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

August 10, 2017

Mr. Mark 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 05000397/2017002

Dear Mr. Reddemann:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Columbia Generating Station. On July 13, 2017, the NRC inspectors discussed the results of this inspection with Mr. G. Hettel, Vice President, Operations, and other members of your staff. The results of this inspection are documented in the enclosed report.

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

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement; and the NRC resident inspector at the Columbia Generating Station.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the Columbia Generating Station.

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

Sincerely,

/RA/

Mark Haire, Branch Chief
Project Branch A
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000397/2017002
w/ Attachments:
1. Supplemental Information
2. Inservice Inspection Document Request
3. Information Request for the Occupational Radiation Safety Inspection

COLUMBIA GENERATING STATION – NRC INTEGRATED INSPECTION REPORT
05000397/2017002 – August 10, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000397
License:	NPF-21
Report:	05000397/2017002
Licensee:	Energy Northwest
Facility:	Columbia Generating Station
Location:	North Power Plant Loop Richland, WA 99354
Dates:	April 1 through June 30, 2017
Inspectors:	G. Kolcum, Senior Resident Inspector R. Alexander, Senior Project Engineer D. Bradley, Senior Resident Inspector L. Brandt, Resident Inspector L. Carson, Senior Health Physicist J. Drake, Senior Reactor Inspector S. Money, Health Physicist J. O'Donnell, Health Physicist
Approved By:	Mark Haire Chief, Project Branch A Division of Reactor Projects

SUMMARY

IR 05000397/2017002; 04/01/2017 – 06/30/2017; Columbia Generating Station; Maintenance Effectiveness, Radiological Hazard Assessment and Exposure Controls, Problem Identification and Resolution.

The inspection activities described in this report were performed between April 1 and June 30, 2017, by the resident inspectors at Columbia Generating Station and inspectors from the NRC's Region IV office. Three findings of very low safety significance (Green) are documented in this report. Two of these findings involved a violation of NRC requirements. The significance of inspection findings is indicated by their color (i.e., Green, greater than Green, White, Yellow, or Red), that is determined using Inspection Manual Chapter 0609, "Significance Determination Process," dated April 29, 2015. Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," dated July 2016.

Cornerstone: Initiating Events

- Green. The inspectors reviewed a self-revealed finding for the licensee's failure to follow plant Procedure SWP-CAP-01, "Corrective Action Program," that ensures corrective actions are timely. As a corrective action for failures associated with mechanism operated cell switches for nonsafety 4160 VAC circuit breakers in 2013 and 2015, the licensee assigned modifications to the mechanism operated cell switches but failed to implement them in a timely manner. Consequently, on July 20, 2016, circuit breaker E-CB-S/3 mechanism operated cell switches failed to change state resulting in a loss of a main feed pump and an unplanned runback to 70 percent reactor power. As corrective action, the licensee declared the startup transformer inoperable, modified the mechanism operated cell assembly for circuit breaker E-CB-S/3 to remove one switch, and performed post-maintenance testing. The licensee also initiated Action Request 352504 to perform an apparent cause review and address long-term corrective actions.

  The failure to follow plant Procedure SWP-CAP-01, "Corrective Action Program," that ensures corrective actions are timely was a performance deficiency. The performance deficiency was more than minor because it affected the equipment performance attribute of the Initiating Event Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the loss of major loads on E-SM-3 upset plant stability by causing a loss of feed and reactor runback transient. The inspector performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions." The inspectors determined that the finding was of very low safety significance (Green) because the finding did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Specifically, the licensee remained at power and maintained diverse feed and condensate pumps.

  This finding had a cross-cutting aspect in the area of human performance, consistent process, in that the licensee failed to use a systematic approach to make decisions including incorporating risk insights. Specifically, circuit breaker E-CB-S/3 is utilized at least monthly

for emergency diesel generator surveillance testing and a failure could render the startup transformer inoperable. The mechanism operated cell assembly modification, recommended in 2013 and assigned for action in 2015, was not planned or scheduled as a work order at the time of the failure in 2016 [H.13]. (Section 1R12)

Cornerstone: Mitigating Systems

- Green. The inspectors reviewed a self-revealed, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to promptly identify and correct a condition adverse to quality. Specifically, since 2012, the licensee failed to implement prompt corrective actions to correct an adverse condition related to the use of a contactor coil for a motor starter in the high pressure core spray room normal supply fan. As an immediate corrective action, the licensee replaced the contactor for the high pressure core spray room normal supply fan. The licensee entered this issue into the corrective action program as Action Request 360595.

  The failure to correct an adverse condition related to the use of a contactor coil for a motor starter in the HPCS room normal supply fan, though the licensee had an opportunity and plan to do so, was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it affected the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee's failure to correct the use of a contactor coil for a motor starter in the high pressure core spray room normal supply fan resulted in an inoperable fan, high pressure core spray bus 4160 VAC switchgear, and high pressure core spray pump during the January 25, 2017, event when smoke was observed from the motor control center. The inspectors 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 (Green) 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 nontechnical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours.

  The inspectors determined that this finding did not have a cross-cutting aspect as the decision to not replace the contactor occurred in 2014 and was not reflective of current performance. (Section 4OA2)

Cornerstone: Occupational Radiation Safety

- Green. The inspectors reviewed a self-revealed, non-cited violation of 10 CFR 20.1501 resulting from the licensee's failure to conduct radiation surveys necessary to establish appropriate controls to support movement of spent filters from the spent fuel pool to a shipping cask. This issue was entered into the licensee's corrective action program as Action Requests 356390 and 358265.

  The licensee's failure to perform surveys necessary to establish appropriate controls to support the movement of filters from the spent fuel pool to a shipping cask was a

performance deficiency. The performance deficiency was more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of program and process and adversely affected the associated cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation. Specifically, the inadequate radiation surveys resulted in inadequate controls being implemented causing unplanned and unintended personnel dose. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that the finding was of very low safety significance (Green), because it did not involve: (1) ALARA planning and controls; (2) an overexposure; (3) a substantial potential for overexposure; or (4) an impaired ability to assess dose. The finding had a cross-cutting aspect in the area of human performance, associated with work management, because the organization failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the licensee's organization and work processes failed to include the identification and management of radiological risk commensurate with the spent fuel pool filter project and the need for strict coordination with different groups or job activities [H.5]. (Section 2RS1)

Licensee-Identified Violations

Violations of very low safety significance (Green) that were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and associated corrective action tracking numbers are listed in Section 4OA7 of this report.

PLANT STATUS

The plant began the inspection period at 65 percent power due to power requirements from the Bonneville Power Administration (BPA). On May 13, 2017, the plant shutdown for a planned refueling outage. On June 15, 2017, the reactor was made critical following completion of the refueling outage. On June 19, 2017, operations personnel synchronized the main generator with the grid and began power ascension. On June 25, 2017, the plant reached 100 percent power where it remained 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 Summer Readiness for Offsite and Alternate AC Power Systems

a. Inspection Scope

On June 23, 2017, the inspectors completed an inspection of the station's off-site and alternate-ac power systems. The inspectors inspected the material condition of these systems, including transformers and other switchyard equipment to verify that plant features and procedures were appropriate for operation and continued availability of off-site and alternate-ac power systems. The inspectors reviewed outstanding work orders and open condition reports for these systems. The inspectors walked down the switchyard to observe the material condition of equipment providing off-site power sources.

The inspectors verified that the licensee's procedures included appropriate measures to monitor and maintain availability and reliability of the off-site and alternate-ac power systems.

These activities constituted one sample of summer readiness of off-site and alternate-ac power systems, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On April 21, 2017, the inspectors completed an inspection of the station's readiness for impending adverse weather conditions. The inspectors reviewed plant design features, the licensee's procedures to respond to high winds, and the licensee's 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 Walk-Down

a. Inspection Scope

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

- April 10, 2017, main steam safety relief valves
- April 14, 2017, main feedwater booster pumps
- June 15, 2017, Division 1 and 2 of the standby liquid control system
- June 15, 2017, reactor core isolation cooling 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

No findings were identified.

.2 Complete Walk-Down

a. Inspection Scope

On May 15, 2017, the inspectors performed a complete system walk-down inspection of the mechanism operated cell (MOC) switch extent of condition. The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, in-process design changes, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

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

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

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 five plant areas important to safety:

- April 28, 2017, reactor building refueling floor
- May 15, 2017, reactor building emergency core cooling system pump rooms
- May 16, 2017, turbine building and heater bay areas
- May 30, 2017, primary containment
- June 7, 2017, main control 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 five 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 May 8, 2017, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis, the inspectors chose one plant area containing risk-significant structures, systems, and components (SSCs) that was susceptible to flooding:

- Motor control centers E-MC-7BA, E-MC-7BB, and E-MC-7B with high energy line break barrier door R410 found open

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

These activities constituted completion of one flood protection measures sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

On May 22, 2017, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors observed performance tests for the heat exchangers and observed the licensee's inspection of the reactor core isolation cooling lube oil heat exchanger and the main condenser, and the material condition of the heat exchanger internals. Additionally, the inspectors walked down each of the heat exchangers to observe its performance and material condition and verified that the heat exchanger was correctly categorized under the Maintenance Rule and was receiving the required maintenance.

These activities constituted completion of two heat sink performance annual review samples, as defined in Inspection Procedure 71111.07.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

.1 Non-destructive Examination Activities and Welding Activities

a. Inspection Scope

The inspectors directly observed the following nondestructive examinations:

SYSTEM	COMPONENT IDENTIFICATION	EXAMINATION TYPE
Low Pressure Core Spray	LPCS-V-34 Body to Bonnet Seal Weld	Penetrant
Main Steam	30 MS 1 A8	Ultrasonic
Main Steam	30 MS 1 A13	Ultrasonic
Reactor Pressure Vessel	N7	Ultrasonic
Main Steam	MS-89 Lugs	Magnetic
Shroud	H-8 Weld 158° to 202°	Visual
Main Steam	MS-202-4 Spring Can Hanger	Visual

The inspectors reviewed records for the following nondestructive examinations:

SYSTEM	COMPONENT IDENTIFICATION	EXAMINATION TYPE
Main Steam	MS-HA-2	Visual
Recirculation	RRC-12	Visual
Residual Heat Removal	RHR-V-50B	Visual
Reactor Feedwater	RFW-164	Visual
Containment Vent	Weld 2-13176	Radiograph

During the review and observation of each examination, the inspectors observed whether activities were performed in accordance with the American Society of Mechanical Engineers (ASME) Code requirements and applicable procedures. The inspectors also reviewed the qualifications of nondestructive examination technicians performing inspections to determine whether they were current.

