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

February 5, 2018

EA-17-179

Mr. Mark E. Reddemann
Chief Executive Officer
Energy Northwest
P.O. Box 968
Richland, WA 99352-0968

SUBJECT: COLUMBIA GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000397/2017004 AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Reddemann:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Columbia Generating Station. On January 11, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented five findings of very low safety significance (Green) in this report. Three of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

Additionally, a violation involving the failure to maintain the operability of secondary containment during Operations with a Potential to Drain the Reactor Vessel (OPDRV) was identified. Specifically, from May 13 - June 19, 2017, Columbia Generating Station performed six OPDRV activities with secondary containment inoperable in violation of Technical Specification (TS) 3.6.4.1, "Secondary Containment." The NRC issued Enforcement Guidance Memorandum 11-003, "Enforcement Guidance Memorandum on Dispositioning Boiling Water Reactor Licensee Noncompliance with Technical Specification Containment Requirements During Operations with a Potential for Draining the Reactor Vessel," Revision 3, on January 15, 2016, allowing for the exercise of enforcement discretion for OPDRV-related technical specification violations, when certain criteria are met. The NRC concluded that Columbia Generating Station met these criteria. Therefore, the NRC is exercising enforcement discretion in accordance with Section 3.5, "Violations Involving Special Circumstances," of the NRC Enforcement Policy and will not issue enforcement action for this violation, subject to a timely license amendment request being submitted.

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

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the Columbia Generating Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Mark Haire, Chief
Project Branch A
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000397/2017004
w/ Attachment: Supplemental Information

COLUMBIA GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000397/2017004 AND EXERCISE OF ENFORCEMENT DISCRETION – FEBRUARY 5, 2018

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000397
License:	NPF-21
Report:	05000397/2017004
Licensee:	Energy Northwest
Facility:	Columbia Generating Station
Location:	North Power Plant Loop Richland, WA 99354
Dates:	October 1 through December 31, 2017
Inspectors:	G. Kolcum, Senior Resident Inspector L. Brandt, Resident Inspector W. Cullum, Reactor Inspector P. Elkmann, Senior Emergency Preparedness Inspector J. Kirkland, Senior Operations Engineer D. Reinert, Resident Inspector C. Smith, Reactor Inspector E. Uribe, Reactor Inspector
Approved By:	Mark Haire Chief, Project Branch A Division of Reactor Projects

Enclosure

SUMMARY

IR 05000397/2017004; 10/01/2017 – 12/31/2017; Columbia Generating Station Integrated Inspection Report; Surveillance Testing, Problem Identification and Resolution, Follow-up of Events and Notices of Enforcement Discretion.

The inspection activities described in this report were performed between October 1 and December 31, 2017, by the resident inspectors at Columbia Generating Station and inspectors from the NRC's Region IV office. Five findings of very low safety significance (Green) are documented in this report. Three of these findings involved violations of NRC requirements. The significance of inspection findings is indicated by their color (i.e., Green, greater than Green, White, Yellow, or Red), determined using Inspection Manual Chapter 0609, "Significance Determination Process," dated April 29, 2015. Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. 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," dated July 2016.

Cornerstone: Initiating Events

- Green. The inspectors reviewed a self-revealed finding for the licensee's failure to follow plant Procedure EGM-1-9, "Single Point Vulnerability Review Process," that establishes the licensee's requirements for performing single point vulnerability reviews by identifying single component failures within the system that could lead to a reactor turbine trip and scram. Specifically, the licensee identified the main condenser air removal suction valve as a single point vulnerability but failed to identify its solenoid pilot valves as single point vulnerabilities. Therefore, the components did not receive the proper review and priority. The licensee entered this issue into their corrective action program as Action Request 370326.

  The failure to follow plant Procedure EGM-1-9, "Single Point Vulnerability Review Process," Revision 0, was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the inspectors determined the finding was of very low safety significance (Green) because the finding did not cause the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. This finding does not have a cross-cutting aspect since the failure to identify the single point vulnerability was performed in December 2008 and was not reflective of current licensee performance. (Section 4OA3)

Cornerstone: Mitigating Systems

- Green. The inspectors reviewed a self-revealed, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to maintain the configuration of the division 2 emergency diesel generator test mode relays. Specifically, the licensee failed to install a locking strap onto the test mode relays as required by the

vendor manual which rendered the division 2 emergency diesel generator inoperable on September 21, 2017. As an immediate corrective action, the licensee installed the locking straps onto the test mode relays in the division 2 emergency diesel generator and entered this issue into their corrective action program as Action Request 371627.

The failure to maintain the configuration of the division 2 emergency diesel generator test mode relays was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the configuration control 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. 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 that the finding was of very low safety significance (Green) because all of the screening questions were answered in the negative. This finding was not assigned a cross-cutting aspect because the performance deficiency occurred in the early 1980s, and thus was not indicative of current performance. (Section 1R22)

- Green. The inspectors reviewed a self-revealed finding for the licensee's failure to follow plant Procedure 1.3.64, "Plant Clearance Order," that ensures equipment status is properly controlled. Specifically, during Refueling Outage R23, the licensee removed the clearance tags on the reactor feedwater pumps minimum flow block valves, RFW-V-106A and RFW-V-106B, but failed to open the components per the Tag Removal List. Consequently, on September 3, 2017, reactor feedwater pump 1B was observed to be operating with abnormally high temperatures, and on September 4, 2017, reactor feedwater pump 1A was observed to have abnormal flow indications after returning to service. As part of corrective actions, the licensee immediately opened the valves, issued a night order addressing chain operated valves and requiring use of stem position indications when repositioning such valves, and conducted a review of these types of valves to determine the extent of condition. The licensee entered this issue into their corrective action program as Action Request 370966 to perform an apparent cause review and address long-term corrective actions.

  The failure to follow plant Procedure 1.3.64, "Plant Clearance Order," Revision 39, was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it affected the configuration control 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, in June 2017, the licensee removed the clearance tags on the reactor feedwater pumps minimum flow block valves but failed to ensure the components were open per the Tag Removal List. Consequently, later in September 2017, both reactor feedwater pumps were observed to be operating with abnormal indications, and the failure to open the reactor feedwater minimum flow block valves prevented the reactor feedwater pumps from operating on minimum flow during pump starts. The inspectors used Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," to properly characterize the finding. Since the first instance of the performance deficiency occurred with the plant on shutdown cooling, the inspectors performed an initial significance determination using NRC Inspection Manual Chapter 0609, Appendix G, Attachment 1, Exhibit 3, "Mitigating Systems Screening Questions." The inspectors determined that the finding was of very low safety significance (Green) because all of the screening questions were answered in the negative. Since the second instance of the performance deficiency

occurred with the plant secured from shutdown cooling, the inspectors performed another initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that the finding was of very low safety significance (Green) because all of these screening questions were also answered in the negative. Specifically, in both instances, the licensee isolated the reactor feedwater system minimum flow lines, but the reactor feedwater system maintained the ability to inject water into the reactor vessel. This finding had a cross-cutting aspect in the area of human performance, documentation, in that the licensee failed to create and maintain complete, accurate, and up-to-date documentation, in that the procedure did not contain guidance on how to correctly open the valves [H.7]. (Section 4OA2)

- Green. The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 5.4.1.a, for the licensee's failure to perform maintenance with documented instructions appropriate to the circumstances. Specifically, on June 10, 2017, the licensee installed two washers onto the governor valve mechanical linkage per Work Order 02043358, which rendered the reactor core isolation cooling system inoperable on September 16, 2017. Corrective actions included removing the additional washer and performing a cause evaluation to determine additional cause(s) of the turbine governor valve binding. The licensee entered this issue into their corrective action program as Action Request 371429.

  The failure to perform maintenance with documented instructions appropriate to the circumstances was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the configuration control 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. 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 that the finding was of very low safety significance (Green) because all of the screening questions were answered in the negative. This finding had a cross-cutting aspect in the area of human performance, challenge the unknown, in that the licensee did not stop when faced with uncertain conditions and evaluate and manage risks before proceeding. Specifically, the licensee did not challenge the use of two washers during reassembly when only one washer was removed during disassembly [H.11]. (Section 4OA2)

Cornerstone: Barrier Integrity

- Green. The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to follow procedure SYS-2-25, "Procedure PM Template Preparation and Review," Revision 2. Specifically, the licensee failed to implement adequate preventive maintenance (PM) for the aging of grease on 480V breakers because the maintenance optimization template was not adequate to prevent the circuit breaker for the reactor building 1B exhaust fan motor from failing due to hardened grease before its overhaul date. The licensee's corrective actions included replacing the circuit breaker for reactor exhaust air fan 1B and reviewing and updating the preventive maintenance and refurbishment dates for similar breakers, and the licensee entered this issue into their corrective action program as Action Request 358027.

