

# Wolf Creek 1

## 3Q/2011 Plant Inspection Findings

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### Initiating Events

**Significance:** G Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

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

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:** G 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:**  Jun 16, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **No Procedure for Debris in Transformer an Tank Yards Propr to Severe Weather**

The inspectors identified a noncited violation of Technical Specification 5.4.1.a, “Administrative Procedures,” for having no procedure to address onsite debris impacting plant equipment during severe weather. The inspectors walked down external areas of the plant on June 1 and June 9, 2011, prior to the onset of predicted severe thunderstorms and tornadoes. The inspectors found loose debris each time and brought it to the attention of the licensee who secured the materials. The inspectors walked down the transformer yard and tank yard during a thunderstorm on June 16 and found loose debris such as plywood, trash, wood planks, and fiberglass planks. The inspectors brought this to the attention of Wolf Creek and the materials were removed or secured. Wolf Creek initiated several condition reports but they only addressed immediate cleanup. Wolf Creek procedures had no steps for securing potential wind-driven projectiles prior to severe weather. After June 16, Wolf Creek wrote Condition Report 40573 which started a weekly maintenance activity to remove loose materials and added procedure steps to have operations walk down external areas prior to severe weather.

This finding was more than minor because it impacted the protection against external factors attribute of 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 inspectors evaluated this finding using Inspection Manual Chapter 0609.04, and determined that it was of very low safety significance (Green) for June 16, 2011, because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment would be unavailable since the reactor was shutdown. Inspectors used Manual Chapter 0609 Appendix G, Checklist 4 for the other occurrences because Wolf Creek was in Modes 4 or 5. The finding again screened to Green because it did not increase the likelihood of a loss of inventory, did not cause the loss of reactor coolant system instrumentation, did not degrade the ability of the licensee to terminate a leak path or add inventory when needed, or degrade the ability to recover residual heat removal if it was lost. This finding has a cross-cutting aspect in the area of problem identification and resolution, specifically the corrective action program attribute because licensee’s short-term corrective actions failed to ensure debris was secured or removed prior to severe weather [P.1 (d)](Section 1R01).

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Jun 16, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Undersized Weld Failure on Charging Header**

The inspectors documented a self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criterion IX, “Control of Special Processes.” Specifically, in October 2009, welders failed to ensure the fillet weld between the train B charging header and the half coupling used to attach two vent valves met the specified weld requirements. This weld failed in January 2011, rendering the train B charging system inoperable. The licensee’s extent of condition review identified 12 vent line welds which did not meet ASME code weld size requirements and/or procedural requirements for 2:1 weld taper configuration. Additionally, quality assurance inspectors failed to identify that the 2:1 taper weld requirements specified by procedure, and ASME minimum weld size requirements, were not met in multiple vent line welds. The weld was repaired and built up to the correct 2:1 aspect ratio. This issue was entered into the licensee’s corrective action program as Condition Reports 32648, 33686, 33689, and 36438.

The finding was more than minor because it was associated with the equipment performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The inspectors performed a Phase 1 screening in accordance with Inspection Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” and determined that the finding was of very low safety significance (Green) because the issue did not result

in exceeding the technical specification limit for identified reactor coolant system leakage or affect other mitigating systems resulting in a total loss of their safety function. This finding had a cross-cutting aspect in the area of human performance, resources, because the licensee failed to ensure that personnel, specifically welders and quality assurance inspectors, were adequately trained in the procedural requirements and methods for measuring weld dimensions to assure nuclear safety [H.2(b)](Section 1R08).

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Jun 16, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Ensure Separation of Stainless Steel and Carbon Steel Grinding and Cutting Tools**

The inspectors identified a noncited violation of 10 CFR Part 50 involving the failure of the licensee to ensure that weld preparation was protected from deleterious contamination in that drawers (located in the hot tool room) containing files, grinding wheels, flapper wheels, and cutting wheels, used for the purpose of weld preparation, contained a mixture of both stainless steel tools and carbon steel tools. The failure to separate tools used for stainless steel weld preparation from tools used for carbon steel preparation could result in the contamination of stainless steel welds by carbon steel and affect the material integrity and corrosion resistance. The licensee immediately removed the tools and replaced them with new tools stored separately for use on specific types of metal. This issue was entered into the licensee's corrective action program as Condition Report 36444.

The finding was more than minor because it was associated with the equipment performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations, and if left uncorrected the finding would become a more significant safety concern. The inspectors performed a Phase 1 screening in accordance with Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because the issue did not result in exceeding the technical specification limit for identified reactor coolant system leakage or affect other mitigating systems resulting in a total loss of their safety function. This finding had a cross-cutting aspect in the area of human performance, resources, because the licensee did not provide complete, accurate, and up-to-date procedures for the preparation of stainless steel and carbon steel welds [H.2(c)](Section 1R08).

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Jun 16, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Ensure Configuration Control of Safety-Related Systems**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," involving the failure of the licensee to review the suitability of installing brass fittings and leaving test fittings on pressure, differential pressure, and flow transmitter equalizing block valve drain ports instead of the design specified stainless steel manifold plugs. During a boric acid walkdown, the inspectors identified that drain ports on the equalizing block of two separate reactor coolant system flow transmitters had brass fittings installed instead of the design specified stainless steel fittings. In response to inspector concerns about the brass fittings, the licensee subsequently discovered that a design configuration nonconformance existed by leaving the test fittings on the drain port during plant operation. Licensee Drawing J-17D22 specifies that manifold plugs be installed in the drain ports during plant operation. The licensee immediately replaced the brass caps with stainless steel fittings. This issue was entered into the licensee's corrective action program as Condition Report 36439.

The finding was more than minor because it was associated with the design control attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The inspectors performed a Phase 1 screening in accordance with Inspection Manual 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because the issue would not result in exceeding the technical specification limit for identified reactor coolant system leakage or affect other mitigating systems resulting in a total loss of their safety function. The inspectors also determined that the finding had a cross-cutting aspect in the area of human performance, resources, because the licensee did not provide adequate training of personnel so that the inappropriately installed fittings

Inspection Report# : [2011003](#) (pdf)

**Significance:** **G** Apr 05, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Inadequate Fire Watch Defeats Halon Fire Suppression in Vital Switchgear Rooms During Fire**

The inspectors reviewed a self-revealing noncited violation of License Condition 2.C.5 for failure to implement adequate fire watches which affected both trains of vital ac and dc switchgear. The inadequate fire watches occurred during an actual fire which negated the Halon system discharge because internal fire doors were not shut, as required, by the fire watch. The inspectors found problems with fire impairments and watches from 2008 that had not been corrected. Subsequent to the fire, Wolf Creek again briefed and trained its personnel on the requirements for fire watches. This issue is captured in the corrective action program as Condition Report 36719.

Failure to implement adequate fire impairments such that the fire watches ensured the success of the Halon system was a performance deficiency. The performance deficiency was more than minor because it impacted the Initiating Events Cornerstone and its objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the protection against external factors attribute was impacted by the fire impairment. To determine significance, the inspectors used Inspection Manual Chapter 0609.04 to screen the finding to Inspection Manual Chapter 0609, Appendix F, because the fire protection defense-in-depth strategies involving automatic suppression, fire barriers, and administrative controls were degraded. The senior reactor analyst conducted a Phase 3 review of this finding and concluded that the incremental core damage frequency was  $1.6E-8$  per year, or very low safety significance (Green). The inspectors found that the cause of the finding had a cross-cutting aspect in the area of problem identification and resolution. Specifically, corrective actions from ineffective fire watches in 2008 did not prevent recurrence of the inadequate fire watch on April 5, 2011 [P.1.d](Section 4OA3.3).

