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

November 14, 2018

Mr. 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 DESIGN BASES ASSURANCE (TEAMS) INSPECTION REPORT 05000482/2018010

Dear Mr. Heflin:

On August 3, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Wolf Creek Generating Station. On August 2, 2018, the NRC team held an initial debrief of the results of this inspection with Mr. Jamie McCoy, Site Vice President, and other members of your staff. On October 1, 2018, a phone call was held with Mr. Steve Smith, Vice President, Engineering, and other members of the licensee staff, to clarify the characterization of the identified findings. On November 1, 2018, an additional phone call was held with Mr. Daljit Mand, Director, Engineering, and other members of the licensee staff, to revise the characterization of the identified findings. On November 13, 2018, a final exit phone call was held with Mr. Gabe Fugate, Director, Plant Support, and other members of the licensee staff, to identify changes to the inspection findings as a result of an enforcement policy review. The results of this inspection are documented in the enclosed report.

The NRC team documented four findings of very low safety significance (Green) and one licensee identified finding, in this report. These findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

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

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document

Room in accordance with 10 CFR 2.390, “Public Inspections, Exemptions, Requests for Withholding.”

Sincerely,

/RA/

Thomas R. Farnholtz, Chief
Engineering Branch 1
Division of Reactor Safety Sincerely,

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

Enclosure:
Inspection Report 05000482/2018010
w/ Attachment:
Supplemental Information

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000482
License Number:	NPF-42
Report Number:	05000482/2018010
Enterprise Identifier:	I-2018-010-0041
Licensee:	Wolf Creek Nuclear Operating Corporation
Facility:	Wolf Creek Generating Station
Location:	Burlington, KS 66839
Inspection Dates:	July 11, 2018 to August 3, 2018
Inspectors:	R. Kopriva, Senior Resident Inspector, Engineering Branch 1 F. Thomas, Resident Inspector, Branch B I. Anchondo, Reactor Inspector, Engineering Branch 2 A. Palmer, Senior Reactor Technology Instructor, Technical Training Center H. Leake, Contractor, Beckman and Associates J. Zudans, Contractor, Beckman and Associates
Approved By:	Thomas R. Farnholtz, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY

The Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an Integrated Inspection at Wolf Creek Generating Station in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. NRC-identified and self-revealed findings, violations, and additional items are summarized in the table below.

List of Findings and Violations

Failure to Follow Procedures			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000482/2018010-01 Closed	None	71111.21M
The team identified two examples of a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to follow procedures.			

Failure to Establish an Adequate Procedure for Operator Time Critical/Time Sensitive Actions Validation			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000482/2018010-02 Closed	None	71111.21M
The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to have an adequate Procedure. Procedure AI 21-016, "Operator Time Critical Actions Validation," Revision 14, Attachment B – "Time Sensitive Action List," does not have unique identifiers for cross referencing the records to the procedure.			

Failure to Correct Reoccurring Problems with Time Critical/Sensitive Action Activities			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000482/2018010-03 Closed	[P.4] – Problem Identification and Resolution, Trending	71111.21M
The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to correct reoccurring problems with Time Critical/Time Sensitive Action issues.			

Failure to Identify that the 125 VDC Equalizing Voltage had Exceeded Design Requirements			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000482/2018010-04 Closed	[H.13] – Human Performance, Consistent Process	71111.21M -
The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to verify or check the adequacy of design calculation NK-E-001, "125 Volt Direct-Current (VDC) Class 1E Battery System Sizing, Voltage Drop and Short Circuit Studies," Revision 4. The licensee failed to recognize that the actual 125 VDC Class 1E bus voltages had exceeded the maximum design limit voltages for downstream equipment identified in the calculation, and they had not placed any limits on voltages which could exceed the design limit of 140 VDC on the Class 1E System components.			

INSPECTION SCOPES

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

REACTOR SAFETY

71111.21M—Design Bases Assurance Inspection (Teams)

From July 16, 2018 to August 3, 2018, the team reviewed the following design attributes associated with risk-significant components, permanent plant modifications, and operating experience.

Component (6 Samples)

(1) Turbine Driven Auxiliary Feedwater Pump PAL02.
   a) Material condition of pump/turbine and pump room walkdown.
   b) Condition reports and maintenance activities associated with pump and turbine.
   c) Operating procedures for pump operation during a design bases loss-of-coolant accident coincident with a loss-of-offsite power.
   d) Pump testing procedures and test trends associated with in-service testing.
   e) System health, system descriptions, vendor technical manual and corrective action reviews.
   f) Engineering evaluations of pump non-conforming conditions.

(2) Shutdown RCP Seals.
   a) Material condition of seals, maintenance activities and corrective actions.
   b) Operating procedures for pump operation in support of FLEX conditions and conformance to requirements for sealing acceptability.
   c) Condition reports and maintenance activities associated with seals and seal package.
   d) FLEX strategies and their implementation at Wolf Creek and conformance to regulatory requirements.
   e) Reactor coolant pump seal test procedures, test results and test trends.
   f) Evolution of Generation III design and modification changes.

(3) Reactor Coolant Pump A Circuit Breaker PA0107.
   a) Design Basis documents.
   b) Current system health report.
   c) Selected drawings.
   d) Maintenance and test procedures.
   e) Condition Reports associated with the Reactor Coolant Pump Circuit

Breaker PA0107.
f) Component maintenance history and corrective action program reports.
g) Electrical distribution and system load flow/voltage drop calculations.

(4) 125 VDC Switchboard Bus NK41
a) Design basis documents.
b) Current system health report.
c) Selected drawings.
d) Maintenance and test procedures.
e) Condition Reports associated with the 125 Volts Direct Current (VDC) System Inverter Bus NK01.
f) Battery short circuit calculations, sizing calculations, coordination studies, voltage drop calculations, and switchboard maintenance activities were appropriate for the design of the system.
g) Input and output operating voltage characteristics to verify the NK41 switchboard and downstream components can perform their design function through all input voltage ranges.
h) Component maintenance history and corrective action program reports.
I) Preventive maintenance, inspection, and testing procedures for Class 1E 125 VDC System components.

(5) 13.8KV AC Bus PA01
a) Component maintenance history and corrective action program reports.
b) Load flow, voltage drop, and short circuit calculations.
c) Protective device selection and settings.
d) Procedures for preventive maintenance, inspection, and testing.
e) Material condition and configuration (i.e., visual inspection during a walkdown).

(6) 4160 VAC Bus NB02
a) Component maintenance history and corrective action program reports.
b) Load flow, voltage drop, and short circuit calculations.
c) Protective device selection and settings.
d) Procedures for preventive maintenance, inspection, and testing.
e) Equipment qualification specifications.
f) Adequacy of offsite power during design basis events.
g) Material condition and configuration (i.e., visual inspection during a walkdown).

