UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

January 29, 2016

Mr. M. E. Reddemann
Chief Executive Officer
Energy Northwest
P.O. Box 968, Mail Drop 1023
Richland, WA 99352-0968

SUBJECT: COLUMBIA GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000397/2015004

Dear Mr. Reddemann,

On December 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Columbia Generating Station. On January 7, 2016, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. Further, inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the 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, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Columbia Generating Station.

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 IV; and the NRC resident inspector at the Columbia Generating Station.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public

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Sincerely,

/RA/

Ryan E. Lantz
Deputy Director
Division of Reactor Projects

Docket No. 50-397
License No. NPF-21

Enclosure:
Inspection Report 05000397/2015004
w/ Attachment: Supplemental Information

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Letter to M.E. Reddemann from R. Lantz dated January 29, 2016

SUBJECT: COLUMBIA GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000397/2015004

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000397
License:	NPF-21
Report:	05000397/2015004
Licensee:	Energy Northwest
Facility:	Columbia Generating Station
Location:	North Power Plant Loop Richland, WA 99354
Dates:	October 1, 2015 through December 31, 2015
Inspectors:	D. Bradley, Resident Inspector J. Groom, Senior Resident Inspector S. Hedger, Operations Engineer S. Janicki, Project Engineer G. Kolcum, Senior Resident Inspector
Approved By:	Ryan Lantz Deputy Director Division of Reactor Projects

SUMMARY

IR 05000397/2015004; 10/01/2015 – 12/31/2015; Columbia Generating Station; Equipment Alignment

The inspection activities described in this report were performed between October 1 and December 31, 2015, by the resident inspectors at Columbia Generating Station and inspectors from the NRC's Region IV office. One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. Additionally, NRC inspectors documented in this report one licensee-identified violation of very low safety significance. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Cornerstone: Mitigating Systems

- Green. The inspectors reviewed a self-revealing non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to implement Work Order 02048855 during maintenance on a safety-related power panel. Specifically, the licensee operated an incorrect electrical disconnect, E-DISC-7AA-6A. Further, upon realization of the error, maintenance personnel re-energized the E-DISC-7AA-6A circuit without understanding the effects of that action. As a result of this incorrect component operation, the division 1 emergency diesel generator was rendered inoperable. As an immediate corrective action, the licensee stopped all associated maintenance and restored the division 1 emergency diesel generator to operable status by performing the standby alignment procedure. The licensee entered this issue into their corrective action program as Action Request 337018.

  The failure to implement Work Order 02048855 during maintenance on a safety-related power panel was a performance deficiency. This performance deficiency was more than minor, and therefore a finding, because it adversely affected the configuration control attribute of the Mitigating Systems Cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the inspectors determined the finding was of very low safety significance (Green) because the finding did not represent a loss of safety function, did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time, and did not represent an actual loss of function of one or more non-technical specification equipment for greater than 24 hours. The inspectors determined the finding had a cross-cutting aspect in the area of human performance associated with the avoid complacency component because the licensee failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes including implementing appropriate error reduction tools. Specifically, the maintenance staff failed to follow the site's error prevention tool process and operated the incorrect component [H.12]. (Section 1R04)

Licensee-Identified Violations

A violation of very low safety significance that was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and associated corrective action tracking numbers are listed in Section 4OA7 of this report.

PLANT STATUS

The plant began the inspection period at 100 percent power. On November 6, 2015, the plant reduced power to approximately 65 percent to identify locations of potential fuel defects. After suppressing the sector of the core with a small defect by fully inserting control rod 34-23, the plant returned to 100 percent on November 9, 2015. On November 21, 2015, the plant reduced power to approximately 70 percent to identify locations of additional fuel defects. After suppressing the sector of the core with a small defect by fully inserting control rod 22-11, the plant returned to 100 percent power on November 22, 2015. The plant remained at 100 percent power for the remainder of the inspection period.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On November 13, 2015, the inspectors completed an inspection of the station's readiness for impending adverse weather conditions involving high winds. The inspectors reviewed plant design features, the licensee's procedures to respond to high winds, and the licensee's planned implementation of these procedures. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant.

These activities constituted one sample of readiness for impending adverse weather conditions, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walk-downs of the following risk-significant systems:

- October 26, 2015, service water pumphouse ventilation system
- October 27, 2015, containment instrument air system
- November 3, 2015, low pressure core spray system

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems were correctly aligned for the existing plant configuration.