The inspectors directly observed a portion of the following welding activities:

SYSTEM	WELD IDENTIFICATION	WELD TYPE
Scram Discharge Instrument Volume A	XI-65 2-12196	Gas Tungsten Arc Welding
Scram Discharge Instrument Volume B	XI-65 2-12210	Gas Tungsten Arc Welding

The inspectors reviewed records for the following welding activities:

SYSTEM	WELD IDENTIFICATION	WELD TYPE
Residual Heat Removal	FW-37	Gas Tungsten Arc Welding
Residual Heat Removal	FW-38	Gas Tungsten Arc Welding
Residual Heat Removal	FW-28	Gas Tungsten Arc Welding

SYSTEM	WELD IDENTIFICATION	WELD TYPE
Residual Heat Removal	XI-1	Gas Tungsten Arc Welding
Main Steam	FW-20	Gas Tungsten Arc Welding

The inspectors reviewed whether the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code Section IX requirements. The inspectors also determined that essential variables were identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specifications.

These activities constituted completion of one inservice inspection sample, as defined in Inspection Procedure 71111.08.

b. Findings

No findings were identified.

.2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed 18 condition reports which dealt with inservice inspection activities and found the corrective actions for inservice inspection issues were appropriate. From this review the inspectors concluded that the licensee has an appropriate threshold for entering inservice inspection issues into the corrective action program and has procedures that direct a root cause evaluation when necessary. The licensee also has an effective program for applying industry inservice inspection operating experience. Specific documents reviewed during this inspection are listed in the attachment.

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 April 4, 2017, the inspectors observed simulator training for 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 training activities.

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

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

The inspectors observed the performance of on-shift licensed operators in the plant's main control room. The inspectors observed the operators' performance of the following activities:

- April 17, 2017, post-maintenance testing of circuit breaker E-CB-8/3, 4160 V circuit breaker for electrical bus E-SM-3, after maintenance activities, including the pre-job brief
- June 15, 2017, plant startup following completion of the refueling outage

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

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed two instances of degraded performance or condition of safety-significant SSCs:

- April 28, 2017, main feedwater booster pump A return to service
- May 15, 2017, mechanism operated cell (MOC) switch extent of condition

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

Introduction. The inspectors reviewed a self-revealed, Green, finding for the licensee's failure to follow plant Procedure SWP-CAP-01, "Corrective Action Program," that ensures corrective actions are timely. As a corrective action for failures associated with MOC switches for nonsafety 4160 VAC circuit breakers in 2013 and 2015, the licensee assigned modifications to the MOC switches but failed to implement them in a timely manner. Consequently, on July 20, 2016, circuit breaker E-CB-S/3 MOC switches failed to change state resulting in a loss of a main feedwater pump and an unplanned runback to 70 percent reactor power.

Description. In May 2013, the licensee replaced six nonsafety Westinghouse DHP 4160 VAC, 3000 amp circuit breakers with Westinghouse DHP-VR breakers as part of an equipment obsolescence project. Both models of circuit breakers contain a pantograph-arm that actuates auxiliary contacts, mechanically, when the circuit breaker changes state. The auxiliary contacts, also known as MOC switches, communicate feedback and control signals to other components based upon the circuit breaker opening or closing. Significantly, the DHP-VR model did not provide as much force to the pantograph arm as the obsolete DHP breaker (approximately 75 pounds force versus 200 pounds force). The DHP-VR model provided an acceptable amount of force but without significant margin to the minimum calculated. The licensee replaced the six nonsafety breakers associated with providing normal and startup power to the nonsafety 4160 VAC busses (E-CB-N1/1, E-CB-N1/2, E-CB-N1/3, E-CB-S/1, E-CB-S/2, and E-CB-S/3). A timeline of action requests (AR) and engineering changes (EC) for these circuit breakers, from initial installation in May 2013 through June 2016, is shown below.

Date	AR / EC	Notes
June 9, 2013	AR 287207	Nonsafety circuit breaker E-CB-S/2 closed but the MOC switches did not change state. This was corrected by adjusting the pantograph assembly to achieve required force.
June 13, 2013	AR 287418 EC 9058	Nonsafety circuit breaker E-CB-N1/1 could not reach the desired closing force and was accepted as-is.
September 20, 2013	AR 294219	Licensee staff reviewed AR 287207, identified that there were unused contacts on the MOC switches, and proposed a modification to reduce the required force. Specifically, the modification would consolidate contacts from three separate MOC switches on each breaker to two. By disconnecting the third and the unnecessary MOC switch, the required pantograph force would be reduced and significantly improve the engineering margin to a failure of MOC switches to change state.

Date	AR / EC	Notes
December 3, 2013	AR 298816	Licensee staff changed the frequency of nonsafety DRP-VR circuit breaker MOC switch inspections from 4 years to 2 years. The change was, "to be used as a bridging strategy for any needed actions prior to implementation of a modification to reduce the number of MOC switches per AR 294219."
June 17, 2015	AR 331377	Nonsafety circuit breaker E-CB-S/1 closed but the MOC switches failed to change state. Troubleshooting revealed mechanical binding of the pantograph and that the force required to operate the MOC assembly was in excess of the acceptable range. In the condition evaluation, a corrective action was assigned to, "consolidate the remaining contacts in use on two MOC switches and remove the third MOC switch thus gaining an additional 13 to 18 lbs of margin."
June 18, 2015	AR 331548	Regarding nonsafety circuit breaker E-CB-S/1, licensee staff noted that, "did not make it two years and lost one-third of its margin." Further, the staff commented, "removing an unused MOC switch in each circuit breaker cubicle will increase margin by 12 to 15 lbs."
July 23, 2015	AR 333584	Licensee staff evaluated the nonsafety MOC switch failures and stated that, "the six work orders to reduce MOC switches from three to two are to be worked in conjunction with their respective MOC switch clean and inspect tasks," on a 2-year frequency.
February 29, 2016	AR 345593	Engineering again recommended eliminating the third MOC switch, "for better MOC switch operation and enhance equipment reliability."

On July 20, 2016, the licensee was configuring the electric plant for a planned emergency diesel generator surveillance test and shut E-CB-S/3. Per design, shutting E-CB-S/3 would provide power to nonsafety 4160 VAC bus E-SM-3 via the startup transformer and automatically cause the normal power supply to separate from the bus by opening circuit breaker E-CB-N1/3. Control room operators noted that E-CB-N1/3 failed to automatically open when E-CB-S/3 was shut and the control room staff manually opened E-CB-N1/3. At this time, the major loads of E-SM-3 tripped which includes a condensate pump, COND-P-1C, and a condensate booster pump, COND-P-2C. Based upon a loss of suction pressure, a reactor feedwater pump, RFW-P-1B, then tripped. The loss of a reactor feedwater pump then caused an automatic reactor runback signal to the reactor recirculation pumps. At the end of the transient, the reactor was stable at approximately 70 percent power and within the capability of the remaining reactor feedwater pump to provide makeup water to the core. This failure was documented in Action Request 352504.

Troubleshooting of the transient revealed that circuit breaker E-CB-S/3 closed but the MOC switches failed to change state due to inadequate force. As a result, circuit breaker E-CB-N1/3 did not automatically open since there was no auxiliary contact signal from E-CB-S/3 MOC switches. When operators later opened the circuit breaker E-CB-N1/3, the major loads of bus E-SM-3 did not have a valid signal of power being available from MOC contacts and the loads tripped, causing the feedwater transient.

The inspectors reviewed work orders, corrective action documents, and licensee procedures associated with MOC switches. The inspectors noted that, from June 2015 to July 2016, the licensee had completed the MOC switch modification for circuit breakers E-CB-N1/1, E-CB-N1/3, E-CB-S/1, and E-CB-S/2. The remaining circuit breakers, E-CB-N1/2 and E-CB-S/3, were still in the planning process and were not yet scheduled in the work order process. The inspectors reviewed plant Procedure SWP-CAP-01, "Corrective Action Program," Revisions 27-36, which discuss the goals for timely corrective actions throughout the document:

> *"Ensure actions are written SMART [Specific, Measureable, Attainable, Realistic, Timely] per CDM-01, Cause Determination Manual"*

The inspectors reviewed plant Procedure CDM-01, "Cause Determination Manual," Revisions 14-16, which further define timely corrective actions:

> *"Timely – the due date for the corrective action should allow sufficient time to complete the action but not allow enough time for more significant consequences to occur from a repeat event."*

The inspectors determined the licensee failed to ensure corrective actions were timely as required by plant procedures. Specifically, the licensee was aware of reduced margin for pantograph force and recommended corrective actions to modify the MOC assemblies in June 2013. The modification of MOC assemblies was not assigned as a corrective action until after the licensee experienced a failure of MOC switches due to inadequate pantograph force in June 2015 under AR 331377. Further, the modification for circuit breaker E-CB-S/3 was not complete at the time of its associated MOC switch failure in July 2016. As a result, the licensee experienced a repeated failure of a MOC switch due to inadequate force. The inspectors concluded that, based upon the MOC switch failures in 2013 and 2015, the due date for corrective action allowed enough time for more significant consequences to occur from a repeat event.

As corrective action, the licensee declared the startup transformer inoperable, modified the MOC assembly for circuit breaker E-CB-S/3 to remove one switch, and performed post-maintenance testing. The licensee also initiated AR 352504 to perform an apparent cause review and address long-term corrective actions.

Analysis. The failure to follow plant Procedure SWP-CAP-01, "Corrective Action Program," that ensures corrective actions are timely was a performance deficiency. Specifically, as a corrective action for adverse conditions associated with MOC switches for 4160 VAC circuit breakers, the licensee assigned a modification to the MOC switches for nonsafety related circuit breaker E-CB-S/3 but failed to implement it in a timely manner. Consequently, on July 20, 2016, circuit breaker E-CB-S/3 MOC switches failed to change state resulting in a loss of a main feed pump and an unplanned runback to 70 percent reactor power. The performance deficiency was more than minor because it

affected the equipment performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the loss of major loads on E-SM-3 upset plant stability by causing a loss of feed and reactor runback transient. The inspector performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions." The inspectors determined that the finding was of very low safety significance (Green) because the finding did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Specifically, the licensee remained at power and maintained a diverse availability of feedwater and condensate pumps.

