

## Wolf Creek 1 2Q/2014 Plant Inspection Findings

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### Initiating Events

**Significance:** G Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Assess Risk Prior to Performing Online Maintenance to an Offsite Power Circuit Component**

The inspectors identified a Green non-cited violation of 10 CFR 50.65(a)(4) for the failure to assess risk associated with an emergent maintenance activity performed on one of the offsite power circuit components inside the Wolf Creek switchyard. Specifically, Wolf Creek arranged for the transmission system maintenance companies to recharge SF6 gas in a 13.8kV breaker actively feeding the train A Class 1E distribution system without performing a risk assessment or management actions to verify the readiness of onsite power sources. The inspectors walked down the task and determined that problems during the task could cause the loss of SF6 pressure, which would have caused this breaker to automatically open. Inspectors determined that operators failed to recognize this potential risk impact, and had incorrectly assumed that being classified as routine maintenance meant that the risk had been pre-determined to be low when no risk evaluation existed.

The inspectors determined that failure to assess risk associated with an emergent maintenance activity in accordance with station procedure AP 22C-003, "Online Nuclear Safety and Generation Risk Assessment," was a performance deficiency. The performance deficiency was more than minor because it affects the switchyard activities area of the protection against external factors attribute of the Initiating Events Cornerstone. Using the Inspection Manual Chapter 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," the inspectors determined that the finding was of very low safety significance (Green) because the risk deficit was small and the duration of the maintenance was brief. The inspectors determined that the finding did not have a cross-cutting aspect because the performance deficiency was caused by an inadequate procedure change that was made in 1998, and did not represent current performance.

Inspection Report# : [2013005](#) (*pdf*)

**Significance:** G Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Ensure that Degraded Voltage Relay Minimum Allowable Time Delay Value is Bounded by Analyzed Value**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," which 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." Specifically, on May 9, 2003, Calculation XX-E-009, "System NB, NG, PG Undervoltage/Degraded Voltage Relay Setpoints," Revision 1, identified that the degraded voltage relays minimum time delay was 7.5 seconds, and the maximum time delay was 8.5 seconds. During testing of the degraded voltage relays, the calculation states, "In all cases the steady state voltage on NB01 and NB02 recovered within the 7.5 seconds accident criteria. However in some cases the

recovery time is marginal.” This requirement was not correctly translated into Surveillance Test Procedures STS IC-805A and STS IC-805B which allow a minimum time delay of 7.0 seconds, and a maximum time delay of 9.0 seconds for the degraded voltage relays timeout period during accident conditions. The licensee has entered this issue into their corrective action program as Condition Report CR-72496.

The team determined that the licensee’s failure to ensure that the analyzed minimum allowable degraded voltage relay time delay of 7.5 seconds and maximum allowable degraded voltage relay time delay of 8.5 seconds, was incorporated into acceptance criteria for surveillance testing procedures was a performance deficiency. This finding was more than minor because it was associated with the Procedure Quality attribute of the Reactor Safety Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, it was indeterminate whether the design requirement to prevent spurious actuation of the degraded voltage relays and consequential loss of offsite power would have been met if the time delay had been set at less than 7.5 seconds or greater than 8.5 seconds. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 1, “Initiating Events Screening Questions,” the finding was determined to have very low safety significance (Green), because it did not cause a reactor trip and loss of mitigation equipment. This finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency did not reflect current licensee performance.

Inspection Report# : [2013008](#) (pdf)

**Significance:**  Jul 24, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Analyze Erected Scaffolding for Fire Impairment and Transient Combustible Loading**

The inspectors identified a non-cited violation of Technical Specification 5.4.1.d “Fire Protection Program Procedures” for the failure to analyze scaffolding for fire protection impairments and transient combustible loading. The cause of the finding was a procedure change that allowed for a grace period of one working day to complete a fire protection review of newly erected scaffolding. As a result, there was no longer a direct interface with the scaffold builders and fire protection engineers, which complicated scoping and tracking the required inspections.

