

# Wolf Creek 1

## 2Q/2012 Plant Inspection Findings

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### Initiating Events

**Significance:** G Jun 29, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Incorrect Leak Seal Injection Port Installation**

A self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Inspections, Procedures, and Drawings," was identified as a result of a leaking watertight door that was observed on January 13, 2012. Station procedure MPM XX-002, "Watertight Door Preventive Maintenance Activities," failed to ensure the proper position of the alignment screws, which resulted in leakage through a misalignment between the door and its threshold. During the January 13, 2012, loss of offsite power, the auxiliary building general area sump pumps did not operate for approximately 36 hours. Condensed steam and other effluents slowly accrued in the stairwell area outside the containment spray pump rooms to a depth of 24 to 36 inches. The train B containment spray pump room watertight door leaked approximately 10 gallons per minute and pooled in both the containment spray pump room and the residual heat removal pump room to a depth of three inches. This issue was entered into the corrective action program under condition report 51622. The licensee corrected the procedure and realigned the affected watertight doors. Failure to properly adjust safety-related watertight door alignment screws during testing activities is a performance deficiency. The performance deficiency is more than minor and therefore a finding because, if left uncorrected it could lead to a more significant safety concern. Using Inspection Manual Chapter 0609, Appendix A, the finding was characterized using Exhibit 4, "Seismic, Flooding, and Severe Weather Screening Criteria." The finding was determined to be of very low safety significance (Green) because the degraded flood protection equipment would not have caused a plant trip or other initiating event, would not degrade two or more trains of a multi-train safety system, would not degrade one or more trains of a supporting system, and the finding does not involve the total loss of any safety function. The inspectors determined the cause of this finding was not indicative of current performance. (Section 1R06).

Inspection Report# : [2012003](#) (*pdf*)

**Significance:** G Feb 12, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Inadequate Procedure Causes Lift of Relief Valve and Reactor Coolant Leak During Shutdown**

The inspectors reviewed a self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for a procedure that failed to restore the reactor coolant pump seal return flow path prior to raising reactor coolant system pressure, which caused the seal return relief valve to lift. During shutdown, reactor coolant pump seal return valve BGHV8100 was shut. On February 12, 2012, Wolf Creek was in Mode 5 with a water-filled (solid) pressurizer at 94 psig. After pressurizer power operated relief valve maintenance, Wolf Creek raised reactor coolant system pressure to 250 psig. With no return path, the relief valve lifted at 150 psig for 15 hours before operators noted an unexplained steady increase in pressurizer relief tank level and re-established the return flow path. Wolf Creek procedures were written to transition straight to refueling, and did not include consideration for maneuvering the plant in Mode 5. This led to shutting valve BGHV8100 without instructions to reopen it before exceeding 150 psig. Wolf Creek subsequently added procedure steps and precautions to reopen the seal return path in Mode 5. The inspectors calculated that approximately 760 gallons of reactor coolant were lost to the relief tank. This issue was placed in the corrective action program as condition report 49021.

Failure to align the reactor coolant pump seal return flow path prior to raising reactor coolant system pressure above the relief valve setpoint, creating a leak path, was a performance deficiency. The inspectors determined that this finding impacted the Initiating Events Cornerstone and its objective to limit the likelihood of events that upset plant stability and challenge safety functions during shutdown. Specifically, it impacted the configuration control attribute

of shutdown equipment lineup which created an unmonitored intersystem leak. The inspectors used Inspection Manual Chapter 0609, Appendix G, Attachment 1, checklist 4 (cold shutdown, level in the pressurizer, time to boil >2 hours) to evaluate the significance of this finding. A Phase 2 analysis was not needed because the level of inventory was terminated when the normal path was opened and the relief valve reseated. The leak would have terminated itself if the reactor coolant system drained itself to below the pump seal. The finding did not affect reactor coolant system level indication, affect the ability to terminate the leak path, affect the ability to add inventory, or affect the ability to recover residual heat removal if it was lost. Therefore, the finding was determined to be of very low safety significance. The inspectors identified the cause of the finding had a human performance cross-cutting aspect in the area of resources. Specifically, complete and accurate procedures were not provided because Procedure GEN 00-006 did not contain guidance to establish the seal return flow path prior to raising reactor coolant system pressure above 150 psig [H.2.c].

Inspection Report# : [2012002](#) (pdf)

Y

**Significance:** Jan 13, 2012

Identified By: Self-Revealing

Item Type: AV Apparent Violation

### **Failure to provide adequate oversight of contractors during maintenance on the Startup Transformer**

The team reviewed a self-revealing apparent violation of Technical Specification 5.4.1.a and Regulatory Guide 1.33 for the failure to follow procedures. Specifically, the electrical penetration seal and wiring assembly associated with the H1/CT4 and H2/CT5 current transformers installed in the startup transformer (XMR01) were replaced without insulating two of the splices, as required by Work Order 11-240360-006, Revision 3. This affected safety-related equipment on January 13, 2012, when the startup transformer experienced a spurious trip and lockout during a plant trip because the two uninsulated wires touched and provided a false high phase differential signal to the protective relaying circuit. The protective lockout caused a prolonged loss of offsite power to Train B equipment. The licensee's root cause analysis concluded that the Startup Transformer failure on January 13, 2012, was caused by the failure to provide adequate oversight of contractors. As a result, the licensee failed to identify that electrical maintenance contractors had failed to install insulating sleeves on wires that affected the differential current protection circuit. This issue was entered into the corrective action program as Condition Report 47653. The licensee's corrective actions included reworking the current transformer junction block to correct the missing insulation sleeves and updating station procedures to require oversight of contractors performing work on risk significant components.

This finding was more than minor because it affected the human performance attribute of the Initiating Events Cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions. This deficiency resulted in the failure of the fast bus transfer and the failure to maintain offsite power to safety-related loads during a reactor/turbine trip. The team performed the significance determination using NRC Inspection Manual Chapter 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," dated January 10, 2008, because it affected the Initiating Events Cornerstone while the plant was at power. The Phase 1 screened to a Phase 3 because the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not be available; it was also potentially risk significant due to seismic external initiating event core damage sequences. A Senior Reactor Analyst performed a Phase 3 analysis using the Wolf Creek SPAR model, Revision 8.20. The performance deficiency was determined to impact all transient sequences, particularly those involving losses of essential service water and/or component cooling water that led to a reactor coolant pump seal loss of coolant accident. The loss of cooling water prevented successful room cooling for mitigation equipment as well as loss of containment recirculation phase cooling. The analyst used half (98.5 days) of the period since the last successful load transfer, since the actual time of failure could not be determined from the available information. Credit for recovery of limited non-vital loads on the startup transformer was given based on licensee troubleshooting results, however no recovery credit was available for room cooling, since the licensee had no preplanned alternate room cooling measures. The evaluation of external events showed a small contribution due to fires. The increase in the core damage probability (ICCDP) was determined to be  $2.59E-5$ . This was a YELLOW significance.