The failure to follow plant procedure SYS-2-25, “Procedure PM Template Preparation and Review,” Revision 2, was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the configuration control 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, hardened grease led to the failure of the reactor building ventilation fan and loss of secondary containment. Using Inspection Manual Chapter 0609, Attachment 04, “Initial Characterization of Findings,” and Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” Exhibit 3, “Barrier Integrity Screening Questions,” dated June 19, 2012, the inspectors determined the finding was of very low safety significance (Green) because (1) the finding did not represent an actual open pathway in the physical integrity of reactor containment, containment isolation system, or heat removal components; and (2) did not involve an actual reduction in function of hydrogen igniters in the reactor containment. This finding had a cross-cutting aspect in the area of human performance, consistent process, in that the licensee did not use a consistent, systematic approach to make decisions and incorporate risk insights as appropriate. Specifically, the licensee did not use a systematic process for preventive maintenance activities when they failed to recognize the grease deficiencies in their 480V breaker system [H.13]. (Section 4OA3)

PLANT STATUS

The plant began the inspection period at 100 percent power. On October 1, 2017, the plant was lowered to 62 percent power for rod sequence exchange and turbine governor valve testing. The plant returned to 100 percent power on October 2, 2017. On October 15, 2017, the plant was lowered to 80 percent power for a sequence exchange. The plant returned to 100 percent power on October 15, 2017. On October 21, 2017, the plant was lowered to 96 percent power for control rod and main steam bypass valve testing. The plant returned to 100 percent power on October 22, 2017.

On November 22, 2017, the plant was lowered to 96 percent power for control rod and main steam isolation valve testing. The plant returned to 100 percent power on November 22, 2017.

On December 16, 2017, the plant was lowered to 90 percent power for a rod pattern adjustment. The plant returned to 100 percent power on December 17, 2017. 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)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

On December 15, 2017, the inspectors completed an inspection of the station's readiness for seasonal extreme weather conditions. The inspectors reviewed the licensee's adverse weather procedures for extreme low temperature and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to the onset of extreme low temperatures, the licensee had corrected weather-related equipment deficiencies identified during the previous cold weather season.

The inspectors selected three risk-significant systems that were required to be protected from extreme low temperatures:

- service water pumps
- diesel generator fuel oil system
- ultimate heat sink

The inspectors reviewed the licensee's procedures and design information to ensure the systems would remain functional when challenged by extreme low temperature. The inspectors verified that operator actions described in the licensee's procedures were adequate to maintain readiness of these systems. The inspectors walked down portions of these systems to verify the physical condition of the adverse weather protection features.

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

b. Findings

No findings were identified.

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:

- November 15, 2017, circulating water pump house, Fire Zone 5010, Zone 4
- November 16, 2017, adjustable speed drive building, Fire Zone ASD
- December 19, 2017; divisions 1 and 2 switchgear and battery rooms; Fire Areas RC-14/1, RC-8/2, RC-5/1, and RC-6/2
- December 19, 2017; divisions 1 and 2 electrical equipment and reactor protection system rooms, remote shutdown room, and vital island corridor; Fire Areas RRC-4/1, RC-7/2, RC-9/2, and RC-19/2

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.

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

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On October 11, 2017, 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 constituted 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 3, 2017, and November 27, 2017, 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 or risk due to loss of secondary containment and heavy lifts at the circulating water pump house. The inspectors observed the operators' performance of the following activities:

- Loss of secondary containment due to loss of power to panel 7A
- Heavy lifts at the circulating water pump house for maintenance on 'B' circulating water pump

In addition, the inspectors assessed the operators' adherence to plant procedures, including conduct of operations procedure and other operations department policies.

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

b. Findings

No findings were identified.

.3 Annual Review

a. Inspection Scope

The inspector conducted an in-office review of the annual requalification training program to determine if pass/fail results exceeded the thresholds established by Inspection Procedure 71111.11, "Licensed Operator Requalification Program and Licensed Operator Performance," and Inspection Manual Chapter 0609, "Significance Determination Process."

On December 28, 2017, the licensee informed the inspector of the following operating test results:

- 5 of 6 crews passed the simulator portion of the operating test
- 50 of 57 licensed operators passed the simulator portion of the operating test
- 56 of 57 licensed operators passed the job performance measure portion of the operating test

The crew that failed the simulator scenario portion of the operating test was remediated, retested, and passed their retake test.

Five of the seven individuals that failed the simulator scenario portions of the operating test were remediated, retested, and passed their retake tests. The other two individuals have been remediated and are scheduled to be retested in January 2018. The lead inspector will follow up with the licensee to ensure the two individuals have passed their retake test prior to assuming licensed operator duties.

The individual that failed the job performance measure portion of the operating test was remediated, retested, and passed their retake test

The inspector completed one inspection sample of the annual licensed operator requalification program, as defined in Inspection Procedure 71111.11.

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 13, 2017, Yellow risk for reactor core isolation cooling surveillance testing and circulating water pump house heavy lifts
- Week of November 27, 2017, Yellow risk for circulating water pump house maintenance on 'B' circulating water pump

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.

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 structures, systems, and components (SSCs).

These activities constituted completion of two 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 one operability determination and functionality assessment that the licensee performed for degraded or nonconforming SSCs:

- November 14, 2017, operability determination for reactor building ventilation radiation monitors

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

These activities constituted completion of one operability and functionality review sample, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R17 Evaluations of Changes, Tests, and Experiments (71111.17)

.1 Evaluations of Changes, Tests, and Experiments

a. Inspection Scope

The inspectors reviewed six evaluations performed pursuant to 10 CFR 50.59 to determine whether the evaluations were adequate and that prior NRC approval was obtained as appropriate. The inspectors also reviewed 23 screenings and/or applicability determinations, where licensee personnel had determined that a 10 CFR 50.59 evaluation was not necessary. The inspectors reviewed these documents to:

- verify that evaluations were performed in accordance with 10 CFR 50.59 when changes, tests, or experiments were made;

- verify that the licensee has appropriately concluded that the change, test, or experiment can be accomplished without obtaining a license amendment;

- verify that safety issues related to the changes, tests, or experiments have been resolved; and

- verify that the licensee's conclusions were correct and consistent with 10 CFR 50.59 for the changes, tests, or experiments that the licensee determined that evaluations were not required.

The inspectors used, in part, Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Implementation," Revision 1, to determine acceptability of the completed

evaluations and screenings. The NEI document was endorsed by the NRC in Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," dated November 2000. The list of evaluations, screenings and/or applicability determinations reviewed by the inspectors is included as an attachment to this report.

This inspection consisted of 29 samples of evaluations, screenings, and/or applicability determinations, as defined in Inspection Procedure 71111.17-05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- October 8, 2017, diesel generator 1 after 2- and 4-year preventive maintenance activities under Work Order 02095888
- October 12, 2107, diesel generator 1 extent of condition maintenance run under Work Order 02119707

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 constituted completion of two 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 three risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the SSCs were capable of performing their safety functions:

In-service tests:

- October 11, 2017, OSP-SLC/IST-Q701, "Standby Liquid Control Pumps Operability Test," Revision 27

Other surveillance tests:

- September 21, 2017, TSP-DG2-B502, "DG2 Load Testing," Revision 22
- October 11, 2017, ISP-RCIC-Q903, "RCIC Isolation On RCIC Steam Supply Flow High Div 2 – CFT/CC," 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 constituted completion of three surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

Introduction. The inspectors reviewed a self-revealed, Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to maintain the configuration of the division 2 emergency diesel generator test mode relays. Specifically, the licensee failed to install a locking strap onto the test mode relays as required by the vendor manual which rendered the division 2 emergency diesel generator inoperable on September 21, 2017.

Description. The division 2 emergency diesel generator output breaker, E-CB-DG2/8, supplies the safety-related bus, E-SM-8, with 4160 VAC power during design basis events. If an emergency diesel generator is running in test mode and synchronized with the startup or backup transformer, the output breaker is designed to automatically trip in order to isolate the emergency diesel generator upon receipt of a loss of coolant accident signal. This automatic function allows the emergency diesel generator to continue running in a ready-to-load condition and be available to supply the emergency bus. Auxiliary relays E-RLY-52X/DG2S8 and E-RLY-52X/DG2B8 perform this function when the division 2 emergency diesel generator is synchronized with the startup or backup transformer, respectively, during surveillance testing.

On September 21, 2017, operations personnel were conducting surveillance testing of the division 2 emergency diesel generator with the diesel running and synchronized to the startup transformer in accordance with Procedure TSP-DG2-B502, "DG2 Load

Testing," Revision 22. During the surveillance, the output breaker failed to automatically trip upon a simulated loss of coolant accident signal. Operations personnel put the diesel in a safe condition by opening the test switch and keeping the diesel synchronized to the grid. Upon investigation, the licensee determined that the E-RLY-52X/DG2S8 relay was not properly seated in the relay base, which prevented the relay from providing a trip signal to the output breaker. In addition, both relay E-RLY-52X/DG2S8 and relay E-RLY-52X/DG2B8 were missing a locking strap as required by the vendor documentation. The licensee concluded the locking strap would have prevented the relay from disconnecting from its base.

