



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
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ARLINGTON, TEXAS 76011-4125

May 20, 2011

Matthew W. Sunseri, President and  
Chief Executive Officer  
Wolf Creek Nuclear Operating Corporation  
P.O. Box 411  
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION – NRC INSPECTION  
PROCEDURE 95002 SUPPLEMENTAL INSPECTION REPORT AND  
ASSESSMENT FOLLOWUP LETTER 05000482/2011006

Dear Mr. Sunseri:

On March 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection pursuant to Inspection Procedure 95002, "Supplemental Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," at your Wolf Creek Generating Station facility. The supplemental inspection also covered the performance issues associated with Inspection Procedure 92723, "Follow Up Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period." The enclosed inspection report documents the inspection results, which were discussed at the exit meeting on April 5, 2011, with yourself and other members of your staff.

As required by the NRC Reactor Oversight Process Action Matrix, this supplemental inspection was performed to address three white performance indicators associated with unplanned scrams, unplanned scrams with complications, and safety system functional failures. These performance issues were documented previously on the NRC public web page ([http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/WC/wc\\_chart.html](http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/WC/wc_chart.html)). The NRC staff was informed on October 29, 2010, of your staff's readiness for this inspection.

The objectives of this supplemental inspection were to: 1) provide assurance that the root causes and the contributing causes for the risk-significant performance issues were understood; 2) provide assurance that the extent-of-condition and extent-of-cause of the issues were identified; and 3) provide assurance that corrective actions were sufficient to address and prevent the recurrence of the root and contributing causes. This inspection also included independent NRC reviews of the extent-of-condition and extent-of-cause for the three white performance indicators and assessments of whether any safety culture component caused or significantly contributed to the issue. The inspection consisted of examination of activities conducted under your license as they relate to safety, compliance with the Commission's rules and regulations, and the conditions of your operating license.

The inspectors determined that your staff performed a comprehensive evaluation of individual and collective causes of the three White performance indicators. Your staff's evaluation identified root causes of the issues to be: 1) inadequate management oversight/standards enforcement, 2) lack of knowledge across the station concerning the components of nuclear safety culture and crosscutting issues, and 3) inadequate hardware monitoring. The inspectors determined that your staff proposed appropriate corrective actions to upgrade preventative maintenance practices, improve system health through operating experience reviews, improve the effectiveness of management review processes, and address deficiencies related to safety culture which, if successfully implemented, will resolve the identified performance issues. With respect to Inspection Procedure 92723, the inspectors determined that your staff identified the causes of the traditional enforcement violations, performed an adequate review of the extent-of-condition and extent-of-cause, and identified appropriate corrective actions sufficient to address the causes.

On May 3, 2011, using the results of this inspection, the NRC staff completed a quarterly review of plant performance of Wolf Creek Generating Station. The assessment also evaluated the performance indicators and the remaining inspection results for the first quarter of calendar year 2011. We noted that the Safety Systems Functional Failure Performance Indicator returned to Green at the beginning of the second quarter of 2010. This letter supplements, but does not supersede, our end-of-cycle assessment letter issued on March 4, 2011.

Overall, Wolf Creek operated in a manner that preserved the public's health and safety and fully met the cornerstone objectives. All inspection findings for the assessment period were classified as having very low safety significance (Green) and all performance indicators indicated performance within the nominal, expected range (Green). As a result, we have assessed Wolf Creek to be in the Licensee Response column of the NRC's Action Matrix. Therefore we plan to conduct baseline inspection during the remainder of the assessment cycle.

Based on the results of this inspection, the NRC has identified one issue that was evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that a violation is associated with this issue. Because of the very low safety significance and because it is entered into your corrective action program, the NRC staff is treating this finding as a noncited violation consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any noncited violation in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Wolf Creek Generating Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's

document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

***/RA/Rick Deese for***

Geoffrey B. Miller, Chief  
Project Branch B  
Division of Reactor Projects

Docket: 50-482  
License: NPF-42

Enclosure:  
Inspection Report 05000482/2011006  
w/Attachment 1: Supplemental Information

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**NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 05000482

License: NPF-42

Report: 05000482/2011006

Licensee: Wolf Creek Nuclear Operating Corporation

Facility: Wolf Creek Generating Station

Location: 1550 Oxen Lane SE  
Burlington, Kansas

Dates: February 7 through March 31, 2011

Inspectors: D. Dumbacher, Senior Resident Inspector (Team Lead)  
B. Correll, Reactor Inspector  
J. Dixon, Senior Resident Inspector  
J. Drake, Senior Reactor Inspector  
N. Makris, Project Engineer  
L. Willoughby, Senior Project Engineer

Approved By: G. Miller, Branch Chief  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000482/2011006, 02/07- 03/31/2011, Wolf Creek Generating Station, Supplemental Inspection - Inspection Procedure 95002.

This supplemental inspection was conducted by two senior resident inspectors, a reactor inspector, a senior reactor inspector, a project engineer, and a senior project engineer. One Green noncited violation was identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The crosscutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### **Cornerstones: Initiating Events and Mitigating Systems**

The NRC staff performed this supplemental inspection in accordance with Inspection Procedure 95002, "Supplemental Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," to assess the licensee's evaluations associated with White performance indicators for unplanned scrams per 7000 critical hours, safety system functional failures, and unplanned scrams with complications. Inspection Procedure 92723, "Follow Up Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12 Month Period," was also performed.

The inspectors determined that the Wolf Creek staff performed a comprehensive evaluation of the events that led to the degraded Initiating Events Cornerstone and three white inputs in the reactor safety strategic performance area. Wolf Creek's evaluation identified root causes of the collective issues to be related to: 1) inadequate management oversight/standards enforcement, 2) lack of knowledge concerning the components of nuclear safety culture and crosscutting issues, and 3) inadequate hardware monitoring.

In addition to assessing the licensee's evaluations, the inspection team performed an independent extent-of-condition and extent-of-cause review and a focused inspection of the site safety culture as it related to the root cause evaluations. The team concluded that the Wolf Creek root cause evaluations and corrective actions, both completed and planned, addressed the extent-of-condition and extent-of-cause, determined if safety culture contributed to the issue, and established and scheduled corrective actions that are sufficient to address the causes and prevent recurrence of the White performance indicators.

Based on independent inspection, the team also determined that the licensee's assessment of Wolf Creek's safety culture was accurate and reflected the conditions at the site. The root cause evaluations appropriately identified needed improvements associated with safety culture behaviors.

**A. NRC-Identified or Self-Revealing Findings**

Cornerstone: Mitigating Systems

Green. 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 trained to cognitively and analytically trend condition reports [H.2(b)](Section 4OA4).

