



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

July 24, 2018

Mr. Brad Sawatzke, Chief Executive Officer
Energy Northwest
MD 1023
P.O. Box 968
Richland, WA 99352

SUBJECT: COLUMBIA GENERATING STATION – NRC INTEGRATED INSPECTION
REPORT 05000397/2018002 AND INDEPENDENT SPENT FUEL STORAGE
INSTALLATION INSPECTION REPORT 07200035/2018001

Dear Mr. Sawatzke:

On June 30, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Columbia Generating Station. On July 12, 2018, the NRC inspectors discussed the results of this inspection with Mr. G. Hettel, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the NCV, 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 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 S. Haire, Chief
Project Branch A
Division of Reactor Projects

Docket Nos. 50-397; 72-035
License No. NPF-21

Enclosure:

Inspection Report 05000397/2018002 and
07200035/2018001 w/Attachments

1. Documents Reviewed
2. Occupational Radiation Safety Inspection
Request for Information

**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000397; 07200035

License Numbers: NPF-21

Report Numbers: 05000397/2018002; 07200035/2018001

Enterprise Identifier: I-2018-002-0020; 1-2018-001-0091

Licensee: Energy Northwest

Facility: Columbia Generating Station and Independent Spent Fuel Storage
Installation

Location: Richland, Washington

Inspection Dates: April 1, 2018 to June 30, 2018

Inspectors: G. Kolcum, Senior Resident Inspector
L. Brandt, Resident Inspector
L. Brookhart, Senior Inspector
L. Carson II, Senior Health Physicist
J. O'Donnell, CHP, Health Physicist

Approved By: M. Haire, Branch Chief
Project Branch A
Division of Reactor Projects

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Columbia Generating Station in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. Findings and violations being considered in the NRC's assessment are summarized in the table below.

List of Findings and Violations

Failure to Maintain Configuration Control in the Diesel Generator 2 Diesel Cooling Water System			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000397/2018002-01 Closed	H.12 – Avoid Complacency	71111.15
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 in accordance with written procedures appropriate to the circumstances. Specifically, on April 9, 2018, the licensee inadvertently bumped and partially opened a diesel cooling water valve, DCW-V-8B2, while operating a nearby demineralized water valve, DW-V-14B2, as part of work activities under Work Request (WR) 29127677, and rendered diesel generator 2 inoperable and unavailable.			

PLANT STATUS

The plant began the inspection period at 100 percent rated thermal power. On April 19, 2018, the reactor unit was down powered to 98 percent due to feedwater heater 2C level control failure. On April 20, 2018, the unit was down powered further to 85 percent for troubleshooting. The unit returned to rated thermal power on April 21, 2018.

On April 27, 2018, the reactor unit was down powered to 85 percent for economic dispatch from Bonneville Power Administration. The unit returned to rated thermal power on April 30, 2018.

On May 18, 2018, the reactor unit automatically scrammed due to a load reject from a grid disturbance. The unit was restarted and synched to the grid on May 24, 2018. Reactor power was raised to 65 percent on May 25, 2018, and remained at 65 percent for economic dispatch from Bonneville Power Administration. The unit returned to rated thermal power on June 11, 2018.

On June 12, 2018, the unit was down powered to 98 percent due to trip of the 2C feedwater heater. On June 14, 2018, the unit was down powered to 85 percent to repair the 2C feedwater level controller. On June 15, 2018, the unit was down powered to 78 percent due to subsequent trips of the 3C and 4C feedwater heaters. After maintenance, the reactor returned to rated thermal power on June 15, 2018.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01—Adverse Weather Protection

Summer Readiness (1 Sample)

The inspectors evaluated summer readiness of offsite and alternate alternating current power systems.

71111.04—Equipment Alignment

Partial Walkdown (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) diesel generator 1 jacket water system on April 9, 2018
- (2) diesel generator 2 jacket water system on April 9, 2018
- (3) diesel generator 3 jacket water system on April 9, 2018
- (4) low pressure core spray system on June 1, 2018

71111.05AQ—Fire Protection Annual/Quarterly

Quarterly Inspection (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Fire Areas RC-14/1, RC-8/2, RC-5/1, and RC-6/2; Divisions 1 and 2 switchgear and battery rooms; on April 6, 2018
- (2) Fire Areas RC-4/1, RC-7/2, RC-9/2, and RC-19/2; Divisions 1 and 2 electrical equipment and reactor protection system rooms, remote shutdown room, and vital island corridor; on April 6, 2018
- (3) Fire Area TG1/2, reactor feed pump rooms, on April 18, 2018
- (4) Fire Area RC-2/1, cable spreading room, on May 10, 2018

71111.06—Flood Protection Measures

Internal Flooding (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the reactor building 471 ft. level on June 22, 2018.

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated a licensed operator requalification evaluated scenario on April 16, 2018.