The licensee performed a cause evaluation to determine when the relay was disengaged from its base. A review of maintenance conducted in the auxiliary cubicle did not identify any work history for the E-RLY-52X/DG2S8 relay nor any work that could have potentially physically disturbed the relay. Therefore, the licensee concluded the E-RLY-52X/DG2S8 relay had been originally installed by the switchgear manufacturer without the locking strap in the early 1980s. As a result, the inspectors determined this issue was not indicative of current performance.

Analysis. The failure to maintain the configuration of the division 2 emergency diesel generator test mode relays was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it affected the configuration control 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 licensee failed to install a locking strap onto the test mode relays as required by the vendor manual which rendered the division 2 emergency diesel generator inoperable on September 21, 2017. 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 that the finding was of very low safety significance (Green) because all of the screening questions were answered in the negative. This finding was not assigned a cross-cutting aspect because it was not indicative of current performance.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Contrary to the above, the licensee failed to establish measures to include provisions to assure that deviations from standards are controlled. Specifically, the licensee failed to install a locking strap onto the test mode relays as required by the vendor manual, rendering the division 2 emergency diesel generator, to which 10 CFR Part 50, Appendix B, applies, inoperable on September 21, 2017. As an immediate corrective action, the licensee installed the locking straps onto the test mode relays in the division 2 emergency diesel generator and entered this issue into the corrective action program as Action Request 371627. Because this finding is of very low safety significance (Green) and was entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000397/2017004-01, "Loss of Configuration Control Results in Emergency Diesel Generator Inoperability."

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed an in-office review of Emergency Plan Revision 65 and Emergency Plan Implementing Procedure 13.1.1A, "Classifying the Emergency, Technical Bases," Revision 32. These revisions implemented the Nuclear Energy Institute (NEI) 99-01, "Emergency Action Level Methodology," Revision 6, emergency action level scheme as approved by the NRC in License Amendment 244, dated August 28, 2017.

These revisions were compared to their previous revisions, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, to NEI 99-01, Revision 6, and to the standards in 10 CFR 50.47(b) to determine if the revisions adequately implemented the requirements of 10 CFR 50.54(q)(3) and 50.54(q)(4). The inspector verified that the licensee implemented those emergency plan and emergency action level changes described in "Safety Evaluation by the Office of Nuclear Reactor Regulation related to Amendment No. 244 to Renewed Facility Operating License NPF-21" and the licensee's "Supplement to Response to Request for Additional Information Related to License Amendment Request to adopt Emergency Action Level Scheme pursuant to NEI 99-01 Revision 6," dated June 21, 2017. These reviews were not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, these revisions are subject to future inspection.

These activities constitute completion of two emergency action level and emergency plan change samples, as defined in Inspection Procedure 71114.04.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors observed an emergency preparedness drill on October 31, 2017, to verify the adequacy and capability of the licensee's assessment of drill performance. The inspectors reviewed the drill scenario; observed the drill from the emergency operations facility, technical support center, and the simulator; and attended the post-drill critique. 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 weaknesses were appropriately identified by the licensee in the post-drill critique and entered into the corrective action program for resolution.

These activities constituted completion of one emergency preparedness drill 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 Reactor Coolant System Specific Activity (BI01)

a. Inspection Scope

The inspectors reviewed the licensee's reactor coolant system chemistry sample analyses for the period of July 2016 through September 2017 to verify the accuracy and completeness of the reported data. The inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample on December 19, 2017. 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 specific activity performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Reactor Coolant System Identified Leakage (BI02)

a. Inspection Scope

The inspectors reviewed the licensee's records of reactor coolant system total leakage for the period of July 2016 through September 2017 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 88, which includes the licensee's actions to assess reactor cooling system total leakage, on December 20, 2017. 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 Action Request 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 constituted completion of one semiannual trend review sample, as defined in Inspection Procedure 71152.

b. Observations and Assessments

On December 11, 2017, the inspectors reviewed the instruments used in abnormal and emergency procedures for secondary containment to make decisions including timelines for implementing action. Procedure 5.3.1, "Secondary Containment Control," Revision 20, provides actions to maintain secondary containment. 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 related corrective action program Action Requests (ARs).

The applicable instruments were found to be within calibration tolerances. Based upon these results, the inspectors determined that the abnormal and emergency procedures referencing instruments would provide the correct actions for a plant event. The inspectors noted that the licensee appropriately considered extent of condition and cause when scheduling corrective action assignments for these ARs. These actions

include a global review of all abnormal procedures to identify additional instruments that are relied upon during events and require calibration.

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

c. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected two issues for an in-depth follow-up:

- On September 5, 2017, operations personnel discovered the reactor feedwater pumps' minimum flow block valves, RFW-V-106A and RFW-V-106B, were closed following startup from Refueling Outage R23.

- On September 16, 2017, the reactor core isolation cooling (RCIC) system failed its quarterly surveillance test due to binding of the RCIC turbine governor valve, RCIC-V-2.

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 planned corrective actions and that these actions were adequate to correct the condition.

These activities constituted completion of two annual follow-up samples, as defined in Inspection Procedure 71152.

b. Findings

(1) Failure to Follow Procedure Results in Isolation of Reactor Feedwater Minimum Flow Lines

Introduction. The inspectors reviewed a self-revealed, Green finding for the licensee's failure to follow plant Procedure 1.3.64, "Plant Clearance Order," that ensures equipment status is properly controlled. Specifically, during Refueling Outage R23, the licensee removed the clearance tags on the reactor feedwater pumps minimum flow block valves, RFW-V-106A and RFW-V-106B, but failed to open the components per the Tag Removal List.

Description. During Refueling Outage R23 that ended on June 19, 2017, the reactor feedwater pumps minimum flow block valves, RFW-V-106A and RFW-V-106B, were closed to support outage maintenance activities. These valves are the manual isolation valves for the minimum flow path for reactor feedwater pumps 1A and 1B, respectively. The reactor feedwater pumps minimum flow block valves, in series with the minimum

flow control valves, provide a flow path back to the main condenser and thereby maintain flow through the reactor feedwater pumps. This ensures the pumps have sufficient flow to cool the pumps when feedwater flow to the reactor pressure vessel is minimal or zero. With the minimum flow block valves closed, the pumps could run against shutoff head. Running a pump against shutoff head, or deadheading, can cause damage to the bearings and degrade overall pump performance, ultimately leading to pump failure. Therefore, following the outage maintenance activities, the RFW-V-106A and RFW-V-106B valves were scheduled to be opened before returning reactor feedwater pumps 1A and 1B to service. Operations personnel removed the clearance tags and manipulated the valve mechanism in the open direction on valve RFW-V-106A on June 10, 2017, and on valve RFW-V-106B on June 17, 2017, in preparation for reactor start-up following Refueling Outage R23.

On September 2, 2017, operations personnel performed reactor start-up following a forced outage due to a loss of condenser vacuum on August 20, 2017. On September 3, 2017, reactor feedwater pump 1B was observed to be operating with abnormally high temperatures. On September 4, 2017, reactor feedwater pump 1A was observed to have abnormal flow indications after returning to service. An investigation of the reactor feedwater pumps' abnormalities on September 5, 2017, determined that both the RFW-V-106A and RFW-V-106B valves were still closed. The licensee took immediate corrective actions to open both minimum flow block valves and initiated Action Request 370966 to perform an apparent cause review and address long-term corrective actions.

The licensee determined the operations personnel assigned to open the valves following Refueling Outage R23 were unfamiliar with the unique chain operated aspects of these valves. The minimum flow block valves are only operated during outages or significant maintenance on the corresponding reactor feedwater pumps. The valves are located in the overhead and are therefore chain operated. Operating experience with these valves shows that it typically takes between 15 and 30 minutes to fully stroke open each valve using the chain operator. However, the operations personnel assigned to open the valves following Refueling Outage R23 reported operating the valve in the open direction for approximately 2 – 3 minutes when the valves became difficult to move. The operations personnel mistakenly believed the valves had reached their open backseats when in fact the operations personnel had only taken up the slack in the mechanism, and the valves had not yet come off their closed seats. The licensee issued a night order addressing chain operated valves and requiring use of stem position indications when repositioning such valves. Additionally, the licensee conducted a review of these types of valves to determine the extent of condition.

