



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

November 9, 2015

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

**SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000327/2015003 AND 05000328/2015003**

Dear Mr. Shea:

On September 30, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Sequoyah Nuclear Plant, Units 1 and 2. On October 15, 2015, the NRC inspectors discussed the results of this inspection with Mr. Rasmussen and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements. The NRC is treating these violations as a non-cited violations (NCVs) consistent with Section 2.3.2.a of the 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 Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Sequoyah Nuclear Plant.

If you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, RII, and the NRC Senior Resident Inspector at Sequoyah 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's Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

Docket Nos.: 50-327, 50-328
License Nos.: DPR-77, DPR-79

Enclosure:
Inspection Report 05000327/2015003,
05000328/2015003
w/Attachment: Supplementary Information

cc: via ListServ distribution via email

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Docket Nos.: 50-327, 50-328
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E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

J. Shea

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Letter to J.W. Shea from Alan Blamey dated November 9, 2015

SUBJECT: SEQUOYAH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000327/2015003 AND 05000328/2015003

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-327, 50-328

License Nos.: DPR-77, DPR-79

Report Nos.: 05000327/2015003, 05000328/2015003

Licensee: Tennessee Valley Authority (TVA)

Facility: Sequoyah Nuclear Plant, Units 1 and 2

Location: Sequoyah Access Road
Soddy-Daisy, TN 37379

Dates: July 1 – September 30, 2015

Inspectors: G .Smith, Senior Resident Inspector
W. Deschaine, Resident Inspector
J. Rivera-Ortiz, Senior Reactor Inspector
M. Coursey, Reactor Inspector

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

Enclosure

SUMMARY OF FINDINGS

IR 05000327/2015-003, 05000328/2015-003; 7/1-9/30/2015; Sequoyah Nuclear Plant, Units 1 and 2; Maintenance Risk Assessment and Emergent Work, and Problem Identification and Resolution.

The report covered a three-month period of inspection by resident inspectors and announced inspections by regional inspectors. Two findings/violations were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP) dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Components Within the Cross Cutting Areas" dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A self-revealing Green NCV of Unit 1 Technical Specification (TS) 6.8.1.a was identified for the licensee's failure to adequately establish a clearance boundary during plant maintenance. Specifically, the licensee caused damage to a safety-related component during maintenance as a result of a failure to de-energize all electrical sources during maintenance troubleshooting activities. The licensee placed the issue into their corrective action program (CAP) and corrected the identified deficiencies.

The inspectors determined that the failure to adequately implement clearance procedures was a performance deficiency. The inspectors determined that the performance deficiency was more than minor because it was associated with the human performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined the finding was of very low safety significance (Green) as the affected safety significant component was repaired within 24 hours. The cause of this finding was related to the cross-cutting aspect of leaders ensuring that personnel, equipment, procedures, and other resources were available and adequate to support nuclear safety [H.1] (Section 1R13)

Cornerstone: Barrier Integrity

- Green. A self-revealing Green NCV of TS 6.8.1.a, "Administrative Controls of Procedures and Programs," was identified for the licensee's failure to implement procedures related to quality during the surveillance capsule relocation activity.

Specifically, procedures NPG-SPP-07.3, "Work Activity Risk Management," and NPG-SPP.07.7, "NPG TCM Role and Oversight of Supplemental Personnel," were not appropriately implemented. The deficiency was entered into the licensee's CAP as Problem Evaluation Report (PER) 1016839.

This finding was determined to be greater than minor because it was associated with the Human Performance attribute of the Barrier Integrity Cornerstone, and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the performance deficiency resulted in the failure to properly secure reactor vessel surveillance capsules and the subsequent damage to the reactor vessel pressure boundary, reactor internals and fuel filter screens. The proper higher risk categorization would have led to enhanced contractor oversight, and the ability to detect when the contractors were performing actions outside the approved procedure. These additional oversights would reasonably be expected to prevent the events that led to the surveillance capsule ejections, and eliminate any potential to cause damage to the reactor vessel pressure boundary, reactor internals, and fuel filter screens. The inspectors identified a cross-cutting aspect in the Human Performance Consistent Process cross-cutting area. Specifically, the licensee failed to consistently incorporate risk insights, as required by procedure NPG-SPP-07.3, which resulted in less than conservative classification for an infrequently performed activity inside the reactor vessel performed by contract personnel. [H.13] (Section 4OA2)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Unit 1 operated at or near 100 percent rated thermal power (RTP) until July 24, 2015, when Unit 1 experienced an automatic reactor trip due to an electrically-induced turbine trip caused by a main generator voltage regulator malfunction. Following repairs, Unit 1 achieved criticality on July 26. However on July 27, during the up-power, at 82 percent RTP, the unit experienced an automatic trip caused by a similar voltage regulator malfunction. Following a more significant investigation and repairs, which included the re-landing of an electrical wire within the voltage regulator that had been improperly landed since initial plant startup in the early 1980's, the unit achieved criticality on July 31. On August 1, the unit reached 100 percent RTP where it continued to operate until August 8, when the unit experienced voltage regulator anomalies that caused unanticipated electrical loading swings. The decision was made to perform a controlled shut-down of the reactor and turbine. During this forced outage, the licensee again performed an intrusive investigation into the main generator voltage malfunction. Following a root cause investigation and the replacement of several electronic cards in the voltage regulator, the unit was taken critical on August 15. On August 18, the unit reached 100 percent RTP where it continued to operate until September 14 when the unit was manually tripped due to a loss of the 1-II 120 volt vital alternating current (AC) instrument bus. Following repairs to the vital AC instrument inverter 0-II, the reactor was taken critical on September 19. On September 20, the unit reached 100 percent RTP where it remained for the remainder of the period.

Unit 2 operated at or near 100 percent RTP until September 25 when reactor power was reduced to 95 percent RTP as a conservative measure in order to address flow oscillations in the heater drain system. The unit remained at 95 percent until the end of the period while troubleshooting of the heater drain system was performed.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness to Cope with External Flooding

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 updated final safety analysis report (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 (CAs) 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 Inspection Procedure (IP) 71111.01. Documents reviewed are listed in the attachment.

The inspectors conducted walk-downs of the following plant areas containing risk-significant structures, systems, and components that are below flood levels and required to stay dry during flooding:

- Emergency Raw Cooling Water (ERCW) building
- Emergency Diesel Generator Building

b. Findings

No findings were identified.

.2 Summer Readiness of Offsite and Alternate AC Power Systems:

a. Inspection Scope

The inspectors performed the annual review of the licensee's readiness of offsite and alternate AC power systems prior to the onset of the high grid loading season. The inspectors reviewed procedures affecting these areas and the communications protocols between the transmission system operator and the licensee to verify that appropriate information is exchanged when issues arise that could impact the offsite power system. The inspectors walked down offsite power supply systems and emergency diesel generators (EDGs), reviewed CA program documents, and interviewed appropriate plant personnel to assess deficiencies and plant readiness for summer high grid loading.