<u>Component Large Early Release Frequency (LERF)</u> (1 Sample)

(1) Containment Isolation Valve EJHV8701A
a) Procedures and associated testing records for the containment and pressure isolation function.
b) Operating procedures for manual manipulation of EJHV8701A during accident conditions.
c) Component maintenance history and corrective action program reports.

<u>Permanent Plant Modification</u> <u>(4 Samples)</u>

(1) DCP 014893, “Switchgear Racking Mechanism Chain Repair,”
(2) DCP 015251, “Emergency Diesel Generator Exciter Power Potential Transformer Protection,”

(3) DCP 015214, “Essential Service Water - Water Hammer Vacuum Breaker Valves Spring Replacement,”
(4) DCP 015040, “Nitrogen Backup for EJHCV0606 and EJHCV0607,”
(5) DCP 014831, “Improved Reactor Coolant Pump Passive Shutdown Seal.”
(6) DCP 004637, “Residual Heat Removal Heat Exchanger Outlet Valve Nitrogen Backup Port.”
(7) DCP 015081, “New Residual Heat Removal Pressure Transmitter EJPIT0027 and NPIS Point.”

Operating Experience (1 Sample)

(1) NRC Generic Letter 2006-02, “Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power”

Evaluation of Inspection Related Operator Procedures and Actions

(1) Control room operator actions resulting from a simulated small break Loss of Coolant Accident.
    a) Control room crew was expected to implement procedures to address the loss of coolant accident and trip reactor coolant pumps when conditions were met.
    b) From the time when reactor coolant system pressure drops below setpoint and conditions are met the operators must take actions to secure reactor coolant pumps within five minutes.

(2) Control room operator actions resulted from a loss of coolant accident which emptied the reactor water storage tank water into containment sump.
    a) Control room crew was expected to implement procedures to address the empty reactor water storage tank and transfer the emergency core cooling system pumps from injection mode to cold leg recirculation mode.
    b) From the time the reactor water storage tank level reaches Lo Lo 1 setpoint the operators must take actions to transfer emergency core cooling system equipment from injection mode to cold leg recirculation within eight minutes nine seconds.

(3) Control room operator actions resulted from a loss of coolant accident which emptied the reactor water storage tank water into containment sump.
    a) Control room crew was expected to implement procedures to address the empty reactor water storage tank and transfer the remaining emergency core cooling system pumps from injection mode to cold leg recirculation mode.
    b) From the time the reactor water storage tanks level reaches Lo Lo 2 setpoint the operators must take actions to transfer remaining emergency core cooling system equipment from injection mode to cold leg recirculation within two minutes ten seconds.

(4) Control room operator actions resulted from a loss of component cooling water in one train with the emergency core cooling system pumps running.
    a) Control room crew was expected to implement procedures to address stopping the affected emergency core cooling system pumps during a loss of component cooling water cooling in a single train.
    b) From the time the component cooling water pumps are not running in a single train the operators must take actions to stop the affected emergency core cooling system pumps to prevent damage from loss of cooling within thirty minutes.

All operator action timings were completed on the simulator successfully.

INSPECTION RESULTS

Failure to Follow Procedures			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000482/2018010-01 Closed	None	71111.21M

Introduction:

The team identified two examples of a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to follow procedures.

Example 1

Description:

The team reviewed control room time critical and time sensitive activities which are used to validate design bases criteria. Without verification and validation of time critical/sensitive activities, the licensee would not be able to confirm that timing of design bases criteria would be met.

The team selected time critical and time sensitive, non-exempt tasks to be reviewed, which are identified in Attachments A and B of Procedure AI 21-016, "Operator Time Critical Actions Validation," revision 14. These nonexempt tasks are required to be validated at least once every five years. The team reviewed approximately forty nine records from 2013 to 2018, and found that when reviewing "Time Verification" Form AIF 21-016-02, Revision 1, most of the records provided had Block 2 and Block 3 filled out improperly. The errors included the blocks being empty or were filled out with insufficient information. Block 2 is the identification information to link the form back to the task in the Attachments A or B of the procedure. Block 3 is the reference information to show to how it was validated using other documents. Without correct information in Block 2, the licensee had difficulty demonstrating which task was validated. Without correct information in Block 3, the licensee had difficulty demonstrating under what conditions the task was validated, which calls into question the validity of the document. With some records left blank in Block 2 or Block 3 the licensee was left to determine how the task was validated using comments or assumptions. The team chose only nonexempt tasks to simplify the inspection. It was not clear from the records provided to the team that the licensee's program is being performed as required, and was not being performed as designated in the program procedures.

Corrective Actions: The licensee has acknowledged that the forms had not been filled out properly and that Procedure AI 21-016 had not been followed. The licensee has entered this concern into their corrective action program, and will review the concern of failure to follow station procedures.

Corrective Action Reference: Condition Report CR-00125356.

Example 2

Description:

During a review of Operability Evaluation OE-NK-18-005, dated July 26, 2018, the team questioned whether the downstream components from Class 1E 125 VAC Bus NK01 had been considered in the extent of condition of the evaluation. The operability evaluation did not address the downstream components, as Condition Report CR-00125361 only focused on the NK batteries and chargers, without regard for the downstream components. This does not comply with the licensee's procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 35. Section 6.1.2.1.a requires that operability determinations should include which structures, systems, and components (SSCs) are affected by the degraded or non-conforming condition. The operability determination performed for condition report CR-125361 failed to meet this requirement in that the components downstream of the NK buses had not been considered for overvoltage effects.

Corrective Actions: On August 1, 2018, the licensee completed the revised Operability Evaluation OE NK-18-005, to address the effect of the overvoltage condition on the downstream 125 VDC rated equipment. The licensee determined that reasonable assurance exists that the systems, structures, and components, associated with the operability evaluation remained capable of performing their specified safety function. The licensee has entered this concern into their corrective action program, and will review the concern of failure to follow station procedures.

Corrective Action Reference: Condition Report CR-00125487

Performance Assessment:

Performance Deficiency: The team determined that the licensee's failure to follow procedures (Procedure AI-21-016, "Operator Time Critical Actions Validation," Revision 14, and Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 35) was a performance deficiency.

Screening: The team determined the performance deficiency was more than minor because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, for Example 1: the licensee failed to complete Time Verification Form AIF 21-016-02, to accurately validate simulator time critical and time sensitive activities for control room and in plant activities. Without verification of time critical/sensitive activities, the licensee could not confirm the timing of design bases criteria would be met. For Example 2: the operability screening of Condition Report CR-00125361 for the 140 VDC design limit for 125 VDC System components having been exceeded only focused on battery banks NK11, NK12, NK13, NK14, and the battery chargers, but did not address the effects of overvoltage conditions on downstream equipment.

