



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

August 3, 2016

Adam C. Heflin, President and
Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

**SUBJECT: WOLF CREEK GENERATING STATION – NRC INTEGRATED INSPECTION
REPORT 05000482/2016002**

Dear Mr. Heflin:

On June 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Wolf Creek Generating Station. On July 27, 2016, the NRC inspectors discussed the results of this inspection with Cleveland Reasoner, Site Vice President, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. Further, inspectors documented five 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, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Wolf Creek Generating Station.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV and the NRC resident inspector at the Wolf Creek Generating Station.

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

A. Heflin

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Sincerely,

/RA/

Nicholas H. Taylor, Branch Chief
Project Branch B
Division of Reactor Projects

Docket No.: 50-482
License No.: NPF-42

Enclosure:

Inspection Report 05000482/2016002

w/ Attachments:

1. Supplemental Information
2. Request for Information for the Occupational Radiation Safety Inspection

A. Heflin

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Letter to Adam C. Heflin from Nicholas H. Taylor dated August 3, 2016

SUBJECT: WOLF CREEK GENERATING STATION – NRC INTEGRATED INSPECTION
REPORT 05000482/2016002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000482
License: NPF-42
Report: 05000482/2016002
Licensee: Wolf Creek Nuclear Operating Corporation
Facility: Wolf Creek Generating Station
Location: 1550 Oxen Lane NE
Burlington, KS 66839
Dates: April 1 through June 30, 2016
Inspectors: D. Dodson, Senior Resident Inspector
F. Thomas, Resident Inspector
L. Carson II, Senior Health Physicist
J. Drake, Senior Reactor Inspector
N. Greene, PhD, Health Physicist
P. Hernandez, Health Physicist
M. Phalen, Senior Health Physicist
D. Proulx, Senior Project Engineer
W. Sifre, Senior Reactor Inspector
C. Stott, Reactor Inspector
Approved By: Nicholas H. Taylor
Chief, Project Branch B
Division of Reactor Projects

SUMMARY

IR 05000482/2016002; 04/01/2016 – 06/30/2016; Wolf Creek Generating Station; Follow-up of Events and Notices of Enforcement

The inspection activities described in this report were performed between April 1 and June 30, 2016, by the resident inspectors at Wolf Creek Generating Station and inspectors from the NRC's Region IV office. One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. Additionally, NRC inspectors documented in this report five licensee-identified violations of very low safety significance. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green non-cited violation of Technical Specification Limiting Condition for Operation 3.7.11 and 3.0.3 for the licensee's failure to place the unit in mode 3 within 7 hours, mode 4 within 13 hours, and mode 5 within 37 hours with two trains (SGK04A and SGK04B) of the control room air conditioning system (CRACS) inoperable. Specifically, the licensee failed to adequately establish CRACS testing flow rate acceptance criteria, which resulted in train A of the safety-related CRACS being inoperable from October 11, 2005, to August 13, 2013; and train B being inoperable from October 3, 2002, to July 18, 2013. The licensee's immediate corrective actions included corrective maintenance on the CRACS to increase the airflow to meet acceptance criteria limits. Condition Report 105208 was initiated by the licensee for any necessary process changes and extent of condition actions.

This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors utilized Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and Exhibit 2 of Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," and determined this finding was not a deficiency affecting the design or qualification of a mitigating SSC that maintained its operability or functionality, the finding did not represent a loss of system and/or function, the finding did not represent an actual loss of function of at least a single train for greater than its Technical Specification allowed outage time, and the finding did not represent an actual loss of function of one or more non-Technical Specification trains of equipment designated as high safety-significant. Therefore, the inspectors determined the finding was of very low safety significance (Green). The finding has a cross-cutting aspect in the area of human performance, change management, because leaders did not use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, there is not currently a formal process for procedure writers to consider measurement uncertainty when establishing and changing testing acceptance criteria, which resulted in extended

inoperability of both the SGK04A and SGK04B units following significant changes to Technical Specifications that included adding surveillance requirements for the SGK04A and SGK04B units in 1999. This issue is indicative of current performance because the same issue would be expected to occur today [H.3]. (Section 4OA3)

Licensee-Identified Violations

Five violations of very low safety significance 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

Wolf Creek Generating Station operated at or near full power for the entire inspection period.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On April 26, 2016, 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 severe thunderstorms and tornado watches, and the licensee's planned implementation of these procedures. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant.

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

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

Partial Walk-Down

a. Inspection Scope

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

- April 28, 2016, control room air conditioning unit B
- May 18, 2016, component cooling water pump B
- May 25, 2016, emergency diesel generator B
- June 7, 2016, component cooling water pump D

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.

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

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

- May 25, 2016, fire area F-1, general floor area, elevation 2047 feet
- May 31, 2016, fire area A-15, auxiliary feedwater pump room C, elevation 2000 feet
- June 17, 2016, fire area A-27, motor generator set room, elevation 2026 feet
- June 29, 2016, fire area ESW-1, essential service water pump house A train, elevation 2000 feet

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

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

b. Findings

No findings were identified.

.2 Annual Inspection

a. Inspection Scope

On June 24, 2015, the inspectors completed their annual evaluation of the licensee's fire brigade performance. This evaluation included observation of an unannounced fire drill for a fire in the north end of the auxiliary building, elevation 1974 feet (A-1), on June 24, 2016.

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

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

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

.1 Annual Review

a. Inspection Scope

On April 5, 2016, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors observed the licensee's inspection of the SGK04B control room air-conditioning unit heat exchanger and the material condition of the heat exchanger internals. Additionally, the inspectors walked down the SGK04B heat exchanger to observe its performance and material condition and verified that the SGK04B heat exchanger was correctly categorized under the Maintenance Rule and was receiving the required maintenance.

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

b. Findings

No findings were identified.

.2 Triennial Review

a. Inspection Scope

On May 23, 2016, through May 26, 2016, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors reviewed licensee programs to verify heat exchanger performance and operability for the following heat exchangers:

- Component cooling water heat exchanger A
- Containment air cooler A
- Air compressor and aftercooler B
- Fuel pool cooling pump room cooler B
- Class 1E switchgear cooler A

The inspectors verified whether testing, inspection, maintenance, and chemistry control programs are adequate to ensure proper heat transfer. The inspectors verified that the periodic testing and monitoring methods, as outlined in commitments to NRC Generic Letter 89-13, utilized proper industry heat exchanger guidance. Additionally, the inspectors verified that the licensee's chemistry program ensured that biological fouling was properly controlled between tests. The inspectors reviewed previous maintenance

records of the heat exchangers to verify that the licensee's heat exchanger inspections adequately addressed structural integrity and cleanliness of their tubes.

These activities constitute completion of five triennial heat sink inspection samples as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

a. Inspection Scope

This inspection was focused on closing an Unresolved Item (URI) opened during the performance of Inspection Procedure 71111.08, "Inservice Inspection Activities," documented in NRC Inspection Report 05000482/2015001. The inspectors reviewed additional licensing basis information provided by the licensee, as well as industry standards and regulatory guidance. Information in Section 4OA5 of this report documents the resolution of this URI.

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 May 16, 2014, the inspectors observed an evaluated simulator scenario performed by an operating crew. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed the modeling and performance of the simulator during the requalification activities.

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

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

On June 1, 2016, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened risk due to the ongoing performance of STS IC-508A, "Refueling

Water Storage Tank Level Transmitter Calibration,” Revision 6; during two previous performances of the same procedure on May 19 and 26, 2016, the station received a reactor partial trip alarm concurrent with a low steam line pressure bistable trip.

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)

a. Inspection Scope

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

- March 10, 2016, SKG04A and SGK04B control room air conditioning units, refrigerant leaks

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 one maintenance effectiveness sample, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- April 28, 2106, planned maintenance on control room air conditioning unit A
- May 25, 2016, planned maintenance outages for emergency diesel generator A and essential service water system A

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 results of the assessments.

The inspectors also observed portions of two emergent work activities that had the potential to cause an initiating event and to affect the functional capability of mitigating systems:

- April 12, 2016, repair of Benton 345 kilovolt offsite power line support structure
- May 23, 2016, maintenance on emergency diesel generator A channel 1 undervoltage bistable power supply

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 four 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 three operability determinations and functionality assessments that the licensee performed for degraded or nonconforming SSCs:

- April 25, 2016, operability determination of essential service water pump discharge check valves and cross-connect check valves
- May 5, 2016, operability determination of essential service water pump B discharge check valve
- June 7, 2016, functionality determination of diesel fire pump

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

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

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- April 6, 2016, SGK04B control room air conditioning unit
- April 21, 2016, shutdown rod bank E demand counter
- May 3, 2016, emergency diesel generator B emergency fuel oil storage tank level indicator replacement
- May 19, 2016, steam line low pressure bistable card replacement
- May 31, 2016, turbine driven auxiliary feedwater pump test

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 five post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed six 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:

- May 5, 2016, STS EF-100B, “[Essential Service Water] System Inservice Pump B & [Essential Service Water] B Check Valve Test,” Revision 47
- June 1, 2016, STS AL-201C, “Turbine Driven Auxiliary Feedwater System Inservice Valve Test,” Revision 9

Containment isolation valve surveillance tests:

- April 11, 2016, STS BM-205, "[Steam Generator Blowdown] System Inservice Valve Test," Revision 13

Reactor coolant system leak detection tests:

- May 4, 2016, STS BB-006, "[Reactor Coolant System] Water Inventory Balance Using the NPIS Computer," Revision 14

Other surveillance tests:

- April 7, 2016, STS GG-001B, "Emergency Exhaust Filtration System Train B Operability Test," Revision 23
- May 12, 2016, STS IC-255B, "Channel Operational Test Control Room Air Intake Radiation Monitor," Revision 16A

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 six 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

2RS5 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

The inspectors evaluated the accuracy and operability of the radiation monitoring equipment used by the licensee to monitor areas, materials, and workers to ensure a radiologically safe work environment. This evaluation included equipment used to monitor radiological conditions related to normal plant operations, anticipated operational occurrences, and conditions resulting from postulated accidents. The inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance associated with radiation monitoring instrumentation, as described below:

- The inspectors performed walk downs and observations of selected plant radiation monitoring equipment and instrumentation, including portable survey instruments, area radiation monitors, continuous air monitors, personnel contamination monitors, portal monitors, and small article monitors. The

inspectors assessed material condition and operability, evaluated positioning of instruments relative to the radiation sources or areas they were intended to monitor, and verified performance of source checks and calibrations.

- The inspectors evaluated the calibration and testing program, including laboratory instrumentation, whole body counters, post-accident monitoring instrumentation, portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, electronic dosimetry, air samplers, and continuous air monitors.
- The inspectors assessed problem identification and resolution for radiation monitoring instrumentation. 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 three required samples of radiation monitoring instrumentation, as defined in Inspection Procedure 71124.05.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

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

- During walk downs and observations of selected portions of the radioactive gaseous and liquid effluent equipment, the inspectors evaluated routine processing and discharge of effluents, including sample collection and analysis. The inspectors observed equipment configuration and flow paths of selected gaseous and liquid discharge system components, effluent monitoring systems, filtered ventilation system material condition, and significant changes to effluent release points.
- Calibration and testing program for process and effluent monitors, including National Institute of Standards and Technology (NIST) traceability of sources, primary and secondary calibration data, channel calibrations, set-point determination bases, and surveillance test results.