Failure to analyze scaffolding for fire impairment and transient combustible loading is a performance deficiency. The performance deficiency is more than minor because it affects the protection against external factors attribute of the Initiating Events Cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors evaluated the finding using Inspection Manual Chapter 0609, Appendix A, “Significance Determination for Findings at Power”, Exhibit 1, “Initiating Events Screening Questions”, Section E, “External Event Initiators”, and determined that the finding was of very low safety significance (Green) because the finding did not impact the frequency of a fire initiating event. The inspectors determined that this finding had a cross-cutting aspect in the human performance area of work control, because the licensee failed to appropriately coordinate work activities by incorporating the need for planned compensatory actions. Specifically, Wolf Creek did not ensure that a fire protection assessment of scaffold 13-S100 and 13-S134 was performed in a timely manner which resulted in compensatory measures for the impaired sprinkler heads and transient combustible material not being established.

Inspection Report# : [2013004](#) (pdf)

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## Mitigating Systems

**Significance:** G Mar 28, 2014

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Work Instructions for Reinstallation of ESW Expansion Joints**

The inspectors identified a non-cited violation of Technical Specification 5.4.1.a, "Procedures," for maintenance instructions inappropriate to the circumstances. Specifically, Work Orders 11-341986-005 and 11-342065-002 did not contain adequate instructions for reassembling essential service water Garlock expansion joints to ensure proper joint alignment. As a result, on February 11, 2014, the inspectors identified that the inlet expansion joint for the essential service water intercooler heat exchanger, which provides cooling to emergency diesel generator B jacket water system, was misaligned by 0.5 inches, which exceeded the vendor specification of less than 0.125 inch. This item was entered into the corrective action program as Condition Reports 79352 and 79623, and the fitting was replaced during the mid-cycle 2014 outage. The licensee also conducted an extent of condition inspection and identified three additional Garlock expansion joints that were not made with the approved liner material.

The failure to properly reinstall essential service water expansion joints consistent with the vendor approved and analyzed configuration was a performance deficiency. The performance deficiency is more than minor because it affected the equipment performance attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the misaligned Garlock expansion joint in the essential service water system degraded its long-term operability and its ability to withstand a seismic event. Using the Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined that the finding was of very low safety significance (Green) because 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 in accordance with the licensee's Maintenance Rule program for greater than 24 hours. Specifically, although the expansion joint was in a degraded condition, it was determined to be operable based on an engineering evaluation and seismic test data. The inspectors determined that the finding had a cross-cutting aspect in the human performance area of resources because the licensee did not ensure that personnel equipment, procedures, and other resources were available and adequate to support nuclear safety.

Inspection Report# : [2014002](#) (*pdf*)

**Significance:** G Mar 28, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Failure to Maintain Seismic and Missile Protection Design Basis Requirements During Essential Service Water Construction**

A self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified for the failure to conduct excavation work such that it would ensure that design basis requirements for tornado missile protection and seismic qualification of safety-related cables were maintained during construction near the essential service water pump house. Specifically, when excavation near underground essential service water cables caused a loss of safety-related backfill over the cables, the licensee did not plan and execute the work in a manner that ensured that the qualified soil coverage around the train B essential service water duct bank was maintained by protecting against trench cave-ins.

Failure to maintain adequate soil coverage of the essential service water duct banks during construction is a performance deficiency. The deficiency is more than minor because it affected the protection against external factors and design control attributes of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Inspection Manual Chapter 0609, Appendix A, Exhibit 4, "External Events Screening Questions," the inspectors determined that

the finding was of very low safety significance (Green) because the finding did not involve the total loss of any safety function that contributes to external event initiated core damage accident sequences. The inspectors determined that the finding had a cross-cutting aspect of work management in the area of human performance in that the process for planning, controlling, and executing work did not adequately include the identification and management of risk. Specifically, work planning did not account for adequate shoring material to prevent design basis ground cover from caving in during planned excavations in the vicinity of operable safety related equipment.