As part of this inspection, the inspectors evaluated a training scenario on the simulator where the operations crew was challenged by degraded voltage conditions in the switchyard as well as malfunctions to the main generator voltage regulator. The operators utilized Abnormal Operating Procedure (AOP),-P.07, "Degraded Grid or Abnormal Voltage Conditions," Rev. 6 during this exercise. Documents reviewed are listed in the Attachment. The inspectors completed one sample, as defined in IP 71111.01

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

Partial System Walk-down

a. Inspection Scope

The inspectors performed partial walk-downs of the following three systems to verify the operability of redundant or diverse trains and components when safety equipment was inoperable. The inspectors focused on identification of discrepancies that could impact

the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, walked down control system components, and determined whether selected breakers, valves, and support equipment were in the correct position to support system operation. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP. Documents reviewed are listed in the Attachment. The inspectors completed three samples, as defined in IP 71111.04.

- Unit 1 'B' train emergency core cooling (ECCS) train while 'A' train charging pump was out-of-service (OOS) maintenance
- Unit 2 'A' train ECCS while Unit 2 'B' charging pump was OOS for maintenance
- Unit 2 'A' Residual Heat Removal (RHR) train while 'B' RHR was OOS for maintenance

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Fire Protection Tours

a. Inspection Scope

The inspectors conducted a tour of the five areas important to safety listed below to assess the material condition and operational status of fire protection features. The inspectors evaluated whether: combustibles and ignition sources were controlled in accordance with the licensee's administrative procedures; fire detection and suppression equipment was available for use; passive fire barriers were maintained in good material condition; and compensatory measures for OOS, degraded, or inoperable fire protection equipment were implemented in accordance with the licensee's fire plan. Documents reviewed are listed in the Attachment. The inspectors completed five samples, as defined in IP 71111.05Q.

- ERCW building elevation 688
- ERCW building elevation 704
- ERCW building elevation 720
- Auxiliary building elevation 734
- Auxiliary building elevation 749

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

Internal Flooding

a. Inspection Scope

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 also assessed the condition of flood protection barriers and drain systems. In addition, the inspectors verified the licensee was identifying and properly addressing issues using the CAP. The inspectors completed one sample, as defined in IP 71111.06.

- Shutdown Board Room (Auxiliary Building elevation 734')

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors interviewed plant personnel, conducted plant walk-downs, and reviewed records for a sample of heat exchangers that were directly cooled by the ERCW system, to verify that heat exchanger deficiencies or potential common cause problems that could result in initiating events, or affect multiple heat exchangers in mitigating systems, were being identified, evaluated, and resolved. The inspectors selected the following heat exchangers for review based on their risk-significance in the licensee's probabilistic risk analysis, and their safety-related mitigating functions.

- Component cooling system (CCS) heat exchangers 2A1 and 0B1
- EDG coolers 2A1 and 2A2
- Containment spray (CS) heat exchangers 1A and 2A

For the CCS heat exchangers 2A1 and 0B1, the inspectors reviewed the results of routine thermal performance tests performed to monitor the effects of fouling and establish the inspection/cleaning frequency. The inspectors verified that the test methodology, conditions, and acceptance criteria were consistent with accepted industry practices. The inspectors also verified that the performance test results were correctly applied to the evaluation of heat transfer capability under design basis conditions. Additionally, the inspectors reviewed records for recent inspection/cleaning activities,

and post-cleaning testing, to verify these were adequate to maintain thermal performance in accordance with the system design basis.

For the EDG Coolers 2A1 and 2A2, the inspectors reviewed the results of routine temperature trending performed to monitor the effects of fouling, and establish the inspection/cleaning frequency. The inspectors verified that the temperature trending methodology, conditions, and acceptance criteria were consistent with accepted industry practices, and adequate to demonstrate operability under design basis conditions. The inspectors also reviewed records for recent inspection/cleaning activities to verify that the cleaning method, and established frequency, were adequate to maintain thermal performance in accordance with the system design basis. Additionally, the inspectors reviewed recent eddy current (EC) examination reports to verify that tube integrity was being assessed, and that the number of tubes plugged were within the plugging limits in design basis calculations.

For the CS heat exchangers 1A and 2A, the inspectors reviewed records for recent inspection/cleaning activities to verify that the cleaning method, and established frequency, were adequate to maintain thermal performance in accordance with the system design basis. The inspectors also verified that the heat exchangers were maintained in wet layup configuration, as described in the licensee's response to Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment." Additionally, the inspectors reviewed recent EC examination reports to verify that tube integrity was being assessed, that heat exchanger operation was not resulting in excessive flow induced vibration, and that the number of tubes plugged were within the plugging limits in design basis calculations.

The inspectors' review of performance testing and inspection/cleaning methodologies for the selected heat exchangers verified that licensee's activities were adequate to detect degradation prior to loss of heat removal capabilities below design basis values, and consistent with the licensee's regulatory commitments in response to GL 89-13. The inspectors' review included periodic flow testing records at or near maximum design flow, to verify flow through each heat exchanger was consistent with the system design basis. The inspectors also reviewed system health reports to determine whether the licensee's chemical treatment programs for corrosion, and fouling control, were effective in preventing system degradation. The inspectors also conducted a walk-down of the selected heat exchangers to verify that visible conditions adverse to quality were identified and corrected. The walk-down included verification that local and main control room instrumentation was functional in accordance with the systems' design basis, and that no indications of water hammer damage existed.

In addition to the heat exchangers, the inspectors reviewed a sample of ultimate heat sink (UHS) inspection attributes, as described in the next paragraphs, to verify the performance of the UHS, and its subcomponents, was adequate to ensure availability and accessibility to the in-plant cooling water systems.

The inspectors reviewed survey records of the intake underwater reef to verify the licensee had established a program to identify degradation, and determine whether sufficient reservoir capacity was available to perform its design basis function. During the walk-down, the inspectors verified that the riprap protection of the intake canal was in place, and that vegetation present along the slopes of the intake canal was maintained to prevent adverse effects on the function of the UHS.

The UHS inspection sample also included a walk-down of the Unit 1 and 2 intake pumping station and ERCW system, to assess the material condition and functionality of accessible structures and components such as strainers, pumps, instrumentation, and component supports. The inspectors selected ERCW strainer A1-AA and traveling screen 1A for an in-depth review of routine backwash operation, and visual inspection records. In addition, the inspectors interviewed plant staff and reviewed inspection records for visual inspections of the intake structure to determine whether structural integrity and pump bay silt accumulation was monitored, trended, and maintained. During the walk-down, the inspectors interviewed plant staff to assess the operation of the ERCW system and UHS, including functionality during adverse weather conditions and monitoring, trending, and control of macro-fouling to prevent clogging. The inspectors also reviewed history of through wall leaks in ERCW piping to verify the licensee dispositioned the leaks, in accordance with the applicable piping integrity standards.

