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

November 12, 2015

EA-15-202

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

SUBJECT: COLUMBIA GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000397/2015003 AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Reddemann,

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Columbia Generating Station. On October 1, 2015, the NRC inspectors discussed the results of this inspection with Mr. W.G. Hettel, Chief Operating Officer and Chief Nuclear Officer, and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented five findings of very low safety significance (Green) in this report. Four 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, 2015, through June 13, 2015, Columbia Generating Station performed five OPDRV activities with secondary containment inoperable in violation of Technical Specification (TS) 3.6.4.1, "Secondary Containment." The NRC issued EGM 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 2, on December 13, 2013, allowing for the exercise of enforcement discretion for OPDRV-related TS violations, when certain criteria are met. The NRC concluded that Columbia Generating Station met these criteria. Because the violation was identified during the discretion period described in EGM 11-003, 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.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with

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

If you disagree with a cross-cutting aspect assignment 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 Regional Administrator, Region IV; and the NRC resident inspector at the Columbia Generating Station.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Troy W. Pruett
Director
Division of Reactor Projects

Docket Nos. 50-397
License Nos. NPF-21

Enclosure: Inspection Report 05000397/2015003
w/ Attachment: Supplemental Information

cc w/ encl: Electronic Distribution

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

If you disagree with a cross-cutting aspect assignment 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 Regional Administrator, Region IV; and the NRC resident inspector at the Columbia Generating Station.

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ADAMS ACCESSION NUMBER: **ML15316A834**

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OFFICE	RIV/DRS	RIV/TSS	RIV/ACES	RIV/DRP	RIV/DRP		
NAME	GWerner	ERuesch	JKramer	RSmith	TPruett		
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Letter to M.E. Reddemann from T. Pruett dated November 12, 2015

SUBJECT: COLUMBIA GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000397/2015003 AND EXERCISE OF ENFORCEMENT DISCRETION

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000397
License:	NPF-21
Report:	05000397/2015003
Licensee:	Energy Northwest
Facility:	Columbia Generating Station
Location:	North Power Plant Loop Richland, WA 99354
Dates:	July 1, 2015 through September 30, 2015
Inspectors:	D. Bradley, Resident Inspector L. Carson, Senior Health Physicist N. Greene, PhD, Health Physicist J. Groom, Senior Resident Inspector J. O'Donnell, CHP, Health Physicist M. Phalen, Senior Health Physicist C. Stott, Project Engineer
Approved By:	Richard Smith Acting Chief, Projects Branch A Division of Reactor Projects

SUMMARY

IR 05000397/2015003; 07/01/2015 – 09/30/2015; Columbia Generating Station; Equipment Alignment, Licensed Operator Performance, Radioactive Solid Waste Processing.

The inspection activities described in this report were performed between July 1 and September 30, 2015, 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. Four of these findings involved violations of NRC requirements. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding associated with the licensee's failure to maintain seismic instrumentation functional as required by Licensee Controlled Specification 1.3.7.2, "Seismic Monitoring Instrumentation." Specifically, because of inadequate calibration procedures, several as-left setpoints for the seismic response spectrum recorders indicating lights were non-conservative relative to their function to alert operators of ground motion exceeding the operating basis earthquake (OBE). Following discovery of this issue, the licensee recalibrated the seismic response spectrum recorders using OBE ground motions as the upper tolerance. The licensee entered this issue into their corrective action program as Action Request 333996.

  The performance deficiency was more than minor because it affected the configuration control attribute of the Mitigating Systems Cornerstone objective and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in seismic instruments calibrations that were non-conservative relative to their function to alert plant operators that a shutdown is required. NRC regulations require a plant shutdown since systems necessary for continued operation without undue risk to the health and safety of the public are not designed to remain functional, in all cases, following an OBE. The inspector performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that the finding was of very low safety significance because (1) the finding was not a deficiency affecting the design or qualification of a mitigating system; (2) the finding did not represent a loss of system and/or function; (3) the finding did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time; and (4) the finding does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. Additionally, the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event. The finding does not have a cross-cutting aspect since the configuration control error is associated with an instrument setpoint change request from 1990 and therefore not reflective of current licensee performance. (Section 1R04)

- Green. The inspectors identified a non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the failure to maintain an adequate abnormal procedure for earthquakes. Specifically, the licensee failed to establish appropriate shutdown criteria for earthquakes that exhibit ground motion exceeding the operating basis earthquake (OBE). The licensee's shutdown criteria would allow for continued operations if ground motion at a single frequency exceeded the design response spectrum. In response to this issue, the licensee initiated corrective actions to change the station's earthquake abnormal procedure to provide shutdown criteria consistent with the original licensing basis of the facility. The licensee entered this issue into their corrective action program as Action Request 336875.

  The performance deficiency was more than minor because it affected the procedural adequacy attribute of the Mitigating Systems Cornerstone objective and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in shutdown criteria that would allow for continued operations following events where ground motion at a single frequency exceeded the design response spectra. NRC regulations require a plant shutdown since systems necessary for continued operation without undue risk to the health and safety of the public are not designed to remain functional, in all cases, following an OBE. The inspector performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that the finding was of very low safety significance because (1) the finding was not a deficiency affecting the design or qualification of a mitigating system; (2) the finding did not represent a loss of system and/or function; (3) the finding did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time; and (4) the finding does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. Additionally, the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event. The finding does not have a cross-cutting aspect since the procedure error is associated with a 1996 change to the licensing basis and therefore not reflective of current licensee performance. (Section 1R04)

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to verify the adequacy of the design of the control room HVAC system. Specifically, the licensee failed to demonstrate the ability of control room HVAC design to maintain the temperatures in the main control room below habitability and environmental qualification limits, for the duration of all accident scenarios. The licensee initiated Action Request 332565 to document the concern, issued night order 1662 to communicate the issue, aligned both control room air handling units to their respective chillers, created a quick card procedure to perform the chiller reset actions, and validated the quick card actions could be accomplished within 10 minutes. Additionally, the licensee determined that operators could restore the chillers during accident conditions within 90 minutes to prevent temperatures from exceeding equipment operability limits.

  The performance deficiency was more than minor because it adversely affected the design control attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding was of

very low safety significance because (1) the finding was not a deficiency affecting the design or qualification of a mitigating system; (2) the finding did not represent a loss of system and/or function; (3) the finding did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time; and (4) the finding does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. This finding had a cross-cutting aspect in the area of problem identification and resolution, evaluation, in that the licensee did not thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, the licensee did not thoroughly evaluate the extent of condition from NRC-identified NCV 05000397/2013002-04, "Failure to Obtain NRC Approval for Changes to Control Room HVAC Requirements," for the effect of this change on other station calculations [P.2]. (Section 1R04)

- Green. The inspectors identified a non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to ensure operators could perform time-critical steps for fire events. Specifically, on July 4, 2015, the licensee failed to implement written procedures to ensure that an equipment operator can complete certain post-fire safe-shutdown actions within 10 minutes. In response to this conclusion, the licensee initiated Action Request 332747 to document the inability to meet the post-fire safe-shutdown actions in accordance with procedure PPM 1.3.1, "Operating Policy, Programs, and Practices," Revision 119. Additionally, the licensee issued Night Order 1655, reminding all operating crews of the requirements of procedure PPM 1.3.1 for leaving the protected area.

  This performance deficiency was more than minor because it was associated with the protection against external factors attribute of the Mitigating System Cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. A senior reactor analyst performed a detailed significance determination process review using NRC Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination," dated September 20, 2013 and NRC Inspection Manual 0308, Attachment 3, Appendix F, "Technical Basis Fire Protection Significance Determination Process (Supplemental Guidance for Implementing IMC 0609, Appendix F) At Power Operations," dated February 28, 2005. The senior reactor analyst determined that the failure of the equipment operator to perform the certain post-fire safe-shutdown actions within 10 minutes would not adversely affect a quantitative risk assessment, and therefore this finding was of very low safety significance (Green). This finding has a cross-cutting aspect in the area of Human Performance, Teamwork, because the licensee failed to communicate and to coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, the equipment operator spoke with the shift technical advisor about the need to exit the protected area at the morning turnover meeting but neither individual spoke with the control room supervisor. Communication was ineffective in that the Equipment Operator believed permission was granted and proceeded to exit the protected area [H.4]. (Section 1R11)

Cornerstone: Public Radiation Safety

- Green. The inspectors reviewed a self-revealing, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to follow their Process Control Program as implemented by their solid radioactive waste system procedures. Specifically, the licensee failed to reduce the free standing liquid in a condensate filter demineralizer

resin disposal package (Liner 14-033-L) to less than the required 0.5 percent of the total waste volume. Corrective actions included retrieving the packages from waste shipment 14-32, testing each liner for free standing liquid content, and removing additional water as necessary. The licensee documented this issue in their corrective action program as Action Requests 00316555 and 00316676.

The failure to follow the Process Control Program, resulting in the inadequate dewatering of radioactive waste liner contents, was a performance deficiency. The inspectors determined that the performance deficiency was more than minor, because it adversely affected the Public Radiation Safety cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released in the public domain. Specifically, the failure to ensure that the free standing liquid in the radioactive waste liner shipped to US Ecology did not exceed 0.5 percent of the total waste volume subjected the disposal facility to the possibility of improper handling of the waste. Using Inspection Manual Chapter 0609, Appendix D, "Public Radiation Safety Significance Determination Process," dated February 12, 2008, the inspectors determined the violation was of very low safety significance (Green) because: (1) radiation limits were not exceeded, (2) there was no breach of the package during transit, (3) there were no Certificate of Compliance issues, and (4) the low level burial ground nonconformance did not involve a 10 CFR 61.55 waste under-classification. The inspectors determined that the finding has a design margin cross-cutting aspect in the area of human performance, because the licensee failed to operate and maintain the radioactive waste dewatering system within the vendor design margins when changes were made to the operating procedures [H.6]. (Section 2RS8)

PLANT STATUS

The plant began the inspection period at approximately 65 percent power while troubleshooting a non-safety feedwater valve. On July 23, 2015, the plant returned to 100 percent power. On July 24, 2015, the plant experienced a loss of the 'B' recirculation pump and power was reduced to approximately 34 percent. Following repair to a non-safety cooling system supporting the recirculation pump, the plant returned to 100 percent power on July 26, 2015. The plant remained at 100 percent power for the remainder of the inspection period.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

On July 22, 2015, 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 seasonal high temperatures and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to the onset of hot weather, the licensee had corrected weather-related equipment deficiencies identified during the previous season.

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

- emergency diesel generators including support ventilation systems
- standby service water system
- high pressure core spray system

The inspectors reviewed the licensee's procedures and design information to ensure the systems would remain functional when challenged by adverse weather. 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.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On August 20, 2015, the inspectors completed an inspection of the station's readiness for impending adverse weather conditions involving high winds. The inspectors reviewed plant design features, the licensee's procedures to respond to tornadoes and high winds, and the licensee's potential implementation of these procedures. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant.

