



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

November 10, 2016

EA-16-117

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
05000390/2016003, 05000391/2016003 AND NOTICE OF VIOLATION AND OI
REPORT NUMBER OI-2-2015-039

Dear Mr. Shea:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Watts Bar Nuclear Plant, Unit 1 and Unit 2. On November 4, 2016, the NRC inspectors discussed the results of this inspection with Mr. Delson Erb 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 Inspection Manual Chapter (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.

Based on the results of an NRC investigation, the NRC has determined that a Severity Level IV violation of NRC requirements occurred. In consideration of the fact that the individuals involved were contract fire watch personnel with minimal supervisory responsibilities, and that the underlying safety significance of the issue was very low, the NRC concluded that this violation should be characterized at Severity Level IV in accordance with Section 2.2.1.d of the Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at (<http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>). The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in the subject inspection report. The violation is being cited in accordance with Section 2.3.2.a.4 of the Enforcement Policy because it involved willfulness and a lack of supervisory oversight.

You are required to respond to this letter to address the cited violation and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response. The NRC review of your response will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

NRC inspectors also documented one finding of very low safety significance in this report which was also a violation of NRC requirements. Further, inspectors documented one licensee-identified violation which was determined to be of very low safety significance. The NRC is treating these violations as noncited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy. If you contest these violations or significance of these 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

Enclosures:

1. Notice of Violation
2. NRC Inspection Report 05000390/2016003, 05000391/2016003
w/Attachment: Supplemental Information

cc/w encls.: Distribution via ListServ

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*See previous concurrence

DOCUMENT NAME: G:\DRPII\WATTS BAR\REPORTS\2016\003\2016.003

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OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRP	
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SIGNATURE	/RA via Email/	/RA via Email/	/RA via Email/	/RA via Email/	*/RA/	/RA/	
DATE	11/7/2016	11/7/2016	11/7/2016	11/7/2016	11/10/2016	11/10/2016	
OFFICE	RII:DRS	RII:DRS	RII:DRS	RII:DRS	RII:EICS	RII:ORA	
NAME	A Nielsen	C Dykes	J. Panfel	J. Rivera	M. Kowal	S. Price	
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DATE	11/7/2016	11/7/2016	11/7/2016	11/7/2016	11/10/2016	11/10/2016	

Letter to Joseph Shea from Alan Blamey dated November 10, 2016

SUBJECT: WATTS BAR NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000390/2016003, 05000391/2016003 AND NOTICE OF VIOLATION

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S. Maxey, RII

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RidsNrrPMWattsBar1 Resource

RidsNrrPMWattsBar2 Resource

NOTICE OF VIOLATION

Tennessee Valley Authority
Watts Bar Nuclear Plant
Unit 1

Docket No. 50-390
License No.: NPF-90
EA-16-117

During an NRC investigation completed on May 12, 2016, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

- A. 10 CFR 50.9(a) states, in part, that information required by the Commission's regulations, orders, or license conditions to be maintained by the licensee shall be complete and accurate in all material respects.

Watts Bar Nuclear Plant Units 1 and 2 Technical Specification 5.7.1.1.d requires, in part, that written procedures be established, implemented, and maintained covering the activities involved with Fire Protection Program implementation.

The Watts Bar Fire Protection Report lists compensatory actions that must be implemented when there are impaired fire protection systems, including, under some circumstances, a continuous fire watch.

TVA Corporate Procedure NPG-SPP-18.4.6, Control of Fire Protection Impairments, Rev. 0006, is the implementing/controlling process for all Fire Protection impairments, and establishes the process for implementing compensatory actions for fire impairments as directed by the Fire Protection Report.

NPG-SPP-18.4.6, Section 3.2.6.A, states that "Fire watches are utilized for the surveillance of areas where fire protection systems are impaired. The compensatory fire watch process is described in Attachment 7" of NPG-SPP-18.4.6.

NPG-SPP-18.4.6, Attachment 7, Section 3.1, specifies compensatory fire watch responsibilities, and requires that compensatory fire watches "log on Form NPG-SPP-18.4.6-3, Continuous Compensatory Fire Watch Turnover Form, each time coverage is assumed or transferred."

NPG-SPP-18.4.6, Section 4.2.C, requires that Form NPG-SPP-18.4.6-3 be retained for 90 days.

Fire Protection Impairment Permit C10-0639, dated August 6, 2010, established a continuous fire watch for multiple areas on the 713' elevation of the auxiliary building as a compensatory measure for fire protection equipment disabled to support Unit 2 construction activities.

Contrary to the above, on April 28, 2015, the licensee failed to maintain continuous compensatory fire watch information that was complete and accurate in all material respects. Specifically, a Continuous Compensatory Fire Watch Turnover Form, NPG-SPP-18.4.6-3, stated that continuous fire watch patrols for Fire Protection Impairment Permit C10-0639 were completed, when in fact such fire watches had not been performed. The continuous fire watch patrol data is material to the NRC in that it provides evidence of compliance with regulatory requirements. This is a Severity Level IV violation (Enforcement Policy Section 2.2.1.d).

Pursuant to the provisions of 10 CFR 2.201, Tennessee Valley Authority is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation. This reply should be clearly marked as a "Reply to a Notice of Violation; EA-16-117" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken; and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the operating license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that delete such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 10th day of November, 2016

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-390, 50-391

License No.: NPF-90, NPF-96

Report No.: 05000390/2016003, 05000391/2016003

Licensee: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant, Units 1 and 2

Location: Spring City, TN 37381

Dates: July 1 through September 30, 2016

Inspectors: J. Nadel, Senior Resident Inspector
J. Hamman, Resident Inspector
J. Jandovitz, Senior Resident Inspector
A. Nielsen, Senior Health Physicist
C. Dykes, Health Physicist
J. Panfel, Health Physicist
J. Rivera, Health Physicist
A. Wilson, Project Engineer

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

SUMMARY OF FINDINGS

IR 05000390/2016-003; 05000391;2016-003; July 1, 2016 – September 30, 2016; Watts Bar, Units 1 and 2; Fire Protection; Problem Identification and Resolution.

The report covered a three-month period of inspection by the resident inspectors and Office of Investigation staff. One cited severity level IV violation and one Green non-cited violation was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) 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 August 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 6.

Cornerstone: Mitigating Systems

- Green. A self-revealed non-cited violation (NCV) of 10 *Code of Federal Regulations* (CFR) 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified for the licensee's failure to use a procedure appropriate to the circumstances when work scope changed which contributed to the loss of the 1B-B shutdown board on May 17, 2016. The violation was entered into the licensee's CAP as CR 1172243.