Additionally, the inspectors reviewed CA documents related to the ERCW system and UHS performance issues to determine whether the licensee had an appropriate threshold for identifying issues, and to evaluate the effectiveness of the CAs. The documents reviewed are listed in the Attachment to this report. The inspector completed three heat exchanger and one heat sink sample as defined in IP 71111.07.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Quarterly Review

a. Inspection Scope

The inspectors performed one licensed operator requalification program review. The inspectors evaluated a simulator session on July 23, 2015. The training scenario was conducted in accordance with Simulator Exercise Guide (SEG) #S-83. SEG #S-83 involved a trip of a main feed-water pump with no associated turbine runback as well as a large break LOCA without an automatic containment sump swap over. The inspectors observed crew performance in terms of: communications; ability to take timely and proper actions; prioritizing, interpreting and verifying alarms; correct use and implementation of procedures, including the alarm response procedures; timely control board operation and manipulation, including high risk operator actions; oversight and direction provided by shift manager, including the ability to identify and implement

appropriate TS action; and, group dynamics involved in crew performance. The inspectors also observed the evaluators' critique and reviewed simulator fidelity to verify that it matched actual plant response. Documents reviewed are listed in the Attachment. This activity constituted one inspection sample, as defined in IP 71111.11.

b. Findings

No findings were identified

.2 Quarterly Review of Licensed Operator Performance

a. Inspection Scope

The inspectors observed and assessed licensed operator performance in the main control room during periods of heightened activity or risk. The inspectors reviewed various licensee policies and procedures such as OPDP-1, Conduct of Operations, NPG-SPP-10.0, Plant Operations, and 0-GO-5, Normal Power Operation. The inspectors utilized activities such as post-maintenance testing, surveillance testing, unplanned transients, infrequent plant evolutions, plant startups and shutdowns, reactor power and turbine load changes, and refueling and other outage activities to focus on the following conduct of operations as appropriate:

- 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

Specifically, the inspectors observed licensed operator performance during the following activities:

- Unit 1 reactor startup on July 31
- Unit 1 main generator sync to the grid on August 15

Documents reviewed are listed in the Attachment. This activity constituted one inspection sample, as defined in IP 71111.11.

b. Findings

No findings were identified

1R12 Maintenance Effectiveness (71111.12)a. Inspection Scope

The inspectors reviewed the maintenance activities, issues, and/or systems listed below to verify the effectiveness of the licensee's activities in terms of: appropriate work practices; identifying and addressing common cause failures; scoping in accordance with 10 CFR 50.65(b); characterizing reliability issues for performance; trending key parameters for condition monitoring; charging unavailability for performance monitoring; classification in accordance with 10 CFR 50.65(a)(1) or (a)(2); appropriateness of performance criteria for structure, system, or components (SSCs) and functions classified as (a)(2); and appropriateness of goals and CAs for SSCs and functions classified as (a)(1). Documents reviewed are listed in the Attachment. The inspectors completed three samples, as defined in IP 71111.12.

- Cause Determination Evaluation (CDE) 2788 – Unit 1 'A' 480V Board Room Chiller
- CDE 2805 – 'A' train 6.9 KV Shutdown Board Room Chiller failure
- CDE 2806 – 'B' train 6.9 KV Shutdown Board Room Chiller failure

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)a. Inspection Scope

The inspectors reviewed the six maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk management actions. The inspectors also verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the CAP. Additionally, for maintenance resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities. Documents reviewed are listed in the attachment. The inspectors completed six samples, as defined in IP 71111.13.

- Main Generator VR Failure - ODMI for Main Generator Voltage Regulator (Condition Report (CR) 1068605)
- 2B RHR and 2B Containment Spray Pump Outage
- A train Auxiliary Air Compressor outage
- Unit 1 Steam-driven Auxiliary feed-water (AFW) pump maintenance
- Emergent failure of Unit 1 Loop 3 cold leg resistance temperature device
- Emergent failure of Unit 1 'A' Solid State Protection System under-voltage card

b. Findings

Inadequate Clearance Causes damage to 'A' train Solid State Protection System

Introduction. A self-revealing Green NCV of Units 1 TS 6.8.1.a, Administrative Controls (Procedures), was identified for the licensee's failure to establish an adequate clearance boundary in preparation for maintenance activities on the Unit 1 'B' Reactor Trip Bypass (BYB) circuit breaker

Description. On September 17, 2015, with Unit 1 in Mode 3 following a recent reactor trip, a ground alarm on the vital battery direct current bus II ('B' train) was received in the control room. The ground was received during the performance of SI-93, "Reactor Trip Instrumentation Functional Tests" Rev. 32. The ground isolation procedure isolated the ground to the BYB breaker. Work order (WO) 117175043 was generated in order to troubleshoot and repair the ground within the BYB breaker.

On September 19, following completion of WO 117175043, during the performance of testing on the BYB breaker, technicians noted there was a standing trip signal on BYB breaker. Subsequent trouble shooting revealed that the 'A' Solid State Protection System (SSPS) under-voltage (UV) card was damaged and indicated 0 volts not the expected 48 volts. The licensee determined that during execution of WO 117175043, the technician accidentally shorted across the energized UV relay associated with the 'A' train SSPS. This error resulted in the damage to the UV relay. Due to the design and configuration of the reactor trip bypass breakers, the opposite train SSPS UV relay feeds each bypass breaker and should have been de-energized as part of the clearance boundary established for WO 117175043.

The licensee determined that the 'A' train SSPS card needed to be replaced which involved removing from service the 'A' train actuation circuits associated with safety injection and containment isolation. On September 19, the licensee replaced the 'A' train SSPS card under WO 117177680.

Analysis. The licensee's failure to adequately isolate all energy sources within the BYB prior to maintenance as required by NPG-SPP-10.2, "Clearance Procedure to Safely Control Energy," Revision 2, Step 1.0.A, was a performance deficiency. The finding was determined to be greater than minor because it was associated with the human performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in damage to the 'A' SSPS.

The inspectors performed the SDP using NRC IMC 0609, "Significance Determination Process, Attachment 0609.04, "Initial Characterization of Findings," Appendix A., The finding was screened using IMC 0609 Appendix A Exhibit 2, and was determined to be of very low safety significance (Green) because the finding did not represent an actual loss of function of one or more non-Technical Specification Trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for more than 24 hours. Using Manual Chapter 0310, "Aspects Within the

Cross-Cutting Areas,” the inspectors identified a cross-cutting aspect in the “Resources” component of the Human Performance area, because the leaders failed to ensure that personnel, equipment, procedures, and other resources were available and adequate to support nuclear safety [H.1]

Enforcement. Unit 1 TS 6.8.1.a requires, in part, that written procedures be established, implemented, and maintained covering the activities specified in Appendix A, “Typical Procedures for Pressurized Water Reactors and Boiling Water Reactors,” of Regulatory Guide (RG) 1.33, “Quality Assurance Program Requirements (Operations),” Revision 2, dated February 1978. RG 1.33 Appendix A, Section 1, “Administrative Procedures,” requires written procedures for equipment control (e.g., locking and tagging). Procedure NPG-SPP-10.2, “Clearance Procedure to Safely Control Energy,” Revision 2, is the plant procedure that implements this requirement by safely controlling hazardous energy. NPG-SPP-10.2 states, in part, that this procedure is used to ensure that before performing work on machines or equipment where the unexpected energizing, start up, or release of stored energy could occur and cause injury or property damage, the machine or equipment is isolated from its energy source and rendered non-operative. Contrary to TS 6.8.1.a, on September 17, 2015, the licensee failed to adequately establish a clearance that isolated the power from the UV card located in the ‘A’ train SSPS while performing maintenance within the BYB breaker. This lack of isolation led to the inadvertent electrical shorting and ultimate damage to the ‘A’ SSPS card. Because this violation is of very low safety significance and been entered into the licensee’s CAP as CR 1083349, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000327/2015003-01, Inadequate Clearance Causes damage to ‘A’ train SSPS.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

For the three operability evaluations described in the CRs listed below, the inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available, such that no unrecognized increase in risk occurred. The inspectors compared the operability evaluations to UFSAR descriptions to determine if the system or component’s intended function(s) were adversely impacted. In addition, the inspectors reviewed compensatory measures implemented to determine whether the compensatory measures worked as stated and the measures were adequately controlled. The inspectors also reviewed a sampling of CRs to assess whether the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment. The inspectors completed three samples, as defined in IP 71111.15.