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

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- July 2, 2015, control room emergency chillers
- July 20, 2015, seismic instrumentation
- July 28, 2015, standby liquid control system
- September 14, 2015, standby gas treatment system

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

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

b. Findings

.1 Failure to Maintain Seismic Instrumentation Functional to Alert Plant Operators of Ground Motions Exceeding the Operating Basis Earthquake

Introduction. The inspectors identified a Green finding associated with the licensee's failure to maintain seismic instrumentation functional as required by Licensee Controlled Specification (LCS) 1.3.7.2, "Seismic Monitoring Instrumentation." Specifically, because of inadequate calibration procedures, several as-left setpoints for the seismic response

spectrum recorders indicating lights were non-conservative relative to their function to alert operators of ground motion exceeding the operating basis earthquake.

Description. On July 20, 2015, the inspectors reviewed the design and calibration settings for the Columbia Generating Station seismic triaxial response spectrum recorders, designated SEIS-RSRT-1/1, 1/2 and 1/3. The seismic RSRTs consist of three units, two horizontal and one vertical, each containing twelve frequency sensitive reeds used to passively record earthquake ground motions. The RSRTs have a secondary function to provide visual warnings to operators of exceedances of pre-determined ground acceleration limits. The RSRTs include red lights to indicate that operating basis earthquake (OBE) ground motions have been exceeded at certain frequencies. Licensee Control Specification 1.3.7.2 requires that the seismic instrumentation, including the triaxial response spectra recorders, remain functional to ensure the capability to promptly determine the magnitude of a seismic event and initiate evaluation of the seismic response features important to safety. In particular, the RSRTs red indicating lights are described in Columbia Generating Station FSAR, Section 3.7.4.4, as equipment used to alert plant operators that a shutdown is required. Title 10 CFR Part 100, Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," requires a plant shutdown if vibratory ground motion exceeding the OBE occurs. The OBE is defined as the earthquake which produces the vibratory ground motion where features of the nuclear power plant necessary for continued operation without undue risk to the health and safety of the public are designed to remain functional.

The inspectors reviewed calculation CE-02-90-21, "Setpoints for Response Spectrum Indicating Lights," Revision 0, used to establish the ground acceleration levels where the RSRT red indicating lights illuminate. The calculation determined target acceleration values for the RSRT red indicating lights based on the most conservative OBE seismic response spectra for the reactor building base mat. This setpoint methodology was consistent with Regulatory Guide 1.12, "Nuclear Power Plant Instrumentation for Earthquakes," Revision 1, and American Nuclear Society ANS Standard 2.2, "Earthquake Instrumentation Criteria for Nuclear Power Plants," 1978. This regulatory guidance provided acceptable methods for meeting the seismic instrumentation requirements in 10 CFR Part 100, Appendix A and recommended a response spectrum recorder with setpoints established at OBE ground motions.

The inspectors compared the setpoints established in calculation CE-02-90-21 to the setpoints found in calibration implementing procedure ISP-SEIS-X304, "Seismic System Reactor Building Foundation Triaxial Response – Spectrum Recorder – CC," Revision 1. Instrument Setpoint Change Request 979, dated April 30, 1990, established allowable setpoints and included an upper and lower tolerance of approximately 5-10 percent from the nominal setpoints established in calculation CE-02-90-21. The inspectors compared the setpoints against the design basis earthquake and concluded that since the nominal setpoint exactly matched the OBE ground motion values, the upper tolerance would, in all cases, result in setpoints that exceed the OBE seismic ground motion response spectra at the reactor building base mat.

The inspector reviewed the as-left setpoints for SEIS-RSRT-1/1, 1/2 and 1/3 and identified 12 of 36 setpoints that exceeded the nominal target accelerations established in calculation CE-02-90-21, resulting in red indicating lights that would not illuminate until after OBE seismic ground motions were exceeded. The inspectors concluded that these as-left setpoints were non-conservative relative to their LCS required function to alert

plant operators of the need for a plant shutdown as required by 10 CFR 100 and the Columbia Generating Station FSAR.

On August 3, 2015, plant operators declared SEIS-RSRT-1/1, 1/2 and 1/3 non-functional due to non-conservative setpoints for the system's red indicating lights and entered LCS 1.3.7.2, Condition A. During the period that SEIS-RSRT-1/1, 1/2 and 1/3 were non-functional, the passive features of the seismic monitoring system were still available for earthquake evaluation. On August 10, 2015, the licensee established new setpoints for SEIS-RSRT-1/1, 1/2 and 1/3 using OBE ground motions as the upper tolerance. On August 18, 2015, the licensee completed a calibration using the revised setpoints and exited LCS 1.3.7.2, Condition A. The licensee entered this issue into their corrective action program as Action Request 333996.

Analysis. The failure to maintain seismic instruments functional to provide indications of exceeding the OBE seismic ground motion response spectra was a performance deficiency. The performance deficiency was more than minor because it affected the configuration control attribute of the Mitigating Systems Cornerstone objective and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in seismic instrument calibrations that were non-conservative relative to their function to alert plant operators that a shutdown is required. NRC regulations require a plant shutdown since systems necessary for continued operation without undue risk to the health and safety of the public are not designed to remain functional, in all cases, following an OBE. The inspector performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that the finding was of very low safety significance because (1) the finding was not a deficiency affecting the design or qualification of a mitigating system; (2) the finding did not represent a loss of system and/or function; (3) the finding did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time; and (4) the finding does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. Additionally, the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event. The finding does not have a cross-cutting aspect since the configuration control error is associated with an instrument setpoint change request from 1990 and therefore not reflective of current licensee performance.

Enforcement. Enforcement action does not apply because the performance deficiency did not involve a violation of regulatory requirements. The finding is of very low safety significance and the issue was entered into the licensee's corrective action program as Action Request 333996. (FIN 05000397/2015003-01, Failure to Maintain Seismic Instrumentation Functional to Alert Plant Operators of Ground Motions Exceeding the Operating Basis Earthquake)

.2 Non-Conservative Shutdown Criteria in Earthquake Abnormal Procedure

Introduction. The inspectors identified a Green, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the failure to maintain an adequate abnormal procedure for earthquakes. Specifically, the licensee failed to establish appropriate

shutdown criteria for earthquakes that exhibit ground motion exceeding the OBE.

Description. On July 20, 2015, the inspectors performed a review of the Columbia Generating Station seismic instrumentation and monitoring (SEIS) system. The SEIS system, described in the Final Safety Analysis Report, Section 3.7.4, "Seismic Instrumentation," consists of multiple passive and active subsystems used to record earthquake ground motion and to alert plant operators that design response spectra have been exceeded. One of those subsystems are the triaxial response-spectrum recorders used for comparison of measured and predicted earthquake responses. Final Safety Analysis Report, Section 3.7.4.4 provides guidance that if an earthquake is felt in the control room and the spectra experienced at the foundation of the reactor building exceeds the OBE acceleration levels as indicated on two or more response spectra indicating lights, the plant will be shut down pending permission to resume operations. The shutdown criteria in abnormal procedure "ABN-Earthquake," Revisions 0-13, reflected the shutdown criteria found in FSAR Section 3.7.4.4.

The inspectors questioned the need for two or more response spectra indicating lights to indicate that operating basis earthquake acceleration levels were exceeded prior to initiating a plant shutdown. The inspectors reviewed 10 CFR Part 100, Appendix A, which states, in part, that if vibratory ground motion exceeding that of the OBE occurs, shutdown of the nuclear power plant will be required. The inspectors determined that the licensee's shutdown criteria in Final Safety Analysis Report, Section 3.7.4.4 and incorporated into abnormal procedure "ABN-Earthquake" was contrary to 10 CFR Part 100, Appendix A. Specifically, the licensee's shutdown criteria would allow for continued operations if ground motion at a single frequency exceeded the design response spectrum. The inspectors reviewed historical licensing basis for Columbia Generating Station and found that FSAR Amendment 33, in effect when the full power operating license was issued for the station, provided the following:

> *If the Instrumentation shows that the peak acceleration or the response spectra experienced at the foundation of the reactor building exceeds the operating basis earthquake acceleration levels or response spectra, the plant will be shut down pending permission to resume operations.*

The inspector discovered that the licensee changed FSAR Section 3.7.4.4 under licensing document change notice LDCN 96-079, dated December 12, 1996. This LDCN's purpose was to "strike a balance between ensuring that actions are not taken on a spurious signal and taking conservative actions following an earthquake." The inspectors agreed that shutdown of the plant due to a spurious signal was not desirable but that in the case of a single, valid indication that the OBE design response spectra was exceeded, shutdown of the nuclear power plant was required. The inspectors determined that the change implemented in LDCN 96-079 resulted in a non-conservative shutdown criteria compared to the regulatory requirements in 10 CFR Part 100, Appendix A.

In response to this issue, the licensee initiated corrective actions to change abnormal procedure ABN-Earthquake to provide a shutdown criteria consistent with the original licensing basis of the facility. The licensee entered this issue into their corrective action program as AR 336875.

Analysis. The failure to establish appropriate shutdown criteria in abnormal procedures for earthquakes was a performance deficiency. The performance deficiency was more than minor because it affected the procedural adequacy attribute of the Mitigating Systems Cornerstone objective and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in shutdown criteria that would allow for continued operations following events where ground motion at a single frequency exceeded the design response spectra. NRC regulations require a plant shutdown since systems necessary for continued operation without undue risk to the health and safety of the public are not designed to remain functional, in all cases, following an OBE. The inspector performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that the finding was of very low safety significance because (1) the finding was not a deficiency affecting the design or qualification of a mitigating system; (2) the finding did not represent a loss of system and/or function; (3) the finding did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time; and (4) the finding does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. Additionally, the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event. The finding does not have a cross-cutting aspect since the procedure error is associated with a 1996 change to the licensing basis and therefore not reflective of current licensee performance.

Enforcement. Technical Specification 5.4.1.a, "Procedures," 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 6.w. of Regulatory Guide 1.33, Appendix A, requires specific procedures for acts of Nature (e.g., tornado, flood, dam failure, earthquakes). Licensee Procedure ABN-Earthquake, "Earthquake", Revision 0-13, is a procedure, required by Paragraph 6.w. of Regulatory Guide 1.33, Appendix A for earthquakes. Contrary to the above, from August 8, 2005 to the present, the licensee failed to maintain an adequate procedure as recommended in Regulatory Guide 1.33, Revision 2, Appendix A, Paragraph 6.w. Specifically, the shutdown criteria specified in Step 4.4 of procedure ABN-Earthquake, Revisions 0-13 was non-conservative relative to the shutdown criteria in 10 CFR 100, Appendix A because it would allow for continued operations if ground motion at a single frequency exceeded the design response spectrum. The licensee initiated corrective actions to change abnormal procedure ABN-Earthquake to provide a shutdown criteria consistent with the original licensing basis of the facility. Because this finding is of very low safety significance and entered into the licensee's corrective action program as Action Request 336875, the violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000397/2015003-02, Non-Conservative Shutdown Criteria in Earthquake Abnormal Procedure)

.3 Failure to Provide Design Control Measures for Control Room Emergency Chillers

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to verify the adequacy of the design of the control room HVAC system. Specifically, the licensee

failed to demonstrate the ability of control room HVAC design to maintain the temperatures in the main control room below habitability and environmental qualification limits, for the duration of all accident scenarios.