The failure to use a procedure appropriate to the circumstances, such as NPG-SPP-07.6, NPG Work Management Planning Procedure, Revision (Rev.) 14, for a work scope change associated with a design change work order on the 1B-B shutdown board on May 17, 2016, was a performance deficiency. The performance deficiency was more than minor because it affected the equipment performance attribute of the mitigating systems cornerstone objective because the loss of the 1B-B shutdown board caused the inoperability of the B train of the onsite electrical distribution system and also resulted in the inoperability of all B train structures, systems, or components (SSCs) powered from the 1B-B shutdown board. The inspectors performed an initial screening of the finding and 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 technical specification (TS) allowed outage time. The finding had a cross-cutting aspect in the Work Management component of the Human Performance area because the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the process of planning and executing the work activities for Design Change Notice (DCN) 64063 failed to identify and manage the risk associated with system restoration due to either equipment failure or personnel error [H.5]. (Section 4OA2.2)

Other Findings

- Severity Level IV. The NRC identified a Severity Level IV violation of 10 CFR 50.9 "Completeness and Accuracy of Information," for the failure to maintain continuous compensatory fire watch information that was complete and accurate in all material respects. The licensee's actions of creating falsified fire watch completion records for the 713' elevation of the Auxiliary Building was a performance deficiency. The licensee entered this issue into the corrective action program as CR 1019953 and took remedial action against the involved individuals commensurate with the circumstances.

The NRC evaluated this issue under the traditional enforcement process because it involved willfulness. In consideration of the fact that the individuals were contract fire watch personnel with minimal supervisory responsibilities, and that the underlying safety significance of the missed fire watch was low, the NRC concluded that this violation should be characterized at Severity Level IV in accordance with Section 2.2.1.d of the Enforcement Policy. Furthermore, because this violation involved willfulness and lack of supervisory oversight, the non-cited violation criteria of paragraph 2.3.2.a.4.(c) was not satisfied, such that this violation will be cited. This violation was evaluated under the traditional enforcement process and thus does not have a cross cutting aspect. (Section 1R05)

Violations of very low safety or security significance or Severity Level IV that were identified by the licensee have been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 started the reporting period at 96 percent rated thermal power due to back pressure limits on the #3 low pressure turbine portion of the main turbine. Unit 1 operated between 81 and 97 percent rated thermal power, as necessary to maintain backpressure limits, until September 1, 2016, when the main turbine was shut down in order to allow a transfer of the Unit 1 reactor coolant pump electrical power supply. Reactor power remained at about 12 percent while the transfer was in progress, and returned to 85 percent rated thermal power on September 4, 2016. Unit 1 increased to 96 percent rated thermal power on September 5, 2016, and remained between 90 and 98 percent rated thermal power through the end of the reporting period.

Unit 2 started the reporting period in Mode 3. Unit 2 was restarted on July 2, 2016, and increased rated thermal power to 47 percent. On July 14, 2016, reactor power was decreased to 30 percent rated thermal power and then tripped for a reactor trip coincident with a loss of offsite power test. Unit 2 was restarted on July 17, 2016, and the main generator was synchronized to the grid on July 18, 2016. Reactor power was increased over the next two weeks to 73 percent rated thermal power. On August 3, 2016, the reactor was tripped from 30 percent rated thermal power for a shutdown from the auxiliary control room test. Unit 2 was restarted on August 7, followed by the main generator being synchronized to the grid on August 9, 2016. Unit 2 increased rated thermal power to 70 percent on August 11, 2016, and was shut down on August 13, 2016, to repair the main generator. Unit 2 was restarted on August 22, 2016, and the main generator was synchronized to the grid later that day. Unit 2 reactor power was increased until August 23, 2016, when the reactor tripped at 46 percent power due to loss of 2A main feed pump flow. Unit 2 was restarted on August 25, 2016. The main generator was synchronized to the grid later the same day, and reactor power was increased to at or near 100 percent rated thermal power on August 30, 2016. On August 30, 2016, Unit 2 reactor tripped due to a fire in the main bank transformer. Unit 2 was restarted on September 25, 2016. Unit 2 reactor power was increased to at or near 100 percent rated thermal power, until September 30, 2016 when a 50 percent load rejection test was performed.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Review of Offsite Power and Alternate AC Power Readiness

a. Inspection Scope

The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate alternating current (AC) power systems were appropriate.

The inspectors reviewed the licensee's procedures affecting those areas and the communications protocols between the transmission system operator and the nuclear power plant to verify that the appropriate information was exchanged when issues arose that could impact the offsite power system.

The inspectors evaluated the readiness of the offsite and alternate AC power systems by reviewing the licensee's procedures that address measures to monitor and maintain the availability and reliability of the offsite and alternative AC power systems. The inspectors also performed a walkdown of the Watts Bar hydro 161KV switchyard and the 161KV switchgear building and reviewed the physical arrangement and the material condition of the associated equipment. Documents reviewed are listed in the Attachment. This activity constituted one Summer Readiness sample, as defined in Inspection Procedure (IP) 71111.01.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 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 Updated Final Safety Analysis Report (UFSAR), system operating procedures, and Technical Specifications (TS) to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system. Documents reviewed are listed in the Attachment. This activity constituted four inspection samples, as defined in IP 71111.04.

- A train shutdown boardroom chiller while B train was OOS for maintenance
- 1A and 1B train of motor-driven auxiliary feedwater (MDAFW) while the turbine-driven auxiliary feedwater (TDAFW) pump was OOS for preventive maintenance
- 1A train of the component cooling system (CCS) while the 1B train was OOS for 1B-B pump motor replacement
- A train main control room chiller while B train was OOS for maintenance

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 six inspection samples, as defined in IP 71111.05AQ.

- Auxiliary building elevation 772 Unit 1 control rod drive room
- Auxiliary building elevation 772 Unit 2 control rod drive room
- Auxiliary building level 772 Train A pressurizer heater transformer room
- Auxiliary building level 772 Train B pressurizer heater transformer room
- Auxiliary building elevation 757 emergency gas treatment room
- Auxiliary building elevation 757 reverse osmosis room

b. Findings

Introduction. On May 12, 2016, the NRC Office of Investigations (OI) completed an investigation to determine whether in April 2015, fire watch completion records for the 713' elevation of the Auxiliary Building were falsified at Watts Bar Unit 2. The NRC concluded that contract fire protection personnel, employed by the licensee, engaged in deliberate misconduct by attempting to conceal a missed fire watch by way of conspiring to provide falsified documentation on April 28, 2015. This constitutes a violation of 10 CFR 50.9(a) for the failure to maintain information complete and accurate in all material respects. A Notice of Violation is issued as Enclosure 1 to this report.

Discussion. On May 11, 2015, the NRC received information that fire watch completion records for the 713' elevation of the Auxiliary Building were falsified at Watts Bar Unit 2. The licensee had discovered that on April 27, 2015, from 7:36 AM until 4:00 PM, the licensee failed to perform a continuous fire watch as required by Fire Protection Impairment Permit C10-0639, which authorized an impairment of fire detection systems to allow for welding work on the 713' elevation of Watts Bar Nuclear Power Plant, Unit 2. During that time, TVA performed seven hourly fire watches on the 713' elevation.