These activities constituted three partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On October 19, 2015, the inspectors performed a complete system walk-down inspection of the division 1 emergency diesel generator. The inspectors reviewed the licensee's procedures and system design information to determine the correct system lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constituted one complete system walk-down sample, as defined in Inspection Procedure 71111.04.

b. Findings

Introduction. The inspectors reviewed a self-revealing, Green, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to implement Work Order 02048855 during maintenance on a safety-related power panel. Specifically, the licensee operated an incorrect electrical disconnect, E-DISC-7AA-6A. Further, upon realization of the error, maintenance personnel re-energized the E-DISC-7AA-6A circuit without understanding the effects of that action. As a result of this incorrect component operation, the division 1 emergency diesel generator was rendered inoperable.

Description. On September 25, 2015, the licensee inspected and performed annual preventative maintenance tasks associated with the division 1 emergency diesel generator (DG1) room's hoist under Work Order (WO) 02048855. After completing the de-energized portions of the work, the electricians connected the hoist to a 480 VAC welding receptacle powered by division 1 vital power (E-MC-7AA). Per step 4.6 of the WO, the electricians contacted operations staff in the main control room to shut electrical disconnect E-DISC-7AA-7B to power the hoist via the welding receptacle. The main control room declined the request to send an operations staff member to shut the disconnect, and, instead, granted permission for the electricians to perform the step. When the electrician operated disconnect E-DISC-7AA-7B with his right hand, he placed his left hand on the switchgear cabinet for stability and inadvertently opened another disconnect, E-DISC-7AA-6A. This incorrect action removed power from the 480 VAC to 120 VAC transformer, E-TR-7AAA, that powers the following loads associated with DG1:

- DG1 room HVAC (E-CP-DHV/1)
- DG1 unit miscellaneous alarms (E-CP-DG/RP1)

- Diesel generator corridor HVAC (E-CP-DGHV/4/1)
- DG1 fuel oil tank instrumentation (E-TB-D1101)
- DG1 generator space heater (DG-H-DG1/H2)

Because alarms sounded on the DG1 control panel, maintenance personnel immediately recognized their error and rapidly shut E-DISC-7AA-6A. Control room staff responded to the alarms, spoke with maintenance staff, stopped all work on DG1, and declared DG1 inoperable at 12:17 p.m. After performing system walkdowns and the standby alignment procedure, SOP-DG1-STBY, "Emergency Diesel Generator (Div 1) Standby Lineup," Revision 20, operations staff declared DG1 operable at 2:45 p.m. As part of an immediate event investigation, the licensee determined that the maintenance staff failed to perform the site's error prevention tool process prior to manipulating the disconnect.

The inspectors determined the licensee failed to follow WO 02048855 and operated an incorrect electrical disconnect that rendered DG1 inoperable. The inspectors noted that Section 7 of licensee procedure MI-1.8, "Conduct of Maintenance," Revision 61, requires maintenance personnel to strictly adhere to procedures and, in the face of uncertainty, stop work and seek assistance. The inspectors determined that the electricians' action to immediately shut E-DISC-7AA-6A, after the first error of opening that disconnect, was contrary to MI-1.8 and the WO.

As an immediate corrective action, the licensee stopped all associated maintenance and restored the division 1 diesel generator to operable status by performing the standby alignment procedure. The licensee entered this issue into their corrective action program as Action Request 337018.

Analysis. The failure to implement Work Order 02048855 during maintenance on a safety-related power panel was a performance deficiency. This performance deficiency was more than minor, and therefore a finding, because it adversely affected the configuration control attribute of the Mitigating Systems Cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the inspectors determined the finding was of very low safety significance (Green) because the finding did not represent a loss of safety function, did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time, and did not represent an actual loss of function of one or more non-technical specification equipment for greater than 24 hours. The inspectors determined the finding had a cross-cutting aspect in the area of human performance associated with the avoid complacency component because the licensee failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes including implementing appropriate error reduction tools. Specifically, the maintenance staff failed to follow the site's error prevention tool process and operated the incorrect component [H.12].

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires, in part, that written procedures be established, implemented and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Section 9.a of Regulatory Guide 1.33, Appendix A, requires that maintenance that can affect the performance of safety-related equipment should be

properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. The licensee established Licensee Work Order 02048855 to meet Regulatory Guide 1.33 requirements. Step 4.6 of Work Order 02048855 required maintenance personnel to, "Coordinate with Operations to CLOSE E-DISC-7AA-7B." Contrary to the above, on September 25, 2015, maintenance personnel failed to coordinate with Operations to close E-DISC-7AA-7B. Specifically, when performing Step 4.6 of Work Order 02048855, the licensee also operated an incorrect electrical disconnect, E-DISC-7AA-6A. As a result of this incorrect component operation, the division 1 emergency diesel generator was rendered inoperable. Further, upon realization of the error, maintenance personnel did not stop work and re-energized the E-DISC-7AA-6A circuit without understanding the effect of that action. As an immediate corrective action, the licensee stopped all associated maintenance work and restored the division 1 emergency diesel generator to operable status by performing the standby alignment procedure. 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 corrective action program as 337018. (NCV 05000397/2015004-01, Incorrect Electrical Component Operated During Maintenance)