The evaluation of large early release failures resulted in an ICLERP of  $1.62E-7$ . This was a WHITE significance, which is superseded by the YELLOW significance of the ICCDP.

This finding had a human performance cross-cutting aspect associated with the work control component in that licensee personnel associated with the oversight of the work did not appropriately coordinate work activities, and address the impact of changes to the work scope consistent with nuclear safety [H.3(b)] (Section 40A5.2).

G

**Significance:** Dec 31, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Evaluate Gasket Compatibility**

The inspectors reviewed a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with an improperly selected essential service water gasket that sprayed safety-related electrical equipment. On August 31, 2011, essential service water pump A was started and a 1 gpm leak from a bolted flange on the strainer was observed spraying a Class 1E supply transformer. The gasket was found to be broken due to excessive torque, and was replaced. Wolf Creek's apparent cause evaluation concluded that the cause of the gasket failure was not evaluating the suitability of existing gasket material to be used in conjunction with the new, hard Ceramalloy coating applied to the strainers as part of a design change in 2003. The strainer joints had been previously re-tightened to stop leakage without evaluating the cause. Selecting inappropriate gasket material, which led to repeated leaks and tightening until the gasket broke, was a performance deficiency. The performance deficiency is more than minor because it could be a precursor to a loss of essential service water event. Specifically, the water spray was wetting a transformer that could have caused the loss of the train A traveling screen, strainer, and ventilation. The inspectors used Inspection Manual Chapter 0609.04, and determined the issue was Green, or very low safety significance, because assuming worst case degradation, the finding did not affect train B. Also, train A essential service water was inoperable for less than its allowed outage time of 72 hours because it was successfully run the previous day. The finding had a cross-cutting aspect in the area of problem identification and resolution because Wolf Creek did not thoroughly evaluate the problem such that the resolutions address causes and extent of conditions, as necessary. Specifically the bolted flanges of the essential service water strainer A had leaked multiple times over the past 2 years, but did not get evaluated because they were classified as 'find and fix.' [P.1(c)] (Section 1R12).

Inspection Report# : [2011005](#) (pdf)

G

**Significance:** Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Account for RCP Seal Injection in Safety Analysis for Inadvertent Safety Injection**

On June 13, 2011, the inspectors identified a non-cited violation of 10 CFR, Part 50, Appendix B, Criterion XVI, for an inadequate safety analysis of inadvertent operation of the emergency core cooling system. The inspectors identified that Updated Safety Analysis Report, Chapter 15.5.1, "Inadvertent Operation of the ECCS," was inadequate because it did not account for the effects of reactor coolant pump seal injection flow. Since the pressurizer would be nearly full when operators terminate safety injection flow, the added volume would eventually overflow the pressurizer. Relief of liquid by the pressurizer safety valves is not permissible by the Updated Safety Analysis Report and the Standard Review Plan because the event could then propagate to a loss of coolant accident. The inspectors also identified that Wolf Creek needed an additional time critical operator action to re-establish letdown to reduce pressurizer level. The inspectors identified that operators were not tested on these actions in the simulator. Wolf Creek evaluations in 2011 did not find the error in the safety analysis or operator training. Wolf Creek planned to re-perform this safety analysis and has changed its simulator training to include timing of safety injection termination and establishing letdown. This issue was entered in the corrective action program as condition report 40410.

Failure to identify an inadequate safety analysis for inadvertent safety injection while comparing the plant response during an actual inadvertent safety injection to the safety analysis was a performance deficiency. This finding was more than minor because it impacted the design control attribute of the Initiating Events Cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors used Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined that the issue required a Phase 3 analysis because it involved a primary system loss of coolant accident initiator that could exceed the technical specification limit for allowable leakage. The senior reactor analyst calculated a bounding incremental core damage probability of 9.0E-7 per year or very low safety significance. This finding had a cross-cutting aspect in the area of problem identification and resolution associated with problem evaluation. Specifically, condition reports 34964 and 35700 did not identify the issue although they were tasked with evaluating the March 19 event against the safety analysis. [P.1(c)] (Section 1R18)

Inspection Report# : [2011005](#) (pdf)

**G**

**Significance:** Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Evaluation of Effects of Emergency Diesel Generator Frequency Variation on Supplied Equipment**

The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, for the licensee's failure to adequately evaluate the effects of allowed technical specification frequency variations on plant equipment in design calculations. Specifically, significant affects on the Class 1E electrical equipment air conditioning units were observed which required licensee action. The reduced cooling capacity raised temperatures above the allowable limits for equipment in those rooms. This finding was entered into the licensee's corrective action program as condition report 2007-002734, for which the licensee performed a comprehensive analysis of the effects of frequency variation on safety-related equipment.

Failure to adequately analyze the effects of allowable frequency variations on equipment performance was a performance deficiency. This finding is more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with Inspection Manual Chapter 0609.04, this finding was determined to be of very low safety significance (Green) because it did not create a loss of safety system function of a single train for greater than the technical specification allowed outage times, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding did not have a cross-cutting aspect because the most significant contributing cause did not reflect current licensee performance (Section 4OA2).

Inspection Report# : [2011005](#) (pdf)

**G**

**Significance:** Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Maintain Steam Generator Level Above Lo Lo Level Setpoint**

The inspectors reviewed a noncited violation of Technical Specification 5.4.1.a, "Procedures," for failure of operators to follow procedure to maintain steam generator water level. This failure resulted in level in steam generator B level lowering such that a Lo Lo level actuation was initiated, which isolated normal feedwater and initiated auxiliary feedwater. A reactor trip signal was also

- 4 - Enclosure

received, but the control rods were already tripped. The licensee captured this issue in their corrective action program as Condition Report 39732 and subsequently changed its operating procedures and conducted remediation training of licensed operators.