The inspectors reviewed plant Procedure 1.3.64, "Plant Clearance Order," Revision 39, that ensures equipment status is properly controlled. Step 4.10.3 states, in part, that the assigned individual should remove clearance tags and reposition the components per the Tag Removal List. The Tag Removal Lists in the clearance orders following Refueling Outage R23 listed valves RFW-V-106A and RFW-V-106B to be opened and left open when removing the clearance tags. The inspectors determined the licensee failed to properly control the reactor feedwater pumps minimum flow block valves' position as required by plant procedures. Additionally, the inspectors determined that since the performance deficiency occurred on June 10, 2017, with shutdown cooling still in service (RFW-V-106A) and again on June 17, 2017, after shutdown cooling had been

secured (RFW-V-106B), the issue should be assessed using both the shutdown operations and at-power significance determination processes.

Analysis. The failure to follow plant Procedure 1.3.64, “Plant Clearance Order,” that ensures equipment status is properly controlled, was a performance deficiency. The performance deficiency was more than minor because it affected the configuration control 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 licensee removed the clearance tags on the reactor feedwater pumps minimum flow block valves, RFW-V-106A and RFW-V-106B, but failed to open the components per the Tag Removal List. Consequently, on September 3, 2017, reactor feedwater pump 1B was observed to be operating with abnormally high temperatures, and on September 4, 2017, reactor feedwater pump 1A was observed to have abnormal flow indications after returning to service. Additionally, the failure to open the reactor feedwater minimum flow block valves prevented the reactor feedwater pumps from operating on minimum flow during pump start.

The inspectors used Inspection Manual Chapter 0609, Attachment 04, “Initial Characterization of Findings,” to properly characterize the finding. Since the first instance of the performance deficiency occurred with the plant on shutdown cooling, the inspectors performed an initial significance determination using NRC Inspection Manual Chapter 0609, Appendix G, Attachment 1, Exhibit 3, “Mitigating Systems Screening Questions.” The inspectors determined that the finding was of very low safety significance (Green) because all of the screening questions were answered in the negative.

Since the second instance of the performance deficiency occurred with the plant secured from shutdown cooling, the inspectors performed another initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” Exhibit 2, “Mitigating Systems Screening Questions.” The inspectors determined that the finding was also of very low safety significance (Green) because all of the screening questions were answered in the negative. Specifically, in both instances, the licensee isolated the reactor feedwater system minimum flow lines, but the reactor feedwater system maintained the ability to inject water into the reactor vessel.

This finding had a cross-cutting aspect in the area of human performance, documentation, in that the licensee failed to create and maintain complete, accurate, and up-to-date documentation, in that the procedure did not contain guidance on how to correctly open the valves [H.7].

Enforcement. This finding does not involve enforcement action because no violation of a regulatory requirement was identified. This issue was entered into the licensee’s corrective action program as Action Request 370966. Because this finding does not involve a violation and is of very low safety significance (Green), it is identified as FIN 05000397/2017004-02, “Failure to Follow Procedure Results in Isolation of Reactor Feedwater Minimum Flow Lines.”

(2) Inadequate Work Instructions Result in Reactor Core Isolation Cooling System Inoperability and Unavailability

Introduction. The inspectors reviewed a self-revealed, Green, non-cited violation of Technical Specification 5.4.1.a, for the licensee's failure to perform maintenance with documented instructions appropriate to the circumstances. Specifically, on June 10, 2017, the licensee installed two washers onto the RCIC turbine governor valve mechanical linkage per Work Order 02043358, which rendered the RCIC system inoperable on September 16, 2017.

Description. During Refueling Outage R23, maintenance personnel performed maintenance on the RCIC turbine governor valve, RCIC-V-2, from May 30 - June 11, 2017. The RCIC-V-2 valve controls the steam flow to the RCIC turbine and is opened by spring force and closed by the oil pressure of the RCIC turbine governor control system. The RCIC flow control circuit determines the required valve position and positions the governor remote servo unit. This remote servo unit is connected to RCIC-V-2 by the governor valve lever arm. As part of the maintenance, the governor valve lever arm was disassembled on May 31, 2017, per Work Order 02043358, Revision 0. Maintenance personnel noted in Step 4.6 of the work instructions that one washer was removed from between the governor lever and remote servo slip link on the south side of the mechanical linkage. During reassembly, measurements of the linkage were taken and determined to be greater than the allowed specification. The Operation Maintenance Manual allowed the use of one or two washers to ensure the linkage was within the required 0.010 – 0.015 inch clearance. Work Order 02043358, Revision 4 was created to allow maintenance personnel to install a washer on the north side of the mechanical linkage, in addition to the original one washer previously removed in Step 4.6. After the linkage was reassembled, maintenance personnel manually stroked the linkage to verify there was no binding of RCIC-V-2. Once all work on the RCIC system was completed, operations personnel performed a post maintenance test on June 16, 2017, to verify operability. Again, no binding was observed on RCIC-V-2.

On September 16, 2017, operations personnel were conducting quarterly surveillance testing of the RCIC system in accordance with Procedure 10.25.17, "PM CAL/Test – RCIC Turbine Governor Controller," Revision 13. After the surveillance, operations personnel attempted to shut down the RCIC turbine in accordance with Procedure SOP-RCIC-SHUTDOWN, "RCIC Shutdown," Revision 10. With the controller at 0 percent demand, the RCIC turbine's speed should have slowed; however, the turbine continued to run with a flow of 390 gpm, due to what was determined to be binding of the governor valve linkage. Troubleshooting determined that as the RCIC turbine runs and heats up, the linkage moves due to thermal growth and causes binding at the linkage pivot point. The additional washer installed in June 2017 limited the clearance in the linkage joint, caused additional friction, and resulted in the valve binding during the system shutdown. Binding of the valve due to two washers had been previously identified by the licensee in 1996 in Technical Evaluation Request 96-0125-0; however, that information was not correctly incorporated into the maintenance Work Order drawings. Corrective actions included removing the additional washer on September 16, 2017, and updating the drawings. The licensee entered this issue into the corrective action program as Action Request 371429.

In reviewing this issue, the inspectors determined that manual operation of the RCIC system is described in the current licensing basis, as well as in the station's emergency operating procedures. Specifically, Section 5.4.6.2.5.1 of the Final Safety Analysis Report (FSAR) states, in part, that "during extended periods of [RCIC] operation and when the normal [reactor vessel] water level is again reached, the [High Pressure Core Spray] system may be manually tripped and the RCIC system flow controller may be adjusted and switched to manual operation. This prevents unnecessary cycling of the two systems. The RCIC flow to the vessel is controlled by adjusting flow to the amount necessary to maintain vessel level." In addition, the emergency operation procedures for station blackout (SBO) and extended loss of AC power (ELAP) direct operations personnel to shift RCIC operation to the condensate storage tank (CST) in CST to CST mode. As part of that process, steps 2.1.5 and 2.1.8 of Procedure SOP-RCIC-TRANSFER-QC, "RCIC Transfer to CST – CST Mode," Revision 0, state, in part, to place RCIC-FIC-600 (RCIC Flow Control) in manual and adjust RCIC turbine speed greater than 2100 rpm but less than 5000 rpm, and RCIC pump discharge flow between 300-600 gpm.

The inspectors determined that the binding of the governor valve linkage during manual operation was contrary to the FSAR description of the RCIC system and may have complicated operations personnel's response to an SBO/ELAP per procedures. Therefore, the inspectors concluded that the governor valve linkage binding adversely affected the reliability of the RCIC system during an SBO/ELAP. However, since the automatic start and stop features of RCIC were not impacted by the governor valve linkage binding, the system's injection safety function was maintained.

Analysis. The failure to perform maintenance with documented instructions appropriate to the circumstances was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it affected the configuration control 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, on June 10, 2017, the licensee installed two washers onto the governor valve mechanical linkage per Work Order 02043358 and rendered the reactor core isolation cooling system inoperable on September 16, 2017. 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 that the finding was of very low safety significance (Green) because all of the screening questions were answered in the negative.

This finding had a cross-cutting aspect in the area of human performance, challenge the unknown, in that the licensee did not stop when faced with uncertain conditions and evaluate and manage risks before proceeding. Specifically, the licensee did not challenge the use of two washers during reassembly when only one washer was removed during disassembly [H.11].

Enforcement. Technical Specification 5.4.1.a, requires, in part, that written procedures be established, implemented, and maintained as 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, that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed

in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. The licensee established Work Order 02043358 for reassembling the RCIC system, a safety-related system, to meet the Regulatory Guide 1.33, Revision 2, Appendix A requirement. Contrary to the above, on June 10, 2017, the licensee failed to perform maintenance that can affect the performance of safety-related equipment in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances as recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Specifically, Work Order 02043358 was not appropriate to the circumstances in that the licensee installed two washers onto the governor valve mechanical linkage per the work order, and rendered the RCIC system, to which 10 CFR Part 50, Appendix B, applies, inoperable on September 16, 2017. The licensee removed the additional washer and reassembled the governor valve mechanical linkage per work instructions to correct the condition. The licensee entered this issue into the corrective action program as Action Request 371429. Because this finding is of very low safety significance (Green) and was entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy:
NCV 05000397/2017004-03, "Inadequate Work Instructions Result in Reactor Core Isolation Cooling System Inoperability."