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on four plant areas important to safety:

- October 22, 2015, Fire Area RC-9, remote shutdown room
- November 19, 2015, Fire Areas DG-7, DG-8, DG-9, emergency diesel generator day tank rooms for division 1, 2, and 3
- November 24, 2015, Fire Area TG-1/2, turbine building 441' elevation
- December 9, 2015, Fire Areas M-9, M-21, M-73, reactor building instrument rack rooms

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted four quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

.2 Annual Inspection

a. Inspection Scope

On November 19, 2015, the inspectors completed their annual evaluation of the licensee's fire brigade performance. This evaluation included observation of two announced fire drills for periodic training assessment.

During these drills, the inspectors evaluated the capability of the fire brigade members, the leadership ability of the brigade leader, the brigade's use of turnout gear and fire-fighting equipment, and the effectiveness of the fire brigade's team operation. The inspectors also reviewed whether the licensee's fire brigade met NRC requirements for training, dedicated size and membership, and equipment.

These activities constituted one annual inspection sample, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On October 8, 2015, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis, the inspectors chose two plant areas containing risk-significant structures, systems, and components that were susceptible to flooding:

- Radioactive waste building 507 foot elevation, adjacent to the main control room
- Radioactive waste building 501 foot elevation, main control room

The inspectors reviewed plant design features and licensee procedures for coping with internal flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether operator actions credited for flood mitigation could be successfully accomplished.

In addition, on October 6, 2015, the inspectors completed an inspection of underground bunkers susceptible to flooding. The inspectors selected four underground vaults that contained risk-significant or multiple-train cables whose failure could disable risk-significant equipment:

- Manhole E-MH-E10, adjacent to the diesel generator building
- Manhole E-MH-E11, between the service water pumphouses and diesel generator building
- Manhole E-MH-E17A, adjacent to the service water pumphouses
- Manhole E-MH-E17B, adjacent to the service water pumphouses

The inspectors reviewed the material condition of the cables and splices contained in the vaults and looked for evidence of cable degradation due to water intrusion. The inspectors verified that the cables and vaults met design requirements.

These activities constitute completion of one flood protection measures sample and one bunker/manhole sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

On November 2, 2015, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors observed the licensee's implementation of biofouling controls for the residual heat removal heat exchangers and observed the licensee's inspection of residual heat removal heat exchanger RHR-HX-1A during Refueling Outage R-22 to verify the material condition of the heat exchanger internals. Additionally, the inspectors walked down the residual heat removal heat exchangers to observe its performance and material condition and verified that the residual heat removal heat exchangers were correctly categorized under the Maintenance Rule and was receiving the required maintenance.

These activities constitute completion of one heat sink performance annual review sample, as defined in Inspection Procedure 71111.07.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On November 10, 2015, the inspectors observed a portion of an annual requalification test for licensed operators. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed the modeling and performance of the simulator during the requalification activities.

These activities constitute completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

On October 30, 2015, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened activity due to surveillance testing and high winds. The inspectors observed the operators' performance of the following activities:

- Procedure TSP-DG3/LOCA-B501, "HPCS Diesel Generator DG3 LOCA Test," Revision 25, including the pre-job brief
- Procedure ISP-RPS-B602, "Reactor Vessel Steam Dome Pressure High – RPS Trip Channel B1," Revision 4
- Procedure ISP-RPS-B606, "TTV Closure RPS Trip Channel B1," Revision 5
- Procedure ABN-WIND, "Tornado/High Winds," Revision 27

In addition, the inspectors assessed the operators' adherence to plant procedures, including PPM 1.3.1, "Operating Policy, Programs, and Practices," Revision 119 and other operations department policies.

These activities constitute completion of one quarterly licensed operator performance sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.3 Annual Review of Requalification Examination Results

a. Inspection Scope

The licensee will complete the required requalification examination on December 17, 2015, but will not have final results in time to meet the reporting requirements for the NRC Integrated Inspection Report 05000397/2015004. The final results will be reported in January 2016 and will be included in the NRC Integrated Inspection Report 05000397/2016001. The inspectors will compare these results to NRC Manual Chapter 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process," values and determine if there are findings based on these results.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed the performance of the following structures, systems, and components (SSCs):

- October 21, 2015, 115 kV and 230 kV electrical distribution systems
- December 11, 2015, division 1 emergency diesel generator

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of two maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed two risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- October 7, 2015, yellow risk for 12-year preventative maintenance on the division 1 emergency diesel generator

- November 8, 2015, power suppression testing to identify fuel defects

The inspectors verified that these risk assessments were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the result of the assessments.