According to the testimony received by the NRC OI, on the morning of April 28, 2015, the licensee contract fire watch foreman attempted to persuade four fire watch laborers to sign fire watch records indicating that they performed the missed fire watch from the day before. Three of the individuals each signed the fire watch turnover records. However, one fire watch laborer refused to sign the fire watch turnover records. A meeting was held with the contract fire watch foreman, the contract fire protection specialist, and the TVA fire protection foreman. When it became clear that one individual would not sign the fire watch turnover record, the contract fire watch foreman disposed of the paperwork. The missed fire watch was reported to management, prompting investigations about the root causes of the missed fire watch. The licensee initiated condition report 1019953. The falsified fire watch record was never recovered.

Analysis. The licensee's actions of creating falsified fire watch completion records for the 713' elevation of the Auxiliary Building was a performance deficiency. The NRC determined this violation was also associated with a performance deficiency for the failure to perform the continuous fire watch on April 27, 2015. This licensee-identified

violation is of very low safety significance and is described in Section 4OA7 of this report. This violation was evaluated under the traditional enforcement process and thus does not have a cross cutting aspect.

The NRC evaluated this issue under the traditional enforcement process because it involved willfulness. As discussed in the NRC Enforcement Policy, willful violations are a particular concern to the NRC. In reaching the conclusion that the actions were willful, the NRC noted that during transcribed interviews with NRC's OI representatives, the involved individuals acknowledged that they were trained in fire watch procedures and did not lack an understanding of their duties and responsibilities. The involved individuals acted deliberately when they attempted to conceal a missed fire watch by way of conspiring to provide falsified documentation. In consideration of the fact that the individuals were contract fire watch personnel with minimal supervisory responsibilities, and that the underlying safety significance of the missed fire watch was very low, the NRC concluded that this violation should be characterized at Severity Level IV in accordance with Section 2.2.1.d of the Enforcement Policy. Furthermore, because this violation involved willfulness and lack of supervisory oversight, the non-cited violation criteria of paragraph 2.3.2.a.4.(c) was not satisfied, such that this violation will be cited.

Enforcement. 10 CFR 50.9(a) states, in part, that information required by the Commission's regulations, orders, or license conditions to be maintained by the licensee shall be complete and accurate in all material respects.

Watts Bar Nuclear Plant Units 1 and 2 Technical Specification 5.7.1.1.d requires, in part, that written procedures be established, implemented, and maintained covering the activities involved with Fire Protection Program implementation.

The Watts Bar Fire Protection Report lists compensatory actions that must be implemented when there are impaired fire protection systems, including, under some circumstances, a continuous fire watch. TVA Corporate Procedure NPG-SPP-18.4.6, Control of Fire Protection Impairments, Rev. 0006, is the implementing/controlling process for all Fire Protection impairments, and establishes the process for implementing compensatory actions for fire impairments as directed by the Fire Protection Report. NPG-SPP-18.4.6, Section 3.2.6.A, states that "Fire watches are utilized for the surveillance of areas where fire protection systems are impaired. The compensatory fire watch process is described in Attachment 7" of NPG-SPP-18.4.6. NPG-SPP-18.4.6, Attachment 7, Section 3.1, specifies compensatory fire watch responsibilities, and requires that compensatory fire watches "log on Form NPG-SPP-18.4.6-3, Continuous Compensatory Fire Watch Turnover Form, each time coverage is assumed or transferred." NPG-SPP-18.4.6, Section 4.2.C, requires that Form NPG-SPP-18.4.6-3 be retained for 90 days.

Fire Protection Impairment Permit C10-0639, dated August 6, 2010, established a continuous fire watch for a multiple areas on the 713' elevation of the auxiliary building as a compensatory measure for fire protection equipment disabled to support Unit 2 construction activities.

Contrary to the above, on April 28, 2015, the licensee failed to maintain continuous compensatory fire watch information that was complete and accurate in all material respects. Specifically, a Continuous Compensatory Fire Watch Turnover Form, NPG-SPP-18.4.6-3, annotated that continuous fire watch patrols for Fire Protection

Impairment Permit C10-0639 were completed, when in fact such fire watches had not been performed. The continuous fire watch patrol data is material to the NRC in that it provides evidence of compliance with regulatory requirements.

The licensee took remedial action against the involved individuals commensurate with the circumstances. The licensee initiated condition report 1019953 to communicate with staff the importance of recognizing when a continuous fire watch is required. A Notice of Violation was issued with this report. This is identified as violation (VIO) 05000390/2016003-01, Falsified Fire Watch Records.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

.1 Internal Flooding

The inspectors reviewed related flood analysis documents and walked down the area listed below containing risk-significant structures, systems, and components susceptible to flooding. The inspectors verified that plant design features and plant procedures for flood mitigation were consistent with UFSAR design requirements and the internal flooding analysis assumptions. The inspectors assessed the condition of flood mitigation features such as drains, barriers, curbs, and door seals. In addition, the inspectors verified the licensee was identifying and properly addressing internal flooding issues in the corrective action program (CAP). Documents reviewed are listed in the Attachment. This inspection constituted one inspection sample, as defined in IP 71111.06.

- Auxiliary building elevation 757, electric board rooms

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification and Performance (71111.11)

.1 Licensed Operator Regualification Review

a. Inspection Scope

On September 7, 2016, the inspectors observed the simulator evaluation for Operations Crew 1 per 3-OT-SRT-E2-2, Inadvertent dilution event followed by a feed line break and loss of offsite power.

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 problem listed below. A review was performed to assess the effectiveness of maintenance efforts that apply to scoped structures, systems, or components (SSCs) and to verify that the licensee was following the requirements of TI-119, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting - 10 CFR 50.65, and NPG-SPP-03.4, Maintenance Rule

Performance Indicator Monitoring, Trending, and Reporting - 10 CFR 50.65. Reviews focused, as appropriate, on: 1) appropriate work practices; 2) identification and resolution of common cause failures; 3) scoping in accordance with 10 CFR 50.65; 4) characterizing reliability issues for performance monitoring; 5) tracking unavailability for performance monitoring; 6) balancing reliability and unavailability; 7) trending key parameters for condition monitoring; 8) system classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); 9) appropriateness of performance criteria in accordance with 10 CFR 50.65(a)(2); and 10) appropriateness and adequacy of 10 CFR 50.65 (a)(1) goals, monitoring and corrective actions. Documents reviewed are listed in the Attachment. This activity constituted one Maintenance Effectiveness inspection sample, as defined in IP 71111.12.