Operator Performance (1 Sample)

The inspectors observed and evaluated:

- (1) down power to 85 percent due to failure of feedwater heater 2C, on April 20, 2018
- (2) startup to power increase, on May 24, 2018

71111.12—Maintenance Effectiveness

Routine Maintenance Effectiveness (3 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) HT-TE-SW71/2, high pressure core spray heat tracing replacement, on April 23, 2018
- (2) E-RLY-86TM, main generator lockout relay, on May 22, 2018
- (3) RPS-RLY-K10F for EOC-RPT, maintenance to disable end of cycle recirculation pump trip relay, on May 30, 2018

71111.13—Maintenance Risk Assessments and Emergent Work Control (2 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) yellow risk for heavy lifts at circulating water pump house on April 26, 2018
- (2) yellow risk for standby gas treatment train A maintenance, week of May 14, 2018

71111.15—Operability Determinations and Functionality Assessments (8 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) diesel generator 1 fuel oil pump 1B on April 1, 2018
- (2) diesel generator 2 unplanned inoperability and unavailability for drain of jacket water on April 9, 2018
- (3) standby service water 'B' pump house door gearbox on April 17, 2018
- (4) high pressure core spray power panel 4A voltage near minimum 120VAC on April 17, 2018
- (5) residual heat removal pump 1B relief valve on May 4, 2018
- (6) main steam relief valve 1B dual indication on May 18, 2018
- (7) standby service water 'A' spray ring header on May 24, 2018
- (8) condensate pump 2C elevated water in oil, on May 24, 2018

71111.18—Plant Modifications (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) EC 17224, main transformer 1, 2, 3 alarm and trip function, on May 22, 2018
- (2) EC 17227, main transformer horizontal links bolting, on May 22, 2018

71111.19—Post Maintenance Testing (8 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) diesel generator 1 fuel oil pump 1B, on April 1, 2018
- (2) residual heat removal loop B operability test on April 1, 2018
- (3) reactor building ventilation system operation on April 3, 2018
- (4) high pressure core spray reactor coolant system interface valve leakage pressure monitor on April 5, 2018
- (5) wetwell exhaust isolation valve 3A maintenance for post-accident monitoring position indication on April 13, 2018
- (6) power panel 4A transformer replacement on May 4, 2018
- (7) main transformer 1, 2, 3 relay testing on May 22, 2018
- (8) main transformer 1 Buchholz relay testing on May 22, 2018

71111.20—Refueling and Other Outage Activities (1 Sample)

The inspectors evaluated forced outage activities following the load reject grid disturbance from May 18, 2018 to May 25, 2018.

71111.22—Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (3 Samples)

- (1) ISP-SEIS-M201, Seismic System Channel Check, Revision 6, on April 23, 2018
- (2) OSP-ELEC-M703, HPCS Diesel Generator Monthly Operability Test, Revision 66, on April 25, 2018
- (3) ISP-RPS-S901, RPS (Channel A1) and EOC Recirc Pump Trip – TGV Fast Closure RPS-PS-5A – CFT/CC, Revision 0, on May 7, 2018; and ISP RPS-S902, RPS (Channel A2) and EOC Recirc Pump Trip – TGV Fast Closure RPS-PS-5C – CFT/CC, Revision 0, on May 9, 2018

In-service (1 Sample)

(1) OSP-HPCS/IST-Q701, HPCS System Operability Test, Revision 53, on April 23, 2018

Reactor Coolant System Leak Detection (1 Sample)

(1) daily reactor coolant system leak checks, shift and daily instrument checks
(Modes 1, 2, 3) on June 25, 2018

71114.06—Drill Evaluation

Drill/Training Evolution (1 Sample)

The inspectors evaluated the emergency preparedness training drill on May 15, 2018.

RADIATION SAFETY

71124.02—Occupational As Low As Reasonably Achievable (ALARA) Planning and Controls

Radiological Work Planning (1 Sample)

The inspectors evaluated the licensee's radiological work planning by reviewing the following activities:

- (1) RWP 30004209, EDR Tank-5 Desludge
- (2) RWP 30004210, EDR Tank-5 Desludge High Risk
- (3) RWP 30003882, Main Steam Relief Valves
- (4) RWP 30003098, Wetwell Cleanup and Inspection
- (5) RWP 30003873, Drywell Shielding

Verification of Dose Estimates and Exposure Tracking Systems (1 Sample)

The inspectors evaluated dose estimates and exposure tracking.

71124.04—Occupational Dose Assessment

Source Term Characterization (1 Sample)

The inspectors evaluated the licensee's source term characterization.

External Dosimetry (1 Sample)

The inspectors evaluated the licensee's external dosimetry program.

Internal Dosimetry (1 Sample)

The inspectors evaluated the licensee's internal dosimetry program.

Special Dosimetric Situations (1 Sample)

The inspectors evaluated the licensee's performance for special dosimetry situations.

OTHER ACTIVITIES – BASELINE

71151—Performance Indicator Verification (5 Samples)

The inspectors verified licensee performance indicators submittals listed below:

- (1) MS06: Emergency AC Power Systems (07/01/2017–06/30/2018)
- (2) MS07: High Pressure Injection Systems (07/01/2017–06/30/2018)
- (3) MS08: Heat Removal Systems (07/01/2017–06/30/2018)
- (4) MS09: Residual Heat Removal Systems (07/01/2017–06/30/2018)
- (5) MS10: Cooling Water Support Systems (07/01/2017–06/30/2018)

71152—Problem Identification and Resolution

Semiannual Trend Review (1 Sample)

The inspectors reviewed the licensee's corrective action program for trends that might be indicative of a more significant safety issue. The inspectors reviewed a negative trend in human performance and documented one observation.