On December 14, 2015, the inspectors also observed portions of one emergent work activity that had the potential to affect the functional capability of mitigating systems: troubleshooting the division 1 emergency diesel generator after observing voltage oscillations during testing.

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected SSCs.

These activities constitute completion of three maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed five operability determinations that the licensee performed for degraded or nonconforming SSCs:

- October 26, 2015, AR 336947, operability determination of service water systems including low flow alarms and operator workarounds
- November 4, 2015, AR 339069, operability determination of main steam level transmitter MS-LT-61D following discovery of discrepancies on the instrument master data sheet
- November 12, 2015, AR 339680, operability determination of inverter IN-2A and IN-2B including automatic transfer
- November 17, 2015, AR 340134, operability determination of 125 VDC distribution panel E-DP-S12D with degraded voltage
- November 25, 2015, AR 340271, operability determination of jet pump 11 including flow indication

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded SSC to be operable, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability of the degraded SSC.

The inspectors reviewed operator actions taken or planned to compensate for degraded or nonconforming conditions. The inspectors verified that the licensee effectively managed these operator workarounds to prevent adverse effects on the function of mitigating systems and to minimize their impact on the operators' ability to implement abnormal and emergency operating procedures.

These activities constitute completion of five operability and functionality review samples, which included one operator work-around sample, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed four post-maintenance testing activities that affected risk-significant SSCs:

- October 13, 2015, post-maintenance test of DMA-FN-12 following coupling repair and replacement of 480 VAC motor control center starter under Work Order 02035813

- October 16, 2015, post-maintenance test of the division 1 emergency diesel generator following completion of 12-year preventative maintenance and governor actuator replacement under Work Order 02050057

- November 19, 2015, post-maintenance test of the division 2 control room emergency chiller following oil filter replacement under Work Order 02085097

- December 8, 2015, post-maintenance test of division 1 residual heat removal train following 480 VAC motor control center replacements under Work Orders 02035840, 02035839, and 02082047

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constitute completion of four post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed two risk-significant surveillance tests and reviewed test results to verify that the tests adequately demonstrated that the SSCs were capable of performing their safety functions:

- December 10, 2015, procedure OSP-ELEC-M701, “Diesel Generator 1 - Monthly Operability Test,” Revision 54

- December 14, 2015, procedure TSP-DG1-B502, “Standby Diesel Generator DG1 Load Testing,” Revision 19

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the test satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constitute completion of two surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

Training Evolution Observation

a. Inspection Scope

On November 18, 2015, the inspectors observed simulator-based licensed operator requalification training that included implementation of the licensee's emergency plan. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weakness was appropriately identified by the evaluators and entered into the corrective action program for resolution.

These activities constitute completion of one training observation sample, as defined in Inspection Procedure 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 Verification (71151)

.1 Mitigating Systems Performance Index: Heat Removal Systems (MS08)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of October 2014 through September 2015 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for heat removal systems, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index: Cooling Water Support Systems (MS10)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of October 2014 through September 2015 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for cooling water support systems, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Reactor Coolant System Identified Leakage (BI02)

a. Inspection Scope

The inspectors reviewed the licensee's records of reactor coolant system identified leakage for the period of April 2014 through September 2015 to verify the accuracy and completeness of the reported data. The inspectors observed the performance of OSP-INST-H101, "Shift and Daily Instrument Checks (Modes 1, 2, 3)," Revision 85, on October 30, 2015. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system leakage performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Semiannual Trend Review

a. Inspection Scope

The inspectors reviewed the licensee's corrective action program, performance indicators, system health reports, and other documentation to identify trends that might indicate the existence of a more significant safety issue. The inspectors verified that the licensee was taking corrective actions to address identified adverse trends.