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

.1 (Closed) Licensee Event Report (LER) 05000397/2016-002-00 and 05000397/2016-002-01, "Valve Closure Results in Momentary Increase in Secondary Containment Differential Pressure"

a. Inspection Scope

On October 3, 2016, a reactor building exhaust valve unexpectedly closed, resulting in a loss of secondary containment vacuum. As a result, secondary containment became inoperable due to pressure exceeding the technical specification limit of -0.25 inches of water gauge (iwg). Operations personnel restored secondary containment within 4 minutes by manually starting standby gas treatment system A. The cause of the exhaust valve closure was a loose termination point on the termination board that caused an intermittent loss of power to the valve. The corrective action for this event was to tighten the loose termination point screw. The revision to the LER added the cause of the exhaust valve closure.

b. Findings

The inspectors reviewed the LER, and no findings or violations of NRC requirements were identified. This licensee event report is closed.

.2 (Closed) Licensee Event Report (LER) 05000397/2016-003-00 and 05000397/2016-003-01, "Failure of Fan to Start Results in Momentary Increase in Secondary Containment Pressure"

a. Inspection Scope

On November 20, 2016, operations personnel began the post-maintenance test of reactor exhaust air fan 1B with the reactor building heating, ventilation, and air conditioning (HVAC) system A running. Operations personnel stopped the reactor

building HVAC system A per station procedures and proceeded to start HVAC system B; however, reactor exhaust air fan 1B failed to manually start. The failure of reactor exhaust air fan 1B to start resulted in a time period with no reactor building fans running. Reactor building pressure increased, and secondary containment pressure was not maintained less than or equal to -0.25 iwg. Operations personnel manually started HVAC system A and restored secondary containment pressure to less than -0.25 iwg within one minute. The cause of the exhaust fan's failure to start was hardened grease on the closing mechanism of the fan's circuit breaker. Corrective actions included replacing the circuit breaker for reactor exhaust air fan 1B and reviewing and updating the preventive maintenance and refurbishment dates for similar breakers. The revision to the LER added the cause of the exhaust fan's failure to start.

b. Findings

Introduction. The inspectors reviewed a Green, self-revealed, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to follow procedure SYS-2-25, "Procedure PM Template Preparation and Review," Revision 2. Specifically, the licensee failed to implement adequate preventive maintenance (PM) for the aging of grease on 480V breakers because the maintenance optimization template (MOT) was not adequate when the circuit breaker for the reactor building 1B exhaust fan motor failed before its overhaul date.

Description. On November 20, 2016, the operators were swapping reactor building ventilation fans when the reactor building 1B exhaust fan motor failed to start leading to a loss of secondary containment. Troubleshooting was performed on the circuit breaker and the switch located in the control room which was also not working correctly. On January 18, 2017, a new control room switch was installed. During the post maintenance test, the reactor building 1B exhaust fan motor failed to start. The circuit breaker was replaced, and the operators ran the fan successfully. When the licensee sent the reactor building 1B exhaust fan motor breaker to Westinghouse for review, Westinghouse's failure analysis report concluded on March 14, 2017, that hardened grease led to the breaker failure. The investigation determined that hardened grease prevented the breaker from closing which led to the loss of reactor building ventilation and loss of secondary containment. The reactor building 1B exhaust fan motor circuit breaker failed on November 20, 2016, prior to a 12 year overhaul due by the end of 2017.

The inspectors reviewed the licensee data on breaker failures due to degraded lubrication. Eight circuit breaker failures were due to degraded lubrication when identified at the vendor or the licensee's overhauls, and the licensee's inspections. In addition, the inspectors determined the trend showed that the circuit breaker grease was degraded when performing the six year maintenance. The lubrication maintenance needed updating with the observed performance of the grease.

SYS-2-25, "Procedure PM Template Preparation and Review," Revision 2, requires in section 4.5 that "on an annual basis a review is performed to ENSURE the MOT [Maintenance Overhaul Template] is aligned with industry best practices and recommendations." The MOT considers inputs from EPRI guidance, vendor recommendations, external operating experience, and internal operating experience. In the case of the reactor building 1B exhaust fan motor breaker, and other breakers with grease deficiencies, the internal operating experience review should have determined

that degraded lubrication was due to maintenance not being performed at correct frequencies. The licensee entered this issue into their corrective action program as Action Request 358027.

Analysis. The failure to follow plant procedure SYS-2-25, "Procedure PM Template Preparation and Review," Revision 2, was a performance deficiency. Specifically, the licensee failed to implement adequate PM for the aging of grease on 480V breakers because the MOT review was not adequate when the circuit breaker for the reactor building 1B exhaust fan motor failed due to hardened grease before its overhaul date. The performance deficiency was more than minor, and therefore a finding, because it was associated with the configuration control 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 hardened grease led to the failure of the reactor building ventilation fan and loss of secondary containment. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 3, "Barrier Integrity Screening Questions," dated June 19, 2012, the inspectors determined the finding was of very low safety significance (Green) because the finding (1) did not represent an actual open pathway in the physical integrity of reactor containment, containment isolation system, or heat removal components; and (2) did not involve an actual reduction in function of hydrogen igniters in the reactor containment. Specifically, the licensee failed to implement an adequate PM for the aging of grease on 480V breakers because the MOT was not adequately reviewed, which resulted in the circuit breaker for the reactor building 1B exhaust fan motor failing before its overhaul date.

This finding had a cross-cutting aspect in the area of human performance, consistent process, in that the licensee did not use a consistent, systematic approach to make decisions and incorporate risk insights as appropriate. Specifically, the licensee did not use a systematic process for preventive maintenance activities when they failed to recognize the grease deficiencies in their 480V breaker system [H.13].

Enforcement. Technical Specification 5.4.1.a requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2. Section 9.b of Appendix A of Regulatory Guide 1.33, Revision 2, requires procedures for performing preventive maintenance on safety-related equipment. The licensee established procedure SYS-2-25, "Procedure PM Template Preparation and Review," Revision 2, to meet the Regulatory Guide 1.33 requirement. Section 4.5 of procedure SYS-2-25 requires "on an annual basis a review is performed to ENSURE the MOT is aligned with industry best practices and recommendations." Contrary to the above, since 2015, the licensee did not ensure that an adequate review was performed to ensure the MOT is aligned with industry best practices and recommendations. Specifically, the licensee should have determined during MOT reviews that degraded lubrication was due to maintenance not being performed at correct frequencies. As a result of these inadequate reviews, on November 20, 2016, the circuit breaker for the reactor building 1B exhaust fan motor failed due to hardened grease before its overhaul date causing a loss of secondary containment. The licensee's corrective actions included replacing the circuit breaker for reactor exhaust air fan 1B and reviewing and updating the preventive maintenance and refurbishment dates for similar breakers, and the

licensee entered this issue into their corrective action program as Action Request 358027. Because this finding is of very low safety significance (Green) and was entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000397/2017004-04, "Failure to Follow Procedure Leads to Loss of Secondary Containment."

This licensee event report is closed.

.3 (Closed) Licensee Event Report (LER) 05000397/2017-002-00, "Implementation of Enforcement Guidance Memorandum 11-003, Revision 3"

a. Inspection Scope

During Refueling Outage 23 (R23) in May – June 2017, Columbia Generating Station implemented Enforcement Guidance Memorandum (EGM) 11-003, Revision 3, "Dispositioning Boiling Water Reactor Licensee Noncompliance with Technical Specification Containment Requirements during Operations with a Potential for Draining the Reactor Vessel," dated January 15, 2016. Consistent with EGM 11-003, Revision 3, secondary containment operability was not maintained during operations with a potential for draining the reactor vessel activities, and required action C.1 of Technical Specification 3.6.4.1 was not completed.

The inspectors reviewed this licensee event report for potential performance deficiencies and violations of regulatory requirements. The inspectors reviewed the station's implementation of the EGM 11-003, Revision 3, during operations with a potential for draining the reactor vessel. Specific observations included:

1. The inspectors observed that the operations logged all potential for draining the reactor vessel activities in the control room narrative logs. Additionally, the R23 Outage Shutdown Safety Plan documented the actions taken to ensure water inventory was maintained and defense-in-depth criteria were in place prior to entering operations with the potential to drain the reactor vessel.

2. The inspectors noted that the licensee maintained reactor vessel water level at least greater than 22 feet above the top of the reactor pressure vessel flange as required by Technical Specification 3.9.6. The inspectors also verified that at least one safety-related pump was the standby source of makeup designated in the control room narrative logs for the evolutions. The inspectors confirmed that the worst case estimated time to drain the reactor cavity to the reactor pressure vessel flange was greater than 24 hours.