Inspection Report# : [2014002](#) (pdf)

**Significance:**  Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Preclude Repetition of a Significant Condition Adverse to Quality Affecting Class 1E Air Conditioning Unit**

A Green self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," was identified for failure to identify the underlying causes of the train A Class 1E air conditioner slug flow in the refrigerant prior to a recurrent failure.

Failure to correctly identify the causal links between a known direct cause and the underlying root cause in order to preclude repetition is a performance deficiency, specifically when considering that the condition adverse to quality was identified as a significant condition adverse to quality because its repetition would have a serious effect on operability of technical specification systems, structures, and components, by the screening review team per station procedure AI 28A-010, "Screening Condition Reports," Step 6.3.5. The performance deficiency is more than minor because it affected the equipment performance attribute of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically the leftover debris in the system resulted in a subsequent maintenance outage to replace rapidly degrading components. Using the Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding was of very low safety significance (Green) because 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 in accordance with the licensee's maintenance rule program for greater than 24 hours. The inspectors determined that the cause of the finding had a cross cutting aspect in the area of problem identification and resolution. The licensee did not thoroughly evaluate problems such that the resolutions address causes and extent of conditions, as necessary. This includes properly classifying, prioritizing, and evaluating for operability and reportability conditions adverse to quality. Specifically, the licensee framed the cause evaluation within the scope of the Notice of Enforcement Discretion (NOED) request and repair plan, and therefore overly focused attention on the compressor itself, and did not consider system components outside the compressor until after the second failure in September.

Inspection Report# : [2013005](#) (pdf)

**Significance:**  Dec 31, 2013

Identified By: NRC

Item Type: FIN Finding

**Failure Rates Exceed Twenty Percent for Annual Requalification Operating Tests**

The inspector reviewed a self-revealing finding associated with licensed operator performance on the annual requalification operating tests. Specifically, 2 of 8 crews (25 percent) failed the simulator scenario portion of the operating test; and 11 of 46 licensed operators (23 percent) either failed the scenario or failed the job performance measure portions of the operating tests. The licensee remediated and retested the staff prior to returning them to licensed duties. Wolf Creek entered this finding into their corrective action program as Condition Report 75336.

In accordance with Inspection Procedure 71111.11, each of the following was a performance deficiency against expected licensed operator knowledge and abilities: 1) Greater than 20 percent of the crews failing their scenarios; and 2) greater than 20 percent of the licensed operator staff failing their operating tests. Using Manual Chapter 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," the inspector determined that the finding was more than minor because the performance deficiency was associated with the Mitigating Systems Cornerstone attribute of human performance, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspector determined that this finding could be evaluated using Inspection Manual Chapter 0609, "Significance Determination Process," Appendix I, "Licensed Operator Requalification Significance Determination Process." This finding was of very low safety significance (Green) because the finding was related to the requalification exam results, did not result in a failure rate of greater than 40 percent, and the licensed operators were remediated prior to returning to shift. This finding has a cross-cutting aspect in the area of human performance associated with resources, because the licensee failed to ensure that personnel were adequately trained to assure nuclear safety.

Inspection Report# : [2013005](#) (*pdf*)

**Significance:**  Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Follow Procedure When Making Changes to Off-Normal Operating Procedure OFN NB-042**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," which states, in part, "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." Specifically, in 2007 the licensee failed to follow Procedure AP 15C-004, "Preparation, Review and Approval of Procedures, Instructions and Forms," when making changes to safety-related emergency diesel generator surveillance testing Procedure OFN NB-042. The technical reviewer failed to identify that the power supply for the communication equipment for the dedicated operator was from non-essential power and would be lost during a loss of offsite power event, losing the communications between the control room and the operator. The licensee has entered this issue into their corrective action program as Condition Report CR-72711.