Inspection Report# : [2011003](#) (*pdf*)

**Significance:** **G** Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Clearance Order Disables Power Operated Relief Valve Low Temperature Overpressure Function**

The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to follow the requirements of Procedure AP 21E-001, "Clearance Orders." This procedure violation resulted in an inadequate tagout for the Train A solid state protection system resulting in an unplanned swap of the volume control tank charging pump suction to the reactor water storage tank and an unplanned entry into Technical Specification 3.4.12 due to the de-energization of power operated relief valve A low temperature overpressure protection relays. Operators took manual actions to restore the pump suction, and power was restored after approximately four hours. This finding has been entered into the licensee's corrective action program as Condition Reports 35288 and 35318.

The failure to follow procedures to complete clearance orders with adequate boundaries is a performance deficiency. The performance deficiency was more than minor because it impacted the Initiating Events Cornerstone objective of configuration control to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The significance of the finding was determined using Inspection Manual Chapter 0609, Significance Determination Process, Appendix G, Checklist 2, and determined to be of very low safety significance, because it did not cause the loss of mitigating capability of core heat removal, inventory control, power availability, containment control, or reactivity control. Additionally, the cause of the finding is related to the human performance crosscutting component of work control. Specifically, the licensee did not appropriately plan for the maintenance work scope by ensuring work groups and an offsite organization communicate the necessary electrical boundaries to assure plant and human performance [H.3(b)] (Section 1R20).

Inspection Report# : [2011002](#) (*pdf*)

**Significance:** **G** Mar 21, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Maintain RCS Pressure Below Relief Valve Setpoint**

The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a, "Administrative

Procedures,” for failure to follow procedural requirements to maintain reactor coolant system pressure below 350 psig. Control room operators increased charging flow at too great a rate with the reactor coolant system water-solid which caused the pressurizer power-operated relief valve to cycle three times over several minutes until adjustments to letdown could be made to reduce reactor coolant system pressure. Also, the letdown pressure controller was left in manual when automatic control would have lessened the pressure increase. Wolf Creek wrote Condition Report 35244 to

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correct the deficiency by changing several procedures for water-solid plant operations.

The failure to maintain pressure below the power-operated relief valve setpoint was a performance deficiency. The performance deficiency was more than minor because it impacted the Initiating Events Cornerstone objective of configuration control to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The significance of the finding was determined using Inspection Manual Chapter 0609, Significance Determination Process, Appendix G, Checklist 2, and determined to be of very low safety significance (Green), because it did not cause the loss of mitigating capability of core heat removal, inventory control, power availability, containment control, or reactivity control. Additionally, the finding also did not cause any low temperature overpressure technical specifications to be exceeded. The inspectors found that the cause of the finding had a cross-cutting aspect in the area of human performance. Specifically, operators had to rely on skill of the craft when procedures should have supplied more instruction for manipulating charging and letdown with a water-solid plant [H.2.c](Section 4OA3.2).

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Mar 19, 2011

Identified By: Self-Revealing

Item Type: VIO Violation

#### **Failure to Correct Procedure for Opening Main Steam Isolation Valves (EA-11-149)**

The inspectors identified a cited violation of Technical Specification 5.4.1.a, “Administrative Procedures,” involving Wolf Creek’s failure to correct Procedure SYS AB-120 for main steam isolation valve operation. Specifically, between March 3, 2010, and March 19, 2011, Wolf Creek experienced repeat cases of safety-system actuations due to Procedure SYS AB-120 containing inadequate steps to establish conditions necessary to open a main steam isolation valve. Corrective actions were previously limited to steam header pressures below 300 psi. Wolf Creek commenced a root cause evaluation of the March 19, 2011, safety injection under Condition Report 34964. Due to Wolf Creek’s failure to restore compliance from previous NCV 05000482/2010004-01 within a reasonable time after the violation was identified, this violation is being cited as a Notice of Violation consistent with the Enforcement Policy.

Failure to correct deficiencies in Procedure SYS AB-120 for steam pressures above 300 psi was a performance deficiency. The inspectors determined that this finding was more than minor because it impacted 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. Specifically, this issue relates to the configuration control attribute for shut down equipment alignment. The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04. Assuming worst case degradation, the finding resulted in exceeding the technical specification limit for reactor coolant system leakage due to the pressurizer power-operated relief valve cycling. Therefore, the inspectors screened the finding to a Phase 2 review by the senior reactor analyst. The senior reactor analyst used the Wolf Creek SPAR model and concluded that the incremental core damage probability was  $3.7E-7$  (Green). The inspectors found that the cause of the finding has a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action program. Specifically, several evaluations failed to have an adequate extent of condition review and did not find that procedures were inadequate for opening a main steam isolation valve above 300 psi [P.1(c)](Section 4OA3.1).

Inspection Report# : [2011003](#) (pdf)

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

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Identify Boric Acid Leak on Instrument Lines to Reactor Coolant System**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures,

and Drawings,” involving the licensee’s failure to identify, document, and evaluate sources of boric acid leakage. During a boric acid walkdown and containment closeout tour on December 7, 2010, the inspectors identified a boric acid leak in an instrument line to the reactor coolant system loop 2 flow transmitters which had not been previously identified and documented by the licensee. As such, the licensee failed to accomplish the requirements of procedure AP 16F-001, “Boric Acid Corrosion Control Program,” Revision 6A, step 6.1, which stated, in part, that sources of boron leakage shall be identified and documented in the applicable corrective action document. The licensee entered this finding into their corrective action system as Condition Report 31003 and replaced the leaking union.

The finding was determined to be more than minor because it was associated with the Initiating Events Cornerstone attribute of human performance 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, and determined the finding was of very low safety significance (Green) because the issue would not result in exceeding the technical specification limit for identified reactor coolant system leakage or affect other mitigating systems resulting in a total loss of their safety function. The inspectors also determined that the finding had a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee did not have a sufficiently low threshold in order to identify boric acid leaks during walkdowns [P.1.(a)] .

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Procedures for Establishing Feedwater Preheat**

The inspectors identified a noncited violation of Technical Specification 5.4.1.a, “Procedures,” for Wolf Creek Procedures GEN 00-003, “Hot Standby to Minimum Load,” and SYS AE-200, “Feedwater Preheating During Plant Startup and Shutdown,” being inadequate by failing to require maximum feedwater preheating. This could lead to a reactor trip caused by steam generator level oscillations attributable to low feedwater temperature. This was a contributing factor in the October 17, 2010, reactor trip. A temporary change was made to the procedures that cautioned operating crews to maintain maximum feedwater preheating. This issue was entered in the licensee’s corrective action program as Condition Reports 29845 and 29846.