Annual Follow-up of Selected Issues (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) Independent Spent Fuel Storage Installation cask stuck in reactor building, on April 7, 2018

71153—Follow-up of Events and Notices of Enforcement Discretion

Events (1 Sample)

The inspectors evaluated the plant scram from a load reject due to a grid disturbance and the licensee's response on May 18, 2018.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

60855.1 - Operation of an Independent Spent Fuel Storage Installation at Operating Plants

The inspectors evaluated the licensee's operation of the Independent Spent Fuel Storage Installation (ISFSI) from April 2 through April 5, 2018, on-site at Columbia Generating Station (CGS).

The CGS ISFSI was licensed as a general Part 72 license and utilized the Holtec HI-STORM 100 System, approved under Certificate of Compliance 1014, License

Amendment 9, Revision 1, and Final Safety Analysis Report (FSAR), Revision 13. The CGS had been loading HI-STORM 100S Version 243 overpacks containing the Multi-Purpose Canister, MPC-68, and more recently the MPC-68M. CGS's ISFSI contained a total of 39 HI-STORM overpacks at the time of the routine inspection. CGS was in the middle of its 2018 loading campaign. Inspectors were onsite to observe loading activities associated with cask Number 40. The CGS planned to complete an additional 5 canisters by the end of the campaign, increasing the total number of casks to 45 at the ISFSI.

The ISFSI activities specifically reviewed during the on-site inspection and the subsequent in-office review included:

- (1) Evaluated and observed cask transportation operations.
- (2) Reviewed the licensee's loading, processing, and heavy load procedures associated with their current dry fuel storage campaign.
- (3) Reviewed the licensee's corrective action program implementation for ISFSI operations since the last routine ISFSI inspection, which was completed in July 2016.
- (4) Reviewed quality assurance (QA) program implementation, including recent QA audits, surveillances, receipt inspection, and quality control activities.
- (5) Reviewed documentation related to Technical Specification (TS) required operational surveillance activities and FSAR required annual maintenance activities.
- (6) Reviewed the licensee's radiological monitoring data for the calendar years 2016 and 2017.
- (7) Reviewed spent fuel documentation for the canisters loaded since the last routine ISFSI inspection (Canisters 37-40) to confirm the fuel met all TS requirements for storage at the ISFSI.
- (8) Reviewed annual maintenance activities for heavy lifting components which included special lifting devices, the vertical cask transporter, and the site's single-failure proof cask handling crane.
- (9) Reviewed all 72.48 safety evaluations/screenings for changes made to the licensee's ISFSI operations in accordance with Inspection Procedure 60857 since the last routine ISFSI inspection.
- (10) Reviewed all changes made to the licensee's 72.212 Report from Revision 9 to Revision 10 under the licensee's 72.48 program in accordance with Inspection Procedure 60857.

The inspectors did not identify any issues of concerns requiring documentation.

INSPECTION RESULTS

Failure to Maintain Configuration Control in the Diesel Generator 2 Diesel Cooling Water System			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000397/2018002-01 Closed	H.12 – Avoid Complacency	71111.15
<p>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 in accordance with written procedures appropriate to the circumstances. Specifically, on April 9, 2018, the licensee inadvertently bumped and partially opened a diesel cooling water valve, DCW-V-8B2, while operating a nearby demineralized water valve, DW-V-14B2, as part of work activities under Work Request (WR) 29127677, and rendered diesel generator 2 inoperable and unavailable.</p>			
<p><u>Description:</u> On April 9, 2018, while operating demineralized water valve DW-V-14B2, maintenance personnel inadvertently bumped and partially opened diesel cooling water valve DCW-V-8B2. The maintenance personnel completed their work activities, cleaned up the work area, and returned to the shop, unaware that their actions resulted in the partial opening of DCW-V-8B2. Meanwhile, the accidental opening of this diesel cooling water valve caused the diesel generator 2 diesel cooling water expansion tank to drain into a nearby floor drain. Approximately 40 minutes later, the main control room received a diesel generator 2 local panel trouble alarm. Operations personnel responded to the alarm, found the diesel cooling water valve out of position (partially open), and closed the valve. During this event, the tank level reached -4.5 inches, which is outside the normal standby lineup band of +2 to +6 inches. This rendered diesel generator 2 inoperable and caused an unplanned entry into Technical Specification 3.8.1 for one required diesel generator inoperable. The licensee restored the required water level within 40 minutes of declaring the diesel inoperable. The licensee then verified the diesel was in the proper standby lineup and restored the diesel to operable status approximately 2 hours later. Subsequently, the licensee initiated an investigation of the event that stated the diesel generator was rendered unavailable because it would not have been able to complete its 24-hour mission time with the open diesel cooling water valve. The diesel generator would have started, loaded, and overheated in approximately 10 minutes without a credited cooling water makeup source. Total unavailability time accrued was 86 minutes.</p>			
<p>Procedure 1.3.81, "Maintaining Plant Component Status Control," Revision 12, ensures plant component status control is maintained. Step 5.5.2 states that personnel performing work in the plant that are given permission to manipulate the plant are required to accept responsibility for, and are accountable for, maintaining plant component status control. Step 6.6.2.d states, in part, that electrical, mechanical, and instrumentation and control maintenance personnel manipulate components only as specified in approved procedures and work packages that have been authorized by the shift manager or designee.</p>			
<p>The inspectors noted that step 6.1 of Procedure MI-1.8, "Conduct of Maintenance," Revision 70, directs all maintenance personnel to use and adhere to the station error prevention tools as described in Procedure STANDARD-01. Procedure STANDARD-01, "Worker Error Prevention Tools," Revision 10, step 3.3 states, in part, that station personnel</p>			