- Sampling and analysis controls used to ensure representative sampling and appropriate compensatory sampling. Reviews included results of the inter-laboratory comparison program.
- Instrumentation and equipment, including effluent flow measuring instruments, air cleaning systems, and post-accident effluent monitoring instruments.
- Dose calculations for effluent releases. The inspectors reviewed a selection of radioactive liquid and gaseous waste discharge permits and abnormal gaseous or liquid tank discharges, and verified the projected doses were accurate. The inspectors also reviewed 10 CFR Part 61 analyses and methods used to determine which isotopes were included in the source term. The inspectors reviewed land use census results, offsite dose calculation manual changes, and significant changes in reported dose values from previous years.
- Problem identification and resolution for radioactive gaseous and liquid effluent treatment. 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 six required samples of radioactive gaseous and liquid effluent treatment program, as defined in Inspection Procedure 71124.06.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

a. Inspection Scope

The inspectors evaluated whether the licensee's radiological environmental monitoring program quantified the impact of radioactive effluent releases to the environment and sufficiently validated the integrity of the radioactive gaseous and liquid effluent release program. The inspectors also verified that the licensee continued to implement the voluntary Nuclear Energy Institute/Industry Ground Water Protection Initiative. The inspectors reviewed or observed the following items:

- The inspectors observed selected air sampling and dosimeter monitoring stations, sampler station modifications, and the collection and preparation of environmental samples. The inspectors reviewed calibration and maintenance records for selected air samplers, composite water samplers, and environmental sample radiation measurement instrumentation, and inter-laboratory comparison program results. The inspectors reviewed selected events documented in the annual environmental monitoring report and significant changes made by the licensee to the offsite dose calculation manual as the result of changes to the land census. The inspectors evaluated the operability, calibration, and maintenance of meteorological instruments and assessed the meteorological

dispersion and deposition factors. The inspectors verified the licensee had implemented a sampling and monitoring program sufficient to detect leakage from SSCs with credible mechanism for licensed material to reach ground water and reviewed changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater.

- Groundwater protection initiative implementation, including assessment of groundwater monitoring results, identified leakage or spill events and entries made into 10 CFR 50.75(g) records, licensee evaluations of the extent of the contamination and the radiological source term, and reports of events associated with spills, leaks, and groundwater monitoring results.
- Problem identification and resolution for the radiological environmental monitoring program. 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 three required samples of radiological environmental monitoring program, as defined in Inspection Procedure 71124.07.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- Radioactive material storage waste storage areas including container labeling/marketing and monitoring containers for deformation or signs of waste decomposition.
- Radioactive waste system walk-down including radioactive waste processing and handling equipment. Review of waste processing equipment that is not operational or abandoned in place equipment consistent with system descriptions and the process control program.
- Waste characterization and classification including radio-chemical sample analysis results for radioactive waste streams and use of scaling factors and calculations to account for difficult-to-measure radionuclides, processes for waste classification including use of scaling factors and 10 CFR Part 61 analysis.
- Shipment preparation packaging, surveying, labeling, marking, placarding, vehicle checking, driver instructing, and preparation of the disposal manifests.

- Shipping records including for LSAI, II, III; SCOI, II: Type A or Type B records.
- Problem identification and resolution for radioactive solid waste processing and radioactive material handling, storage, and transportation. 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 six required samples of radioactive solid waste processing and radioactive material handling, storage, and transportation program, as defined in Inspection Procedure 71124.08.

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

40A1 Performance Indicator Verification (71151)

.1 Reactor Coolant System Specific Activity (BI01)

a. Inspection Scope

The inspectors reviewed the licensee's reactor coolant system chemistry sample analyses for the period of April 1, 2015, through March 31, 2016, to verify the accuracy and completeness of the reported data. The inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample on June 13, 2016. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

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

b. Findings

No findings were identified.

.2 Reactor Coolant System Identified Leakage (BI02)

a. Inspection Scope

The inspectors reviewed the licensee's records of reactor coolant system identified leakage for the period of April 1, 2015, through March 31, 2016, to verify the accuracy and completeness of the reported data. The inspectors observed the performance of STS BB-006, "RCS Water Inventory Balance Using the NPSI Computer," Revision 14, on June 24, 2016. The inspectors used definitions and guidance contained in Nuclear

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

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

b. Findings

No findings were identified.

40A2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

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

b. Findings

No findings were identified.

.2 Semiannual Trend Review

a. Inspection Scope

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

- Procedure use and adherence
- Operability evaluations

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

b. Observations and Assessments

The inspectors evaluated a sample of issues and events that occurred over the course of the past two quarters to determine whether issues were appropriately considered as emerging or adverse trends. The inspectors verified that these issues were addressed

within the scope of the corrective action program or through department review and documentation in the quarterly trend presentation for overall assessment.

The inspectors identified issues associated with implementation of Procedure AP 15C-002, "Procedure Use and Adherence:"

- The inspectors identified six separate issues associated with implementation of Procedure AP 15C-002, "Procedure Use and Adherence," Revision 41, during one test. Section 6.1.2, for continuous use procedures, states, "Review and placekeep each step after completion to ensure the step was performed correctly," and "Each step of a continuous use procedure shall be completed or properly N/A'd before proceeding to the next step." On May 5, 2016, the inspectors observed activities associated with completion of Procedure STS EF-100B, "[Essential Service Water] System Inservice Pump B & [Essential Service Water] B Check Valve Test," Revision 47, and noted six separate issues associated with the licensee reviewing and placekeeping each step after completion to ensure the step was performed correctly, and the licensee ensuring each step of the continuous use procedure was completed or properly "N/A'd" before proceeding to the next step. Specifically, Step 8.2.3.3 was inappropriately marked as "N/A;" Steps 8.2.23.3 and 8.2.23.4 were not performed correctly due to transposition and recording errors; Step 8.2.24.1 utilized an incorrect pressure value; and Step 8.1.17 data was recorded with a unit error. None of these six separate issues were identified by the implementing operations crew or during the operations crew review of the procedure. These issues were entered into the corrective action program as Condition Report 104532.
- The inspectors identified that Procedure AP 15C-002, "Procedure Use and Adherence," Revision 41, Section 6.1.2, for continuous use procedures, states, "Perform the step as written in the sequence specified, except when the procedure or approved process specifically allows deviation." On June 1, 2016, the inspectors observed activities associated with completion of Procedure STS IC-508A, "Refueling Water Storage Tank Level Transmitter Calibration," Revision 6, and noted that steps were not performed as written in the sequence specified, and the approved process did not specifically allow deviation. Specifically, personnel did not recognize the need to document supervisor approval to re-perform an as-found data collection step. This issue was entered into the corrective action program as Condition Report 105566.

The inspectors discussed the issues associated with following Procedure AP 15C-002, "Procedure Use and Adherence," at the exit meeting on July 27, 2016. The licensee documented Condition Report 106079 in response to the inspectors' observations.

The inspectors noted that NRC Inspection Report 05000482/2015004 documented an apparent increase in the number of operability evaluation issues. The inspectors observed apparent station improvement in this area as a result of actions associated with Condition Report 96033, increased control room oversight, and periodic operability determination training. Although operability process implementation improvement was recognized by the inspectors, the inspectors noted some continuing NRC-identified issues. Specifically, these included:

- The inspectors identified that Procedure AP 26C-004, “Determination and Functionality Assessment,” Revision 32, states that operability determinations should include “whether there is a reasonable expectation of operability, including the basis for the determination and any compensatory measures put in place to establish or restore operability.” This procedure was not adequately implemented on two occasions in response to Condition Reports 104268 and 104066. Neither Condition Report 104268 nor Condition Report 104066 adequately addressed operability concerns associated with the emergency diesel generator fuel oil transfer pump control circuitry’s potential to activate the thermal overloads that would stop the pump and render the emergency diesel generator inoperable; NCV 05000482/2016007-02, “Failure to Verify the Adequacy of Design of the Control Circuitry of the Fuel Oil Transfer Pumps,” documents additional details concerning the technical issue. Specifically, the immediate operability screening for both conditions reports was determined to be, “N/A,” and failed to evaluate the issue for immediate operability. Although an immediate operability determination was not immediately completed, the licensee revised its operability screening, completed an immediate operability determination, and adequately justified operability. This issue was entered into the corrective action program as Condition Report 104322.
- The licensee identified that the operability determination associated with Condition Report 104910 was inadequately completed. Specifically, a negative trend in B component cooling water pump outboard bearing oil leakage rate was identified, and the operability determination did not quantify the leakage rate and compare that to the mission time specified in AP 26C-004, “Operability Screening,” Revision 32. After additional information from engineering was received and quantification of the oil leakage rate was completed, the operability determination was changed to “Inoperable.” A licensee identified violation documented in Section 4OA7 of this report discusses this issue.
- The inspectors identified that operability evaluations were not always completed in a timely manner while additional information was being gathered to justify operability. Specifically, completion of operability evaluations associated with the 2016 Component Design Basis team inspection and issues associated with resident inspector activities were sometimes delayed to prevent burdening Operations with unanswered questions during operability screenings. Also, operability determinations for issues associated with resident inspector activities and questions were apparently delayed while additional analyses were performed to justify operability. Specifically, following inspector questions that identified issues associated with a penetration into a safety related area, an operability determination and condition report appeared to be delayed to facilitate completion of analysis that could be used to justify operability. Condition Report 105307 documented the inspectors’ concerns.

The inspectors discussed the continuing operability process issues at the exit meeting on July 27, 2016. The licensee documented Condition Report 106062 to address continuing operability process issues.

c. Findings

No findings were identified.

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

- .1 (Closed) Licensee Event Report (LER) 05000482/2014-001-00: Failure to Comply with Required Action of Technical Specification 3.4.3 while Performing a Vacuum Fill of the Reactor Coolant System

During a review of outside operating experience on January 6, 2014, the licensee determined that the reactor coolant system pressure was placed in a vacuum condition, in violation of Technical Specification 3.4.3, which specifies a minimum operating pressure of 0 psig. Wolf Creek operators drew a vacuum on the reactor coolant system to support reactor coolant system filling operations on May 8, 2011, and March 30, 2013, using Procedure SYS BB-112, "Vacuum Fill of the RCS" (to approximately 20 inches of Hg, absolute pressure). Technical Specification 3.4.3, "[Reactor Coolant System] Pressure and Temperature Limits," requires, in part, that the licensee maintain the reactor coolant system pressure, temperature, and heatup and cooldown rates to the limits specified in the Pressure and Temperature Limits Report (PTLR) at all times. The limits of the curves in the PTLR specify a minimum pressure of 0 psig. Required Action C.1 of Technical Specification 3.4.3 specifies that with the reactor coolant system parameters outside of the limits of the PTLR, restore the parameters to within the limits immediately. Because the plant was outside of the PTLR limits with respect to pressure and not restored immediately, the plant was in a condition prohibited by the Technical Specifications, which is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

The licensee placed this issue in the corrective action program as Condition Report 78920. For immediate corrective actions, the licensee cancelled the procedure that implemented vacuum fill of the reactor coolant system. The inspectors determined that this constituted a licensee-identified violation, and the enforcement aspects of this violation are discussed in Section 4OA7 of this inspection report.

This licensee event report is closed.

- .2 (Closed) LER 05000482/2014-004-00: Condition Prohibited by Technical Specifications due to an Instrument Tunnel Sump Level Indication Transmitter Incompatible with the Containment Environment

On June 2, 2014, the licensee determined that the instrument tunnel sump level indication was inoperable from the period of July 13, 2013, to November 20, 2013, due to erratic and unreliable indication. Therefore, the required actions of Technical Specification 3.4.15 "[Reactor Coolant System] Leakage Detection Instrumentation," were not met. Because the licensee did not take the required actions of Technical Specification 3.4.15, the plant was in a condition prohibited by the Technical Specifications, which is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B). The licensee's root cause analysis determined that the local transmitter was not qualified for the long term exposure of the radiation levels encountered in containment, resulting in the erratic indication.

The licensee placed this issue in the corrective action program as Condition Report 84690. For immediate corrective actions, the licensee instituted compensatory measures for alternate means of identifying reactor coolant system leakage. In April 2015, the licensee replaced the instrument tunnel sump transmitter with two newly designed and fully qualified transmitters, and tested them satisfactorily. The inspectors

reviewed the licensee's corrective action documents and determined the actions had been completed. The inspectors determined that this constituted a licensee-identified violation, and the enforcement aspects of this violation are discussed in Section 4OA7 of this inspection report.

This licensee event report is closed.