3. The inspectors verified that the operations with a potential for draining the reactor vessels were not conducted in Mode 4 with secondary containment inoperable, and the licensee did not move irradiated fuel during the operations with a potential for draining the reactor vessels. The inspectors verified that two independent means of measuring reactor pressure vessel water level were available for identifying the onset of loss of inventory events. Additionally, the inspectors verified the capability to isolate the potential leakage path during operations with the potential to drain the reactor vessel before the water inventory reached the reactor pressure vessel flange was maintained.

Technical Specification 3.6.4.1, "Secondary Containment" requires, in part, that secondary containment shall be operable during operations with a potential for draining the reactor vessel. Technical Specification 3.6.4.1, Condition C, requires the licensee to initiate actions to suspend operations with a potential for draining the reactor vessel immediately when secondary containment is inoperable. Contrary to the above, from May 13 - June 19, 2017, Columbia Generating Station performed a total of six operations with a potential for draining the reactor vessel activities while in Mode 5 without an operable secondary containment. These conditions were reported as conditions prohibited by Technical Specifications. The licensee entered this issue into its corrective action program as Action Request 343903.

Since this violation occurred during the discretion period described in EGM 11-003, Revision 3, the NRC is exercising enforcement discretion in accordance with Section 3.5, "Violations Involving Special Circumstances," of the NRC Enforcement Policy, and, therefore, will not issue enforcement action for this violation (EA-17-179).

In accordance with EGM 11-003, Revision 3, each licensee that receives discretion must submit a license amendment required within 12 months of the NRC staff's publication in the Federal Register of the notice of availability for a generic change to the standard TS to provide more clarity to the term OPDRV. However, as of the date of this report, the NRC staff has not yet published in the Federal Register this generic change information.

b. Findings

A violation of Technical Specification 3.6.4.1 was identified. Because the violation was identified during the discretion period described in EGM 11-003, Revision 3, the NRC is exercising enforcement discretion in accordance with Section 3.5, "Violations Involving Special Circumstances," of the NRC Enforcement Policy and, therefore, will not issue enforcement action for this violation, subject to a timely license amendment request being submitted.

This licensee event report is closed.

.4 (Closed) Licensee Event Report (LER) 05000397/2017-004-00, "Manual Reactor Scram Due to High Main Condenser Back Pressure"

a. Inspection Scope

On August 20, 2017, Columbia Generating Station experienced a loss of condenser vacuum, resulting in a manual reactor scram. The loss of condenser vacuum was due to the spurious closure of the main condenser air removal suction valve. The main condenser air removal suction valve failed closed as a result of the failure of one of its solenoid pilot valves due to thermal aging. The immediate corrective action was to install a modification to gag open the main condenser air removal suction valve for the remainder of the operating cycle.

b. Findings

Introduction. The inspectors reviewed a self-revealed, Green, finding for the licensee's failure to follow plant Procedure EGM-1-9, "Single Point Vulnerability Review Process," that establishes the licensee's requirements for performing single point vulnerability

reviews by identifying single component failures within the system that could lead to a reactor turbine trip and scram.

Description. A single point vulnerability is defined as a subset of critical components and should include as a minimum those single components whose failure will directly result in a turbine trip or reactor scram. On October 17, 2005, the licensee identified the main condenser air removal suction valve as a single point vulnerability if the valve were to fail closed on a loss of power. Closure of this valve would isolate the entire air removal and offgas systems and cause a reactor scram on loss of condenser vacuum. This issue was documented in engineering evaluation AR-EVAL 10718 to upgrade the failure logic on the valve to reduce the single point vulnerability potential. The logic change modification was approved by the Plant Health Committee in January 2006; however, the project was placed on the long range plan list. On April 9, 2012, the Design Sub-Committee created an action to prepare a design change to remove the single point vulnerability, but the action remained on the minor modifications list with a due date of October 30, 2020.

The licensee created an interim compensatory measure to replace the solenoid pilot valves that provide control air to the actuator of the main condenser air removal suction valve on a 10-year frequency until a design modification was completed. Both solenoid pilot valves were replaced in 2007.

In December 2008, the licensee completed their single point vulnerability review per Procedure EGM-1-9, "Single Point Vulnerability Review Process," Revision 0. Procedure EGM-1-9 established the licensee's requirements for implementation of the Single Point Vulnerability Review Process. Step 4.3.2 of Procedure EGM-1-9 states, in part, that

> *A single point vulnerability review "should be of sufficient detail to uncover items that could lead to a Reactor Turbine Trip/Scram event."*

The review concluded that the offgas system contained several single train configurations of mechanical components with low risk of failure. Neither the main condenser air removal suction valve nor its solenoid pilot valves were mentioned in the report.

In January 2016, Work Orders 02078368 and 02078369 to replace the solenoid pilot valves were identified as preventive maintenance activities and submitted for inclusion in the original scope for Refueling Outage R23 scheduled for May 2017. At the scope freeze milestone, the work orders to replace the solenoid pilot valves were removed from the Refueling Outage R23 scope.

Licensee management removed the work orders from the Refueling Outage R23 scope to utilize the grace period for the 10-year preventive maintenance work that would not have expired until December 16, 2019, after Refueling Outage R24. As a result of the removal at scope freeze, the solenoid valve replacements were not performed in Refueling Outage R23. On August 20, 2017, the main condenser air removal suction valve failed closed because one of its solenoid pilot valves failed due to thermal aging. The solenoid pilot valves were identified as critical components, but were not identified as single point vulnerabilities and therefore did not receive the proper review and priority. Closure of the main condenser air removal suction valve isolated the entire air removal

and offgas systems and caused a loss of condenser vacuum and subsequent manual reactor scram.

The inspectors determined the licensee failed to conduct an adequate single point vulnerability review as required by plant procedures in December 2008 when the solenoid pilot valves where not identified as single point vulnerable. The licensee completed an immediate corrective action to install a temporary modification to gag open the main condenser air removal suction valve for the remainder of the operating cycle. Additionally, the licensee conducted a review of all single point vulnerable components to determine the extent of condition. The licensee entered this issue into the corrective action program as Action Request 370326 to perform an apparent cause review and address long-term corrective actions.

Analysis. The failure to follow plant Procedure EGM-1-9, "Single Point Vulnerability Review Process," Revision 0, was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee identified the main condenser air removal suction valve as a single point vulnerability but failed to identify its solenoid pilot valves as single point vulnerabilities. Therefore, the components did not receive the proper review and priority. Using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 1, "Initiating Events Screening Questions," dated June 19, 2012, the inspectors determined the finding was of very low safety significance (Green) because the finding did not cause the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

This finding does not have a cross-cutting aspect since the failure to identify the single point vulnerability was performed in December 2008 and was not reflective of current licensee performance.

Enforcement. This finding does not involve enforcement action because no violation of a regulatory requirement was identified. This issue was entered into the licensee's corrective action program as Action Request 370326. Because this finding does not involve a violation and is of very low safety significance (Green), it is identified as FIN 05000397/2017004-05, "Failure to Follow Single Point Vulnerability Review Process for Components Results in Reactor Scram."

This licensee event report is closed.

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

4OA6 Meetings, Including Exit

Exit Meeting Summary

On October 20, 2017, the inspectors presented the Evaluations of Changes, Tests, and Experiments inspection results to Mr. A. Javorik, Vice President of Engineering, and other

members of the licensee's staff. The licensee acknowledged the results as presented. While some proprietary information was reviewed during this inspection, no proprietary information was included in this report.

On December 14, 2017, the inspectors discussed the in-office inspection of the Emergency Plan, Revision 65, and Emergency Plan Implementing Procedure 13.1.1A, Revision 32, with Mr. S. Clizbe, Manager, Emergency Preparedness, and other members of the licensee staff. The licensee acknowledged the issues presented.

On December 28, 2017, the inspectors obtained the final annual examination results and telephonically exited with Mr. G. Wyatt, Supervisor, Simulator and Examination Group, on January 2, 2018. The inspectors did not review any proprietary information during this inspection.