**B. Licensee-Identified Violations**

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and associated condition report numbers are listed in Section 4OA7.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 40A3 Event Follow-up

.1 (Closed) Licensee Event Report 05000482/2010-005-00: Reactor Trip due to Low Steam Generator Level from Trip of Main Feedwater Pump

On March 2, 2010, a trip of the Train A main feedwater pump caused a low-low steam generator water level reactor trip. The trip of the main feedwater pump was due to nonsafety-related inverter PN09 failing to transfer to the alternate supply during preparation for minor maintenance. During performance of Procedure SYS PN-200, "Energizing and Deenergizing Inverters PN09 and PN10," inverter PN09 failed to transfer from the normal to alternate power supply due to sticking of the reed relay on the static transfer switch circuit board after exceeding its design life. The failure to transfer caused a loss of speed signal to main feedwater pump A resulting in an overspeed trip and caused a loss of steam dump capability. The unit received a feedwater isolation signal and an auxiliary feedwater actuation signal.

The inspectors determined the licensee's root cause evaluation inappropriately identified the direct cause as the root cause and incorrectly stated the actions taken to replace the cards were sufficient such that no corrective actions to prevent recurrence were necessary. The NRC inspectors concluded that a contributing cause identified in the root cause evaluation, the decision to continue operating with equipment beyond its design life, was more appropriate as a root cause. The inspectors also identified that the root cause evaluation for extent-of-condition was narrowly focused, in that the licensee only identified other inverters as being within the extent-of-condition. A broader extent-of-condition would have included any electronic circuit boards with design life limitations and would not be limited to inverters. Corrective actions taken by the licensee to address the contributing cause included replacing the circuit cards and preventative maintenance frequency changes to prevent exceeding the design life of the circuit cards. The inspectors determined the corrective actions were appropriate to prevent recurrence.

The inspectors concluded the failure to identify the lowest level root cause and the narrowly focused extent-of-condition determination were a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving a failure to follow root cause Procedure AI 28A-001, "Level 1 CR Evaluation (IIT)," Revision 12. Since the licensee took appropriate corrective actions as part of an identified contributing cause, the inspectors determined this violation was of minor safety significance. Violations of minor safety or security concern generally do not warrant enforcement action but must be corrected.

Event follow-up inspections by NRC inspectors identified two Green findings associated with this event: FIN 05000482/2010002-04 and NCV 05000482/2010002-05. The inspectors reviewed the licensee event report and determined that the report adequately documented the summary of the event, including the potential safety consequences, cause of the event, and corrective actions required to address the performance deficiency. No additional findings were identified. This licensee event report is closed.



.2 (Closed) Licensee Event Report 05000482/2010-012-00: Reactor Trip due to Operator Inability to Control Steam Generator Level Oscillations at Low Power

On October 17, 2010, a reactor trip occurred due to inadequate steam generator water level control during low power operations. During plant startup following a forced outage, reactor power was increased above 10 percent to approximately 17 percent when starting to roll the main turbine and synchronize to the grid. While rolling the main turbine, feedwater temperature began to drop due to insufficient feedwater preheating. The operators took manual control of steam generator water level but were unable to maintain level below the high-high steam generator water level turbine trip and feedwater isolation signal. Auxiliary feedwater was unable to match steam demand and the reactor tripped on low-low steam generator water level. The inability to control steam generator water level was due to the decreased feedwater temperature caused by insufficient feedwater preheating during the power increase associated with placing the main turbine on line. Operators failed to recognize that feedwater preheating from the main steam system had a capacity limit of 10 percent until the main turbine is brought on line.

The licensee submitted a licensee event report for the reactor trip on December 16, 2010. The licensee made procedure changes to require the main turbine to be synchronized to the grid prior to exceeding 10 percent reactor power. Event follow-up inspections by NRC inspectors identified four Green noncited violations associated with this event; 05000482/2010005-08; 05000482/2010005-09; 05000482/2010005-10; and 05000482/2010005-11. The inspectors reviewed the licensee event report and determined that the report adequately documented the summary of the event including the potential safety consequences, cause of the event, and corrective actions required to address the performance deficiency. No additional findings were identified. This licensee event report is closed.

**40A4 Supplemental Inspection (95002)**

.01 Inspection Scope

The NRC staff performed this supplemental inspection in accordance with Inspection Procedure 95002, "Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," to assess the degraded Initiating Events Cornerstone and the three White inputs to the reactor safety strategic performance area. The team also performed Inspection Procedure 92723, "Follow Up Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12 Month Period," in conjunction with the supplemental inspection. The inspection objectives were to:

- provide assurance that the root and contributing causes of risk-significant issues were understood
- provide assurance that the extent-of-condition and extent-of-cause of risk-significant issues were identified and to independently assess the extent-of-condition and extent-of-cause of individual and collective risk-significant issues
- independently determine if safety culture components caused or significantly contributed to the risk significant issues

- provide assurance that the licensee's corrective actions for risk-significant issues were or will be sufficient to address the root and contributing causes and to preclude repetition

The licensee entered the Degraded Cornerstone Column of the NRC's Action Matrix in the first quarter of 2010 as a result of three performance indicators crossing the threshold from Green (very low safety significance) to White (low to moderate safety significance). The performance indicators were Unplanned Scrams per 7000 Critical Hours, Unplanned Scrams with Complications, and Safety System Functional Failures.

The licensee staff informed the NRC that Wolf Creek was prepared for the supplemental inspection on October 29, 2010. To determine the causes and organizational attributes that resulted in the three White performance indicators, the licensee performed root cause evaluations documented in Condition Reports 26805 (collective), 23119 (safety system functional failures), 24445 (unplanned scrams) and 25817 (scrams with complications). These condition reports were associated with many individual event condition reports. Altogether the inspection scope and the licensee actions included well over 1000 corrective actions. The team noted that the licensee recovery team performed an overarching safety culture review to determine whether safety culture components and aspects contributed to the performance issues that led to the White NRC performance indicators. The team inspected this effort by reviewing Condition Reports 23032 and 25896. For the traditional enforcement violations, the team reviewed licensee efforts documented in Condition Report 23110. The inspection team reviewed the licensee's root cause and other supporting evaluations, and the team reviewed corrective actions that were taken or planned to address the identified causes. The inspection team also held discussions with licensee personnel to ensure that the root and contributing causes and the contribution of safety culture components were understood and corrective actions taken or planned were appropriate to address the causes and preclude repetition. The inspection team independently assessed the extent-of-condition and extent-of-cause of the identified issues and performed an assessment of whether any safety culture components caused or significantly contributed to the issues.

## .02 Evaluation of the Inspection Requirements

### 02.01 Problem Identification

#### a. Identification of the issue (i.e. licensee-identified, self-revealing, or NRC-identified) and the conditions under which the issue was identified

As a result of the multiple reactor scrams and safety system functional failures in 2009 and 2010, the licensee identified three White performance indicators through the NRC's performance indicator reporting process.

The Unplanned Scrams with Complications performance indicator crossed the threshold from Green to White as a result of unplanned scrams in 2009 that were the subject of a Reactor Oversight Process Working Group Frequently Asked Question. On April 28, 2009, the main feedwater regulating valve controller power supply fuses failed, isolating flow to steam Generator B and resulting in a reactor trip from loss of power to a main feed regulating valve controller. Also, on August 19, 2009, a complete loss of offsite power resulted in a complicated scram. Based on the resolution of the Frequently Asked

Question, Wolf Creek reported both of these reactor trips as Unplanned Scrams with Complications, which caused this performance indicator in the Initiating Events cornerstone to be White starting in the third quarter of 2009.