The inadequate procedural direction to establish maximum feedwater preheating is a performance deficiency. The performance deficiency is more than minor, therefore a finding, because it is associated with the Initiating Events Cornerstone attribute of procedure quality and it affects 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. The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04. This finding was determined to be of very low safety significance since the finding contributed to the likelihood of a reactor trip; however, it did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding had a crosscutting aspect in the area of problem identification and resolution associated with the operating experience component because Wolf Creek failed to institutionalize internal and external operating experience by changing plant procedures [P.2(b)].

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Procedures to Ensure Proper Main Feed Pump Speed During Startup**

The inspectors identified a noncited violation of Technical Specification 5.4.1.a, “Procedures,” for Wolf Creek Procedures GEN 00-003, “Hot Standby to Minimum Load,” and SYS AE-121, “Turbine Driven Main Feedwater Pump Startup,” being inadequate by failing to direct control room operators to establish a main feedwater pump speed that will allow the feed bypass regulating valves to control in the 60 to 80 percent open range, prior to raising power from 8 to 16 percent. Feed bypass regulating valve throttle characteristics are highly non-linear below this range which complicates manual and automatic control. This was a contributing factor in the October 17, 2010, reactor trip. A temporary change was made to the procedures that cautioned operating crews to ensure earlier establishment of optimal feedwater bypass control valve position. This issue was entered in the licensee’s corrective action program as

The inadequate procedural direction to establish optimal bypass valve position at the correct time during the startup is a performance deficiency. The performance deficiency is more than minor, therefore a finding, because it is associated with the Initiating Events Cornerstone attribute of procedure quality and it affects 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 evaluated the significance of this finding using Inspection Manual Chapter 0609.04. This finding was determined to be of very low safety significance since the finding contributed to the likelihood of a reactor trip; however, it did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding had a crosscutting aspect in the area of problem identification and resolution associated with the operating experience component because Wolf Creek failed to institutionalize internal operating experience by changing plant procedures [P.2(b)].

Inspection Report# : [2010005](#) (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*)

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## Mitigating Systems

**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:**  May 06, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Analyze for Vortexing in Containment Spray Additive Tank**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” for the failure to translate the design basis into instructions, procedures, and drawings. The inspectors found that the licensee failed to assess whether vortexing occurred in the containment spray additive tank in the event of a design-basis accident. Wolf Creek entered this issue in the corrective action program as Condition Report 38715.

Failure to implement design control measures to analyze whether containment spray piping remained full of water was a performance deficiency. This finding 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 the containment

spray system to respond to initiating events and prevent undesirable consequences. Specifically, the inspectors had reasonable doubt on the capability of the containment spray system to properly inject because of vortexing in the containment spray additive tank. The inspectors performed the significance determination using Inspection Manual Chapter 0609.04. The finding was determined to be of very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in loss of operability or functionality. Although the failure to have this calculation had existed since original construction, the inspectors determined this finding reflected current performance since the licensee was required to evaluate likelihood of tanks allowing gas intrusion into the emergency core cooling systems in response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." Consequently, this finding had problem identification and resolution cross-cutting aspects associated with the corrective action program in that the licensee did not thoroughly evaluate the potential for gas intrusion from all possible tanks [P.1(c)](Section 40A5).

Inspection Report# : [2011003](#) (*pdf*)

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Design Control of the Fuel Oil Storage Tank Fill System**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, for the failure to assure that applicable regulatory requirements and the design basis were met. Specifically, the licensee failed to ensure that the fuel oil storage tank fill system minimized turbulence, as required by the Updated Safety Analysis Report, such that the emergency diesel generators can be refueled while running uninterrupted. The licensee entered this issue in the corrective action program and will develop corrective actions as part of Condition Report 34730.

The failure to establish measures to assure that applicable regulatory requirements and the design basis are met was a performance deficiency. The performance deficiency was more than minor because it impacted the Mitigating Systems Cornerstone attribute of design control and affects the associated 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 inspectors determined that the finding had very low safety significance because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the licensee failed to use conservative assumptions in decision making and adopt a requirement to demonstrate the proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove the action [H.1(b)] (Section 1R04).

Inspection Report# : [2011002](#) (*pdf*)

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Isolated Cooling to Inservice Safety-Related Equipment**

The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a involving the failure to properly implement the clearance order procedure resulting in a failure to provide adequate cooling to inservice safety-related equipment. Operators restored cooling water flow after approximately one hour. The licensee entered the finding into their corrective action program as Condition Report 33357.

The inspectors determined that the failure to ensure that plant conditions could support establishing the clearance order boundaries, which resulted in a component cooling water heatup and trip of the inservice control room air conditioner, was a performance deficiency. The inspectors determined that this finding was more than minor because it is associated with the configuration control attribute for the Mitigating Systems Cornerstone and it affected the 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 finding was determined to have very low safety significance because it was confirmed not to result in loss of operability of control room air conditioning Train B for greater than its technical specification allowed outage time and it did not result in the loss of the normal service water function for greater than 24 hours. This finding has a crosscutting aspect in the area of

human performance associated with work control because the licensee failed to plan the work activity by incorporating the impact on the plant [H.3(a)] (Section 1R04).

Inspection Report# : [2011002](#) (pdf)

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Monitor the Performance of Nonsafety Related Systems and Components Used in the Plant Emergency Operating Procedures under 10 CFR 50.65 Programs**

The inspectors identified a noncited violation of 10 CFR 50.65(a)(1) with three examples involving the failure to monitor the performance of stand by nonsafety-related systems and components that exceeded performance criteria against goals. First, the inspectors identified that the licensee failed to monitor the turbine-driven main feedwater pumps against their standby restart function to fill the steam generators in emergency operating procedures. Failures of the two turbine-driven main feedwater pumps occurred which could have prevented fulfillment of this function. Second, the inspectors identified that the licensee failed to evaluate reactor trips caused by the main feedwater system against the system's plant level monitoring criteria. Third, the inspectors identified that the licensee failed to monitor the instrument air compressor system against its emergency operating procedure function to restart and provide compressed air. Several instrument air compressor trips have occurred in the last 18 months which could have prevented fulfillment of this function. The licensee entered this issue in the corrective action program and will develop corrective actions as part of Condition Report 36600.

The failure to establish performance monitoring goals commensurate with the mitigating safety function specified in the emergency operating procedures and the plant level criteria is a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it impacts 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 (i.e., core damage). Using the NRC Inspection Manual Chapter 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding screened to a Phase 2 significance determination because it involved a potential loss of safety function of the main feedwater system and failure of the instrument air system. A Region IV senior reactor analyst performed a Phase 2 significance determination and using the pre-solved worksheet from the "Risk Informed Inspection Notebook for the Wolf Creek," Revision 2.01a; however, the presolved worksheet did not include the simultaneous failure of multiple components in different systems. Therefore, the senior reactor analyst performed a bounding Phase 3 significance determination using Appendix M of Inspection Manual Chapter 0609, "Significance Determination Process Using Qualitative Criteria," Section 4.1.2. The analyst determined that the finding was of very low safety significance (Green). The bounding change to the core damage frequency was approximately  $8 \text{ E-7/year}$ . The relatively low risk worth of the instrument air system at Wolf Creek helped to mitigate the significance. To evaluate the change to the large early release frequency (LERF), the analyst used Inspection Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process." The finding screened as having very low safety significance for LERF because it did not affect the intersystem loss of coolant accident or steam generator tube rupture categories. The inspectors determined that the finding had a crosscutting aspect in the area of problem identification and resolution. Specifically, when Wolf Creek evaluated exceeding the plant level monitoring criteria for reactor trips, their analysis did not identify that failures within the main feedwater system were the cause of four of the six reactor trips, and did not place the affected system function in a(1) monitoring [P.1(c)] (Section 1R12).