Description. On July 2, 2015, the inspectors performed a review of the control room HVAC system with a focus on the control room emergency chillers. The Final Safety Analysis Report, Section 9.4.1.1, "Design Basis" states, in part, that the design of the control room HVAC system is such that in an emergency condition, "the control room temperature will be maintained within the habitability limit (85°F) by the control room chilled water. Service water can maintain the control room temperature limit of 85°F during colder weather. Service water will maintain the control room within the environmental qualification temperature limit for control room equipment (104°F)."

The inspectors noted that the vendor manuals for the control room emergency chillers described an automatic trip feature that required local resetting. Specifically, the manufacturer states the following in the "Normal Operating Sequence" section of the manual:

> *Shutdown where the unit cannot automatically restart…Shutdown on a power failure produces the same results as for a safety shutdown except relay 14R is de-energized…It is necessary to depress the "STOP-RESET" button to energize relay 14R when power is restored after interruption.*

The inspectors reviewed relevant electrical diagrams and confirmed that operation of the control room emergency chillers required a local reset of relay 14R following a loss of power. The alignment of the control room HVAC system is such that the division 1 air handling unit, WMA-AH-51A, is aligned to standby service water and the division 2 air handling unit, WMA-AH-51B, is aligned to chill water. Because of the design feature involving the relay 14R and the alignment of the air-handling units, the inspectors identified that:

1) Following any event that resulted in a loss of offsite power with a single-failure of the Division 1 emergency diesel generator, the control room would not receive cooling via WMA-AH-51B, the only operable air handling unit, until the local chiller reset pushbutton was depressed. The control room would remain without cooling until this manual reset was accomplished since relay 14R would be de-energized.

2) Following certain events involving a loss of offsite power with a single-failure of the Division 2 emergency diesel generator, the control room would experience reduced, and in some instances, no external cooling. In particular, when ambient conditions would not allow service water alone to maintain the control room below the 85°F habitability limit, operators would be prompted to secure standby service water cooling to WMA-AH-51A and realign cooling from the control room emergency chillers system. The inspectors noted that during the shift between standby service water and control room emergency chill water, there would be a brief period when the control room would receive no external cooling.

For each of the above scenarios, temperatures in the control room could exceed 85°F or 104°F due to times necessary for system realignment or local resetting manual actions. At the time of the inspection, procedure OI-69, "Time Critical Operator Actions," Revision 5, did not identify any required manual actions associated with local reset or

realignment of the control room HVAC system. This procedure defines a time critical action as a manual action, or series of actions that must be completed within a specified time to meet the plant-licensing basis.

The inspectors reviewed calculation ME-02-92-43, "Room Temperature Calculation for DG Building, Reactor Building, Radwaste Building, and Service Water," Revision 10, and noted that this calculation covers the control room air-handling units but only considers steady-state conditions for heat exchanger performance. There is no discussion in ME-02-92-43 for transient scenarios where the control room would receive no external cooling, such as those involving local resetting of control room emergency chillers or during required shifts between standby service water and control room emergency chill water.

The inspectors requested a design analysis that demonstrated the ability of control room HVAC design to maintain the temperatures in the main control room below habitability and environmental qualification limits during these transient situations. The licensee was unable to locate a design verification that demonstrated the ability of the control room HVAC system during transient scenarios following a loss of power and could not determine the peak control room temperature nor the impact to habitability or equipment qualification in these scenarios.

The inspectors reviewed previous inspection reports for the station and noted one related finding: NRC-identified NCV 05000397/2013002-04, "Failure to Obtain NRC Approval for Changes to Control Room HVAC Requirements." This NCV identified an incorrect value for the control room temperature limit and resulted in the current value as found in the licensee's design basis. The inspectors determined that the extent of condition review from this 2013 finding did not adequately consider the effects of lowering a design habitability temperature for the control room from 104°F to 85°F, necessitating the need for the control room emergency chillers. Specifically, when evaluating the correct habitability limit of 85°F, the licensee only considered the steady state cooling needs of the control room and not the transient effects experienced because of the chiller design.

In response to the NRC's conclusions, the licensee initiated Action Request 332565 to document the concern, issued night order 1662 to communicate the issue, aligned both control room air handling units to their respective chillers, created a quick card procedure to perform the chiller reset actions, and validated the quick card actions could be accomplished within 10 minutes. Additionally, the licensee determined that operators could restore the chillers during accident conditions within 90 minutes to prevent temperatures from exceeding equipment operability limits.

Analysis. The failure to provide design control measures to verify the adequacy of the design of the control room emergency chillers was a performance deficiency. The performance deficiency was more than minor because it adversely affected the design control attribute of the Mitigating Systems 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 demonstrate the ability of control room HVAC design to maintain the temperatures in the main control room below habitability and environmental qualification limits, for the duration of all accident scenarios. Using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding was of

very low safety significance because (1) the finding was not a deficiency affecting the design or qualification of a mitigating system; (2) the finding did not represent a loss of system and/or function; (3) the finding did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time; and (4) the finding does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. This finding had a cross-cutting aspect in the area of problem identification and resolution, evaluation, in that the licensee did not thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, the licensee did not thoroughly evaluate the extent of condition from NRC-identified NCV 05000397/2013002-04, "Failure to Obtain NRC Approval for Changes to Control Room HVAC Requirements," for the effect of this change on other station calculations [P.2].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Final Safety Analysis Report, Section 9.4.1.1, "Design Basis," established the design of the control room HVAC system and specified, in part, that during emergency conditions, the control room temperature will be maintained within the habitability limit (85°F) by the control room chilled water. Service water can maintain the control room temperature limit of 85°F during colder weather. Service water will maintain the control room within the environmental qualification temperature limit for control room equipment (104°F). Contrary to the above, prior to July 2, 2015, the licensee failed to implement design control measures for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Specifically, the licensee failed to verify the adequacy of the design of the control room emergency chillers involving loss of offsite power scenarios that result in transient losses of control room cooling such that the design basis, established in Final Safety Analysis Report, Section 9.4.1.1 was ensured.

The licensee initiated Action Request 332565 to document the concern, issued night order 1662 to communicate the issue, aligned both control room air handling units to their respective chillers, created a quick card procedure to perform the chiller reset actions, and validated the quick card actions could be accomplished within 10 minutes. Because the finding is of very low safety significance (Green) and has been 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 05000397/2015003-03, Failure to Provide Design Control Measures for Control Room Emergency Chillers)

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:

- July 1, 2015, Fire Areas RC-4, 5, 6, 7, 8, and 9 and RC-14, radioactive waste building 467' elevation vital island
- July 14, 2015, Fire Area R-8, low pressure core spray pump room
- July 15, 2015, Fire Area RC-11, 12 and 13, radioactive waste building 525' elevation
- August 13, 2015, Fire Area R-5, residual heat removal train A pump room

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.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On July 21, 2015, the inspectors completed an inspection of underground bunkers susceptible to flooding. The inspectors selected one underground vault, electrical manhole E-MH-08, that contained risk-significant or multiple-train cables whose failure could disable risk-significant equipment.

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

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

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 July 29, 2015, the inspectors observed an evaluated simulator scenario performed by an operating crew. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed the modeling and performance of the simulator during the requalification activities.

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

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

On August 5, 2015, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened risk due to an unplanned orange risk window for Bonneville Power Administration's emergent work on the 230 kV switchyard. The inspectors observed the operators' performance of the following activities:

- Leak repair on the digital electro-hydraulic system under WO 02086051, including the pre-job brief

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

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

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to ensure operators could perform time-critical steps for fire events. Specifically, the licensee failed to implement written procedures to ensure that Category 2 personnel, needed for post-fire safe shutdown, can complete required actions within 10 minutes.

Description. During a log review, the inspectors identified that an equipment operator (OPS3) left the protected area (PA) to compile equipment logs on July 4, 2015, at 8:57 AM and again at 4:37 PM. Licensee procedure PPM 1.3.1, "Operating Policy, Programs, and Practices," Revision 119, classifies watch positions as either Category 1 or Category 2. Category 1 personnel include the shift technical advisor (STA) and emergency action level notifier. Category 2 personnel include the shift manager (SM), all three reactor operators, the control room supervisor (CRS), and the OPS2 and OPS3 equipment operator positions. Procedure PPM 1.3.1 states that while Category 1 personnel may leave the PA with a risk evaluation and permission of the shift manager, Category 2 personnel "should not leave the protected area unless an emergent condition is jeopardizing the plant" and they "respond to an event that requires action within 10 minutes." The OPS3 equipment operator is a Category 2 watchstander because in the event of a control room fire, they must trip the condensate and condensate booster pumps within 10 minutes. These actions are proceduralized in ABN-CR-EVAC, "Control Room Evacuation and Remote Cooldown," Revision 33.

The inspectors questioned the ability of OPS3 to move from outside the PA to their required station in a timely manner. The inspectors noted that the licensee performed a timed walkthrough of post-fire safe-shutdown actions for OPS3 for a similar issue in 2014. Specifically, the evaluation for NRC-identified NCV 05000397/2014003-02, "Failure to Implement Procedures That Ensure Operators Could Perform Time Critical Steps for Fire Events" concluded that OPS3 was not able to complete certain post-fire safe-shutdown actions within 10 minutes when initially located outside the PA. Instead, the equipment operator completed the required actions within 11 minutes and 33 seconds. The inspectors determined that this previous walkthrough from 2014 is representative of the issue identified on July 4, 2015 and no additional timed walkthrough was required.

The inspectors concluded that by allowing Category 2 personnel to leave the PA, the licensee had not preserved the assumptions of available personnel in ABN-CR-EVAC to reach safe-shutdown conditions for a control room fire. Therefore, the licensee was not implementing written procedures for plant fires and responsibilities for safe operation as required by Technical Specification 5.4.1.a through Appendix A of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2.

In response to this conclusion, the licensee initiated AR 332747 to document the inability to meet the post-fire safe-shutdown actions in accordance with procedure PPM 1.3.1. Additionally, the licensee issued Night Order 1655, reminding all operating crews of the requirements of procedure PPM 1.3.1 for leaving the PA. Through interviews, the licensee determined that the equipment operator discussed the need to leave the PA with the STA. Neither individual, however, discussed the situation with CRS, SM, or reviewed the relevant PPM 1.3.1 procedure.

Analysis. The failure to implement written procedures to ensure that Category 2 personnel can complete certain post-fire safe-shutdown actions within 10 minutes was a performance deficiency. This performance deficiency was more than minor because it was associated with the protection against external factors attribute of the Mitigating System Cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, by allowing Category 2 personnel to leave the protected area, the licensee had not preserved the assumptions of available personnel

in ABN-CR-EVAC to reach safe-shutdown conditions for a control room fire. The inspectors screened the finding in accordance with NRC Manual Chapter IMC 0609, Attachment 4, "Initial Characterization of Findings." In table 3, the inspectors answered "yes" to question E.2 because the finding affects the ability to reach and maintain safe shutdown conditions in case of a fire. Therefore, to assess this finding, a senior reactor analyst used NRC IMC 0609, Appendix F, "Fire Protection Significance Determination," dated September 20, 2013. The analyst noted that the degradation rating examples in Attachment 2 of that appendix were not well suited for this finding. Therefore, the analyst used the generic guidance from NRC IMC 0308, Attachment 3, Appendix F, "Technical Basis Fire Protection Significance Determination Process (Supplemental Guidance for Implementing IMC 0609, Appendix F) At Power Operations," dated February 28, 2005. This guidance stated, in part:

> …the definition of "low degradation" implies that the performance and/or reliability of the fire protection feature is not substantially impacted by the noted degradation finding. Hence, the feature would be given essentially full credit in the PRA-based analysis. In this case, the risk change is essentially zero, and the finding should be screened to Green.