The issue was considered more than minor because it impacted the human performance attribute of the Initiating Events Cornerstone and its objective to limit the events that upset plant stability and challenge safety systems during power and shutdown operations. Using Inspection Manual Chapter 0609.04, the inspectors determined the finding to be of very low safety significance (Green) because the finding did not contribute to both the likelihood of a reactor trip and the loss of mitigation equipment. The inspectors determined that the finding has a crosscutting aspect in the area of human performance associated with the decision making component because the decision by the crew to maintain steam generator level in a difficult to maintain band proved to have unintended consequences

Inspection Report# : [2011004](#) (pdf)

**G**

**Significance:** Jul 21, 2011

Identified By: NRC

Item Type: FIN Finding

**Switchyard component Failures Cause Loss of Ring Bus and Loss of Offsite Power**

On July 21, 2011, the inspectors identified a finding for degraded switchyard equipment that caused a loss of offsite power. Updated Safety Analysis Report (USAR), Section 8.2.1.3.g.1, states that: "Any transmission line can be cleared under normal or fault conditions without affecting any other transmission line." On August 19, 2009, the damaged carrier system signal failures that allowed a lightning strike to cause a loss of all three 345 kV lines was



inconsistent with the Updated Safety Analysis Report. Wolf Creek's root cause and hardware failure analysis of the capacitive coupled voltage transformer found that it was degraded for a significant period of time. There was no causal analysis of the out of tune wave trap that contributed to the event. The inspectors concluded that the deficiency could have been prevented if Wolf Creek adopted significant external operating experience from 2004. This included inspection and/or replacement of aging capacitive coupled voltage transformers. Corrective actions from the 2004 operating experience were not implemented in a 2007 self assessment and were finally implemented in December 2009. This issue is captured in the corrective action program as Condition Report 19245. Wolf Creek and its owner companies have since upgraded all capacitive coupled voltage transformers (finishing in spring 2011), added fault data recorders, added enhanced line checking procedures with the grid operator, regrounded all three 345 kV lines, and plans to add an offsite power technical requirements manual limiting condition of operation per Condition Report 43244.

The failure to maintain 345 kV equipment such that a single line fault could be cleared without affecting the other lines, as described in the Updated Safety Analysis Report, is a performance deficiency. The issue is more than minor because it impacted the protection against external factors attribute of the Initiating Events Cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Inspection Manual Chapter 0609.04, inspectors screened the finding to Phase 3 because it caused both a reactor trip and loss of mitigation equipment or functions to not be available. The Senior Reactor Analyst calculated that the increase in core damage frequency was  $2.6 \times 10^{-7}$  or green. The inspectors determined that no crosscutting aspects applied because this finding is not indicative of current licensee performance.

Inspection Report# : [2011004](#) (pdf)

**Significance:**  Dec 31, 2009

Identified By: NRC

Item Type: VIO Violation

#### **Failure to Correct Vessel Head Vent Path**

The inspectors identified a cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," due to an inadequate vent path for the reactor vessel head. The inadequate vent path resulted in the formation of voids in the reactor vessel head during Refueling Outage 17. Failure to ensure an adequate vent path in the reactor vessel head was the subject of a noncited violation in NRC Inspection Report 05000482/2008004. During and after Refueling Outage 16, Wolf Creek initiated a root cause evaluation and corrective actions to prevent occurrence. When one of the possible root causes was disproven in Refueling Outage 17, no additional action was taken to determine the cause of the vessel head vent blockage. However, the licensee could not exclude blockage in the piping. This issue was entered into the corrective action program and the licensee plans to conduct a more thorough inspection of the piping during the next refueling outage. This issue is being tracked by the licensee as Condition Report 22501.

The inspectors determined that the failure to provide adequate vessel head vent path to prevent gas accumulation in the reactor vessel during depressurized plant operations was a performance deficiency. The inspectors determined that this finding, which was associated with the Initiating Events Cornerstone, was more than minor because if left uncorrected, it would have become a more significant safety concern. Specifically, without an adequate vent path the reactor vessel does not have an effective means of relieving noncondensable gases to prevent a loss of reactor coolant system inventory. The inspectors evaluated this finding using Inspection Manual Chapter 0609, Appendix G, Attachment 1, and determined it be of very low safety significance based upon the demonstrated availability of mitigating systems and the flooded reactor cavity inventory. The inspectors determined the cause of the finding had a problem identification and resolution aspect in the corrective action program. Specifically, Wolf Creek's corrective actions were not successful to address the vent path blockage in a timely manner [P.1(d)].

Inspection Report# : [2009005](#) (pdf)

**Significance:**  Mar 31, 2009

Identified By: NRC

Item Type: VIO Violation

## Failure to correct component cooling water valve closures

The inspectors identified a cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," involving Wolf Creek's failure to correct the cause of the reactor coolant pump thermal barrier component cooling water heat exchanger outlet valves stroking closed on high flow. Specifically, between 2001 and 2009, Wolf Creek experienced repeated cases of the reactor coolant pump thermal barrier component cooling water heat exchanger outlet valves stroking closed during component cooling water pump swaps and during isolations of the radioactive waste evaporators. Wolf Creek reinitiated evaluation of the issue after the inspector's questions but did not review the impact on the operators' ability to open the valves given the valves' circuit breakers opening. Repeated throttle valve adjustments have not been successful in stopping the valve closures. This issue and the corrective actions are being tracked by the licensee in Condition Report 2007 002074 and has corrective action pending to modify valve circuitry but it has not been implemented.

The failure to correct a condition adverse to quality of ensuring reactor coolant pump seal cooling as described in the Updated Safety Analysis Report is a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute for the Initiating Events Cornerstone; and, it affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was determined to be of very low safety significance because the finding would not result in exceeding the Technical Specification limit for identified reactor coolant system leakage and would not have affected other mitigation systems resulting in a total loss of the seal cooling safety function. This finding is being cited because the licensee failed to establish measures to assure this condition adverse to quality was promptly identified and corrected. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because, even though numerous instances of valve closures occurred since the first noncited violation, Wolf Creek downgraded the condition report. Using nonconservative assumptions, the licensee consistently viewed this issue as not having a risk impact because seal injection was not simultaneously lost. [H.1.b]

Inspection Report# : [2009002](#) (pdf)

Inspection Report# : [2009005](#) (pdf)

Inspection Report# : [2012009](#) (pdf)

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## Mitigating Systems

**Significance:**  Jun 29, 2012

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### Unacceptable Leakage through Safety-Related Watertight Door during Loss of Offsite Power

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for a work order that did not accomplish a leak seal repair in accordance with its engineering evaluation. Valve BMV0037 is a safety related ASME Code Class 2 steam generator blowdown valve that had a body-to-bonnet steam leak. Wolf Creek and its vendor produced modification documents to perform a leak-seal repair. The inspectors identified that on December 10, 2011, Wolf Creek installed an injection port in the valve body in close proximity of another injection port. Work orders allowed the location of the injection ports to be determined by the work. The pair was not installed in accordance with change package 9385. After inspector questioning, Wolf Creek performed an evaluation that demonstrated that the valve body retained structural integrity. This issue was entered into the corrective action program under condition report 52992.