Significance: The team assessed the significance of the findings using NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued October 7, 2016. Using Exhibit 2, "Mitigating Systems Screening Questions," the team determined the findings to be of very low safety significance (Green) because the findings were a design or qualification deficiency that did not represent a loss of

operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather.

Cross-cutting Aspect: The team determined that the finding did not have a cross cutting aspect associated with it.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

Contrary to the above, prior to July 30, 2018, the licensee failed to accomplish activities affecting quality in accordance with station procedures. For Example 1; Procedure AI-21-016, "Operator Time Critical Actions Validation," Revision 14, contains Form AIF 21-016-02, "Time Verification Form," Revision 1. On AIF 21-016-02, Block 2 is the identification information to link the form back to the task in the Attachments A or B of the procedure. Block 3 is the reference information to show to how it was validated using other documents. On several the forms, Block 2 and Block 3 were not filled out correctly as required by the procedure. For Example 2; licensee Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 35, Section 6.1.2, states, in part, "that the scope of a Operability Determination must be sufficient to address the capability of systems, structures, and components to perform their specified safety functions." The operability screening of Condition Report CR-00125361 did not follow Procedure AP 26C-004, in that it did not address all of the capabilities of the component to perform its safety function as the effects of overvoltage conditions on downstream equipment were not analyzed.

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

Failure to Establish an Adequate Procedure for Operator Time Critical Actions Validation			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000482/2018010-02 Closed	None	71111.21M

Introduction:

The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to have an adequate Procedure. Procedure AI 21-016, "Operator Time Critical Actions Validation," Revision 14, Attachment B – "Time Sensitive Action List," does not have unique identifiers for cross referencing the records to the procedure.

Description:

The Design Basis Assurance inspection procedure 71111.21M, Section 03.01 b.2.b discusses operations margin and refers to components required to be operated during high risk and/or time critical operations. The team elected to review Procedure AI 21-016, "Operator Time Critical Actions Validation," Revision 14, to confirm that the licensee was performing design basis time critical and time sensitive actions for operations activities. The team identified a procedure deficiency in that Attachment B, "Time Sensitive Action List," did not have unique identifiers in task Block 2 similar to task Block 2 found in Attachment A. This lack of unique identifier prevents cross referencing the records for Time Sensitive Actions listed in Attachment B with the records documenting the required validation. Block 2 of Form AIF AI 21-016-02 would use this information to link the form back to the task in the procedure attachments to prove it had been validated.

As an example, in the Time Critical Action heading, each time critical action in Attachment A starts with a code "TCA_SLB_S1". Attachment B just has verbiage. The records that were provided were filled out with a variety of descriptions, usually not matching the description provided in the attachment. Without this unique information identifier, it was difficult to determine which task was validated, and at times impossible to determine what was being validated.

Corrective Actions: The licensee has acknowledged that Form AIF AI 21-016-02, Attachment B, "Time Sensitive Action List," did not have unique identifiers in task Block 2, and is in the process of reviewing the procedure to identify and correct deficiencies that may exist.

Corrective Action Reference: Condition Reports CR-00125536 and CR-00125350.

Performance Assessment:

Performance Deficiency: The team determined that the licensee's failure to have an adequate procedure with unique identifiers for the Time Sensitive Actions in Attachment B of Procedure AI 21-016 was a performance deficiency.

Screening: The team determined that the finding was more than minor because it was associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to have unique identifiers for the time sensitive actions so that records could be cross referenced to the procedure to document that the required tasks had been validated successfully.

Significance: The team assessed the significance of the finding using NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued October 7, 2016. Using Exhibit 2, "Mitigating Systems Screening Questions," the team determined the finding to be of very low safety significance (Green) because the finding was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather.

Cross-cutting Aspect: The team determined that this finding did not have a cross cutting aspect associated with it.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

Contrary to the above, prior to July 30, 2018, the licensee failed to include appropriate quantitative or qualitative acceptance criteria for determining that important activities had been satisfactorily accomplished. The licensee had failed to establish an adequate procedure for cross referencing Time Sensitive Actions listed in Attachment B with the records documenting the required validation. Specifically, Procedure AI 21-016, Attachment B – "Time Sensitive Action List," Revision 14, was inadequate in that each Time Sensitive Action did not have a unique identifier for cross referencing the records to the procedure. (Could not correlate which records were used to validate which task).

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

Failure to Correct Reoccurring Problems with Time Critical/Sensitive Action Activities			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000482/2018010-03 Closed	[P.4] – Problem Identification and Resolution, Trending	71111.21M

Introduction:

The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to correct reoccurring problems with completing Time Critical/Time Sensitive Action issues.

Description:

The team reviewed corrective actions associated with Procedure AP 21-04, "Operator Response Time Program," Revision 4B, and Procedure AI 21-016, "Operator Time Critical Actions Validation," Revision 14. The team found that during the five year cycle of the program, the licensee had identified multiple (approximately 18) deficiencies in the program (i.e. source document to the form is not consistently being utilized, several of the time critical actions in AI 21-016 have not been validated, time critical actions not submitted as required, time sensitive action program requires enhancement, operations time sensitive action cannot be satisfied, several operator time critical actions are not validated and could result in operating outside of analyzed limits.) The licensee's review pertaining to the identification of

the problems, and resolution of the issues had resulted in inadequate identification of reoccurring problems, and problem resolution. The concerns were also identification in a Mid Cycle Self-Assessment (CR-00085924), QA Audits (CR-00104699), and an NRC Component Design Basis Inspection (CR-00103698). The corrective actions derived to answer the concerns had not prevented the problems from reoccurring. The licensee had addressed the concerns in eighteen different condition reports dating back to 2013.

The team found that over the last five years, the corrective actions taken by the licensee for the deficiencies and deviations in the Operator Time Critical Action Validations were ineffective.

Corrective Actions: The licensee has acknowledged that the corrective actions for these issues had not resolved the issues. The licensee has entered this concern into their corrective action program, and will be reviewing the issues.

Corrective Action Reference: Condition Report CR-00125533.

Performance Assessment:

Performance Deficiency: The licensee's failure to promptly identify and correct deficiencies with the validation of Time Critical and Time Sensitive Actions, as required by 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was a performance deficiency.

Screening: The team determined the performance deficiency was more than minor because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the licensee did not recognize that they had failed to correct reoccurring deficiencies concerning validation of Time Critical/Time Sensitive Actions over the last five years, which could lead to inaccurate design bases assumptions or incorrect operator actions.

Significance: The team assessed the significance of the finding using NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued October 7, 2016. Using Exhibit 2, "Mitigating Systems Screening Questions," the team determined the finding to be of very low safety significance (Green) because the finding was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather.