For this finding, procedure ABN-CR-EVAC directed operator OPS3 to trip the condensate and condensate booster pumps within 10 minutes, but due to this finding, that action could be delayed to the 11.5 minute point. The subject action was intended to prevent taking the plant to a "solid" (completely filled) condition. However, the analyst noted that the failure to take this action would not increase the core damage probability (overfilling events at boiling water reactors soon after shutdown should not drive core damage and are not included in the probabilistic risk assessment model). Instead, this action is a desired step that was intended to establish positive control over reactor vessel pressure and level. In addition, the exposure period for this finding was very short (less than one day). Since the failure to perform this action within 10 minutes would not adversely affect a quantitative assessment, this finding was of very low safety significance (Green). This finding has a cross-cutting aspect in the area of Human Performance, Teamwork, because the licensee failed to communicate and to coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, the equipment operator spoke with the STA about the need to exit the PA at the morning turnover meeting but neither individual spoke with the CRS. Communication was ineffective in that the equipment operator believed permission was granted and proceeded to exit the PA [H.4].

Enforcement. Technical Specification 5.4.1.a, "Procedures" requires, in part, that written procedures shall be established, implemented, and maintained for activities described in Appendix A of the Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Appendix A, Section 1.b requires administrative procedures for authorities and responsibilities for safe operation and shutdown. Licensee procedure PPM 1.3.1, "Operating Policy, Programs, and Practices," Revision 119, a procedure required by Section 1.b of Regulatory Guide 1.33, Appendix A, establishes authorities and responsibilities for safe operation and shutdown, and states that Category 2 personnel should not leave the protected area unless an emergent condition is jeopardizing the plant and they respond to an event that requires action within 10 minutes. Contrary to this requirement, on July 4, 2015, Category 2 personnel (i.e., an equipment operator) left the protected area when no emergent condition jeopardizing the plant existed and therefore was unable to respond to an event that requires action within 10 minutes.

Specifically, the operator would not be able to complete certain time-critical operator actions associated with fire events as required by procedure ABN-CR-EVAC, "Control Room Evacuation and Remote Cooldown," Revision 33.

The licensee initiated Action Request 332747 to document the non-compliance with PPM 1.3.1. Additionally, the licensee issued Night Order 1655 reminding all operating crews of the requirements of PPM 1.3.1 for leaving the Protected Area. Because this violation was of very low safety significance 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 Enforcement Policy. (NCV 05000397/2015003-04, Failure to Implement Procedures to Ensure Availability of Safe Shutdown Personnel)

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed two instances of degraded performance or condition of safety-related structures, systems, and components (SSCs):

- July 10, 2015, system review of control room emergency chillers including maintenance history of system rupture discs
- September 10, 2015, main steam level indicating switches including maintenance history involving internal binding failures documented in AR 332078

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

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

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- August 20, 2015, planned yellow risk for a diesel generator 2 monthly surveillance under Work Order 02068579

- September 15, 2015, planned yellow risk for a reactor core isolation cooling system work window under Work Order 02078715

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.

Additionally, on September 28, 2015, the inspectors observed the operators response to emergent work activities that resulted in unplanned unavailability of emergency diesel generator 2. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected SSCs.

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

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

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

- July 1, 2015, AR 332078, documenting reactor vessel water level indicating switches MS-LIS-24A and C indicating abnormally high
- July 1, 2015, AR 332326, documenting concerns related to residual heat removal system operability during venting operations
- July 22, 2015, AR 333334, documenting a slow opening time for main steam isolation valve MS-V-22D
- August 13, 2015, AR 334459, documenting concerns related to required manual actions for the control room HVAC system emergency chillers

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

These activities constitute completion of four operability and functionality review samples as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

On July 1, 2015, the inspectors reviewed a temporary modification of reactor feedwater valve RFW-V-102A under Engineering Change EC14111. The inspectors verified that the licensee had installed this temporary modification in accordance with technically adequate design documents. The inspectors verified that this modification did not adversely impact the operability or availability of affected SSCs. The inspectors reviewed design documentation and plant procedures affected by the modification to verify the licensee maintained configuration control.

These activities constitute completion of one sample of temporary modifications, as defined in Inspection Procedure 71111.18.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- August 5, 2015, post-maintenance test for service water temperature control valve SW-TCV-11A, following maintenance under WO 02075767
- August 26, 2015, post-maintenance test for the Division 3 diesel mixed air system, following maintenance under WO 02066727
- September 16, 2015, post-maintenance test for reactor core isolation cooling system, following maintenance under Work Order 02078715
- September 28, 2015, post-maintenance test for the Division 2 diesel generator, following replacement of shutdown relays under Work Order 02002258

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

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

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed 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:

Routine tests:

- August 6, 2015, procedure OSP-DO/IST-Q701, "DO-P-1A Operability," Revision 14, including a surveillance for the diesel generator fuel oil transfer pump

In-service tests:

- September 8, 2015, procedure OSP-LPCS/IST-Q702, "LPCS System Operability Test," Revision 39

Reactor coolant system leak detection tests:

- September 16, 2015, procedure OSP-INST-H101, "Shift and Daily Instrument Checks Modes 1, 2, 3" Revision 85, including reactor coolant system leakage calculation

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

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

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors observed an emergency preparedness drill on July 7, 2015, 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 simulator, technical support center, operations support center and emergency operations facility, 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 constitute completion of one emergency preparedness drill observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS5 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

The inspectors evaluated the accuracy and operability of the radiation monitoring equipment used by the licensee (1) to monitor areas, materials, and workers to ensure a radiologically safe work environment, and (2) to detect and quantify radioactive process streams and effluent releases. The inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance in the following areas:

- Selected plant configurations and alignments of process, post-accident, and effluent monitors with descriptions in the Final Safety Analysis Report and the offsite dose calculation manual

- Selected instrumentation, including effluent monitoring instrument, portable survey instruments, area radiation monitors, continuous air monitors, personnel contamination monitors, portal monitors, and small article monitors to examine their configurations and source checks

- Calibration and testing of process and effluent monitors, laboratory instrumentation, whole body counters, post-accident monitoring instrumentation, portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, electronic dosimetry, air samplers, and continuous air monitors

- Audits, self-assessments, and corrective action documents related to radiation monitoring instrumentation since the last inspection

These activities constitute completion of one sample of radiation monitoring instrumentation as defined in Inspection Procedure 71124.05.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

The inspectors evaluated whether the licensee maintained gaseous and liquid effluent processing systems and properly mitigated, monitored, and evaluated radiological discharges with respect to public exposure. The inspectors verified that abnormal radioactive gaseous or liquid discharges and conditions, when effluent radiation monitors are out-of-service, were controlled in accordance with the applicable regulatory requirements and licensee procedures. The inspectors verified that the licensee's quality control program ensured radioactive effluent sampling and analysis adequately quantified and evaluated discharges of radioactive materials. The inspectors verified the adequacy of public dose projections resulting from radioactive effluent discharges. The inspectors interviewed licensee personnel and reviewed or observed the following items:

- Radiological effluent release reports since the previous inspection and reports related to the effluent program issued since the previous inspection
- Effluent program implementing procedures, including sampling, monitor setpoint determinations and dose calculations
- Equipment configuration and flow paths of selected gaseous and liquid discharge system components, filtered ventilation system material condition, and significant changes to their effluent release points, if any, and associated 10 CFR 50.59 reviews
- Selected portions of the routine processing and discharge of radioactive gaseous and liquid effluents (including sample collection and analysis)
- Controls used to ensure representative sampling and appropriate compensatory sampling
- Results of the inter-laboratory comparison program
- Effluent stack flow rates
- Surveillance test results of technical specification-required ventilation effluent discharge systems since the previous inspection
- Significant changes in reported dose values
- A selection of radioactive liquid and gaseous waste discharge permits
- Part 61 analyses and methods used to determine which isotopes are included in the source term
- Offsite dose calculation manual changes
- Meteorological dispersion and deposition factors

- Latest land use census
- Records of abnormal gaseous or liquid tank discharges
- Groundwater monitoring results
- Changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater
- Identified leakage or spill events and entries made into 10 CFR 50.75(g) records, if any, and associated evaluations of the extent of the contamination and the radiological source term
- Offsite notifications, and reports of events associated with spills, leaks, and groundwater monitoring results
- Audits, self-assessments, reports, and corrective action documents related to radioactive gaseous and liquid effluent treatment since the last inspection

These activities constitute completion of one sample of radioactive gaseous and liquid effluent treatment, as defined in Inspection Procedure 71124.06.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

a. Inspection Scope

The inspectors evaluated whether the licensee's radiological environmental monitoring program quantified the impact of radioactive effluent releases to the environment and sufficiently validated the integrity of the radioactive gaseous and liquid effluent release program. The inspectors verified that the radiological environmental monitoring program was implemented consistent with the licensee's technical specifications and offsite dose calculation manual, and that the radioactive effluent release program met the design objective in Appendix I to 10 CFR Part 50. The inspectors verified that the licensee's radiological environmental monitoring program monitored non-effluent exposure pathways, was based on sound principles and assumptions, and validated that doses to members of the public were within regulatory dose limits. The inspectors reviewed or observed the following items:

- Annual environmental monitoring reports and offsite dose calculation manual
- Selected air sampling and dosimeter monitoring stations
- Collection and preparation of environmental samples
- Operability, calibration, and maintenance of meteorological instruments

- Selected events documented in the annual environmental monitoring report which involved a missed sample, inoperable sampler, lost dosimeter, or anomalous measurement

- Selected structures, systems, or components that may contain licensed material and has a credible mechanism for licensed material to reach ground water

- Records required by 10 CFR 50.75(g)

- Significant changes made by the licensee to the offsite dose calculation manual as the result of changes to the land census or sampler station modifications since the last inspection

- Calibration and maintenance records for selected air samplers, composite water samplers, and environmental sample radiation measurement instrumentation

- Inter-laboratory comparison program results

- Audits, self-assessments, reports, and corrective action documents related to the radiological environmental monitoring program since the last inspection

These activities constitute completion of one sample of radiological environmental monitoring program as defined in Inspection Procedure 71124.07.

