's failure to report, within 60 days of discovery, a condition which was prohibited by the plant's TS associated with recent performances of TS surveillance requirement (SR) 3.5.2.3 for verification that emergency core cooling system (ECCS) piping is full of water.

Description: In early May 2016, the inspectors identified a discrepancy in the way the licensee was targeting and tracking its due dates for conditions deemed to be reportable in LERs. The licensee, in many cases, would assign a corrective action (CA) to Engineering to perform a past operability evaluation (POE) of the discovered condition. This CA would typically be due in 10 days, but that could be extended with site management permission in accordance with the allowances of corrective action program procedures. When the POE is completed, then a second 10 day CA would be assigned for site licensing to review the reportability of the condition based on the POE. If site licensing concluded that the issue was reportable based on this review, a new CA to submit a LER would be assigned with a 60 day due date from the date of the completion of the licensing review. This process would occur even in cases where the POE concluded that the subject SSC was inoperable in the past for long periods of time.

The residents reviewed NUREG 1022, Event Report Guidelines 10 CFR 50.72 and 50.73, Revision 3. In Section 2.5, Time Limits for Reporting, it states, "the discovery date is generally the date the event was discovered rather than the date when an evaluation of the event is completed." It goes on to say that, in some cases, it may be necessary to undertake an evaluation to determine if an event or condition is reportable. In these cases the NRC guidance on operability, now in inspection manual chapter 0326, should apply. This guidance indicates that whenever a reasonable expectation of operability no longer exists, appropriate actions, including reporting, should be taken.

The inspectors concluded that, while the time of discovery should most often be the date the issue was first identified in the CAP, it would be appropriate in some cases to count the time of discovery from the completion of a POE of the condition. However, it would not be appropriate to further delay the LER report date based on a licensing reportability review of the conclusions of the POE.

In response to the inspectors' concerns, the licensee readjusted the LER due dates for several pending reportable issues and thus avoided untimely reports. However, an extent of condition review identified that LER 2016-003-00, Technical Specification Surveillance Requirement Not Met During Emergency Core Cooling System Venting, had not met the 60 day time limit for reporting. The issue was first identified on

January 22, 2016, in CR 1127959 as a failure to meet technical specification surveillance requirements for TS 3.5.2.3. A site licensing reportability review was assigned and started five days later on January 27, 2016. A past operability determination was completed on March 4, 2016. The site licensing reportability review was not completed until March 11, 2016. Subsequently, the licensee submitted LER 2016-003-00 for this issue on May 10, 2016. Inspectors concluded that this represented a violation of 10 CFR 50.73 and a LER should have been submitted within 60 days from the date of discovery of the failure, by March 22, 2016.

Analysis. The NRC determined this violation was not associated with a more-than-minor performance deficiency for disposition under the ROP. Traditional enforcement violations are not assessed for cross-cutting aspects. The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impeded the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance. This violation was dispositioned using Section 2.2.4 of the NRC's Enforcement Policy. Using the example listed in Section 6.9.d.9, "A licensee fails to make report required by 10 CFR 50.73," the issue was determined to be a SL IV violation.

Enforcement: 10 CFR 50.73(a)(2)(i)(B) requires, in part, that licensees shall submit a LER within 60 days to the NRC after discovery of any operation or condition which was prohibited by the plant's TS. Contrary to the above, the licensee failed to submit a LER within 60 days of discovery of a condition prohibited by technical specifications associated with TS surveillance requirement 3.5.2.3 on March 23, 2016. Subsequently, the licensee submitted LER 2016-003-00 for this issue on May 10, 2016. This violation was placed in the licensee's CAP as CR 1166564. This violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy: (NCV 05000390/2016002-09, Untimely 10 CFR 50.73 Notification of Failure to Meet Technical Specification Surveillance Requirement 3.5.2.3 for the Emergency Core Cooling System).