This finding had a cross-cutting aspect in the area of human performance, consistent process, in that the licensee failed to use a systematic approach to make decisions including incorporating risk insights. Specifically, circuit breaker E-CB-S/3 is utilized at least monthly for emergency diesel generator surveillance testing and a failure could render the startup transformer inoperable. The MOC assembly modification, recommended in 2013 and assigned for action in 2015, was not planned or scheduled as a work order at the time of the failure in 2016 [H.13].

Enforcement. This finding does not involve enforcement action because no violation of a regulatory requirement was identified. This issue was entered into the licensee's corrective action program as AR 352504. Because this finding does not involve a violation and is of very low safety significance (Green), it is identified as FIN 05000397/2017002-01, "Mechanism Operated Cell Switch Failure."

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

a. Inspection Scope

The inspectors reviewed five 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:

- April 1, 2017, downpower to 65 percent power at request of BPA
- April 16, 2017, elevation in reactor power to 70 percent power
- April 21, 2017, high risk lift of the main turbine rotor
- May 15, 2017, MOC switch extent of condition
- May 18, 2017, shutdown safety plan for refueling outage protected equipment walkdown

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 May 8, 2017, the inspectors reviewed one risk assessment of an emergent work activity that had the potential to affect the functional capability of mitigating systems when a high energy line break barrier for a motor control center room door R410 was found open at power.

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

These activities constituted completion of six 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 seven operability determinations that the licensee performed for degraded or nonconforming SSCs:

- May 8, 2017, operability determination of motor control center E-MC-7BA, E-MC-7BB, and E-MC-7B with high energy line break barrier door R410 found open under AR 364712
- May 11, 2017, operability determination of high pressure core spray after damper failed closed under AR 365054
- May 15, 2017, operability determination of MOC switch on Division 1 of the emergency diesel generator under AR 363561 and AR 362861
- May 25, 2017, operability determination of reactor core isolation cooling with a piece of the turbine blade missing following maintenance under AR 366167
- June 1, 2017, operability determination of low pressure core spray with voids in the system following maintenance under AR 366333 and AR 366343
- June 1, 2017, operability determination of Division 1 of service water with voids in the system after maintenance under AR 366706
- June 1, 2017, operability determination of high pressure core spray double disc gate valves HPCS-V-1, HPCS-V-4, HPCS-V-12, and HPCS-V-15 with inadequate torque values under AR 366800

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 constituted completion of seven 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 June 5, 2017, the inspectors reviewed a permanent modification to the wetwell when the licensee added a hardened containment vent, EC 13094.

The inspectors reviewed the design and implementation of the modification. The inspectors verified that work activities involved in implementing the modification did not adversely impact operator actions that may be required in response to an emergency or other unplanned event. The inspectors verified that post-modification testing was adequate to establish the operability of the SSC as modified.

These activities constituted completion of one sample of permanent 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 nine post-maintenance testing activities that affected risk-significant SSCs:

- April 3, 2017, residual heat removal system circuit breaker 2B under Work Order 02109221
- April 4, 2017, service water pump A under Work Order 02109226
- April 5, 2017, Division 1 emergency diesel generator circuit breakers, E-CB-DG1/7 and E-CB-7/DG1 under Work Orders 02109229 and 02109228
- April 13, 2017, low pressure core spray pump under Work Order 02109227
- April 13, 2017, residual heat removal system circuit breaker 2A under Work Order 02109223
- April 17, 2017, 4160 VAC circuit breaker E-CB-8/3 under Work Order 02109223
- April 20, 2017, residual heat removal system circuit breaker 2C under Work Order 02109225

- April 25, 2017, 4160 VAC circuit breaker E-CB-8/85/1 under Work Order 02109502

- June 15, 2017, main steam isolation valve 22D pneumatic leak under Work Order 02114395

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

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

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

During the station's refueling outage that concluded on June 19, 2017, the inspectors evaluated the licensee's outage activities. The inspectors verified that the licensee considered risk in developing and implementing the outage plan, appropriately managed personnel fatigue, and developed mitigation strategies for losses of key safety functions. This verification included the following:

- Review of the licensee's outage plan prior to the outage

- Review and verification of the licensee's fatigue management activities

- Monitoring of shut-down and cool-down activities

- Verification that the licensee maintained defense-in-depth during outage activities

- Observation and review of operations with a potential for draining the reactor vessel

- Observation and review of fuel handling activities

- Monitoring of heat-up and startup activities

These activities constituted completion of one refueling outage sample, as defined in Inspection Procedure 71111.20.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

In-service tests:

- June 13, 2017, OSP-HPCS/IST-Q701, “HPCS Operability Test,” Revision 50
- June 17, 2017, OSP-RCIC/IST-Q701, “RCIC Operability Test,” Revision 60

Containment isolation valve surveillance tests:

- May 14, 2017, TSP-MSIV-B801, “Main Steam Isolation Valve Leak Rate Testing,” Revision 10

Reactor coolant system leak detection tests:

- June 26, 2017, drywell unidentified leakage surveillance test and shift and daily instrument checks

Other surveillance tests:

- May 14, 2017, OSP-HPCS/IST-R701, “HPCS Check Valve Operability Refueling Shutdown,” Revision 7
- May 27, 2017, TSP-DG1/LOP-B501, “Standby Diesel Generator DG1 Loss of Power Test,” Revision 19
- May 27, 2017, TSP-DG1/LOCA-B501, “Standby Diesel Generator DG1 LOCA Test,” Revision 28
- May 28, 2017, OSP-UV/DV-B501, “4.16 kV Emergency Bus Undervoltage and Degraded Voltage – Logic System Functional Test (Div 1),” Revision 8
- June 12, 2017, OSP-RCIC/IST-R702, “RCIC Valve Operability Test,” Revision 41

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

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

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

The inspectors evaluated the licensee's performance in assessing the radiological hazards in the workplace associated with licensed activities. The inspectors assessed the licensee's implementation of appropriate radiation monitoring and exposure control measures for both individual and collective exposures. During the inspection, the inspectors interviewed licensee personnel, walked down various areas in the plant, performed independent radiation dose rate measurements, and observed postings and physical controls. The inspectors reviewed licensee performance in the following areas:

- Radiological hazard assessment, including a review of the plant's radiological source terms and associated radiological hazards. The inspectors also reviewed the licensee's radiological survey program to determine whether radiological hazards were properly identified for routine and nonroutine activities and assessed for changes in plant operations.

- Instructions to workers including radiation work permit requirements and restrictions, actions for electronic dosimeter alarms, changing radiological conditions, and radioactive material container labeling.

- Contamination and radioactive material control, including release of potentially contaminated material from the radiologically controlled area, radiological survey performance, radiation instrument sensitivities, material control and release criteria, and control and accountability of sealed radioactive sources.

- Radiological hazards control and work coverage. During walk-downs of the facility and job performance observations, the inspectors evaluated ambient radiological conditions, radiological postings, adequacy of radiological controls, radiation protection job coverage, and contamination controls. The inspectors also evaluated dosimetry selection and placement as well as the use of dosimetry in areas with significant dose rate gradients. The inspectors examined the licensee's controls for items stored in the spent fuel pool and evaluated airborne radioactivity controls and monitoring.

- High radiation area and very high radiation area controls. During plant walk-downs, the inspectors verified the adequacy of posting and physical controls, including areas of the plant with the potential to become risk-significant high radiation areas.

- Radiation worker performance and radiation protection technician proficiency with respect to radiation protection work requirements. The inspectors determined if workers were aware of significant radiological conditions in their workplace, radiation work permit controls/limits in place, and electronic dosimeter dose and dose rate set points. The inspectors observed radiation protection technician job performance, including the performance of radiation surveys.

- Problem identification and resolution for radiological hazard assessment and exposure controls. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constituted completion of the seven required samples of the radiological hazard assessment and exposure control program, as defined in Inspection Procedure 71124.01.

b. Findings

Introduction. The inspectors reviewed a self-revealed, Green, non-cited violation (NCV) of 10 CFR 20.1501 for the licensee's failure to take surveys necessary to establish appropriate controls to support movement of spent filters from the spent fuel pool to a waste liner/shipping cask. As a result, workers received unintended, unplanned collective dose of 1.35 person-rem to retrieve highly radioactive filters from the liner. The licensee entered this issue into the corrective action program as Action Requests 356390 and 358265. An apparent cause evaluation was completed on December 20, 2016.

Description. On October 13, 2016, the licensee began to remove approximately 70 spent filters from the spent fuel pool (SFP) to place in a liner for radioactive waste disposal. This activity marked the end of the 2016 SFP cleanup campaign. During the evolution, a worker's electronic alarming dosimeter (EAD) and several area radiation monitors (ARMs) unexpectedly alarmed when six filters were simultaneously lifted from the SFP and cleared the water surface. The six filters were raised from the SFP as part of a "drip dry" process prior to moving them into a shipping cask and liner. The filters were placed in the liner, despite instructions to have them placed back into the SFP. The SFP cleanup project was then stopped due to the unexpected radiological conditions.

During the radiological event, two radiation protection (RP) technicians measured dose rates 10 times higher at their respective locations than during previous filter moves. One filter was allowed to be transferred to the cask when a plant ARM measured 15 rem/hour. A temporary ARM that alarmed was located 10 to 15 feet from the filter removal area and measured 500 millirem/hour; another temporary ARM 80 feet away measured 100 millirem/hour. Also, the refueling floor ARM-RIS-1 measured over 240 millirem/hour during the event. Finally, one worker's EAD alarmed at 1,100 millirem/hour.

From October 14-31, 2016, the licensee worked to develop a formal recovery plan to reduce dose rates for the filter shipment. Nonetheless, workers received unintended, unplanned collective dose of 1.35 person-rem to recover from this event.

The inspectors determined that the licensee used a vendor procedure for processing each spent filter, Radiation Work Permits (RWPs) 30003788 and 30003790, and Work Order (WO) 02095196 for controlling worker radiation exposure and handling radioactive material. The RWPs contained an ALARA plan, high risk work plan, and instructions work order. The filter removal process involved lifting each filter via rope and crane, and letting the water drain out before placing the filter in the cask according to the RWP and plan. In addition, the vendor procedure, "Load Waste Container on the Refueling Floor

Using In-Air Transfer Method," Revision 0, had several precautions for maintaining strict adherence to radiation measurements and radiological controls.