Cross-cutting Aspect: The team determined that this finding had a cross cutting aspect in the area of Problem Identification and Resolution, Trending, where the organization periodically analyzes information from the corrective action program and other assessments in the aggregate to identify programmatic and common cause issues. The licensee failed to recognize reoccurring concerns pertaining to time critical action, even after these issues had been identified in self-assessment and Quality Control audits. [P.4]

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action", states, in part, "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, defective materials and equipment, and nonconformances, are promptly identified and corrected."

Contrary to the above, since May 2012 until August 1, 2018, the licensee failed to assure that conditions adverse to quality, such as failures, deficiencies, and nonconformances, are promptly identified and corrected. Specifically, the licensee had identified multiple (approximately 18) deficiencies with Time Critical and Time Sensitive Actions and the corrective actions had been inadequate to correct the conditions, even after these issues had been identified in self-assessment and Quality Control audits.

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

Failure to Identify 125 VDC Equalizing Voltage Exceeded Design Requirements			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000482/2018010-04 Closed	[H.13] – Human Performance, Consistent Process	71111.21M -

Introduction:

The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to verify or check the adequacy of design calculation NK-E-001, "125 Volt Direct-Current (VDC) Class 1E Battery System Sizing, Voltage Drop and Short Circuit Studies," Revision 4. The licensee failed to recognize that the actual 125 VDC Class 1E bus voltages had exceeded the maximum design limit voltages for downstream equipment identified in the calculation, and they had not placed any limits on voltages which could exceed the design limit of 140 VDC on the Class 1E System components.

Description:

One of the components the team selected to inspect was the 125 VDC Switchboard Bus NK41. The Wolf Creek Updated Safety Analysis Report, Section 1.2.7.2 states that vital alternating current instrumentation and control power supply systems include battery systems, static inverters, and distribution panels. All of the voltages listed in that section of the updated safety analysis report are nominal values, and all electrical Class IE equipment is designed to accept the expected range in voltage. As part of the review for this component, the team reviewed design calculation NK-E-001, "125 Volt Direct-Current (VDC) Class 1E Battery System Sizing, Voltage Drop and Short Circuit Studies," Revision 4. During the review of the calculation, the team identified concerns with the validation of certain criteria specified in the calculation.

The team noted that procedure MPE E050Q-05, "Battery Equalizing Procedure," Revision 14, references a battery equalizing voltage range of 139.5 to 140 VDC for the 125 VDC batteries (NK11, NK12, NK13, and NK14); and procedure STS NB-005, "Breaker Alignment Verification," Revision 34, Appendix B, references a required voltage range of 130 to 140 VDC for the Class 1E 125 VDC electrical distribution buses NK01, NK02, NK03, and NK04.

The team identified that design calculation NK-E-001 lists several components with maximum voltage limits that are less than the maximum voltages of 140 VDC. The team requested voltage data during the time that the battery equalize charging was in progress. The licensee provided the team data measurements that had been taken between April 10, 2018 and April 18, 2018. The data indicated that the actual NK01 bus voltage exceeded the 140 VDC procedure and calculation limit (up to 143 VDC for approximately 20 minutes during NK11 battery equalize charging). The team identified periods when components downstream of the Class 1E 125 VDC electrical distribution buses (with design limits less than 140 VDC) had been exposed to voltages that exceeded maximum design values for components listed in design calculation NK-E-001. The licensee did not have an analysis to address the concern pertaining to whether the equipment downstream of the NK01 bus could withstand voltages that exceeded design limits. Also, Procedure MPE E050Q-05 references a maximum equalizing voltage of 140 VDC for the battery banks.

According to licensee systems engineering personnel, this condition would only be expected during battery equalize charging activities. Section 7.2 of procedure MPE E050Q-05 requires that battery terminal voltage is measured and that potentiometer adjustments be made to obtain equalize values given in the table for equalize voltage range, but there were no steps that prohibited exceeding the 140 VDC maximum value. Furthermore, procedure STS NB-005, “Breaker Alignment Verification,” does not reference any specific steps to ensure that the 140 VDC voltage limit would not be exceeded. Neither of the procedures referenced identify any actions to be taken when the voltage limit is exceeded.

Corrective Actions. On August 1, 2018, the licensee completed Operability Evaluation OE NK-18-005, to address the effect of the overvoltage condition on the 125 VDC battery, battery charger, and equalizer. The licensee determined that reasonable assurance exists that the systems, structures, or components associated with the operability evaluation remained capable of performing their specified safety function. According to updated information in Condition Report CR-00125361, a procedure change request (PCR) was initiated to add battery voltage monitoring to procedure MPE E050Q-05 to ensure maximum voltage values are not exceeded. Furthermore, updated information in Condition Report CR-00125468, indicated that an action was initiated to review previous performance of NK buses to determine the historical amount of overvoltage that may have occurred.

Corrective Action References: Condition Reports CR-00125361 and CR-00125468.

Performance Assessment:

Performance Deficiency: The licensee’s failure to verify or check the adequacy of design calculation NK-E-001, “125 Volt Direct-Current (VDC) Class 1E Battery System Sizing, Voltage Drop and Short Circuit Studies,” Revision 4, was a performance deficiency.

Screening: The team determined the performance deficiency was more than minor because it was associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to verify or check the adequacy of design calculation NK-E-001, “125 Volt Direct-Current (VDC) Class 1E Battery System Sizing, Voltage Drop and Short Circuit Studies,” Revision 4, regarding maximum allowed Class 1E 125 VDC voltage, and procedures involving Class 1E 125 VDC system components. There had been periods of time when components downstream of the Class 1E 125 VDC electrical distribution buses

(with design limits less than 140 VDC) had been exposed to voltages that exceeded maximum design values. Furthermore, procedure STS NB-005, "Breaker Alignment Verification," does not reference any specific steps to ensure that the 140 VDC voltage is not exceeded, and none of the procedures reference any actions to take when the voltage limit is exceeded.

Significance: The team assessed the significance of the finding using NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued October 7, 2016. Using Exhibit 2, "Mitigating Systems Screening Questions," the team determined the finding to be of very low safety significance (Green) because the finding was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather.

Cross-Cutting Aspect: The team determined that this finding had a crosscutting aspect in the area of Human Performance, Consistent Process, where Individuals use a consistent, systematic approach to make decisions. Risk insights are incorporated as appropriate. Specifically, the licensee did not use a consistent, systematic approach for reviewing components downstream of the battery chargers for overvoltage conditions as identified in the design basis calculation. [H.13]

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program."

Contrary to the above, prior to August 1, 2018, the licensee failed to verify or check the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Specifically, the licensee failed to verify or check the adequacy of design calculation NK-E-001, Revision 4, "125 Volt Direct-Current (VDC) Class 1E Battery System Sizing, Voltage Drop and Short Circuit Studies," and procedures involving Class 1E 125 VDC system components, by not recognizing that the actual 125 VDC Class 1E bus voltages had exceeded the maximum design limit voltages for downstream equipment identified in design calculation NK-E-001. Also, the licensee had not placed any voltage limits in any procedures for the 125 VDC Class 1E System which had actually exceeded the design limit of 140 VDC.