On January 11, 2018, the inspectors presented the quarterly 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.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

A. Black, Manager, Emergency Services
D. Brandon, Design Engineering Manager
D. Brown, Plant General Manager
S. Brush, ALARA Planner, Radiation Protection
S. Clizbe, Emergency Preparedness Manager
B. Cook, Manager, Training
G. Crawford, Welding Engineer
M. Davis, Manager, Chemistry and Radiological Services
J. Dorwin, Engineer, Code Programs
A. Fahnestock, Program Manager, Emergency Preparedness
C. Forrester, Acting Manager, Emergency Preparedness
R. Garcia, Licensing Engineer
K. Gillard, Analyst, Chemistry and Radiological Services
E. Gilmour, Computer Engineering Manager
P. Girgis, Procurement Engineer
D. Gregoire, Manager, Regulatory Affairs
J. Hauger, Systems Engineering Manager
G. Hettel, Vice President, Operations
G. Higgs, Continuous Improvement Manager
A. Holt, Supervisor, Information Services
A. Javorik, Vice President of Engineering
J. Jones, Assistant Operations Manager
M. Kellett, Assistant to the Vice President of Operations
M. Khaudiser, Manager, Chemistry and Radiation Safety
D. Kovacs, Manager, Information Services
N. LaBella, Inservice Inspection, Nondestructive Examiner
S. Lorence, Human Resources Manager
C. Moon, Manager, Quality
S. Nappi, Assistant to the Vice President of Operations
T. Parmelee, Compliance Engineer
G. Pierce, Manager, Training
J. Pierce, Manager, Continuous Improvement
R. Prewett, Maintenance Manager
M. Rice, Design Authority
S. Richter, Inservice Inspection Engineer
R. Sanker, Radiological Support Supervisor, Radiation Protection
B. Sawatzke, Chief Nuclear Officer
B. Schuetz, Plant General Manager
J. Smith, Radiological Operations Supervisor, Radiation Protection
B. Stanislewski, Security Operations Manager
M. Stodick, Assistant Operations Manage
G. Strong, Electrical Design Supervisor
D. Suarez, Regulatory Compliance Engineer
M. Sullivan, Manager, Security Operations
C. Vadoli, Electrical I&C Design Supervisor

D. Wolfgramm, Compliance Supervisor, Regulatory Affairs
R. Wynegar, Senior Licensing Engineer
A. Zbib, Mechanical Design Supervisor

NRC Personnel

R. Deese, Senior Risk Analyst

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000397/2017004-01	NCV	Loss of Configuration Control Results in Emergency Diesel Generator Inoperability (Section 1R22)
05000397/2017004-02	FIN	Failure to Follow Procedure Results in Isolation of Reactor Feedwater Minimum Flow Lines (Section 4OA2)
05000397/2017004-03	NCV	Inadequate Work Instructions Result in Reactor Core Isolation Cooling System Inoperability (Section 4OA2)
05000397/2017004-04	NCV	Failure to Follow Procedure Leads to Loss of Secondary Containment (Section 4OA3)
05000397/2017004-05	FIN	Failure to Follow Single Point Vulnerability Review Process for Components Results in Reactor Scram (Section 4OA3)

Closed

05000397/2016-002-00; 05000397/2016-002-01	LER	Valve Closure Results in Momentary Increase in Secondary Containment Differential Pressure (Section 4OA3)
05000397/2016-003-00; 05000397/2016-003-01	LER	Failure of Fan to Start Results in Momentary Increase in Secondary Containment Pressure (Section 4OA3)
05000397/2017-002-00	LER	Implementation of Enforcement Guidance Memorandum 11-003, Revision 3 (Section 4OA3)
05000397/2017-004-00	LER	Manual Reactor Scram Due to High Main Condenser Back Pressure (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

Number	Title	Revision
E/I-02-90-01	Low Voltage System Loading, Security Loading and Voltage Calculation	014

Procedures

Number	Title	Revision
SOP-COLDWEATHER-OPS	Cold Weather Operations	029
SOP-COLDWEATHER-OPS	Cold Weather Operations	030
SOP-SW-SPRAY	Standby Service Water Spray Header Operation	000
13.1.1	Classifying the Emergency	048
ABN-ELEC-GRID	Degraded Off-Site Power Grid	010

Miscellaneous Documents

Number	Title	Date
PER-203-3953	Insulation Not Restored on Above-ground HPCS SW Return Piping Prior to Onset of Cold Weather Operations	November 3, 2003
AR EVAL 358993	Install a Temporary Heater in HPCS DDG Battery Room D114	December 16, 2016

Action Requests (ARs)

305059	307195	351788	358881	359026
374840				

Section 1R05: Fire Protection

Procedures

Number	Title	Revision
1.3.10	Plant Fire Protection Program Implementation	034
1.3.10A	Control of Ignition Sources	017
1.3.10C	Control of Transient Combustibles	020
FPP-1.6	Combustible Loading Calculation Control	002
FPP-2.2-12	Annual Fire Door Operability Test	005
FPP-2.2.7	Fire Protection Water System Inspections	006

Miscellaneous Documents

Number	Title	Revision
ABN-FIRE	Fire	039
PRP-RW-467	Radwaste 467	005
PFR-MN-XFMR-YD-MISC	MN XFMR YD Misc Bldgs	006
PFZONE4	Non-Power Block Pre-Fire Plan	006

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

Procedures

Number	Title	Revision
TDI-08	Licensed Operator Requalification Program	015
TDI-06	Simulator Management	019
TDI-11	Shift Manager Program	003

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Number	Title	Revision
1.3.76	Integrated Risk Management	049
1.3.85	On-Line Fire Risk Management	005
1.5.14	Risk Assessment and Management for Maintenance/Surveillance Activities	039
ISPM-7	Electrical Safety	017
OI-69	Time Critical Operator Actions	010
OI-14	Columbia Generating Station Operational Challenges and Risk Program	015

Miscellaneous Documents

Number	Title	Date
	High Risk Work Plan for Circulating Water Maintenance	October 6, 2017
	PARAGON Risk Week of October 9, 2017	October 15, 2017

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

Number	Title	Revision
1.3.66	Operability and Functionality Evaluation	034
OI-09	Operator Standards and Expectations	068

Section 1R17: Evaluation of Changes, Tests, and Experiments

10 CFR 50.59 Applicability Determinations

Number	Title	Revision
AD-15-0164	Perform Accept As-Is evaluation for Jet Pump 17/18 Riser Flaw	000
AD-15-0042	Install Permanent Shims under Cooling Coil RRA-CC-4	000
AD-16-0843	SW Spray Pond Local Level Indicator	000

10 CFR 50.59 Screenings

Number	Title	Revision
14-0051	Replace Level Switches in Scram Discharge Volume	000
15-0134	Modify swing check valve RFW-V-10A hinge using weld build	000
16-0037	Replace isolation valves EDR-V-19 and EDR-V-20 with butterfly valves rather than gate valves	000
16-0136	Change minimum service water operability flow value to meet room heat load requirements	000
16-0156	Replace CRD-FCV-2A and its associated CRD-AO-2A air operator with an improved valve design	000
17-0098	Replacement of RHR-P-2A with a refurbished pump	000
15-0093	Change overall gear ratio on motor operator RHR-MO-40	000
15-0104	Replace threads on motor operator CW-MO-1C with helicoils	000
14-0002	Accept as is Non-conforming Condition Temperature De-rating of Main Steam Relief Valve Educator Gasket Material	000
15-0143	Temporary Modification to Closed and De-energize HPCS-V-11 in its Design Bases Closed Position	000
15-0162	Temporary Modification to Closed and De-energize HPCS-V-11 in its Design Bases Closed Position	000
17-0013	Temporary Modification to Closed and De-energize HPCS-V-11 in its Design Bases Closed Position	000
16-0215	Service Water Spray Pond Local Level Indicators	000
12-0031	Replace HPCS-GEN-DG3 Governor Control System	000

15-0181	Replace HPCS-GEN-DG3 Governor Control System	000
16-0044	Electrical soft back-seating of RFW-MO-65A to seal off a packing leak	000
16-0209	Replace RPS contactor/starter with recommended replacement from General Electric	000
16-0219	Install portable temporary heater in HPCS DG Battery Room D114	000
17-0024	Increase electrical capacity of Motor Control Center E-MC-5A to load served from power panel E-DP-SS1	000
17-0074	Change 125VDC Battery System Undervoltage Relay Settings to align with the Post Fire Safe Shutdown Calculation	000
17-0081	Replace motor on RFW-MO-65A which actuates RFW-V-65A	000
17-0106	Performing electrical back-seating of valve BS-V-1A	000
15-0114	Make the installation of EC TMOD 13203 into a permanent change	000

10 CFR 50.59 Evaluations

Number	Title	Revision
14-0002	Leading Edge Flow Meter (LEFM) Check Plus System	000
14-0005	Replace HPCS-GEN-DG3 Governor Control System	000
15-0001	Suppression Pool Temperature Monitoring Response Time	000
15-0002	Negative Pressure Design Evaluation: Increase Containment Spray Flow Rate and Change from CONTEMPT to SHEX06 Methodology	000
16-0001	ASD system hardening project	000
17-0001	Replacing the existing Control Room Chiller analog temperature controls with digital pressure controls	000

Design Change Packages

Number	Title	Revision
EC 13917	Close HPCS-V-11 and Deactivate HPCS-MO-11	001
EC 14789	ASD system hardening project	001
EC 14635	Replace RHR-P-2A pump and motor	000
EC 13912	Modify RFW-V-10A disc stop	000