- CR 984618, Pin hole leak 1B ERCW leak on header to ECCS room coolers
- CR 1060105, Westinghouse Mass and Energy release calculation error
- CR 1018384, 2A DG frequency did not meet the acceptance criteria of 2-SI-OPS-082-007.A

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below and the associated 10 CFR 50.59 screening, and compared it against the UFSAR and TS to verify whether the modification affected operability or availability of the affected system.

- SQN-1-2015-057-001, Voltage Regulator Monitoring Equipment

Following installation and testing, the inspectors observed indications affected by the modification, discussed them with operators, and verified that the modification was installed properly and its operation did not adversely affect safety system functions. Documents reviewed are listed in the Attachment. The inspectors completed one sample, as defined in IP 71111.18.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests associated with the five WOs listed below to assess whether procedures and test activities ensured system operability and functional capability. The inspectors reviewed the licensee's test procedure to evaluate whether: the procedure adequately tested the safety function(s) that may have been affected by the maintenance activity; the acceptance criteria in the procedure were consistent with information in the applicable licensing basis and/or design basis documents; and the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed the test data to determine whether test results adequately demonstrated restoration of the affected safety function(s). Documents reviewed are listed in the Attachment. The inspectors completed five samples, as defined in IP 71111.19.

- WO116109358, EDG Exhaust Fan 480 Volt breaker PM
- WO115892738, Aux Air compressor A rebuild
- WO 116271442, Aux Building High Energy Line Break (HELB) temperature recorder calibration
- WO 115897881, 2B EDG 2 year Inspection

- WO 116066454, 2B EDG Electronic Governor Control Card maintenance

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

.1 Unit 1 Forced Outage (July 24 – July 26)

a. Inspection Scope

Following the automatic trip of Unit 1 on July 24, 2015, the licensee maintained Unit 1 in Mode 3 until conditions to support restart were established on July 26, 2015. The inspectors observed portions of the plant startup including reactor criticality and power ascension. The inspectors verified that mode changes were performed in accordance with plant TS. This inspection satisfied one inspection sample for Outage Activities, as defined in IP 71111.20.

b. Findings

No findings were identified.

.2 Unit 1 Forced Outage (July 27 – July 31)

a. Inspection Scope

Following the automatic trip of Unit 1 on July 27, 2015, the licensee maintained Unit 1 in Mode 3 until conditions to support restart were established on July 31, 2015. The inspectors observed portions of the plant startup including reactor criticality and power ascension. The inspectors verified that mode changes were performed in accordance with plant TS. This inspection satisfied one inspection sample for Outage Activities, as defined in IP 71111.20.

b. Findings

No findings were identified.

.3 Unit 1 Forced Outage (August 8 – August 15)

a. Inspection Scope

Following the controlled shutdown of the Unit 1 reactor on August 8, 2015, the licensee maintained Unit 1 in Mode 3 until conditions to support restart were established on August 15, 2015. The inspectors observed portions of the plant startup including reactor criticality and power ascension. The inspectors verified that mode changes were performed in accordance with plant technical specifications. This inspection satisfied one inspection sample for Outage Activities, as defined in IP 71111.20.

b. Findings

No findings were identified.

.4 Unit 1 Forced Outage (September 14 – September 19)

a. Inspection Scope

Following the manual trip of Unit 1 on September 14, 2015, the licensee maintained Unit 1 in Mode 3 until conditions to support restart were established on September 19, 2015. The inspectors observed portions of the plant startup including reactor criticality and power ascension. The inspectors verified that mode changes were performed in accordance with plant TS. This inspection satisfied one inspection sample for Outage Activities, as defined in IP 71111.20.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

For the three surveillance tests identified below, the inspectors assessed whether the SSCs involved in these tests satisfied the requirements described in the TS surveillance requirements, the UFSAR, applicable licensee procedures, and whether the tests demonstrated that the SSCs were capable of performing their intended safety functions. This was accomplished by witnessing testing and/or reviewing the test data. Documents reviewed are listed in the Attachment. The inspectors completed three samples, as defined in IP 71111.22.

In-Service Tests:

- 1-SI-SXP-062-203.0, 1A and 1B CCP Comprehensive Section XI Test, Rev. 11

RCS leakage test:

- 0-SI-OPS-068-137.0, Reactor Coolant System Water Inventory, Rev. 23

Routine Surveillance Tests:

- 0-SI-NUC-000-007.0 Measurement of At Power MTC, Revision 18 (Unit 2)

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

Resident inspectors evaluated the conduct of routine licensee simulator exercise on July 23, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulated control room to verify that event classification and notifications were done in accordance with EPIP-1, Emergency Plan Classification Matrix, Revision 52. The inspectors also attended the licensee critique of the drill to compare any inspector observed weakness with those identified by the licensee in order to verify whether the licensee was properly identifying deficiencies. The inspectors completed one sample, as defined in IP 71114.06.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

4OA1 Performance Indicator (PI) Verification (71151)

a. Inspection Scope

The inspectors sampled licensee submittals for the 12 PIs listed below for the period from July 1, 2014 through June 30, 2015 for both Unit 1 and Unit 2. Definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Indicator Guideline, Revision 6, were used to determine the reporting basis for each data element in order to verify the accuracy of the PI data reported during that period.

Cornerstone: Mitigating Systems

- Mitigating Systems Performance Index (MSPI): Emergency AC Power
- MSPI: High Pressure Injection System
- MSPI: Heat Removal System (AFW)
- MSPI: Residual Heat Removal System
- MSPI: Cooling Water System
- Safety System Functional Failures

The inspectors reviewed portions of the operations logs and raw PI data developed from monthly operating reports and discussed the methods for compiling and reporting the PIs with engineering personnel. The inspectors also independently calculated selected

reported values to verify their accuracy and compared graphical representations from the most recent PI report to the raw data to verify that the data was correctly reflected in the report. Specifically for the MSPI, the inspectors reviewed the basis document and derivation reports to verify that the licensee was properly entering the raw data as suggested by NEI 99-02. For Safety System Functional Failures, the inspectors also reviewed licensee evaluation reports (LERs) issued during the referenced timeframe. Documents reviewed are listed in the Attachment. The inspectors completed 12 samples, as defined in IP 71151.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Daily Review

a. Inspection Scope

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

b. Findings and Observations

No findings were identified.