The failure to ensure that the configuration of a safety-related steam generator blowdown was controlled in accordance with the approved engineering change package during leak seal activities is a performance deficiency. This finding was more than minor because it impacted the procedure quality attribute of the Initiating Events Cornerstone and affected the objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Using Inspection Manual Chapter 0609, Appendix A, this finding was determined to be of very low safety significance because an evaluation after the modification was able to demonstrate structural integrity. Therefore, the finding does not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment will not be available. The inspectors identified the cause of the finding had a human performance crosscutting aspect in the area of resources. Specifically, the

licensee did not ensure that the work order instructions were complete, accurate, and reflected up-to-date design documentation sufficiently to control plant configuration in accordance with design [H.2.c] (Section 1R18).  
Inspection Report# : [2012003](#) (*pdf*)

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**Significance:** Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Identify and Correct a Condition Adverse to Fire Protection**

The team identified a non-cited violation of License Condition 2.C.5.a for the failure of the licensee to identify and correct a condition adverse to fire protection. Specifically, the licensee failed to identify an adverse trend in the diesel driven fire water pump oil samples and take appropriate corrective actions. The licensee's corrective actions included installing a new diesel driven fire water pump, revising the oil sample procedure to increase the sensitivity to the presence of water, and evaluating further corrective actions. This issue was entered into the licensee's corrective action program as Condition Report 43710.

This performance deficiency was more than minor because it affected the Mitigating Systems Cornerstone attribute of protection against external factors (fire) and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Corrective actions to address the adverse condition were not taken, which led to the catastrophic failure of the right-angle drive for the diesel driven fire water pump. The team performed the significance determination using NRC Inspection Manual Chapter 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," dated January 10, 2008, because it affected the Mitigating Systems Cornerstone while the plant was at power, and concluded the finding needed additional screening under Appendix F, "Fire Protection Significance Determination Process," dated February 28, 2005. The team determined that the condition represented a low degradation of the fire protection program element of fixed fire protection systems due to a loss of the diesel driven fire water pump, and using Figure F.1 the finding was determined to be of very low safety significance based on Task 1.3.1. In addition, this finding had a problem identification and resolution cross cutting aspect associated with the corrective action program component in that the licensee failed to thoroughly evaluate problems such that resolutions address causes and extent of condition [P.1(c)] (Section 4OA5.10).

Inspection Report# : [2012009](#) (*pdf*)

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**Significance:** Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Procedure for Temporary Fire Pump**

The team reviewed a self-revealing non-cited violation of Technical Specification 5.4.1.d for the failure to have procedures appropriate for the implementation of fire protection compensatory measures. Specifically, Procedure SYS FP-290, "Temporary Fire Pump Operations," Revision 10, did not have appropriate guidance for the installation and operation of a temporary diesel driven fire water pump. This pump was a compensatory action for the nonfunctional normally installed diesel driven fire water pump. The licensee's corrective actions included revising Procedure SYS FP-290 to provide adequate instructions to operate the temporary diesel driven fire water pump continuously to preclude another loss of fire water suppression capability; completing a temporary modification for the installation of the temporary diesel driven fire water pump; and replacing the permanently installed diesel driven fire water pump. This issue was entered into the licensee's corrective action program as Condition Reports 43710 and 51821.

This performance deficiency was more than minor because it affected the Mitigating Systems Cornerstone attribute of protection against external factors and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inadequate procedure contributed to the delayed recovery of the fire water system for approximately 9 hours. A Phase 1 screening identified that the issue should be evaluated under NRC Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process." A Region IV Senior Reactor Analyst, who determined that NRC Inspection Manual 0609, Appendix F, "Fire Protection Significance Determination Process," was not a good tool to evaluate this issue because the firewater system was credited in both the fire suppression and the internal events probabilistic risk assessment models. Therefore the analyst performed a bounding detailed risk evaluation for this performance deficiency. The exposure period of 68 days was used for the time when the pump was placed in a cold-

weather alignment. The senior reactor analyst determined that bounding change to the core damage frequency was  $5.9E-7$  per year. The dominant core damage sequences included loss of offsite power initiating events (including fire induced loss of offsite power events), the failure of component cooling water, and the failure to establish alternate lube oil cooling to the charging and high pressure safety injection pumps. The availability of the motor-driven pump, the limited frequency of risk significant fire induced loss of offsite power events, and the availability of front line lube oil cooling systems, such as component cooling water, helped to mitigate the finding's significance. This finding had a human performance cross-cutting aspect associated with the decision making component in that the licensee failed to make safety-significant decisions using a systematic process to ensure safety was maintained while reviewing changes to the plant and procedures necessary to implement required compensatory measures [H.1(a)] (Section 4OA5.8).

Inspection Report# : [2012009](#) (pdf)

**Significance:**  Jun 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Preventative Maintenance Procedure on Turbine Driven Auxiliary Feedwater Pump**

The team reviewed a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to have an adequate preventative maintenance procedure, PM 28129, "Refueling Inspection of the Trip Tappet." Specifically, the dimensional criterion for the head lever to tappet nut engagement was not verified to be in accordance with vendor recommended criteria. The licensee's corrective actions included replacement of the trip tappet nut, trip lever, and trip linkage spring, as well as, inspecting all contact points on the trip linkage for damage or wear and specifying a more precise method of measuring the head lever to tappet nut engagement. This issue was documented in the licensee's corrective action program as Condition Report 47658. This finding was more than minor because it affected the Mitigating Systems Cornerstone attributes of Human Performance and Procedure Quality and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This deficiency resulted in the potential of the turbine driven auxiliary feedwater pump to trip during a seismic, or other jarring events. The team performed the significance determination using NRC Inspection Manual Chapter 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," dated January 10, 2008, because it affected the Mitigating Systems Cornerstone while the plant was at power. The Phase 1 screened to a Phase 3 because the finding was potentially risk significant due to seismic external initiating event core damage sequences. A Senior Reactor Analyst performed a Phase 3 analysis. The performance deficiency was determined to impact seismic events, since a seismic event could jar the mechanism enough to trip the turbine. Assuming all seismic events would trip the turbine, the analyst used SPAR-H to evaluate operator action to reset the trip mechanism. Considering the recovery, and conservatively assuming a zero baseline, the Delta-CDF of the finding was  $7.9E-9$ /yr, or very low safety significance (Green). This finding did not have any cross-cutting aspects because the preventative maintenance procedure was changed in 1999 and no other procedure changes since then would have caused the licensee to review this change, therefore, it is not representative of current licensee performance (Section 4OA5.3).