On March 8, 2010, during a plant start up at approximately 42 percent power, operators manually tripped the reactor following an unplanned trip of the only running feedwater pump. This plant startup was being conducted following a previous reactor trip on March 2, 2010, in which loss of power to an electrical inverter led to a trip of main feedwater Pump A and resultant low steam generator water levels. These reactor trips combined with two others from April 2009 and August 2009 caused the Unplanned Scrams per 7000 Critical Hours performance indicator to be White. Additionally, in April 2010 Wolf Creek reported four safety system functional failures for the first calendar quarter of 2010. Combined with the five others previously reported, these functional failures caused the Safety System Functional Failures performance indicator also to be White.

The inspectors verified that this information was appropriately documented in the licensee's evaluations.

b. Issue duration and prior opportunities for identification

The degraded Initiating Events Cornerstone and the three White inputs to the reactor safety strategic performance area existed from March 2010 when they were identified by Wolf Creek's performance indicator submittals. The Complicated Scrams performance indicator crossed the Green/White threshold in the third quarter 2009. The Unplanned Scrams per 7000 Critical Hours performance indicator was White starting in the first quarter of 2010. Both of these performance indicators returned to Green in the second quarter of 2010. The Safety System Functional Failures performance indicator also first crossed the Green/White threshold in the first quarter of 2010 and did not return Green until after the first quarter of 2011. Each of the reactor scrams and safety system functional failures was an opportunity to identify the need for corrective actions to reverse the negative performance trend.

The inspectors concluded that the licensee's evaluations adequately identified how long each issue existed and prior opportunities for identification of the failures.

c. Licensee documentation of the plant specific risk consequences, as applicable, and compliance concerns associated with the issues both individually and collectively

The inspectors verified that the licensee's evaluation adequately documented the plant specific risk consequences in qualitative statements that equipment failures directly affect nuclear safety by challenging critical safety functions and operator response. There were no previously documented findings associated with the scrams or safety system functional failures that were more than very low safety significance.

02.02 Root Cause, Extent-of-Condition, and Extent-of-Cause Evaluation

a. Determine that the licensee evaluated the issue using a systematic methodology to identify the root and contributing causes

The licensee used the following methods to complete the root cause evaluation:

- event and causal factor charting
- hazard-barrier-target analysis
- management oversight and risk tree (MORT) analysis
- fault tree analysis

The NRC team concluded the licensee evaluated the issues using systematic methodologies to identify root and contributing causes.

- b. Determine that the licensee's root cause evaluation was conducted to a level of detail commensurate with the significance of the issue

The licensee's evaluation identified the root causes of collective issues to be: 1) inadequate management oversight, 2) lack of knowledge concerning components of nuclear safety culture, and 3) inadequate hardware monitoring. The NRC team performed a focused inspection to independently assess the validity of the licensee's conclusions regarding the extent-of-condition and extent-of-cause of the issues. The NRC inspection team review for each performance indicator, individually and collectively, determined that the licensee's root cause evaluation level of detail was commensurate with the significance of the problem.

- c. Consideration of prior occurrences of the issue and knowledge of operating experience

Based on the licensee's detailed evaluation and conclusions, the inspection team determined that the licensee's root cause analysis included an appropriate consideration of prior occurrences of the issue and knowledge of prior operating experience.

- d. Determine that the licensee's root cause evaluation addresses the extent-of-condition and extent-of-cause of the issues

The inspectors concluded that the licensee's root cause analysis appropriately addressed the extent-of-condition and the extent-of-cause of the issue. However, for many of the root cause evaluations the documentation was high-level, difficult to follow, and did not always provide a strong basis for implementation and closure of the individual corrective actions. The team determined that, in these cases, appropriate corrective actions were specified for each root and contributing cause in other condition reports.

- e. Review the licensee's root cause, extent-of-condition, and extent-of-cause evaluations in order to verify that the licensee appropriately considered the safety culture components as described in Inspection Manual Chapter 0305

Because multiple condition reports and several safety culture aspects were associated with the performance issues, the licensee conducted collective reviews of the past two safety culture assessments and the six significant contributing condition reports. This effort resulted in the licensee creating roll-up Condition Report 26805 to prioritize safety culture corrective actions in September 2010. The team concluded that the prioritization was logical and that the corrective actions, while appropriate, needed increased oversight and reinforcement. In response to the inspection team's observations, the licensee added specific items to improve safety culture behaviors, trending, and knowledge levels of the operating and engineering departments to the Recovery Change

Management Plan for the upcoming cycle. The licensee also strengthened the safety culture communication plan to reinforce human performance tool usage at all levels.

### 02.03 Corrective Action

- a. Determine that: 1) the licensee specified appropriate corrective actions for each root and/or contributing cause, or 2) an evaluation that states no actions are necessary is adequate

The licensee initiated well over 1000 corrective actions to address the root and contributing causes from the individual and collective cause evaluations. The inspectors concluded that the licensee had specified appropriate corrective actions for each root and/or contributing cause. The inspectors observed some cases where the licensee's corrective actions could have been more specifically tied to causes and more generally applied to safety culture aspects. These observations are discussed in Section 02.07 of this report.

- b. Determine that the licensee prioritized corrective actions with consideration of risk significance and regulatory compliance

The majority of the corrective actions developed by the licensee involved long term maintenance plans and plant modifications. The licensee also prioritized communication of standards and newly formed additional review processes as short term items. These short term items were still in progress at the time of the inspection. The inspection team determined that there were no risk significant immediate corrective actions necessary. The inspection team concluded that the corrective actions identified in the root cause evaluations for the White performance indicators were appropriately prioritized based on risk significance and regulatory compliance.

- c. Determine that the licensee established a schedule for implementing and completing the corrective actions

The inspection team found that the licensee's root cause evaluations established many different, independent schedules for completion of the over 1000 corrective actions. Tracking, evaluating and closing corrective actions was assigned to the licensee recovery team. The NRC inspection team observed that the individual schedules did not appear to be coordinated with one another. To address the inspection team's observation, the licensee staff compiled and provided a table to the inspectors which tracked each corrective action item milestone with its corresponding completion date. The inspectors concluded the revised schedule was appropriate for effectively implementing and completing the corrective actions.

- d. Determine that the licensee developed quantitative and/or qualitative measures of success for determining the effectiveness of the corrective actions to preclude repetition

The measures developed by the licensee for determining the effectiveness of corrective actions included the following:

- Corrective Action and Operating Experience Review Board external reviews
- Increased frequency of quality assurance audits to assess the adequacy of the corrective action program initiatives generated

- Increased frequency of safety culture assessments

The inspection team determined that the quantitative and qualitative measures developed by the licensee for determining the effectiveness of the corrective actions were appropriate.

- e. Determine that the licensee's planned or taken corrective actions adequately address a Notice of Violation that was the basis for the supplemental inspection, if applicable

A Notice of Violation was not the basis for this supplemental inspection.