The team determined that the failure to follow Procedure AP 15C-004 when making changes to off normal operating Procedure OFN NB-042 was a performance deficiency. This finding was more than minor because it was associated with the Equipment Performance attribute of the Reactor Safety, Mitigating Systems Cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to perform a technical walk-down of the procedure steps to verify the power supply for the communication equipment would not be lost during a loss of power event. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, the inspectors determined the finding was of very low safety significance (Green), because the finding was not a design deficiency and did not result in the loss of operability or functionality. This finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency did not reflect current licensee performance.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:**  Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Verify or Check the Adequacy of Design Calculations**

The team identified a Green, non-cited violation, with three examples, of 10 CFR 50, Appendix B, Criterion III, "Design Control," which 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.” Specifically, on September 12, 2011, the licensee failed to verify or check the adequacy of design Calculation XX-E-006, “AC System Analysis,” Revision 6, by 1) not recognizing that the actual switchyard voltage could be lower than the calculated minimum voltage due to loop uncertainties of the switchyard voltmeters, 2) failing to provide a comparison between postulated loading levels and equipment ratings for distribution equipment, in order to verify that overloading conditions would not occur, and 3) not placing limits on the voltages on the Class 1E 480 Vac system which could exceed the allowable maximum equipment voltage rating of 506 Vac. The licensee has entered these issues into their corrective action program as Condition Reports CR-73244, CR-73240, and CR-73206.

The team determined that the licensee’s failure to verify or check the adequacy of design Calculation XX E 006, “AC System Analysis,” Revision 6, was a performance deficiency. This finding was more than minor because it was associated with the Design Control attribute of the Reactor Safety, 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 XX-E-006, “AC System Analysis,” Revision 6, regarding loop uncertainties of the switchyard voltmeters, equipment loading, and maximum allowed Class 1E 480 voltage. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, the inspectors determined the finding was of very low safety significance (Green), because the finding was not a design deficiency and did not result in the loss of operability or functionality. This finding had a cross-cutting aspect in the area of Human Performance, associated with the Resources component because the licensee failed to ensure that personnel, equipment, procedures, and other resources are adequate to assure nuclear safety by maintaining long term plant safety by maintenance of design margins. Inspection Report# : [2013008](#) (*pdf*)

**Significance:**  Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Prevent Over Voltages on the 480 Vac System During Emergency Diesel Generator Training**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” which 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 nonconformances are promptly identified and corrected.” Specifically, in 2006, the licensee implemented corrective actions per Condition Report 2006-2062, to monitor the voltages for the 480 Vac system to ensure that over-voltages would not occur during emergency diesel generator testing. The licensee implemented voltage monitoring for the “B” Train 480 Vac system, but failed to monitor voltages of “A” Train, which had the same vulnerability. The licensee has entered this issue into their corrective action program as Condition Report CR-73209.

The team determined that the licensee’s failure to implement corrective actions into diesel testing Procedure STS KJ-001A was a performance deficiency. This finding was more than minor because it was associated with the Equipment Performance attribute of the Reactor Safety, 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 ensure that over-voltages would not occur during the testing of the “A” train emergency diesel generator. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, the inspectors determined the finding was of very low safety significance (Green), because the finding was not a design deficiency and did not result in the loss of operability or functionality. This finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency did not reflect current licensee performance.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:** G Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Ensure Motors are Operated Within Their Thermal Limits**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion III, “Design Control,” which 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.” Specifically, on June 26, 2013, the licensee issued drawing E-11005, “List of Loads Supplied by Emergency Diesel Generator,” Revision 39, that identified certain motors with load brake horsepower in excess of the motor nameplate ratings, but failed to verify that the excess horsepower would not result in the motors exceeding their thermal design limits. Additionally, the brake horsepower values on the referenced drawing do not reflect the worst-case condition, which would occur when the diesel generator is operating at maximum allowable frequency and powering the motors. The licensee has entered this issue into their corrective action program as Condition Report CR-72945.