- Condition Report 1202186, SR cooler tagged for one month with no work performed

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 0905 with rigging and lifting in the switchyard for Unit 2 main bank transformer work.
- Risk assessment for work week 0711 with the planned 30 percent turbine trip and loss of offsite power unit 2 power ascension test
- Risk assessment for work week 0815 with the emergent failure of the 1B-B emergency diesel generator (EDG) during surveillance testing
- Risk assessment for work week 0919 with 2A CCS pump planned maintenance outage and 2A EDG OOS due to output breaker failed to close

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, as appropriate: 1) the technical adequacy of the evaluations; 2) whether continued system operability was warranted; 3) whether the compensatory measures, if involved, were in place, would work as intended, and were appropriately controlled; 4) where continued operability was considered unjustified, the impact on TS limiting conditions for operation (LCO) and the risk significance in accordance with the significant determination process (SDP). The inspectors verified that the operability evaluations were performed in accordance with NPG-SPP-03.1, Corrective Action Program. Additional documents reviewed are listed in the Attachment. This activity constituted eight Operability Evaluation inspection samples, as defined in IP 71111.15.

- Past operability evaluation (POE) for CR 1209083, foreign material found in the local control cabinet for the Unit 2 TDAFW pump
- Immediate Determination of Operability (IDO) for CR 1208659, decrease in discharge head for the A-A and B-A essential raw cooling water (ERCW) pumps during performance of 0-SI-67-901-A
- POE for CR 1185262, NRC found temporary oil container zip tied to unit 2 TDAFW pump
- IDO for CR 1192025, 2B-B EDG fuel leak during 2-PAT-5.2
- IDO for CR 1194218, Curtis Wright part 21 evaluation
- IDO for CR 1204793, Unsecured temporary equipment near safety-related components on auxiliary building roof
- Prompt Determination of Operability for CR 1197251, 2-SI-72-904A failed acceptance criteria for IST seat leakage on containment spray pump 2A-A discharge check valve
- Review of evaluation of reactor coolant system loop operability due to fire damage to the 1A and 1B reactor coolant pump normal electrical supply bus

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the temporary plant modification(s) listed below against the requirements of NPG-SPP-09.3, Plant Modifications and Engineering Change Control, and NPG-SPP-09.4, 10 CFR 50.59 Evaluation of Changes, Tests, and Experiments, and verified that the modification did not affect system operability or availability as described by the TS or the UFSAR. In addition, the inspectors determined whether: 1) the installation of the permanent modification was in accordance with the work package; 2) adequate configuration control was in place; 3) procedures and drawings were updated; and 4) post-installation tests verified operability of the affected systems. Documents reviewed are listed in the Attachment. This activity constituted one Plant Modifications inspection sample, as defined in IP 71111.18.

- Temporary modification WBN-1-2016-202-001, Disconnect reactor coolant pump (RCP) bus 1A from unit station service transformer (USST) 1A and disconnect RCP bus 1B from USST 1B

b. Findings

No findings were identified.

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 five Post Maintenance Testing inspection samples, as defined in IP 71111.19.

- Work Order (WO) 117977904, 1B-B centrifugal charging pump room cooler post maintenance test (PMT) following fan shaft bearing replacement
- WO 117434202, Manhole 9B sump pump replacement.
- WO 118146541, 2-SI-63-902-A, stroke time test for 2-FCV-63-116 following resistor replacement in indicating circuit
- WO 118146532, 2-SI-63-902-A, stroke time test for 2-FCV-63-164 following resistor replacement in indicating circuit
- WO 118078437, 1B-B EDG PMT following replacement of the digital reference unit and the 2301A load sharing card

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; three in-service; three routine; and one RCS leak rate, as defined in IP 71111.22.

In-Service Test:

- WO 118021058, 2-SI-72-904-A, check valve testing during operations containment spray (Train A)
- WO 117613024, 1-SI-74-901-B, residual heat removal pump 1B-B quarterly performance test
- WO 117645410, 2-SI-62-901-A, 2A-A centrifugal charging pump quarterly performance test

Other Surveillances

- WO 117829325, 2-SI-3-901-A, Motor driven auxiliary feedwater pump 2A-A quarterly performance test.
- WO 117771590, 2-SI-63-10.1-A, Emergency core cooling system discharge pipe venting - train A inside containment
- WO 118132683, 2-SI-262-1-B for Unit 2 pressurizer heater BOX and BOY relays - CR 1206962

RCS Leak Rate Surveillances

- WOs 117640292, 117589102, 1-SI-68-32, Reactor coolant system water inventory balance

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

On August 10, 2016, 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. 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.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (Seven Inspection Samples Completed)

a. Inspection Scope

Hazard Assessment and Instructions to Workers: During facility tours, the inspectors directly observed radiological postings and container labeling for areas established within the radiologically controlled area (RCA) of the auxiliary building, Unit 2 (U2) containment, and the refueling floor and radioactive waste (radwaste) processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas. The inspectors reviewed survey records for several plant areas including surveys for airborne radioactivity, gamma surveys, surveys for alpha-emitters and other hard-to-detect radionuclides, and pre-job surveys for upcoming tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. The inspectors attended pre-job briefings and reviewed radiation work permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers.

Control of Radioactive Material: The inspectors observed surveys of material and personnel being released from the RCA using small article monitor, personnel contamination monitor, and portal monitor instruments. The inspectors discussed equipment sensitivity, alarm setpoints, and release program guidance with licensee staff. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with licensee staff.

Hazard Control: The inspectors evaluated access controls and barrier effectiveness for selected high radiation area (HRA), locked high radiation area (LHRA), and very high radiation area (VHRA) locations and discussed changes to procedural guidance for LHRA and VHRA controls with radiation protection (RP) supervisors. The inspectors reviewed implementation of controls for the storage of irradiated material within the spent fuel pool. Established radiological controls, including airborne controls and electronic dosimeter (ED) alarm setpoints, were evaluated for selected spent fuel floor tasks, U2 lower containment tasks and filter change out activities. In addition, the inspectors reviewed licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations. The inspectors also reviewed the use of personnel dosimetry including extremity dosimetry and multibadging in high dose rate gradients.

Radiation Worker Performance and RP Technician Proficiency: Occupational workers' adherence to selected RWPs and RP technician proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. Jobs observed in HRAs and contaminated areas included decontamination of work areas on the spent fuel floor, quality assurance testing on valve work in U2 lower containment, and a filter change-out in the auxiliary building.