#### 02.04 Independent Assessment of Extent-of-Condition and Extent-of-Cause

- a. Inspection Scope

Inspection Procedure 95002 requires that the inspection staff perform a focused inspection to independently assess the validity of the licensee's conclusions regarding the extent-of-condition and extent-of-cause of the issue. The objective of this requirement is to independently sample performance, as necessary, within the key attributes of the cornerstones that are related to the subject issue to ensure that the licensee's evaluation regarding the extent-of-condition and extent-of-cause is sufficiently comprehensive.

The inspectors conducted independent extent-of-condition and extent-of-cause reviews for the issues associated with the White performance indicators. The inspection staff's independent review focused on the primary root causes associated with the performance indicators in addition to the licensee's identified contributing causes that involved more specific aspects of the broader root causes. The inspection staff assessed whether the licensee's extent-of-condition and extent-of-cause evaluations sufficiently identified and bounded all engineering and maintenance organizational issues. The staff also assessed whether the licensee's extent-of-condition and extent-of-cause evaluations sufficiently determined the actual extent of similar organizational issues that potentially existed in other station departments, programs, and processes. The team independently sampled performance within the key attributes of the Initiating Events and Mitigating Systems Cornerstones that are related to the contributors of the performance issues to ensure that the licensee's evaluation regarding the extent-of-condition and extent-of-cause were sufficiently comprehensive.

In conducting this independent review, the inspection staff interviewed station management and personnel, reviewed program and process documentation, and reviewed existing station program monitoring and improvement efforts, including review of corrective action documents.

- b. Assessment

The team concluded that the licensee had identified all substantive extent-of-condition and extent-of-cause issues. However, the team's independent extent-of-condition and extent-of-cause review identified some cases where the licensee's evaluations were narrowly focused. For example, the licensee's evaluation of scrams with complications in Condition Report 25817 limited the review of main feedwater system health to just the startup feedwater pump, which inappropriately excluded many components with the

potential to affect system performance. The evaluation also did not evaluate the August 2009 loss of offsite power and condensate and heater drain bus event, making instead a statement that a loss of offsite power will always result in a complicated scram. The team identified this as another example where the evaluation of Condition Report 25817 missed an opportunity to improve feedwater system reliability. The team concluded Wolf Creek's root cause analysis procedures could be improved to enable the licensee to consistently identify systemic causal factors.

As a result of the inspection team's observations, Wolf Creek reviewed Condition Report 25817 to identify additional interim and long-term corrective actions. This included a review by the Quality group and bringing in additional root cause evaluators to ensure the root cause analysis procedures were improved as needed.

## 02.05 Safety Culture Consideration

### a. Inspection Scope

Inspection Procedure 95002 requires that the inspection team perform a focused inspection to independently determine that the licensee's root cause evaluation appropriately considered whether any safety culture component caused or significantly contributed to any risk significant issue.

The inspection team reviewed condition reports and procedures and conducted interviews with licensee personnel to determine if the licensee properly considered whether any safety culture component caused or contributed to the performance issues. Additionally, the inspectors performed a review of the common cause evaluation.

### b. Assessment

As part of the collective root cause evaluation, the licensee evaluated the identified root and contributing causes against the safety culture components that could have contributed to the issues. The licensee's root cause evaluation included a discussion of the 13 safety culture components as described in Regulatory Issue Summary 2006-013, "Information on the Changes Made to the Reactor Oversight Process to More Fully Address Safety Culture."

The inspection team independently confirmed the licensee's conclusion that improving safety culture behaviors should be a high priority item for the recovery effort. The documented station reviews indicated that every safety culture component was a contributor to the performance issues, and all were significant contributors with the exception of self- and independent-assessments. The inspection team concluded all the safety culture components were significant contributors. The inspection team confirmed that the licensee established appropriate corrective actions to address safety culture. The team identified challenges to Wolf Creek's ensuring long-term promotion of a positive safety culture. Specifically:

- Although safety concept is a recognized value in the organization, it is inconsistently accepted and understood across all levels of personnel. Some problems still exist in the transmission, comprehension, and implementation of the safety message.

- Some individuals readily accept responsibility for and take ownership of problems, while others are still reluctant to do so.
- Observed safety behaviors were not consistently integrated into all activities in the organization. Processes and programs are in various stages of transition, which often reduces their effectiveness.
- An integrated and cohesive organizational safety leadership process does not yet exist. The values and attitudes of the workforce are generally positive, but the team identified that personnel are not yet aligned with a common set of values.

#### 02.06 Evaluation of Inspection Manual Chapter 0305 Criteria for Treatment of Old Design Issues

The licensee did not request credit for self-identification of an old design issue; therefore, the risk-significant issue was not evaluated against the Inspection Manual Chapter 0305 criteria for treatment of an old design issue.

#### 02.07 Findings and Observations

- a. Introduction. The inspectors identified a Green 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.

Description. On February 17, 2011, the licensee received laboratory test results on the Train B emergency diesel generator fuel oil storage tank and determined that the cloud point parameter was out of specification at -8° Celsius. The specification limit for cloud point was no higher than -9° Celsius. The licensee subsequently declared the emergency diesel generator inoperable and entered Technical Specification 3.8.3. As part of the review of the event, the licensee sent an additional sample from the fuel oil storage tank to the same laboratory, as well as to an additional laboratory for comparison. The licensee also sent samples from the Train A emergency diesel generator fuel oil storage tank to determine the extent-of-condition. These actions are documented in Condition Report 33750.

Procedure AP 28A-0100, step 5.13.3, required licensee personnel 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. In various condition reports over the past two years, the licensee documented that the cloud point parameter had been out of specification in new fuel oil shipments. In addition to the sample in February 2011, Condition Reports 21044, 25018 and 26345 documented the cloud point parameter being an issue in October 2009, April 2010 and June 2010, respectively. Condition Report 26345 did not receive an appropriate review to identify that the adverse trend, if not resolved promptly, could result in the emergency diesel generator becoming inoperable. Corrective actions from Condition Report 26345 included purchasing fuel oil from a new vendor that would provide a low cloud point, but this was not implemented in a timely manner to prevent the unplanned technical specification entry. As a result, on February 17, 2011, the Train B fuel oil storage tank cloud point parameter went out of specification requiring the licensee to withdraw fuel oil and replace it with in-specification fuel oil from the new vendor. Two tanker loads of new fuel oil were placed into the



storage tank and a multilevel sample of the resulting mixture was analyzed to ensure that all chemistry parameters were within specification. 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.