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08)

a. Inspection Scope

The inspectors evaluated the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material. The inspectors interviewed licensee personnel and reviewed the following items:

- The solid radioactive waste system description, process control program, and the scope of the licensee's audit program

- Control of radioactive waste storage areas including container labeling/marking and monitoring containers for deformation or signs of waste decomposition

- Changes to the liquid and solid waste processing system configuration including a review of waste processing equipment that is not operational or abandoned in place

- Radio-chemical sample analysis results for radioactive waste streams and use of scaling factors and calculations to account for difficult-to-measure radionuclides

- Processes for waste classification including use of scaling factors and 10 CFR Part 61 analysis

- Shipment packaging, surveying, labeling, marking, placarding, vehicle checking, driver instructing, and preparation of the disposal manifest

- Audits, self-assessments, reports, and corrective action reports radioactive solid waste processing, and radioactive material handling, storage, and transportation performed since the last inspection

These activities constitute completion of one sample of radioactive solid waste processing, and radioactive material handling, storage, and transportation as defined in Inspection Procedure 71124.08.

b. Findings

Introduction. The inspectors reviewed a Green, self-revealing, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to follow their Process Control Program as implemented by their solid radioactive waste system procedures. The licensee shipped a radioactive shipment of condensate filter demineralizer resin waste for disposal to US Ecology of Washington with free standing liquid in excess of 0.5 percent of the total waste volume.

Description. On August 11, 2014, the licensee completed dewatering and drying of resin for a condensate demineralizer filter waste liner (14-033-L). On October 9, 2014, radioactive waste liner 14-033-L was shipped to US Ecology for disposal at their low level radioactive waste burial site near Richland, Washington. The liner was part of radioactive waste shipment #14-32 and manifested as a Class A Unstable waste form. On October 23, 2014, liner 14-033-L was randomly selected by the burial site for inspection to ensure compliance with the disposal site's license conditions. US Ecology punctured the bottom of the liner and determined that the liner contained free standing liquid, as evidenced by a slurry mix (150 ml) that drained from the puncture hole. On October 27, 2014, US Ecology continued their inspection of liner 14-033-L by fully opening the liner lid and sampling for additional free standing liquid. The inspection results revealed that over 8.5 gallons of free standing liquid was contained within the liner. This represented approximately 0.75 percent of the total waste volume (1132 gallons) and was in excess of the 0.5 percent free standing liquid requirement for unstable waste form. US Ecology contacted the licensee and informed them of the burial site noncompliance.

The licensee retrieved the packages (i.e., liners) contained in shipment #14-32 from US Ecology. Each liner was then tested for free standing liquid content and additional water was removed as necessary. This issue was entered into the licensee's corrective action program as Action Request 00316676, and an apparent cause evaluation was performed.

The inspectors reviewed selected licensee, vendor, and burial site information related to this issue and interviewed selected knowledgeable plant staff. The inspectors determined that the licensee failed to maintain the appropriate operating procedures and dewatering components for the resin drying and dewatering system used for the condensate filter demineralizer waste liners. Specifically, in 1999 and 2012, changes

were made to the Process Control Program via modifications to the resin drying system process. These modifications were different from the approved operations and specifications under NRC-approved Topical Report, TP-02-P-A, "Covering Nuclear Packaging, Inc. Dewatering System," approved September 6, 1985. In 1999, the specific change made was to open the valve to the lowest set of filter laterals in order to allow the use of these filters throughout the dewatering process for the condensate filter demineralizers. In 2011, following a condenser change-out, the carbon steel components of the new condenser introduced iron oxide into the resin drying system. This high iron oxide content coated the bottom filter laterals in the resin drying system and caused discoloration of the resin water. In 2012, additional changes to the Process Control Program instructed the resin drying system operators to declare the bottom filter laterals as damaged if they saw a discoloration in the resin drying system viewing window. These changes were not in accordance with vendor specifications.

The inspectors determined that the licensee performed an inadequate technical review for the resin drying and dewatering system when changes were made to the Process Control Program. Additionally, the inspectors reviewed the 10 CFR 50.59 screening, dated July 6, 2010, and determined that the licensee performed an inadequate technical review to assess potential adverse impacts of the condenser change-out on the plant's radioactive waste processing system. Consequently, the inspectors concluded that between 1999 and 2013, the licensee failed to maintain the vendor procedures and appropriate design margins for the resin drying system. This resulted in inadequate dewatering of the resin for condensate filter demineralizers in liner 14-033-L.

Analysis. The failure to follow the Process Control Program, resulting in the inadequate dewatering of radioactive waste liner contents, was a performance deficiency. Inspectors determined that the performance deficiency was more than minor, because it adversely affected the Public Radiation Safety cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released in the public domain. Specifically, the failure to ensure that the free standing liquid in the radioactive waste liner shipped to US Ecology did not exceed 0.5 percent of the total waste volume subjected the disposal facility to the possibility of improper handling of the waste. Using Inspection Manual Chapter 0609, Appendix D, "Public Radiation Safety Significance Determination Process," dated February 12, 2008, the inspectors determined the violation was of very low safety significance (Green) because: (1) radiation limits were not exceeded, (2) there was no breach of the package during transit, (3) there were no Certificate of Compliance issues, and (4) the low level burial ground nonconformance did not involve a 10 CFR 61.55 waste under classification. The inspectors determined that the finding has a design margin cross-cutting aspect in the area of human performance, because the licensee failed to operate and maintain the radioactive waste dewatering system within the vendor design margins when changes were made to the operating procedures [H.6].

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires, in part, that written procedures be established, implemented, and maintained for activities described in Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, Appendix A, dated February 1978. Regulatory Guide 1.33, Section 7.b.(2) requires procedures for the Solid Waste System – Spent Resins and Filter Sludge Handling. The licensee's Process Control Program procedure, SWP-RMP-02, "The Radioactive Waste Process Control Program," implements this requirement. Section 2.2.1.a of Procedure SWP-RMP-02, Revision 5, states, in part, that "The [resin dewatering and drying]

process is designed to reduce the free water, by disposal package volume, to less than … 0.5 percent when waste is packaged in an unstable waste form." Contrary to the above, on August 11, 2014, the licensee's resin dewatering and drying process failed to reduce the free water, by disposal package volume, to less than 0.5 percent when waste was packaged in an unstable waste form. Specifically, condensate filter demineralizer resin liner 14-033-L contained approximately 0.75 percent free standing liquid when it was received by US Ecology for disposal. Corrective actions included retrieving the packages from waste shipment (#14-32), and testing each liner for free standing liquid content, removing additional water as necessary. Because this violation is of very low safety significance and has been entered into the licensee's corrective action program as Action Request 00316676, it is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000397/2015003-05, Failure to Reduce the Free Water in a Class A Unstable Resin Disposal Package to Less than 0.5 Percent of Waste Volume)

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index: Emergency AC Power Systems (MS06), High Pressure Injection Systems (MS07), Residual Heat Removal Systems (MS09),

a. Inspection Scope

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

These activities constituted verification of the mitigating system performance index for emergency ac power systems, high pressure injection systems, and residual heat removal systems as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 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 2014 through June 2015 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 September 1, 2015. The inspectors used definitions and guidance contained in Nuclear Energy Institute

Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, to determine the accuracy of the reported data.

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

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

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

b. Findings

No findings were identified.

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

.1 (Closed) Licensee Event Report 05000397/2015-002-00, “Inadequately Fused Non-Class 1E Circuit on Division 1 120/240 VAC Bus”

On April 29, 2015, the licensee determined that Division 1 120/240 VAC vital instrumentation bus was inadequately protected for all conditions. Specifically, the Class 1E electrical panel E-PP-7AA did not have adequate electrical separation for scenarios involving a loss of offsite power coincident with a short circuit in a Non-Class 1E cooling fan. This issue was dispositioned as a licensee identified violation in Section 4OA7 of NRC Integrated Inspection Report 05000397/2015002, dated August 7, 2015 (ML15219A143). No additional performance deficiencies were identified. This licensee event report is closed.

.2 (Closed) Licensee Event Report 05000397/2015-003-00, “Implementation of Enforcement Guidance Memorandum (EGM) 11-003, Revision 2”

During Refueling Outage 22 in May – June 2015, Columbia Generating Station implemented the guidance of Enforcement Guidance Memorandum (EGM) 11-003, Revision 2, “Dispositioning Boiling Water Reactor Licensee Noncompliance with Technical Specification Containment Requirements during Operations with a Potential for Draining the Reactor Vessel,” dated December 13, 2013. Consistent with

EGM 11-003, Revision 2, secondary containment operability was not maintained during operations with a potential for draining the reactor vessel activities, and required action C.2 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 2, 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, and that the log entry appropriately recorded the standby source of makeup designated for the evolutions.

2. The inspectors noted that the licensee maintained reactor vessel water level at least greater than 21 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 designed 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 and that 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.

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 13, 2015, Columbia Generating Station performed a total of five 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 329328.

Since this violation occurred during the discretion period described in EGM 11-003, Revision 2, 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. In accordance with EGM 11-003, Revision 2, each licensee that receives discretion must submit a license amendment request (LAR) to resolve the issue for its plant which the NRC staff LAR acceptance review finds acceptable in accordance with LIC-109, "Acceptance Review Procedures." The generic solution will be a generic change to the Standard Technical Specifications, and the NRC will publish a notice of availability (NOA) for the TS solution in the Federal Register. Each licensee that receives discretion must submit its amendment request within 12 months of the NRC staff's issuance of the NOA.

Licensees may submit LARs to adopt the NRC-approved approach or to propose an alternative approach for their plants.

This licensee event report is closed.

.3 (Closed) Licensee Event Report 05000397/2015-004-00, "Unplanned Loss of 4.16KV Bus 7 Switchgear" Revision 0

On May 22, 2015, the licensee momentarily lost the division 1 vital bus, SM-7, due to a human performance error during maintenance. Specifically, a licensee electrician connected a multi-meter test lead to the wrong port on the instrument which caused an electrical short on SM-7. The SM-7 bus automatically divorced from the startup transformer due to a sensed phase-to-phase short, the short was isolated by a blown fuse, and SM-7 was rapidly repowered by the backup transformer via automatic transfer. The division 1 emergency diesel generator also auto-started from the loss of SM-7 and was secured. At the time of this transient, the plant was in a refueling outage in Mode 5 and crediting division 2 components for safety functions. The inspectors reviewed the licensee event report associated with this event and determined that the report adequately documented the summary of the event including the cause of the event and potential safety consequences. Required components for electrical power, inventory control, and decay heat removal were available and not challenged during the transient. Since this human performance error occurred while the plant was shutdown with division 1 components inoperable for testing, the inspectors did not identify any more than minor performance deficiencies. This licensee event report is closed.