are responsible for performing work activities using the error prevention tools in accordance with this standard. Section 4.0 details the fundamental human performance tools workers apply during work activities to help them maintain positive control, regardless of their perception of the risk. For example, Section 4.2 describes the Take 2 error prevention tool. Step 4.2.1 states, in part, that Take 2 is a jobsite review done when first arriving at the jobsite. The worker develops an accurate understanding of... the work environment... by taking time to become acquainted with the immediate work area. Step 4.2.4.a instructs the worker to review the Take 2 lanyard or job aid. The Take 2 job aid lists several questions to engage the worker. Question 7 asks, "Is there a component misposition or bump hazard in the work area (2 ft zone)? If yes, engage Operations." The licensee's event investigation indicated that the maintenance personnel conducted a Take 2 upon arriving at the jobsite but did not refer to their Take 2 job aid.

Notwithstanding the plant procedure for preventing inadvertent operation of equipment, the inspectors noted that WR 29127677 did not contain the necessary controls to ensure that safety-related equipment was not adversely affected during maintenance.

Corrective Actions: The licensee's corrective actions included immediately closing the diesel cooling water valve, replenishing the diesel cooling water level, restoring diesel generator 2 to operable status, and completing an event investigation.

Corrective Action Reference(s): Action Request 378835

Performance Assessment:

Performance Deficiency: The failure to perform maintenance in accordance with documented instructions appropriate to the circumstances was a performance deficiency.

Screening: 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 (i.e., core damage). Specifically, on April 9, 2018, the licensee inadvertently bumped and partially opened a diesel cooling water valve, DCW-V-8B2, while operating a nearby demineralized water valve, DW-V-14B2, as part of work activities under WR 29127677, and rendered diesel generator 2 inoperable and unavailable.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012. The inspectors determined the finding was of very low safety significance (Green) because all of the screening questions were answered in the negative.

Cross-cutting Aspect: This finding has a cross-cutting aspect in the area of human performance, avoid complacency, in that the licensee failed to implement appropriate error reduction tools and recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Specifically, licensee staff failed to implement the guidance found in the Take 2 card which demonstrated complacency in the perceived lack of intrusiveness of the work [H.12].

Enforcement:

Violation: 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.a of Appendix A of Regulatory Guide 1.33, Revision 2, requires, in part, that maintenance that can affect the performance of safety-related equipment should be performed in accordance with documented instructions appropriate to the circumstances. The licensee established Procedure 1.3.81, "Maintaining Plant Component Status Control," Revision 12, to meet the Regulatory Guide 1.33 requirement. Step 6.6.2.d states, in part, that electrical, mechanical, and instrumentation and control maintenance personnel manipulate components only as specified in approved procedures and work packages that have been authorized by the shift manager or designee. Contrary to the above, on April 9, 2018, the licensee did not manipulate components only as specified in approved procedures and work packages that had been authorized by the shift manager or designee. Specifically, the licensee inadvertently bumped and partially opened diesel cooling water valve DCW-V-8B2 as part of work activities under WR 29127677, and rendered diesel generator 2 inoperable and unavailable.

Disposition: This violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy.

Observation	71152 – Semiannual Trend Review
<p>The inspectors performed an in-depth review of the licensee's evaluation and corrective actions related to human performance issues. Since the end of refueling outage RF23 in June 2017, the licensee has initiated multiple condition reports documenting human performance errors. The licensee had also identified an adverse trend as documented in Action Requests 377654, 377416, and 378892.</p> <p>This review focused on condition reports that documented plant component status control errors and failures to follow procedures. While many of the human performance issues were of minor significance, several resulted in NRC documented findings:</p> <ul style="list-style-type: none">• FIN 05000397/2017004-02, "Failure to Follow Procedure Results in Isolation of Reactor Feedwater Minimum Flow Lines." (ADAMS Accession Number ML18036B104)• NCV 05000397/2018001-01, "Failure to Follow Procedure Leads to Loss of Secondary Containment." (ADAMS Accession Number ML18116A407)• NCV 05000397/2018002-01, "Failure to Maintain Configuration Control in the Diesel Generator 2 Diesel Cooling Water System." (Section 71111.15 of this report) <p>The inspectors noted that the licensee appropriately considered extent of condition and cause when scheduling corrective action assignments. These actions included a site-wide initiative to identify and eliminate any potential plant component status control hazards and a supervisor observation "blitz" that focused on human performance behaviors such as pre-job briefs, use of the Take 2 card, procedure use and adherence, and supervisory oversight. The</p>	

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.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

On April 5, 2018, the inspectors presented the results from the routine ISFSI inspection to Mr. G. Hettel, Vice President of Operations (title at the time of the ISFSI inspection, but subsequently assumed the title of Senior Vice President and Chief Nuclear Officer), and other members of the licensee staff.