.5 Update to AV 05000390/2016-001-10: Failure to Maintain an Adequate Surveillance Procedure for Emergency Core Cooling System Venting

a. Inspection Scope

The inspectors completed their review of the risk significance of apparent violation (AV) 05000390/2016-001-10. The licensee completed their past operability evaluation of the unit 1 ECCS systems in March 2016. The evaluation reviewed the last three years of historical data for potential sources of gas accumulation in ECCS piping. A vendor performed hydraulic water hammer sensitivity analysis was also included. The inspectors concluded that the past operability evaluation, and its conclusion that it demonstrated reasonable assurance of past operability.

b. Findings

Introduction: The NRC identified a Green NCV of TS 5.7.1.1.a, Procedures, for the licensee's failure to maintain procedure 1-SI-63-10.1-A, ECCS Discharge Pipes Venting – Train A Inside Containment, Revisions 11-16, in accordance with the requirements of Regulatory Guide 1.33. Specifically, the procedure did not have provisions for

quantifying accumulated gases during venting which allowed ECCS piping to be vented without being evaluated for potential adverse impacts on system operability.

Description: NRC Generic Letter 2008-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems, states, in part, that surveillance requirements should reasonably ensure that gas has not affected operability and will not likely accumulate in sufficient quantity to jeopardize operability before the next surveillance. The licensee performed surveillance procedure 1-SI-63-10.1-A, ECCS Discharge Pipes Venting – Train A Inside Containment, to meet TS Surveillance Requirement (SR) 3.5.2.3 which verifies that ECCS piping is full of water by venting system piping high points. The procedure, prior to Revision 11, also included methods to quantify the amount of gas vented from the piping. The inspectors reviewed past performances of the surveillance and noted that 1-SI-63-10.1A had been revised eight times since July 2015. These revisions included several one-time only revisions and were in response to problems with gas quantification test methods, ultimately resulting in Revision 16, which removed gas quantification steps. The acceptance criteria for 1-SI-63-10.1A, Revisions 11-16 was to observe a solid stream of water from the vent line for each section of piping that is vented. There were no provisions in the procedure for quantifying any gas that was released. Therefore, operability impacts associated with any gas went unanalyzed.

Interviews with operations personnel who conduct the surveillance instruction (SI), observation of the venting by inspectors, and review of the SI venting data, showed that reliable gas quantification data had not been recorded since July 2015. Since no reliable analysis was available to support the licensee's process of measuring ECCS piping gas, the inspectors concluded that the procedure revisions which removed gas quantification requirements were inadequate. Additionally, instances where the procedure did require gas quantification, but the results were not evaluated as reliable due to problems with the quantification or testing methods, also represent inadequate procedural revisions. Furthermore, inspectors noted that revision 14, performed on December 9, 2015, removed all acceptance criteria from the procedure, including the requirement to verify that all gas has been vented from the system by the observation of a solid stream of water. Inspectors concluded that this procedure change did not meet the TS SR 3.5.2.3. The licensee addressed the December 9, 2015, surveillance as a missed surveillance.

In response to the inspectors concerns the licensee performed a PDO on February 2, 2016. The PDO concluded that current gas accumulation rates in the ECCS would require weekly performances of 1-SI-63-10.1A in order to ensure operability of ECCS until corrective actions to build scaffolding to allow for manual ultrasonic testing of gas accumulation could be completed. The licensee entered these issues into their corrective action program as CR 1136359.

A POE was completed in March 2016. The evaluation concluded that the ECCS was always operable over the three-year exposure period. Inspectors performed a detailed review of the operability evaluation and concluded that reasonable assurance of past operability existed for the ECCS.