Inspection Report# : [2012009](#) (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)

**Significance:**  May 26, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Procedure to Implement Compensatory Measures**

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to adequately translate design information into procedures and requirements. Specifically, the licensee had information that its calculation for vital switchgear cooling included nonconservative assumptions. These assumptions called into question the ability of air conditioning systems to adequately cool Class 1E switchgear under all design conditions. The licensee failed to revise procedures to include compensatory actions necessary to ensure the vital switchgear remained operable. The licensee entered this finding in its corrective action program as condition report 53393.

The inspectors determined that the licensee's failure to adequately translate design information into procedures 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. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined the finding was of very low safety significance (Green) because it did not represent a loss of system safety function, did not represent the actual loss of safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting aspect in the corrective action component of the problem identification and resolution cross-cutting area because the licensee failed to thoroughly evaluate the problem such that its resolution addressed its causes and extent of conditions (P.1(c)). (Section 40A2.5.a)

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

**Significance:**  May 26, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Untimely Corrective Action**

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to effectively correct deficient procedures regarding the use of clearance orders. A number of clearance-related problems revealed several deficiencies in procedures to ensure that safe tag-out of equipment occurred prior to the start of work, that independent reviews of qualified individuals were being completed during clearance order preparation, and that effective training was being conducted where performance gaps were identified. The licensee failed to correct these deficiencies in a timely manner. The licensee entered this finding in its corrective action program as condition report 53451.

The team determined that the failure to correct an adverse trend in the use of clearance orders was a performance deficiency. This finding was more than minor because if left uncorrected, it could lead to a more significant safety concern. Specifically, continued failure to establish the correct clearance order boundaries could result in the loss of configuration control for systems required to maintain nuclear safety. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined that this finding was of very low safety

significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The team determined that this finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to ensure complete, accurate and up-to-date design documentation, procedures, and work packages were available and adequate to support nuclear safety (H.2(c)). (Section 40A2.5.d)

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

**Significance:**  May 26, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Complete Corrective Actions**

The team identified a non-cited violation of 10 CFR Part 50, Criterion V, “Instructions, Procedures, and Drawings,” for the licensee’s failure to establish adequate procedures for resolution of corrective actions. Specifically, the licensee failed to establish procedures to ensure that planned corrective actions were effectively implemented. The licensee entered this finding in its corrective action program as condition report 53432.

The failure to establish adequate procedures for resolution of corrective actions was a performance deficiency. This finding was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, failure to establish adequate procedures for resolution of corrective actions could result in important actions not being accomplished. Using Manual Chapter 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” this finding was determined to be of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the decision making component of the human performance cross-cutting area because the licensee failed to demonstrate that nuclear safety is an overriding priority by making safety-significant or risk-significant decisions using a systematic process (H.1(a)). (Section 40A2.5.e)

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

**Significance:**  May 26, 2012

Identified By: NRC

Item Type: VIO Violation

### **Failure to Implement Procedures to Test Safety-Related Equipment**

The team identified a violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to perform testing of safety-related spring-loaded tornado dampers in the emergency diesel generator and essential service water rooms. In 2008, the licensee identified that because the updated safety analysis report (USAR) incorrectly classified these active components as passive, they had not been included in a periodic testing or surveillance program. Since 2010, action items to test the dampers have received four due date extensions. Additionally, required training for this testing was completed and closed. However, no testing or surveillance was accomplished. This failure was the subject of a previous violation issued by the NRC. The licensee failed to take timely corrective actions to restore compliance. The licensee entered this finding in its corrective action program as condition report 53363.

The team determined that the licensee’s failure to implement corrective action was a performance deficiency. This finding was more than minor because it affected the equipment reliability 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, failure to implement this corrective action could result in reduced reliability of safety-related equipment during an event initiated by a tornado. Using Chapter 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” the team determined that this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and during a tornado, would not cause a plant trip if failed, would not degrade two or more trains of a multi-train safety system, and would not degrade one or more trains of a system that supports a safety system or function. This finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to provide complete, accurate, and up-to-date design documentation, procedures, and work

packages were available and adequate to support nuclear safety (H.2(c)). (Section 40A2.5.f)

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

**Significance:**  May 26, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Prevent Recurrent of Component Cooling Water System Voiding**

On February 23, 2011, a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was revealed when an anomalous start of component cooling water pump B indicated gas voiding in the component cooling water piping. This violation was due to the licensee's inadequate root cause evaluation and failure to prevent recurrence of the voiding that had previously occurred in May 2010. The licensee entered this finding in its corrective action program as condition report 33925.

The failure to properly identify design issues as a root cause and to take action to prevent the recurrence of a component cooling water system voiding was a performance deficiency. The performance deficiency is more than minor because it impacted 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, excessive voiding of the component cooling water system could lead to lack of cooling to important safety-related components. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the issue was of very low safety significance (Green) because it did not represent a loss of system safety function or loss of a single train longer than its technical specification allowed outage time. 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 thoroughly evaluate a problem such that its resolution addressed its cause and extent of condition. Specifically, condition report 25918 did not properly identify design issues as a root cause requiring immediate system modifications to preclude recurrence (P.1(c)). (Section 40A2.5.g)

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

**Significance:**  May 26, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Adequately Evaluate the Suitability of Nonsafety-related Gaskets, O-Rings, and Seals Installed in Safety-Related Equipment and to Identify Extent of the Condition**

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to evaluate the suitability of nonsafety-related gaskets, o-rings, and seals installed in safety-related components. These nonsafety-related parts were originally installed due to erroneous Safety Classification Assessments. After determining that the parts were inappropriate in safety-related joints, the licensee failed to promptly correct the condition and failed to fully identify which components were affected. The licensee entered this finding in its corrective action program as condition report 53456.