.2 Selected Issue Follow-up: PER 1016839, "Loose Parts Surveillance Specimen Capsule Root Cause"

a. Inspection Scope

The inspectors reviewed a sample of ISI-related issues entered into the CAP to determine if the licensee had appropriately described the scope of the problem, and had initiated CAs. Specifically, the inspectors reviewed the licensee's causal analysis PER 1016839 regarding dropped surveillance specimen capsules. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. Documents reviewed are listed in the attachment. The inspectors completed one sample, as defined in IP 71152.

b. Findings

Introduction. A self-revealing Green NCV of licensee TS 6.8.1.a, was identified for the licensee's failure to implement a procedure related to quality. Specifically, procedures

NPG-SPP-07.3 and NPG-SPP.07.7 were not followed when the licensee failed to appropriately categorize the risk category for the surveillance capsule relocation as “high” and create the Risk Management Plan for this activity. The licensee subsequently failed to recognize the contractor was deviating from the required capsule relocation procedure and halt work accordingly.

Description. Subsequent to the completion of the Unit 1 19th (U1R19) refueling outage in October 2013 and approximately eight days after the reactor coolant pumps were restarted, a Loose Parts Monitoring System (LPMS) alarm was received in the main control room. Following an investigation, the loose part was estimated to weigh approximately one pound and was located in the lower vessel region. There were no indications of any loose parts on the LPMS prior to the U1R19 outage. When Unit 1 shutdown for the U1R20 refueling outage in April 2015, a search for the loose part commenced. Loose parts, consistent with those inside the reactor vessel surveillance capsules, were found by visual observation to be attached to the bottom of some fuel filter screens during defueling. Following removal of the core barrel, it was determined that two specimen capsules were not in their appropriate holders.

During the U1R19 refueling outage, the licensee contracted vendor services to relocate two of the reactor vessel surveillance capsules. The reactor vessel surveillance capsules are physically located inside the reactor vessel in baskets attached to the external wall of the core barrel. A Phase 1 Risk Analysis of the work was completed during work planning, per procedure NPG-SPP-07.3, Work Activity Risk Management, Revision 12. The work was evaluated to be low risk. Because of this low risk evaluation, no additional oversight actions beyond normal work control procedures were required to implement this maintenance activity. Whereas, a high risk categorization would have required a Risk Management Plan to be created for the capsule relocation with associated greater attention to the activity, including potential increased licensee oversight of contract personnel. Attachment 2 of the NPG-SPP-07.3 states, in part, “If the work involves, or has the potential to affect (close proximity), any of the following: Fission Product Barriers, Irradiated Fuel Channel or Cladding, Reactor Vessel or piping, ... then the risk is characterized as high.” The surveillance capsules are within the reactor vessel; therefore, this activity was in close proximity and had the potential to affect the reactor vessel and piping and should have been evaluated as high risk.

The work to relocate the surveillance capsules occurred on October 25, 2013. The contractor crew and the licensee’s Contract Technical Steward (CTS) conducted a pre-job brief, including a review of procedural compliance expectations, prior to initiating the work. The crew commenced work, but encountered several challenges in reactor vessel configuration or equipment failures that prompted them to deviate from the procedure in order to accomplish the work. The challenges included, but were not limited to: the camera was not used to observe installation of the relocated capsules from an adjacent position for lowering the capsules into position; pressing of the capsule into the specimen holder; and a lack of visual verification of capsule positioning.

Although, the CTS was informed what was happening, the CTS was not told specifically these issues resulted in deviations from the written procedure; nor did the CTS recognize these as deviations from the procedure. Procedure NPG-SPP-07.7, “NPG

TCM Role and Oversight of Supplemental Personnel,” Revision 0, requires contractors to perform procedures with verbatim compliance or otherwise, stop work. Additionally, the procedure requires the Task Manager (TM) to be familiar with the procedures in use by supplemental personnel, so the TM can monitor contractor performance and recognize deviations to procedures in use. Since no other licensee personnel were assigned these duties, the responsibilities of the TM were placed on the CTS by default, and were not implemented in accordance with specified guidance.

Analysis. The licensee’s failure to implement procedures related to quality during the Unit 1 surveillance capsule relocation activity as required by TS 6.8.1.a. was a performance deficiency. Specifically, procedures NPG-SPP-07.3 and NPG-SPP.07.7 were not followed when the licensee failed to appropriately categorize the risk category for the surveillance capsule relocation as high, and create the Risk Management Plan for this activity. The licensee subsequently failed to recognize the contractor was deviating from the required capsule relocation procedure and halt work accordingly. This finding was determined to be greater than minor because it was associated with the Human Performance attribute of the Barrier Integrity Cornerstone, and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the performance deficiency resulted in the failure to properly secure reactor vessel surveillance capsules and the subsequent damage to the reactor vessel pressure boundary, reactor internals and fuel filter screens. The inspectors used IMC 0609, “Significance Determination Process,” Attachment 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” dated June 19, 2012, and Appendix A “The Significance Determination Process for Findings At-Power,” also dated June 19, 2012, and determined that the finding was of low safety significance (Green) because it did not represent an actual failure of the reactor pressure vessel pressure boundary, or the ability to interfere with any mitigating systems during a LOCA.

Using Manual Chapter 0310, “Aspects Within the Cross-Cutting Areas,” the inspector identified a cross-cutting aspect in the “Consistent Processes” component of the Human Performance area because , the licensee failed to consistently incorporate risk insights, as required by procedure NPG-SPP-07.3.

Enforcement. TS 6.8.1.a states, in part, that written procedures shall be established, implemented and maintained covering specific activities, to include procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. The procedures listed in Regulatory Guide 1.33, Revision 2 include procedures for the control of maintenance, repair, replacement, and modification work.

Contrary to the above, during the Unit 1 refueling outage in October 2013, the licensee failed to properly implement procedures for the control of maintenance, repair, replacement, and modification work. Specifically, the licensee failed to implement the requirements of NPG-SPP-07.3, Work Activity Risk Management, Revision 12 and NPG-SPP-07.7, NPG TCM Role and Oversight of Supplemental Personnel, Revision 0, by not properly categorizing the surveillance capsule relocation as high risk and developing a Risk Management Plan for the activity; and failing to stop work when an approved

contractor procedure was not being followed. Because this finding is of very low safety significance, and has been entered into the licensee's CAP as PER 1016839, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000327/2015003-02, Failure to Implement Work Risk Activity and Oversight of Supplemental Personnel Procedures.

4OA3 Follow-up of Events (71153)

.1 (Closed) LER 050000328/2015-001-00, "Automatic Reactor Trip due to Failure of Main Generator C-phase Neutral Current Transformer Cable"

a. Inspection Scope

On March 2, 2015, Unit 2 reactor automatically tripped following a turbine trip due to actuation of the main generator 287G differential relay. The relay actuation was a result of a failure of the main generator C-phase neutral current transformer (CT) cable. The safety systems performed as designed for the reactor trip. The event was documented in the licensee CAP as CR 993743.