Analysis. Failure to track and trend the emergency diesel generator chemistry parameters as required by the corrective action program procedure was a performance deficiency. The 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 human performance crosscutting aspects associated with resources in that the licensee did not ensure that the corrective action program coordinators were effectively trained to cognitively and analytically trend condition reports [H.2(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. Procedure AP 28A-0100, "Condition Reports," step 5.13.3 requires the licensee, in part, to evaluate condition report data to identify and evaluate potential trends. Contrary to this, from October 2009 to February 19, 2011, the licensee failed to evaluate condition report data to identify and evaluate potential trends in emergency diesel generator fuel oil storage tank chemistry parameters. As a result, the station entered Technical Specification 3.8.3 for a high cloud point on the Train B emergency diesel generator fuel oil storage tank. Immediate corrective actions included withdrawing fuel oil and replacing it with new fuel oil until the cloud point could be reduced to below the maximum value. Since this violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Reports 33395, 33435, and 33750, it is being treated as a noncited violation consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2011006-01, "Failure to Trend Emergency Diesel Generator Chemistry Parameters Results in an Unplanned Technical Specification Entry."

b. NRC Team Observations

1) Maintenance to Improve Equipment Reliability

The inspection team noted that the licensee's corrective actions for improving equipment reliability focused primarily on preventative maintenance improvements. The team determined this focus initially may not result in protecting the functionality of the key systems inputting to the safety system functional failure performance indicator in the short term. The team concluded that a broader root cause of inadequate maintenance in general, versus just improved preventative maintenance, may be more appropriate to address equipment reliability issues. This action is consistent with the licensee roll-up root cause of tolerance for known degraded equipment conditions. The team determined that the recent refueling water storage tank and emergency diesel generator fuel oil storage tank degraded chemistry issues, emergency diesel generator fuel rack pin inoperability, and component cooling water system voiding were examples that demonstrated the importance of improvement in general maintenance practices and represented conditions that could challenge the safety system functional failure performance indicator.

The team concluded that corrective actions to develop a preventative maintenance optimization plan, improve operating experience reviews, and perform significant main feedwater modifications were appropriate. However, the corrective actions to add digital feedwater controls will not be complete until Fall 2015.

The licensee identified inadequate equipment performance monitoring and trending as a maintenance improvement item, but initiated actions for "new" systems/components only. The team concluded a broader application of this action would be more appropriate. For example, the team identified that the station thermography tool is not being used to its full extent. This was similar to the previous limited use of ultrasonic testing and guided wave technology for essential service water corrosion issues. The licensee initiated Condition Report 33435 to evaluate additional corrective actions for equipment performance and monitoring.

2) Corrective Action Documentation

The team identified several instances where the documentation of corrective actions was not clearly defined through the corrective action program, which could provide challenges to the timely completion of the actions and to the ability of the licensee's quality control organization to perform effectiveness reviews. For example, corrective actions for root causes in Condition Report 23119 (safety system functional failures) were contained in Condition Report 24445, but were not listed as corrective actions to prevent recurrence in Condition Report 24445. This could lead to closure of the actions out without sufficient reviews to ensure effective corrective actions occurred. As a second example, overall station roll-up Condition Report 26805 contained no documented corrective actions. Instead, this condition report provided a prioritization of the common causes in the other six high level individual event roll-up condition reports (see Attachment 2). The documentation of the corrective actions for the causes and safety culture component concerns are embedded in various other condition reports. The team identified this as a challenge to correctly implementing and closing out the individual corrective actions. The licensee took actions to address this issue, including initiating Condition Reports 33722 and 33958 and developing additional root cause

evaluators to improve documentation standards and reduce root cause evaluation backlogs.

The team also identified that two key licensee initiatives (each a corrective action to prevent recurrence), the Preventative Maintenance Optimization Plan and the Ops Focus Plan, were essentially mission statements and lacked the details necessary to guide implementation. As a result of the team inspection, the licensee developed revisions to these plans to provide better detail and clarity.

### 3) Training as a Corrective Action

The licensee identified a corrective action of improved training, modeled after previous changes made to improve the technical program for engineers and operators, to address performance issues associated with both the safety system functional failures and unplanned scrams performance indicators. However, training provided as a corrective action for risk assessments failed the licensee's initial effectiveness review. This was one of the first effectiveness reviews performed by the licensee, and it identified that the training corrective action was narrowly focused and not likely to reach everyone affected. The team identified some additional examples where training as a corrective action had not yet been fully effective, including:

- A corrective action review board graded the root cause evaluation of "inadequate clearances orders due to not isolating the energy source," as acceptable without a training corrective action when the cause was an inability to read prints.
- At the time of the inspection, neither engineering nor training departments had been trained on the updated operating experience process.
- The team observed some cases where system engineer knowledge levels were not broad or integrated.
- Root cause team member training was not consistently producing thorough extent-of-cause results.
- The team received interview comments indicative of operations and training department dissatisfaction with support by the other department. Other comments also identified cases where managers may have decided not to assign training related corrective actions based on limited training resources.

The team concluded that broader training, improvements for both engineers and operators is needed. The licensee initiated Condition Reports 34280 and 34281 to address engineering and operations department training issues.

### 4) Problem Identification

The team concluded the various review board initiatives, specifically the corrective action review board challenge meetings, apparent cause evaluation level corrective action and collegial operating experience review boards, were positive efforts. However, individual level behavior changes will be needed to identify trends or deficiencies in equipment and engineering performance. The team noted some cases where the threshold for

identifying and trending degraded conditions in the plant could be improved. Examples include:

- A high level alarm indicative of actual rising essential service water vault water level was initially assumed to be invalid in Fall 2010. This resulted in delaying an operability assessment over two shifts.
- The team identified that self- and independent-assessments were not being effectively used to identify and correct problems. The licensee initiated condition report 34076 and directed the quality assurance department to perform an additional surveillance of the corrective action program to address this issue.
- The team noted two examples of initial failure to act on contracted engineering evaluations. The first example involved a contractor evaluation of the feedwater pump suction strainer in December 2010 that stated the strainer could introduce new failure mechanisms. The inspection team noted a failed strainer could release debris which could impact the feedwater regulating and isolation valves. The licensee initiated Condition Report 32445 to evaluate this condition. The second example was previously identified in an NRC inspection of essential service water and involved a deficient in-house engineering analysis accepted without action despite outside contractor evaluations stating that water hammer stresses were significant enough to warrant inclusion in the system design calculations. At the close of the inspection the licensee was reevaluating both of these issues.
- The team identified some process programs that may result in tracking and correcting problems outside of the corrective action program. One example is the PILOT system used to record and trend management field observations. The licensee initiated Condition Report 33316 to address this concern.

##### 5) Management Oversight and Leadership

In Condition Report 26805, "Collective Significance of Degraded Cornerstone Performance," the licensee identified Management/Oversight/Standards Enforcement as one of the overall root causes of the site's performance issues. The team concluded that licensee actions to address improving management oversight were appropriate. However, the team identified that the additional review boards requiring management participation had the unintended consequence of reducing the amount of time available for managers and supervisors to conduct plant tours and field observations. The team also identified some cases where review boards accepted quality assurance reports of effective program performance despite identified repeat findings, and cases where the review boards did not consistently challenge extent-of-condition and extent-of-cause issues in root cause evaluations.

To address the team's observations the licensee developed initiatives to improve standards for leadership meetings, division manager alignment meetings and plant wide communication efforts.

#### 4OA6 Meetings

##### Exit Meeting Summary

On April 5, 2011, the inspectors presented the inspection results to Mr. M. Sunseri and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors identified that proprietary information was reviewed but would not be retained following report issuance or included in the inspection report.