Inspection Report# : [2011002](#) (pdf)

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Follow 10 CFR 50.65 a(2) for Main Control Board Annunciator Power Supply Failures**

The inspectors identified a noncited violation of 10 CFR 50.65 a(2), involving the failure to demonstrate that the performance of main control board annunciator power supplies was effectively controlled through preventive maintenance such that the annunciators remained capable of performing their intended function. The licensee entered this issue into the corrective action program and will develop corrective actions as part of Condition Report 34681.

The failure to properly evaluate the failed main control board annunciator power supplies, establish performance

goals, and monitor their performance is considered a performance deficiency. This finding is more than minor because it is associated with the Mitigating Systems Cornerstone attribute of equipment performance and it adversely affects the cornerstone objective ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheets, the finding is determined to have very low safety significance since it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding was determined to have a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee failed to properly classify, prioritize, and evaluate a condition adverse to quality [P.1(c)] (Section 1R12).

Inspection Report# : [2011002](#) (pdf)

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Calculation for Vital Switchgear Cooling**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, involving an inadequate calculation supporting vital switchgear room temperatures with only one vital switchgear cooler operable. The licensee entered this issue in the corrective action program and will develop corrective actions as part of Condition Reports 27276, 28252, and 31452.

The inspectors considered the inadequate heat loads and assumptions used in calculation GK-06-W to be a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it impacted with the equipment performance attribute of the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors screened the finding to Green because the additional temperatures would not have caused the loss of functionality of vital switchgear or batteries, and it did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. No crosscutting aspects were identified because the supporting documentation was prepared in the late 1990s and was not representative of current licensee performance (Section 1R15).

Inspection Report# : [2011002](#) (pdf)

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Perform an Operability Determination for Degradation of the Fuel Oil Storage Tank**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, involving the failure to follow plant procedures. Specifically, the licensee failed to follow procedure and perform an operability determination when a nonconforming or degraded condition was identified in the Train B emergency diesel generator fuel oil storage tank, as required by Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 21. The licensee subsequently performed an operability determination and concluded the fuel oil storage tank was operable but degraded. The licensee entered this issue in the corrective action program as Condition Reports 33355 and 34068.

The failure to follow Procedure AP 26C-004, "Operability Determination and Functionality Assessment," Revision 21, when a nonconforming or degraded condition was identified was a performance deficiency. This performance deficiency was more than minor because it could become a more significant safety concern if left uncorrected. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the inspectors determined that the finding had very low safety significance (Green) because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee failed to thoroughly evaluate problems, including evaluating operability, such that the resolution addressed the cause [P.1(c)] (Section 1R15).

Inspection Report# : [2011002](#) (pdf)

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Verify Ultimate Heat Sink Sedimentation Levels within Design Bases**

The inspectors identified a noncited violation of 10 CFR Part 50 Appendix B, Criterion III, involving a failure to perform periodic testing to verify that ultimate heat sink sedimentation remained within design basis limits. The licensee subsequently verified the ultimate heat sink depth remained acceptable using SONAR. The licensee entered this issue in the corrective action program as Condition Report 27144.

Wolf Creek's failure to perform periodic testing to verify that ultimate heat sink sedimentation remained within design basis limits is a performance deficiency. The issue is more than minor, and therefore a finding, because if left uncorrected the issue has the potential to become a more significant safety concern. The inspectors concluded that the issue screened to Green under the significance determination process using Inspection Manual Chapter 0609.04, "Phase 1-Initial Screening and Characterization of Findings," because the finding was a design deficiency that was later confirmed not to result in the loss of operability or functionality of the ultimate heat sink. The inspectors concluded that this finding's cause has a crosscutting aspect in the area of human performance associated with the work control component because Wolf Creek did not appropriately coordinate work activities by incorporating actions to address the impact of changes to the work scope or activity on the plant and human performance. Specifically, when Wolf Creek performed and planned dredging preventive maintenance on the ultimate heat sink, they did not consider the need to confirm as-found and as-left sediment depth to verify that their design basis was met [H.3(b)] (Section 1R19).

Inspection Report# : [2011002](#) (*pdf*)

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Fill and Vent of Component Cooling Water**

The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to perform an adequate fill and vent of the component cooling water system which resulted in voiding of the system. The licensee entered the finding into their corrective action program and will develop corrective actions as part of Condition Report 33925.

The inspectors determined that the failure to perform an adequate fill and vent of component cooling water that resulted in system voiding was a performance deficiency. The inspectors determined that this finding was more than minor because it is associated with the human performance attribute of the Mitigating Systems Cornerstone and it affected the 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 finding was determined to have very low safety significance (Green) because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee failed to take appropriate corrective actions from previous voiding events [P.1(d)] (Section 1R19).

Inspection Report# : [2011002](#) (*pdf*)

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Repetitive Failure to Enter Technical Specifications for Auxiliary Feedwater Suction Valve Testing**

The inspectors identified a noncited violation of Technical Specification 5.4.1.a, "Procedures," involving the failure to follow Procedure AP 21-001, "Conduct of Operations." Specifically, the licensee failed to enter into technical specification limiting condition of operation 3.7.5.B.1 for one auxiliary feedwater pump inoperable during performance of 92-day check valve surveillance tests. Wolf Creek took prompt corrective action to amend the procedures to include instructions for maintaining the pumps operable with manual actions. This occurred prior to the

next check valve test. This issue is captured in Condition Report 34469.

The failure to enter technical specification action statements in accordance with Procedure AP 21-001 was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it impacted with the human performance attribute of 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. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance (Green) because the issue did not result in a loss of operability for a time period greater than the action statement, and did it not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the finding has a crosscutting aspect in the area of human performance associated with decision making. Specifically, informally maintained pre-job briefing sheets were being relied upon to determine technical specification applicability instead of the licensee's decision making process of operator review on a case by case basis [H.1(a)] (Section 1R22).

Inspection Report# : [2011002](#) (pdf)

**Significance:**  Mar 08, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Properly Establish Clearance Order Boundary Isolation Resulting in Loss of Component Cooling Water Inventory**

The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1a, "Administrative Procedures," for a loss of component cooling water train B inventory caused by inadequate clearance order verification. Valve HBV110 was stuck in position and was partially open. When the clearance order was implemented, the operators concluded the valve was already closed. Subsequently, the valve created a leakage path which exceeded the surge tank makeup flow capacity and required manual isolation by the control room operators to protect safety-related components. Wolf Creek has taken corrective actions to include communication of expected as-found equipment positions in pre-job briefings and the clearance order template. This issue is captured in the corrective action program as Condition Reports 34505 and 40219.

Failure to properly establish clearance order boundary isolation was a performance deficiency. The performance deficiency is more than minor because it is associated with the equipment performance and human performance attributes of the Mitigating Systems Cornerstone and impacted the cornerstone objective of ensuring 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 because the finding did not result in the loss of operability or functionality of the component cooling water train or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors found that the finding had a cross-cutting aspect of work practices in the area of human performance associated with the communication of human error prevention techniques, such as holding pre-job briefings, self- and peer-checking, and proper documentation of activities [H.4(a)](Section 1R04).