According to RWP 30003790, the high risk work plan, and SFP cleanup ALARA plan dated September 7, 2016, the RP staff expected the exterior contact reading on the filters to range from 170 mrem/hour to 10 rem/hour. The maximum internal dose rate for the filter internals were expected to be 23.9 to 120 rem/hour on contact. As a radiological control in the ALARA plan, items measuring greater than 800 millirem/hour were to be returned to the SFP for rinsing. The licensee's investigation revealed that RP allowed movement of six filters at one time without adequate radiation surveys and contrary to the RWP high risk work plan that required workers to back out and stop work if the dose rates exceeded 150 percent of expected dose rates. The licensee's investigation determined that the RP surveys were ineffective. In particular, pre-job surveys to determine expected dose rates of the filters being removed did not occur prior to handling and removal from the SFP. The investigation report stated that RP did not accurately monitor and communicate radiological conditions. This inadequacy resulted in RP staff not knowing that filter dose rates measured as high as 4,000 rem/hour. On October 21, 2016, surveys were performed on three filters to verify dose rates. The licensee measured 14,000 rem/hour inside one of the filters.

The inspectors determined that RP had mis-focused its worker radiation safety attentions. The investigation report had several statements that demonstrated that the licensee focused more on whether the loaded cask met shipment and disposal requirements than assessing occupational radiation exposure. Additionally, the licensee relied on September 2015 and May 2016 radioactive waste characterization data to establish radiological controls for the evolution.

Analysis. The licensee's failure to perform surveys necessary to establish appropriate controls to support the movement of the filters from the SFP to the waste liner was a performance deficiency. The performance deficiency was more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of program and process and adversely affected the associated cornerstone objective to ensure adequate protection of worker health and safety from exposure to radiation. Specifically, the inadequate radiation surveys resulted in inadequate controls being implemented causing unplanned and unintended personnel dose.

Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that the finding was of very low safety significance (Green) because it did not involve: (1) ALARA planning and controls; (2) an overexposure; (3) a substantial potential for overexposure; or (4) an impaired ability to assess dose. The finding had a cross-cutting aspect in the area of human performance, associated with work management, because the organization failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the licensee's organization and work processes failed to include the identification and management of radiological risk commensurate with the SFP filter project and the need for strict coordination with different groups or job activities [H.5].

Enforcement. Title 10 CFR 20.1501(a)(2) requires, in part, that each licensee shall make, or cause to be made, surveys that: are reasonable under the circumstances to

evaluate the magnitude and extent of radiation levels and the potential radiological hazards of the radiation levels detected.

Contrary to the above, on October 13, 2016, the licensee failed to make, or cause to be made, surveys that were reasonable under the circumstances to evaluate the magnitude and extent of radiation levels and the potential radiological hazards of the radiation levels detected. Specifically, before and during movement of some 70 spent filters from the SFP to a waste liner/shipping cask for disposal, the licensee failed to make radiation surveys necessary to establish appropriate radiological controls to support the filter movement. Consequently, workers received unintended, unplanned collective dose of 1.35 person-rem in retrieving highly radioactive filters from the waste liner.

Because the violation is of very low safety significance (Green) and the licensee has entered the issue into their corrective action program as ARs 356390 and 358265, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000397/2017002-02, "Failure to Conduct Adequate Surveys of Spent Filters Moved from the Spent Fuel Pool")

2RS2 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

The inspectors assessed licensee performance with respect to maintaining individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors performed this portion of the attachment during the refueling outage, in order to directly observe the licensee's ALARA process activities including planning, implementation of radiological work controls, execution of work activities, and ALARA review of work-in-progress. During the inspection the inspectors interviewed licensee personnel, reviewed licensee documents, and evaluated licensee performance in the following areas:

- Implementation of ALARA and radiological work controls. The inspectors observed pre-job briefings, reviewed planned radiological administrative, operational, and engineering controls, and compared the planned controls to field activities.

- Radiation worker and radiation protection technician performance during work activities performed in radiation areas, airborne radioactivity areas, or high radiation areas.

- Problem identification and resolution for ALARA and radiological work controls. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constituted completion of three of the five required samples of the occupational ALARA planning and controls program, as defined in Inspection Procedure 71124.02, and completes the inspection.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Mitigating System Performance Index: Safety System Functional Failures (MS05)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of June 1, 2016, through June 1, 2017, 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 safety system functional failures performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Occupational Exposure Control Effectiveness (OR01)

a. Inspection Scope

The inspectors verified that there were no unplanned exposures or losses of radiological control over locked high radiation areas and very high radiation areas during the period of January 1, 2016, to March 31, 2017. The inspectors reviewed a sample of radiologically controlled area exit transactions showing exposures greater than 100 millirem. 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 occupational exposure control effectiveness performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Radiological Effluent Technical Specifications (RETS)/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences (PR01)

a. Inspection Scope

The inspectors reviewed corrective action program records for liquid and gaseous effluent releases that occurred between January 1, 2016, and March 31, 2017, and leaks and spills to verify the performance indicator 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 RETS/ODCM radiological effluent occurrences performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

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

b. Findings

No findings were identified.

.2 Semiannual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.1, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of January 2017 through June 2017 although some examples expanded beyond those dates where the scope of the trend warranted.

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

b. Observations and Assessments

On June 2, 2017, the inspectors reviewed the instruments used in abnormal and emergency procedures to make decisions including timelines for implementing action. Procedure OI-45, "Color Banding of Control Room Instrumentation," Revision 7, provides operational limits for control room instrumentation. To verify that the licensee was taking corrective actions to address identified adverse trends that might indicate the existence of a more significant safety issue, the inspectors reviewed related corrective action program ARs.

Instruments were found to be within calibration tolerance. Minor administrative errors were found in Procedure OI-45. Based upon these results, the inspectors determined that the abnormal and emergency procedures referencing instruments would provide the correct actions for a plant event. The inspectors noted that the licensee appropriately considered extent of condition and cause when scheduling corrective action assignments for these ARs. These actions include a global review of all abnormal procedures for additional instruments that may be uncalibrated and relied upon during events.

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

c. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

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

- April 3, 2017, failure of motor control center for the Division 3 emergency diesel generator normal supply fan DMA-FN-32 under AR 360595

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

- April 4, 2017, missed opportunity for high pressure core spray inservice testing on valve HPCS-V-2 under AR 364471

  The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors

verified that the licensee appropriately prioritized the corrective actions and that these actions were adequate to correct the condition.

- June 1, 2017, high pressure core spray Anchor-Darling double disc gate valves HPCS-V-1, HPCS-V-4, HPCS-V-12, and HPCS-V-15 with inadequate torque values under AR 366640

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

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

b. Findings

Introduction. The inspectors reviewed a self-revealed, Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to promptly identify and correct a condition adverse to quality. Specifically, since 2012, the licensee failed to implement prompt corrective actions to correct an adverse condition related to the use of a contactor coil for a motor starter in the high pressure core spray (HPCS) room normal supply fan.

Description. On January 25, 2017, the HPCS room normal supply fan caused a main control room alarm and smoke was reported coming from the HPCS motor control center. An operator at the motor control center immediately opened the electrical disconnect to the HPCS room normal supply fan and the smoke stopped. The HPCS room normal supply fan was declared inoperable, along with HPCS 4160 VAC switchgear, and the HPCS pump. Examination of the damage to the motor control center included an overheated and cracked contactor coil. The licensee replaced the contactor assembly and HPCS was returned to service in approximately 16 hours.

The HPCS room normal supply fan operates continuously and the coil had operated 8.9 years before failure. As a safety-related component, the HPCS room normal supply fan is part of a 480 VAC motor starter that allows its load to start and run. The main contactor opens and closes to provide power to the load. The main contactor is operated by 120 VAC solenoid power from the control power transformer. The magnet assembly in the main contactor contains the coil.

On June 16, 2012, a failure of a different brand of motor control center contactor failed and AR 265422 required a preventative maintenance (PM) replacement of normally energized safety related coils. This review of the 480 VAC system moved the system into Maintenance Rule a(1) status on December 19, 2012. The performance improvement plan developed for the 480 VAC system was to replace the normally energized coils during upcoming PM activities. Work Order 02018345 was created for the HPCS room normal supply fan coil replacement. On January 20, 2014, the normal PM under WO 02018345 using Procedure Preparation Manual (PPM) 10.25.187, "Motor Control Center Starter (Bucket) Maintenance," Revision 24, found no issues with the motor control center and the coil inspection was recorded as satisfactory, though the coil was not replaced. In addition, a Work Task 02018345-06 was written to replace the coil

for Work Request 29103810 that was generated. Without any explanation, the task was closed and therefore, the maintenance rule program owner believed the coil for the HPCS room normal supply fan had been replaced per the PM activities established as a corrective action per AR 265422.

As an immediate corrective action, the licensee replaced the contactor for the HPCS room normal supply fan. The licensee entered this issue into the corrective action program as AR 360595.

Analysis. The failure to correct an adverse condition related to the use of a contactor coil for a motor starter in the HPCS room normal supply fan, though the licensee had an opportunity and plan to do so, was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it affected the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, on January 25, 2017, the HPCS room normal supply fan caused a main control room alarm, and smoke was reported coming from the HPCS motor control center. This failure resulted in the HPCS room normal supply fan to be inoperable, along with HPCS 4160 VAC switchgear, and the HPCS pump. The inspectors 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 (Green) 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 nontechnical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours.

The inspectors determined that this finding did not have a cross-cutting aspect as the decision to not replace the contactor occurred in 2014 and was not reflective of current performance.