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

Licensee-Identified Non-Cited Violation	71152—Problem Identification and Resolution
This violation of very low safety significance was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.	
Violation: Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," states, in part, "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected." Contrary to the above, prior to 2015, the licensee failed to promptly identify and correct a repetitive deficiency or nonconformance. Specifically, the licensee had identified a leaking flange on the residual heat removal heat exchanger since 1997. Prior to 1997 a different data base had been used to record boric acid leakage, and the data was not available during the inspection. Over the years since plant startup, the licensee had been diligent in completing boric acid evaluations on the leaking residual heat removal heat exchanger flange, indicating minimal wastage of the flange closure studs and nuts that had been subjected to boric acid. Corrective actions included cleaning up the boric acid leakage, and checking or re-torqueing the closure nuts. These measures did not correct the problem of the leaking heat exchanger flange. In 2015 the licensee completed an in-depth engineering evaluation of the leaking flange, including discussions with the heat exchanger manufacturer. New corrective measures included changing the torque values on the closure studs and nuts. The licensee is still evaluating the results of the corrective actions taken to preclude further leakage. Significance/Severity Level: The team assessed the significance of the finding using NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued October 7, 2016. The team concluded the finding was of very low safety significance (Green) because all questions in Exhibit 2 could be answered no. Corrective Action Reference(s): Condition Reports CR-00057242, CR-00057267, and CR-00125123.	

EXIT MEETINGS AND DEBRIEFS

On August 2, 2018, the team presented the initial results of this design basis assurance inspection to Mr. Jamie McCoy, Site Vice President, and other members of the licensee staff. On October 1, 2018, a phone call was held with Mr. Steve Smith, Vice President, Engineering, and other members of the licensee staff, to clarify the characterization of the identified findings. On November 1, 2018, an additional phone call was held with Mr. Daljit Mand, Director, Engineering, and other members of the licensee staff, to revise the characterization of the identified findings. On November 13, 2018, a final exit phone call was held with Mr. Gabe Fugate, Director, Plant Support, and other members of the licensee staff, to identify changes to the inspection findings as a result of an enforcement policy review. The team verified no proprietary information was retained or documented in this report.

DOCUMENTS REVIEWED

Calculations

Number	Title	Revision
A-06-W	Thermal Capability of Electrical Penetration Assemblies (EPA) Versus Dual Short Circuit Protection to Satisfy Reg. [Regulatory] Guide 1.63	007
H-06	Protective Relays	10
H-08	System NB Protective Relays	5
H-15	Provide RCPM Protective Relay Settings (Class 1E) for UV & UF	4
NK-E-001	125 VDC Class 1E Battery System Sizing, Voltage Drop and Short Circuit Studies	4
NN-E-001	Class 1E NN Inverter Loading	0
P-009A-010-CN001	Piping Stress Analysis for Essential Service Water System, Train B	June 20, 2017
PK-E-001	Non-Class 1E 125 Volt DC System	3
WCN-023-CALC-001	Transient water hammer analysis of the essential service water system following a LOOP with a higher setpoint for the vacuum breakers at the top of the loop.	1
XX-E-006	AC System Analysis	8

Condition Reports (CR-)

00056641	00077640	00098218	00106993	00118952
00057242	00077791	00098844	00107885	00118954
00057267	00077792	00099349	00107915	00119043
00069540	00077794	00099930	00109450	00119167-01
00070051	00082790	00099956	00109656	00120213
00070256	00085924	00099993	00109733	00121267
00070380	00088577	00100863	00109893	00121828
00070718	00088665	00101289	00110094	00122600
00071246	00091857	00101942	00110420	00123328

Condition Reports (CR-)

00071977	00092106	00102416-01	00110546	00123329
00072165	00092324	00103150	00111571	00123660
00072426	00093748	00103658	00112981	00123843
00072496	00093748	00103698	00116051	00123902
00073206	00094365	00103918	00116852	00123908
00073240	00094366	00104699	00117311	00124694
00073244	00094627	00105147	00117441	00124822
00073443	00097769	00105480	00117639	00124997
00073445	00098177	00106923	00118853	

Condition Reports Generated During the Inspection (CR-)

00125081	00125166	00125310	00125413	00125489
00125111	00125183	00125350	00125414	00125490
00125112	00125184	00125356	00125447	00125492
00125123	00125191	00125361	00125456	00125513
00125136	00125225	00125362	00125457	00125521
00125139	00125227	00125370	00125458	00125533
00125152	00125255	00125405	00125468	00125536
00125158	00125255a	00125406	00125487	00125557

Design Change Packages

Number	Title	Revision Date
014831	Improved RCP Passive Shutdown Seal	0
015040	Nitrogen Backup for EJHCV0606 and EJHCV0607	01
015070	NN Power to GK Damper	0
015081	New RHR Pressure Transmitter EJPIT0027 and NPIS [Nuclear Plant Information System] Point	0

Design Change Packages

Number	Title	Revision Date
015214	ESW Water Hammer Vacuum Breaker Valves Spring Replacement	0
14923	Restore Regulatory Compliance for 10 480 V MOVs	0
CCP 11897	Transformer XNB02 Tap Change	2
DCP 13271	Turbine Trip Wiring Changes in Support of DCP 011354	1
FCN 015251	EDG Exciter Power Potential Transformer Protection	1
MCP 14893	Switchgear Racking Mechanism Chain Repair	0
PMR 04637	RHR Heat Exchanger Outlet Valve Nitrogen Backup Port	0

Drawings

Number	Title	Revision
5736	Vertical Residual H.E. Outline Drawing	5
5739	Vertical Residual Heat Exchanger Details	3
5740	Vertical Residual Heat Exchanger Details	4
E-009B-00025	Breaker Schematic G.E. 13.8KV	W02
E-02PA01	Logic Diagram, Unit Auxiliary Source 13.8kV Bus Feeder Breakers	4
E-11001	Main Single Line Diagram	11
E-11005	List of Loads Supplied by Emergency Diesel Generator	58
E-11010	DC [Direct Current] Main Single Line Diagram	11
E-11010	DC [Direct Current] Main Single Line Diagram	11
E-11010A	DC [Direct Current] Main Single Line Diagram (PK03 And PK04 Bus)	05