Problem Identification and Resolution: The inspectors reviewed and assessed CRs associated with radiological hazard assessment and control. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: Radiation protection activities were evaluated against the requirements of UFSAR Section 12, parts of TS Section 5.0, 10 CFR Parts 19 and 20, and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, "Control of Radioactively Contaminated Material". Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (Six Inspection Samples Completed)

a. Inspection Scope

Radioactive Effluent Treatment Systems: The inspectors walked down components of the gaseous and liquid radwaste processing and effluent discharge systems. To the extent practical, the inspectors observed and evaluated the material condition of in-place waste processing equipment for indications of degradation or leakage that could constitute a possible release pathway to the environment. Inspected components included floor drain tanks, waste monitor tanks, liquid waste filtration and ion-exchange equipment, and associated piping and valves. The inspectors interviewed licensee staff regarding equipment configuration and effluent monitor operation. The inspectors also walked down and reviewed surveillance test records for gaseous effluent filtration systems.

Effluent Monitoring and Discharge: The inspectors observed the collection and processing of gaseous effluent samples from the auxiliary building vent. Technician proficiency in collecting, processing, and preparing the applicable release permits was evaluated. The inspectors reviewed recent liquid and gaseous release permits including pre-release sampling results, effluent monitor alarm setpoints, and public dose calculations. For the shield building exhaust and liquid radwaste effluent monitors, the inspectors walked down the monitoring equipment, reviewed calibration and functional test records, and evaluated traceability of radioactive calibration sources to national standards. The inspectors also evaluated the licensee's capability to collect high-range post-accident effluent samples. The inspectors reviewed and discussed with licensee staff the methodology for determining vent and stack flow rates and compared current vent flows to design values in the Offsite Dose Calculation Manual (ODCM).

The inspectors also reviewed compensatory sampling data for time periods when selected radiation monitors were out of service. The inspectors reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze effluent samples. The inspectors also reviewed licensee effluent source term characterizations and changes to effluent release points. In addition, the inspectors evaluated recent land use census results.

The inspectors reviewed the 2014 and 2015 Annual Radioactive Effluent Reports to evaluate reported doses to the public, to review any anomalous events, and to review ODCM changes.

Problem Identification and Resolution: The inspectors reviewed and assessed CRs associated with gaseous and liquid effluent processing and release activities. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: Radwaste system operation and effluent processing activities were evaluated against requirements and guidance documented in the following: 10 CFR Part 20; 10 CFR Part 50 Appendix I; ODCM; UFSAR Section 11; Regulatory Guide (RG) 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants"; RG 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50 Appendix I"; RG 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations)-Effluent Streams and the Environment"; NUREG-0737, "Clarification of TMI Action Plan Requirements"; and TS Section 5. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP) (Three Inspection Samples Completed)

a. Inspection Scope

REMP Implementation: The inspectors reviewed the 2014 and 2015 Annual Radiological Environmental Operating Reports and the 2014 and 2015 Annual Radioactive Effluent Release Reports. Selected environmental measurements were reviewed for consistency with licensee effluent data, evaluated for radionuclide concentration trends, and compared with detection level sensitivity requirements as described in the ODCM. The inspectors assessed the licensee's response to any missed or anomalous environmental samples. The inspectors also reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze environmental samples. Any changes to the ODCM, land use census, or environmental program processes were discussed with licensee staff.

The inspectors observed the routine collection of airborne particulate and iodine samples and groundwater samples at selected locations as required by the licensee's ODCM. The inspectors noted the material condition of the continuous air samplers and environmental dosimeters. The inspectors also reviewed calibration and maintenance records for the environmental sampling equipment.

Meteorological Monitoring Program: The inspectors observed the physical condition of the meteorological tower and its instrumentation and discussed equipment operability and maintenance history with licensee staff. The inspectors evaluated transmission of

locally generated meteorological data to other licensee groups such as emergency operations personnel and main control room operators. Calibration records for the meteorological measurements of wind speed, wind direction, and temperature were reviewed. The inspectors also reviewed meteorological measurement data recovery for 2014 and 2015.

Ground Water Protection: The inspectors reviewed the licensee's continued implementation of the industry's Ground Water Protection Initiative Nuclear Energy Institute (NEI) 07-07 and discussed any changes to the program. The inspectors discussed program guidance for dealing with spills, leaks, and unexpected discharges with licensee staff and reviewed recent monitoring well results and any voluntary communications. The inspectors also reviewed recent entries into the 10 CFR 50.75(g) decommissioning file. The inspectors reviewed and discussed the licensee's program for monitoring of structures, systems, and components with the potential to release radioactive material to the environment. Potential effluent release points due to onsite surface water bodies were also evaluated.

Problem Identification and Resolution: The inspectors reviewed CRs in the areas of radiological environmental monitoring and meteorological tower maintenance. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: The inspectors evaluated REMP implementation and meteorological monitoring against the requirements and guidance contained in: 10 CFR Part 20; Appendices E and I to 10 CFR Part 50; TS Section 5.7.2; UFSAR Sections 2.3 and 11.6; RG 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment"; Branch Technical Position, "An Acceptable Radiological Environmental Monitoring Program" – 1979; Reg Guide 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants"; NEI 07-07, "Industry Groundwater Protection Initiative – Final Guidance Document"; and approved licensee procedures. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (Six Inspection Samples Completed)

a. Inspection Scope

Radioactive Material Storage: The inspectors walked down indoor and outdoor areas inside the protected area as well as 'Foxtrot Pad' outside the protected area and 'Decon Hill.' During the walkdowns, the inspectors observed the physical condition and labeling of storage containers and the radiological postings for satellite radioactive material storage areas. The inspectors also reviewed the licensee's radwaste procedures for routine surveys and waste storage.

Radioactive Waste System Walkdown, Characterization, and Classification: The inspectors walked down accessible sections of the liquid and solid radwaste systems to assess material condition and conformance of equipment with system design diagrams.

This included the mobile waste demineralizer system, the spent resin processing system, the railroad bay, and the waste packaging area. The inspectors discussed the function of radwaste components with the radwaste operator. The inspectors discussed possible changes to the radwaste processing systems with radwaste staff. The processes for the dewatering of resins, spent resin tank recirculation, resin sampling, and transfer of resins from the processing pads to the shipping casks and temporary storage casks were reviewed and discussed with the resin processing contractor.

The inspectors reviewed the 2014 and 2015 Radioactive Effluent Release Reports and the 2014-2016 radionuclide characterization and classification for the dry active waste and resin waste streams. The inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. The inspectors also evaluated how changes to plant operational parameters were taken into account in waste characterization.

Shipment Preparation and Records: The inspectors observed preparation activities for several shipments. The inspectors reviewed shipping records for consistency with licensee procedures and compliance with NRC and Department of Transportation (DOT) regulations. This included review of emergency response information, waste classification, radiation survey results, information on the waste manifest, and the authorization of the receiving licensee to receive shipments. Training records for selected individuals currently qualified to ship radioactive material were reviewed for compliance with 49 CFR Part 172 Subpart H.