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that, "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected." The licensee created WO 02018345 to comply with this requirement to replace a continually energized contactor coil as a corrective action for a previously identified failure in similar equipment. Contrary to the above, the licensee failed to assure conditions adverse to quality were promptly identified and corrected. Specifically, since December 19, 2012, the licensee failed to promptly correct a condition adverse to quality related to the contactor for the HPCS room normal supply fan, to which 10 CFR Part 50, Appendix B, applies. Consequently, following the failure of the HPCS normal supply fan on January 25, 2017, the licensee's failure to implement prompt corrective actions to correct an adverse condition related to the use of a contactor coil for a motor starter in the HPCS room normal supply fan resulted in the HPCS room normal supply fan to be inoperable, along with HPCS 4160 VAC switchgear, and the HPCS pump. As an immediate corrective action, the licensee replaced the contactor for the HPCS room normal supply fan and initiated Action Request 350595. Because this finding was of

very low safety significance (Green) and was entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000397/2017002-03, "Inadequate Corrective Actions Causes Failure of HPCS Room Normal Supply Fan")

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

.1 (Closed) Licensee Event Report (LER) 05000397/2016004-01, "Automatic Scram Due to Off-site Load Reject"

On December 18, 2016, an automatic scram occurred due to a fault on an off-site transmission network. A reactor scram was automatically initiated by the plant response to the transient. The entity responsible for the off-site transmission network, Bonneville Power Administration (BPA), performed a cause evaluation for the loss of off-site power that determined the event was caused by three sequential 500 kV breaker failures. BPA took immediate corrective actions to restore the off-site transmission network. Station personnel performed a root cause evaluation on the station's response to the reactor scram, including failure to trip both the main turbine and main generator, and human performance issues operating the reactor core isolation cooling system. The enforcement aspects of this event are documented in Section 3.4 of NRC Special Inspection Report 05000397/2017008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17096A781). This revision to the LER added language from both the BPA and the station's cause analyses but did not significantly change the NRC's conclusion. This licensee event report is closed.

.2 (Closed) Licensee Event Report (LER) 05000397/2017001-00, "Contactor Coil Failure Results in Tripping of HPCS Diesel Mixed Air Fan"

On January 25, 2017, smoke was detected in the HPCS system diesel room with no indication of a fire. Immediate recovery actions by operations personnel included opening the disconnect for the affected motor starter, at which point the smoke dissipated. Investigation of the condition found the motor starter for the diesel mixed air fan had failed. Prior to the start of the event, the HPCS system had been declared inoperable for planned maintenance in accordance with plant technical specifications. The inspectors documented the summary of the event including the potential safety consequences and corrective actions required to address the issue as well as the enforcement aspect of this event in Section 4OA2.3(b) of this report. This licensee event report is closed.

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

4OA6 Meetings, Including Exit

Exit Meeting Summary

On May 25, 2017, the inspectors presented the inservice inspection and radiation safety inspection results to Mr. B. Sawatzke, Chief Nuclear Officer, and other members of the licensee staff. The licensee acknowledged the issues presented for both inspections. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On July 13, 2017, the inspectors presented the inspection results to Mr. G. Hettel, Vice President, Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance were identified by the licensee and are violations of NRC requirements, which meet the criteria of the NRC Enforcement Policy for being dispositioned as non-cited violations.

- Title 10 CFR 50.55a(g)4, "Inservice Inspection Standards Requirement For Operating Plants," requires, in part, that throughout the service life of a boiling water-cooled nuclear power facility, components that are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements set forth in Section XI of the ASME Code. The ASME Code, Section XI, Article IWA-2610, requires that all welds and components subject to a surface or volumetric examination be included in the licensee's inservice inspection program. This includes identifying each system support that is subject to Section XI requirements. Contrary to the above, prior to March 9, 2017, the licensee did not apply the applicable inservice inspection requirements to all system pressure boundaries within ASME Code Class 1, 2, and 3 boundaries. Specifically, the licensee failed to include the control rod drive housing welds, as well as portions of the residual heat removal and high pressure core spray systems in their inservice inspection program. The licensee entered this issue into their corrective action program as AR 00343761 and reasonably determined the affected components and system remained operable. The licensee restored compliance by entering the components and systems into the ASME Section XI program. The finding was of very low safety significance (Green) because the finding did not represent an actual loss of safety function of a system or train, and did not result in the loss of a single train for greater than technical specification allowed outage time.

- Title 10 CFR 50.55a(g)(5)(i), "ISI Program Update: Applicable ISI Code Editions and Addenda," requires, in part, that the inservice inspection program for a boiling water-cooled nuclear power facility must be revised by the licensee, as necessary, to meet the requirements of paragraph (g)(4) of this section. Paragraph (g)4(ii*), "*Applicable ISI Code: Successive 120-Month Intervals," requires, in part, that inservice examination of components and system pressure tests conducted during successive 120-month inspection intervals must comply with the requirements of the latest edition and addenda of the Code incorporated by reference in paragraph (a) of this section, 12 months before the start of the 120-month inspection interval. Contrary to these requirements, the licensee failed to issue the inspection plan for the fourth 10-year inservice inspection interval in a timely manner. Specifically, the licensee failed to issue the inservice inspection plan until January 27, 2016, even though the third 10-year inservice inspection interval had ended on December 13, 2015. A relief request to allow emergent repairs to be completed under the third 10-year inservice inspection plan was requested by the licensee on December 16, 2015, and was approved by the NRC; however, no repairs needed to be completed. The finding was of very low safety significance (Green) because the finding did not represent an actual loss of safety function of a system or train and did not result in the loss of a single train for greater than technical specification

allowed outage time. This issue was entered into the licensee's corrective action program as AR 00341506.

- On October 13, 2016, several ARMs unexpectedly alarmed when six filters were simultaneously lifted from the SFP to be placed into a radioactive waste liner. The radiation work permit (RWP) governing performance of the job, RWP 3003788, Revision 00, dated September 7, 2016, had the following, "Hold Point," requirements in the event that unexpected radiological conditions occurred during the movement of spent filters:

    - Stop work immediately and notify RP personnel if an unanticipated ARM alarms.

    - If a reading greater than 10 rem/hour contact or 800 millirem/hour at 30 centimeters was detected, but not expected, place the filter back into the SFP.

  The six filters that had been raised from the SFP had radiation levels as high as 14,000 rem/hour on contact and over 300 rem/hour at almost 30 centimeters. However, the filters were placed in the liner rather than back into the SFP, as specified in the RWP and instructed by RP staff during the evolution.

  Technical Specification 5.4.1.a requires, in part, that procedures be written, implemented, and established for those areas recommended in Regulatory Guide 1.33, Appendix A, Revision 2, 1978. Section 7(e) of Appendix A recommends written procedures for RWP systems to control access to radioactive materials and limit personnel exposure. Radiation Work Permit 3003788 stated, in part, in the event of unexpected radiological conditions during movement of spent filters, stop work immediately if an unanticipated area radiation monitor alarms, and if a reading greater than 10 rem/hour contact was detected but not expected, place the filter back into the SFP. Contrary to the above, on October 13, 2016, the licensee failed to stop work immediately when several area radiation monitors unexpectedly alarmed and failed to place the filters back into the SFP when readings greater than 10 rem/hour contact were detected but not expected. Subsequently, 16 workers received an additional 63.5 millirem when the instructions of the RWP and RP staff were not followed.

  The finding was of very low safety significance (Green) because it did not involve: (1) as-low-as-reasonably achievable (ALARA) planning and controls; (2) a radiological overexposure; (3) a substantial potential for an exposure; or (4) a compromised ability to assess the dose. This issue was entered into the licensee's corrective action program as ARs 356390 and 358265.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

A. Black, Manager, Emergency Services
D. Brandon, Design Engineering Manager
S. Brush, ALARA Planner, Radiation Protection
B. Cook, Manager, Training
G. Crawford, Welding Engineer
M. Davis, Manager, Chemistry and Radiological Services
J. Dorwin, Engineer, Code Programs
C. Forrester, Acting Manager, Emergency Preparedness
K. Gillard, Analyst, Chemistry and Radiological Services
D. Gregoire, Manager, Regulatory Affairs
G. Hettel, Vice President, Operations
G. Higgs, Manager, Maintenance
A. Holt, Supervisor, Information Services
M. Hummer, Licensing Engineer
M. Khaudiser, Manager, Chemistry and Radiation Safety
D. Kovacs, Manager, Information Services
N. LaBella, Inservice Inspection, Nondestructive Examiner
C. Moon, Manager, Quality
G. Pierce, Manager, Training
J. Pierce, Manager, Continuous Improvement
R. Prewett, Operations Manager
M. Rice, Design Authority
S. Richter, Inservice Inspection Engineer
R. Sanker, Radiological Support Supervisor, Radiation Protection
B. Sawatzke, Chief Nuclear Officer
B. Schuetz, Plant General Manager
J. Smith, Radiological Operations Supervisor, Radiation Protection
D. Suarez, Regulatory Compliance Engineer
M. Sullivan, Manager, Security Operations
D. Wolfgramm, Compliance Supervisor, Regulatory Affairs

NRC Personnel

R. Deese, Senior Risk Analyst

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000397/2017002-01	FIN	Mechanism Operated Cell Switch Failure (Section 1R12)
05000397/2017002-02	NCV	Failure to Conduct Adequate Surveys of Spent Filters Moved from the Spent Fuel Pool (Section 2RS1)
05000397/2017002-03	NCV	Inadequate Corrective Actions Causes Failure of HPCS Room Normal Supply Fan (Section 4OA2)

Closed

05000397/2016-004-01	LER	Automatic Scram Due to Off-site Load Reject (Section 4OA3)
05000397/2017-001-00	LER	Contactor Coil Failure Results in Tripping of HPCS Diesel Mixed Air Fan (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

Number	Title	Revision
13.1.1	Classifying the Emergency	47
ABN-ELEC GRID	Degraded Off Site Power Grid	7
SOP-HOTWEATHER-OPS	Hot Weather Operations	6
SOP-WARMWEATHER-OPS	Warm Weather Operations	11

Action Requests (ARs)

367981

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
OI-69	Time Critical Operator Actions	7
SOP-CRD-LU	Control Rod Drive System Lineup	0
SOP-ELEC-125V-OPS	125 VDC System Operation	3
SOP-ELEC-250-OPS	250 VDC System Operation	2
SOP-ELEC-4160-OPS	4160 Volt AC Electrical Power Distribution System Operation	12
SOP-SLC-LU	SLC System Valve and Breaker Lineup	0

Procedures

Number	Title	Revision
TSP-DG2/LOCA-B501	Standby Diesel Generator DG2 LOCA Test	26

Action Requests (ARs)

345593	362861	363902	366342	366978
367089				

Section 1R05: Fire Protection

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
PFP-DG-BUILDING	Diesel Generator Building	4
PFP-MN-XFMR-YD-MISC	Main Xfmr Yd Misc Buildings	6
PFP-RB-422	Reactor 422	6
PFP-RB-441	Reactor 441	5
PFP-RB-471	Reactor 471	5
PFP-RB-501	Reactor 501	3