.3 (Closed) LER 05000482/2015-002-00: Two Control Room Air Conditioning Trains Inoperable Due to Failure to Meet Surveillance Requirement, and LER 05000482/2015-002-01: Two Control Room Air Conditioning Trains Inoperable Due to Failure to Meet Surveillance Requirement

a. Inspection Scope

On April 16, 2015, an apparent cause evaluation associated with Condition Report 92274, "Application of SR 3.0.1," identified the potential that the acceptance criteria in Procedures STS PE-010A, "Control Room A/C System Flow Rate Verification A Train," and STS PE-010B, "Control Room A/C System Flow Rate Verification B Train," may not have been met when the acceptance criteria was revised on January 3, 2013. The acceptance criteria was revised from greater than 18,360 cubic feet per minute (CFM) and less than 22,440 CFM to a new value of greater than 21,012 CFM, which incorporated instrument uncertainty based on vendor information. The licensee determined that the prior performances of STS PE-010A and STS PE-010B did not meet the new acceptance criteria. Additionally, Procedure STS PE-010B was not performed successfully until July 18, 2013, and Procedure STS PE-010A was not performed successfully until August 13, 2013.

The licensee determined that the apparent cause of this event was information in operability evaluation OE-GK-017 that addressed a separate issue on the same equipment, and enabled control room operators and engineering personnel to rationalize the assumption that the change to the acceptance criteria was bounded and did not impact the ability to meet surveillance requirement SR 3.7.11.1.

The licensee's immediate corrective actions included performing corrective maintenance on both control room air conditioning system (CRACS) trains to increase the airflow to meet the procedure acceptance criteria, and subsequent performances of Procedures STS PE-010A and STS PE-010B were successful. An adjustable sheave was installed in the B CRACS train in July 2013 and in the A CRACS train in March 2015. Furthermore, procedure AP 15C-004, "Preparation, Review and Approval of Procedures, Instructions and Forms," is being revised to require operations surveillance coordinator review of technical specification surveillance requirement procedures that result in a change in acceptance criteria.

The licensee event report is closed.

b. Findings

Failure to Adequately Establish Control Room Air Conditioning System Testing Flow Rate Acceptance Criteria

Introduction. The inspectors identified a Green non-cited violation (NCV) of Technical Specification Limiting Condition for Operation (LCO) 3.7.11 and 3.0.3 for the licensee's failure to place the unit in mode 3 within 7 hours, mode 4 within 13 hours, and mode 5 within 37 hours with two trains (SGK04A and SGK04B) of the CRACS inoperable. Specifically, the licensee failed to adequately establish CRACS testing flow rate acceptance criteria, which resulted in train A of the safety-related CRACS being inoperable from October 11, 2005, to August 13, 2013; and train B being inoperable from October 3, 2002, to July 18, 2013.

Description. Technical Specification LCO 3.7.11, "Control Room Air Conditioning System (CRACS)", states, "Two CRACS trains shall be operable," in modes 1, 2, 3, 4, 5, and 6, and during movement of irradiated fuel assemblies. Technical Specification 3.7.11, Condition B, requires the reactor to be in mode 3 within 6 hours if one train of the CRACS has been inoperable for 30 days. Condition E, requires immediate entry into Technical Specification 3.0.3, if two CRACS trains are inoperable in modes 1, 2, 3, or 4. Technical Specification 3.0.3, requires, in part, that when an LCO is not met and the associated actions are not met, the unit shall be placed in a mode or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable, in mode 3 within 7 hours, mode 4 within 13 hours, and mode 5 within 37 hours.

On December 18, 1999, Wolf Creek Nuclear Operating Corporation implemented license amendment number 123 that converted the Technical Specifications to the improved Technical Specifications. The amendment included new specification 3.7.11, "Control Room Air Conditioning System (CRACS)," and the new surveillance requirement SR 3.7.11.1. SR 3.7.11.1 verifies that the heat removal capabilities of CRACS units SGK04A and SGK04B are adequate to remove the heat load assumed in the control room during design basis accidents. This surveillance requirement consists of verifying the heat removal capability of the condenser heat exchanger, ensuring the proper operation of major components in the refrigeration cycle, verification of unit air flow capacity, and water flow measurement. Station Procedures STS PE-010A, "Control Room A/C System Flow Rate Verification A Train," and STS PE-010B, "Control Room A/C System Flow Rate Verification B Train," were initially issued on December 18, 1999. For verification of unit air flow capacity, acceptance criteria of greater than 20,400 CFM were specified.

On March 11, 2002, the acceptance criteria associated with unit air flow capacity were inappropriately revised to greater than 18,360 CFM and less than 22,440 CFM based on information in ASME/ANSI N510-1980, "Testing of Nuclear Air-Cleaning Systems." NRC finding 05000482/2012004-03, "Safety-Related Fan Flow Rate Acceptance Criteria Reduced Below Design Basis Limit," which was documented in Inspection Report 05000482/2012004 (ADAMS Accession #: ML12314A296), discusses how ASME/ANSI N510-1980 was incorrectly applied to the testing of the Class IE electrical equipment air-conditioning system.

The acceptance criteria of Procedures STS PE-010A and STS PE-010B remained the same until January 3, 2013, when the acceptance criteria were revised to greater than 21,012 CFM to correct the previously inadequate acceptance criteria of greater than 18,360 CFM and less than 22,440 CFM. Subsequently, on November 6, 2013, Calculation GK-M-001, "Cooling and Heating Load Calculation for Control Room [Heating Ventilation and Air Conditioning] System Capabilities During Normal Plant Operation and Accident Conditions – (SGK04A/B)," Revision 3, was issued and revised the minimum required accident air flow to 20,480 CFM. Accounting for 3 percent instrument uncertainty in accordance with vendor documentation, the minimum required accident air flow during testing would have been 21,094 CFM following the November 6, 2013, calculation revision. On April 14, 2015, Calculation WCN-15-CA-CBV-001, "Impact of ESW Pipe Chase on Control Building [Heating, Ventilation, and Air Conditioning]," Revision 2, was completed and required the design flow be revised to greater than 20,520 CFM. The testing acceptance criteria of STS PE-010A and STS PE-010B were revised to account for 3 percent instrument uncertainty and to add margin, and were revised to 21,250 CFM (without the additional margin, the minimum required accident air flow plus 3 percent for instrument uncertainty is 21,136 CFM). 21,250 CFM is the current STS PE-010A and STS PE-010B unit air flow acceptance criteria for the SGK04A and SGK04B units.

On April 16, 2015, a Wolf Creek apparent cause evaluation associated with Condition Report 92274, "Application of SR 3.0.1," identified the potential that the acceptance criteria in Procedures STS PE-010A and STS PE-010B may not have been met when the acceptance criteria were revised on January 3, 2013. The acceptance criteria had been revised from greater than 18,360 CFM and less than 22,440 CFM to a new value of greater than 21,012 CFM. Licensee Event Report 2015-002-01 was submitted to the NRC on August 26, 2015, and stated, "From January 3, 2013, through August 13, 2013, the Conditions and Required Actions of LCO 3.7.11, LCO 3.0.3 and LCO 3.0.4 were not met."

Based on questions by the inspectors the licensee initiated Condition Report 105208 to document that from December 18, 1999, until January 3, 2013, instrument uncertainty was not included in the acceptance criteria of STS PE-010A and STS PE-010B. The inspectors noted that LER 2015-002-01 documented that instrument uncertainty was not included in the acceptance criteria of STS PE-010A and STS PE-010B from March 11, 2002, until January 3, 2013. However, the licensee's cause evaluation and Licensee Event Report failed to identify that instrument uncertainty had never been included in the STS PE-010A and STS PE-010B acceptance criteria from December 18, 1999, until March 11, 2002.

Also as a result of questions by the inspectors Condition Report 105208 documented that there was no formal process for procedure writers to consider measurement uncertainty when changing acceptance criteria and that a check for measurement uncertainty in the procedure change process was needed. The inspectors concluded that the licensee's cause evaluation and LER failed to identify this concern, which appeared to be the original cause of the licensee's failure to establish adequate acceptance criteria and failure to recognize the inoperability of trains A and B of the CRACS.

Based on previous performances of STS PE-010A and STS PE-010B and considering the design basis required flow with instrument uncertainty included, SGK04A was

inoperable from October 11, 2005, to August 13, 2013; and SGK04B was inoperable from October 3, 2002, to July 18, 2013. Thus, in accordance with Technical Specification 3.7.11, the station should have entered mode 3 on November 3, 2002, with the SGK04B unit inoperable for greater than 30 days. The station did not meet Technical Specification 3.7.11 until August 13, 2013. The SGK04A and SGK04B units were simultaneously inoperable from October 11, 2005, through July 18, 2013. Although the SGK04A and SGK04B units were simultaneously inoperable for an extended period of time, the inspectors noted that the SGK04 units functioned and provided control room cooling throughout the inoperability period, the inspectors noted that licensee air flow calculations contained additional margin, and the inspectors noted that measured air flow rate testing results were never less than required design basis flow rates by more than 1.8 percent, which is less than the 3 percent instrument uncertainty.

The licensee's immediate corrective actions included corrective maintenance on the CRACS trains to increase the airflow to meet acceptance criteria limits, Procedures STS PE-010A and STS PE-010B were performed successfully on March 6, 2015, and January 13, 2015, for A and B trains, respectively. Condition Report 105208 was initiated by the licensee for evaluation of any necessary process changes and extent of condition. Furthermore, procedure AP 15C-004, "Preparation, Review and Approval of Procedures, Instructions and Forms," is being revised to require operations surveillance coordinator review of technical specification surveillance procedures that result in a change in acceptance criteria.

Analysis. The inspectors determined that Wolf Creek's failure to establish adequate CRACS testing flow rate acceptance criteria was a performance deficiency that impacted the station's ability to adequately implement Technical Specification surveillance requirement SR 3.7.11, "Control Room Air Conditioning System (CRACS)." This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone, and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the station operated in a condition prohibited by Technical Specifications with train A of the safety-related CRACS inoperable from October 11, 2005, to August 13, 2013, and train B inoperable from October 3, 2002, to July 18, 2013.

In accordance with Inspection Manual Chapter 0609.04, "Initial Characterization of Findings," and Exhibit 2 of Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, and April 29, 2015, respectively, the performance deficiency affects a mitigating SSC. The inspectors determined this finding was not a deficiency affecting the design or qualification of a mitigating SSC that maintained its operability or functionality, the finding did not represent a loss of system and/or function, the finding did not represent an actual loss of function of at least a single train for greater than its Technical Specification allowed outage time, and the finding did not represent an actual loss of function of one or more non-Technical Specification trains of equipment designated as high safety-significant. Therefore, the inspectors determined the finding was of very low safety significance (Green).

The inspectors determined that in accordance with Inspection Manual Chapter 0310, "Aspects Within The Cross-Cutting Areas," issued December 4, 2014, the finding has a cross-cutting aspect in the area of human performance, change management, because

leaders did not use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, there is not currently a formal process for procedure writers to consider measurement uncertainty when establishing and changing testing acceptance criteria, which resulted in extended inoperability of both the SGK04A and SGK04B units following significant changes to Technical Specifications that included adding surveillance requirements for the SGK04A and SGK04B units in 1999. This issue is indicative of current performance because the same issue would be expected to occur today. Condition Report 105208, which was written in response to the inspectors' questions, documents that a check for measurement uncertainty in the procedure change process is needed [H.3].