Analysis: The inspectors determined that the licensee's failure to maintain 1-SI-63-10.1-A, as required by technical specifications, was a performance deficiency. The performance deficiency was more than minor because if left uncorrected, the

performance deficiency had the potential to lead to a more significant safety concern. Specifically, if left uncorrected the potential existed for an unacceptable void affecting ECCS operability to develop prior to the next scheduled surveillance. The inspectors screened the finding in accordance with NRC Manual Chapter IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power". Using IMC 0609 Appendix A, Exhibit 2 – Mitigating Systems Screening Questions, the inspectors determined that this finding was of very low safety significance (Green) because the finding did not represent an actual loss of function of a single train for greater than its TS allowed outage time. The inspectors determined that the finding had a cross-cutting aspect of Change Management in the area of Human Performance because the licensee failed to use a systematic process to implement changes to the ECCS venting procedure to ensure that GL 2008-01 commitments would continue to be met. [H.3]

Enforcement: TS Section 5.7.1.1.a states, in part, that "written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." NRC Regulatory Guide 1.33, Appendix A, Section 8.b states, "Specific procedures for surveillance tests, inspections, and calibration should be written (implementing procedures are required for each surveillance test, inspection, or calibration listed in the technical specification)". Contrary to the above, from July 2015, until February 2016 the licensee failed to maintain a procedure required by Regulatory Guide 1.33, Appendix A, Sections 8b. Specifically, surveillance procedure 1-SI-63-10.1-A, ECCS Discharge Pipes Venting – Train A Inside Containment, Revisions 11-16, failed to include provisions to accurately quantify the amount of gas vented. This resulted in potential adverse impacts on system safety function due to accumulated gas voids in the ECCS piping. The licensee implemented manual ultrasonic testing (UT) of gas accumulation and entered this issue into the corrective action program as CR 1136359. This violation is being treated as an NCV consistent with Section 2.3.2 of the NRC's Enforcement Policy, NCV 05000390/2016001-10, Failure to Maintain an Adequate Surveillance Procedure for Emergency Core Cooling System Venting.

.6 (Closed) LER 05000390/2016-007-00: Technical Specification Action Not Met for Rod Position Indication

a. Inspection Scope

On June 20, 2016, the licensee submitted a LER documenting the discovery of a condition prohibited by TS associated with a unit 1 dropped rod event on November 5, 2015. While TS LCO 3.1.5, Rod Group Alignment Limits, was entered for the dropped rod, TS LCO 3.1.8, Rod Position Indication, was not entered and the required actions were not taken.

The inspectors performed a detailed review of the information related to the LER. Inspectors reviewed documents, and discussed the event with plant personnel to gain an understanding of the event. The inspectors assessed the licensee's compensatory measures and corrective actions to determine if they were adequate.

b. Findings

Introduction: The NRC identified a SL IV NCV of 10 CFR 50.73(a)(2)(i)(B) for the licensee's failure to report, within 60 days of discovery, a condition which was prohibited by the plant's TS. Specifically, the licensee failed to notify the NRC that the TS LCO 3.1.8 required action and completion time was not met when the ARPI and the demand position indication systems were not operable.