On May 24, 2018, the inspectors presented the baseline radiation protection inspection results to Mr. G. Hettel, Senior Vice President and Chief Nuclear Officer, and other members of the licensee staff.

On July 12, 2018, the inspectors presented the quarterly resident inspector inspection results to Mr. G. Hettel, Senior Vice President and Chief Nuclear Officer, and other members of the licensee staff.

DOCUMENTS REVIEWED

71111.01 - Adverse Weather Protection

Action Requests

379022	381176
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Procedures

(Number)	Title	Revision
13.1.1	Classifying the Emergency	049
13.1.1A	Classifying the Emergency – Technical Bases	033
ABN-ELEC-GRID	Degraded Off Site Power Grid	010
SOP-HOTWEATHER-OPS	Hot Weather Operations	006
SOP-WARMWEATHER-OPS	Warm Weather Operations	015

71111.04 - Equipment Alignment

Procedures

(Number)	Title	Revision
5.5.1	Overriding ECCS Valve Logic to Allow Throttling RPV Injection	006
OSP-LPCS-M102	LPCS Valve Lineup	002
SOP-LPCS-LU	LPCS Valve and Breaker Lineup	003
SOP-LPCS-STBY	Placing LPCS in Standby Status	002
SOP-DG-DCW	Emergency Diesel Generator Jacket Water Cooling	014
SOP-DG1-LU	Emergency Diesel Generator (Div 1) Valve and Power Supply Lineup	006
SOP-DG2-LU	Emergency Diesel Generator (Div 2) Valve and Power Supply Lineup	006
SOP-DG3-LU	High Pressure Core Spray Diesel Generator Valve and Power Supply Lineup	007

Miscellaneous Documents

(Number)	Title	Revision
	Final Safety Analysis Report	064

71111.05AQ - Fire Protection Annual/Quarterly

Action Requests

378829	379167	379972
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Procedures (Number)	Title	Revision
1.3.10C	Control of Transient Combustibles	020
PFP-RW-467	Radwaste 467	005
PFP-RW-484-487	Radwaste 484-487	005
1.3.10A	Control of Ignition Sources	017
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
PFP-TG-441-456	Turbine Generator 441-456	008

Miscellaneous Documents (Number)	Title	Revision
	FSAR Fire Hazards Analysis	
BIP 17-0613	Barrier Impairment Permit	
BIP 17-0614	Barrier Impairment Permit	
BIP 17-0615	Barrier Impairment Permit	
BIP 17-0616	Barrier Impairment Permit	
BIP 17-0643	Barrier Impairment Permit	
BIP 17-0662	Barrier Impairment Permit	
BIP 18-0096	Barrier Impairment Permit	
BIP 18-0097	Barrier Impairment Permit	
BIP 18-0111	Barrier Impairment Permit	
BIP 18-0017	Barrier Impairment Permit	
BIP 18-0018	Barrier Impairment Permit	
BIP 18-0019	Barrier Impairment Permit	
BIP 18-0029	Barrier Impairment Permit	
BIP 18-0031	Barrier Impairment Permit	
BIP 18-0037	Barrier Impairment Permit	
BIP 18-0041	Barrier Impairment Permit	
BIP 18-0050	Barrier Impairment Permit	
CALC FP-02-85-03	Combustible Loading Calculation	010

71111.06 - Flood Protection Measures

Action Requests

378764

Procedures (Number)	Title	Revision
ABN-FLOODING	Flooding	020
ME-02-02-02	Calculation for Reactor Building Flooding Analysis	004
PFP-RB-572	Reactor 572	004

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Action Requests

379240

Procedures (Number)	Title	Revision
13.1.1	Classifying the Emergency	048
OI-09	Operations Standards and Expectations	064
1.3.1	Operating Policy, Programs, and Practices	126
5.1.1	RPV Control	021
5.2.1	Primary Containment Control	027
5.3.1	Secondary Containment Control	020

Miscellaneous Documents (Number)	Title	Revision
LR002398	Cycle 18-2 Evaluated Scenario	001
	Crew F Evaluated Scenario Cycle 18-2	000
	4.0 Critique Summary	

71111.12 - Maintenance Effectiveness

Action Requests
380427

Work Orders
02094222 02128788 29142758

Procedures (Number)	Title	Revision
1.5.11	Maintenance Rule Program	015
OI-53	Offsite Power	014
SOP-RPS-OPS	Reactor Protection System Operation	015
SOP-RPS-START	Reactor Protection System Startup	007

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Work Orders
02085935

Procedures (Number)	Title	Revision
1.3.83	Protected Equipment Program	026
1.5.14	Risk Assessment and Management for Maintenance/Surveillance Activities	040
1.5.11	Maintenance Rule Program	015
WCI-4	Online Work Control Process	048
1.3.76	Integrated Risk Management	050

Miscellaneous Documents
(Number)