Enforcement. Technical Specification 3.7.11, Condition B, requires the reactor to be in mode 3 within 6 hours if one train of the CRACS has been inoperable for 30 days while in mode 1, 2, 3, or 4. Contrary to the above, from November 3, 2002, until August 13, 2013, the reactor was not in mode 3 within 6 hours with one train of the CRACS inoperable for 30 days while in mode 1, 2, 3, or 4. Specifically, the B train of the CRACS was inoperable for 30 days while in mode 1, 2, 3, and 4. The licensee entered this condition into its corrective action program as Condition Report 95378. The licensee's immediate corrective actions included corrective maintenance on the CRACS to increase the airflow to meet acceptance criteria limits. Surveillance Procedures STS PE-010A and STS PE-010B were performed successfully on March 6, 2015, and January 13, 2015, for A and B trains, respectively. Condition Report 105208 was initiated by the licensee for any necessary process changes and extent of condition actions. Furthermore, procedure AP 15C-004, "Preparation, Review and Approval of Procedures, Instructions and Forms," is being revised to require Operations Surveillance Coordinator review of Technical Specification surveillance procedures that result in a change in acceptance criteria. Because this violation was of very low safety significance and this issue was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. (NCV 05000482/2016002-01, Failure to Adequately Establish Control Room Air Conditioning System Testing Flow Rate Acceptance Criteria)

- 4 (Closed) LER 05000482/2015-004-00: Inadequate Procedure Results in Two Containment Isolation Valves being in a Condition Prohibited by Technical Specifications, and LER 05000482/2015-004-01: Incorrect Decision Results in Two Containment Isolation Valves being in a Condition Prohibited by Technical Specifications

On May 5, 2015, it was discovered that the motive force (air supply) was not removed for two containment shutdown purge valves as required by Technical Specification 3.6.3, "Containment Isolation Valves." The motive force was restored to allow the performance of Procedure STS KJ-001A, "Integrated Diesel Generator and Safeguards Actuation Test – Train A," on April 26, 2015. After performance of Procedure STS KJ-001A, the motive force was not removed for the two containment shutdown purge valves. The plant entered Mode 4 on April 28, 2015.

Upon discovery, the air supply valves for the two containment shutdown purge valves were locked closed, removing the motive force. The cause of the event was determined to be the decision to only track components listed on a locked component log using Form APF 21G-001-01, "Log of Locked Component Manipulations," Revision 1, during plant start up, which allowed a mode change with components out of position. Each

impacted penetration flow path had a redundant valve that was closed with the motive force removed.

The licensee implemented the following corrective actions: (1) On May 5, 2015, the air supply valves for GTHZ0007 and GTHZ0009 were locked closed and verified, which removed the motive force; and (2) Procedure AP 21G-001, "Control of Locked Component Status," was revised to ensure an "Equipment Out of Service Log" entry was made for components required to be locked by technical specifications. The inspectors determined that this constituted a licensee-identified violation, and the enforcement aspects of this violation are discussed in Section 4OA7 of this inspection report.

The licensee event reports are closed.

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

4OA5 Other Activities

(Closed) Unresolved Item (URI) 05000482/2015001-01, Questions Related to Ultrasonic Examination of Reactor Vessel Flange Stud Hole Threads

On May 7, 2015, the NRC issued Wolf Creek Nuclear Operating Corporation a URI related to the examination technique utilized by the licensee to perform reactor vessel flange ligament inspections for ASME Code compliance. The concern was that the technique being utilized by the licensee might not provide adequate coverage of the required examination area and may not be capable of detecting indications orientated on a plane normal to the axis of the stud that were equal to or exceeded 0.2 inch, as measured radially from the root of the thread, as required by the licensee's procedure and Section XI of the ASME Code. Demonstrations of the technique were completed by the licensee and verified that the technique could detect flaws in the required examination area. The results of these demonstrations were reviewed by the NRC staff and considered acceptable. Based on these facts, the NRC considers this item to be closed and no follow-up inspection activity for this item is planned.

No findings were identified. The unresolved item is closed.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On May 26, 2016, regional inspectors presented the final heat sink performance inspection results to Mr. J. McCoy, Vice President, Engineering, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. Proprietary information was returned or destroyed.

On June 10, 2016, regional inspectors presented the inservice inspection activity inspection results via telephonic exit to Mr. W. Muilenburg, Supervisor, Licensing. The licensee acknowledged the issue presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On June 23, 2016, regional inspectors presented the radiation safety inspection results to Mr. M. Skiles, and other members of the licensee staff via teleconference. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On July 27, 2016, the resident inspectors presented the inspection results to Cleveland Reasoner, Site Vice President, 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.

40A7 Licensee-Identified Violations

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

- Technical Specification 5.7.2 states, in part, that high radiation areas with dose rates greater than 1.0 rem per hour at 30 centimeters shall be conspicuously posted as a high radiation area and shall be provided with a locked or continuously guarded door or gate to prevent unauthorized entry. Contrary to the above, on January 27, 2016, room 7406 on the 2013 foot elevation of the radwaste building areas had dose rates greater than 1.0 rem per hour and was not conspicuously posted as a high radiation area nor provided with a locked or continuously guarded door or gate to prevent unauthorized entry. This issue was identified by radiation protection technicians performing radiological surveys in the area. The licensee documented this issue in the corrective action program as Condition Report 102344. The finding was determined to be of very low safety significance (Green) because it was not an as-low-as-reasonably-achievable planning issue, there was no overexposure or potential for overexposure, and the licensee's ability to assess dose was not compromised.
- Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be accomplished in accordance with documented instructions, procedures, or drawings of a type appropriate to the circumstances. Licensee Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 32, an Appendix B quality related procedure, provides instructions for determining whether equipment is operable when oil leakage is identified. Procedure AP 26C-004, Step 6.2.1.1, states in part, that if operability of a system/component is being questioned due to system leakage that the leak rate has been quantified and total identified leakage for the affected system has been determined and compared to the limits of Attachment F, "Allowable Oil Leakage for Successful Mission." Contrary to the above, from May 28, 2016, until May 31, 2016, operability of a system/component was being questioned due to system leakage and the leak rate had not been quantified and the total identified leakage for the affected system was not determined and compared to the limits of Attachment F, "Allowable Oil Leakage for Successful Mission." Specifically, operability of the B component cooling water pump was questioned due to system leakage as documented in Condition Report 104910, and the leak rate had not been quantified and the total identified leakage for the affected system was not determined, which resulted in the immediate operability determination being incorrect and the immediate operability determination requiring revision. Immediate corrective actions included revising the immediate operability determination for the B component cooling water pump from operable to inoperable, generating a

required reading for senior reactor operators, and documenting Condition Report 104959. Using Exhibit 2, "Mitigating Systems Screening Questions," of Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Finding At-Power," dated June 19, 2012, the inspectors determined this finding was not a deficiency affecting the design or qualification of a mitigating SSC that maintained its operability or functionality, the finding did not represent a loss of system and/or function, the finding did not represent an actual loss of function of at least a single train for greater than it Technical Specification allowed outage time, and the finding did not represent an actual loss of function of one or more non-Technical Specification trains of equipment designated as high safety-significant. Therefore, the inspectors determined the finding was of very low safety significance (Green).

- Technical Specification 3.4.3, "[Reactor Coolant System] Pressure and Temperature Limits," states, in part, that reactor coolant system pressure, reactor coolant system temperature, and reactor coolant system heatup and cooldown rates shall be maintained within the limits specified in the "Pressure and Temperature Limits Report (PTLR)." Section 2.1.2 of the PTLR specifies that the reactor coolant system shall be maintained within the parameters of Figure 2.1-1 of the PTLR, which specifies a minimum pressure of 0 psig. Required Action C.1 of Technical Specification 3.4.3 specifies that with the reactor coolant system parameters outside the limits of the PTLR, restore the parameters to within the limits immediately. Contrary to the above, on May 8, 2011, and March 30, 2013, with the reactor coolant system parameters outside the limits of the PTLR, parameters were not restored to within the limits immediately. Specifically, the licensee drew a vacuum on the reactor coolant system to less than 0 psig to support filling operations but did not take action to immediately restore the reactor coolant system pressure to greater than or equal to 0 psig, as specified in the PTLR. The licensee placed this issue in the corrective action program as Condition Report 78920. The licensee performed Engineering Evaluation EER 92-BB-02 and determined that drawing a vacuum on the reactor coolant system would not result in excessive stresses for reactor coolant system structures, systems and components. Using Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," dated May 9, 2014, this issue screened to Green because it did not result in a loss of reactor coolant system barrier integrity.
- Technical Specification 3.4.15, "[Reactor Coolant System] Leakage Detection Instrumentation," states, in part, that reactor coolant system leakage detection instrumentation shall be operable, including the containment sump level and flow monitoring system. Required Action A of Technical Specification 3.4.15, states, in part, that with the required containment sump level and flow monitoring system inoperable, restore the required containment sump level and flow monitoring system to operable status within 30 days—if the required action and associated completion time are not met, Condition E requires the reactor to be in mode 3 within 6 hours and in mode 5 within 36 hours. Contrary to the above, from the period of July 13, 2013, to November 20, 2013, with the containment sump level and flow monitoring system inoperable for greater than 30 days, the reactor was not placed in mode 3 within 6 hours or mode 5 within 36 hours. Specifically, the instrument tunnel sump level indication was inoperable because of erratic indication, but the licensee did not take the required action of Technical Specification 3.4.15. The licensee placed this issue in the corrective action program as Condition Report 84690. Using Manual Chapter 0609, Appendix A, "Significance Determination Process, for Findings at Power," dated June 19, 2012, this issue screened

to Green because it did not result in reactor coolant system leakage or degrade the licensee's ability to detect and mitigate a small break loss of coolant accident.

- Technical Specification 3.6.3, "Containment Isolation Valves," requires each containment isolation valve to be operable in modes 1, 2, 3, and 4. To be operable, containment isolation valves GTHZ0007 and GTHZ0009, which are Category 3 valves, must be closed with the motive force removed. Technical Specification 3.6.3, Condition A, Required Action A.1, requires, in part, that the affected penetration flow path for any inoperable Category 3 containment isolation valve be isolated within 12 hours. Additionally, Required Action A.2, requires, in part, that the licensee verify the affected penetration flow path is isolated prior to entering mode 4 from mode 5. Contrary to the above, from April 28, 2015, through May 5, 2015, the licensee failed to verify the affected penetration flow path was isolated prior to entering mode 4 from mode 5 on April 28, 2015. As a result, Technical specification 3.6.3, Condition A, was not met. On May 5, 2015, the licensee discovered that the motive force for valves GTHZ0007 and GTHZ0009 was not removed and the air supply valves had not been locked closed, and the affected penetration flow paths were not isolated prior to entering mode 4 from mode 5 on April 28, 2015. The inspectors noted that although the motive force was not removed for valves GTHZ0007 and GTHZ0009, the valves were in their closed safeguards positions and redundant valves in series were closed with the motive force removed, which ensured each penetration flow path had one operable valve closed with its motive force removed. Using Exhibit 3, "Barrier Integrity Screening Questions," of Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Finding At-Power," dated June 19, 2012, the inspectors determined the finding did not represent an actual open pathway in the physical integrity of reactor containment (valves, airlocks, etc.), containment isolation system (logic and instrumentation), or heat removal components, and the finding did not involve an actual reduction in function of hydrogen igniters in the reactor containment. Therefore, the inspectors determined that this finding is of very low safety significance (Green).