These activities constitute completion of one semiannual trend review sample, as defined in Inspection Procedure 71152.

b. Observations and Assessments

To verify that the licensee was taking corrective actions to address identified adverse trends that might indicate the existence of a more significant safety issue, the inspectors reviewed corrective action program documentation associated with the following licensee-identified trend:

- Management of service life for components under Action Requests (ARs): 335071, 335073, 335074, 335075, 335076, 335077, 335078, 335079, 335080, 335081, 335082, 335083, 335084, 335085, 335086, 335087, 335088, 335089

The licensee identified components nearing the end of their service life and validated preventative maintenance tasks that establish the health of systems between service life replacements. This effort was part of a plant-wide review of preventive maintenance frequencies under AR 324519 and is associated with corrective action for NRC-identified NCV 05000397/2015007-05, "Failure to Initiate Condition Report for Operating Experience that Impacts Molded Case Circuit Breakers." The components and preventative maintenance tasks identified ranged across both safety and non-safety systems. The inspectors focused on components in the following safety systems:

- Vital Switchgear HVAC (AR 335073)
- Division 1 diesel generator electrical components (AR 335074)

For AR 335073, the licensee reviewed previous maintenance and performance history of the associated components. Preventative maintenance tasks 13232 and 13234 require cooling coil inspection, cleaning, and anode replacement every four years. Both divisions of cooling coils, WMA-CC-53A1 and WMA-CC-53B1, are within periodicity and were chemically cleaned during refueling outage 22 in the summer of 2015 (Work Orders 02047395 and 02047394). After cleaning, the coils were inspected by borescope and no adverse conditions were identified. The licensee continues to monitor the condition of the components through periodic surveillance testing and the previously-discussed inspection on a 4-year interval. The licensee determined that this frequency is adequate to maintain the health of the cooling coils. The inspectors considered that, in response to this trend, the licensee had completed an appropriate evaluation and had developed appropriate corrective actions.

For AR 335074, the licensee reviewed the previous maintenance and performance history of the associated components. Preventative maintenance task 18866-02, which was last performed in 2003 (Work Order 01001812), requires replacement of the voltage regulator every 12 years. The next replacement is scheduled for the summer of 2017 and is within the 25 percent grace period as defined in Section 4 of licensee procedure 1.5.13, "Preventative Maintenance Optimization Living Program," Revision 33. Further, the excitation system diodes require replacement on a 32-year frequency (tracked on preventative maintenance task 18866-03); this replacement has never been performed. The replacement is also scheduled for the summer of 2017 and is within the 25 percent grace period as defined in Section 4 of licensee procedure 1.5.13. The licensee monitors the condition of these components through periodic surveillance testing and the previously-discussed maintenance. The licensee determined that the this frequency is adequate to maintain the health of the components. The inspectors considered that, in response to this trend, the licensee had completed an appropriate evaluation and had developed appropriate corrective actions.

c. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected one issue for an in-depth follow-up:

- Action Requst 333679, loss of electrical bus SL-63 and trip of recirculation pump 1B on July 24, 2015

The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the corrective actions and that these actions were adequate to correct the condition.

These activities constitute completion of one annual follow-up sample as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) LER 05000397/2015-005-00: Reactor Pressure Vessel Level Indication Switch Failures

On June 25, 2015, the licensee determined that the division 1 reactor protection system trip logic was unable to generate a full scram on reactor water level low (level 3). This condition also affected the ability to automatically isolate shutdown cooling. Specifically, the associated level indicating switches, MS-LIS-24A and MS-LIS-24C, were mechanically bound in the off scale-high position. This issue was dispositioned as a

licensee identified violation in Section 4OA7 of this report. This licensee event report is closed.

.2 (Closed) LER 0500397/2015-006-00 and -01: Postulated Multiple Spurious Operations Scenario That Could Adversely Impact Post-Fire Safe Shutdown

On July 6, 2015, the licensee determined that the original assessment of Multiple Spurious Operation (MSO) for the High Pressure Core Spray (HPCS) system incorrectly excluded a credible scenario. This condition could create a flow path that results in a loss of suppression pool inventory during a fire. This issue was dispositioned as a licensee identified violation in Section 4OA7 of NRC triennial fire protection inspection report 05000397/2015008 (ADAMs Accession Number ML15307A231). This licensee event report is closed.

These activities constitute completion of two event follow-up samples, as defined in Inspection Procedure 71153.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On November 16, 2015, the Operations Engineer inspector discussed the availability of licensed operator annual operating test results with Mr. G. Wyatt, Simulator and Examination Group Supervisor.

On January 7, 2016, the resident inspectors presented the inspection results to Mr. M. Reddemann, Chief Executive Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a non-cited violation.