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

4OA6 Meetings, Including Exit

Exit Meeting Summary

On September 24, 2015, the inspectors presented the radiation safety inspection results to Mr. W.G. Hettel, Chief Operating Officer and Chief Nuclear Officer, and other members of the licensee staff. The inspection results were re-exited telephonically on October 7, 2015, to update the licensee on enforcement specifics of the non-cited violation. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On October 1, 2015, the inspectors presented the inspection results to Mr. W.G. Hettel, Chief Operating Officer and Chief Nuclear 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
S. Abney, Assistant Manager, Operations
P. Allen, System Engineer, System Engineering
D. Brown, Manager, System Engineering
S. Clizbe, Manager, Emergency Preparedness
M. Davis, Manager, Chemistry/Radiation Protection
E. Dumlao, Senior Engineer
D. Gregoire, Manager, Regulatory Affairs
J. Hauger, System Engineering
G. Hettel, Chief Nuclear Officer and Chief Operating Officer
G. Higgs, Manager, Maintenance
M. Hummer, Licensing Engineer
A. Javorik, Vice President, Engineering
M. Laudisio, Manager, Radiation Protection
C. Moon, Manager, Quality
R. Prewett, Plant General Manager
G. Pierce, Manager, Training
A. Rice, Manager, Chemistry
B. Schuetz, Vice President, Operations
D. Stevens, Operations Manager
G. Strong, Electrical Design Supervisor
D. Suarez, Regulatory Compliance Engineer
J. Tansy, Reactor Engineering Supervisor
J. Trautvetter, Compliance Supervisor, Regulatory Affairs
L. Williams, Licensing Supervisor
D. Wolfgramm, Compliance Engineering

NRC Personnel
G. Replogle, Senior Reactor Analyst

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000397/2015003-01	FIN	Failure to Maintain Seismic Instrumentation Functional to Alert Plant Operators of Ground Motions Exceeding the Operating Basis Earthquake (Section 1R04)
05000397/2015003-02	NCV	Non-Conservative Shutdown Criteria in Earthquake Abnormal Procedure (Section 1R04)
05000397/2015003-03	NCV	Failure to Provide Design Control Measures for Control Room Emergency Chillers (Section 1R04)
05000397/2015003-04	NCV	Failure to Implement Procedures to Ensure Availability of Safe Shutdown Personnel (Section 1R11)

Opened and Closed

05000397/2015003-05	NCV	Failure to Reduce the Free Water in a Class A Unstable Resin Disposal Package to Less than 0.5 Percent of Waste Volume (Section 2RS8)

Closed

05000397/2015-002-00	LER	Inadequately Fused Non- Class 1E Circuit on Division 1 120/240 VAC Bus (Section 4OA3)
05000397/2015-003-00	LER	Implementation of Enforcement Guidance Memorandum (EGM) 11-003, Revision 2 (Section 4OA3)
05000397/2015-004-00	LER	Unplanned Loss of 4.16KV Bus 7 Switchgear (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

Number	Title	Revision
ABN-WIND	Tornado/High Winds	27
SOP-HOTWEATHER-OPS	Hot Weather Operations	6
SOP-WARMWEATHER-OPS	Warm Weather Operations	11
SOP-SW-LU	Standby Service Water System Valve & Breaker Lineup	6

Action Requests (ARs)

293549	293878	299646	300923	300999
304714	308167	312775	333418	334819

Section 1R04: Equipment Alignment

Procedures

Number	Title	Revision
1.3.66	Operability and Functionality Evaluation	32
5.0.12	Station Blackout and Extended Loss of AC Power Basis	0

Procedures

Number	Title	Revision
ABN-Earthquake	Earthquake	13
ABN-HVAC	HVAC Trouble	12
ISP-SEIS-S402	Triaxial Seismic Switch Model SP-1/TS-3 – CFT	3
ISP-SEIS-S403	Seismic System Reactor Building Foundation Triaxial Response – Spectrum Recorders – CFT	1
ISP-SEIS-X304	Seismic System Reactor Building Foundation Triaxial Response – Spectrum Recorders – CC	2
OI-69	Time Critical Operator Actions	4
OSP-CCH/IST-M702	Control Room Emergency Chiller System B Operability	35
SOP-HVAC/CR-LU	Control, Cable, and Critical Switchgear Rooms HVAC Lineup	1
SOP-HVAC/CR-START	Control, Cable, and Critical Switchgear Rooms HVAC Start	10
SOP-HVAC/CR-OPS	Control, Cable, and Critical Switchgear Rooms HVAC Operation	19
SOP-RCC-LU	RCC System Valve and Breaker Line-Up	1
SOP-SW-LU	Standby Service Water System Valve & Breaker Lineup	6
TSP-DG2/LOCA-B501	Standby Diesel Generator DG2 LOCA Test	26
SOP-SLC-LU	SLC System Valve and Breaker Lineup	0
SOP-SGT-LU	Standby Gas Treatment System Lineup	0

Calculations

Number	Title	Revision
CE-02-90-21	Calculation for Set Points Response Spectrum Indicating Lights	0
ME-02-92-43	Room Temperature Calculation for DG Building, Reactor Building, Radwaste Building and Service Water	10

Drawings

Number	Title	Revision
EWO-101E-008	Electrical Wiring Diagram Heat Trace SLC Pump Suction Piping	2
M522	Flow Diagram Standby Liquid Control System	39

Miscellaneous

Number	Title	Revision/ Date
C92-0020	Component Classification Evaluation Record	0
E555-HT-HTP-8B/A	Fuse Detail Report	December 15, 2008
ISCR 979	Instrument Setpoint Change Request SEIS-RSRT-1/1, 1/2, 1/3	April 30, 1990
LDCN-11-001, 11-013	Columbia Generating Station Final Safety Analysis Report	61

Work Orders

02041736 02075766

Action Requests (ARs)

046497	298184	302392	304002	304040
307688	307703	308892	311384	313567
313883	313960	318811	319542	323891
325520	330741	333996		

Section 1R05: Fire Protection

Drawings

Number	Title	Revision
E503-1	Motor Control Center General Notes, MCC and Starter Index	86
E535-49A	Connection Wiring Diagram Motor Control Center E-MC-7F	23
E535-49B	Connection Wiring Diagram Motor Control Center E-MC-7F	23
E753	Radwaste and Control Building Elevation 525'-0" Power Conduit and Tray Plans	41
PFSS-1	Appendix R Post Fire Safe Shutdown (PFSS) Division 1 Boundaries One Line Diagram	10

Procedures

Number	Title	Revision
1.3.10A	Control of Ignition Sources	15
FPP-1.6	Combustible Loading Calculation Control	2
FPP-2.2.12	Annual Fire Door Operability Test	4
FPP-2.2.7	Fire Protection Water System Inspections	5

Fire Protection Pre-Plans

Number	Title	Revision
PFP-RB-422	Reactor 422	5
PFP-RW-467	Radwaste 467	5
PFP-RW-484-487	Radwaste 484-487	5
PFP-RW-525	Radwaste 525	5

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

Procedures

Number	Title	Revision
OI-9	Operations Standards and Expectation	62
OI-45	Color Banding of Control Room Instrumentation	6
OI-53	Offsite Power	14
1.3.67	Operational Decision Making Process	14
1.3.84	Reactivity Management Control	2
13.1.1	Classifying the Emergency	47
5.1.1	RPV Control	20
5.2.1	Primary Containment Control	22
5.3.1	Secondary Containment Control	19

Action Requests (ARs)

332747 333692

Section 1R12: Maintenance Effectiveness

Procedures

Number	Title	Revision
1.5.11	Maintenance Rule Program	13
MOT-CHILL-1-1	Chiller Maintenance Scope and Basis Document	7
MOT-PRV-1-1	Pressure Relief Valve Maintenance Scope and Basis Document	6

Miscellaneous

Number	Title	Revision/ Date
	Maintenance Rule Evaluations CCH System	June 30, 2015
	CCH System Performance Improvement Plan	4
51182	Reactor Operating Events-Event Notification Report	June 25, 2015
CVI 531-00,1,1	Differential Pressure Indicating Switches, Unit, Calibration and Parts List	3
GEP-6013	Preparation and Installation of the ULTRX Rupture Disc Assembly	2008
IMDS	Instrument Master Data Sheets DMA-TIS-32A/B	7

Action Requests (ARs)

020602	020829	122680	132812	135119
195492	195876	226018	284341	298184
304040	307688	307703	307863	307897
308892	308950	311597	313567	313883
318811	319542	320707	332078	332096
332617	332889	334369	334438	

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Number	Title	Revision
ABN-CR-EVAC	Control Room Evacuation and Remote Cooldown	33

Procedures

Number	Title	Revision
OI-14	Columbia Generating Station Operational Challenges and Risk Program	13
OI-69	Time Critical Operator Actions	4
1.3.1	Operating Policies, Programs, and Practices	119
1.3.76	Integrated Risk Management	44

Action Requests (ARs)

302053	306204	309005	311964	314936
314983	319661	321848	322776	323263
323364	329491	333025	333041	333041
333622	333731	334749		

Work Orders (WOs)

02082634

Miscellaneous

Number	Title	Date
	Protected Equipment Tracking Sheet	August 20, 2015
	Protected Equipment Tracking Sheet	September 13, 2015
	Protected Equipment Tracking Sheet	September 26, 2015

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

Number	Title	Revision
1.3.66	Operability and Functionality Evaluation	32
4.601.A2	601.A2 Annunciator Panel Alarms	27
5.0.12	Station Blackout and Extended Loss of AC Power Basis	0
ABN-HVAC	HVAC Trouble	12
OI-69	Time Critical Operator Actions	4
OI-9	Operations Standards and Expectation	62

Procedures

Number	Title	Revision
OSP-CCH/IST-M702	Control Room Emergency Chiller System B Operability	35
SOP-HOTWEATHER-OPS	Hot Weather Operations	6
SOP-HVAC/CR-LU	Control, Cable, and Critical Switchgear Rooms HVAC Lineup	1
SOP-HVAC/CR-OPS	Control, Cable, and Critical Switchgear Rooms HVAC Operation	19
SOP-HVAC/CR-START	Control, Cable, and Critical Switchgear Rooms HVAC Start	10

Calculations

Number	Title	Revision
ME-02-89-49	Calculation for Main Steam Isolation Valve Actuator Force Balance	0
NE-02-85-19	Calculation Post-Fire Safe Shutdown (PFSS) Analysis	7

Miscellaneous

Number	Title	Revision/ Date
531-00,1,1	Barton Differential Pressure Indicating Switches, Unit, Calibration and Parts List	3
IMDS	Instrument Master Data Sheets MS-LIS-24A/C	16
NO 1419	Night Order	October 27, 2012
NO 1653	Night Order	July 8, 2015
TM-2150	Mission Time of Emergency Safety Features	0

Action Requests (ARs)

273129	332823	332326	332330	332078
032562	332096	021535	028598	333334
334459				

Section 1R18: Plant Modifications

Miscellaneous

Number	Title	Revision
EC14111	RFW-V-102A Push Rod Assembly	0

Section 1R19: Post-Maintenance Testing

Procedures

Number	Title	Revision
OSP-CCH/IST-M701	Control Room Emergency Chiller System A Operability	38
OSP-RCIC/IST-Q701	RCIC Operability Test	56
OSP-ELEC-S702	Diesel Generator 2 Semi-Annual Operability Test	55
SOP-DG2-START	Emergency Diesel Generator (DIV 2) Start	26

Work Orders

02059527	02066727	02069655	02066726	02070167
02075767				

Miscellaneous

Number	Title	Revision
IMDS	Instrument Master Data Sheets DMA-TIS-32A/B	7

Action Requests (ARs)

298184	314814	319542	320386	321294
323891	324941	325599	331175	332159
335270	335441	336314	336431	336485