#### 4OA7 Licensee-identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section 2.3.2 of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a noncited violation.

- Title 10 CFR 50.65 a(4) requires, in part, that before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to the above, during the weeks of November 29, 2010, December 27, 2010 and January 17, 2011, Wolf Creek failed to properly identify and take appropriate risk management actions for medium and high risk maintenance activities as required by station Procedure AP 22C-007, "Risk Management and Contingency Planning," Revision 4. The inspectors performed the significance determination using NRC Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and Manual Chapter 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process" and determined the finding was of very low safety significance (Green) because it related only to risk management actions and did not result in an increase in core damage probability. This licensee entered this issue into the corrective action program as Condition Reports 00032886 and 00032887.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel

L. Bell, Systems Engineering  
M. Blow, Operations  
S. Hedges, Site Vice President  
D. Hooper, Supervisor, Licensing  
T. Jensen, Manager, Chemistry  
S. Koenig, Manager Corrective Action  
W. Norton, Manager IPS/Scheduling  
L. Parmenter, Assistant to Manager, Operations Department  
G. Pendergrass, Director, Plant Engineering  
L. Ratzlaff, Supervisor, Support Engineering  
E. Ray, Manager Quality  
L. Rockers, Licensing Engineer  
R. Smith, Plant Manager  
M. Sunseri, President and Chief Executive Officer  
S. Wahlmeier, Systems Engineering  
J. Yunk, Manager, Human Resources

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened and Closed

05000482/2011006-01 NCV Failure to Trend Emergency Diesel Generator Chemistry Parameters Results in an Unplanned Technical Specification Entry (Section 4OA4)

#### Closed

05000482/2010-005-00 LER Reactor Trip due to Low Steam Generator Level from Trip of Main Feedwater Pump (Section 4OA3)

05000482/2010-012-00 LER Reactor Trip due to Operator's Inability to Control Steam Generator Level Oscillations at Low Power (Section 4OA3)

### LIST OF DOCUMENTS REVIEWED

#### **Section 4OA4: Supplemental Inspection**

#### PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
AI 09A-008	Engineering Allocation	3
AI 16C-007	Work Order Planning	30

AI 17C-005	Shift Manager Selection, Initial Training and Continuing Training Program	5
AI 18A-001	Receipt, Investigation, and Closure of Employee Concerns	2
AI 18A-002	Conducting Exit/Walk-in Interviews	1A
AI 18A-003	Preparation, Maintenance, and Security of Employee Concerns Files	1A
AI 21-016	Operator Time Critical Actions Validation	1
AI 22C-008	Work Scoping Team	6
AI 22C-012	Quality Review Team (QRT) for Maintenance Work Planning	0
AI 22D-001	High Impact Teams	5
AI 22I-004	Project Ranking Guide	0, 1, 2
AI 23M-003	Maintenance Rule Expert Panel Duties and Responsibilities	7
AI 23O-001	Functional Importance Determination	0, 1, 2, 2A
AI 28A-001	Level 1 CR Evaluation (IIT)	12
AI 28A-003	Rapid Response To Events Of Significance	3A
AI 28A-006	Level 3 CR Evaluation	9
AI 28A-007	Level 2 CR Evaluation	4
AI 28A-010	Screening Condition Reports	6, 7
AI 28A-023	Evaluation of Maintenance Rule Functional Failure PIRs	1
AI 28E-007	Corrective Action Coding and Trend Analysis	7A
AI 28E-008	Condition Report Trend Code Assignment Process	2A
AI 34-003	Corrective Action Program Coordinators – Roles & Responsibilities	1A
ALR KC-888	Fire Protection Panel KC-008 Alarm Response	18A
ALR 00-120A	MFP A Trip	9, 10
ALR 00-120B	MFP A Suct Press LO	11
ALR 00-016B	PB03 / 04 Bus UV	11
AP 02-003	Chemistry Specification Manual	34B
AP 16C-006	MPAC Work Request/Work Order Process Controls	15

AP 18A-001	Employee Concerns Program	4
AP 20E-001	Industry Operating Experience Program	10, 11, 12, 13
AP 21-200	Operational Decision Making and Problem Analysis	3
AP 21C-001	WCGS/WESTAR Substation	8, 9, 11A
AP 22A-001	Screening, Prioritization and Pre-Approval	13
AP 22B-001	Outage Risk Management	9, 11, 12
AP 22C-003	Operational Risk Assessment Program	14A
AP 22C-003	On-Line Nuclear Safety and Generation Risk Assessment	15, 15A
AP 22C-005	IPS Daily Scheduling	12
AP 22C-007	Risk Management and Contingency Planning	4
AP 23M-001	WCGS Maintenance Rule Program	6
AP 23O-001	Plant Health Committee	4
AP 23-006	System Engineering Program	20, 20A
AP 23-008	Equipment Reliability Program	4
AP 24B-001	Control of Site Contractor Services	7
AP 26A-001	Reportable Events – Evaluation and Documentation	15
AP 26A-004	Communications With the Nuclear Regulatory Commission	10/11
AP 26A-007	NRC Performance Indicators	8
AP 28-011	Resolving Degraded or Nonconforming Conditions Impacting SSCs	2
AP 28A-100	Condition Reports	13
AP 36-001	Nuclear Safety Culture	0
CKL ZL-009	Site Reading Sheets	70
GEN 00-002	Cold Shutdown to Hot Standby	71
GEN 00-003	Hot Standby to Medium Load, pages 20 and 21	29
GEN 00-003, 10	Hot Standby to Medium Load	33
GEN 00-004	Power Operation, page 36 of 63	65
GEN 00-006	Hot Standby to Cold Shutdown	70



I-ENG-005	Infrared Thermograph	4
MPE E009Q-03	Inspection and Testing of Siemens Vacuum Circuit Breakers	4
OFN BB-031	Shutdown LOCA	17
OFN MA-038	Rapid Plant Shutdown, page 2 of 45	12
OFN NB-030	Loss of AC Emergency Bus NB01 (NB02)	20
OFN NB-035	Loss of Off-Site Power Restoration	0
RNM C-130	Miscellaneous Relay and Meter Equipment	6
STN AE-007	Startup Main Feedwater Pump Operational Test	0
SYS AE-132	MFIV Pressure Open with ASU (Laptop)	0 and 1
SYS AE-200	Operation of Feedwater Heating	7
STS AE-201	Feedwater Chemical Injection Inservice Valve Test	22
STS IC-215	TADOT of Manual Reactor Trip, Trip and Bypass Breaker UV/Shunt Trip, Turbine Trip on Reactor Trip and P-4	13, 14
STS RE-018	Multiple Rod Drop Time Measurement	11
SYS AC-120	Main turbine Generator Startup	51
SYS AE-121	Turbine Driven Main Feedwater Pump Startup	32, 33
SYS AE-320	Turbine Driven Main Feedwater Pump Shutdown	23
SYS EJ-320	Placing RHR System in Safety Injection Standby Condition	34
SYS EJ-321	Shutdown of a Residual Heat Removal Train	29
SYS SB-122	Enabling/Disabling P-4/LO Tavg FWIS	1, 2
WCRE-13	Wolf Creek Generating Station Lake Water Systems Structural Integrity Program	2