- Technical Specification 5.4.1.a, “Procedures,” requires, in part, that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Paragraph 9.a of Regulatory Guide 1.33, Appendix A, requires, in part, written procedures for performing maintenance that can affect the performance of safety-related equipment. The licensee established Procedures ISP-MS-Q901, “RPS, Reactor Water Level Low, Level 3 – Div 1 – CFT/CC,” Revision 10, and PPM 10.24.34, “PM Calibration Test Barton Differential Indicating Switch,” Revision 13, to meet the Regulatory Guide 1.33 requirements when performing maintenance on safety-related Barton main steam level indicating switches. Contrary to the above, prior to June 25, 2015, the licensee failed to maintain written procedures for performing maintenance that can affect the performance of safety-related equipment. Specifically, the licensee failed to include instructions in Procedures ISP-MS-Q901 or PPM 10.24.34 for setting the mechanical stop inside Barton main steam level indicating switches. Subsequently, the mechanical indicator in the switches for MS-LIS-24A and MS-LIS-24C became mechanically bound on the rubber stop within the switch when the level was raised off-scale high during the

refueling outage. The licensee implemented corrective action by inserting a half scram signal to comply with technical specifications, calibrating the affected switches including steps to set the mechanical stop, and initiating a condition report. The finding represented a loss of safety system function for reactor water level low (level 3) scram signals and for shutdown cooling isolation logic. Because the finding affected mitigating equipment during at-power and shutdown operations, the inspectors assessed the finding in both the Inspection Manual Chapter (MC) 0609, Appendix A, "Significance Determination Process for At-Power Findings," and MC 0609, Appendix G, "Shutdown Operations Significance Determination Process." Using Exhibit 2 of MC 0609, Appendix A, and Exhibit 3 of MC 0609, Appendix G, inspectors determined that the finding required a detailed risk evaluation for the at-power portion of the finding and a Phase 2 evaluation for the shutdown portion of the finding because the finding represented a loss of safety-system function. A Region IV senior reactor analyst determined the issue was of very low safety significance (Green) and represented a total change to the core damage frequency of 4.4E-7/year. The dominant sequences were anticipated transients without scram and shutdown loss of inventory. For the at-power exposure, risk was mitigated by the use of the standby liquid control system and recirculation pump trips for the anticipated transients without scram. For the shutdown exposure, risk was mitigated by automatic injection by an emergency core cooling system pump for the losses of inventory. This issue was entered into the licensee's corrective action program as AR 332078.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
S. Abney, Assistant Manager, Operations
O. Brooks, Emergency Preparedness Coordinator
D. Brown, Manager, System Engineering
S. Cooper, Plant Fire Marshal
S. Clizbe, Manager, Emergency Preparedness
D. Gregoire, Manager, Regulatory Affairs
G. Hettel, Vice President, Operations
G. Higgs, Manager, Maintenance
M. Hummer, Licensing Engineer
A. Javorik, Vice President, Engineering
C. Moon, Manager, Quality
R. Prewett, Operations Manager
G. Pierce, Manager, Training
B. Schuetz, Plant General Manager
D. Stevens, Assistant Manager, Operations
D. Suarez, Regulatory Compliance Engineer
K. Van Speybroek, EFIN Supervisor
L. Williams, Licensing Supervisor
D. Wolfgramm, Compliance Supervisor, Regulatory Affairs
G. Wyatt, Supervisor, Simulator and Examination Group
J. Zielinski, Cable Condition Monitoring Program Manager

NRC Personnel
R. Deese, Senior Reactor Analyst
V. Gaddy, Branch Chief

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000397/2015004-01	NCV	Incorrect Electrical Component Operated During Maintenance (Section 1R04)

Closed

05000397/2015-005-00	LER	Reactor Pressure Vessel Level Indication Switch Failures (Section 4OA3.1)
05000397/2015-006-00	LER	Postulated Multiple Spurious Operations Scenario That Could Adversely Impact Post-Fire Safe Shutdown (Section 4OA3.2)
05000397/2015-006-01	LER	Postulated Multiple Spurious Operations Scenario That Could Adversely Impact Post-Fire Safe Shutdown (Section 4OA3.2)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

Number	Title	Revision
1.3.57	Barrier Impairment	34
ABN-WIND	Tornado/High Wind	27

Miscellaneous

Number	Title	Date
15-0403	Barrier Impairment	
1676	Night Order - Excavation Activity	October 29, 2015

Action Requests (ARs)

334819	333007	339196	340150	340155

Work Order (WO)

02079797

Section 1R04: Equipment Alignment

Procedures

Number	Title	Revision
1.5.13	Preventative Maintenance Optimization Living Program	33
1.5.14	Risk Assessment and Management for Maintenance/Surveillance Activities	37
4.840.A5	840.A5 Annunciator Panel Alarms	27
CSP-DO-C101	Diesel Generator New Fuel Test	14
SOP-CIA-LU	Containment Instrument Air System Valve and Breaker Lineup	2
SOP-CN-FILL	Containment Nitrogen System Fill	1
SOP-DG1-LU	Emergency Diesel Generator (Div 1) Valve and Power Supply Lineup	4
SOP-DG1-STBY	Emergency Diesel Generator (Div1) Standby Lineup	20
SOP-LPCS-LU	LPCS Valve and Breaker Lineup	3
SOP-SW-LU	Standby Service Water System Valve & Breaker Lineup	6