The inspectors reviewed the LER, CR and Root Cause Evaluation Report to verify that the cause of the failed main generator C-phase neutral CT cable was identified and that CAs were appropriate. A broken splice connection was identified between the 287G differential relay and the C-phase CT. This main generator C-phase neutral CT cable failed open due to a combination of corrosion and periodic physical manipulation. The cause of this event was a lack of inspections in the preventive maintenance procedure to identify potential failure mechanisms. Prior to restart, both Unit 2 C-phase neutral CTs and one B-phase neutral CT along with all associated neutral side field cables were replaced. The inspectors concluded that the licensee's CAs were appropriate, including replacement of all Unit 1 and Unit 2 main generator CT bolted connections with solder filled splices, covered in Raychem to prevent water intrusion.

The inspectors discussed the trip with operations, engineering, and licensee management personnel to gain an understanding of the event and assess follow-up actions. The inspectors reviewed operator actions taken to determine whether they were in accordance with licensee procedures and TS, and reviewed unit and system indications to verify whether actions and system responses were as expected and designed. The inspectors verified that timely notifications were made in accordance with 10 CFR 50.72, that licensee staff properly implemented the appropriate plant procedures, and that plant equipment performed as required. This LER is closed.

b. Findings

No findings were identified.

.2 Unit 1 Automatic Reactor Trip

a. Inspection Scope

On July 24, 2015, the inspectors responded to an automatic reactor trip on Unit 1 due to an electrically-induced turbine trip caused by a main generator voltage regulator malfunction. The inspectors evaluated plant status, mitigating actions, and the licensee's classification of the event, to enable the NRC to determine an appropriate NRC response. The inspectors discussed the trip with operations, engineering, and licensee management personnel to gain an understanding of the event and assess follow-up actions. The inspectors reviewed operator actions taken to determine whether they were in accordance with licensee procedures and TS, and reviewed unit and system indications to verify whether actions and system responses were as expected and designed. The inspectors found that operators responded to the situation appropriately and in accordance with plant procedures, and that plant systems responded to the trip as designed. The inspectors also reviewed the initial licensee notifications to verify that they met the requirements specified in NUREG-1022, "Event Reporting Guidelines." The event was reported to the NRC as EN 51259, and documented in the licensee's CAP as CR 1062507.

b. Findings

No findings were identified.

.3 Unit 1 Automatic Reactor Trip

a. Inspection Scope

On July 27, 2015, the inspectors responded to an automatic reactor trip on Unit 1 due to an electrically-induced turbine trip caused by a main generator voltage regulator malfunction. The inspectors evaluated plant status, mitigating actions, and the licensee's classification of the event, to enable the NRC to determine an appropriate NRC response. The inspectors discussed the trip with operations, engineering, and licensee management personnel to gain an understanding of the event and assess follow-up actions. The inspectors reviewed operator actions taken to determine whether they were in accordance with licensee procedures and TS, and reviewed unit and system indications to verify whether actions and system responses were as expected and designed. The inspectors found that operators responded to the situation appropriately and in accordance with plant procedures, and that plant systems responded to the trip as designed. The inspectors also reviewed the initial licensee notifications to verify that they met the requirements specified in NUREG-1022, "Event Reporting Guidelines." The event was reported to the NRC as event notification 51265, and documented in the licensee's CAP as CR 1063215.

b. Findings

No findings were identified.

.4 Unit 1 Automatic Reactor Trip

a. Inspection Scope

On September 14, 2015, the inspectors responded to Unit 1 due to a manual reactor trip directed by the site's abnormal operating procedure due to a loss of the 1-II 120 volt vital AC instrument bus. The inspectors evaluated plant status, mitigating actions, and the licensee's classification of the event, to enable the NRC to determine an appropriate NRC response. The inspectors discussed the trip with operations, engineering, and licensee management personnel to gain an understanding of the event and assess follow-up actions. The inspectors reviewed operator actions taken to determine whether they were in accordance with licensee procedures and TS, and reviewed unit and system indications to verify whether actions and system responses were as expected and designed. The inspectors found that operators responded to the situation appropriately and in accordance with plant procedures, and that plant systems responded to the trip as designed. The inspectors also reviewed the initial licensee notifications to verify that they met the requirements specified in NUREG-1022, "Event Reporting Guidelines." The event was reported to the NRC as EN 51392, and documented in the licensee's CAP as CR 1081482.

b. Findings

No findings were identified.

4OA5 Other Activities

(Closed) Unresolved Item (URI) 05000327/2015002-02, Spilled Specimen Capsule

a. Inspection Scope

The inspectors opened URI 05000327/2015002-02, "Spilled Specimen Capsule," as a result of numerous loose parts that were discovered in the bottom of the Unit 1 reactor vessel during the spring outage of 2015. The loose parts were suspected to be from two missing specimen capsules that were not in their expected holding baskets located on the side of the core barrel. The inspectors performed a more detailed review of this issue in Section 4OA2 of this report and noted one NCV as a result of the issue. URI 05000327/2015002-02, "Spilled Specimen Capsule" is considered closed.

b. Findings

One NCV was identified. (See Section 4OA2)

4OA6 Meetings, Including Exit

Exit Meeting Summary

On October 15, 2015, the resident inspectors presented the inspection results to Mr. Rasmussen and other members of his staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

J. Alfultis, Senior Manager Site Projects
J. Carlin, Site Vice President
G. Garner, Director Work Management
M. Giacini, Director Plant Support
M. Halter, Senior Manager Radiation Protection
M. Henderson, Manager Engineering Programs
J. Johnson, Manager Site Licensing
A. Little, Senior Manager Nuclear Site Security
T. Marshall, Director Operations
M. McBrearty, Manager Emergency Preparedness
S. McCamy, Quality Assurance Manager
W. Pierce, Director Engineering
P. Pratt, Plant Manager
M. Rasmussen, Director Maintenance
K. Smith, Director Training

NRC personnel

A. Hon, Project Manager, Office of Nuclear Reactor Regulation

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000327/2015003-01	NCV	Inadequate Clearance Causes damage to 'A' train SSPS (Section 1R13)
05000327/2015003-02	NCV	Failure to Implement Work Risk Activity and Oversight of Supplemental Personnel Procedures (Section 4OA2)

Closed

05000327/2015002-02	URI	Spilled Specimen Capsule (Section 4OA5)
050000328/2015-001-00	LER	Automatic Reactor Trip due to Failure of Main Generator C-phase Neutral Current Transformer Cable (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

Section R01: Adverse Weather Protection

Procedures

AOP-N.03, Flooding, Revision 53 & 54

NPG-SPP-09.22, External Flood Protection Program, Revision 1

Other documents

OPL271AOP-N.03, Flooding, Revision 4

SQN-DC-V-47.0, Flood Mode Mitigation System, Revision 1

1, 2-47WHYD-ERCW, External Flood Hazard Barriers ERCW Pumping Station, Revision 2