Action Requests (ARs)

366144	366567	366908	367227	367800
367981				

Section 1R06: Flood Protection Measures

Miscellaneous Documents

Number	Title	Revision
E503-7	Auxiliary One Line Diagram	93
E503-8	Auxiliary One Line Diagram	102
EC16477	MCC Room R411 with door R410 open – Barrier Impairment Evaluation	0
M714	RFW, RCIC, HPCS, SW, RWCU, RRC, & TSW Reactor Building El. 522'-0"	39

Procedures

Number	Title	Revision
1.3.57	Barrier Impairment	34
27033	Confined Space	4
ISPM-3	Confined Space Entry	15
PFP-RB-522	Reactor 522	5

Action Requests (ARs)

348263	364712	364716	366623	367760

Section 1R07: Heat Sink Performance

Miscellaneous Documents

Number	Title	Revision
RCIC-HX-2	Inservice Inspection Drawing for WNP-2 Weld and Component Identification Diagram Auxiliary Cooling Supply to RCIC-HX-2	3

Procedures

Number	Title	Revision
8.3.159	Main Condenser Inspection	9
10.19.7	Condenser Tube Cleaning, Inspection, and Plugging	10
HXP-01	Heat Exchanger Program	0
SOP-ENTRY-COND	Condenser Entry During Outages	6

Action Requests (ARs)

366570	366608	366852	366548	365931

Section 1R08: Inservice Inspection Activities

Miscellaneous Documents

Number	Title	Revision/Date
266703	Maintenance Welding Program (MWP) self-assessment	2
320140-04	Assessment of the Inservice Inspection Activities (ISI)	
GO2-15-157	Columbia Generating Station, Docket No. 50-397; Fourth Ten-Year Interval Inservice Inspection (ISI) Program Request 4ISI-02	December 10, 2015
G02-15-180	Columbia Generating Station, Docket No. 50-397; Fourth Ten-Year Interval Inservice Inspection (ISI) Program Relief Request 41SI-06	December 22, 2015
GO2-16-008	Columbia Generating Station, Docket No. 50-397; Fourth Ten-Year Interval Inservice Inspection (ISI) Program Relief Request 4ISI-04	February 4, 2016
G02-16-012	Columbia Generating Station, Docket No. 50-397; Inservice Inspection (ISI) Program Relief Request 4151-05	February 17, 2016
G02-16-027	Columbia Generating Station, Docket No. 50-397; Fourth Ten-Year Interval Inservice Inspection (ISI) Program Relief Request 41SI-06	February 17, 2016
G02-16-034	Columbia Generating Station, Docket No. 50-397; Fourth Ten-Year Interval Inservice Inspection (ISI) Program Relief Request 41SI-06	March 30, 2016
RPV -102	Reactor Pressure Vessel Top & Bottom Head Welds	5

Procedures

Number	Title	Revision
1.3.9	Temporary Modifications	53
8.3.425	Performance Demonstration Initiative Generic Procedures – ISI	5
ASME-P1-GTAW-1	Gas Tungsten Arc Welding (GTAW) of Carbon Steels	4
ASME-P1-GTAW/SMAW-1	Gas Tungsten Arc Welding and Shielded Metal Arc Welding (GTAW/SMAW) of Carbon Steel	5
ASME-P8/P1 - GTAW-1	Gas Tungsten Arc Welding (GTAW) of Austenitic Stainless Steels to Carbon Steels	2

Procedures

Number	Title	Revision
ASME-P8-GTAW-1	GTAW Welding of Austenitic Stainless Steels	3
GEH-UT-300	Procedure For Manual Examination Of Reactor Vessel Assembly Welds In Accordance With PDI	12
GEH-UT-311	Procedure For Manual Ultrasonic Examination Of Nozzle Inner Radius, Bore And Selected Nozzle To Vessel Regions	19
ISPM-3	Confined Space Entry	16
ISPM-9	Fall Protection	19
NDE-SPS-3-1	Liquid Penetrant Examination - Columbia Generating Station – ISI	2
NDE-SPS-3-3	Liquid Penetrant Examination - Columbia Generating Station – ISI	2
NDE-SPS-4-3	Magnetic Particle Examination Columbia Generating Station	2
NDE-SPS-7-3	Visual Examination - Component Supports	2
NDE-SPS-7-4	Visual Examination of Containment	2
NDE-SPS-7-5	Invessel Visual Inspection of the RPV Internals (IVVI)	6
PDI-UT-1	PDI Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds	F
PDI-UT-2	PDI Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds	G
SWP-CM-02	Temporary Configuration Changes	1

Action Requests (ARs)

00341506	00342108	00343175	00343227	00343761
00346587	00347948	00351966	00358196	00329359
00329488	00328829	00329966	00329946	00330022
00322256	00321073	00321432	00321888	

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

Miscellaneous Documents

Number	Title	Revision/Date
LR000069	Plant Shutdown Scenario	April 4, 2017
TDI-08	Licensed Operator Requalification Program	11
TDI-06	Simulator Management	17
TDI-11	Shift Manager Program	3

Procedures

Number	Title	Revision
SOP-MT-Shutdown	Main Turbine Shutdown	11

Section 1R12: Maintenance Effectiveness

Procedures

Number	Title	Revision
1.3.1	Operating Policies, Programs, and Practices	120
1.5.11	Maintenance Rule Program	14
ABN-ELEC-LOOP	Loss of All Off-Site Power	15

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Number	Title	Revision
1.3.76	Integrated Risk Management	44
1.5.14	Risk Assessment and Management for Maintenance/Surveillance Activities	37
ISPM-7	Electrical Safety	14
OI69	Time Critical Operator Actions	7
OI-14	Columbia Generating Station Operational Challenges and Risk Program	13

Section 1R15: Operability Determinations and Functionality Assessments

Miscellaneous Documents

Number	Title	Revision
1.3.66	Operability and Functionality Evaluation	32
OI-9	Operator Standards and Expectations	63
OSP-RPS-Q402	MSIV Closure Scram Functional	15
PER 298-1231	Root Cause Analysis PER 298-1231	2
SW DBD 309	Design Basis Document: Standby Service Water System	17

Action Requests (ARs)

366800	364712	365054	363561	362861
366167	366333	366343	366706	366699
367078	367118	367323	367329	

Section 1R18: Plant Modifications

Procedures

Number	Title	Revision
1.5.13	Preventative Maintenance Optimization Living Program	34

Action Requests (ARs)

341272	361698	363733	366463	366603
366752				

Work Orders (WOs)

02082836

Section 1R19: Post-Maintenance Testing

Miscellaneous Documents

Number	Title	Revision
10.25.13	Westinghouse Medium Voltage Circuit Breakers	33
10.25.13A	4.16 kV Vacuum Breaker Maintenance with Stored Energy	17
10.25.13B	DHP-VR-350 3000 Amp Circuit Breaker Maintenance	02
10.25.141A	Installation of Electrically Operated Grounding Devices	13

Miscellaneous Documents

Number	Title	Revision
10.25.141B	Installation of Manual Grounding Devices	6
CBP-01	Circuit Breaker Program	1
CRLY-01	Critical Relay Program	0
SOP-CRD-HCU	Control Rod Drive System HCU Operations	26
SOP-TST-01	Post Maintenance Testing Program	16

Work Orders (WOs)

02095887

Section 1R20: Refueling and Other Outage Activities

Miscellaneous Documents

Number	Title	Revision/Date
	Control Rod Scram Time Results	June 13, 2017
	Decision Making Matrix: COND-DM-1F Resin Intrusion Event	June 18, 2017
	Fatigue Tracking Record Report 5/13/2017 – 6/19/2017	June 20, 2017
	Operational Decision making Issue Evaluation: Elevated Reactor Chemistry Parameters	2
	Reactivity Control Plan: Cycle 24 BOC Startup	June 14, 2017
884-00	Jet Pump	1
0015762417	C24 Approved Startup Pull Sheet	June 14, 2017
EC16574	Plant Specific Evaluation for SWE-CHE-02	1
M529	Flow Diagram Nuclear Boiler – Main Steam System Reactor Building	106
R23	Outage Shutdown Safety Plan	11
S795	Structural Drawing Reactor Building Containment Vessel Sh. 2	53
S797	Structural Drawing Reactor Building Containment Vessel Sh. 4	18
SD000134	System Description: Condensate	16

Procedures

Number	Title	Revision
1.3.84	Reactivity Management Control	3
3.1.1	Master Startup Checklist	58
3.1.2	Reactor Plant Startup	84
3.2.1	Normal Plant Shutdown	88
3.3.1	Reactor Scram	63
3.4.4	Natural Circulation	5
6.3.5	Full Core Verification	12
9.3.7	Reactor Shutdown and Startup Calculations	2
9.3.6	Estimated Critical Position Calculation	5
9.3.12	Plant Power Maneuvering	34
13.8.1	Emergency Dose Projection System Operations	36
OCC-01	Outage Control Center Norms	5
OI-09	Operations Standards and Expectation	67
OI-51	OPS Outage Preparation	12
OSP-MS-M701	Bypass Valves Test	11
SOP-CFD-BW/PC	Main Condensate Filters Demineralizer Backwash and Precoat	3
SOP-CFD-DRAIN	Main Condensate Filters Demineralizer Drain	2
SOP-CFD-FILL	Main Condensate Filters Demineralizer System Fill	10
SOP-CFD-LU	Main Condensate Filters Demineralizer System Valve Breaker Lineup	2
SOP-CFD-OPS	Main Condensate Filters Demineralizer System Operations	12
SOP-CFD-SHUTDOWN	Main Condensate Filters Demineralizer System Shutdown	4
SOP-ENTRY-WW	Personnel Entry Into Wetwell	9
SOP-FPC-OPS	Fuel Pool Cooling and Cleanup Operations	10
SOP-FPC-ASSIST-ALT	Alternate Fuel Pool Cooling Assist	11
SOP-RHR-SDC	RHR Shutdown Cooling	27
SWP-CHE-02	Chemical Process Management and Control	27

Procedures

Number	Title	Revision
SWP-FFD-04	Work Hour Controls	19
SWP-PUR-04	Material, equipment, Parts and Supplies Procurement	15
OSP-HPCS/IST-Q701	HPCS System Operability Test	50

Action Requests (ARs)

367334	367367	365345	365960	367907
367936	366940	366220	366178	365757
365565	365377	367044		

Work Orders (WOs)