Description: On November 5, 2015, at 9:43 p.m., shutdown bank A rod D2 indicated it was at the bottom of the core. The licensee entered TS LCO 3.1.5, Rod Group Alignment Limits Not Met, and abnormal operating instruction (AOI) 1-AOI-2, Malfunction of Reactor Rod Control System, Section 3.3, Dropped Rod Control Cluster Assembly (RCCA). The licensee did not enter TS LCO 3.1.8 which required that the ARPI and the demand position system shall be operable. Surveillance requirement (SR) 3.1.8.1 required verification each ARPI agrees within twelve steps of the group demand position for the full indicated range of rod travel. Since rod D2 dropped into the core, SR 3.1.8.1 was not met due to the group demand position being at 231 steps and rod D2 ARPI indicating that the rod was on the bottom of the core (essentially zero steps). TS SR 3.0.1 states, in part, that failure to meet a surveillance, whether such failure is experienced during the performance of the surveillance or between performances of the surveillance, shall be failure to meet the LCO. Therefore, when rod D2 dropped, surveillance 3.1.8.1 was not met, and TS LCO 3.1.8 was not met. The required action under TS LCO 3.1.8 when one ARPI inoperable for one or more groups is to verify the position of the rods with inoperable position indicators by using either the moveable incore detectors or the power distribution monitoring system (PDMS). The completion time for this action is once per eight hours. A review of plant operating logs shows that this required action was not performed. Since the required action and completion time was not met, TS LCO 3.1.8 Action D required that the reactor be in mode 3 within six hours. A review of plant operating logs showed that the licensee did not enter mode 3 until November 7, 2015, at 12:35 a.m., which was 26 hours and 52 minutes later, which was therefore beyond the completion times of TS LCO 3.1.8 actions A and D. CR 1102100 was written on November 10, 2015 documenting the requirement to enter TS 3.1.8 which had been missed on November 5, 2015. The licensee closed the CR to a documented position from Licensing that entry into TS 3.1.8 was not appropriate. The inspectors determined that a LER should have been submitted within 60 days from the date of discovery of the failure to meet TS 3.1.8, by January 9, 2016. The licensee submitted LER 2016-007-00 for this issue on June 20, 2016.

Analysis: The NRC determined this violation was associated with a minor performance deficiency for the licensee's failure to follow OPDP-8, Operability Determination Process and Limiting Conditions for Operation Tracking. Specifically, the licensee failed to enter action statement A and D of TS LCO 3.1.8. This violation was determined to be minor in accordance with IMC 612 Appendix B because it represented a failure to implement a procedural requirement that had no safety impact under the given situation. This is because the reason for disagreement between the ARPI and the demand position system was a dropped control rod, not a separate failure of either the ARPI or the demand position indication system. Traditional enforcement violations are not assessed for cross-cutting aspects. The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impeded the NRC's ability to regulate using traditional enforcement to adequately deter non-



compliance. This violation was dispositioned using Section 2.2.4 of the NRC's Enforcement Policy. Using the example listed in Section 6.9.d.9, "A licensee fails to make report required by 10 CFR 50.73," the issue was determined to be a SL IV violation.

Enforcement: 10 CFR 50.73(a)(2)(i)(B) requires, in part, that licensees shall submit a LER within 60 days to the NRC after discovery of any operation or condition which was prohibited by the plant's Technical Specifications. Contrary to the above, the licensee failed to submit a LER within 60 days of discovery of a condition prohibited by technical specifications associated with TS 3.1.8 requirements on January 10, 2016. The licensee submitted LER 2016-007-00 for this issue on June 20, 2016. This violation was placed in the licensee's CAP as CR 1163150. This violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy: (NCV 05000390/2016002-10, Untimely 10 CFR 50.73 Notification of an Inoperable Rod Position Indication).

#### 4OA6 Meetings, including Exit

On July 14 2016, the resident inspectors presented the quarterly inspection results to Mr. Simmons and other 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, WBN Site Licensing  
M. Bottorff, Operations Superintendent  
M. Casner, Director, Engineering  
S. Connors, Plant Manager  
T. Detchemendy, Emergency Preparedness Manager  
E. Ellis, Senior Manager, Nuclear Site Security  
D. Erb, Assistant Plant Manager  
T. Morgan, Site Licensing  
J. O'Dell, Site Licensing Supervisor  
G. Pry, Director, Plant Support  
P. Simmons, Site Vice President  
R. Stroud, Site Licensing