The failure of the licensee to evaluate the suitability of the specific nonsafety-related material installed in safety-related equipment and to determine the extent to which this condition existed was a performance deficiency. This performance deficiency was more than minor because it affected the design control attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate evaluation of nonsafety-related gaskets, o-rings, and seals installed in safety-related equipment adversely affected the reliability of the affected systems. Using 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 confirmed not to result in loss of operability or functionality. This performance deficiency had a cross-cutting aspect in the corrective action program component of the problem identification and resolution cross-cutting area because the licensee did not take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity (P.1(d)). (Section 40A2.5.h)

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

**G****Significance:** May 26, 2012

Identified By: NRC

Item Type: FIN Finding

**Inappropriately High Threshold for Condition Report Initiation**

The team identified a finding for the licensee's failure to ensure that condition reports were initiated as required by procedure. The licensee's implementing procedure for its corrective action program did not contain clear guidance as to what conditions were required to be entered into the corrective action program, or how soon after discovery the condition report was required to be generated. The team identified several examples where condition reports were not generated, though it appeared from the guidance that they were required. The licensee entered this finding in its corrective action program as condition report 53445.

The failure of licensee personnel to promptly initiate condition reports for identified issues, contrary to procedural requirements, is a performance deficiency. This performance deficiency is more than minor because if left uncorrected, it could lead to a more significant safety concern. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined that this finding was of very low safety significance (Green) because it did not involve a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to ensure procedures necessary for complete, accurate, and up-to-date procedures were available and adequate to support nuclear safety. Specifically, the corrective action program procedure was vague in its guidance as to when a condition report was required (H.2(c)). (Section 40A2.5.i)

Inspection Report# : [2012007](#) (*pdf*)**G****Significance:** Jan 24, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Loss of Configuration Control Causes Loss of All Non-Vital Power**

Inspectors identified a non-cited violation of Technical Specification 5.4.1.a, "Procedures," for implementation of an unauthorized modification by using a clearance order and a temporary procedure. This left the power source to a temporary protective relay unprotected. When another clearance order was being placed for main generator work, the temporary relay power source was lost when fuses were removed which supplied power to the temporary relay. This tripped the offsite power breaker to 13.8kV bus PA01 and tripped PA01 distribution breakers on January 24, 2012. Safety busses were unaffected because they were cross tied and being supplied by the No. 7 transformer. All non-vital systems lost power including normal service water which was removing core decay heat until operators could manually start and align essential service water pumps. Power to all systems was restored within approximately 24 hours. The inspectors found that the installation of temporary equipment was an unevaluated long standing practice. The temporary procedure was consistent with a system operating procedure when it was approved on January 17, 2012. This conclusion differed from Wolf Creek's apparent cause determination which did not identify the issue as an unevaluated modification. The inspectors concluded that they added value and considered the issue NRC identified. Initially, corrective actions included changing the clearance order to prevent removing of fuses to the temporary relay. After inspector questions, Wolf Creek blocked the use of the temporary procedure and procedure SYS MA-120 until further evaluation was completed. This has been entered into the corrective action program as condition reports 48182, 48642, and 51408.

Failure to control system configuration such that unplanned loss of power would not occur is a performance deficiency. The inspectors determined that this finding was more than minor because it impacted the mitigating systems cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, it impacted the configuration control attribute of shutdown equipment lineup which created a loss of offsite power to 13.8kV bus PA01. The inspectors screened the loss of service water pumps B and C, A and B circulating water pumps, vital air conditioning units, emergency diesel generator starting air compressors, transformer XNB01 cooling fans, heat tracing, auxiliary boiler steam heating, the condensate storage tank makeup pump, and the refueling water storage tank makeup pump to Manual Chapter 0609, attachment G, checklist 4. Wolf Creek had inventory in the pressurizer with a time to boil greater than 2 hours. The inspectors screened the finding to Green or very low safety significance because it did not



involve a loss of reactor coolant system inventory, did not affect reactor coolant system level instrumentation, did not affect the licensee's ability to terminate a leak path, did not affect the licensee's ability to add reactor coolant system inventory when needed, or degrade the licensee's ability to recover decay heat removal once it was lost. Additionally, the inspectors screened the loss of the electric fire pump and jockey (keep full) fire pump to Inspection Manual Chapter 0609.04. Specifically, these pumps were out of service for less than 24 hours, and therefore, screened to Green or very low safety significance. The inspectors identified that the cause of the finding had a human performance cross-cutting aspect in the area of resources because the loss of power was caused by a lack of complete, accurate and up-to-date design documentation, procedures, drawings, fuse labeling, and work orders necessary to support the temporary configuration established through TMP 12-001 [H.2.c].

Inspection Report# : [2012002](#) (pdf)

**G**

**Significance:** Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Incorrect Retraction of an Event that Could Have Prevented Fulfillment of a Safety Function**

The inspectors identified a Severity Level IV noncited violation of 10 CFR 50.73 because the licensee inappropriately retracted a licensee event report. On September 29, 2011, Wolf Creek issued Licensee Event Report 2011-004-01 which retracted the 10 CFR 50.73(a)(2)(v)(D) portion of the report for loss of both trains of automatic safety injection on March 19, 2011. The automatic functioning of safety injection is required by Technical Specification 3.3.2, function 1.b. Wolf Creek licensee event report 2011-004-00 was correct in its reporting the loss of safety function. In retracting this aspect, Wolf Creek credited manual action to restart safety injection and the long standing logic design. However, NUREG 1022, Section 3.2.7, specifies that inoperable systems required by the technical specifications be reported. This issue is entered into the licensee's corrective action program as condition report 46110.

The inspectors reviewed this issue in accordance with Inspection Manual Chapter 0612 and the NRC Enforcement Manual and determined that traditional enforcement was applicable to this issue because the NRC's regulatory ability was affected. Specifically, the NRC relies on the licensee to identify and report conditions or events meeting the criteria specified in regulations in order to perform its regulatory function, and when this is not done, the regulatory function is impacted. The inspectors used the Enforcement Policy and the available risk information to conclude that this violation is appropriately characterized as Severity Level IV.

Inspection Report# : [2011005](#) (pdf)

**G**

**Significance:** Dec 12, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Alternative Shutdown Procedure**

The team identified a Green non-cited violation of Technical Specification 5.4.1.d for the failure to implement and maintain adequate written procedures covering fire protection program implementation. Specifically, the team identified two examples where the licensee failed to maintain an alternative shutdown procedure that ensured operators would prevent overfilling the pressurizer and steam generators, respectively. The licensee documented this deficiency in Condition Report 045442.

The failure to maintain adequate written procedures covering fire protection program implementation was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems Cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated the significance of this finding using Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," because the performance deficiency affected fire protection defense-in-depth strategies involving post-fire safe shutdown systems. A senior reactor analyst performed a Phase 3 evaluation and determined this finding had very low risk significance based upon a bounding analysis (Green). This finding did not reflect current licensee performance (Section 1R05.05.2).