02072441

Section 1R22: Surveillance Testing

Miscellaneous Documents

	Title	Date
	Daily and System Logs	June 25, 2017

Procedures

Number	Title	Revision
OSP-ELEC-M701	Diesel Generator 1 – Monthly Operability Test	55
OSP-ELEC-M702	Diesel Generator 2 – Monthly Operability Test	56
OSP-ELEC-M703	HPCS Diesel Generator Monthly Operability Test	61, 65
OSP-UV/DV-B501	4.16 kV Emergency Bus Undervoltage and Degraded Voltage – LSFT (DIV 1)	8
SOP-FDR-OPS	Floor Drain System Operation	3
SOP-HPCS-CST/SP	HPCS CST and Suppression Pool Operations	14
SOP-HPCS-DRAIN	HPCS Drain	7

Procedures

Number	Title	Revision
SOP-HPCS-FILL	HPCS Fill	12
SOP-HPCS-INJECTION	HPCS RPV Injection	11
SOP-HPCS-LU	HPCS Valve and Breaker Lineup	3
SOP-RCIC-DRAIN	RCIC Drain	4
SOP-RCIC-FILL	RCIC Fill and Vent	16
SOP-RCIC-INJECTION	RCIC RPV Injection	10
SOP-RCIC-LU	RCIC Valve and Breaker Lineup	3
SOP-RCIC-OIL	RCIC Turbine or Pump Oil Fill and Prime	10
SOP-RCIC-SUCTION	RCIC Suction Transfer	1
TSP-DG1/LOCA-B501	Standby Diesel Generator DG1 LOCA Test	28
TSP-DG1/LOP-B501	Standby Diesel Generator DG1 Loss of Power Test	19
TSP-MSIV-B801	Main Steam Isolation Valve Leak Rate Testing	10

Action Requests (ARs)

365226 365236

Work Orders (WOs)

02073080 02104566

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Air Sampling Surveys

Number	Title	Date
17029	Air Sample of LPT-1A Shell During Sandblasting	May 20, 2017
17110	Air Sample of GA During RX Cavity Disassembly	May 23, 2017
17120	Air Sample Inside RX 606 Cavity	May 23, 2017
17147	Air Sample Inside WW for Dive Platform Installation	May 23, 2017

Audits and Self-Assessments

Number	Title	Date
003597-02	Snapshot Self-Assessment Report: Annual Review of Columbia Generating Station Radiation Protection Program	April 20, 2017
357501	Snapshot Self-Assessment Report: Radiological Hazard Assessment	February 13, 2017
357503	Snapshot Self-Assessment Report: PI Verification – Occupational Exposure Control Effectiveness	January 26, 2017
357509	Snapshot Self-Assessment Report: PI Verification – RETS-ODCM Radiological Effluent Occurrences	February 7, 2017

Miscellaneous Documents

Number	Title	Revision/Date
	Wet Well Underwater ISI/Coating Inspection De-sludge High Risk Work Plan	0
	Radioactive Source Inventory	April 19, 2017
	Sources > 1 Ci in TES Source Tracking System	April 19, 2017
	Shiftly Key Inventory Sheet for HRAs, LHRAs, and VHRAs	May 24, 2017
26480	LHRA/VHRA/High Risk Briefing Checklist	11
26871	High Risk Work Plan	11

Procedures

Number	Title	Revision
GEN-RPP-04	Entry Into, Conduct In, and Exit From Radiologically Controlled Areas	31
PPM 1.11.15	Control of Radioactive Material	12
PPM 1.11.23	Radioactive Material Container Control	5
PPM 11.2.7.3	High Radiation Area, Locked High Radiation Area, and Very High Radiation Area Controls	41
PPM 11.2.8.2	Radiation Work Permit Preparation and Use	1
PPM 11.2.13.1	Radiation and Contamination Surveys	38
PPM 11.2.14.2	Receipt Of Radioactive Material	17
PPM 11.2.14.4	Procurement, Receipt, Control and Leak Testing of Radioactive Sources and Devices	24
SWP-RPP-01	Radiation Protection Program	14

Procedures

Number	Title	Revision
	Load Waste Container on the Refueling Floor Using In-Air Transfer Method	0

Radiation Surveys

Number	Title	Date
0405-10	PSF Monthly Routine	April 7, 2017
0428-3	RW 487 Monthly Routine	May 1, 2017
0514-42	RB 471 Wetwell Dive Survey	May 14, 2017
0520-3	471' RB Wetwell Job Coverage	May 22, 2017
0521-35	RW 467 Monthly	May 21, 2017
0522-18	RB 471 Survey of Sludge Filter	May 23, 2017
0523-3	Radiography Boundary Dose Rate Survey	May 23, 2017
0523-5	Receipt of RT Source	May 23, 2017
0523-12	RB 471 Southside HCV Radiography	May 23, 2017
0523-33	Outgoing Shipment to Permafix 17-23	May 23, 2017

Radiation Work Permits

Number	Title	Revision
30003788	2016RX 606 SFPCU Load Dry Cask, LHR **HIGH RISK**	018
30003790	High Risk Work Plan, and SFP Cleanup ALARA Plan	01
30003895	CRDM BOXES – RECEIPT/SHIPMENT OF BOXES *HRA*	00
30003897	CRDM TRANSFER D/W TO RX 501' EQ HATCH *LHRA*	01
30003908	RX/WW DIVE INSPECTION ***LHRA/HIGH RISK***	02
30004069	RX HCV RADIOGRAPY****LHRA** **HIGH RISK**	02

Action Requests (ARs)

356390	357436	358265	364189	364345
365358	365814	365903		

Section 2RS2: Occupational ALARA Planning and Controls

ALARA Planning, In-Progress Reviews, and Post-Job Reviews

Number	Title	Revision/Date
	RWP In-Progress Status Report	May 23, 2017
30001279	ALARA Planning Notes	
30001279	High Risk Plan	0
30003729	ALARA Checklist by RWP	June 6, 2016
30003788	ALARA Post-Job Review	January 12, 2017
30003788	Highly Radioactive Speck Retrieval ALARA Plan	
30003844	ALARA Plan Summary	
30003850	ALARA Planning Notes	
30003907	ALARA Plan Summary	
30003907	ALARA Planning Meeting Held for Use of EDEX	March 28, 2017
30003907	High Risk Plan	0
30003920	ALARA Plan Summary	
30003920	High Risk Plan	0
30003953	ALARA Plan Summary	
30003953	Main Planning Checklist and Comments	

Audits and Self-Assessments

Number	Title	Date
AR-SA 00357504	Snapshot Self-Assessment on Occupational ALARA Planning and Controls	January 26, 2017

Miscellaneous Documents

Number	Title	Date
2015	CGS Refueling Outage CRE Report (RF22)	
AR 340746	CGS CRE/Source Term Reduction – 5 Year Plan	April 2017

Procedures

Number	Title	Revision
GEN-RPP-01	ALARA Program Description	8

Procedures

Number	Title	Revision
GEN-RPP-02	Radiological Planning and Control Process	34
GEN-RPP-13	Senior Site ALARA Committee	13
GEN-RPP-14	Control of Temporary Shielding	13
PPM 11.2.2.7	ALARA Procedure Analysis	12
PPM 11.2.2.8	ALARA Engineering Analysis	7
PPM 11.2.2.11	Exposure Evaluations for Maintaining TEDE ALARA	8
PPM 11.2.2.12	Radiological Risk Assessment and Management	7
PPM 11.2.2.13	Flushing and Shielding Evaluations	2
PPM 11.2.2.14	Radiological Planning and Reviews	3
PPM 11.2.8.2	Radiation Work Permit Preparation and Use	1

Radiation Surveys

Number	Title	Date
6857	ISFSI Pad	April 26, 2016
VSDS_Prod-M-20170124-5	ISFSI Pad	January 24, 2017
VSDS_Prod-M-20170421-3	ISFSI Pad	April 21, 2017
VSDS_Prod-M-20170523-7	RB 501 TIP Mezz RFW, RWCU Valve	May 23, 2017
VSDS_Prod-M-20170524-2	RB 471 South Side	May 23, 2017

Radiation Work Permits

Number	Title	Revision
30001279	R23 WW Packaging TTDF-34 Filter *LHRA* *HIGH RISK* STK	1
30003729	2016 ISFSI Pad – General Access	1
30003788	2016 RX 606 SFPCU Load Dry Cask, LHR **HIGH RISK**	8
30003844	R23 RX 548 RWCU HX RM Work – LHRA – HRISK – STK	0
30003850	R23 RX 522 RWCU Pump Rooms & Mezzanine **LHR**	0

Radiation Work Permits

Number	Title	Revision
30003907	R23 RX 548 RWCU HX RM FAC Exam – LHRA – HRISK – STK - MPACKS	0
30003920	R23 RX 548 RWCU HX Replace RWCU-RV-1&3 *LHRA*HI RISK*STK *MP	0
30003953	R23 RX 522 RWCU Pump Rm / Mezz – LHRA – HRISK - STK	0

Action Requests (ARs)

345668	346506	347086	347543	347830
348218	348241	349808	352677	354106
354503	354655	355189	357149	360058
361244	362440			

Section 4OA1: Performance Indicator Verification

Miscellaneous Documents

Title
MSPI Derivation Reports

Procedures

Number	Title	Revision
1.5.11	Maintenance Rule Program	15
NEI-99-02	Regulatory Assessment Performance Indicator Guidelines	7
PPM 1.5.13	Preventive Maintenance Optimization Living Program	37
SWP-CAP-01	Corrective Action Program	37

Action Requests (ARs)

364189	364345	365358	365814

Section 4OA2: Problem Identification and Resolution

Miscellaneous Documents

Title	Date
Inservice Testing Plan – 4th 10 Year Interval	December 18, 2014

Procedures

Number	Title	Revision
9.3.32	Fuel Integrity Monitoring	12
SWP-CAP-01	Corrective Action Program	33
SWP-CAP-05	Corrective Action Review Board	19
SWP-CAP-06	Condition Report Review	22

Action Requests (ARs)

363471	363510	332078	313504

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

Procedures

Number	Title	Revision
1.3.68	Work Management Process	33
OI-41	Operations Work Control Expectations	60

February 15, 2017

Our inspection dates are subject to change based on your updated schedule of outage activities. If there are any questions about this inspection or the material requested, please contact James Drake at 817-200-1558 or e-mail James.Drake@nrc.gov.