CONDITION REPORTS

777	7499	7508	7509	7510
7511	8575	9181	9375	9519
10247	10300	11768	12913	13805
13957	14261	14262	15269	15306
15407	15520	15521	15576	16455
16467	16657	16905	17776	17900
18034	18156	18413	19245	19295

19318	19360	19369	19371	19390
19447	19913	19914	19960	20665
21002	21039	21044	21260	21509
21641	21702	21813	21816	22470
22781	22979	23008	23032	23108
23110	23114	23119	23154	23479
23852	23938	23992	24445	24852
25018	25817	25892	25896	26345
26384	26787	26805	27005	27527
27997	27998	28175	28208	28224
28474	29095	29098	29128	29181
29204	29286	29818	30271	31121
31151	31458	31800	32326	32404
32431	32434	32436	32438	32445
32446	32451	32492	32506	33041
33076	33087	33103	33109	33143
33177	33202*	33212*	33217*	33229*
33253	33316*	33320	33327	33329*
33331*	33336*	33341*	33342*	33351*
33385*	33393*	33395*	33416*	33419*
33423*	33435*	33440*	33442*	33456*
33457*	33459*	33465*	33466*	33467*
33469*	33529*	33535*	33540*	33541*
33575*	33594*	33625*	33720*	33722*
33752*	33761*	33869*	33890*	33903
33917	33922*	33928*	33929*	33958*
33983*	33990*	2006-001409	2006-001798	2006-003035
2006-003271	2006-003473	2006-003815	2007-000040	2007-000187
2007-000202	2007-001013	2007-001707	2007-001780	2007-001993
2007-002000	2007-002009	2007-002128	2007-002331	2007-002749
2007-002854	2007-003350	2007-003612	2007-003798	2007-004055
2007-004125	2007-004126	2007-004127	2007-004128	2007-004129
2007-004130	2007-004132	2008-000116	2008-000149	2008-000164
2008-000465	2008-000989	2008-001014	2008-002230	2008-002237

2008-003419	2008-003802	2008-003810	2008-004136	2008-004536
2008-004997	2008-006105	PIR 1995-0586	PIR 1995-2858	PIR 1996-3260
PIR 1997-0078	PIR 1998-2794	PIR 2000-0834	PIR 2000-0835	PIR 2000-0871
PIR 2000-2212	PIR 2001-0041	PIR 2001-2368	PIR 2002-0860	PIR 2003-2178
PIR 2003-2496	PIR 2004-0586	PIR 2004-0684	PIR 2004-2435	PIR 2004-2502
PIR 2004-2644	PIR 2004-2684	PIR 2004-2813	PIR 2004-3390	PIR 2005-0121
PIR 2005-0382	PIR 2005-0771	PIR 2005-0773	PIR 2005-0774	PIR 2005-0775
PIR 2005-0776	PIR 2005-0777	PIR 2005-0778	PIR 2005-0779	PIR 2005-0780
PIR 2005-0781	PIR 2005-0782	PIR 2005-0783	PIR 2005-0784	PIR 2005-0785
PIR 2005-0786	PIR 2005-0787	PIR 2005-0788	PIR 2005-0789	PIR 2005-0790
PIR 2005-0791	PIR 2005-0792	PIR 2005-0794	PIR 2005-0795	PIR 2005-0796
PIR 2005-1411	PIR 2005-1962	PIR 2005-2126	PIR 2005-2164	PIR 2005-2167
PIR 2005-2168	PIR 2005-2461	PIR 2005-2507	PIR 2005-2619	PIR 2007-0483
PIR 2008-1105	PIR 2008-003802			

\*Condition Reports generated during the inspection

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
M-12AB03	Main Steam System	18
M-12AE01	Piping & Instrumentation Diagram Feedwater System	37
M-12AE02	Piping & Instrumentation Diagram Feedwater System	13

LEERS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
2008-002-01	Technical Specification Allowed Outage Time Exceeded due to Room Cooler Leak	January 11, 2010
2008-003-00	Manual Reactor Trip due to Loss of Steam Generator Level	May 13, 2008
2008-004-02	Loss of Offsite Power Event When the Reactor was De-fueled	November 11, 2009
2008-007-00	Two Residual Heat Removal Trains Inoperable in Mode 3 due to Check Valve Leakage	July 10, 2007
2008-008-00	Potential for Residual Heat Removal Trains to be Inoperable during Mode Change	October 3, 2008

2008-008-02	Potential for Residual Heat Removal Trains to be Inoperable during Mode Change	August 25, 2009
2009-001-00	Reactor Protection System Actuation and Reactor Trip due to Main Feedwater Regulating Valve Failing Closed	June 24, 2009
2009-002-00	Loss of Offsite Power due to Lightning	October 17, 2009
2009-005-00	Loss of Both Diesel Generators with all Fuel in the Spent Fuel Pool	December 21, 2009
2009-009-01	Defeating Feedwater Isolation on Low Tavg Coincident with P-4 Function Results in Missed Mode Change	March 3, 2010
2010-001-00	Automatic Start of Motor Driven Auxiliary Feedwater Pumps Inoperable During Startup in Mode 1	March 22, 2010
2010-002-00	Turbine Trip Function of Reactor Trip, P-4 Interlock Defeated During Entry into and in Mode 3	March 29, 2010

WORK ORDERS

00-223036-004	04-266765-000	05-273961-002	06-286463-000	07-291802-000
07-300375-000	08-303896-000	08-303897-000	09-316562-002	09-316566-004
09-316730-000	09-317186-000	09-317187-000	09-317188-000	09-317189-000
09-317190-000	09-317749-000	09-317750-000	09-317752-000	09-317753-000
09-317754-000	09-317755-000	09-317756-000	09-317757-000	09-317820-000
09-317821-000	09-317822-000	09-317823-000	09-321570-000	09-321571-000
09-321572-000	09-321573-000	09-322495-000	09-322503-000	10-324684-000
10-325088-000	10-325088-001	10-325205-000	10-326827-057	10-331761-000
10-332022-000	10-332233-000	10-332233-001	10-332631-000	10-332731-000
11-337163-002				

MEETING NOTES

MEETING

DATE

OE Collegial Review	February 10, 2011
Level 4 Challenge Board	February 23, 2011
Corrective Action Challenge Board	February 24, 2011