Drawings

Number	Title	Revision
E-11010A	DC [Direct Current] Main Single Line Diagram (PK03 And PK04 Bus)	05
E-11023	Relay Setting Tabulation & Coordination Curves System NB	10
E-11030	Relay Setting Tabulation RCPM UV & UF Monitors	8
E-11032	Substation and Plant Transformer Tap Settings	5
E-11MA01	Main Generator Single Line Metering and Relaying Diagram	33
E-11NB02	Lower Medium Voltage Sys. Class 1E 4.16 kV Single Line Meter and Relay Diagram	10
E-11PA01	Higher Medium Voltage System 13.8 kV Single Line Meter & Relay Diagram	13
E-11PK01	Non-Class 1E 125V System Meter & Relay Diagram	13
E-12NF01	Load Shedding and Emergency Load Sequencing Logic	4
E-13BB01	Schematic Diagram Reactor Coolant Pumps	18
E-13N03	Schematic Diagram RHR Pump MOV	8
EID-0004	Pool Parameters	3
IP-M-18EF13-010-A-1	Hanger Details Small Pipes, Essential Water System	0
KD-7496	One Line Diagram	67
KD-7496A	Distribution System Equipment Lineup Limitations	10
KL-1909	Logic Block Diagram, Load Shedding & Emergency Load Sequencing System (LSELS)	E
M-018-00077	Electrical Schematic Diesel Gen. [Generator] Control NE107	W01
M-018-00077	Electrical Schematic Diesel Gen. [Generator] Control NE106	W20
M-018-00301	Interconnection Wiring Diagram (NE107)	W08

Drawings

Number	Title	Revision
M-12BB01	Piping & Instrumentation Diagram Reactor Coolant System	37
M-12BB04	Piping & Instrumentation Diagram Reactor Coolant System	24
M-12EF01	Piping and Instrumentation Diagram, Essential Service Water System	29
M-12EF02	Piping and Instrumentation Diagram, Essential Service Water System	42
M-12EJ01	Piping & Instrumentation Diagram Residual Heat Removal System	55
M-12E-J01	P&ID, Residual Heat Removal System	52
M-12EM01	Piping & Instrumentation Diagram High Pressure Coolant Injection System	45
M-12EP01	Piping & Instrumentation Diagram Accumulator Safety Injection	16
M-223F-00003	CRISPIN Model VR-41 Model Relief Check Valve Flanged Ends Size 4 Fig. 150 - VR	W04
M-724-00761	Motor Operated Gate Valve	6
WIP-J-110-00660-W11-A-1	Wiring Diagram Termination Area Rack HF187A Separation Group 5	00
WIP-J-110-00671-W10-A-1	Rack HF187A & 187B Loading Standardized Nuclear Unit Power Plant System Applicable to Unit 1, Bechtel P.O. 10466-J-110-1	00
WIP-J-110-01026-000-A-1	Instrument Loop Diagram Residual Heat Removal System RHR Pump Discharge Header Pressure	00
WIP-J-14EJ08-002-A-1	Instrument Isometric Drawing RHR [Residual Heat Removal] HX [Heat Exchanger] 1B to ACCUM [Accumulator] INJ [Injection] LP [Loop] 3 & 4	00
WIP-J-17P39-000-A-1	Instrument Mounting Detail Pressure Transmitter (Rosemount) Packed Manifold	01
WIP-M-12EJ01-053-A-1	Piping and Instrumentation Diagram Residual Heat Removal System	00
WIP-M-13EJ10-002-A-1	Schematic Diagram Instrumentation	00

Procedures

Number	Title	Revision
18-0022	Essential Reading – LBLOCA HL Break	0
AI 16C-006	Troubleshooting	8
AI 16C-007	Work Order Planning	56
AI 16F-001	Evaluation of Boric Acid Leakage	10
AI 21-016	Operator Time Critical Actions Validation	14
AI 23O-001	Functional Importance Determination	7
AI 26C-004	Technical Specification Application for Containment Isolation Valves	7
AI 26C-004	Technical Specification Application for Containment Isolation Valves	7A
AI 28A-010	Screening Condition Reports	29A
AI 28A-010	Screening Condition Reports	21
AI 28A-100	Condition Report Resolution	14
AI 28B-005	Evidence and Action Matrix	4
AI 30B-005	Development and Conduct of Simulator Activities for Licensed Operator Training	31
AI 30B-015	Licensed Operator Requalification Examination Guidelines	12
ALR 501	Standby Diesel Engine System Control Panel KJ-121	28
AP 05-002	Disposition and Change Packages	30
AP 05-002	Disposition and Change Package	30
AP 05-005	Design, Implementation and Configuration Control of Modifications	22
AP 05-005	Design, Implementation and Configuration Control of Modifications	22, 26

Procedures

Number	Title	Revision
AP 05-013	Review of Vendor Technical Documents	8
AP 05-013	Review of Vendor Technical Documents	8
AP 05-024	Minor Change Package	0
AP 05C-004	Basic Engineering Dispositions	0, 1
AP 15C-001	Procedure Writers Guide	31
AP 15C003	Procedure Users Guide for Abnormal Plant Conditions	37
AP 16C-006	MPAC Work Request/Work Order Process Controls	21A
AP 16F-001	Boric Acid Corrosion Control Program	9
AP 20E-001	Industry Operating Experience Program	27
AP 21-001	Conduct of Operations	82
AP 21-004	Operator Response Time Program	4B
AP 21A-002	Diverse and Flexible Coping Mitigation Strategies (FLEX) Program	2
AP 21C-001	Wolf Creek Substation	21
AP 22A-001	Screening, Prioritization and Pre-Approval	22
AP 26A-003	10 CFR 50.59 Reviews	14
AP 26C-004	Operability Determination and Functionality Assessment	35
AP 28-001	Operability Evaluations	25
AP 28-007	Nonconformance Control	10
AP 28-011	Resolving Degraded or Nonconforming Conditions Impacting SSCs	7
AP 28A-100	Corrective Action Program	23

Procedures

Number	Title	Revision
AP 28A-100	Corrective Action Program	22
BD EMG E-0	Reactor Trip of Safety Injection	28
BD EMG E-1	Loss of Reactor or Secondary Coolant	19
BD EMG E-2	Faulted SG Isolation	14
BD EMG ES-12	Transfer to Cold Leg Recirculation	16
EMG E-0	Reactor Trip or Safety Injection	39A
EMG E-1	Loss of Reactor or Secondary Coolant	29
EMG E-2	Faulted SG Isolation	22
EMG ES-12	Transfer to Cold Leg Recirculation	23
EMG FR-C2	Response to Degraded Cooling	17
EMG FR-P1	Response to Imminent Pressurized Thermal Shock Conditions	22
IP-ENG-001	Standard Design Process	0
KMS-4	Mechanical Standard for Bolting	4
KMS-6	Fastener Specification for Use at the Wolf Creek General Station in Both ASME and Non-ASME/ANSI	3
M-10EJ	System Description Residual Heat Removal	4
MPE E009-01	Siemens Breaker Cubicle Maintenance, Testing, and Swapping	6
MPE E009Q-01	13.8 kV and 4.16 kV Switchgear Inspection and Testing	35
MPE E009Q-01	13.8 KV And 4.16 KV Switchgear Inspection and Testing	33A
MPE E009Q-01	13.8 KV And 4.16 KV Switchgear Inspection and Testing	35