Title

Date

	High Risk Work Plan for Underwater Diving in Support of CW-P-1C	01/16/2018
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71111.15 - Operability Determinations and Functionality Assessments

Action Requests

306206	371516	378475	378835
378990	379120	379244	379504
380257	380307		

Work Orders

02123413	02126245
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Procedures

(Number)

Title

Revision

1.3.66	Operability and Functionality Evaluation	034
10.25.53	Inspection of Lighting Panels and Power Panels	013
OI-09	Operations Standards and Expectation	069
OI-14	Columbia Generating Station Operational Challenges and Risk Program	016
OSP-ELEC-W102	Electrical Distribution Subsystem Breaker Alignment and Power Availability Verification	031
OSP-ELEC-W101	Offsite Station Power Alignment Check	031

Miscellaneous Documents

(Number)

Title

Date

EC 17110 EVAL	DO-P-1B Failed to Start when Selected	06/13/2018
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71111.18 – Plant Modifications

Action Requests

380372	380404
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Procedures

(Number)

Title

Revision

ENG-DES-02	Columbia Generating Station Plant Modification Process	019
SWP-DES-01	Plant Modification and Configuration Control	017

71111.19 - Post Maintenance Testing

Action Requests

378475	378488	378990	379191
379244			

Work Orders

02118434	02126245	02126307	02126372
02126372	02128700	02326309	29142042

Procedures
(Number)

Title	Revision
Operations Work Control Expectations	063
Post Maintenance Testing Program	017

71111.20 – Refueling and Other Outage Activities

Procedures
(Number)

Title	Revision
Estimated Critical Position Calculation	005
Reactor Shutdown and Startup Calculations	002
Outage Control Center Norms	006
Operator Standards and Expectations	069
Reactivity Management Control	004
Master Startup Checklist	058
Reactor Plant Startup	084
Normal Plant Shutdown	088
Reactor Scram	065
RHR Shutdown Cooling	028

71111.22 - Surveillance Testing

Work Orders

02114669	02118974	02118950	02122396
02122397			

Procedures
(Number)

Title	Revision
Instrument Master Data Sheet	013
Shift and Daily Instrument Checks (Modes 1,2,3)	089

Miscellaneous Documents
(Number)

Title	Revision
Setting Range Determination for Instrument Loop MS-LIS-24B	001
License Document Change Notice SR 1.3.7.6.2	
Frequency Change per SFCP	
Surveillance Test Interval Change Form, Turbine Valve Surveillance	

71114.06 - Drill Evaluation

Procedures (Number)	Title	Revision
13.10.1	Control Room Operation and Shift Manager Duties	035
13.10.2	TSC Manager Duties	035
13.2.1	Emergency Exposure Levels, Protective Action Guides	022
13.2.2	Determining Protective Actions	020
13.4.1	Emergency Notifications	043
13.5.1	Local, Protected Area, or Site Evacuation	029
13.9.1	Environmental Field Monitoring Operations	045
13.10.9	Operations Support Center Manager and Staff Duties	049
13.11.1	EOF Manager Duties	044
13.13.1	Reentry Operations	010
13.13.3	Intermediate Phase MUDAC Operations	018
13.13.4	After Action Reporting	010
13.14.9	Drill and Exercise Program	018

71124.02—Occupational As Low As Reasonably Achievable (ALARA) Planning and Controls

Action Requests			
370540	377573	377743	377911
379078	354266	354320	375379
376734	365777		

Procedures (Number)	Title	Revision
11.2.13.8	Airborne Radioactivity Surveys	019
11.2.7.1	Area Posting	043
HPI-0.19	Radiation Protection Standards and Expectations	017
HPI-6.4	Administering an Occupational Radiation Exposure History File	025
SWP-RPP-01	Radiation Protection Program	016
GEN-RPP-01	ALARA Program Description	009
GEN-RPP-02	Radiological Planning and Control Process	034
GEN-RPP-13	Senior Site ALARA Committee	013
GEN-RPP-14	Control of Temporary Shielding	014
PPM 11.2.2.7	ALARA Procedure Analysis	012
PPM 11.2.2.8	ALARA Engineering Analysis	007

Procedures (Number)	Title	Revision
PPM 11.2.2.11	Exposure Evaluations for Maintaining TEDE ALARA	008
PPM 11.2.2.12	Radiological Risk Assessment and Management	008
PPM 11.2.2.13	Flushing and Shielding Evaluations	002
PPM 11.2.2.14	Radiological Planning and Reviews	004
PPM 11.2.8.2	Radiation Work Permit Preparation and Use	001

Audits and Self- Assessments (Number)	Title	Date
AR-SA No. 375350	Annual Radiation Protection Program Review	03/30/2018
SR-18-01	Continuous Monitoring Report	03/07/2018
SR-17-04	Continuous Monitoring Report	11/02/2017
374279	Self-Assessment: 71124.02 ALARA	02/15/2018

Radiation Work Permits (Number)	Title	Revision
RWP 30004209	2018 EDR Tank-5 Desludge	001
RWP 30004210	2018 EDR Tank-5 Desludge High Risk	002
RWP 30003882	Main Steam Relief Valves	001
RWP 30003098	Wetwell Cleanup and Inspection	001
RWP 30003873	Drywell Shielding	001