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Mar 08, 2011

Identified By: NRC

Item Type: FIN Finding

### **Inadequate Acceptance Criteria for Postmaintenance Testing of the Startup Feedwater Pump**

The inspectors identified a finding involving the failure to follow the requirements of Procedure AP 16E-002, "Post Maintenance Testing Development," for the startup feedwater pump. On November 4-6, 2010, Wolf Creek workers disassembled the startup feedwater pump for numerous preventive and corrective activities including removing the rotating element. On November 17, 2010, Wolf Creek conducted surveillance Procedure STN AE-007, "Startup Main Feedwater Pump Operational Test," following reassembly. The only acceptance criteria listed in this procedure is that the motor-driven feedwater pump starts from the control room with no local operator action. The inspectors found this contrary to Procedure AP 16E-002, which requires acceptance criteria for a pump flow capacity test, vibration, bearing and lubrication temperatures, motor current, external leakage, and lubrication level be found satisfactory. This issue is captured in the corrective action program as Condition Report 39494. Wolf Creek issued a new work package to conduct a single-point pump capacity test and complete the required postmaintenance testing. Wolf Creek found,

pending final review, that initial calculations show that the pump design is capable of enough flow to provide a heat sink in emergency operating procedures.

Failure to follow Procedure AP 16E-002 for developing test criteria for plant equipment after the completion of maintenance activities is a performance deficiency. The finding is more than minor because it is associated with the Mitigating Systems Cornerstone attribute of equipment performance and it adversely affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, the inspectors determined that the finding had very low safety significance (Green) because it did not result in a loss of system safety function, an actual loss of safety function of a single train for greater than its technical specification allowed outage time, or screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors determined that the finding had a cross-cutting aspect in the area of problem identification and resolution. Specifically, Wolf Creek created a testing procedure in response to a root cause evaluation, but did not consider acceptance criteria  
Inspection Report# : [2011003](#) (pdf)

**Significance:**  Feb 25, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Trend Emergency Diesel Generator Chemistry Parameters Results in an Unplanned Technical Specification Entry**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to follow Procedure AP 28A-0100, "Condition Reports," Revision 13. On February 17, 2011, the licensee received laboratory test results on the emergency diesel generator B fuel oil storage tank and determined that the cloud point parameter was out of specification at -8° Celsius. However, Procedure AP 28A-0100, step 5.13.3, required the licensee to evaluate condition report data to identify and evaluate potential trends. The emergency diesel fuel oil storage tank cloud point parameter had been trending closer to the acceptance criteria over the last several fuel oil additions. The licensee had allowed the original fuel oil vendor to continue to deliver fuel that was out of specification which resulted in a gradual trend toward the limits of the chemistry parameters. This trend was not appropriately evaluated because the licensee had not performed training to ensure that consistent and appropriate evaluations would be performed.

This finding was more than minor because it affected the Mitigating Systems Cornerstone attribute of equipment performance by impacting the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This deficiency directly resulted in emergency diesel generator B being declared inoperable due to its fuel oil storage tank being out of specification. The inspectors performed the significance determination using NRC Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," because it affected the Mitigating Systems Cornerstone while the plant was at power. The finding was determined to be of very low safety significance (Green) because it was not a design or qualification deficiency; it did not result in the loss of a system safety function; it did not represent the loss of a single train for greater than technical specification allowed time; it did not represent a loss of one or more non-technical specification risk-significant equipment for greater than 24 hours; and it did not screen as potentially risk significant due to seismic, flooding, or severe weather. In addition, this finding had a human performance crosscutting aspect associated with resources in that the licensee did not ensure that the corrective action program coordinators were effectively train

Inspection Report# : [2011006](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Account for Water Hammer Stresses in Essential Service Water System Calculations**

The inspector identified a Green noncited violation of 10 CFR 50, Appendix B, Criterion III, having very low safety significance for the licensee's failure to ensure that applicable regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures and instructions. Wolf Creek failed to properly account for essential service water piping membrane stress and impact loads as required by the 1974 ASME Code, Section III, paragraphs ND-3112.4 and ND-3111. Specifically, the licensee's design calculations for the essential service water system did not account for the pressure fluctuations caused by a known column closure water hammer phenomena

which occurs during a loss of offsite power or load sequencer testing. Wolf Creek has written Condition Report 33253 and plans to address the issue.

The licensee's failure to account for the pressure fluctuations caused by a known column closure water hammer phenomena in the design calculations for the essential service water system was a performance deficiency. This performance deficiency was more than minor and therefore a finding because it was associated with the human performance attribute of the Mitigating Systems Cornerstone, 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 the significance of the finding using IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it did not represent an actual loss of safety function of a single train for greater than its technical specification allowed outage time. This finding has a crosscutting aspect in the human performance cross-cutting area, associated with the decision making component, because the licensee used non-conservative values without adequate engineering justification to conclude that essential service water system piping met minimum wall thickness criteria for operability [H.1(b)].

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Maintain Licensed Operator Examination Integrity**

The inspectors identified a Green noncited violation of 10 CFR Part 55.49, "Integrity of Examinations and Tests," for the failure of the licensee to ensure that the integrity of the written examinations and the operating tests administered to licensed operators was maintained. Seven licensed operators received two dynamic scenarios for their operating tests that had been previously administered to other licensed operators in previous weeks for the 2009 operating tests. Also, six licensed operators for week 4 and 12 licensed operators for week 5 received written examinations during the 2010 examinations that contained more than 50 percent repeat questions from the previous week examinations. These failures resulted in a compromise of examination integrity because they exceeded the 50 percent overlap defined by ACAD 07-01, "Guidelines for the Continuing Training of Licensed Personnel," for this portion of the examination and operating tests, but did not lead to an actual effect on the equitable and consistent administration of the examination. This issue was entered into the licensee's corrective action program as Condition Report 28854.

The failure of the licensee's training staff to maintain the integrity of examinations administered to licensed operations personnel was a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it adversely impacted the human 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. Additionally, if left uncorrected, the finding could have become more significant in that allowing licensed operators to return to the control room without valid demonstration of appropriate knowledge on the biennial examinations and operating tests could be a precursor to a significant event if undetected performance deficiencies develop. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, and the corresponding Appendix I, "Licensed Operator Requalification Significance Determination Process," the finding was determined to have very low safety significance (Green) because the finding resulted in a compromise of the integrity of operating test dynamic scenarios and written examinations and compensatory actions were not immediately taken in 2009 (for the operating tests) and 2010 (for the written examinations) when the compromise should have been discovered. Because the equitable and consistent administration of the exam was not actually impacted by this compromise, it is being characterized as a Green noncited violation. This finding has a crosscutting aspect in the area of human performance associated with the resources component because the licensee did not ensure that the associated procedure used to create the examinations and operating tests was complete, accurate, and up to date to ensure that the 50 percent maximum overlap standard was not exceeded [H.2(c)].