Section 1R22: Surveillance Testing

Procedures

Number	Title	Revision
OSP-INST-H101	Shift and Daily Instrument Checks Modes 1, 2, 3	85
OSP-DO/IST-Q701	DO-P-1A Operability	14

Procedures

Number	Title	Revision
OSP-LPCS/IST-Q702	LPCS System Operability Test	39

Action Requests (ARs)

316238	326038	332078	332833	335006
335144				

Section 1EP6: Drill Evaluation

Procedures

Number	Title	Revision
5.1.1	RPV Control	20
5.2.1	Primary Containment Control	22
5.3.1	Secondary Containment Control	19
13.1.1	Classifying the Emergency	47

Action Requests (ARs)

332756	333042

Miscellaneous

Number	Title	Date
	ERO Team A Drill Guide	July 7, 2015
	ERO Team A Drill Report – After Action Improvement Plan	July 30, 2015

Section 2RS5: Radiation Monitoring Instrumentation

Procedures

Number	Title	Revision
CI-13.10	Canberra iSolo Alpha/Beta Counting System	04
CI-13.12	Global Value Gamma Ray Analyzer System	03
CI-13.6	ORTEC Gamma Ray Analyzer System	03
CI-13.9	Tri-Carb Liquid Scintillation Counting System	03
HPI-12.100	Calibration of the SAM12 Small Article Monitor	03
HPI-5.6	FastScan Whole Body Count System	07

Procedures

Number	Title	Revision
HPI-7.5	Eberline Model RO-2 and RO-2A Calibration	10
PPM 16.1.2	Stack Monitor Low Range Detector	14
PPM 16.2.1	TEA Low Range Noble Gas Monitor Channel 1	10
PPM 16.4.4	OFFGAS Post Treatment Radiation Monitor CH A	16
PPM 16.7.2	FDR-RIS-606, Liquid Radwaste Effluent Monitor	08
PPM 16.7.4	Liquid Radwaste Effluent Line Flow Rate	07

Action Requests (ARs)

00307356	00308226	00308390	00308468	00309073
00309410	00310348	00312551	00319190	00319873
00325863	00326107	00334647		

Audits and Self-Assessments

Number	Title	Date
301869	Snapshot Self-Assessment Report – Radiation Instruments	July 25, 2015
AU-CH-14	Quality Services Audit Report – Chemistry/REMP/Non-Rad & Rad Effluents/ODCM Program	October 23, 2014

Installed Radiation Instrument Calibration Records

WO Number	Title	Date
01167050	TEA Low Range Noble Gas Monitor Channel 1	April 3, 2014
02043785	OFFGAS Post Treatment Radiation Monitor CH A	May 23, 2015
02047822	CC/RC Secondary Containment Isolation Reactor Building Vent Radiation Channel D	March 26, 2014
02051142	Liquid Radwaste Flow Instrument	June 13, 2014
02051815	MSL High Radiation Channel A	June 27, 2014
02053216	Stack Monitor Low Range Noble Gas Monitor	July 17, 2014
02062579	Liquid Radwaste Effluent Radiation Monitor	March 3, 2015
02066745	Plant Blowdown Discharge Line Flow Rate	July 3, 2015

Portable Radiation Instrument Calibration Records

Number	Title	Date
3891	Victoreen Model 570 R-Chamber Set	January 20, 2014
F112	Ludlum Model 177 Frisker	April 1, 2015
NO17	Eberline ASP-1 w/ NRD Neutron Detector	April 8, 2015
RO196	Eberline RO-2	April 24, 2015
RO237	Ludlum Model 14C	July 23, 2015
RS26	Thermo/Bicron Micro-Rem Meter	April 30, 2015
RV07	Victoreen 451B	April 2, 2015
T070	Teletector Model 6112M	May 20, 2015

Stationary Radiation Instrument Calibration Records

Number	Title	Date
36797	iSolo Calibration	September 23, 2015
HP-EQ-42712	SAM12 Small Article Monitor	September 23, 2015
HP-EQ-42734	GEM-5	July 19, 2015
HP-EQ-42747	GEM-5	September 3, 2015
HP-EQ-42783	ARGOS-5 A/B	July 14, 2015
HP-EQ-42813	SAM12 Small Article Monitor	April 20, 2015
HP-EQ-C015122	IPM-8	May 8, 2015
Ortec #5	Efficiency Verification Worksheet Calibration of 47 mm Filter Shelf 1	September 23, 2015
Ortec #5	Efficiency Verification Worksheet Calibration of 250 ml Polybottle - Shelf 1	September 23, 2015
WBC#2	FastScan Calibration	July 29, 2015
WO 02062192	Annual Tritium Quench Curve Calibration	June 10, 2015

Miscellaneous Documents

Number	Title	Revision/Date
	Offsite Dose Calculation Manual	53
	Calibration Lab Irradiator Periodic Dose Rate Decay Adjustment	July 7, 2015

Miscellaneous Documents

Number	Title	Revision/Date
15-02	Calculation of the Activity for K40 Daily Check Source Used with SAM 9/11/12 and BM 285 Monitors (Revises Calculation No. 04-1)	June 23, 2015

Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment

Procedures

Number	Title	Revision
1.11.12	Removal of Liquids from RCA	11
11.2.15.7	Release of Material from Radiologically Controlled Area	21
TSP-BOP/ISOL-B501	Balance of Plant Isolation Logic System Functional Test	07
TSP-SGT-B501	Standby Gas Treatment System Functional Test	08
10.2.8	Carbon Filter In Place Testing	08
10.2.82	HEPA Filter In Place Testing	07
12.4.21	The Sampling and Determination of Tritium	25
12.5.8	Gaseous Effluent Discharge Sampling	23
12.5.28	Sampling and Analysis for Unrestricted Release	12
16.11.1	Monthly Grab Gas Samples	10
16.11.6	Weekly Iodine, Particulate, and Tritium Analysis Results	15
MSP-SGT-B102	Standby Gas Treatment System Unit B HEPA Filter Test	04
MSP-SGT-B103	Standby Gas Treatment Filtration System – Unit A Carbon Adsorber Test	10
MSP-SGT-B104	Standby Gas Treatment Filtration System – Unit B Carbon Adsorber Test	08
9.3.32	Fuel Integrity Monitoring	12

Action Requests (ARs)

00297561	00301591	00310348	00315360	00315492
00320966	00321016	00321365	00323071	00323632
00326490	00331287	00331587	00331588	00331589
00334641	00291084			

Audits, Self-Assessments, and Surveillances

Number	Title	Date
AU-CH-14	Chemistry-REMP-Non-Rad and Rad Effluents-ODCM Program Audit	October 16, 2014
AU-RP-RW-13	Radiation Protection and Process Control	November 16, 2013
23748A	NUPIC Audit NCS Corporation	September 3, 2014
23748B	NUPIC Audit AEP Audit No. PA-14-12	November 25, 2014

Air Cleaning System Surveillance Test Records

Number	Title	Date
WO 2004423	Standby Gas Treatment Filtration System – Unit A Carbon Adsorber Test	July 15, 2013
WO 2046928	Standby Gas Treatment System Unit B HEPA Filter Test	April 28, 2014
WO 2046928	Standby Gas Treatment Filtration System – Unit B Carbon Adsorber Test	April 28, 2014

Title	Date
2013 Annual Radioactive Effluent Release Report	April 2014
2014 Annual Radioactive Effluent Release Report	April 2015
Cross-Check Program 2013 Summary Report	February 2014
Cross-Check Program 2014 Summary Report	February 2015

Section 2RS7: Radiological Environmental Monitoring Program

Procedures

Number	Title	Revision
SWP-CHE-01	Groundwater Protection Program	03
PPM 1.11.1	REMP Implementation Procedure	-
REMP 5.11	Use and Maintenance of Automatic Composite Samplers	02
REMP 9.10	Environmental TLD Calculations	01
REMP 11.01	Milk Sampling	06

Procedures

Number	Title	Revision
REMP 11.02	Soil and Sediment Sampling	03
REMP 11.06	Fish Collection and Preparation	01
REMP 11.07	REMP Water Sample Collection	06
REMP 11.09	REMP Air Sample Collection	05
REMP 12.06	Quality Assurance for the Radiological Laboratory	01
REMP 12.07	Radiological Laboratory Measurement Assurance Program	01
SOP 11.09r05	REMP Air Sample Collection	05

Audits, Self-Assessments, and Surveillances

Number	Title	Date
AR 291084	Perform a Self-Assessment of SWP-CHE-01, Groundwater Protection Program Against the Requirements of NEI 07-07	January, 2014
15-A-08	Energy Northwest Audit Report 15-A-08 of Mission Support Alliance – Radiological Site Services	March 9, 2015
AU-RP/RW-13	Quality Services Audit Report; Radiation Protection and Process Control program	November 2013
AR-SA:305111	Focused Self-Assessment Report; Radioactive Gaseous and Liquid Effluents; Radiological Environmental Monitoring Program; and Radioactive Solid Waste Processing, Radioactive Material Handling, Storage, and Transportation	June 19, 2015

Action Requests (ARs)

00320966	00303414	00335039	00331779	00300634
00317136	00333542	00318632	00320309	00316091
00321365	00325192	00329806	00331590	0033106
00333286	00299745	00334171	00334146	00303414

Miscellaneous Documents

Title	Revision/Date
Plant Meteorological Tower Data Availability Records, 2013, 2015 and 2015 (Year to Date)	September 2015
Plant Specific Logs for Licensee Compliance to Title 10 Part 50.75.g. (Year to Date)	September 2015
2013 Annual Radiological Environmental Operating Report	May 2014
2014 Annual Radiological Environmental Operating Report	May 2015
Offsite Dose Calculation Manual	June 1991
Offsite Dose Calculation Manual	53

Section 2RS8: Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation

Procedures

Number	Title	Revision
1.10.1	Notifications and Reportable Events	37
11.2.23.1	Shipping Radioactive Materials and Waste	15
11.2.23.2	Computerized Radioactive Waste and Material Characterization	19
11.2.23.4	Packaging Radioactive Material and Waste	23
11.2.23.14	Sampling of Radioactive Waste Streams	12
11.2.23.19	Operation of The Pacific Nuclear Resin Drying System	07, 13, 14
11.2.23.29	LSA Contaminated Laundry Shipments	11
11.2.23.37	Use of the 14D-2.0 Type A Transportation Cask	05
RW000103	Waste Characterizing Computer Code	00
RW000115	WNP-2 Radwaste Procedure Training	00
RW000116	NRC Packaging and Shipping Regulations	00
RW000117	DOT Packaging and Shipping Regulations	00
RW000118	Burial Site Disposal Requirements	00
SWP-CHE-02	Chemical Process Management and Control	24

Procedures

Number	Title	Revision
SWP-RMP-02	Radioactive Waste Process Control Program	05

Audits, Self-Assessments, and Surveillances

Number	Title	Date
AU-RP/RW-13	Quality Services Audit Report: Radiation Protection and Process Control Program	December 3, 2013
AU-CH-14	Quality Service Audit Report: Chemistry/REMP/Non-Rad and Rad Effluents/ODCM Program	October 23, 2014
30511	Focused Self-Assessment Report: Radioactive Gaseous and Liquid Effluents; Radiological Environmental Monitoring Program; Radioactive Solid Waste Processing, Radioactive Material Handling, Storage, and Transportation	June 19, 2015