The team determined that the licensee’s failure to evaluate motor loading to confirm margin exists to prevent overheating of the motors was a performance deficiency. This finding was more than minor because it was associated with the Design Control attribute of the Reactor Safety, 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, motors serving loads with demands in excess of the motor horsepower ratings were not analyzed to ensure that overheating would not occur. In accordance with Inspection Manual Chapter 0609 Appendix A, Exhibit 2, the inspectors determined the finding was of very low safety significance (Green), because the finding was not a design deficiency and did not result in the loss of operability or functionality. This finding had a cross-cutting aspect in the area of Human Performance, associated with the Resources component, because the licensee failed to ensure that personnel, equipment, procedures, and other resources are adequate to assure nuclear safety by maintaining long term plant safety by maintenance of design margins.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:** G Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Fully Implement Electrical Protection Criteria for Containment Penetrations**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion III, “Design Control,” which 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.” Specifically, on June 23, 2010, the licensee failed to verify that Calculation A-06-W meet all of the criteria identified in the Updated Safety Analysis Report, Section 8.1.4.3. The team determined that the criteria identified in the Updated Safety Analysis Report was not met for several circuits, where the vertical intercept of the magnetic only circuit breaker time-current curve overlaps the penetration conductor damage curve. This indicates that, for a sustained short circuit of a certain magnitude, the thermal limit of the conductor passing through a penetration could be exceeded without tripping of the magnetic-only circuit breaker. The licensee has entered this issue into their corrective action program as Condition Report CR-73124.

The team determined that the licensee’s failure to ensure that containment penetrations are properly sized to meet the Updated Safety Analysis Report, Section 8.1.4.3, requirements was a performance deficiency. This finding was more

than minor because it was associated with the Configuration Control attribute of the Reactor Safety, Barrier Integrity Cornerstone and adversely affected the cornerstone objective to ensure that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the thermal limit of the penetration conductor could be exceeded without tripping the magnetic-only circuit breaker, jeopardizing the integrity of the electrical penetration. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 3, "Barrier Integrity Screening Questions," the finding was determined to have very low safety significance (Green), because it did not result in an actual open pathway in containment and did not involve hydrogen igniters. This finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency did not reflect current licensee performance.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:**  Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Account for Flow Measurement Uncertainty when Operating the Residual Heat Removal Pumps in the Low Flow Regime**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," which 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." Specifically, on August 27, 2013, the team identified that the licensee had failed to account for flow measurement uncertainties of the Residual Heat Removal System. Technical Specifications require that when operating in Mode 6, the circulating residual heat removal flow is required to be greater than or equal to 1000 gpm for adequate heat removal and to prevent stratification, and Alarm Response Procedure ALR 00-049C, "RHR LOOP 1 FLOW LOW," requires that when operating the residual heat removal pumps at low flows that the flow must be at or above 1700 gpm for pump protection. The failure to account for flow measurement uncertainties could allow flow to actually be below the required technical specification and alarm response limits, without the operator's knowledge. The licensee has entered this issue into their corrective action program as Condition Reports CR-73071 and CR-73231.

The team determined that the failure to account for flow measurement uncertainties when operating Residual Heat Removal pumps at low flows was a performance deficiency. This finding was more than minor because it was associated with the Procedure Quality attribute of the Reactor Safety, 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 failure to account for flow measurement uncertainties in the residual heat removal system could allow operation below technical specification and alarm response limits and potentially damage the residual heat removal pumps. In accordance with NRC Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," the finding was determined to have very low safety significance (Green), because the finding did not require a quantitative assessment because adequate mitigating equipment remained available and the finding did not constitute a loss of control as defined in Appendix G. This finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency did not reflect current licensee performance.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:**  Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Properly Assess Problems with Component Cooling Water Valve EGHV102**

The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action,"

which states, in part, “Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, defective materials and equipment, and nonconformance are promptly identified and corrected.” Specifically, in April 2011 and November, 2012, the licensee failed to properly categorize Condition Reports CR-37825 and CR-60298 correctly, which resulted in the condition reports not getting an Apparent Cause Evaluation, to promptly identify and correct the cause of the Component Cooling Water Butterfly Valve EGHV0102 loose disc to shaft, failure of the groove pin in the valve, and to investigate the extent of condition for similar valves currently installed in the plant. The licensee has entered this issue into their corrective action program as Condition Report CR-73227.