ALARA Planning, In-Progress Reviews, and Post-Job Reviews (Number)	Title	Date
WO 2117848	Clean EDR Tank-5	02/11/2018
WO 2088288	Suppression Pool Cleanup	
WO 2088287	Chemical Decon Cleanup	
WO 2077319	Drywell Shielding	

Miscellaneous Documents

Senior Site ALARA Committee EDR Tank-5 Desludge
2017 CGS Dose Report to the NRC
05-2018 CGS 5 Year CRE Reduction Plan
R23 CRE Outage Report

71124.04—Occupational Dose Assessment

Action Requests

357564	360494	361631	365110
365545	365692	366701	367779
369181	374380	375624	376342
376403	377080	378436	

Procedures (Number)	Title	Revision
11.2.13.8	Airborne Radioactivity Surveys	019
11.2.4.5	Whole Body Counts and Daily Checks Using the Renaissance FastScan	016
11.2.6.7	Special Dosimetry	018
11.2.7.1	Area Posting	043
GEN-RPP-06	Dosimetry Program Description	013
HPI 4.30	Processing, Evaluation, and Reporting of DLR Exposure Data	014
HPI-0.19	Radiation Protection Standards and Expectations	017
HPI-5.9	Evaluation of In-Vivo Bioassay Results Following a Potential Intake	014
HPI-6.4	Administering an Occupational Radiation Exposure History File	025
SWP-RPP-01	Radiation Protection Program	016

Audits and Self-Assessments (Number)	Title	Date
374271	Self-Assessment: 71124.04 Occupational Dose Assessment	02/15/2018
374020	Self-Assessment: Site Bioassay Program	11/15/2017

Miscellaneous Documents (Number)	Title	Date
	Data Verification (REIRS Submission)	03/12/2018
100518-0	NVLAP Scope and ISO 17025 Certificate for Landauer	01/01/2018
15-02	Bases for Neutron Correction Factors for OSLN and Survey Instruments	04/03/2015

Miscellaneous Documents (Number)	Title	Date
DAC-0446	Scaling Factor Determination at Columbia Generating Station – 2017	02/28/ 2018
VSDS_ProS-M-20171223-2	RW 487 Monthly Survey	12/23/2017

71151 - Performance Indicator Verification

Action Requests			
377435	378504	379269	379591
380459	380745		

Procedures (Number)	Title	Revision
1.5.11	Maintenance Rule Program	015
SYS-4-22	Maintenance Rule Program	013
SYS-4-31	System and Equipment Performance Monitoring and Trending Program	012

71152 - Problem Identification and Resolution

Action Requests			
378489	378892	377416	376891
376894	375755	377654	377144
175386	373903	373313	378956
376921	372667	372847	373141

Work Orders	
02108935	

Procedures (Number)	Title	Revision
1.3.81	Maintaining Plant Component Status Control	012
1.5.14	Risk Assessment and Management for Maintenance/Surveillance Activities	040
6.6.5	Movement and Transfer Operations of HI-TRAC and HI-STORM in the Reactor Building	017
SOP-DOOR/HATCH OPS	Reactor Building, Turbine Building, Radwaste Building, and Containment Personnel, Equipment Access Doors, and Hatches	013
SOP-FLOCCULATOR-OPS	Flocculator System Operation	006
SWP-CAP-01	Corrective Action Program	039
SWP-CAP-06	Corrective Action Review	024
GBP-CAP-04	Corrective Action Review Board	000
GBP-CAP-03	Trending Program	000

Miscellaneous Documents (Number)	Title	Revision /Date
	Ops Excellence Plan Cycle 24	

60855.1–Operation of an Independent Spent Fuel Storage Installation

Action Requests			
00377488	00377489	00373321	00369032
00360032			

Work Orders			
02100824-01	02088436-01	02119266-01	02119264-01
02119263-01	02119261-01	02115652-01	02101322-01

Procedures (Number)	Title	Revision
PPM 6.6.4	HI-STORM System Site Transportation	015
PPM 6.6.5	Transfer Operations of HI-Track/HI-STORM in the Reactor Building	017
PPM 6.6.6	MPC Fuel Loading	015
PPM 6.6.7	MPC Processing	028
PPM 6.6.12	Vacuum Drying System Operations	006
PPM 6.6.13	Helium Backfill System Operations	004
PPM 6.6.14	MPC Alternate Cooling Water System Operation	002
PPM 6.6.15	Spent Fuel Cask Loading Verification	006
PPM 6.3.23	Handling Irradiated Fuel in the Spent Fuel Pool	010
SWP-LIC-02	Licensing Basis Impact Determinations	014
OSP-SFS-D101	Storage Cask Heat Removal System Daily Checks	015
PPM 10.4.5	Reactor and Turbine Building Overhead Traveling Crane Inspection, Maintenance and Testing	023
PPM 9.6.1	Spent Fuel Selection for Cask Storage	008
PPM 6.3.40	Determination of Fuel Assembly Condition for ISFSI	006

Design Basis Documents (Number)	Title	Revision
72.212	ISFSI 10 CFR 72.212 Evaluation 72-35	010
ISFSI FSAR	HI-STORM 100 ISFSI Final Safety Analysis Report	013
CoC 1014	CoC and Technical Specifications for HI-STORM 100, Amendment 9	001