### **ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened and Closed

|                     |     |   |
|---------------------|-----|---|
| 05000390/2016002-01 | NCV | Failure to Ensure that a Train of Source Range Detection was Available to Monitor Neutron Population During a Fire Event [Section 1R05] |
| 05000390/2016002-02 | NCV | Failure to Translate Design Requirements into a Maintenance Procedure for the 1B-B Charging Pump Room Cooler (Section 1R15.1)           |
| 05000390/2016002-03 | NCV | Untimely 10 CFR 50.73 Notification of an Inoperable Charging Pump (Section 1R15.2)  |
| 05000391/2016002-04 | NCV | Failure to Follow Operability Procedure Results in Potential Inoperability of the 2A-A Auxiliary Feedwater Pump (Section 1R15.3)        |
| 05000391/2016002-05 | NCV | Failure to Perform A TDAFW Surveillance In Accordance With Procedures (Section 1R22)  |
| 05000390/2016002-06 | NCV | Failure to Satisfy TS LCO 3.6.3 (Section 4OA2.3.1)  |
| 05000390/2016002-07 | NCV | Untimely 10 CFR 50.73 Notification of Inoperable Containment Penetrations (Section 4OA2.3.2)  |
| 05000391/2016002-08 | NCV | Failure to Follow Maintenance Procedure Results in overspeed trip of the 2C-S Turbine Driven Auxiliary Feedwater Pump (Section 4OA3.1)  |

|                     |     |   |
|---------------------|-----|---|
| 05000390/2016002-09 | NCV | Untimely 10 CFR 50.73 Notification of Failure to Meet Technical Specification Surveillance Requirement 3.5.2.3 for the Emergency Core Cooling System (Section 4OA3.4) |
|---------------------|-----|---|

|                     |     |  |
|---------------------|-----|--|
| 05000390/2016002-10 | NCV | Untimely 10 CFR 50.73 Notification of an Inoperable Rod Position Indication (Section 4OA3.6) |
|---------------------|-----|--|

Closed

|                      |     |  |
|----------------------|-----|--|
| 05000390/2016-003-00 | LER | Technical Specification Surveillance Requirement Not Met During Emergency Core Cooling System Venting (Section 4OA3.4) |
|----------------------|-----|--|

|                      |     |   |
|----------------------|-----|---|
| 05000390/2016-007-00 | LER | Technical Specification Action Not Met for Rod Position Indication (Section 4OA3.6) |
|----------------------|-----|---|

|                     |     |   |
|---------------------|-----|---|
| 05000390/2016001-08 | URI | Charging Pump 1B-B Room Cooler Fan Bearing Failure (Section 1R15) |
|---------------------|-----|---|

|                     |     |  |
|---------------------|-----|--|
| 05000390/2015010-01 | URI | 420 Minute Operator Manual Action to Provide Source Range Monitoring Capability [Section 1R05] |
|---------------------|-----|--|

|                     |     |   |
|---------------------|-----|---|
| 05000390/2016001-10 | NCV | Failure to Maintain an Adequate Surveillance Procedure for Emergency Core Cooling System Venting (Section 4OA3.5) |
|---------------------|-----|---|

Updated

|                     |    |   |
|---------------------|----|---|
| 05000390/2016001-10 | AV | Failure to Maintain an Adequate Surveillance Procedure for Emergency Core Cooling System Venting (Section 4OA3.5) |
|---------------------|----|---|

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

NPG-SPP-07.1.7, Station Seasonal Readiness, Rev. 0005  
0-PI-OPS-1-SO, Summer Operation  
1-SOI-62.01, CVCS-Charging and Letdown, Rev. 0004  
2-SOI-62.01, CVCS-Charging and Letdown, Rev. 0005  
0-SOI-70.01, Component Cooling Water (CCS) System, Rev. 0023  
WO 115810992  
CR 1159361  
CR 1187246

### **Section 1R04: Equipment Alignment**

#### Procedures

2-PI-OPS-1-PE, Protected Equipment, Rev. 0001  
2-SOI-7201, Containment Spray System; ATT 1P, Power Checklist 2-72.01-1P, Rev. 0000  
2-SOI-72.01, Containment Spray System; ATT 1V, Valve Checklist 2072.01-1V, Rev. 0001  
0-SOI-82.04, Diesel Generator (DG) 2B-B, Revision 6  
0-SOI-82.04, Diesel Generator (DG) 2B-B, Revision 6; ATT 1V, Checklist 82.04-1V, Rev. 0000  
0-SOI-82.04, Diesel Generator (DG) 2B-B, Revision 6; ATT 1P, Power Checklist 82.04-1P, Rev. 0000