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

C. Adkinson, Environmental Biologist IV
T. Baban, Manager, System Engineering
W. Brown, Superintendent, Security Operations
T. Broyles, Manager, Information Services
D. Campbell, Superintendent, Maintenance
C. Carman, Supervisor, Chemistry
J. Dorsey, Technician I, Chemistry
T. East, Superintendent, Emergency Planning
J. Edwards, Manager, Operations
D. Erbe, Manager, Security
R. Flannigan, Manager, Nuclear Engineering
K. Fredrickson, Engineer, Licensing
J. Freeman, Supervisor of Treatment Systems, Operations
J. Fritton, Oversight
C. Garcia, Supervisor Engineer
D. Gibson, Master HP Technician
C. Gross, Manager, Chemistry
D. Grove, Superintendent, Maintenance Support
C. Hafenstine, Manager, Regulatory Affairs
A. Heflin, President and Chief Executive Officer
S. Henry, Manager, Integrated Plant Scheduling
P. Herrman, Manager, Engineering Programs
R. Hobby, Licensing Engineer
J. Isch, Superintendent, Operations Work Controls
J. Jenek, Quality Specialist iii
B. Ketchum, Supervisor Engineer
B. Lee, Licensed Supervising Instructor
M. Legresley, Engineer
K. Lemaster, Master Technician, Chemistry
D. Mand, Manager, Design Engineering
N. Mayhew, Engineer III
J. McCoy, Vice President, Engineering
M. McMullen, Design Engineer
C. Medenciy, Radioactive Materials Shipper
C. Menke, Supervisor Maintenance
K. Miller, Master Instruments and Controls Technician
N. Mingle, Engineer
K. Mitchell, Master Chemistry Technician
W. Muilenburg, Supervisor, Licensing
L. Ratzlaff, Manager, Maintenance
R. Raymer, Engineering Technologist V
C. Reasoner, Site Vice President
T. Rice, Technician III, Safety
J. Rudeen, Supervisor, Regulatory Support
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M. Skiles, Manager, Radiation Protection
 T. Slenker, Supervisor, Operations Support
 S. Smith, Plant Manager
 M. Staiger, Engineer II
 L. Stevens, Licensing Engineer V
 L. Stone, Licensing Engineer V
 A. Stull, Vice President and Chief Administrative Officer
 J. Suter, Supervisor Engineer
 M. Tate, Superintendent, Security Operations
 J. Truelove, Supervisor, Chemistry
 J. Vopat, Technician II, Chemistry

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

05000482/2016002-01	NCV	Failure to Adequately Establish Control Room Air Conditioning System Testing Flow Rate Acceptance Criteria (4OA3)
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Closed

05000482/2014-001-00	LER	Failure to Comply with Required Action of Technical Specification 3.4.3 while Performing a Vacuum Fill of the Reactor Coolant System (4OA3)
05000482/2014-004-00	LER	Condition Prohibited by Technical Specifications due to an Instrument Tunnel Sump Level Indication Transmitter Incompatible with the Containment Environment (4OA3)
05000482/2015-001-01	URI	Questions Related to Ultrasonic Examination of Reactor Vessel Flange Stud Hole Threads (4OA5)
05000482/2015-002-00	LER	Two Control Room Air Conditioning Trains Inoperable Due to Failure to Meet Surveillance Requirement (4OA3)
05000482/2015-002-01	LER	Two Control Room Air Conditioning Trains Inoperable Due to Failure to Meet Surveillance Requirement (4OA3)
05000482/2015-004-00	LER	Inadequate Procedure Results in Two Containment Isolation Valves being in a Condition Prohibited by Technical Specifications (4OA3)
05000482/2015-004-01	LER	Incorrect Decision Results in Two Containment Isolation Valves being in a Condition Prohibited by Technical Specifications (4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AP 17C-028	Emergency Response Duties and Responsibilities	15
OFN AF-025	Unit Limitations	48
SYS OPS-009	Hot Weather Operations	0

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
Wolf Creek FYI	Wolf Creek Corporate Communications Notice – Early Release Due to Impending Severe Weather	April 26, 2016

Section 1R04: Equipment Alignment

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CKL EG-120	Component Cooling Water System Valve, Switch and Breaker Lineup	48
CKL GK-121	Control Building HVAC Valve Checklist	18
CKL GK-131	Control Building HVAC Electrical Checklist	28
CKL KJ-121	Diesel Generator NE01 and NE02 Valve Checklist	39
SYS EG-120	Component Cooling Water System	38

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
J-12SA04	Control Logic Diagram ESFAS Control Room Ventilation Isolation Safety Limits	3
J-104-00390	Logic Block Diagram ESFAS (KP1909W), Sheet 1	W08
M-1H1521	Heating, Ventilating, & Air Cond. Auxiliary Building EL. 2047'-6" Area 2	9
M-12EB03	Piping & Instrumentation Diagram Component Cooling Water System	19
M-12EG01	Piping & Instrumentation Diagram Component Cooling Water System	24

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-12EG02	Piping & Instrumentation Diagram Component Cooling Water System	26
M-12EG03	Piping & Instrumentation Diagram Component Cooling Water System	19
M-12GK01	Piping & Instrumentation Diagram Control Building H.V.A.C	13
M-12GK02	Piping & Instrumentation Diagram Control Building HVAC	22
M-12GK03	Piping & Instrumentation Diagram Control Building HVAC	20
M-12GK04	Piping & Instrumentation Diagram Control Building HVAC	12
M-12KJ04	Piping & Instrumentation Diagram Standby Diesel Generator "B" Cooling Water System	18
M-12KJ05	Piping & Instrumentation Diagram Standby Diesel Generator "B" Intake Exhaust, F.O. & Start Air Sys.	17
M-12KJ06	Piping & Instrumentation Diagram Standby Diesel Generator "B" Lube Oil System	21

Section 1R05: Fire Protection

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AI 10-001	Fire Brigade Equipment Inventory, Maintenance and Cleaning	12
AP 10-105	Fire Protection Training and Drills	19
AP 10-106	Fire Preplans	16
AP 10-106	Fire Preplans	17

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-1F9905	Fire Hazard Analysis	6
E-1F9905	Fire Hazard Analysis	7
E-1F9910	Post-Fire Safe Shutdown Area Analysis	14

Condition Reports

62669	105119	105426	105533	105534
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Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
062416/0900/U/D	PC Storage Fire	June 24, 2016

Section 1R07: Heat Sink Performance

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AI 07A-008	Lake Water Chemical Treatment Program	20
AI 07D-001	Resource Management and Ecological Monitoring Programs	12
AI 23L-005	Lake Water Piping Integrity	5
ALR 00-055A	Essential Service Water Pump A Pressure Low	11A
ALR 00-055B	Essential Service Water Pump B Pressure Low	12A
ALR 00-055C	Essential Service Water Pump Trouble	11
AP 15C-002	Procedure Use and Adherence	41
AP 21-001	Conduct of Operations	77
AP 23L-001	Lake Water Systems Corrosion and Fouling Mitigation Program	7
AP 23L-002	Heat Exchanger Program	4
AP 23L-003	Buried Piping and Tanks Program	3
MPE GK-004	GK Unit Preparation for Work	7
OFN EF-033	Loss of Essential Service Water	18
OFN SG-003	Natural Events	30
QCP-20-514	Eddy Current Testing	6
QCP-20-518	Visual Examination of Heat Exchangers and Piping Components	7
STN EF-022A	ESW Train A Post-LOCA Flow Balance	8B
STN EF-022B	ESW Train A Post-LOCA Flow Balance	10
STN PE-033	CCW Heat Exchanger Performance Test	13
STN PE-036	Safety Related Room Cooler Heat Transfer Verification and Performance Trending	16
STN PE-037A	ESW Train A Heat Exchanger Flow and DP Trending	18A
STN PE-037B	ESW Train A Heat Exchanger Flow and DP Trending	21

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
STN PE-038	Containment Cooler Performance Test	13
STN PE-040	ESW Crosstie Valve Leak Test	10
STN PE-056	ESW Emergency Make-Up Piping Flow Test	10
STS MT-073	SGK04B Heat Exchanger Inspection	3B
SYS CI-010A	A Train ESW Chemical Addition	2
SYS CI-010B	B Train ESW Chemical Addition	2
SYS CI-003	S/U and S/D for the Macrofoul Treatment of ESW/Service Water	2
SYS CI-004	S/U and S/D for the Copper Corrosion Inhibitor Treatment of ESW/Service Water	3
SYS CI-006	S/U and S/D of the Scale Inhibitor Treatment for Service Water	2
SYS CI-008	Operation of the Circulating and Service Water Corrosion Monitoring System	2
SYS EF-300	ESW/Service Water Macrofouling Treatment	35
SYS OQT-001B	Operations B Train Quarterly Tasks	13

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-1HX001	Heat Exchanger Tube Sheet Maps	76

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36334	99593	100883	100950	101790	102575
103515	104817				

Jobs

10-324747	10-328253	12-352168	12-354020	12-354021	12-358715
12-358716	12-359623	13-370650	13-370651	13-374576	13-379272
14-385020	14-390223	14-394444	15-397194	15-400748	

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
25360-000-MOC-AN-0001	Emergency Diesel Generator Frequency Variation Impact on Motor Operated Mechanical Equipment Performance	0
96227-TR-01 CN001	Containment Fan Cooler Response to a Simultaneous LOCA and LOOP Event	4
AN-00-037	Containment Cooler Requirements for Loss of RHR Shutdown Cooling	0
AN-05-016	Updated MSLB Containment Pressure and Temperature Response Analysis for the Limiting Cases, Accounting for the Uncertainty of the Initial Containment Temperature	0
AN-97-004	Updated Containment Pressure and Temperature Response Analysis for the Limiting LOCA Scenario, Accounting for Additional Time Delay for Fan Coolers Activation	0
CA-529-452	Design Report for Replacement Coil for SGG04A/B	0
CA-529-1236	Design Report Addendum for Replacement Coil for SGG04A/B	0
CA-529-1236-000-CN001	Vendor Calculation: Aerofin Design Report CA-529-452 for SGG04A and SGG04B Spent Fuel Pool Room Coolers	3
CA-529-1236-000-CN002	Design Report Addendum for Replacement Coil for SGG04A/B	0
EF-10	Essential Service Water Flow Requirements	2
EF-10-002-CN001	Essential Service Water (ESW) System Flow Requirements	2
EF-22	Essential Service Water Power Block Piping Differential Pressure During LOCA/SIS Conditions	1
EF-39	Heat Exchanger Tube Minimum Wall	0
EF-M-076	Hydraulic Analysis for Essential Service Water (ESW) System following a Loss of Offsite Power (LOOP)	3
EF-M-078	Evaluation of Wolf Creek Essential Service Water System (ESW) Modification During LOOP/LOCA Conditions	1
EG-08-W	Minimum Wall Thickness of Tubing in Cooling Water Heat Exchangers EEG01A and EEG01B	1
EG-09-W	Tube Plugging for CCW Heat Exchangers	0

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
EG-M-032	Component Cooling Water Heat Exchanger Performance During Normal Operations, Shutdown at 4 Hours (and 12 Hours), and Post-LOCA Recirculation	0
EG-M-032 CN004	Component Cooling Water Heat Exchanger Performance During Normal Operations, Shutdown at Four Hours (and 12 hours) and Post-LOCA Recirculation	0
GG-352	Fuel building HVAC System	1
GG-M-004	Cooling Load and Fuel Pool Area Temperature – Normal Operation	0
GG-M-005	Spent Fuel Pump (PEC01A/PEC01B) and Heat Exchanger (EEC01A/EEC01B) Rooms 6104 and 6105 Temperature and Equipment Operability	0
GG-M-005-000- CN001	Spent Fuel Pump (PEC01A / PEC01B) and Heat Exchanger (EEC01A / EEC01B) Rooms 6104 and 6105 Temperatures and Equipment Operability	0
GG-MH-001	Mechanical – Calculate the Cooling Capacity of Spent Fuel Pump Room Coolers at Low Flow Conditions	2
GK-06-W	SGK05A/B Class 1E Electrical Equipment Rooms A/C Units, Single Unit Operation Capability	7
GK-99	No Media Per PIR 98-1545 Criteria for Minimum Wall for Room Coolers Cu-Ni Tubes	2
GK-361	Control Building HVAC Nodal Points for the Flow Diagram	1
GK-372	Nozzle Movements Due to Thermal Growth of Air Handling Unit SGK05A and B	0
GK-C-004	Test Response Spectra for Proportional Three Mode Controllers in GK System	0
GK-C-004	Test Response Spectra for Proportional Three Mode Controllers in GK System	December 1991
GK-M-009	Tube Plugging Criteria for Control Room AC Unit SGK04A/B Condensers and ESF Switchgear Rooms AC Unit SGK05A/B Condensers	1
GK-M-010	Tube Pitting Criteria for Control Room SGK04A/B and Electrical Switch Gear Rooms SGK05A/B Condensing Units	0
GK-M-014	Cooling and Heating Load for Control Building Class 1E Electrical Equipment Areas During Accident Conditions – Train A	0