Action Requests (ARs)

00297650	00300182	00308527	00316555	00316676
00316835	00316913	00320373	00323678	00323841
00325137	00332690	00332758	00333434	00333463
00333590				

Radioactive Material and Waste Shipments

Number	Title	Date
13-07	RWCU Resin (Non-DOT)	March 26, 2013
13-39	12 Boxes of Dry Active Waste (LSA II)	June 11, 2013
13-46	12 Boxes of Dry Active Waste (LSA II)	June 27, 2013
13-50	Resin Bead, 1 PDX, 8 Boxes of Dry Active Waste (LSA II)	August 27, 2013
14-03	RHR-P-2B (Type A)	January 16, 2014
14-10	4 Condensate F/D Resins, 2 Boxes Dry Active Waste (LSA II)	May 20, 2014
14-16	EDDR/FDR F/D Resins (LSA II)	June 11, 2014

Radioactive Material and Waste Shipments

Number	Title	Date
14-32	Condensate F/D Resins – 5 liners (RETURNED) (LSA II)	October 9, 2014
14-38	EDR/FDR Resin Condensate (LSA II)	December 15, 2014
15-01	Condensate F/D Resins; 4 Boxes Dry Active Waste (LSA II)	January 20, 2015
15-43	One 20’ C-Van with Dry Active Waste (LSA II)	June 4, 2015

Radiation Work Permits

Number	Title	Revision
30003514	2015 RW 437’ Waste Processing NUPAC Cage – LHRA	00
30003520	2015 RW NUPAC Cage Processing – LHRA High Risk	00
30003498	NRC Tours and Inspections - HRA	00

Radiological Surveys

Number	Title	Date
4435	ISFSI Building 105	July 27, 2015
4497	Building 167 & C-Vans	August 3, 2015
4500	Warehouse 5 (Building 80)	August 3, 2015
4710	Building 13 Laundry	August 21, 2015
4874	LSA Pad	September 8, 2015
5057	Radwaste 437’ NUPAC Cage	September 23, 2015

Miscellaneous Documents

Number	Title	Revision/Date
ODCM LEP	Columbia Generating Station Offsite Dose Calculation Manual	53
	Columbia Generating Station Final Safety Analysis Report – Chapter 11.4, "Solid Waste Management System"	57
	2013 Annual Radioactive Effluent Release Report	April 30, 2014
DIC 1554.58	Columbia Generating Station Scaling Factor Determination Package	March 24, 2015
	2014 Annual Radioactive Effluent Release Report	April 30, 2015
	10 CFR 61 Scaling Factor Determination	September 17, 2015

Section 4OA1: Performance Indicator Verification

Procedures

Number	Title	Revision
CI-10.17	Iodine	12
CSP-I131-W101	Reactor Coolant Isotopic Analysis for I-131 Dose Equivalent	9

Miscellaneous

Number	Title	Revision
MSPI-01-BD-001	MSPI Basis Document	17

286838 286894 332833 333421

Work Orders

02069131

Section 4OA2: Problem Identification and Resolution

Procedures

Number	Title	Revision
SWP-CAP-06	Condition Report Review	22

Action Requests (ARs)

329576	333690	334108

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

Procedures

Number	Title	Revision
3.4.1	Minimizing the Potential of Draining the Reactor Vessel	19

Action Requests (ARs)

323625	326336	326573	328051	328312
328726	329328			

The following items are requested for the
Public Radiation Safety Inspection
Columbia
September 21-24, 2015
Integrated Report 2015003

Inspection areas are listed in the attachments below.

Please provide the requested information on or before **August 31, 2015.**

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.0**1** 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 Martin Phalen at (817) 200-1158 or martin.phalen@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.

1. Radiation Monitoring Instrumentation (71124.05)
Date of Last Inspection: **November 8, 2013**

A. List of contacts and telephone numbers for the following areas:
   1. Effluent monitor calibration
   2. Radiation protection instrument calibration
   3. Installed instrument calibrations
   4. Count room and Laboratory instrument calibrations

B. Applicable organization charts

C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support and LERs, written since date of last inspection, related to:
   1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, or whole body counters
   2. Installed radiation monitors

D. Procedure index for:
   1. Calibration, use and operation of continuous air monitors, criticality monitors, portable survey instruments, temporary area radiation monitors, electronic dosimeters, teledosimetry, personnel contamination monitors, and whole body counters.
   2. Calibration of installed radiation monitors

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. Calibration of portable radiation detection instruments (for portable ion chambers)
   2. Whole body counter calibration
   3. Laboratory instrumentation quality control

F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:
   1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, whole body counters,
   2. Installed radiation monitors,
   3. Effluent radiation monitors
   4. Count room radiation instruments

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. Offsite dose calculation manual, technical requirements manual, or licensee controlled specifications which lists the effluent monitors and calibration requirements.

H. Current calibration data for the whole body counter’s.

I. Primary to secondary source calibration correlation for effluent monitors.

J. A list of the point of discharge effluent monitors with the two most recent calibration dates and the work order numbers associated with the calibrations.

K. Radiation Monitoring System health report for the previous 12 months

2. Radioactive Gaseous and Liquid Effluent Treatment (71124.06)
Date of Last Inspection: **November 8, 2013**

A. List of contacts and telephone numbers for the following areas:
   1. Radiological effluent control
   2. Engineered safety feature air cleaning systems

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. Radioactive effluents
   2. Engineered Safety Feature Air cleaning systems

D. Procedure indexes for the following areas
   1. Radioactive effluents
   2. Engineered Safety Feature Air cleaning systems

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. Sampling of radioactive effluents
   2. Sample analysis
   3. Generating radioactive effluent release permits
   4. Laboratory instrumentation quality control
   5. In-place testing of HEPA filters and charcoal adsorbers
   6. New or applicable procedures for effluent programs (e.g., including ground water monitoring programs)

F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:
   1. Radioactive effluents
   2. Effluent radiation monitors
   3. Engineered Safety Feature Air cleaning systems

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. 2013 and 2014 Annual Radioactive Effluent Release Report or the two most recent reports

H. Current Copy of the Offsite Dose Calculation Manual

I. Copy of the 2013 and 2014 interlaboratory comparison results for laboratory quality control performance of effluent sample analysis, or the two most recent results.

J. Effluent sampling schedule for the week of the inspection

K. New entries into 10 CFR 50.75(g) files since date of last inspection

L. Operations department (or other responsible dept.) log records for effluent monitors removed from service or out of service

M. Listing or log of liquid and gaseous release permits since date of last inspection

N. A list of the technical specification-required air cleaning systems with the two most recent surveillance test dates of in-place filter testing (of HEPA filters and charcoal adsorbers) and laboratory testing (of charcoal efficiency) and the work order numbers associated with the surveillances

O. System Health Report for radiation monitoring instrumentation. Also, please provide a specific list of all effluent radiation monitors that were considered inoperable for 7 days or more since November 2011. If applicable, please provide the relative Special Report and condition report(s) moreover

P. A list of all radiation monitors that are considered §50.65/Maintenance Rule equipment.

Q. A list of all significant changes made to the Gaseous and Liquid Effluent Process Monitoring System since the last inspection. If applicable, please provide the corresponding UFSAR section in which this change was documented.

R. A list of any occurrences in which a non-radioactive system was contaminated by a radioactive system. Please include any relative condition report(s).

3. Radiological Environmental Monitoring Program (71124.07)
Date of Last Inspection: **November 8, 2013**

A. List of contacts and telephone numbers for the following areas:
1. Radiological environmental monitoring
2. Meteorological monitoring

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. Radiological environmental monitoring program (including contractor environmental laboratory audits, if used to perform environmental program functions)
2. Environmental TLD processing facility
3. Meteorological monitoring program

D. Procedure index for the following areas:
1. Radiological environmental monitoring program
2. Meteorological monitoring program

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. Environmental Program Description
2. Sampling, collection and preparation of environmental samples
3. Sample analysis (if applicable)
4. Laboratory instrumentation quality control
5. Procedures associated with the Offsite Dose Calculation Manual
6. Appropriate QA Audit and program procedures, and/or sections of the station's QA manual (which pertain to the REMP)

F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:
1. Radiological environmental monitoring

2. Meteorological monitoring

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. Wind Rose data and evaluations used for establishing environmental sampling locations

H. Copies of the 2 most recent calibration packages for the meteorological tower instruments

I. Copy of the 2013 and 2014 Annual Radiological Environmental Operating Report and Land Use Census, and current revision of the Offsite Dose Calculation Manual, or the two most recent reports.

J. Copy of the environmental laboratory's interlaboratory comparison program results for 2013 and 2014, or the two most recent results, if not included in the annual radiological environmental operating report

K. Data from the environmental laboratory documenting the analytical detection sensitivities for the various environmental sample media (i.e., air, water, soil, vegetation, and milk)

L. Quality Assurance audits (e.g., NUPIC) for contracted services

M. Current NEI Groundwater Initiative Plan and status

N. Technical requirements manual or licensee controlled specifications which lists the meteorological instruments calibration requirements

O. A list of Regulatory Guides and/or NUREGs that you are currently committed to relative to the *Radiological Environmental Monitoring Program*. Please include the revision and/or date for the committed item and where this can be located in your current licensing basis/UFSAR.

P. If applicable, per NEI 07-07, provide any reports that document any spills/leaks to groundwater since the last inspection

4. Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08)

Date of Last Inspection: **November 8, 2013**

A. List of contacts and telephone numbers for the following areas:
1. Solid Radioactive waste processing
2. Transportation of radioactive material/waste

B. Applicable organization charts (and list of personnel involved in solid radwaste processing, transferring, and transportation of radioactive waste/materials)

C. Copies of audits, department self-assessments, and LERs written since date of last inspection related to:
1. Solid radioactive waste management
2. Radioactive material/waste transportation program

D. Procedure index for the following areas:
1. Solid radioactive waste management
2. Radioactive material/waste transportation

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. Process control program
   2. Solid and liquid radioactive waste processing
   3. Radioactive material/waste shipping
   4. Methodology used for waste concentration averaging, if applicable
   5. Waste stream sampling and analysis

F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection related to:
   1. Solid radioactive waste
   2. Transportation of radioactive material/waste

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. Copies of training lesson plans for 49CFR172 subpart H, for radwaste processing, packaging, and shipping

H. A summary of radioactive material and radioactive waste shipments made from date of last inspection to present

I. Waste stream sample analyses results and resulting scaling factors for 2013, 2014, and 2915, or the two most recent results

J. Waste classification reports if performed by vendors (such as for irradiated hardware)

K. A listing of all onsite radwaste storage facilities. Please include a summary *or* listing of the items stored in each facility, including the *total* amount of radioactivity and the *highest* general area dose rate

Although it is not necessary to compile the following information, the inspector will also review:

L. Training, and qualifications records of personnel responsible for the conduct of radioactive waste processing, package preparation, and shipping