### **Section 1R05: Fire Protection**

WBN-Prefire Plan AUX-0-772-01, Rev. 1  
WBN-Prefire Plan AUX-0-772-02, Rev. 4  
WBN-Prefire Plan AUX-0-772-03, Rev. 4  
PEP No.: AUX-0-772-02, Rev. 4  
PEP No.: AUX-0-772-03, Rev. 4  
Fire Protection Impairment Permit No. C16-0300, dated 3/25/16  
Clearance Coversheet 0-31-0022-CO, dated 4/5/16  
Calculation WBN-OSG4-165, Manual Actions Required for Safe Shutdown Following a Fire, dated 06/23/1993  
DCN 36149-A, Provide Local Source Range Monitor, dated 09/21/1995  
NRC Letter, Meeting Summary – April 27, 1995, Meeting with TVA Regarding Fire Protection and Cable Issues, dated 05/09/1995  
Procedure 1-AOI-30.2 C.36, Fire Safe Shutdown Room 737-A1A, dated 01/29/2015  
Westinghouse House Owners Group Letter, WOG-05-36, Request for Enforcement Discretion for RCP Seal Performance Findings in TFPIs, dated 01/28/2005

### **Section 1R06: Flood Protection Measures (71111.06)**

WO 117434209  
Drawing 15W810-23 Rev 3

### **Section 1R11: Licensed Operator Regualification Program**

Simulator Exercise Guide 3-OT-SRT-SUP10

### **Section 1R12: Maintenance Effectiveness**

ECO 2-211-0206-WW  
WO 115178123 (MEG)  
WO 116856382 (MODS)

NPG-SPP-03.4, Maintenance Rule Performance Indicator Monitoring, Trending and Reporting –  
10CFR50.65, Rev. 0003

0-TI-119

CR 1125332

WO 117511639

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

WO 117707359

WO 117714351

WBN-SDD-N3-63-4001, Safety Injection System (Unit 1/Unit 2), Rev. 3

CR 1157660

WBN TS 3.8.1, AC Sources-Operating

WBN TS Bases B 3.8.1, AC Sources-Operating

NPG-SPP-07.2.11-2, Shutdown Risk Management, Rev. 0008

WBN Configuration Risk Monitor 4/18/16-4/22/16

NPG-SPP-07.3, Work Activity Risk Management Process, Rev. 0019

Unit 1 Operations Log dated 4/8/16-4/22/16

**Section 1R15: Operability Determinations and Functionality Assessments**

NEDP-27-1 [10-22-2014] Past Operability Evaluation Documentation for PER 1163431

OPDP-8, Operability Determination Process and Limiting Conditions for Operation Tracking,  
Rev. 0022

Unit 2 Operations Logs, dated 3/31/2016

Archive U2 R0 Tracking only LCOTRs: TS 3.7.5 TR A MDAFW, dated 6/16/2016

TI-78, Lubrication Program, Rev. 0014, Appendix H

WO 117726182

CRs 1179293, 1167102, 1156287, 1153972

Log Entries Report 3/27/2016

2-TURB-1-2A-S, Attachment A, WO 117756657

SDD-N3-3B-4002, Auxiliary Feedwater System Unit 1 / Unit 2 QA Record, Rev. 0023

**Section 1R19: Post Maintenance Testing**

WO 117508885

WO 117779687

WO 117922376; 1-SI-61-6, Weekly Ice Condenser Intermediate Deck Doors visual Inspection,  
dated June 22, 2016