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
GN-M-011	Containment Air Coolers (SGN01A, SGN01B, SGN01C, SGN01D) Tube Plugging Criteria	1
GN-MW-004	Minimum Tube Wall Thickness for Containment Cooler Tubes onSGN01A/D	0
GN-S-005	WCGS CuNi Replacement Containment Air Cooler Coils Evaluations for ASME Section III Subsections ND and NF	1
GN-S-006	WCGS AL-6XN Replacement Containment Air Cooler Coils Evaluations for ASME Section III Subsection ND and NF	1
KA-M-004	Sizing of Cooling Water Booster Pumps for the Atlas Copco Air Compressors	1
KA-MH-003	Cooling Duty for the Atlas Copco Air Compressors (CKA01A and CKA01B)	2
M-612C-00015	Performance Calculations and Curves	1
XX-C-022-000-CN001	Seismic Qualification of Room Coolers Procured from UE	0
XX-M-067	Tube Pitting Criteria for Safety-Related Room Cooler Cooling Coils	1
XX-M-068	Tube Plugging Criteria for Safety-Related Room Cooler (Aerofin AL6XN) Cooling Coils	2

Thermal Performance Analyses

<u>Number</u>	<u>Title</u>	<u>Date</u>
EEG01A-1	CCW Heat Exchanger Performance Test	December 24, 2015
EEG01A-2	CCW Heat Exchanger Performance Test	March 17, 2011
SGL15B-1	Safety Related Room Cooler Heat Transfer Verification and Performance Trending	October 9, 2014
SGL15B-2	Safety Related Room Cooler Heat Transfer Verification and Performance Trending	August 14, 2013
SGN01D-1	Containment Cooler Performance Test	April 6, 2016
SGN01D-2	Containment Cooler Performance Test	October 15, 2014

Modifications

<u>Number</u>	<u>Title</u>	<u>Revision</u>
014003	Containment Air Cooler Coil Replacement for SGN01D	0
014732	Containment Air Cooler Coil Replacement – SGN01A, B, & C	2

Vendor Documents

<u>Number</u>	<u>Title</u>	<u>Revision/</u> <u>Date</u>
M-612C-00015	Performance Calculations and Curves	December 12, 2007
M-620-00154	Coil Performance Topical Report	W02
M-622.1A-VDS- 1.07	SGK05A/B Condenser Vendor Data Sheet	April 11, 2005
M-622.1A- 00052	Design Report No. N251	March 7, 2003

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/</u> <u>Date</u>
14-0209-TR- 001	Containment Cooler Tube Condition Assessment	0
755200/2	Wolf Creek Nuclear Operating Corporation Hydrographic Survey of UHS Reservoir and ESWS Intake Channel at the Wolf Creek Generating Station, Burlington, Kansas	June 18, 2015
ET 90-0023	Docket No. 50-482, Response to Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment"	January 30, 1990
ET 94-0012	Docket No.50-482, Updated Response to Generic Letter 89-13	February 18, 1994
ET 94-0075	Docket No.50-482, Final Response to Generic Letter 89-13	November 28, 1994
ET 99-0042	Docket No.50-482, Updated Response to Generic Letter 89-13	November 17, 1999
OE EF-16-001	"Evaluation of Wolf Creek Essential Service Water System (ESW) Modifications during LOOP/LOCA Conditions	1

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
OE GK-15-012	SGK05A, Class 1E Electrical Equipment Air-Conditioning Unit, was found in a "Lube Oil Failure" trip condition after elevated temperatures were noticed on the 2,016 feet elevation of the control building.	1
SA-2013-0068	Lake Water Program Formal Self-Assessment	March 30, 2015
SA-2013-0073	Lake Water Self-Assessment	January 16, 2014
WCEM-06-005	Zebra Mussel, Water Quality, and Aquatic Vegetation Monitoring – Coffey County Lake – 2015 Report and 2016 Plans	16
WCNOC – 22	2009 Thru 2014 Periodic Surveillance Report for Ultimate Heat Sink and Associated Safety-Related Structures	17

Section 1R11: Licensed Operator Requalification Program

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ALR 00-083C	Rx Partial Trip	5A
AP 21-001	Conduct of Operations	77
AP 22-001	Conduct of Pre-Job and Post-Job Briefs	19
OFN SB-008	Instrument Malfunctions	44
STS IC-507D	Steam Line Pressure Instrumentation Channel Calibration – Protection Set 1	8
STS IC-508A	Refueling Water Storage Tank Level Transmitter Calibration	6

Condition Reports

104976 105566

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
EPF 06-007-01	Wolf Creek Generating Station Emergency Notification (Message #CR-001)	12E
LR4412001	Annunciator Response Practice	1

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
LR4640001	Operating Crew Simulator Performance Evaluation Summary Sheet	May 16, 2016
LR4640001	Simulator Evaluation	0
LR5001005	E-Plan Simulator Performance Evaluation Summary Sheet	May 16, 2016

Section 1R12: Maintenance Effectiveness

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
MPE GK-004	GK Unit Preparation for Work	7
QCP-20-518	Visual Examination of Heat Exchangers and Piping Components	7
STS MT-073	SGK04B Heat Exchanger Inspection	3B

Condition Reports

101867 103311 104838 104878

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
2016-010	RER Reportability Determination	March 14, 2016
51493	Functional Failure Determination Checklist	May 23, 2012
53159	Functional Failure Determination Checklist	June 15, 2012
53299	Functional Failure Determination Checklist	June 22, 2012
68661	Functional Failure Determination Checklist	June 7, 2013
71634	Functional Failure Determination Checklist	September 4, 2013
74985	Functional Failure Determination Checklist	November 14, 2013
85936	Functional Failure Determination Checklist	August 14, 2014
101867	Functional Failure Determination Checklist	January 26, 2016
103311	Functional Failure Determination Checklist	April 1, 2016
GK	System Health Report	January 1, 2016, through March 31, 2016

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AP 22C-003	On-Line Nuclear Safety and Generation Risk Assessment	22
AP 22C-007	Risk Management and Contingency Planning	11
INC C-1008	Calibration of Power Supplies	3B
RNM C-0064	KGB1907 Power Supply Acceptance Test	1
STS GK-001A	Control Room Emergency Vent System Train A Operability Test	32
STS GK-002A	Control Room A/C Unit Operability Test	2
STS IC-208A	4KV Loss of Voltage & Degraded Voltage TADOT NB01 Bus – SEP GRP 1	29A
SYS GK-123	Control Building A/C Units Startup and Shutdown	29A

Condition Reports

104760 104761 104857

Jobs

15-408144-000 15-408144-001 15-408144-002 15-408144-003

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
16-203	On-Line Nuclear Safety and Generation Risk Assessment: Risk Assessment Dates: April 11, 2016 through April 17, 2016	April 13, 2016
16-203	On-Line Nuclear Safety and Generation Risk Assessment: Risk Assessment Dates: April 11, 2016 through April 17, 2016	April 14, 2016
16-203	On-Line Nuclear Safety and Generation Risk Assessment: Risk Assessment Dates: April 11, 2016 through April 17, 2016	April 15, 2016
16-205	On-Line Nuclear Safety and Generation Risk Assessment: Risk Assessment Dates: April 25, 2016 through May 1, 2016	April 28, 2016
16-209	On-Line Nuclear Safety and Generation Risk Assessment: Risk Assessment Dates: May 23, 2016 through May 29, 2016	May 23, 2016

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
16-209	On-Line Nuclear Safety and Generation Risk Assessment: Risk Assessment Dates: May 23, 2016 through May 29, 2016	May 27, 2016

Section 1R15: Operability Evaluations

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
STN FP-211	Diesel Fire Pump 1FP01PB Monthly Operation and Fuel Level Check	36
STS EF-100B	ESW System Inservice Pump B & ESW B Check Valve Test	47

Condition Reports

104184	104425	104427	104523	105031
105032	105033	105034	105263	105264
105347				

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-0023	P&ID Fire Protection System (FP), Sheet 1	63

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/ Date</u>
A-3824-06	Installation Operation and Maintenance – Diesel Fire Pump 1FP001PB and Jockey Pump 1FP003P	W13
P-1-W	Starting of Essential Service Water Pump Against Reverse Rotation	0
STS EF-100B	ESW System Inservice Pump B & ESW B Check Valve Test	Performed May 5, 2016

Section 1R19: Post-Maintenance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AP 12-003	Foreign Material Exclusion	15

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AP 21F-001	Equipment Out-of-Service Control	23
GEN 00-004	Power Operation	86
INC C-1004	Calibration of Indicators	6B
STN IC-256B	Calibration of Emergency Fuel Oil Storage Tank B Level Loop	13
STN SF-001	Control Rod Parking	18A
STS AL-103	TDAFW Pump Inservice Pump Test	66A
STS CH-008B	Emergency Fuel Oil Storage Tank B	23
STS EG-100A	Component Cooling Water Pumps A/C Inservice Pump Test	32
STS GK-002B	Control Room A/C Unit Operability Test	2
STS SF-001	Control and Shutdown Rod Operability Verification	28

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-761-0214-01	Interconnecting Wiring Diagram Cabinet 01 Steam Pressure – Loop 1 Protection 1 Cabinet 01 Card Fram 04	W05
M-761-0216-01	Interconnecting Wiring Diagram Cabinet 01	4

Condition Reports

104121	104337	104346	104727	104883
104942	104943	104957		

Jobs

15-405389-000	15-407456-000	15-407456-003	15-407456-004	15-407456-006
15-407456-007	15-407487-000	15-407487-001	15-407953-000	15-408111-000
15-408319-000	16-411548-000	16-413431-000	16-413431-001	16-414528-000

Section 1R22: Surveillance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AP 29G-001	RCS Unidentified Leak Rate Monitoring Program	5
CKL ZL-003	Control Room Daily Readings	69A

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
STS AL-201C	Turbine Driven Auxiliary Feedwater System Inservice Valve Test	9
STS BB-006	RCS Water Inventory Balance Using the NPIS Computer	14
STS BM-205	SGBD System Inservice Valve Test	13
STS CR-001	Shift Log for Modes 1, 2, & 3	97
STS EF-100B	ESW System Inservice Pump B & ESW B Check Valve Test	47
STS GG-001B	Emergency Exhaust Filtration System Train B Operability Test	23
STS IC-255B	Channel Operational Test Control Room Air Intake Radiation Monitor GK RE-0004	16A
SYS GG-200	Fuel Building Emergency Exhaust Operations	31

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
J-12SA04	Control Logic Diagram ESFAS Control Room Ventilation Isolation Safety Limits	3
J-104-00390	Logic Block Diagram ESFAS (KP1909W), Sheet 1	W08
M-12AL01	Piping and Instrumentation Diagram Auxiliary Feedwater System	28
M-12GK01	Piping & Instrumentation Diagram Control Building H.V.A.C	13
M-12GK02	Piping & Instrumentation Diagram Control Building H.V.A.C	22
M-12GK03	Piping & Instrumentation Diagram Control Building H.V.A.C	20

Condition Reports

101098	101865	103374	104425	104427
104532				

Jobs

15-405388-000	15-409511-000
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Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
16-207	On-Line Nuclear Safety and Generation Risk Assessment: Risk Assessment Dates: May 9, 2016 through May 16, 2016	May 12, 2016

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
NPIS-A-Active	RCS Leakage Summary Report, Wolf Creek Nuclear Generating Plant – NPIS-A	May 5, 2016
STS EF-100B	ESW System Inservice Pump B & ESW B Check Valve Test	Performed May 5, 2016

Section 2RS5: Radiation Monitoring Instrumentation

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AI 02E-009	Instructions for Intrinsic Germanium Detector Energy Calibration	13
AI 02E-010	Instructions for IG Detector Efficiency Calibration	7A
AI 03-008	Control Chart Development, Use and Review Using Lab Stats	6
AP 02-008	Verification of Analytical Performance	12
AP 02E-001	Chemistry Calibration Program	36
RPP 01-405	HP Instrument Program	33
RPP 03-407	Testing of Portal Monitors as Passive Whole Body Counters	1A
RPP 06-103	Ludlum 9-4 Calibration	0
RPP 06-113	MGP Telepole Calibration	3
RPP 06-306	PM12 Calibration	1
RPP 06-315	Eberline PCM-1B Calibration	10
RPP 06-317	Eberline PCM-2 Calibration	5
RPP 06-319	SAM11 Calibration	1
RPP 06-825	J. L. Shephard Multi-Source Calibration System Operation	8A
STS IC-452B	Channel Calibration New Fuel Storage Facility Criticality Monitor SDRE-0035	4A
STS IC-454B	Channel Calibration Spent Fuel Pool Criticality Monitor Area Radiation Monitor SDRE-0038	11