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Properly Identify and Evaluate Degraded Piping in the Train A Essential Service Water System**

The inspector identified a Green noncited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to properly evaluate a condition adverse to quality involving train A of the essential service water system. The cause and extent of condition of the pitting corrosion of the essential service water piping was not fully addressed by the licensee due to inadequate analysis and lack of engineering justification for the assumptions used to evaluate the degradation. As a result, the licensee was unable to ensure the pitting degradation did not reduce essential service water pipe wall thickness below the minimum allowed ASME code specifications. This resulted in train A of the essential service water system being declared inoperable from 2:20 p.m. until 10:21 p.m. on December 9, 2010, while measurements of the piping wall thickness were obtained. The licensee entered this issue into the corrective action program as Condition Report 18785.

The failure to properly evaluate the degraded condition of the essential service water piping was a performance deficiency. The inspector determined this finding was more than minor because it was associated with the human performance attribute of the Mitigating Systems Cornerstone, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to events to prevent undesirable consequences. The inspector determined the significance of the finding using IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it did not represent an actual loss of safety function of a single train for greater than its technical specification allowed outage time. This finding had a crosscutting aspect in the human performance cross-cutting area, decision making component, because the licensee did not use conservative assumptions in its decision making when they initially used non-conservative values without adequate engineering justification to conclude that the train A essential service water piping met minimum wall thickness criteria for operability [H.1(b)].

Inspection Report# : [2010005](#) (pdf)

**Significance:** G Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Evaluate Corrosion Mechanism in Accordance with Code Case N513**

On September 15, 2010, the inspectors identified a Green noncited violation of 10 CFR 50.55a(b)(5) for failing to implement the requirements of Code Case N513-2, Section 2.0(e). On June 29, 2010, Wolf Creek discovered a through-wall leak of a 30 inch essential service water pipe. The flaw was evaluated using ASME Code Case N513-2. Code Case N513, Section 2.0(e) required the flaw be re-examined every 30 days unless a flaw growth evaluation is prepared to justify re-examination every 90 days. The evaluation is required to include corrosion rate and corrosion mechanism. The inspectors reviewed the engineering disposition for the flaw and did not find a discussion of the corrosion mechanism or a justification of the corrosion rate. The inspectors reviewed independent laboratory analyses of removed Wolf Creek piping samples that stated that microbiologically influenced corrosion was likely and that the corrosion likely progressed through-wall at a high rate. On September 30, 2010, an engineering disposition was created in response to Condition Report 28077 which included a corrosion evaluation and established a much higher corrosion rate. Key in that corrosion evaluation was the use of empirical data from testing of known flaws which showed a corrosion rate between -4 mils per year to 29 mils per year. The flaw was reexamined after 90 days and minimal growth was found.

The failure to comply with the requirements of ASME Code Case N513-2, Section 2.0(e) was considered a performance deficiency. The finding is greater than minor because the failure to perform timely and adequate evaluations of degraded, nonconforming, and unanalyzed conditions for operability, if left uncorrected, would have the potential to lead to a more significant safety concern. The finding is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of this finding using Phase 1 of Inspection Manual Chapter 0609.04, and determined that the finding was of very low safety significance (Green) because the issue did not result in a loss of operability or functionality, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with corrective action program component because operations and engineering personnel failed to thoroughly evaluate problems such that the resolutions addressed the cause and extent of condition [P.1(c)].

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Procedure for Steam Generator Hi-Hi Turbine Trip**

The inspectors identified a noncited violation of Technical Specification 5.4.1.a, "Procedures," for Wolf Creek Procedure ALR 00-112A, "Steam Generator Level Hi-Hi Turbine Trip," being inadequate when reactor power exceeds the capabilities for the auxiliary feedwater system to maintain adequate steam generator inventory after P-14 actuation. This contributed to the operators' attempt to perform a controlled shutdown instead of a reactor trip, thereby causing an automatic reactor trip. The licensee incorporated guidance in their startup training to trip the reactor when inadequate feedwater flow exists after P-14 actuation. This issue was entered into the licensee's corrective action program as Condition Report 29540.

The inadequate procedural direction after P-14 actuation is a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the Mitigating Systems Cornerstone attribute of human performance and it affected the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings." This finding was determined to be of very low safety significance since the finding does not represent a loss of system safety function, nor does the finding represent actual loss of safety function for single train for a greater time than permitted by technical specifications. This finding had a crosscutting aspect in the area of human performance associated with the resources component because Wolf Creek failed to validate that the procedure would be successful in stabilizing the plant [H.2(c)].

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Simulation Facility Fidelity**

The inspectors identified a noncited violation of 10 CFR 55.46(c)(1)(i), "Simulator Fidelity," in that the licensee's simulation facility did not have adequate fidelity to simulate steam generator level oscillations that occur during startup and shutdown after a loss of feedwater preheat, thereby creating the possibility for negative training. Specifically, two constants that are used in the model for the Westinghouse 7300 steam generator level control cards were improperly programmed in the simulator. The licensee changed the constants in the simulator model and initiated actions to ensure accurate low-power steam generator oscillation modeling. This issue was entered into the licensee's corrective action program as Condition Report 29541.

The failure to have a properly modeled simulation facility is a performance deficiency. The performance deficiency is more than minor, therefore a finding, because it is associated with the Mitigating Systems Cornerstone attribute of human performance and it affected the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings." This finding was determined to be of very low safety significance because the finding neither represents a loss of system safety function, nor does it represent actual loss of safety function for single train for a greater time than permitted by technical specifications. This finding had a crosscutting aspect in the area of human performance associated with the resources component because Wolf Creek did not ensure the simulation facility was accurately modeling plant behavior [H.2(d)].

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Nov 24, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Promptly Identify and Correct a Condition Adverse to Quality**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to promptly identify voiding conditions in the component cooling water and residual heat removal system piping. The licensee failed to promptly identify the presence of voids in both the component cooling water and residual heat removal systems despite unexpected component cooling water pump auto starts and unexpected audible water hammer and minimum flow valve (EJ FCV-610) cycling during component cooling water and residual heat removal pump surveillances.

This finding was more than minor because the failure to promptly identify conditions adverse to quality associated with the component cooling water and residual heat removal systems is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in a loss of operability. The finding had a crosscutting aspect in the human performance, decision making component, because the licensee failed to use conservative assumptions during the evaluation of the pressure oscillations exhibited during the component cooling water pump starts.

Inspection Report# : [2010008](#) (pdf)

**Significance:**  Nov 24, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Inadequate Procedure for Fill and Vent of the Component Cooling Water System**

The inspectors identified a self-revealing noncited violation of Technical Specification 5.4.1, "Procedures," for failure to maintain procedures required for filling and venting of the component cooling water system. The licensee failed to ensure that the procedures for filling and venting the component cooling water system were adequately written to prevent gas accumulation and voids to form in the system.

This finding was more than minor because the failure to maintain an adequate procedure for filling and venting the component cooling water system is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue screened as having very low safety significance because it was a qualification deficiency confirmed not to result in a loss of operability. No crosscutting aspect was assigned, as this condition was not reflective of current licensee performance.

Inspection Report# : [2010008](#) (pdf)

**Significance:**  Nov 24, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Perform an Adequate Operability Evaluation**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," regarding the failure to follow the requirements of Procedures AP 28-001, "Operability Evaluations," and AP 26C-004, "Technical Specification Operability," associated with deficiencies resulting from the presence of voiding in the train A residual heat removal heat exchanger. This condition resulted in the failure to adequately address the impact of the voided condition for the high head pumps and the heat removal capacity of the heat exchanger.