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Number	Title	Revision
MPE E050Q-05	Battery Equalizing Procedure	14
MPM M712Q-01	Reactor Coolant Pump Seal Removal/Installation	25
MPM M712Q-02	Reactor Coolant Pump Seal Cartridge Inspection/Rebuild	10
OFN BB-005	RCP Malfunctions	27
OFN BB-005	RCP Malfunctions	28
OFN EG-004	CCW System Malfunctions	18B
OFN EG-004	CCW System Malfunctions	18B
PWROG-14006-P	Implementation Guide for Generation III Westinghouse Seal	0-B
PWROG-16030-NP	Time Critical Action/Time Sensitive Action Program Standard PA-PSC-0840	August, 2016
Record of Completion	Flex Support Guideline (FSG) Validation Process	2
STN EJ-205	RHR System Valve Test	5
STN TCA-001	Manual Time Critical Action Timing	5
STS AL-103	TDAFW Pump Inservice Test	73
STS AL-104	TDAFW ESF Response Time Test	24
STS AL-211	TDAFW Comprehensive Pump Testing and System Flow Path Verification and Inservice Check Valve	37
STS BB-207	RCP Seal Water Injection Inservice Check Valve Test	8
STS BN-208A	RWST to RHR Pump A Suction Valve Test	3A
STS BN-208B	RWST to RHR Pump B Suction Valve Test	3A
STS IC-740A	RHR Switchover to Recirculation Sump Test – Train A	31

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Number	Title	Revision
STS IC-740B	RHR Switchover to Recirculation Sump Test – Train B	28C
STS IC-805B	Channel Calibration of NB02 Grid Degraded Voltage, Time Delay Trip	16
STS IC-902A	Actuation Logic Test Train A Residual Heat Removal Suction Isolation Valves	4A
STS MT-019A	125 VDC Class 1E Quarterly Inspection For NK11 and NK13 Batteries	1B
STS MT-028	Penetration Breaker Inspection	25
STS MT-028	Penetration Breaker Inspection	26
STS MT-079	ESW System Water Hammer Inservice Check Valve Test	2
STS NB-005	Breaker Alignment Verification	34
STS NB-005	Breaker Alignment Verification	35
STS PE-007	Periodic Verification of Motor Operated Valves	5
STS PE-19B	RHR Suction Valve Leak Test	23
STS VT-001	Verification of OMN-1, MOV Exercise Requirements	5
SYS NB-200	Transferring XNB01 Supply Between SL7 and #7 Transformer	19
SYS NK-331	De-energizing NK Buses	18
TSO 0101-21	Division of Responsibility of the Wolf Creek Substation	July 13, 2018
TSO 0400-02	Wolf Creek 345 kV Bus Voltage	April 30, 2018
TSO 0414-02	Monitoring Wolf Creek Contingency Study 345 kV Bus	April 30, 2018
WCAP-16755-NP	Operator Time Critical Action Program Standard	Rev. 0

Vendor Technical Document

Number	Title	Revision Date
6998D62	Colt Industries Type “WNR” Volt Reg. [Voltage Regulation] & Excitation System	January 17, 1983
E-009-00223	Instruction Manual for 13.8 kV Switchgear	W33
E-009-00242	Instruction Manual for 4.16 kV Class 1E Switchgear	W31
E-009-00258	IEEE 323 Qualification Program General Electric Co.	July 2, 1984
E-009-00342	Metal-Clad Switchgear	W09
E-009B-00001	Qualification Plan for Siemens 5-AF-GER-350-1200-78 and 5-3AF-GER-350-2000-78	W05
E-009B-00006	Third Party Qualification Plan for Siemens 52STA Switch Mechanisms	W01
E-009B-00009	Instruction Manual for Siemens Type 3AF-GER Vertical Lift Direct Replacement Circuit Breakers	W06
E-009B-00018	Third Party Qualification Report for Siemens Types 5-3AF-GER-350-1200-78 and 5-3AF-GER-350-2000-78 Vertical Lift Vacuum Circuit Breakers and 52STA Switch Mechanisms	W01
E-009B-00029	Siemens Vacuum Circuit Breakers (Vehicle)	W02
E-009B-00029	Siemens Circuit Breakers (Vehicle) Type GER 5kV to 15kV	
E-009B-00044	Siemens Type-3AFS Vacuum Circuit Breakers	W01
E-009B-00044	Siemens Type-3AFS Vacuum Circuit Breakers	W01
E-020-00055	Installation and Maintenance Instructions – AV-Line Switchboards (GEH-2621C)	
E-020-00055	Instructions (GEH-3042A) – Mounting and Connecting Hardware for QMR Double Branch Panelboard Units, 30-100 Amperes	
E-020-00055	Instructions (GEH-3043) – Mounting and Connecting Hardware for QMR Double Branch Panelboard Units, 30-600 Amperes	
E-050A-00011	Lucent Technologies Lineage 2000 Round Cell Battery	W03

Vendor Technical Document

Number	Title	Revision Date
M-021-00061	Instruction Manual for Auxiliary Feedwater Pumps	W29
M-072-00024	Operation/Maintenance for Cooling Water Heat Exchangers	W07
M-072-00052	Instruction Manual for Auxiliary Heat Exchangers	W11
M-223F-00003	Crispin Model VR-41 Model Relief Check Valve Flanged Ends Size 4 Fig. 150 - VR	W04
M-712-00068	Instruction Manual for Reactor Coolant Pump	W38
WIP-M-223F-00004-W01-A-1	Crispin Mode VR-41 Relief Check Valve Flanged Size 4 150 LB Carbon Steel With Resilient Seat.	W02

Work Orders (WO)

02-242150-013	12-359883-000	13-381325-001	15-399466	16-420373-000
05-273137-002	13-364867-000	13-381325-002	15-399467	16-420373-001
05-277630	13-376820-000	14-385969-000	15-401047-002	17-421126-000
07-295699	13-376820-000	14-385969-001	15-401047-005	17-423640-000
12-357898	13-376820-005	14-394162	15-404075-000	17-434455-000
12-357899	13-376846-000	15-396644-000	15-404395-000	17-434455-001
12-359817-000	13-381325-000	15-398783	15-409923-001	

Miscellaneous

Number	Title	Revision Date
	NERC Interface Coordination Agreement for the Wolf Creek Substation	April 28, 2018
015214	Applicability Determination	01
015214	50.59 Screen	01
07381	Gaskets and Bolting Change Package	1