CR 1183920; Unplanned TS LCO 3.6.12 Entry

**Section 1R22: Surveillance Testing**

WO 116274908

WO 117217571

CR 1164491

1-SI-99-10-A, 62 Day Functional Test of SSPS Train A and Reactor Trip Breaker A, Rev. 0061

WO 117304008

1-SI-72-904-A, Check Valve Testing During Operations – Containment Spray (Train A), Rev.  
0023

WO 117250409

CRs 1163246, 1165524

0-SI-82-11-B, Monthly Diesel Generator Start and Load Test DG 1B-B

WO 1172504080

0-SI-32-902-B, Aux Air Compressor cooling Water Inlet Valve Full Cycle Exercising during Normal Operation – Train B

WO 117332666

1-SI-72-902-B, Valve Full-Stroke Exercising During Plant Operation Containment Spray (Train B), Rev. 0015

WO 117508885

WO 117779687

WO 117922376; 1-SI-61-6, Weekly Ice Condenser Intermediate Deck Doors visual Inspection, dated June 22, 2016

CR 1183920; Unplanned TS LCO 3.6.12 Entry

NPG-SPP-06.9.2, Surveillance Test Program, Rev. 5

2-SI-3-923-S, Auxiliary Feedwater Pump 2A-S Comprehensive Pump Test, Rev.2

### **Section 1EP6: Drill Evaluation**

Controller's Package for Drill Date 6/1/2016

### **Section 4OA2: Problem Identification and Resolution**

Log Entries Report, dated 11/16/2015-4/29/2016

TS 3.6.3, Containment Isolation Valves

CR 1172372

### **Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**

WO 117866741

WBN-2-LPS-46-57-S, Attachment A

2-IMI-46.001, Calibration of Turbine Driven Auxiliary Feedwater Pump 2A-S Governor controls, Rev. 0007

2-IMI-46.002, Auxiliary Feedwater Turbine 2A-S Overspeed Trip Test, Rev. 0003

2-TURB-001-0002A-S, CR 1175968, NPG-SPP-06.14, Troubleshooting Plan

Watts Bar Nuclear Plant Unit 2 Trip Report June 20, 2016

PORC Item Summary Sheets

## LIST OF ACRONYMS

|         |   |
|---------|---|
| AFW     | auxiliary feedwater                                 |
| AOI     | abnormal operating instruction                      |
| ARPI    | analog rod position indicator                       |
| AV      | apparent violation                                  |
| CAP     | Corrective Action Program                           |
| CCP     | centrifugal charging pump                           |
| CCS     | component cooling system                            |
| CFR     | <i>Code of Federal Regulations</i>                  |
| DCA     | drawing change authorization                        |
| EACE    | equipment apparent cause analysis                   |
| ECCS    | emergency core cooling system                       |
| EP      | emergency planning                                  |
| EPIP    | emergency plan implementing procedure               |
| ERCW    | essential raw cooling water                         |
| IDO     | immediate determination of operability              |
| IMC     | Inspection Manual Chapter                           |
| IP      | inspection procedure                                |
| LCO     | limiting condition for operation                    |
| LER     | licensee event report                               |
| MDAFW   | motor-driven auxiliary feedwater                    |
| NCV     | non-cited violation                                 |
| NPG-SPP | nuclear power group standard programs and processes |
| NRC     | Nuclear Regulatory Commission                       |
| OOS     | out of service                                      |
| PDO     | prompt determination of operability                 |
| PI      | performance indicator                               |
| POE     | past operability evaluation                         |
| QA      | quality assurance                                   |
| QC      | quality control                                     |
| ROP     | Reactor Oversight Process                           |
| SDP     | Significance Determination Process                  |
| SSCs    | structures, systems, or components                  |
| TDAFW   | turbine-driven auxiliary feedwater                  |
| TS      | technical specifications                            |
| TVA     | Tennessee Valley Authority                          |
| UFSAR   | Updated Final Safety Analysis Report                |
| WBN     | Watts Bar Nuclear Plant                             |
| WO      | work order  |