Miscellaneous Documents (Number)	Title	Revision /Date
VSDS DIC 1517	Survey of ISFSI Pad and & Building 105 Quarterly	01/23/2018
AU-DC-16	ISFSI Program QA Audit Report	04/20/2016
17-VS-04	Source QA Surveillance Report – Holtec International	09/14/2017
16-VS-05	Source QA Surveillance Report – Holtec International	11/08/2016

DIC 1814.5	Cask Loading Plan for Canisters 37 - 40	March 2018
PLM 003N2471	CGS Vacuum Sipping Final Report Fall 2015	12/07/2015
Cal NE-02-00-08	Calculation for Fuel History Data	006
Cal CE-02-00-12	Analysis of the Reactor Building Railroad Bay 441 Ft Elevation Slab	002
Cal CE-02-01-08	HI-TRAC/HI-STORM Dolly Seismic Restraint @ EL 441'	002
Cal SLENW-Calc-1	Cask Transport Road Design	04/06/2001
GO2-17-091	GGs 2016 Annual Radiological Environmental Operating Report	05/09/2017

72. 48 Screenings

16-009	17-001	17-002	17-003
17-004	17-005	17-006	17-007
17-008	17-009	17-010	17-011
17-012	17-013	18-001	18-004
LDCN-14-024	LDCN-18-13		

Engineering Changes

EC PDC 15708	EC EVAL 17126
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**The following items are requested for the
Occupational Radiation Safety Inspection
at Columbia Generating Station
May 21 thru 25, 2018
Integrated Report 2018002**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before May 11, 2018.

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.01 should be in a file/folder titled "1- A," applicable organization charts in file/folder "1- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the onsite inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact Louis Carson at 817. 200.1221 or louis.carson@nrc.gov and John O'Donnell at 817.200.1441 or John.O'Donnell@nrc.gov

PAPERWORK REDUCTION ACT STATEMENT

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

2. Occupational ALARA Planning and Controls (71124.02)

Date of Last Inspection: May 26, 2017

- A. List of contacts and telephone numbers for ALARA program personnel
- B. Applicable organization charts
- C. Copies of audits, self-assessments, and LERs, written since date of last inspection, focusing on ALARA
- D. Procedure index for ALARA Program
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
 - 1. ALARA Program
 - 2. ALARA Committee
 - 3. Radiation Work Permit Preparation
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address Radiation Work Permit violations, Electronic Dosimeter Alarms, and RWP Dose Estimates

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.
- G. List of work activities greater than 1 rem, since date of last inspection, Include original dose estimate and actual dose.
- H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)
- I. Outline of source term reduction strategy
- J. If available, provide a copy of the ALARA outage report for the most recently completed outages for each unit
- K. Please provide your most recent Annual ALARA Report.

4. Occupational Dose Assessment (Inspection Procedure 71124.04)

Date of Last Inspection: September 1, 2016

- A. List of contacts and telephone numbers for the following areas:
 - 1. Dose Assessment personnel
- B. Applicable organization charts
- C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
 - 1. Occupational Dose Assessment
- D. Procedure indexes for the following areas:
 - 1. Occupational Dose Assessment
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
 - 1. Radiation Protection Program
 - 2. Radiation Protection Conduct of Operations
 - 3. Personnel Dosimetry Program
 - 4. Radiological Posting and Warning Devices
 - 5. Air Sample Analysis
 - 6. Performance of High Exposure Work
 - 7. Declared Pregnant Worker
 - 8. Bioassay Program
- F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:
 - 1. National Voluntary Laboratory Accreditation Program (NVLAP)
 - 2. Dosimetry (TLD/OSL, etc.) problems
 - 3. Electronic alarming dosimeters
 - 4. Bioassays or internally deposited radionuclides or internal dose
 - 5. Neutron dose

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.
- G. List of positive whole body counts since date of last inspection, names redacted if desired
- H. Part 61 analyses/scaling factors
- I. The most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report or, if dosimetry is provided by a vendor, the vendor’s most recent results

COLUMBIA GENERATING STATION – NRC INTEGRATED INSPECTION REPORT
 05000397/2018002 AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION
 INSPECTION REPORT 07200035/2018001 DATED JULY 24, 2018

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Electronic Distribution for Columbia Generating Station

ADAMS ACCESSION NUMBER: ML18206A167

<input checked="" type="checkbox"/> SUNSI Review By: MSH/RDR		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available			Keyword: NRC-002
OFFICE	SRI:DRP/A	RI:DRP/A	DRS/EB1	DRS/EB2	DRS/PSB2	DRS/OB	DNMS:FCDB
NAME	GKolcum	LBrandt	TFarnholtz	JDrake	HGepford	VGaddy	JKatanic
SIGNATURE	/RA/	/RA/	/RA/	/RA/	/RA/	/RA/	/RA-RSB for/
DATE	07/24/18	07/23/2018	07/19/2018	07/19/2018	07/19/18	07/22/18	07/24/18
OFFICE	DRS/IPAT	SPE:DRP/A	BC:DRP/A				
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DATE	07/20/2018	07/20/18	07/24/18				

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