0-TI-DXX-000-922.1, External Flood Protection Program (EFPP), Revision 2

0-TI-DXX-000-922.0, EFPP Bases Document, Revision 1

Section R04: Equipment Alignment

Procedures

0-SO-74-1, Residual Heat Removal System. Revision 97

AOP-R.03, RHR System Malfunctions, Revision 32

Other documents

0-47W810-1, Flow Diagram Residual Heat Removal System, Revision 53

1-47W809-1, Flow Diagram Chemical Volume and Control System, Revision 79

2-47W809-1, Flow Diagram Chemical Volume and Control System, Revision 75

FSAR Sections

5.5.7, Residual Heat Removal System

5.2.2, Reactor Coolant System over Pressurization Protection

Section R05: Fire Protection

Procedures

FPDP-1, Conduct of Fire Protection, Revision 4

0-PI-FPU-317-299.W, Att. 8, Shift Check List, Revision 40

NPG-SPP-18.4.7, Control of Transient Combustibles, Rev. 7

EITP-100, Environmental Compliance, Rev. 7

0-SI-FPU-410-703.0, Inspection of FPR Required Fire Doors, Rev. 6

SQN-FPR-Part-II, SQN Fire Protection Report Part II – Fire Protection Plan, Revision 33

Condition Reports (CR)

1072257, Appendix R Emergency Light R014 battery indicator in yellow area

Other documents

ERCW-0-704-00, Fire Protection Pre-Fire Plans ERCW El. 704, Revision 2
 ERCW-0-720-00, Fire Protection Pre-Fire Plans ERCW El. 720, Revision 3
 AUX-0-734-00, Overall Map of El. 734 showing PFP divisions, Revision 4
 AUX-0-734-01, Aux. Building El. 734 Unit 1 Side Board Rooms, Revision 8
 AUX-0-734-02, Aux. Building El. 734 Unit 2 Side Board Rooms, Revision 7
 AUX-0-734-03, Aux. Building El. 734 Col. U to X, Revision 8
 AUX-0-749-00, Overall Map of El. 749 showing PFP divisions, Revision 4
 AUX-0-749-01, Aux. Building El. 749 Unit 1 Side, Revision 7
 AUX-0-749-02, Aux. Building El. 749 Unit 2 Side, Revision 8

Section R06: Flood Protection MeasuresProcedures

AOP-M.08, Internal Flooding, Rev. 3

Calculations

MDN-000-000-2010-0203, Internal Flooding Analysis, Rev. 3

Other documents

TVA letter to NRC dated May 4, 2007. TVA response to GL 2007-01

Section 1R07: Heat Sink PerformanceProcedures

0-PI-CEM-000-460.4, ERCW Quaternary Amine Treatment Monitoring Rev. 28
 0-PI-CEM-000-460.6, RCW Quaternary Amine Treatment Monitoring, Rev. 7
 0-SO-67-3, ERCW Strainers and Traveling Screens, Rev. 29
 0-TI-SXX-000-146.0, Program for Implementing NRC Generic Letter 89-13, Rev. 4
 2-SI-OPS-082-007.B, Electrical Power System Diesel Generator 2B-B, Rev. 61
 NPG-SPP-09.14, Generic Letter (GL) 89-13 Implementation, Rev. 3

Calculations

EDMS B84131101001, Containment Spray Heat Exchanger UA Value and Tube Plugging Limits, Rev. 6
 EDMS B87071217002, Emergency Diesel Generator (EDG) ERCW Heat Exchanger Evaluation for 87F, Rev. 3
 EDMS B87141022007, Containment Spray Heat Exchanger UA Value and Tube Plugging Limits, Rev. 7
 EDMS B87150209005, SQN-CCS Plate Heat Exchangers 0B1 & 0B2 Train B ERCW Flow Requirements, Rev. 7
 EDMS B87150209008, SQN-CCS Plate Heat Exchangers 1A/2A ERCW Flow Requirements, Rev. 10

Heat Exchanger Inspection/Cleaning Reports

EDMS# - L18 111130 802, Eddy Current Examination Report Emergency Diesel Generator Jacket Water Coolers 2A1,2A2 & 2B1,2B2, November 2011

EDMS# L18150302800, Eddy Current Examination Report Containment Spray 1A,
February 2015

EDMS#: L18 140528 804, Eddy Current Examination Report Containment Spray 2A, May 2014
WO 111233575, GL 89-13 Heat Exchanger Visual Inspection and Evaluation – D/G Water
Cooler 2A-1, 11/28/2011

WO 111233577, GL 89-13 Heat Exchanger Visual Inspection and Evaluation – D/G Water
Cooler 2A-2, 11/28/2011

WO 113323540, CCS HX OB1 Clam Inspection, Special Perform, 5/25/2012

WO 114026619, 2A1 CCS HX Requires Cleaning Due to Increase in Fouling Factor, 11/28/2012

WO 115775098, Containment Spray Heat Exchanger 2A Clam Inspection, 11/25/2014

WO 115960819, Inspect DG Water Cooler 2A-1 for Clams, MIC, and Other Degradation,
2/9/2015

WO 115960829, Inspect DG Water Cooler 2A-2 for Clams, MIC, and Other Degradation,
2/9/2015

WO 116006443, Containment Spray Heat Exchanger 1B Clam Inspection, 1/19/2015

Heat Exchanger Performance Testing Records

WO 113682312, 2R19 Thermal Performance Test Using Single Tube Tester, May 2014

WO 113880600, 2-PI-SFT-070-001.0 CCS Heat Exchanger Performance Test – 2A1 & 2A2,
5/12/2014

WO 113881316, 0-PI-SFT-070-002.0 Performance Test CCS Heat Exchangers 0B1 & 0B2,
5/12/2014

WO 115070586, 2-PI-SFT-070-001.0 CCS Heat Exchanger Performance Test – 2A1 & 2A2,
1/30/2014

WO 115547716, 2-PI-SFT-070-001.0 CCS Heat Exchanger Performance Test – 2A1 & 2A2,
8/12/2014

WO 115603109, 0-PI-SFT-070-002.0 Performance Test CCS Heat Exchangers 0B1 & 0B2,
4/9/2015

WO 115713201, 2-PI-SFT-070-001.0 CCS Heat Exchanger Performance Test – 2A1 & 2A2,
11/13/2014

WO 115915965, 2-PI-SFT-070-001.0 CCS Heat Exchanger Performance Test – 2A1 & 2A2,
2/10/2015

WO 116198353, 2-PI-SFT-070-001.0 CCS Heat Exchanger Performance Test – 2A1 & 2A2,
4/21/2015

Ultimate Heat Sink Performance Testing and Inspection Records

0-SO-67-3, ERCW Strainers and Traveling Screens, ERCW Strainers Backwash on 5/19/2014

0-SO-67-3, ERCW Strainers and Traveling Screens, Traveling Screens Backwash on 5/24/2014

0-SO-67-3, ERCW Strainers and Traveling Screens, Traveling Screens Backwash on 5/22/2014

0-SO-67-3, ERCW Strainers and Traveling Screens, Traveling Screens Backwash on 5/20/2014

WO 112987750, ERCW Strainer A1-AA, Inspect the Inside of the ERCW Strainer to Fulfill the
Requirements of SPP-9.7, 9/25/2012

WO 113262058, ERCW Strainer B2B-B, Inspect the Inside of the ERCW Strainer to Fulfill the
Requirements of SPP-9.7, 12/16/2013