Inspection Report# : [2011007](#) (pdf)

**G****Significance:** Dec 12, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Ensure Post-Fire Safe Shutdown Components Remain Free of Fire Damage**

The team identified a Green non-cited violation of License Condition 2.C(5) because the licensee failed to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the licensee failed to properly analyze for fire damage in the form of shorts-to-ground related to the residual heat removal Train B refueling water storage tank suction valve and the pressurizer power-operated relief valves. Certain postulated shorts-to-ground could spuriously actuate these valves such that safe shutdown would be impacted. The licensee documented these deficiencies in Condition Reports 044912 and 045452, respectively.

The failure to protect the residual heat removal Train B suction cables and the pressurizer power operated relief valve cables against all modes of cable failure during post-fire safe shutdown circuit analysis was a performance deficiency. The performance deficiency was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The team used Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," because the performance deficiency affected fire protection defense-in-depth strategies involving post-fire safe shutdown. The team categorized the finding as having a high degradation rating because the post fire safe shutdown analysis was not complete. Because the Phase 1 screening criteria were not met, the team performed a Phase 2 analysis. The team walked down the affected fire area for each example as part of the Phase 2 quantitative screening. The team identified fire ignition sources and targets, and specific fire growth and damage scenario combinations for each example. The sum of the conditional core damage frequencies for the fire scenarios was  $5.15E^{-7}$ /year, which bounded the total change in core damage frequency associated with this performance deficiency.

This performance deficiency had a cross-cutting aspect in the area of human performance associated with decision making because the licensee did not use conservative assumptions during their design review process. Specifically, the licensee did not follow industry guidance related to performing a circuit analysis [H.1(b)] (Section 1R05.06).

Inspection Report# : [2011007](#) (pdf)**G****Significance:** Nov 04, 2011

Identified By: NRC

Item Type: FIN Finding

**Failure to Verify Isolation of Associated Circuits on Isolation Switches**

The team identified a finding because the licensee was not fully testing the isolation function of local transfer switches located at motor control center breakers for individual components. As a result, the licensee was not performing periodic verifications to confirm that local control circuits would be isolated from the effects of fire damage caused by a control room fire. The licensee documented this deficiency in Condition Report 045434.

The failure to maintain adequate written procedures covering fire protection program implementation was a performance deficiency. Specifically, the licensee failed to ensure that component specific transfer switch testing procedures verified proper circuit isolation from the control room in the event of a control room fire. 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 of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated the finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," because it affected fire protection defense-in-depth strategies involving post fire safe shutdown. Using Appendix F, Attachment 2, "Degradation Rating Guidance Specific to Various Fire Protection Program Elements," the team determined that the finding constituted a low degradation of the safe shutdown area since the control room isolation feature is expected to display nearly the same level of effectiveness and reliability as it would had the degradation not been present. This finding screened as having very low safety significance (Green). Since the failure to test the isolation function had not been verified since initial installation, the team determined that this failure did not reflect

current performance (Section 1R05.05.1).

Inspection Report# : [2011007](#) (pdf)

**Significance:**  Nov 04, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Procedure Inadequacies Related to Cold Shutdown Repairs**

The team identified a Green non-cited violation of License Condition 2.C(5) because the licensee failed to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the licensee failed to provide an adequate procedure for performing cold shutdown repairs required for post-fire safe shutdown. The licensee documented the deficiencies in Condition Reports 045397 and 045417.

The failure to ensure that Procedure OFN RP-017A, “Hot Standby to Cold Shutdown from Outside the Control Room Due To Fire,” Revision 0, could be implemented as written was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems Cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events (fire) to prevent undesirable consequences. The finding was evaluated for safety significance using NRC Inspection Manual Chapter 0609, Appendix F, “Fire Protection Significance Determination Process.” Since the finding was related to the ability to achieve and maintain cold shutdown, the finding screened to Green in Phase 1.

This performance deficiency had a cross-cutting aspect in the area of human performance associated with resources because the licensee did not prepare an accurate and up-to-date procedure that assured nuclear safety. Specifically, personnel did not verify that the steps in the revised procedure could be performed as written and that the components had proper labeling [H.2(c)] (Section 1R05.10).

Inspection Report# : [2011007](#) (pdf)

**Significance:**  Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Follow ASME Code Cas OMN-1 for Butterfly Valves**

The inspectors identified a noncited violation of 10 CFR 50.55a, “Codes and Standards,” when the licensee failed to correctly test a series of butterfly valves. The licensee installed seven Crane butterfly valves in the essential service water system in 2000 and 2002 but did not perform a preservice test under conditions as close as possible to the inservice test conditions or develop and perform an inservice stroke test under conditions as close to design basis conditions as required by their applicable code case. This issue is captured in the corrective action program as Condition Report 44218.

The issue is more than minor because it impacted the Mitigating Systems Cornerstone objective to ensure that to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, the finding was determined to be of very low safety significance (Green) because the finding is not a design or qualification deficiency confirmed not to result in loss of operability or functionality; the finding does not represent a loss of system safety function; the finding does not represent actual loss of safety function of a single train for more than its technical specification allowed outage time; the finding does not represent an actual loss of safety function of one or more nontechnical specification trains of equipment designated as risk significant per 10 CFR 50.65 for more than 24 hours; and the finding does not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors did not assign a crosscutting aspect because the finding was not indicative of current performance (Section 1R22).

Inspection Report# : [2011004](#) (pdf)

**Significance:**  Sep 22, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Emergency Operating Procedure for Steam Generator Tube Rupture**

The inspectors identified a Green noncited violation of Technical Specification 5.4.1.a, "Procedures," due to insufficient procedural direction to operations personnel to perform a subcooled recovery of a steam generator tube rupture if the ruptured steam generator cannot be isolated from any of the intact steam generators. On August 2, 2011, inspectors identified during simulator scenario validation that step 9 of Emergency Mitigation Guideline 3, "Steam Generator Tube Rupture," did not give adequate direction to operations personnel to mitigate a steam generator tube rupture event that required a subcooled recovery. The licensee entered the issue into their corrective action program as condition report 43515.

The finding is more than minor because the performance deficiency is associated with the procedure quality attribute of the mitigating systems cornerstone, and adversely affected the cornerstone's attribute to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding was determined to have very low safety significance because the finding is a deficiency confirmed not to result in a loss of operability or functionality of the overall ability to mitigate an unisolable steam generator tube rupture, if Emergency Mitigation Guideline 3 is used correctly as written. The finding does not have a crosscutting aspect because the deficiency was incorporated into the procedure in May 2000 and was not considered indicative of current licensee performance (Section 4OA5.2).