This finding is more than minor because it is associated with the Mitigating Systems Cornerstone attribute of equipment performance and adversely affects the objective to ensure equipment availability and reliability. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the issue screened as very

low risk significant since the finding did not represent a loss of system safety function. The inspectors determined that this finding had a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee failed to thoroughly evaluate a similar problem such that extent of condition of the voiding was considered and the cause was resolved.

Inspection Report# : [2010008](#) (pdf)

**Significance:**  Nov 24, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Identify and Correct Inadequate RHR Fill and Vent**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to promptly identify and take corrective actions to address inadequacies in the residual heat removal system fill and vent procedure. The licensee failed to perform corrective actions to incorporate minimum flow rates required to sweep air out of the residual heat removal heat exchangers into the system fill and vent procedure during performance of revisions incorporating previous operating experience and corrective actions associated with NRC inspections.

This finding is more than minor because it affected the Mitigating Systems Cornerstone attribute of design control for ensuring the availability, reliability, and capability of safety systems. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance because the voided heat exchanger was a design or qualification deficiency confirmed not to result in loss of operability. The inspectors determined that the finding has a crosscutting aspect in the area of problem identification and resolution associated with the corrective action component because the licensee staff evaluation of previous Performance Improvement Request 2002-2765 was not thorough enough to result in inclusion of minimum flows necessary to sweep voids out of the residual heat removal heat exchanger.

Inspection Report# : [2010008](#) (pdf)

**Significance:**  Oct 01, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Design of Component Cooling Water Safety/Nonsafety Isolation**

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, which states, in part, that "measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions." Specifically, as of October 8, 2010, the licensee failed to incorporate design seismic requirements into the design calculations and actual system operation. This finding was entered into the licensee's corrective action program as Condition Report 00028237.

The team determined that the failure to adequately analyze the isolation between the safety related and nonsafety-related portions of the component cooling water system was a performance deficiency. This finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the design basis analysis did not ensure that the affected train of component cooling water would perform its required functions after the failure of nonsafety-related component cooling water piping. The inspectors evaluated the issue using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings." This finding affected the Mitigating Systems Cornerstone because seismic protection was degraded. The inspectors determined that this finding represented the degradation of equipment and functions specifically designed to mitigate a seismic event and that during an earthquake the deficiency would degrade one train of component cooling water, a system that supports a safety system or function. Therefore, this finding was potentially risk significant to seismic initiators and a Phase 3 analysis was required. A Region IV senior reactor analyst performed the Phase 3 significance determination. The change in core damage frequency was calculated to be  $7.0 \times 10^8$  indicating that this finding was of very low safety significance (Green). The dominant risk sequence included a seismic initiating event, loss of offsite power, loss of reactor coolant pump seal cooling, and a failure of high pressure recirculation. This finding did not have a crosscutting aspect because the most significant

contributor did not reflect current licensee performance.

Inspection Report# : [2010007](#) (pdf)

**Significance:**  Oct 01, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Perform Tornado Damper Testing**

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, which states, in part, that “measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.” Specifically, as of October 8, 2010, the licensee failed to assure that the identified emergency diesel generator room and the service water pump room tornado damper testing deficiency was effectively corrected. This finding was entered into the licensee’s corrective action program as Condition Report 00028185.

The inspectors determined that the failure to implement this corrective action was a performance deficiency. This finding was more than minor because, if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, failure to implement this corrective action would have resulted in a failure to periodically test tornado dampers required to protect both the emergency diesel generator room and the essential service water pump room ventilation system. In accordance with Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” a significance determination screening was performed and determined 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 there was a crosscutting aspect in the area of human performance resources because the licensee failed to provide complete, accurate, and up-to-date work packages [H.2(c)].

Inspection Report# : [2010007](#) (pdf)

**Significance:**  Oct 01, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Auxiliary Feedwater Pump Suction Line Break Analysis and Design**

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, which states, in part, that “measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.” Specifically, as of October 8, 2010, the design calculations associated with the auxiliary feedwater system line break analysis was not consistent with the actual system operation. This finding was entered into the licensee’s corrective action program as Condition Report 00006250.

The team determined that the failure to adequately analyze a postulated failure of the piping from the condensate storage tank to the auxiliary feedwater pumps was a performance deficiency. This finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the design basis analysis did not ensure that the turbine-driven auxiliary feedwater pump would perform its required functions after the failure of nonsafety-related piping from the condensate storage tank. In accordance with NRC Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," a significance determination screening was performed and determined this finding was of very low safety significance (Green) because it 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 licensee's operability evaluation demonstrated that the auxiliary feedwater system was operable. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2010007](#) (pdf)

**Significance:** G Oct 01, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**Emergency Diesel Generator Specified Rating did not Address Engine Operation at Design Basis Extreme Meteorological Temperature Conditions**

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, which states, in part, that “measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures and instructions.” Specifically, prior to September 29, 2010, the licensee failed to ensure that the design bases inputs in the emergency diesel generator equipment specification were bounded by expected operational values. The licensee failed to evaluate the effects of the identified design basis maximum local meteorological conditions on the rating for the emergency diesel generators which could have affected the capability of safety-related equipment to respond to initiating events. This finding was entered into the licensee’s corrective action program as Condition Report 00028695.

The team determined that failure to properly incorporate the licensing design basis for extreme local meteorological temperature conditions as a design input in the emergency diesel generator equipment specification was a performance deficiency. This finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the design basis analysis did not ensure that the diesel generators could perform their design safety function at the maximum design temperature. In accordance with NRC Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," a significance determination screening was performed and determined this finding was of very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in loss of operability or functionality. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2010007](#) (*pdf*)

**Significance:** G Oct 01, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Translate Design Requirements to Operating Procedures for the Transfer of Residual Heat Removal and Containment Spray Suction to the Containment Recirculation Sumps**

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, which states in part, that “measures shall be established to assure that applicable regulatory requirements and the design bases are correctly translated into specifications, drawings, procedures, and instructions.” Specifically, on September 22, 2010, two out of two operating crews failed to satisfy the minimum time requirement for the transfer of suction of the residual heat removal pumps and the containment spray pumps to the containment recirculation sumps following a large break loss of coolant accident with the worst single active failure as described in Table 6.3 12 of the Updated Safety Analysis Report. This finding was entered into the licensee’s corrective action program as Condition Report 00028276.

The team determined that the failure to translate design requirements into operating procedures was a performance deficiency. This finding was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of design control and affected the associated 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 translate design requirements into Procedure EMG ES 12, “Transfer to Cold Leg Recirculation.” In accordance with NRC Inspection Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” a significance determination screening was performed and determined that this finding was of very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in loss of operability or functionality. This finding had a crosscutting aspect in the area of human performance resources because the operating personnel were not trained to complete the transfer to cold leg recirculation within the minimum time to ensure the equipment was available to assure nuclear safety [H.2(b)].