Procedures

Number	Title	Revision
IP-ENG-001	Standard Design Process	000
ENG-DES-50	Interface Procedure for IP-ENG-001 Standard Design Process	001

Procedures

Number	Title	Revision
SWP-PUR-02	Procurement Technical Reviews	010
SWP-PRO-02	Preparation, Review, Approval and Distribution of Procedures	046
SWP-LIC-02	Licensing Basis Impact Determinations	014
OSP-INST-H101	Shift Daily Instrument Checks (Modes 1, 2, 3)	088
10.25.176	Back Seating Motor Operated Valves (MOVS)	010
SPES-1.7.26	Reverse Engineering Guidelines	046
SPES-1.6.20	Spare Parts Engineering Standard	007
SPES-1.6.7	Substitutions Evaluations	053
1.5.13	Preventive Maintenance Optimization Living Program	035
DES-4-1	Preparation, Verification, and Approval of Calculation	023
OSP-HPCS/IST-Q701	HPCS System Operability Test	052
OSP-HPCS-A701	HPCS Keep Fill Integrity Test	009
OPS-INST-H101	Shift and Daily Instrument Checks (Modes 1, 2, and 3)	088
4.840.A5	Annunciator Panel Alarms	027
4.820.B1	Annunciator Panel Alarms	039
OSP-SW-M102	Standby service water loop B valve position verification	035
SOP-RRC-ASD	Reactor recirculation ASD operation	013
4.602.A13	602.A13 Annunciator panel alarms	029

Drawings

Number	Title	Revision
W524-2	Flow Diagram Standby Service Water System Reactor Radwaste DG Bldgs and Yard	118
EWD-7E-004B	Electrical Wiring Diagram High Pressure Core Spray System HPCS Diesel Engine DG-ENG-1C	002
EWD-7E-028A	Electrical Wiring Diagram High Pressure Core Spray System HPCS Bus Relaying & Metering	005
EWD-7E-004E	Electrical Wiring Diagram High Pressure Core Spray System HPCS Diesel Engine DG-ENG-1C	002
EWD-7E-028B	Electrical Wiring Diagram High Pressure Core Spray System HPCS Bus Relaying & Metering	001

Miscellaneous Documents

Number	Title	Revision/Date
14737	Calculation for RHR pressure drop	003
2042945-09	RFW-V-10A Replace soft seat work order post maintenance LLRT	000

Miscellaneous Documents

Number	Title	Revision/Date
2042945-01	RFW-V-10A Replace soft seat work order	000
11542	Calculation for DC gate and globe valves MOV thrust and setpoint	000
CSJ15 HPCS-V-2	Cold Shutdown Justification - Justification to change check valve full open test frequency from quarterly to cold shutdown	000
AU-OP/TS-17	Quality Services Audit Report: Operations, Technical Specifications and Applicable Conditions Program	August 10, 2017

Action Requests (Reviewed)

320675	322022	346817	370810	322423
369387	330795			

Action Requests (Issued)

372796	372765	372687	372660

Section 1R19: Post Maintenance Testing

Procedures

Number	Title	Revision
SWP-TST-01	Post Maintenance Testing Program	017
SPES-1.7.57	Post Maintenance Testing	044

Section 1R22: Surveillance Testing

Miscellaneous Documents

Number	Title	Revision/Date
EWD-47E-007	Electrical Wiring Diagram Standby AC Power System Diesel Generator 2 Breaker E-CB-DG2/8	19
	Daily and System Logs	October 1 – December 31, 2017

Action Requests (ARs)

371608	371627	371628	371646

Section 1EP6: Drill Evaluation

Procedures

Number	Title	Revision
ABN-EARTHQUAKE	Earthquake	013
ABN-ELEC-SM3/SM8	SM-3, SM-8, SM-85, SM-82, SL-81, SL-83 & SL-31 Distribution System Failures	020
ABN-CRD	Complete Loss of CRD Drive Flow	009
ABN-CORE	Unplanned Core Operating Conditions	017
5.1.1	RPV Control	021
5.1.2	RPV Control – ATWS	025
13.1.1	Classifying the Emergency	048
13.1.1A	Classifying the Emergency – Technical Bases	032

Miscellaneous Documents

Number	Title	Revision/Date
	Columbia Generating Station ERO Team "C" Drill Report October 31, 2017	November 30, 2017
	Columbia Generating Station Team C – Drill October 31, 2017 Scenario	000

Action Requests (ARs)

373237	373325	373847

Section 4OA1: Performance Indicator Verification

Procedures

Number	Title	Revision
12.5.3	Reactor Coolant Sampling	015
CI-10.17	Iodine	012
CI-11.4	Metals Analysis	012

Miscellaneous Documents

Number	Title	Revision/Date
CSP-I131-W101	Reactor Coolant Isotopic Analysis for I-131 Dose Equivalent	009

Miscellaneous Documents

Number	Title	Revision/Date
OSP-INST-H101	Shift and Daily Instrument Checks (Modes 1,2,3)	088
02112814-01	CSP-I131-W101 Rx Coolant Isotopic Analysis I-131 Dose Equiv	December 20, 2017

Action Requests (ARs)

371161 371436

Section 4OA2: Problem Identification and Resolution

Procedures

Number	Title	Revision/Date
O-RFW-DT-1A/R23-001	Clearance: RFW-DT-1A, Reactor Feed Pump Drive Turb	May 17, 2017
D-RFW-DT-1B-021	Clearance: RFW-P-1B, Turbine Driven Feedpump B (18520 GPM/2585' NPSH)	June 15, 2017
1.3.1	Operating Policies, Programs and Practices	121
1.3.1	Operating Policies, Programs and Practices	123
1.3.64	Plant Clearance Order	039
1.3.64	Plant Clearance Order	040
5.6.2	Station Blackout (SBO) and Extended Loss of AC Power ELAP Attachments	007
5.6.2	Station Blackout (SBO) and Extended Loss of AC Power ELAP Attachments	008
5.6.2	Station Blackout (SBO) and Extended Loss of AC Power ELAP Attachments	009
5.6.2	Station Blackout (SBO) and Extended Loss of AC Power ELAP Attachments	010
OI-12	Clearance Order Instruction	049
EC 16705	RFW Pump Startup Without Minimum Flow Path Available	001
OSP-RCIC/IST-Q701	RCIC Operability Test	060
SOP-RCIC-SHUTDOWN	RCIC Shutdown	010
10.25.17	PM CAL/Test – RCIC Turbine Governor Controller	013
SOP-RCIC-OIL	RCIC Turbine or Pump Oil Fill and Prime	010

Procedures

Number	Title	Revision/Date
SOP-RCIC-STBY	Placing RCIC in Standby Status	011
SOP-RCIC-TRANSFER-QC	RCIC Transfer to CST - CST Mode	000

Miscellaneous Documents

Number	Title	Revision/Date
02084009-08	10.25.17, Sections 7.3 – 7.8	September 12, 2017
02118515-11	10.25.17, Sections 7.3 – 7.8	September 17, 2017
02118515-20	10.25.17, Sections 7.3 – 7.8	September 18, 2017
02043358-01	RCIC-V-2: Remove and Inspect (Turb-2-1-8.1)	June 11, 2017
02118515-32	RCIC-HO-C002 Align Linkages Between Servo and RCIC-V-2	September 19, 2017
EC 16705	RFW Pump Startup without Minimum Flow Path Available	001
SOP-RCIC-INJECTION	RCIC RPV Injection	010
SOP-RCIC-SUCTION	RCIC Suction Transfer	001
TER 96-0125-0	Binding occurs between the governor remote servo arm and governor lever arm clevis of RCUC turbine governor valve RCIC-V-2	April 18, 1996
02118515-15	RCIC-HO-C002 Shim as Required	September 18, 2017

Action Requests (ARs)

53791	182705	368034	368065	368170
369141	370966	371020	371264	371429
371549				

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

Procedures

Number	Title	Revision
SYS-2-25	Procedure PM Template Preparation and Review	002
1.3.84	Reactivity Management Control	004
3.4.4	Natural Circulation	005
OCC-01	Outage Control Center Norms	006
OI-09	Operator Standards and Expectation	068
OI-51	OPS Outage Preparation	012
SOP-RHR-SDC	RHR Shutdown Cooling	027
1.20.3	Outage Risk Management	012

Miscellaneous Documents

Number	Title	Revision/Date
ME-02-14-18	Upper Containment Pool Draindown Times During Various RFO Maintenance Conditions	000
ME-02-14-18	Upper Containment Pool Draindown Times During Various RFO Maintenance Conditions	001
	Coordination of R23 OPDRV Activities	February 24, 2017
EC 13609	LCO 3.0.4 Evaluation of OPDRV	February 11, 2015
	Ops Logs May 12 – June 20, 2017	May 12 - June 20, 2017

Action Requests (ARs)

358027	370326