Problem Identification and Resolution: The inspectors reviewed CRs in the areas of radwaste/shipping. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20. Radwaste processing activities and equipment configuration were reviewed for compliance with the licensee's process control program. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification (1983). Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71 (which require licensees to comply with DOT regulations in 49 CFR Parts 107, 171-180, and 390-397), as well as the guidance provided in NUREG-1608, "Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects". Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Occupational Radiation Safety Cornerstone:

a. Inspection Scope

The inspectors reviewed the occupational exposure control effectiveness PI results for the Occupational Radiation Safety Cornerstone from October 1, 2015, through June 30, 2016. For the assessment period, the inspectors reviewed electronic dosimeter alarm logs and CRs related to controls for exposure significant areas. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Public Radiation Safety Cornerstone:

a. Inspection Scope

The inspectors reviewed the radiological control effluent release occurrences PI results for the Public Radiation Safety Cornerstone from October 1, 2015, through June 30, 2016. For the assessment period, the inspectors reviewed CRs related to radiological effluent TS/ODCM issues and cumulative and projected doses to the public. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.3 Reactor Safety Cornerstones

a. Inspection Scope

The inspectors sampled licensee submittals for the four PIs listed below. To verify the accuracy of the PI data reported from Q3 2015 through Q2 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. Documents reviewed are listed in the Attachment. This activity constituted five performance indicator samples, as defined in IP 71151.

- Mitigating Systems Performance Index (MSPI) – High Pressure Injection System
- MSPI – Residual Heat Removal
- MSPI – Cooling Water System
- Safety System Functional Failures (SSFF)
- Reactor Coolant System (RCS) Leak Rate

b. Findings

No findings were identified

4OA2 Problem Identification and Resolution (71152)

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

As required by Inspection Procedure 71152, Problem Identification and Resolution, 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.

.2 Annual Sample: CR 1172243, Loss of 1B-B 6.9kV shutdown board on May, 17, 2016

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

This activity constituted one annual follow-up of selected issues sample, as defined in IP 71152.

b. Findings

Introduction. A self-revealed non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified for the licensee's failure to use a procedure appropriate to the circumstances when work scope changed. Specifically, Watts Bar procedure NPG-SPP-10.1, System Status Control, Rev. 8, was used to control a plant configuration change instead of NPG-SPP-07.6, NPG Work Management Planning Procedure, Rev. 14, when unexpected indications were seen during implementation of a WO. This resulted in the de-energization of the 1B-B shutdown board.

Discussion. The 1B-B shutdown board on Watts Bar Unit 1 is the safety-related 6.9kV electrical bus which provides offsite power to B train structures, systems, and components (SSCs). In the case of a loss of offsite power, it also provides SSCs with onsite safety-related electrical power through the standby diesel generators. On May 17, 2016, during restoration from a clearance, it was noted that the B train protection relays for the shutdown board (loss of voltage, degraded voltage, and overvoltage) had not reset as expected per the work order instructions. Technicians attempted to reset the relays multiple times with no change. The technicians then received permission from the shift manager to remove permanently installed isolation device, PK block 1-PK-211-B-17/4, because it was thought that this action would allow the protection relays to be reset. Upon removal of the PK block, 1B-B shutdown board immediately de-energized, causing the inoperability of the shutdown board and numerous supported components. The licensee took the appropriate actions in response to the loss of the 1B-B shutdown board, entered the appropriate technical

specifications limiting conditions for operation for inoperable components, and restored power to the board approximately 1.5 hours after it was lost. The inspectors reviewed the event, the procedural requirements of NPG-SPP-10.1, and NPG-SPP-07.6, NPG Work Management Planning Procedure, Rev. 14. Inspectors noted that the removal of the PK block would be considered a scope change in accordance with step 3.7.9.B of NPG-SPP-07.6 which would have required an engineering review and approval, drawing review and site walkdowns, review of operating experience, review of vendor information, etc. Inspectors concluded that removal of the PK block with no further review, evaluation, or documentation in accordance with NPG-SPP-10.1 was not appropriate to the circumstances given the plant risk associated with the loss of the 1B-B shutdown board, the potential for a human performance error, and the more detailed review requirements for work order scope changes from NPG-SPP-07.6.

Analysis. The failure to use NPG-SPP-07.6, NPG Work Management Planning Procedure, Rev 14, for a work scope change associated with work on the 1B-B shutdown board was a performance deficiency. The performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective in that the loss of the 1B-B shutdown board caused the inoperability of the B train of the onsite electrical distribution system and also resulted in the inoperability of all B train SSCs powered from the 1B-B shutdown board. The inspectors performed an initial screening of the finding in accordance with NRC Manual Chapter 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 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 finding has a cross cutting aspect in the Work Management component of the Human Performance area as defined in NRC IMC 0310, because the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the process of planning and executing the work activities for DCN 64063 failed to identify and manage the risk associated with system restoration due to either equipment failure or personnel error. [H.5].

Enforcement. Title 10 CFR Part 50, Appendix B to 10 CFR Part 50, 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." This requirement is implemented, in part, by TVA procedures NPG-SPP-10.1, System Status Control, Rev. 8 and NPG-SPP-07.6, NPG Work Management Planning Procedure, Rev 14. Contrary to the above, on May 17, 2016 NPG-SPP-10.1, section 3.A was performed when it was not appropriate to the circumstances. The licensee took the appropriate actions in response to the loss of the 1B-B shutdown board, entered the appropriate technical specifications limiting conditions for operation for inoperable components, and restored power to the board approximately 1.5 hours after it was lost. This violation is being treated as an NCV consistent with section 2.3.2 of the Enforcement Policy. The violation was entered into the licensee's CAP as CR 1172243. This violation is identified as NCV 05000390/2016003-02,

Inappropriate Procedure used for Work Order Scope Change Results in Loss of 1B-B Shutdown Board.

.3 Semi-annual Trend Review

a. Inspection Scope

As required by Inspection Procedure 71152, the inspectors performed a review of the licensee's CAP and other associated programs and documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also included licensee trending efforts and licensee human performance results. The inspectors' review nominally considered the six-month period of September 2015 through March 2016, although some examples expanded beyond those dates when the scope of the trend warranted. Inspectors reviewed licensee trend reports for the period in order to determine the existence of any adverse trends that the licensee may not have previously identified. The inspectors' review also included the licensee's integrated trend reports. The inspectors verified that adverse or negative trends identified in the licensee's CRs, periodic reports, and trending efforts were entered into the CAP. This inspection satisfied one inspection sample for Semiannual Trend Review.

b. Observations and Findings

No findings were identified. In general, the licensee had identified trends and appropriately addressed them in their CAP. The inspectors observed that the licensee had performed a detailed review. The licensee routinely reviewed cause codes and utilized key words and system links to identify potential trends in their data. The NRC identified trends relating to: marking procedure and work order steps as not applicable (N/A), condition report initiation timeliness, and operability evaluations.