Condition Reports

83414	88407	93007	97554	100307
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Audits, Self-Assessments, and Surveillances

<u>Number</u>	<u>Title</u>	<u>Date</u>
14-01-RP/PC	Radiation Protection/Solid Radwaste Process Control Programs	April 7, 2014
14-03-ENV	Quality Assurance Audit Report Environmental Management/Effluents	December 18, 2014
14-11-CHM	Quality Assurance Audit Report: Chemistry	December 18, 2014
16-01-RP/PC	Radiation Protection/Solid Radwaste Process Control Programs	February 24, 2016
16-03-ENV	Quality Assurance Audit Report Environmental Management/Effluents	March 31, 2016
K03-001B	Instrument Calibration Frequency Evaluation	December 17, 2015
NUPIC 23677	Thermo Fisher Scientific	May 15, 2014

Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
1503	Liquid Scintillator	January 21, 2015
1503	Liquid Scintillator	May 23, 2016
10066	Whole Body Counter Calibration Certificate	September 8, 2015
10178	Telepole	March 29, 2016
10242	PCM-2	January 21, 2016
10256	ASP-1/NRD	April 6, 2016
10257	ASP-1/NRD	June 25, 2015
11005	SAM 11	January 28, 2016
11075	Shepherd Calibrator	April 6, 2016
11377	PCM-1B	July 27, 2015
11451	Radeco H809V-I	May 24, 2016
107974	ASP-1	June 15, 2016
WO 12-360791	Channel Calibration High Range Area Monitor GTRE-0059	March 21, 2014

Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
WO 12-360792	Channel Calibration High Range Area Radiation Monitor GTRE60	March 22, 2014
WO 14-389735	Channel Calibration High Range Area Radiation Monitor GTRE59	March 3, 2015
WO 14-389743	Channel Calibration High Range Area Radiation Monitor GTRE60	March 3, 2015

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
WO 15-407110	STN IC-534	
WO 15-407112	STN IC-535	
WO 15-407152	STN IC-537	
WO 15-407227	Replace GM tube in 0042	
WO 15-407228	Replace GM tube in 0040	
	System Health Report: Radiation Monitoring	March 31, 2016
	WC Radiation Monitors Considered for Maintenance Rule Equipment	May 23, 2016

Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AI 07B-037	Unit and Radwaste Vent Permits Using RADEAS	2
AP 02E-001	Chemistry Calibration Program	36
AP 07B-003	Offsite Dose Calculation Manual	8
AP 20A-003	QA Audit Requirements, Frequencies, and Scheduling	26
CHS AX-G01	Unit Vent Sampling and/or Exchange of Filters	9A
CHS RW-G02	Radwaste Vent Sampling and/or Exchange of Filters	3D
STN PE-004	Charcoal Adsorber In-Place Leak Test Non-Safety Related Units	11

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
STN SP-010B	Channel Operation Test Radwaste Building Vent System Radiation Monitor GH RE-0010B	9
STS PE-002	Charcoal Adsorbent Sampling for Nuclear Safety Related Units	14
STS PE-005	HEPA Filter In-Place Leak Test Safety Related Units	12
STS PE-006	Charcoal Adsorber In-Place Leak Test Safety Related Units	14

Condition Reports

84942	87594	92222	92921	92959
95488	98578	99405	102541	102590
103675	103811	103812	103813	

Audits, Self-Assessments, and Surveillances

<u>Number</u>	<u>Title</u>	<u>Date</u>
14-11-CHM	Quality Assurance Audit Report: Chemistry	December 18, 2014
16-03-ENV	Quality Assurance Audit Report Environmental Management/Effluents	March 31, 2016

Gaseous and Liquid Release Permits

<u>Permit No.</u>	<u>System</u>	<u>Release Type</u>	<u>Date</u>
U1GB2014-198	Gas Decay Tank	Gas	June 25, 2014
U1GB2015-005	Containment Purge Release	Gas	January 12, 2015
U1GC2014-258	Unit Vent	Gas	December 2, 2014
U1GC2015-039	Radwaste Vent	Gas	March 12, 2015
U1LB2016-014	THF04A	Liquid	March 21, 2016
U1LC2014-172	Turbine Building Sump to Oily Waste	Liquid	September 5, 2014
U1LC2015-083	Steam Generator Blowdown to the Lake	Liquid	October 5, 2015

In-Place Filter Testing Records

<u>Work Order</u>	<u>Test</u>	<u>Date</u>
STS PE-002	Charcoal Adsorbent Sampling – FGG02B	February 24, 2015
STS PE-002	Charcoal Adsorbent Sampling – FGG02A	February 23, 2016
STS PE-005	HEPA Filter In-Place Leak Test – FGG02B	January 17, 2015
STS PE-005	HEPA Filter In-Place Leak Test – FGG02A	February 16, 2015
STS PE-005	HEPA Filter In-Place Leak Test – FGK01A	July 22, 2015
STS PE-006	Charcoal Adsorber In-Place Leak Test – FGG02B	October 7, 2015
STS PE-006	Charcoal Adsorber In-Place Leak Test – FGG02A	February 16, 2015
STS PE-006	Charcoal Adsorber In-Place Leak Test – FGK01B	May 4, 2015

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
RA 15-0039	WCNOC 2014 Annual Radioactive Effluent Release Report	April 27, 2015
RA 16-0034	WCNOC 2015 Annual Radioactive Effluent Release Report	April 28, 2016
	System Health Report: Radiation Monitoring	March 31, 2016
	WC Radiation Monitors Considered for Maintenance Rule Equipment	May 23, 2016

Section 2RS7: Radiological Environmental Monitoring Program

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AI 07B-002	Review of Radiological Environmental Laboratory Analysis Results	12
AI 07B-004	Reporting of Requirements for the Radiological Environmental Monitoring Program	13
AI 07B-005	Radiological Environmental Monitoring Program Implementation	21
AI 07B-015	Land Use Census	11

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AI 07B-033	Annual Radiological Environmental Operating Report Generation	5
AI 07B-034	Radiological Environmental Monitoring Program Air Sampling	12
AI 07B-035	REMP Optically Stimulated Luminescence	7
AP 07B-004	Offsite Dose Calculation Manual (REMP)	21
AP 07E-001	Validation of Meteorological Data	1

Condition Reports

29337	84764	84920	85428	85486
85494	85514	86521	87608	88198
88295	97943	10177	103808	

Audits, Self-Assessments, and Surveillances

<u>Number</u>	<u>Title</u>	<u>Date</u>
14-03-ENV	Quality Assurance Audit Report	April 24, 2014
16-03-ENV	Quality Assurance Audit Report	April 14, 2016
23869	WCNOC Audit Report of Environmental Inc. Midwest Laboratory	July 31, 2014

Calibration and Maintenance Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
15-401597-000	Channel Calibration of Wind Direction Meteorological Instrumentation	October 13, 2015
15-401598-000	Channel Calibration of Wind Speed Meteorological Instrumentation	October 12, 2015
15-401601-000	Channel Calibration of Sonic Wind Speed Direction Deviation Meteorological Instrumentation	October 15, 2015
15-408739-000	Channel Calibration of Sonic Wind Speed Direction Deviation Meteorological Instrumentation	April 14, 2016
15-408747-000	Channel Calibration of Wind Speed Meteorological Instrumentation	April 11, 2016
15-408753-000	Channel Calibration of 60M 10M Differential Temperature Instrumentation	April 13, 2016

Calibration and Maintenance Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
15-408750-000	Channel Calibration of Wind Direction Meteorological Instrumentation	April 12, 2016
	Digital Venturi Calibrator Serial Number 3302	February 3, 2016
	Digital Venturi Calibrator Serial Number 3302	January 21, 2015

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
QH-2014-0950	REMP Review of 2011 through 2013 Wind Direction	December 11, 2014
QH-2015-1115	REMP Review of 2012 through 2014 Wind Direction	July 23, 2015
RA-13-0099	Periodic Hydrogeological Review for Groundwater Protection Program	September 11, 2013
	2014 Annual Radiological Environmental Operating Report	April 23, 2015
	2015 Annual Radiological Environmental Operating Report	April 15, 2016

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

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AP-31A-100	Solid Radwaste Process Control Program	8
CKL-ZL-007	RadWaste Reading Sheets	24
CS-OP-PR-008	Setup and Operations of the Energy Solutions Self-Engaging Dewatering System Fill-head	4
CS-OP-PR-009	Ecodex Precoat/Powdex/Solka-Floc/Diatomaceous Earth/Zoelite Dewatering Procedure for the SEDS	2
CS-OP-PR-010	Bead Resin/Activated Carbon Dewatering Procedure for SEDS	3
HP-1406902	ZERO System Fundamentals	6
HW12155801	Regulations and Requirements Lesson Plan	12A
HW12155802	Regulatory Awareness for Hazardous Material Handlers Lesson Plan	0
HW8115901	Wolf Creek Hazardous Material Transportation Security Plan	4

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
LR-23-303-02	High Ammonia Chemistry Lesson Plan	0
MG-8306900	DTS Zero Skid for Maintenance	1
RPP-07-110	Solid Radwaste Processing	10
RPP-07-112	Processing Cartridge Filters	5
RPP-07-123	Preparation and Shipment of Radioactive Waste and Material	8
RPP-07-131	Bead Resin / Activated Carbon Dewatering Procedure for CNSI 14-215 or Smaller Liners	4
SYS-BG-207	Adding Chemicals to the Reactor Coolant System	30
TO1515901	Fill Head (SEDS) Installation and Operation	0

Condition Reports

84856	84863	86829	91086	91087
91089	91751	96453	96530	96759
97752	98340	98341	98630	101503
102344	102803	102820	102822	

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
14-01-RP/PC	Radiation Protection / Solid Radwaste Process Control Programs	April 22, 2014
16-01-RP/PC	Radiological Protection Process Control	February 24, 2016
14R52	Radioactive Material Shipping Record	December 9, 2014
15R45	Radioactive Waste Shipping Record	November 10, 2015
16R09	Radioactive Waste Shipping Record	December 11, 2016
342275001	Radioactive RCS Crud Filter Analysis	February 21, 2014
366240001	Radioactive Sample (DHUT) Analysis	February 24, 2015

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
39023003	Radioactive Scaling Factor (RCS Filters) Analysis	January 13, 2016
390235001	Radioactive Sample (SFP Filter) Analysis	February 25, 2016
	Miscellaneous Radioactive Material Shipping Training Records, Selected Individuals	May 24, 2016

Section 40A1: Performance Indicator Verification

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CHA RC-004	Gamma Isotopic, Total Curie Content and Dose Equivalent Iodine Determination	15
CHA RC-005	Determination of Gas Activity	9
CHS SJ-143B	RCS/CVCS/RHR Sampling At SJ-143 Panel	2
STS BB-006	RCS Water Inventory Balance Using the NPIS Computer	14

Condition Reports

105050

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
NEI 99-02	Regulatory Assessment Performance Indicator Guideline	7

Section 40A2: Identification and Resolution of Problems

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AP 15C-002	Procedure Use and Adherence	40
AP 15C-002	Procedure Use and Adherence	41
AP 26C-004	Operability Determination and Functionality Assessment	32
STN MA-001	Main Generator Hydrogen Leak Rate Test	16A
STN MA-001	Main Generator Hydrogen Leak Rate Test	17
STS IC-508A	Refueling Water Storage Tank Level Transmitter Calibration	6

Condition Reports

99351	100589	101215	104066	104184
104266	104268	104322	104323	104389
104390	104532	104694	104703	104712
104782	104801	104848	104910	104959
104960	105050	105307	105566	