Miscellaneous

Number	Title	Revision Date
14831	Applicability Determination	0
14831	10CFR 50.59 Screening	0
15040	Applicability Determination	0
15040	10 CFR 50.59 Screening	0
17-00365	Wolf Creek Generating Station, Unit 1 Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation Related to Orders EA-12-049 and EA-12-051	August 2, 2017
59 2012-0003	DCP 14016 10 CFR 50.59 Evaluation	0
BED for CR 46330 Rev. 1	Evaluation of Voids in Suction Piping for Auxiliary Feed Water Pumps	1
BED for SWO 15-401047-002 and 15-401047-005	Expected Life Evaluation for ESW Vacuum Breaker Valves	March 10, 2016
E-009	Technical Specification for Metal-Clad Switchboard	8
E-020	Technical Specification for DC Distribution Switchboards for the Standardized Nuclear Unit Power Plant System (SNUPPS)	08
E-020	Specification: DC Distribution Switchboards	09
E-058	Technical Specification for 600 Volt Single & Multiple Conductor Copper Power Cable for Wolf Creek Nuclear Operating Corporation	13
E-10NB	System Description, Lower Medium Voltage System—4.16 kV (Class 1E Power System	0
E-10NE	System Description, Standby Power Supply System	1
E-10NF	System Description, Load Shedding and Emergency Load Sequencing	1
E-10NK	System Description for 125-Volt DC System (Class 1E Power System)	07

Miscellaneous

Number	Title	Revision Date
E-10PA	System Description, Higher Medium Voltage System—13.8 kV (Non-Class 1E Power System)	0
E-10PA	System Description for Higher Medium Voltage System – 13.8 KV (Non-Class IE Power System)	00
EFV0482	IST Basis Report for Valve EF V0482	N/A
EFV0484	IST Basis Report for Valve EF V0484	N/A
EMG C-12	LOCA Outside Containment	15
ET-17-0003	Docket no. 50-482: Wolf Creek Nuclear Operating Corporation's Compliance Report for the Implementation of Order EA-12-049	January 19, 2017
FD-SL-01-WC	Functional Description, Auxiliary Power System	5
LR1400302	Reactor Coolant Pumps (RCP)	0
LTR-RES-13-108	Input to an Operability Determination Associated with the Shutdown Seal (SDS) Failure to Actuate During Post-Service Testing	0
M-021-00061	Instruction Manual For Auxiliary Feedwater Pumps	W29
M-10AL	Auxiliary Feedwater System, System Description	0
M-10BB	Reactor Coolant System	04
M-10BB	System Description for Reactor Coolant Systems	04
M-10EF	System Description Essential Service Water System	12
M-712-00210	Use of Westinghouse Shield Passive Shutdown Seal for Flex Strategies	1
MGE LT-006	Maintenance of Limotorque Valve Operators Type SMB-0 Thru 4	9
NEI 12-06 [Rev 5]	Diverse and Flexible Coping Strategies (FLEX) Implementation Guide	5
NEI 16-07	Improving the Effectiveness of Issue Resolution to Enhance Safety and Efficiency	0

Miscellaneous

Number	Title	Revision Date
NK	System Health Report for 125 VDC (1E)	(July 1, 2017 – December 31, 2017)
NRC Final Safety Evaluation Report	Topical Report WCAP-17100-P/NP, REVISION 1, "PRA Model for the Westinghouse Shut Down Seal AL" (PA-RMSC-0499) Pressurized Water Reactor Owners Group, Project no. 694	April 29, 2011
NSAL-13-6	SHIELD Passive Thermal Shutdown Seal (SDS) Failure to Actuate During Post-Service Test	July 26, 2013
OE NK-18-005	Operability Evaluation: NK001, NK002, NK003, NK004 125 VDC Bus Switchboard and Component Downstream of the NK Bus Are Listed in Calculation NK-E-001 Appendix E	July 31, 2018
OFN BB-031	Shutdown LOCA	32
OFN EJ-15	Loss of RHR Cooling	29B
ONF EJ-40	CL Recirculation During Mode 3, with Accumulator Isolated in Mode 4, 5, or 6	8
PA	System Health Report for High-Medium Voltage 13.8 kV	(July 1, 2017 – December 31, 2017)
PM FILE 49330	A RCP no. 3 Seal Leak-off Flush	n/a
QH-2018-1612	USAR Self-Assessment for 2018 DBAI	July 19,2018
REVISION TO JLD-ISG-2012-01	Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events	2
SCA-05-0028	Safety Classification Analysis, NB Syst. Magna Blast Breaker Elevating Mechanism Roller Assembly	0
System Health Report	Reactor Coolant System (BB)	July 1, 2017 – December 31, 2017
System Health Report	Auxiliary Feedwater System AL, AP, FC-1	July 1, 2017 – December 31, 2017

Miscellaneous

Number	Title	Revision Date
TDAFWP Test Trends	IST Hydraulic and Vibration Trends for TDAFWP and Screen Shots from Data Program	Various dates
WO 14-0023	Docket No. 50-482: Request for Schedule Relaxation of NRC Order EA-12-049, Requirement IV.A.2, at Wolf Creek Generating Station	March 31, 2014

WOLF CREEK GENERATING STATION NRC DESIGN BASES ASSURANCE (TEAMS)
INSPECTION REPORT 05000482/2018010 DTAED NOVEMBER 14, 2018

DISTRIBUTION:
Regional Administrator (Kriss.Kennedy@nrc.gov)
Deputy Regional Administrator (Scott.Morris@nrc.gov)
DRP Director (Anton.Vegel@nrc.gov)
DRS Director (Mark.Shaffer@nrc.gov)
DRS Deputy Director (Ryan.Lantz@nrc.gov)
DRP Deputy Director (Michael.Hay@nrc.gov)
Regional Counsel (David.Cylkowski@nrc.gov)
RIV/ETA: OEDO (Christopher.Cook@nrc.gov)
Public Affairs Officer (Victor.Dricks@nrc.gov)
Senior Congressional Affairs Officer (Jenny.Weil@nrc.gov)
Project Manager (Balwant.Singal@nrc.gov)
RIV Congressional Affairs Officer (Angel.Moreno@nrc.gov)
RIV RSLO (Bill.Maier@nrc.gov)
Team Lead, DRS/IPAT (Geoffrey.Miller@nrc.gov)
Project Engineer, DRS/IPAT (Peter.Jayroe@nrc.gov)
RITS Coordinator (Marisa.Herrera@nrc.gov)
ACES (R4Enforcement.Resource@nrc.gov)
Branch Chief, DRP/B (Nick.Taylor@nrc.gov)
Senior Project Engineer, DRP/B (David.Proulx@nrc.gov)
Project Engineer, DRP/B (Jim.Melfi@nrc.gov)
Project Engineer, DRP/B (Erica.Combs@nrc.gov)
Senior Resident Inspector (Douglas.Dodson@nrc.gov)
Resident Inspector (Fabian.Thomas@nrc.gov)
WC Administrative Assistant (Susan.Galemore@nrc.gov)

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