The team determined the licensee’s failure to follow the Corrective Action Procedure AI 28A-010, “Screening Condition Reports,” which improperly categorized Condition Reports CR-37825 and CR-60298, which should have had apparent cause evaluations performed, was a performance deficiency. This finding was more than minor because it adversely affected the Equipment Performance attribute of the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to perform an apparent cause evaluation resulted in the licensee not identifying a root cause for the valve leakage, preventing reoccurrence, or investigating the extent of condition for other similar valves installed in the plant. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, the inspectors determined the finding was of very low safety significance (Green), because the finding was not a design deficiency and did not result in the loss of operability or functionality. This finding had a cross-cutting aspect in the area of Human Performance, associated with Work Practices. Specifically the licensee defines and effectively communicates expectations regarding procedural compliance and personnel follow procedures.

Inspection Report# : [2013008](#) (pdf)

**Significance:**  Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Provide Procedure Instructions to Remove Thermal Overload Bypass Jumpers**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion III, “Design Control,” which 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.” Specifically, in 1994, the licensee was committed to the requirements specified in Regulatory Guide 1.106, “Thermal Overload Protection for Electric Motors on Motor-Operated Valves,” Revision 1, to remove the thermal overload bypass jumpers during maintenance and testing. The licensee failed to translate the requirements into Procedure MGE LT-099, “MOV Diagnostic Testing,” and failed to include procedural guidance to remove the thermal overload bypass jumpers when performing maintenance testing that strokes the valve from the control room. Also, the Wolf Creek Updated Safety Analysis Report, Section 8.3.1.1.2, has incomplete information which does not support Regulatory Guide 1.106, in that it does not state that the thermal overload bypass jumpers should be removed when performing maintenance testing that strokes the valve. The licensee has entered this issue into their corrective action program as Condition Reports CR-73120 and CR-73219.

The team determined that the licensee’s failure to provide procedure instructions to remove the thermal over-load bypass jumpers during motor-operated valve diagnostic testing as committed to in Regulatory Guide 1.106, Revision 1, was a performance deficiency. This finding was more than minor because it was associated with the Procedure Quality attribute of the Reactor Safety, 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 include procedural guidance to remove the thermal overload bypass jumpers when performing maintenance testing that strokes the valve from the control room, and to include the requirements of Regulator Guide 1.106 in the Updated Safety Analysis Report, Section 8.3.1.1.2, that the

bypass jumpers will be removed during testing of the motor-operated valves. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, the inspectors determined the finding was of very low safety significance (Green), because the finding was not a design deficiency and did not result in the loss of operability or functionality. This finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency did not reflect current licensee performance.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:**  Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Verify Adequacy of Electrical Protective Devices to Isolate Fire-Damaged Associated Circuits**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion III, “Design Control,” which 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.” Specifically, as of September 2011, Wolf Creek Updated Safety Analysis Report, Appendix 9.5 E, required isolation between safe shutdown circuits and non-safe shutdown (associated) circuits, such that “hot shorts, open circuits, or shorts to ground in the associated circuits will not prevent operation of the safe shutdown equipment.” On September 29, 2011, the licensee completed study WCNOG-171, “Post-Fire Safe Shutdown Associated Circuits Study,” Revision 0, but failed to provide documented verification of the adequacy of electrical protective devices for associated shutdown circuits such that hot shorts or shorts to ground will not prevent operation of the safe shutdown equipment. The licensee has entered this issue into their corrective action program as Condition Report CR-73242.

The team determined that the licensee’s failure to provide a documented comparison of upstream and downstream electrical protective devices with maximum short circuit levels, in order to verify the required coordination, was a performance deficiency. This finding was more than minor because it was associated with the Design Control attribute of the Reactor Safety, 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 was unable to provide an analysis to demonstrate that associated shutdown circuits would be isolated from the safe shutdown circuits during fire events. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, the inspectors determined the finding was of very low safety significance (Green), because the finding was not a design deficiency and did not result in the loss of operability or functionality. The finding had a cross-cutting aspect in the area of Human Performance, Resources attribute, because the licensee failed to ensure that personnel, equipment, procedures, and other resources are adequate to assure nuclear safety by maintaining long-term plant safety by maintenance of design margins.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:**  Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Translate Design Basis Performance Requirements into Pump Surveillance Tests**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XI, “Test Control,” which states, in part, “A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design document.” Specifically, on August 28, 2013, the team identified that the licensee failed to incorporate minimum pump performance requirements into the corresponding pump surveillances for the Containment Spray and Residual Heat Removal pumps. The acceptance criteria did not adequately overlap with the pump design performance requirements.