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
16-04-OPS	Quality Assurance Audit Report (Operations)	June 8, 2016
STN MA-001	Main Generator Hydrogen Leak Rate Test	Completed May 22, 2016
STS EF-100B	ESW System Inservice Pump B & ESW B Check Valve Test	Completed May 5, 2016
STS IC-508A	Refueling Water Storage Tank Level Transmitter Calibration	Completed May 26, 2016
	Quality Oversight Report 1 st Quarter 2016	May 18, 2016
	Quality Oversight Report 4 th Quarter 2015	February 17, 2016

Section 40A3: Event Follow-Up

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AP 21G-001	Control of Locked Component Status	66A
AP 21G-001	Control of Locked Component Status	66B
AP 21G-001	Control of Locked Component Status	67
AP 21G-001	Control of Locked Component Status	69
GEN 00-002	Cold Shutdown To Hot Standby	95B
STS KJ-001	Integrated Diesel Generator and Safeguards Actuation Test – Train A	58
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	0
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	1
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	2
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	2A

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	3
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	3A
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	4
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	0
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	1
STS PE-010B	Control Room A/C System Flow Rate Verification A Train	2
STS PE-010B	Control Room A/C System Flow Rate Verification A Train	2A
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	3
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	4
SYS GT-121	Containment shutdown Purge System Operation	31
SYS GT-120	Containment Mini Purge System Operations	28

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-12GT01	Piping & Instrumentation Diagram Containment Purge Systems HVAC	20

Condition Reports

56214	58535	60099	78920	84690
92109	92274	95378	96131	102455
105208	105260	105540	105543	105546

Jobs

12-362198-002 13-373669-002 13-373669-006

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
2001-3149	Performance Improvement Request	December 18, 2001
2015-011	RER Reportability Determination	March 14, 2015
APF 21G-001-01	Log of Locked Component Manipulations	1

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
GK-M-001	Cooling and Heating Load Calculation for Control Room HVAC System Capabilities During Normal Plant Operation and Accident Condition-(SGK04A/B)	3
LER 05000482/2014-001-00	Failure to Comply with Required Action of Technical Specification 3.4.3 while Performing a Vacuum Fill of the Reactor Coolant System	March 6, 2014
LER 05000482/2014-004-00	Condition Prohibited by Technical Specifications due to an Instrument Tunnel Sump Level Indication Transmitter Incompatible with the Containment Environment	July 31, 2014
LER 05000482/2015-002-01	Two Control Room Air Conditioning Trains Inoperable Due to Failure to Meet Surveillance Requirement	August 26, 2015
LER 05000482/2015-004-00	Inadequate Procedure Results in Two Containment Isolation Valves being in a Condition Prohibited by Technical Specifications	July 1, 2015
LER 05000482/2015-004-01	Incorrect Decision Results in Two Containment Isolation Valves being in a Condition Prohibited by Technical Specifications	September 14, 2015
OE GK-12-017	Operability Evaluation	0
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed April 18, 2001
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed October 16, 2002
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed April 14, 2004
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed October 11, 2005
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed April 12, 2007
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed April 8, 2010
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed October 04, 2011
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed August 13, 2013

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed February 19, 2015
STS PE-010A	Control Room A/C System Flow Rate Verification A Train	Completed March 06, 2015
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed April 3, 2001
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed October 3, 2002
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed April 1, 2004
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed September 28, 2005
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed March 28, 2007
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed September 25, 2008
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed March 22, 2010
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed September 19, 2011
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed July 18, 2013
STS PE-010B	Control Room A/C System Flow Rate Verification B Train	Completed January 13, 2015
SYS GT-120	Containment Mini purge System Operations	Completed May 2, 2015
WC004976	Calibration Data Sheet	December 7, 2015
WCN-15-CA-CBV-001	Impact of ESW Pipe Chase on Control Building HVAC	2
WCN-15-CA-CBV-001	Impact of ESW Pipe Chase on Control Building HVAC	3

Section 40A5: Other Activities

Miscellaneous

Title

Documentation of Technique Demonstration Results

Section 40A7: Licensee-Identified Violations

Condition Reports

102344

**The following items are requested for the
Occupational/Public Radiation Safety Inspection
At Wolf Creek Nuclear Operating Center
(May 23 – June 23, 2016)**

Integrated Inspection Report 2016002

Inspection areas are listed in the attachments below.

Please provide the requested information on or before May 6, 2016.

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.05 should be in a file/folder titled "5- A," applicable organization charts in file/folder "5- B," etc.

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

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

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

If you have any questions or comments, please contact Martin Phalen at (817) 200-1158 or Martin.Phalen@nrc.gov.

Alternatively, you can contact Pete Hernandez at (817) 200-1168 or Pete.Hernandez@nrc.gov.

PAPERWORK REDUCTION ACT STATEMENT

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

1. Radiation Monitoring Instrumentation (71124.05)

Date of Last Inspection: June 2, 2014

- A. List of contacts and telephone numbers for the following areas:
 - 1. Effluent monitor calibration
 - 2. Radiation protection instrument calibration
 - 3. Installed instrument calibrations
 - 4. Count room and Laboratory instrument calibrations
- B. Applicable organization charts
- C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support and LERs, written since date of last inspection, related to:
 - 1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, or whole body counters
 - 2. Installed radiation monitors
- D. Procedure index for:
 - 1. Calibration, use, and operation of continuous air monitors, criticality monitors, portable survey instruments, temporary area radiation monitors, electronic dosimeters, teledosimetry, personnel contamination monitors, and whole body counters.
 - 2. Calibration of installed radiation monitors
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
 - 1. Calibration of portable radiation detection instruments (for portable ion chambers)
 - 2. Whole body counter calibration
 - 3. Laboratory instrumentation quality control
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:
 - 1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, whole body counters,
 - 2. Installed radiation monitors,
 - 3. Effluent radiation monitors
 - 4. Count room radiation instruments

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

- G. Offsite dose calculation manual, technical requirements manual, or licensee controlled specifications which lists the effluent monitors and calibration requirements.
- H. Current calibration data for the whole body counter's.
- I. Primary to secondary source calibration correlation for effluent monitors.
- J. A list of the point of discharge effluent monitors with the two most recent

calibration dates and the work order numbers associated with the calibrations.

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

2. Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

Date of Last Inspection: June 2, 2014

- A. List of contacts and telephone numbers for the following areas:
 - 1. Radiological effluent control
 - 2. Engineered safety feature air cleaning systems
- B. Applicable organization charts
- C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
 - 1. Radioactive effluents
 - 2. Engineered Safety Feature Air cleaning systems
- D. Procedure indexes for the following areas
 - 1. Radioactive effluents
 - 2. Engineered Safety Feature Air cleaning systems
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
 - 1. Sampling of radioactive effluents
 - 2. Sample analysis
 - 3. Generating radioactive effluent release permits
 - 4. Laboratory instrumentation quality control
 - 5. In-place testing of HEPA filters and charcoal adsorbers
 - 6. New or applicable procedures for effluent programs (e.g., including ground water monitoring programs)
- F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:
 - 1. Radioactive effluents
 - 2. Effluent radiation monitors
 - 3. Engineered Safety Feature Air cleaning systems

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.
- G. 2015 Annual Radioactive Effluent Release Report or the two most recent reports.
- H. Current Copy of the Offsite Dose Calculation Manual
- I. Copy of the 2015 inter-laboratory comparison results for laboratory quality control performance of effluent sample analysis, or the two most recent results.
- J. Effluent sampling schedule for the week of the inspection
- K. New entries into 10 CFR 50.75(g) files since date of last inspection
- L. Operations department (or other responsible department) log records for effluent monitors removed from service or out of service
- M. Listing or log of liquid and gaseous release permits since date of last inspection

- N. A list of the technical specification-required air cleaning systems with the two most recent surveillance test dates of in-place filter testing (of HEPA filters and charcoal adsorbers) and laboratory testing (of charcoal efficiency) and the work order numbers associated with the surveillances
- O. System Health Report for radiation monitoring instrumentation. Also, please provide a specific list of all effluent radiation monitors that were considered inoperable for 7 days or more since June 2, 2014. If applicable, please provide the relative Special Report and condition report(s).
- P. A list of all radiation monitors that are considered § 50.65/Maintenance Rule equipment.
- Q. A list of all significant changes made to the Gaseous and Liquid Effluent Process Monitoring System since the last inspection. If applicable, please provide the corresponding UFSAR section in which this change was documented.
- R. A list of any occurrences in which a non-radioactive system was contaminated by a radioactive system. Please include any relative condition report(s).

7. Radiological Environmental Monitoring Program (71124.07)

Date of Last Inspection: June 2, 2014

- A. List of contacts and telephone numbers for the following areas:
 - 1. Radiological environmental monitoring
 - 2. Meteorological monitoring
- B. Applicable organization charts
- C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
 - 1. Radiological environmental monitoring program (including contractor environmental laboratory audits, if used to perform environmental program functions)
 - 2. Environmental TLD processing facility
 - 3. Meteorological monitoring program
- D. Procedure index for the following areas:
 - 1. Radiological environmental monitoring program
 - 2. Meteorological monitoring program
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
 - 1. Environmental Program Description
 - 2. Sampling, collection and preparation of environmental samples
 - 3. Sample analysis (if applicable)
 - 4. Laboratory instrumentation quality control
 - 5. Procedures associated with the Offsite Dose Calculation Manual
 - 6. Appropriate QA Audit and program procedures, and/or sections of the station's QA manual (which pertain to the REMP)

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

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

- G. Wind Rose data and evaluations used for establishing environmental sampling locations
- H. Copies of the 2 most recent calibration packages for the meteorological tower instruments
- I. Copy of the 2015 Annual Radiological Environmental Operating Report and Land Use Census, and current revision of the Offsite Dose Calculation Manual, or the two most recent reports.
- J. Copy of the environmental laboratory’s inter-laboratory comparison program results for 2015, or the two most recent results, if not included in the annual radiological environmental operating report
- K. Data from the environmental laboratory documenting the analytical detection sensitivities for the various environmental sample media (i.e., air, water, soil, vegetation, and milk)
- L. Quality Assurance audits (e.g., NUPIC) for contracted services
- M. Current NEI Groundwater Initiative Plan and status
- N. Technical requirements manual or licensee controlled specifications which lists the meteorological instruments calibration requirements
- O. A list of Regulatory Guides and/or NUREGs that you are currently committed to relative to the *Radiological Environmental Monitoring Program*. Please include the revision and/or date for the committed item and where this can be located in your current licensing basis/UFSAR.
- P. If applicable, per NEI 07-07, provide any reports that document any spills/leaks to groundwater since the last inspection

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

Date of Last Inspection: June 2, 2014

- A. List of contacts and telephone numbers for the following areas:
 - 1. Solid Radioactive waste processing
 - 2. Transportation of radioactive material/waste
- B. Applicable organization charts (and list of all personnel involved in solid radwaste processing, transferring, and transportation of radioactive waste/materials)
- C. Copies of audits, department self-assessments, and LERs written since date of last inspection related to:

1. Solid radioactive waste management
 2. Radioactive material/waste transportation program
- D. Procedure index for the following areas:
1. Solid radioactive waste management
 2. Radioactive material/waste transportation
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
1. Process control program
 2. Solid and liquid radioactive waste processing
 3. Radioactive material/waste shipping
 4. Methodology used for waste concentration averaging, if applicable
 5. Waste stream sampling and analysis
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection related to:
1. Solid radioactive waste
 2. Transportation of radioactive material/waste

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

- G. Copies of training lesson plans for 49CFR172 subpart H, for radwaste processing, packaging, shipping,
- H. A summary of radioactive material and radioactive waste shipments made from date of last inspection to present. I. Waste stream sample analyses results and resulting scaling factors for 2014 and 2015, or the two most recent results.
- J. Waste classification reports if performed by vendors (such as for irradiated hardware)
- K. A listing of all onsite radwaste/RAM storage facilities. Please include a summary *or* listing of the items stored in each facility, including the *total* amount of radioactivity and the *highest* general area dose rate.

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

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