WO 113996788, 0-PI-SFT-067-001 A ERCW Train A Flow Monitoring, 2/14/2013

WO 114882858, ERCW Pump Bay B Suction Well BB, 4/23/2014

WO 114997778, 0-SI-SXP-067-202.A ERCW SWP A-A Section Pump Test, 1/17/2014

WO 115226447, Perform Sounding Surveys of the Area Extending in the Eastward Direction from ERCW, 9/15/2014

WO 115268010, 0-SI-SXP-067-202.A ERCW SWP A-A Section Pump Test, 4/16/2014

WO 115475562, 0-SI-SXP-067-202.A ERCW SWP A-A Section Pump Test, 7/13/2014

WO 115955885, ERCW Pump Bay B Suction Well CB, 5/21/2015

WO 115960757, ERCW Pump Bay B Suction Well AA, 5/28/2015

WO 116013109, ERCW Pump Bay B Suction Well CB, 5/12/2015

Corrective Action Documents

CR 1063529, Could Not Monitor For Mollusk Mortality, 7/28/2015

CR 1067941, Potential Observations for NRC Triennial Heat Sink Inspection, 8/6/2015

CR 521691, Eddy Current Test Indicates There Are 46 Tubes That Should Be Plugged, 3/14/2012

CR 757683, Could not Open 2-VLV-67-534B, 7/25/2013

CR 773237, SQN Review BFN-NOER-13-074 RHR and EDG Heat Exchangers Experience Persistent Fouling, 8/29/2013

CR 798800, Eddy Current Test Indicates Tube Plugging For 1A CS HEX, 10/25/2013

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Other Documents

64-950922-800, Revised Program and Status Update Regarding NRC Generic Letter 89-13, 9/22/1995

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SQN-VTDT193-0010, Vendor Manual Thermxchangers, Inc. Heat Exchangers, Rev. 4

Section R12: Maintenance Effectiveness

Procedures

TI-4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting – 10CFR50.65, Revision 27

NPG-SPP-03.4, Maintenance Rule Performance Indicator Monitoring, Trending, and Reporting – 10CFR50.65, Revision 3

Other documents

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CDE 2806 – B 6.9 KV Shutdown Board Room Chiller failure

CDE 2788 – 1A-A 480V BD Room Chiller

Section R13: Maintenance Risk Assessments and Emergent Work Evaluation

Procedures

NPG-SPP-07.3, Work Activity Risk Management Process, Revision 17
 NPG-SPP-07.2.4, Forced Outage or Short Duration Planned Outage Management, Revision 5
 NPG-SPP-07.2, Outage Management, Revision 5
 GOI-6, Apparatus Operations, Revision 172
 0-GO-16, System Operability Checklists, Revision 21
 NPG-SPP-07.3.4, Protected Equipment, Revision 3

Section R15: Operability Evaluations

Procedures

NEDP-22, Operability Determinations and Functional Evaluations, Rev. 16
 OPDP-8, Operability Determination Process/Limiting Conditions for Operation Tracking, Rev. 19
 NPG-SPP-03.5, Regulatory Reporting Requirements, Revision 11

Operability Determinations

CR 984618, Pin hole leak 1B ERCW leak on header to ECCS room coolers (PDO)
 CR 1060105, Westinghouse Mass and Energy release calculation error
 CR 1018384, 2A DG frequency did not meet the acceptance criteria of 2-SI-OPS-082-007.A

Section R18: Plant Modifications

Procedures

NPG-SPP-09.3, Plant Modifications and Engineering Change Control, Revision 20
 NPG-SPP-09.4, 10 CFR 50.59 Evaluations of Changes, Tests, and Experiments, Revision 9
 NPG-SPP-09.5, Modifications Temporary Configuration Changes, Revision 9

Temporary Modifications

SNQ-1-2015-057-001, Voltage Regulator Monitoring Equipment

Section R19: Post Maintenance Testing

Procedures

MMDP-1, Maintenance Management System, Revision 30
 MMDP-3, Guidelines for Planning and Execution of Troubleshooting Activities, Revision 10
 NPG-SPP-06.5, Foreign Material Control, Revision 8
 NPG-SPP-06.1, Work Order Process Initiation, Revision 5
 NPG-SPP-06.3, Pre-/Post-Maintenance Testing, Revision 1
 NPG-SPP-06.9, Testing Programs, Revision 1
 NPG-SPP-06.9.1, Conduct of Testing, Revision 9
 NPG-SPP-06.9.3, Post-Modification Testing, Revision 6

Work Orders

115892738, Aux Air compressor A rebuild

116271442, Aux Building HELB temperature recorder calibration
115897881, 2B EDG 2 year Inspection
116066454, 2B EDG Electronic Gov Ctrl Card maintenance

Section R20: Refueling and Outage Activities

Procedures

FHI-3, Movement of Fuel, Revision 77
0-GO-15, Containment Closure Control, Revision 40
0-GO-13, Reactor Coolant System Drain and Fill Operations, Revision 87
NPG-SPP-08.1, Nuclear Fuel Management, Revision 11
0-PI-OPS-000-011.0, "Containment Access Control During Modes 1-4, Revision 15

Section R22: Surveillance Testing

Procedures

NPG-SPP-06.9.1, Conduct of Testing, Revision 9
0-SI-SXV-072-266.0, ASME Code Valve Testing, Revision 14
0-SI-OPS-068-137.0, Reactor Coolant System Water Inventory, Revision 34
1-SI-SXP-062-203.0, 1A and 1B CCP Comprehensive Section XI Test, Rev. 11
0-SI-OPS-068-137.0, Reactor Coolant System Water Inventory, Rev. 23
0-SI-NUC-000-007.0 Measurement of At Power MTC, Revision 18 (Unit 2)

Section 40A1: Performance Indicator Verification

Procedures

NPG-SPP-02.2, Performance Indicator Program, Revision 7
NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 7

Section 40A2: Identification and Resolution of Problems

Procedures

NPG-SPP-22.300, Corrective Action Program, Revision 4

Section 40A3: Event Followup

Condition Reports

CR 993743
CR 1062507
CR 1081482

ACRONYMS

AC	alternating current
ADAMS	Agencywide Documents Access and Management System
AFW	auxiliary feed-water
AOP	abnormal operating procedure
BYB	reactor trip bypass bravo
CAs	corrective actions
CAP	corrective action program
CCS	component cooling system
CDE	cause determination evaluation
CR	condition report
CS	containment spray
CT	current transformer
CTS	contract technical steward
EC	eddy current
ECCS	emergency core cooling system
EDG	emergency diesel generator
ERCW	emergency raw cooling water
GL	general letter
HELB	high energy line break
IMC	inspection manual chapter
IP	inspection procedure
LER	licensee event report
LOCA	loss of coolant accident
LPMS	loose parts monitoring system
MSPI	mitigating systems performance index
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
OOS	out-of-service
PERs	problem evaluation reports
PI	performance indicator program
RHR	residual heat removal
RG	regulatory guide
RTP	rated thermal power
SDP	significance determination process
SEG	simulator exercise guide
SSCs	structure, system, or components
SSPS	solid state protection system
TM	task manager
TS	technical specification
TVA	Tennessee Valley Authority
UFSAR	updated final safety analysis report
UHS	ultimate heat sink
URI	unresolved item
UV	under-voltage
WO	work order