Procedure Steps Marked "N/A"

During the six-month period, the inspectors noted that some procedure steps were marked "N/A" during procedure performance. Specifically, the procedure steps were inappropriately marked N/A when performing tests or other activities because the licensee failed to meet the usage allowances for N/A. Examples included using N/A in a reactor startup procedure and during a turbine driven auxiliary feedwater pump calibration when the speed controller calibration could not be completed for the lowest speed setting. Each of these instances was entered in to the licensee's corrective action program, and the licensee entered the trend into their CAP under CRs 1125256 and 1129214. CR 1125256 contains five corrective actions, including issuing interim guidance on the use of N/A, shift orders documenting the guidance, briefing engineering personnel, briefing maintenance superintendents, supervisors and foreman, and completing an effectiveness review.

Condition Report Initiation Timeliness

The inspectors also identified a trend with untimely initiation of condition reports. TVA procedure NPG-SPP-33.301, Condition Report Initiation, requires that issues identified are documented with a CR no later than the end of the current shift. The NRC identified situations where plant conditions were not captured in condition reports, including instances where plant conditions observed by the inspector at the same time as the licensee were not captured in condition reports. The licensee entered this trend into their CAP as CR 1146587. Corrective actions for this condition report included

information sharing with the operations department to make clear the procedural expectation for CR initiation and an effectiveness review.

Operability Evaluations

The inspectors also identified a trend regarding operability determinations where evaluations and conclusions within IDO and PDO do not fully address all aspects of the operability determination process as described in OPDP-8, Operability Process and Limiting Conditions for Operation Tracking. Specific examples include: the PDO for the 1A safety injection pump mechanical seal replacement did not address operability of the 1B safety injection pump, and the IDO for CR 1118832 which concluded that the TDAFW pump was fully operable despite the fact that the speed controller calibration could not be completed for the lowest speed setting. Corrective actions for CR 1146587 included a standing order to explain expectations and requirements for IDO documentation, a training needs analysis to determine the level and scope for operability training for operations and engineering, and a Level 2 analysis.

4OA3 Event Follow-up (71153)

.1 (Closed) Licensee Event Report (LER) 05000390/2015-006-00, Source Range Level Trip Channels (N-31 and N-32) Inoperable During Plant Startup

a. Inspection Scope

The inspectors reviewed LER 05000390/2015-006-00 dated December 21, 2015. This LER discusses the discovery of both source range nuclear instrumentation level trip channels in a bypassed condition on October 22, 2015. The channels had been left bypassed when they were required to be operable from October 19, 2016 when reactor trip breakers (RTBs) were closed through October 21, 2016 when power exceeded the P-6 interlock. This represented a condition prohibited by TS and a condition that could have prevented the fulfillment of a safety function needed to shut down the reactor and maintain it in a safe shutdown condition. The level trip was bypassed by procedure on October 7, 2016 during core reload and was never restored to the required position for plant startup. The inspectors reviewed the LER associated with this event and determined that the report adequately documented the summary of the event including the cause of the event and potential safety consequences. The licensee made changes to several procedures to ensure that the source range level trip channels are explicitly verified prior to RTB closure and to better track activities not completed within one shift. Some corrective actions were still in progress and had not been completed by the time of this inspection report.

b. Findings

The finding associated with this event is contained in Watts Bar Inspection Report 05000390, 391/2015-004 (ML16043A214). No new findings were identified.

.2 (Closed) LER 05000390/2016-008-00, Emergency Diesel Generator Manual Start Due to Loss of Voltage on the 6.9kV Shutdown Board 1B-B

a. Inspection Scope

The inspectors reviewed LER 05000390/2016-008-00 dated July 15, 2016. This LER discusses a loss of voltage event on the 1B-B 6.9kV shutdown board that required the manual start of the EDGs on May 17, 2016. The loss of the 1B-B shutdown board was caused by the removal of an isolation PK block when unexpected conditions were encountered during the execution of a design change work order to install open phase monitoring relays on the shutdown board. Operators responded, in part, by manually starting EDGs 1A-A, 2A-A and 2B-B, which led to the event being reported as a condition that resulted in the manual actuation of the emergency AC electrical system. The 1B-B EDG was not started because it was out of service for maintenance at the time of the event. The inspectors reviewed the LER and associated apparent cause analysis for this event through a PI&R sample documented in Section 4OA2.2 of this report.

b. Findings

No findings were identified.

.3 Unit 2 Manual Reactor Trip due to Lowering Steam Generator Levels

a. Inspection Scope

The inspectors responded to a Unit 2 manual reactor trip that occurred on August 23, 2016, due to lowering steam generator levels caused by a loss of main feedwater from the 2A main feedwater (MFW) pump. The unit was at approximately 46 percent power in mode 1 at the time of the event. The 2A MFW pump turbine began slowing down due to a loss of control oil from a failed hose connection. Since it was the only running MFW pump at the time, the loss of feedwater flow was unrecoverable and the operators performed a manual reactor trip. The licensee determined that the installed hose connection was of a different type than required. This was a latent error from the nuclear construction process for the 2A MFW pump.

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.

b. Findings

No findings were identified.

.4 Unit 2 Automatic Reactor Trip and Notification of Unusual Event

a. Inspection Scope

The inspectors responded to a Unit 2 automatic reactor trip that occurred on August 30, 2016, due to a fire on the 2B main bank transformer (MBT) in the switchyard. The unit was at approximately 99 percent power in mode 1 at the time of the event. At 2113 an explosion and subsequent fire engulfed the 2B MBT, which is the main generator B phase output to the 500KV switchyard. The site fire brigade responded with offsite assistance from Rhea County to help extinguish the fire. The licensee declared a Notice of Unusual Event (NOUE) at 2120 due to the fire lasting more than 15 minutes. The NRC, state, and local agencies were notified. The fire was extinguished at 2228 and the

NOUE was exited at 2342. The preliminary cause of the event was determined to be an internal arcing fault, due to inadequate clearance, on the low side windings of the 2B MBT.

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. At the end of the inspection period the causal analysis of the failure and some corrective actions were still in progress.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

On November 4, 2016, the resident inspectors presented the quarterly inspection results to members of the licensee staff. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

4OA7 Licensee-Identified Violations

The following licensee-identified violation of NRC requirements was determined to be of very low safety significance or Severity Level IV and met the NRC Enforcement Policy criteria for being dispositioned as a Non-Cited Violation.

- Watts Bar Nuclear Plant Units 1 and 2 Technical Specification 5.7.1.1.d requires, in part, that written procedures be established, implemented, and maintained covering the activities involved with Fire Protection Program implementation.

The Watts Bar Fire Protection Report lists compensatory actions that must be implemented when there are impaired fire protection systems, including, under some circumstances, a continuous fire watch.

TVA Corporate Procedure NPG-SPP-18.4.6, Control of Fire Protection Impairments, Rev. 0006, is the implementing/controlling process for all Fire Protection impairments, and establishes the process for implementing compensatory actions for fire impairments as directed by the Fire Protection Report.