Calculation

Number	Title	Revision
ME-02-02-06	Pump Room Heat Up Without Cooling	0
ME-02-91-50	Sizing of DG 1A/1 Water Reservoir Tanks	2
ME-02-92-29	Calculation for Number of Nitrogen Bottles Required for CIA System Operability	0
ME-02-92-43	Room Temperature Calculation for DG Building, Reactor Building, Radwaste Building, and Service Water	11
ME-02-94-42	Time Division 2 Diesel Generator Engines Can Run W/O Service Water	2
ME-02-96-27	Standby Service Water Pumphouse A Temperature With SW HPCS Pump Running	1

Miscellaneous

Number	Title	Revision/Date
DBD 309	Standby Service Water System	16
13-CG-02	Warehousing/Distributor Survey Checklist – Oxarc, Inc	December 10, 2013

Miscellaneous

Number	Title	Revision/Date
DBD 309	Standby Service Water System	16
2883	Procurement Evaluation Revision Record – Oxarc, Inc	February 1, 1995
OpESS 2008-01	Operating Experience Smart Sample – Negative Trend and Recurring Events Involving Emergency Diesel Generators	2008

Action Requests (ARs)

297152	297324	299515	301887	305845
310696	315030	320678	321977	320522
325262	325822	325832	332704	336947
274714	333693	331409	322316	308809
287273	340176			

Work Orders (WOs)

01083177	02000662

Section 1R05: Fire Protection

Procedures

Number	Title	Revision
15.1.10	Fire Response Vehicle Inventory Inspection	13
ABN-FIRE	Fire	35

Fire Protection Pre-Plans

Number	Title	Revision
PFP-RW-467	Radwaste 467	5
PFP-DG-7/8/9	Diesel Generator Building Day Tank Room	3
PFP-M-9/2	Reactor Building 471	3
PFP-M-21/2	Reactor Building 501	3
PFP-M-73/2	Reactor Building 522	2
PFP-TG-1	Turbine Building 441	4

Miscellaneous

Number	Title	Date
	Fire Brigade Drill Sheets	November 19, 2015

Action Requests (ARs)

337714	340835	327874	336691	326308
329942	335409			

Section 1R06: Flood Protection Measures

Calculations

Number	Title	Revision
ME-02-02-02	Calculation for Reactor Building Flooding Analysis	2
ME-02-03-04	Calculation for Radwaste Building Flooding Analysis	4

Miscellaneous

Number	Title	Revision
E822-2	Electrical Manholes Development and Details	5

Action Requests (ARs)

282022	315573	317106	319818	323101
331860	334688	334695	335563	

Work Order (WO)

02066303

Work Request (WR)

29123196

Section 1R07: Heat Sink Performance

Procedure

Number	Title	Revision
8.4.42	Thermal Performance Monitoring of RHR-HX-1A and RHR-HX-1B	12

Action Requests (ARs)

320405	322256	323639	325207	325602
325603	327989	328703	329533	331050
335204				

Work Orders (WOs)

02041703	02008989

Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance

Procedures

Number	Title	Revision
OI-9	Operations Standards and Expectation	63
1.3.1	Operating Policy, Programs, and Practices	120
13.1.1	Classifying the Emergency	47
5.1.1	RPV Control	21
5.2.1	Primary Containment Control	23
5.3.1	Secondary Containment Control	20
ABN-WIND	Tornado/High Winds	27
ISP-RPS-B602	Reactor Vessel Steam Dome Pressure High – RPS Trip Channel B1	4
ISP-RPS-B606	TTV Closure RPS Trip Channel B1	5
TSP-DG3/LOCA-B501	HPCS Diesel Generator DG3 LOCA Test	25

Miscellaneous

Number	Title	Date
LR001837	Drill scenario	November 10, 2015
LR001547	Drill scenario	November 10, 2015

Action Requests (ARs)

339425	338886	336305	336173

Work Orders (WOs)

02046518	02067282	02061557

Section 1R12: Maintenance Effectiveness

Procedures

Number	Title	Revision
1.5.11	Maintenance Rule Program	14
OI-53	Offsite Power	13

Miscellaneous

Number	Title	Revision
CVI 45-00, 105	RTE-ASEA Corporation Instruction Manual for Transformer TRB	4

Action Requests (ARs)