Inspection Report# : [2010007](#) (*pdf*)

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## Barrier Integrity

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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**

On August 10, 2011, the inspectors identified a noncited violation of 10 CFR 50.47(b)(8) when the technical support center doors were propped open without a breach permit. On June 1, 2011, technical support center diesel generator had a fuel oil to coolant leak. On June 3, 2011, work order 11 341781 003 was used to install a temporary technical support center diesel generator. The door was propped open to allow temporary diesel electrical cables to tie into the permanent diesel's generator output lugs. The door was tied open with rope and the entry was taped with sheet plastic to keep the interior air conditioned. On August 24, 2011, the permanent diesel was repaired and doors were shut. The inspectors found that step 6.4.2 of Procedure AP 06-002, "Radiological Emergency Response Plan," states that the technical support center was rated to withstand the 100 year recurrence winds. Procedure AP 10 104 "Breach Authorization," states that door Z015009 does not require a breach permit. Off Normal Procedure OFN SG-003, "Natural Events," would cause operations to review breaches and shut the doors for a tornado. The inspectors did not find any other procedure that would remove the cables and shut the door due to any lesser severe weather. This issue is captured in the corrective action program as Condition Report 42495.

The failure to ensure that the technical support center met step 6.4.2 of the emergency response plan was a performance deficiency. The issue was more than minor because it impacted 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. Specifically, it impacted the facilities and equipment attribute. The inspectors used Section 4.8 of Inspection Manual Chapter 0609, Appendix B, and found that the finding was Green. Specifically, 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. Specifically, the breach procedure was not consistent with the design of the technical support center and resulted in missed compensatory action [H.2.c] (Section 1R05).

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

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## Occupational Radiation Safety

**Significance:**  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Follow Radiation Work Permit Instructions**

The inspectors identified a noncited violation of Technical Specification 5.4.1.a for the failure to follow procedure requirements related to adding work to existing radiation work permits. On January 4, 2011, welding was performed in a locked high radiation area on radiation work permit 110039, which did not cover that type of activity. The ALARA review associated with radiation work permit 110039 stated that this permit was not intended to be used for major contamination breaches. However, welders cut into and welded a contaminated pipe. The licensee placed the finding into the corrective action program as Condition Report 35522 and acknowledged that the radiation work permit used was inappropriate for the work completed.

The failure to follow a procedure was a performance deficiency. The finding was more than minor because it

negatively impacted the Occupational Radiation Safety Cornerstone's attribute of program and process, in that the inappropriate use of a radiation work permit led to workers' unplanned and unintended dose. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance because: (1) it was not associated with ALARA planning or work controls, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. This deficiency had a crosscutting aspect in the area of human performance related to work controls. Specifically, there was inappropriate coordination and communication of work activities between work groups [H.3(b)].

Inspection Report# : [2011002](#) (pdf)

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## Public Radiation Safety

**Significance:**  Dec 31, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Have Procedures to Prevent Draining Radioactive Systems into Nonradioactive Systems**

The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1.a for failure to implement written procedures to prevent draining and venting radioactive systems into nonradioactive systems and prevent unplanned releases of radioactivity into the environment. On October 21, 2009, an auxiliary building operator inadvertently connected a hose carrying radioactive water to a hose that was routed into the auxiliary building nonradioactive sump. Consequently, the operator drained an estimated 800 to 1,000 gallons of reactor coolant into the nonradioactive auxiliary building sump which transferred its radioactive contents to the turbine building sump. When the contaminated turbine building sump attempted to transfer liquid radioactive waste to the non-radioactive wastewater retention basin, radiation monitor RE95 alarmed and terminated the discharge due to the Hi-Hi radioactivity setting of  $7.25E-5$  uCi/ml. The licensee immediately implemented a decontamination recovery plan. This event was entered into the licensee's corrective action program as Condition Reports 20995, 20999, and 29295.

The inspectors determined that failure to have procedures to prevent draining and venting radioactive systems to nonradioactive systems was a performance deficiency. The finding was more than minor because it impacted the program and process attribute of the Public Radiation Safety Cornerstone, and it adversely affected the cornerstone objective of ensuring adequate protection of public health and safety from exposure to radioactive material released into the public domain. Using the Public Radiation Safety Significance Determination Process, the inspectors determined this finding to be of very low safety significance because this was not a failure to implement the effluent program, and it had no impact on public dose. In addition, this finding has a crosscutting aspect in the area of Human Performance related to the personnel work practices component. Specifically, the licensee failed to use self- and peer-checking human error prevention techniques and then proceeded in the face of uncertainty when unexpected plant conditions were known [H.4(a)].

Inspection Report# : [2010005](#) (pdf)

**Significance:**  Dec 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Have Adequate Procedures for Meteorological Monitoring**

The inspectors identified a noncited violation of Technical Specification 5.4.1.a for failure to have adequate procedures for maintaining meteorological monitoring systems functional. The inspectors determined that procedures did not exist for maintaining the functionality or to declare one or more channels of wind instrumentation out of service pursuant to Technical Requirement 3.3.12. Consequently, both channels of the 10 meter wind direction instrumentation were not functional between April and October 2009. The licensee developed additional guidance for determining functionality of the instruments and immediately required the meteorological data to be reviewed on a more frequent basis to ensure validity. The licensee entered this issue into the corrective action program as Condition Report 29337.

The failure to have procedures to maintain meteorological monitoring functional is a performance deficiency. This finding is more than minor because it was associated with the Public Radiation Safety Cornerstone attribute of program and process and affected the cornerstone objective, in that, the failure to have adequate procedures to maintain meteorological monitoring instrumentation functional has the potential to impair public dose assessments of routine and accidental radioactive effluent releases. Using the Public Radiation Safety Significance Determination Process, the inspectors determined this finding to be of very low safety significance because this was not a failure to implement the effluent program, and it had no impact on public dose. This finding has a crosscutting aspect in problem identification and resolution area associated with the corrective action component because the licensee failed to implement a low threshold for completely and accurately identifying issues with the meteorological monitoring instrumentation in a timely manner [P.1(a)].

Inspection Report# : [2010005](#) (*pdf*)

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## Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

**Significance:** N/A Mar 31, 2011

Identified By: NRC

Item Type: FIN Finding

**95002 Inspection**

Inspection Report# : [2011006](#) (*pdf*)

**Significance:** N/A Nov 24, 2010

Identified By: NRC

Item Type: FIN Finding

**Evaluations and Operability Assessments**

The inspectors reviewed the licensee evaluations associated with the component cooling water and residual heat removal systems following the identification of the voiding condition. During the review of the licensee evaluations, the inspectors identified inadequate assumptions within the calculations and operability determinations. The assumptions included; the failure to include the effects of the voided condition in the residual heat removal system on the high head safety pumps; the use of nonconservative assumptions during the determination of the size of the initial void contained in the residual heat removal heat exchanger; and the initial troubleshooting following the start of the standby component cooling water pump during a low discharge pressure condition focused on the potential failure of the pressure switch, when the licensee had sufficient information that the pressure switch operated as expected. In addition, during the inspection the inspectors observed challenges in the licensee's ability to understand abnormal operating conditions, in that, the licensee had multiple opportunities to identify the presence of voids in the residual heat removal and component cooling water systems prior to the actual discovery of the adverse conditions. These included missed opportunities during review of licensee and industry operating experience, indications of flow oscillations during start of system components, and abnormal cycling of flow control valves.

Inspection Report# : [2010008](#) (*pdf*)

Last modified : January 04, 2012