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE / REVISION</u>
	2010 Nuclear Safety Culture Assessment Interview Responses	
	2010 Nuclear Safety Culture Assessment Pre-assessment Survey	
	Amendment to Wolf Creek Generating Station Operating Agreement	August 13, 2010
	Control Room Logs from April 7-8, 2008	
	Control Room Logs from November 17-20, 2008	
	Deficient/Corrective Maintenance Backlog Reduction Initiative dated	January 2011
	Diesel Fuel Oil Strategic Plan	2
	Employee Concern Program Overview 2009	
	Employee Concern Program Overview 2010	
	Engineering Technical Task Brief Desktop Instruction	1
	Essential Service Water Feasibility Study, Wolf Creek Nuclear Operating Corporation, Burlington, Kansas (WCNOC127)	November 2010
	FID Assignments for Fire Pumps, PN09, and PB03	
	Feedwater Quick Hit Assessment	November 12, 2010
	GDC-17 Transmission Network Controls and Reliability Improvement and Related Issues	8
	HU Tools For Engineers Desktop Instruction	0
	Human Performance Toolbox	3
	Jan 2011 Management Observations of Ops	
	Letter ET 10-0011, dated March 4, 2010, from T. J. Garrett WCNOG to NRC	
	List of PRA Top Ten Systems	
	Maintenance Rule Final Scope Evaluation Essential Service Water (EF)	

Metallurgical Failure Evaluation of a Corroded 30" Elbow from the Outlet Side of the Self-Cleaning Strainer of an ESW Line, Report NO. 57809	November 25, 2009
Metallurgical Investigation of a Corroded 18" Welded Pipe, 150-HBC-18 from A ESW Lake Water Line, Report No. 57652	October 27, 2009
MSDS for SPEC-AID 8Q5368ULS	November 17, 2006
NERC Interface Coordination Agreement for the Wolf Creek Substation between Westar Energy, Inc and Wolf Creek Nuclear Operating Corporation	
Nuclear Plant Interface Coordination NUC 001-2	March 23, 2010
On the Spot Change (OTSC) 09-0084, Gen 00-002, Cold Shutdown to Hot	November 17, 2009
Standby On the Spot Change (OTSC) 09-0086, STS RE-018, Multiple Rod Drop Time Measurement	November 19, 2009
On the Spot Change (OTSC) 10-0011, AP 22C-002, Work Controls	February 17, 2010
On the Spot Change (OTSC) 11-0014, AP 28A-100, Condition Reports	February 22, 2011
Operational Focus Plan	1
Operational Focus Plan	2 (draft)
Operations Requalification Cycle 10-04 Schedule	July 7, 2010
Preventative Maintenance Optimization (PMO) Project Report	0, 1, and 2
Project Plan for Essential Service Water Piping Integrity Project	January 18, 2011 2
Project Report, GDC-17 Transmission Network Controls and Reliability Improvement and Related Issues	8
Quality Oversight Report	December 2010/ January 2011
Quick Hit Detail Report 1684, PM Basis Review	January 14, 2010
Quick Hit Detail Report 1795, STP STARS ER Benchmarking Trip	June 29, 2010

Record Supplement/Correction Sheet K01-033 for CR 23119 – Safety System Functional Failures Exceeding PI Threshold	February 24, 2011
Single Point of Entry Training Presentations, PowerPoint Slides	September 2010
Slide presentation on Managing Defenses Md 0510	
Slide presentation on Reducing Error Re 0510	
Student Notes from USA Event Reporting, RA270RPT.H02	3A
Student Work Book for USA Event Reporting, RA270RPT.WB1	3A
Today's Operational Focus	February 7-10, 2011
Training Lesson Materials for General Training GT1535403, Rev 009, on Reportability – Event Notification and Reporting	July 8, 2010
Training Lesson Slides for General Training GT1535403, on Reportability – Event Notification and Reporting	9
Training Roster dated Apr 21, 2010 for AP 26A -001, Reportable Events – Evaluation and Documentation	15
Training slides from USA Event Reporting The 10 CFR 50.72 and 50.73, RA270RPT.PP1	3A
Various Fuel Oil Lab Analysis Data Sheets	
WCGS_PRA_Rev5_Raw Query	
WCGS_PRA_Rev5_RRW Query	
WCNOC Reportability Handbook	4
Wolf Creek Change Management Process Guide	1
Wolf Creek Change Plan Process High Complexity Worksheet	
Wolf Creek Change Plan Process Introduction Worksheet	
Wolf Creek Change Plan Process Low Complexity Worksheet	

	Wolf Creek Change Plan Process Moderate Complexity Worksheet	
	Wolf Creek Nuclear Operating Company Nuclear Safety Culture Assessment	August 2008
	Wolf Creek Nuclear Operating Company Nuclear Safety Culture Assessment	March 2010
	Wolf Creek Nuclear Operating Corporation, The Daily Current	April 13, 2010
	Wolf Creek Nuclear Operating Corporation, The Daily Current	March 17, 2010
	Wolf Creek Technical Specifications, Amendment 188	
	Wolf Creek Updated Safety Analysis Report (USAR)	23
00-223036-000	Tank Inspection Report 100K Diesel Fuel Oil Tanks Alpha/Bravo Wolf Creek Nuclear Operating Corporation (Vendor Report)	April 2002
02846	Feedwater Preheating Calculation	1
AIF 22I-004-01	Project Ranking Points	2
APF 21C-001-01	WCGS Substation Work Authorization	5
Audit 09-02-ENG	Quality Assurance Audit Report Engineering Program	April 3, 2009
Audit 10-02-OPS	Quality Assurance Audit Report Operations Program	March 16, 2010
Audit 10-07-FP	Quality Assurance Audit Report Fire Protection Program	September 23, 2010
Change Package 13343	Alarm 7300 Cabinets Card Frame Fuses	0
CP 013043	Diesel Fuel Oil	0
FAQ 10-03	Wolf Creek Generating Station Unplanned Scrams with Complications	March 18, 2010
FSAR 10.4.7.2.3	Feedwater System Operation	
OTSC 02-0108	50.59 Screening for GEN 00-003, Rev 54 procedure change	April 27, 2002



OTSC 02-0108	50.59 Applicability Determination for GEN 00-003, Rev 54 procedure change	April 27, 2002
RA1331201	Regulatory Awareness	5
RA2331201	Ai 26A-003 Other Regulatory Evaluations for Prior NRC Approval	0
RA270RPT.LP1	Lesson Plan for USA Event Reporting	3A
SEL 2009-152	Self Assessment Report Predictive Maintenance (PdM) Program	
SEL 2010-194	Self Assessment Report Main Feedwater	
SEL-2010-188	NRC Performance Indicator Program	January 11, 2011
SEL 2010-192	INPO TR10-70 Self Assessment	
SEL-2010-194	Main Feedwater Self Assessment	December 7, 2010
SEL 01-033	Licensing Commitments	
SEL 05-01	Transformer and Switchyard Self-Assessment	
STN IC-903	Cross Trip Check XNB01 Switchyard	3
TB-05-6	Westinghouse Technical Bulletin – Retrofit of Printed Circuit Cards for 7300 Based Systems – Capacitor C105 Replacement with Fuse Protection Added	0 and 1
TG1645500	Safety Culture – What's at Stake?	0
TIN ES1312300	Timeliness Evaluations RIS 2005-20	2
TSA 20273-000	Bechtel Response to Reactor Trips caused by Main Feedwater	0 and 1
USN 153113	Feed Pump Turbine Upgrades Per TIL-1206 Recommendations	August 26, 2010