This e-mail 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 31500011. The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

INSERVICE INSPECTION DOCUMENT REQUEST

Inspection Dates: May 22 - 26, 2017

Inspection Procedures: IP 71111.08 "Inservice Inspection (ISI) Activities" Inspectors: Jim Drake

A. Information Requested for the In-Office Preparation Week

The following information should be sent to the Region IV office in hard copy or electronic format (ims.certrec.com preferred), in care of Jim Drake, by April 12, 2017, to facilitate the selection of specific items that will be reviewed during the on-site inspection week. The inspector will select specific items from the information requested below and then request from your staff additional documents needed during the on-site inspection week (Section B of this enclosure). We ask that the specific items selected from the lists be available and ready for review on the first day of inspection. Please provide requested documentation electronically if possible. If requested documents are large and only hard copy formats are available, please inform the inspector(s), and provide subject documentation during the first day of the on-site inspection. If you have any questions regarding this information request, please call the inspector as soon as possible.

Office phone: 817-200-1558, E-mail: James.Drake@nrc.gov

A.1 ISI/Welding Programs and Schedule Information

a) A detailed schedule (including preliminary dates) of:

i) Nondestructive examinations planned for ASME Code class systems and containment, performed as part of your ASME Section XI risk-informed (if applicable) and augmented inservice inspection programs during the upcoming outage.

Provide a status summary of the nondestructive examination

inspection activities vs. the required inspection period percentages for this Interval by category per ASME Section XI IWX-2400 (do not provide separately if other documentation requested contains this information).

ii) Welding activities that are scheduled to be completed during the upcoming outage (ASME Code class structures, systems, or components)

iii) Examinations associated with the Boiling Water Reactor Vessel and Internals Project program (i.e., In-Vessel Visual Inspections)

b) A copy of ASME Section XI Code Relief Requests and associated NRC safety evaluations applicable to the examinations identified above.

c) A list of nondestructive examination reports (ultrasonic, radiography, magnetic particle, dye penetrate, Visual VT-1, VT-2, and VT-3), which have identified relevant conditions on ASME Code Class systems since the beginning of the last refueling outage. This should include the previous Section XI pressure test(s) conducted during start up and any evaluations associated with the results of the pressure tests. The list of nondestructive examination reports should include a brief description of the structures, systems, and components where the relevant condition was identified.

d) A list with a brief description (e.g., system, material, pipe size, weld number, and nondestructive examination performed) of the welds in ASME Code Class systems which have been fabricated due to component repair/replacement activities since the beginning of the last refueling outage, or are planned to be fabricated this refueling outage.

e) If reactor vessel weld examinations required by the ASME Code are scheduled to occur during the upcoming outage, provide a detailed description of the welds to be examined and the extent of the planned examination. Please also provide reference numbers for applicable procedures that will be used to conduct these examinations.

f) A copy of any 10 CFR Part 21 reports applicable to your structures, systems, and components within the scope of Section XI of the ASME Code that have been identified since the beginning of the last refueling outage.

g) A list of any temporary non-code repairs in service (e.g., pinhole leaks)

h) Copies of the most recent self-assessments for the inservice inspection, welding, and Alloy 600 programs

i) Copies of nondestructive examination (including calibration and flaw characterization/sizing procedures) and welding procedures that will be used during the refueling outage.

A.2 Additional Information Related to All Inservice Inspection Activities

a) A list with a brief description of inservice inspection-related issues (e.g., condition reports) entered into your corrective action program since the beginning of the last refueling outage (for the applicable unit). For example, a list based upon data base searches using key words related to piping, such as inservice inspection, ASME Code, Section XI, nondestructive examination, cracks, wear, thinning, leakage, rust, corrosion, or errors in piping/nondestructive examinations.

b) Provide names and phone numbers for the following program leads:

Inservice inspection contacts (examination, planning)
Containment Exams
Snubbers and Supports
Repair and Replacement Program Manager
Licensing Contact
Site Welding Engineer

c) Please make arrangements for fall protection training and scaffolding training if inspector will be required to take site specific training.

B. Information to be provided On-site to the Inspector(s) at the Entrance Meeting May 22, 2017:

B.1 Inservice Inspection / Welding Programs and Schedule Information

a) Updated schedules for inservice inspection/nondestructive examination activities, planned welding activities, and schedule showing contingency repair plans, if available.

b) For ASME Code Class welds selected by the inspector from the lists provided from section A of this enclosure, please provide copies of the following documentation for each subject weld:

i) Weld data sheet (traveler)

ii) Weld configuration and system location

iii) Applicable Code Edition and Addenda for weldment

iv) Applicable Code Edition and Addenda for welding procedures

v) Applicable welding procedure specifications used to fabricate the welds

vi) Copies of procedure qualification records supporting the welding procedure specifications from B.1.b.v.

vii) Copies of mechanical test reports identified in the procedure qualification records above

viii) Copies of the nonconformance reports for the selected welds (if applicable)

ix) Radiographs of the selected welds and access to equipment to allow viewing radiographs (if radiographic was performed)

x) Copies of the preservice examination records for the selected welds

xi) Copies of welder performance qualifications records applicable to the selected welds, including documentation that welder maintained proficiency in the applicable welding processes specified in the welding procedure specifications (at least six months prior to the date of subject work)

xii) Copies of nondestructive examination personnel qualifications (visual test, penetrant test, ultrasonic test, and radiographic test), as applicable

c) For the inservice inspection-related corrective action issues selected by the inspector(s) from Section A of this enclosure, provide a copy of the corrective actions and supporting documentation.

d) For the nondestructive examination reports with relevant conditions on ASME Code class systems selected by the inspector from Section A above, provide a copy of the examination records, examiner qualification records, and associated corrective action documents.

e) A copy of (or ready access to) most current revision of the inservice inspection program manual and plan for the current interval.

f) For the nondestructive examinations selected by the inspector from Section A of this enclosure, provide copy of documentation supporting the procedure qualification (e.g., the Electric Power Research Institute performance demonstration qualification summary sheets). Also, include qualification documentation of the specific equipment to be used (e.g., ultrasonic unit, cables, and transducers including serial numbers) and nondestructive examination personnel qualification records.

g) If site-specific training for fall protection and/or confined space entry is required, please make arrangements for the inspector to attend the training upon arrival at the site to support the nondestructive examination/welding work schedules.

B.2 Codes and Standards

a) Ready access to (i.e., copies provided to the inspector(s) for use during the inspection at the on-site inspection location, or room number and location where available):

i) Applicable editions of the ASME Code (Sections V, IX, and XI) for the inservice inspection program and the repair/replacement program.

ii) Any other applicable Electric Power Research Institute and industry standards referenced in the plant procedures for welding and nondestructive examination activities.

The following items are requested for the
Occupational Radiation Safety Inspection
at Columbia Generating Station
(May 22 – May 26, 2017)
Integrated Report 2017-002

Inspection areas are listed in the attachments below.

Please provide the requested information on or before May 4, 2017.

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 Louis Carson at (817) 200-1221, Louis.Carson@nrc.gov, John O'Donnell at (817) 200-1441, John.O'Donnell@nrc.gov, or Shawn Money at (817) 200-1466, Shawn.Money@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. Radiological Hazard Assessment and Exposure Controls (71124.01) and Performance Indicator Verification (71151)
Date of Last Inspection: **February 29, 2016**

A. List of contacts and telephone numbers for the Radiation Protection Organization Staff and Technicians

B. Applicable organization charts

C. Audits, self-assessments, and LERs written since date of last inspection, related to this inspection area

D. Procedure indexes for the radiation protection procedures

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.

1. Radiation Protection Program Description
2. Radiation Protection Conduct of Operations
3. Personnel Dosimetry Program
4. Posting of Radiological Areas
5. High Radiation Area Controls
6. RCA Access Controls and Radiation Worker Instructions
7. Conduct of Radiological Surveys
8. Radioactive Source Inventory and Control
9. Declared Pregnant Worker Program

F. List of corrective action documents (including corporate and sub-tiered systems) since date of last inspection

a. Initiated by the radiation protection organization
b. Assigned to the radiation protection organization

NOTE: The lists should indicate the <u>significance level</u> of each issue and the <u>search criteria</u> used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.

If not covered above, a summary of corrective action documents since date of last inspection involving unmonitored releases, unplanned releases, or releases in which any dose limit or administrative dose limit was exceeded (for Public Radiation Safety Performance Indicator verification in accordance with IP 71151)

G. List of radiologically significant work activities scheduled to be conducted during the inspection period (If the inspection is scheduled during an outage, please also include a list of work activities greater than 1 rem, scheduled during the outage with the dose estimate for the work activity.)

H. List of active radiation work permits

I. Radioactive source inventory list
a. All radioactive sources that are required to be leak tested

b. All radioactive sources that meet the 10 CFR Part 20, Appendix E, Category 2 and above threshold. Please indicate the radioisotope, initial and current activity (w/assay date), and storage location for each applicable source.

J. The last two leak test results for the radioactive sources inventoried and required to be leak tested. If applicable, specifically provide a list of all radioactive source(s) that have failed its leak test within the last two years

K. A current listing of any non-fuel items stored within your pools, and if available, their appropriate dose rates (Contact / @ 30cm)

L. Computer printout of radiological controlled area entries greater than 100 millirem since the previous inspection to the current inspection entrance date. The printout should include the date of entry, some form of worker identification, the radiation work permit used by the worker, dose accrued by the worker, and the electronic dosimeter dose alarm set-point used during the entry (for Occupational Radiation Safety Performance Indicator verification in accordance with IP 71151).

2. Occupational ALARA Planning and Controls (71124.02)
Date of Last Inspection: **February 29, 2016**

A. List of contacts and telephone numbers for ALARA program personnel

B. Applicable organization charts

C. Copies of audits, self-assessments, and LERs, written since date of last inspection, focusing on ALARA

D. Procedure index for ALARA Program

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.

1. ALARA Program
2. ALARA Committee
3. Radiation Work Permit Preparation

F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address Radiation Work Permit violations, Electronic Dosimeter Alarms, and RWP Dose Estimates

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.

G. List of work activities greater than 1 rem, since date of last inspection, Include original dose estimate and actual dose.

H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)

I. Outline of source term reduction strategy

J. If available, provide a copy of the ALARA outage report for the most recently completed outages for each unit

K. Please provide your most recent Annual ALARA Report.