NPG-SPP-18.4.6, Section 3.2.6.A, states that "Fire watches are utilized for the surveillance of areas where fire protection systems are impaired. The compensatory fire watch process is described in Attachment 7" of NPG-SPP-18.4.6.

Contrary to the above, on April 27, 2015, the licensee failed to perform a continuous fire watch as required for fire protection systems that were impaired. Specifically, the licensee failed to establish the compensatory continuous fire watch required by Fire Protection Impairment Permit C10-0639, which authorized an impairment of fire detection systems to allow for welding work on the 713' elevation of the auxiliary building of Watts Bar Nuclear Power Plant.

This violation is of very low safety significance (Green). This issue was determined to be of very low safety significance based on the results of the IMC 0609, Appendix F, "Fire Protection Significance Determination Process," Phase I Screening Approach. The inspectors determined that the fire finding did not affect the Unit 1 reactor's ability to reach and maintain safe shutdown (either hot or cold) condition. Therefore, the finding screened as Green. Specifically, the only equipment important to safety in the affected fire area was associated with the construction unit (Unit 2), and would not have impacted the safe shutdown of Unit 1. This violation was documented in the licensee's corrective action program as CR 1019953.

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

G. Arent, General Manager, WBN Site Licensing
L. Belvin, Senior Manager, Site Quality Assurance
M. Bottorff, Operations Superintendent
M. Casner, Director, Engineering
S. Connors, Plant Manager
L. Cross, Manager, Electrical Systems
T. Detchemendy, Manager, Emergency Preparedness
J. Edmonds, System Engineer, Electrical
E. Ellis, Senior Manager, Nuclear Site Security
D. Erb, Operations Director
W. Hooks, Manager, Radiation Protection
J. James, Director, Maintenance
J. Polickoski, Senior Corporate Licensing Project Manager
J. Pope, Senior Manager, Site Systems Engineering
G. Pry, Director, Plant Support

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000390/2016003-01	VIO	Falsified Fire Watch Records (Section 1R05)
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Opened and Closed

05000390/2016003-02	NCV	Inappropriate Procedure used for Work Order Scope Change Results in Loss of 1B-B Shutdown Board. (Section 4OA2.2)
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Closed

05000390/2015-006-00	LER	Source Range Level Trip Channels (N-31 and N-32) Inoperable During Plant Startup (Section 4OA3.1)
05000390/2016-008-00	LER	Emergency Diesel Generator Manual Start Due to Loss of Voltage on the 6.9kV Shutdown Board 1B-B (Section 4OA3.2)

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Section 1R04: Equipment Alignment

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1-PI-OPS-1-PE, Protected Equipment, Rev. 18
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Section 1R05: Fire Protection

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Section 1R06: Flood Protection Measures

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Section 1R11: Licensed Operator Regualification Program

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Section 1R12: Maintenance Effectiveness

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0-TI-199, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting –
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Section 1R15: Operability Determinations and Functionality Assessments

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 Calculation EDQ00099920070002, AC Auxiliary Power System Analysis, Rev. 51
 1-GO-3 Unit Startup from Less than 4% Reactor Power to 30% Reactor Power, Rev. 6
 1-GO-3 Unit Startup from Less than 4% Reactor Power to 30% Reactor Power, Rev. 7
 1-GO-4 Normal Power Operation, Rev. 11
 1-GO-4 Normal Power Operation, Rev. 12

Section 1R19: Post Maintenance Testing

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 2-SI-63-902-A, Valve Full-Stroke Exercising During Plant Operation – Safety Injection System (Train A)
 2-SI-63-902-A, Valve Full-Stroke Exercising During Plant Operation – Safety Injection System (Train A), Rev. 0004
 WO 118078437
 PM Work Instruction 600123711, Unit 1, Replace Electrolytic Capacitors and Woodward Controls on the 1B-B Diesel Generator, Rev. 5
 WO 118082313
 NPG-SPP-06.9.1, Conduct of Testing, Attachment 2, Rev. 0009
 Unit 1 Operations Log dated August 18, 2016
 0-SI-82-18-B, 184 Day Fast Start and Load Test DG 1B-B, Rev. 0025

Section 1R22: Surveillance Testing

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 2-SOI-3.02, Auxiliary Feedwater System, Rev. 0004
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 2-SI-262-1-B, Unit 2 Train B Auto Start Lockout, Rev. 12
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Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment

Procedures, Guidance Documents, and Manuals

System Chemistry Specifications, Chapter 3.01, Rev. 0103
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 0-ODI-999-04, Fish Sample Collection, Rev. 0000
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MSPI Derivation Report Residual Heat Removal System, June 2016, Unreliability Index

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NEI-99.02, Rev. 7

Section 40A2: Problem Identification and Resolution

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

Section 40A5: Other Activities

LIST OF ACRONYMS

AC	alternating current
CAP	Corrective Action Program
CCP	centrifugal charging pump
CCS	component cooling system
CFR	<i>Code of Federal Regulations</i>
CR	Condition Report
DOT	Department of Transportation
ED	electronic dosimeter
EDG	emergency diesel generator
EP	emergency planning
EPIP	Emergency Plan Implementing Procedure
ERCW	essential raw cooling water
FE	functional evaluation
HRA	high radiation area
IDO	immediate determination of operability
IMC	Inspection Manual Chapter
IP	inspection procedure
LCO	limiting condition for operation
LER	licensee event report
LHRA	locked high radiation area
LOCA	loss of coolant accident
MBT	main bank transformer
MDAFW	motor-driven auxiliary feedwater
MFW	main feedwater
MSPI	mitigating systems performance index
N/A	not applicable
NCV	non-cited violation
NEI	Nuclear Energy Institute
NOUE	Notice of Unusual Event
NPG-SPP	Nuclear Power Group Standard Programs and Processes
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OOS	out of service
PDO	prompt determination of operability
PI	performance indicator
PMT	preventive maintenance test
POE	past operability determination
Radwaste	radioactive waste
RTB	reactor trip breaker
RCA	radiological control area
RCP	reactor coolant pump
RCS	reactor coolant system
REMP	Radiological Environmental Monitoring Program
Rev.	revision
RFO	refueling outage
RG	regulatory guide
RHR	residual heat removal
RP	radiation protection

RS	radiation safety
RWP	radiation work permit
RWST	refueling water storage tank
SSFF	safety system functional failure
SDP	Significance Determination Process
SSC	structures, systems, or components
TDAFW	turbine-driven auxiliary feedwater
TS	technical specifications
TVA	Tennessee Valley Authority
U2	Unit 2
UFSAR	Updated Final Safety Analysis Report
USST	unit station service transformer
VHRA	very high radiation area
WBN	Watts Bar Nuclear Plant
WO	work order