299038	299973	302237	309244	309996
310328	310346	310642	311834	314741
318705	319659	320006	322324	324740
325176	327320	331073	331091	332987
334518	334825	335601	308113	308469
309451	334301	335578	294730	338320
296621	338017	338001	337939	337646
334487	334412	334410	323626	315173
308859				

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Number	Title	Revision
1.3.76	Integrated Risk Management	44
1.3.83	Protected Equipment Program	11
1.5.14	Risk Assessment and Management for Maintenance/Surveillance Activities	37
9.3.34	Determination of a Defective Fuel Rod Location	8

Miscellaneous

Number	Title	Date
	High Risk Work Plan – Power Suppression Testing	November 4, 2015
	Paragon Profile	December 14, 2015
	Protected Equipment Tracking Sheet	October 7, 2015
	Protected Equipment Tracking Sheet	December 14, 2015

Action Requests (ARs)

337768	339551	336754	336076

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

Number	Title	Revision
1.3.66	Operability and Functionality Evaluation	32
10.25.53	Inspection of Lighting Panels and Power Panels	12
OI-9	Operations Standards and Expectation	63
OI-14	Columbia Generating Station Operational Challenges and Risk Program	13
OSP-ELEC-W102	Electrical Distribution Subsystem Breaker Alignment and Power Availability Verification	28
OSP-RRC-D701	Jet Pump Operability and Recirculation Loop Flow Mismatch, Two Loop Operation	18

Calculation

Number	Title	Revision
2.05.01	Battery Sizing, Voltage Drop, and Charger Studies for Div 1 and 2 Systems	12

Action Requests (ARs)

339069	339680	340134	340271	339555
339642	330654	299909	252104	336947
339753	339984	338530		

Work Orders (WOs)

02084785	01179141	02074914	01190093	

Section 1R19: Post-Maintenance Testing

Procedures

Number	Title	Revision
8.3.215	DG Governor Actuator Setup and Testing	7
OSP-RHR/IST-Q702	RHR Loop A Operability Test	45

Drawings

Number	Title	Revision
EWD-47E-033	Electrical Wiring Diagram Standby AC Power System Diesel Generator 2 Excitation System	7
EWD-47E-046	Electrical Wiring Diagram Standby AC Power System Diesel Generator 1 Governor Speed Control	12

Miscellaneous

Number	Title	Revision
EC 14879	Recommended Post-Maintenance Tests Following Replacement of Hydraulic Actuators DG-EHO-1A1 and DG-EHO-1A2 on Diesel Engines 1A1 and 1A2	0

Action Requests (ARs)

337571	337792	337801	296416	302793
302797	304328	306012	307714	308924
315455	330484			

Work Orders (WOs)

02007174	01186149	02050057	02082047	02035874
02078313				

Section 1R22: Surveillance Testing

Procedures

Number	Title	Revision
OPS-CCH/IST-M702	Control Room Emergency Chiller System B Operability	35
TSP-DG1-B502	Standby Diesel Generator DG1 Load Testing	19

Action Requests (ARs)

280226	318811	334459	334460	335247
335270	341439	341437		

Section 1EP6: Drill Evaluation

Procedures

Number	Title	Revision
5.1.1	RPV Control	21
5.2.1	Primary Containment Control	23
5.3.1	Secondary Containment Control	20
13.1.1	Classifying the Emergency	47
13.1.1A	Classifying the Emergency – Technical Bases	31

Miscellaneous

Number	Title	Date
LR001304	Drill scenario	November 18, 2015

Action Requests (ARs)

336152	333016	332890	324910	338676

Section 4OA1: Performance Indicator Verification

Procedure

Number	Title	Revision
OSP-INST-H101	Shift and Daily Instrument Checks (Modes 1, 2, 3)	85

Miscellaneous

Number	Title	Date
	MSPI Derivation Reports	September 2015

Action Requests (ARs)

316228	335867	323706	317581	338309
334459	325218	323767	322256	

Section 4OA2: Problem Identification and Resolution

Procedure

Number	Title	Revision
1.5.13	Preventative Maintenance Optimization Living Program	33

Action Requests (ARs)

337018	335071	335073	335074	335075
335076	335077	335078	335079	335080
335081	335082	335083	335084	335085
335086	335087	335088	335089	

Work Orders (WOs)

02047395	02047394	01001812

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

Procedures

Number	Title	Revision
10.24.34	PM Calibration Test Barton Differential Indicating Switch	14
ISP-MS-Q901	RPS, Reactor Water Level Low, Level 3 – Div 1 – CFT/CC	11
OSP-INST-H101	Shift and Daily Instrument Checks (Modes 1, 2, 3)	85

Action Requests (ARs)

332078	332096	032526