Further, instrument uncertainty was not adequately evaluated, nor incorporated into the tests. The licensee has entered this issue into their corrective action program as Condition Reports CR-73149 and CR-73070.

The team determined that the failure to establish and incorporate adequate acceptance criteria into the Containment Spray and Residual Heat Removal pump comprehensive surveillance tests was a performance deficiency. This finding was more than minor because it was associated with the Procedure Quality attribute of the Reactor Safety, 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 failure to incorporate adequate acceptance criteria and instrument uncertainties into the safety related surveillances could cause unacceptable pump performance conditions to go undetected. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, the inspectors determined the finding was of very low safety significance (Green), because the finding was not a design deficiency and did not result in the loss of operability or functionality. This finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency did not reflect current licensee performance.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:**  Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Fully Establish Design Control Measures for Vital Essential Chillers SGK05 A/B Air Conditioning Units**

The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action”, which 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.” Specifically, since May 2011, the licensee had numerous opportunities, but failed to correct calculation GK06W and to adequately assess compensatory actions identified to supplement weaknesses in the calculations for operation of one vital air conditioning unit to cool both trains of Class IE electrical equipment. The licensee has entered this issue into their corrective action program as Condition Report CR73410.

The team determined the failure to promptly identify and correct the errors in Calculation GK06W and to have adequate compensatory measures in place as required by the calculation was a performance deficiency. This finding was more than minor because it adversely affected the Equipment Performance attribute of the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, without having an adequate calculation and compensatory measures, the licensee would not be assured that one vital air conditioning unit would be capable of cooling both trains of Class IE electrical equipment. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, the inspectors determined the finding was of very low safety significance (Green), because the finding was not a design deficiency and did not result in the loss of operability or functionality. The finding had a cross-cutting aspect in the area of Human Performance, Resources component, because the licensee failed to ensure that personnel, equipment, procedures, and other resources are available and adequate to assure nuclear safety. Specifically, those resources necessary to provide complete, accurate, and up-to-date design documentations, and equipment are available and adequate to assure nuclear safety.

Inspection Report# : [2013008](#) (*pdf*)

**Significance:**  May 26, 2012

Identified By: NRC

Item Type: VIO Violation

**Failure to Take Timely corrective Action to Preclude Repetition**

The inspectors identified a violation of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” for the

licensee's failure to take corrective action to preclude repetition of system leaks due to water hammer events in the essential service water system. Extensive inadequately evaluated corrosion in the system has led to multiple water-hammer-induced leaks of essential service water piping. These leaks were the subject of two previous violations issued by the NRC. The licensee failed to take timely corrective action to restore compliance. The licensee entered this finding in its corrective action program as condition report 53443.

The failure to preclude recurrence of water hammer in the essential service water system and the failure to take adequate corrective action to control internal pitting corrosion in essential service water system piping was a performance deficiency. The deficiency was more than minor because it is associated with the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. It is therefore a finding. Using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the finding was of very low safety significance (Green) because the finding was a design or qualification deficiency that was confirmed not to result in loss of system operability or functionality. This finding has a cross-cutting aspect in the corrective action program component of the problem identification and resolution cross-cutting area because the licensee failed to take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance (P.1(d)). (Section 40A2.5.c)

Inspection Report# : [2012007](#) (*pdf*)

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## Barrier Integrity

**Significance:**  Mar 28, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Maintain Licensed Power Limits During Planned Evolutions Affecting Reactivity**

A self-revealing non-cited violation, with two examples, of Technical Specification 5.4.1.a, "Procedures," was identified for the failure to follow the reactivity management procedures. On two occasions, operators failed to take prudent actions to ensure that reactor power did not exceed the licensed limit of 3565 megawatts thermal while performing activities known to cause power increases.