Inspection Report# : [2011301](#) (*pdf*)

**Significance:**  Sep 01, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Testing Of Emergency Diesel Generator A**

The inspector identified a noncited violation of 10 CFR 50, Appendix B, Criterion XI, Test Control, with two examples, because the licensee failed to ensure that all testing required to demonstrate that the emergency diesel generators would perform satisfactorily in service was identified and performed. In the first example, the licensee failed to change the loading requirements in Surveillance Test Procedure STS KJ-005A, "Manual/Auto Start, Sync & Loading Of EDG (emergency diesel generator) NE01," when the design basis accident loading of the emergency diesel generators was increased. In the second example, the licensee failed to perform testing required by Regulatory Guide 1.9 and IEEE Standard 387 to recertify the system following replacement of the mechanical governor.

The finding is 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. Using the significance determination process, the inspectors determined that the finding was of very low safety significance (Green) because it was a design or qualification issue that was confirmed not to represent an actual loss of safety function of the emergency diesel generator, since the unit was still able to operate properly in the isochronous mode. This finding was determined to have a crosscutting aspect in the area of human performance associated with the decision making component because the licensee did not use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action was safe in order to proceed rather than a requirement to demonstrate that it was unsafe in order to disapprove the action. Specifically, the licensee decided not to perform all required certification testing per Regulatory Guide 1.9 Revision 3 prior to declaring Emergency Diesel Generator A operable following replacement of the mechanical governor [H.1(b)]. (Section 3.2)

Inspection Report# : [2011009](#) (*pdf*)

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## **Barrier Integrity**

**Significance:**  Mar 26, 2012



Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Test ASME O&M Code Category A Valves in Post-LOCA Flow Path**

The inspectors identified a non-cited violation of 10 CFR Part 50.55a(f)(4), "Codes and Standards," for failure to adequately demonstrate that the seat leakage for 12 emergency core cooling system and containment spray valves remained within acceptable limits. These valves have a combined allowable leakage rate of 3.8 gpm to ensure that control room operator radiation doses remain within regulatory limits during an accident. Since the flowpaths have valves for which seat leakage is limited to a specific maximum amount, the inspectors identified that they should be considered Category A valves as specified in ASME OM (American Society of Mechanical Engineers Operations & Maintenance) Code. Wolf Creek subsequently took corrective action to perform valve seat leakage testing on March 10, 2012, which demonstrated that leakage was within acceptable limits. Additionally, Wolf Creek plans to change Chapter 15 of the USAR and correct its ASME OM Code basis document. This issue was entered into the licensee's corrective action program as condition report 46927.

Failure to correctly identify and perform testing needed to assure plant design for control room habitability is a performance deficiency. This finding is greater than minor because it was associated with the Barrier Integrity Cornerstone attribute of configuration control and affects the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, it affects the design control objective by failing to ensure that design limits were met on a periodic basis. Using Inspection Manual Chapter 0609.04, the issue was determined to not impact public and control room dose (above regulatory limits), it did not impact the control room due to toxic gas, it did not represent an actual open containment bypass path (above of regulatory limits), and did not impact hydrogen igniters. Therefore, this finding was found to be of very low safety significance. Also, public dose was not impacted with a potential radiation dose above a 10 CFR Part 50, Appendix I criteria. This finding did not have a cross-cutting aspect since the error associated with the inservice testing program was not reflective of current licensee performance because the failure to identify and include these valves occurred more than 3 years ago.

Inspection Report# : [2012002](#) (*pdf*)

**G**

**Significance:** Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Preconditioning of 480 Vac Breakers Prior to Required Surveillance Testing**

On November 14, 2011, the inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for pre-conditioning of the 480 Vac breaker for the containment cooling fan D prior to performance of the periodic functional test to satisfy Technical Requirements Manual Surveillance 3.8.11.3. Testing consisted of injecting a current in excess of the breaker's setpoint and measuring the response time. The licensee was observed to perform preventive maintenance activities consisted of cleaning, lubricating, inspecting, and calibrating the circuit breakers, then performed as-left surveillance testing. The inspectors concluded that the preventive maintenance activities were likely to positively impact the surveillance test results. The inspectors identified that the practice had occurred with other 480 Vac breakers because Wolf Creek personnel believed that the performance of as-left testing after preventive maintenance constituted a surveillance test.

The inspectors determined that mixing preventive maintenance and surveillance testing such that the containment cooling fan breaker was preconditioned was a performance deficiency. The finding was more than minor because it could become a more safety significant concern if left uncorrected. Specifically, the programmatic practices could mask safety-related circuit breaker degradation. The inspectors evaluated the significance of this finding under the barrier integrity cornerstone using Phase 1 of Inspection Manual Chapter 0609.04, and determined that the finding had very low safety significance. Specifically, the finding does not represent a degradation of the radiological barrier function provided for the control room, auxiliary building, or spent fuel pool; or represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere; and does not represent an actual open pathway in the physical integrity of the reactor containment; or a heat removal component. The inspectors determined that the finding had a cross-cutting aspect in the area of human performance associated with work control. Specifically, the work order and procedures were performed with competing requirements such that workers had to choose the correct sequence of activities [H.3(b)] (Section 1R22).

Inspection Report# : [2011005](#) (*pdf*)

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## Emergency Preparedness

**Significance:**  Aug 10, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Technical Support Center External Door Propped Open without Impairment**

The inspectors identified a noncited violation of 10 CFR 50.47, "Emergency Plans," for the failure to maintain an adequate emergency facility. The technical support center doors were propped open during maintenance for 82 days without a breach permit, leaving the licensee with no procedural controls to maintain the ability of the technical support center to withstand the 100-year recurrence winds as designed. The licensee's procedures would have caused operations personnel to review breaches and shut doors for a tornado event. This issue is captured in the corrective action program as Condition Report 42495.

The issue was more than minor because it impacted the facilities and equipment attribute of Emergency Preparedness Cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The inspectors used the emergency preparedness significance determination process and determined that the finding was Green because changes were made to the technical support center that did not comply with the plan and did not have compensatory actions, but the facility remained functional. The inspectors found that the cause of the finding had a crosscutting aspect in the area of human performance associated with the resources component, in that the breach procedure was not consistent with the design of the technical support center and resulted in missed compensatory action [H.2.c]

Inspection Report# : [2011004](#) (*pdf*)

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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 : September 12, 2012