On February 17, 2014, while performing chemical and volume control system inservice check valve testing on the discharge check valve of the train A centrifugal charging pump, operators performed a dilution of the reactor coolant system for normal power maintenance while reactivity was also being affected by the testing of the charging pump check valve, resulting in exceeding 100 percent power. On March 6, 2014, while returning the reactor to full power following data collection on the main turbine control valves, operators used an automatic power ramp to a setpoint of only 3 megawatts below 100 percent, without accounting for the overshoot that would result from the selected ramp rate, resulting in exceeding 100 percent power. In both cases, operators were alerted by an alarm indicating that the 1-minute average power level exceeded 100 percent. The inspectors reviewed station procedure GEN 00-004 "Power Operation," and noted a requirement in Attachment A: "For pre-planned evolutions that are expected to cause a transient rise in reactor power that could exceed the licensed power level, prudent actions should be taken to reduce power prior to the evolution."

Failure to take prudent action to maintain the reactor within licensed power limits prior to performing activities known to cause an increase in reactor power levels is a performance deficiency. The performance deficiency was more than minor because it affected both the configuration control attribute of reactivity control as well as the human performance attribute of procedure adherence of the Barrier Integrity Cornerstone, and impacted the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases

caused by accidents or events. The inspectors screened the finding using the reactivity control screening questions found in Inspection Manual Chapter 0609, Appendix A, Exhibit 2, Section C; question number 3 referred the inspectors to Inspection Manual Chapter 0609, Appendix M, “Significance Determination Using Qualitative Criteria.” NRC Management performed the qualitative assessment and determined that the finding was of very low safety significance (Green) because the relatively small magnitude of the overpower events, the prompt operator actions to return power to below the licensed limits upon discovery, and the fact that overpower events did not result in any failure of the fuel cladding. The inspectors determined that the finding had a conservative bias cross-cutting aspect in the area of human performance. Specifically, the affected evolutions were known in advance to have positive reactivity impacts; however, operators did not consider reducing power in the case of the check valve testing, nor was a slow approach to the maximum reactor power level used to avoid overshoot during dynamic turbine loading for the turbine valve data collection in order to prevent licensed power levels from being exceeded.

Inspection Report# : [2014002](#) (*pdf*)

**Significance:** G Oct 28, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Account for Containment Temperature Measurement Uncertainty**

The team identified a Green, non-cited violation of 10 CFR 50, Appendix B, Criterion III, “Design Control,” which 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.” Specifically, on August 28, 2013, the team identified that the licensee had failed to have adequate controls in place to ensure that the bulk average containment temperature would not exceed the Technical Specification limit and design basis limit of 120°F. The licensee did not have: 1) a calculation addressing containment temperature indication uncertainty, 2) there was a lack of temperature sensor and associated circuitry uncertainty, 3) and there was no calculation or justification addressing potential temperature stratification in containment. The licensee has entered these issues into their corrective action program as Condition Reports CR-72639, CR-73118, and CR-73152.

The team determined that the failure to account for instrument uncertainty on the containment bulk average temperature instrumentation used to determine containment operability was a performance deficiency. This finding was more than minor because it was associated with the Design Control attribute of the Reactor Safety, Barrier Integrity Cornerstone, and adversely affected the cornerstone objective to ensure that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, by not accounting for the temperature measurement accuracy and stratification, the containment temperature could unknowingly exceed the Technical Specification operability limit. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 3, “Barrier Integrity Screening Questions,” the finding was determined to have a very low safety significance (Green), because it did not result in an actual open pathway in containment and did not involve hydrogen igniters. Operability Evaluation OE GN-13-006 evaluated the containment temperature concerns and concluded that the containment would be operable, but degraded or nonconforming. This finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency did not reflect current licensee performance.

Inspection Report# : [2013008](#) (*pdf*)

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## **Emergency Preparedness**

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## Occupational Radiation Safety

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## Public Radiation Safety

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## Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

Last modified : August 29, 2014