UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

August 16, 2007

Rick A. Muench, President and
Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION - NRC INTEGRATED INSPECTION REPORT 05000482/2007003

Dear Mr. Muench:

On July 7, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Wolf Creek Generating Station. The enclosed integrated report documents the inspection findings which were discussed on July 11, 2007, with Mr. Brad Norton and other members of your staff.

The inspections examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The report documents five NRC-identified and self-revealing findings of very low safety significance (Green). Four of these findings were determined to involve violations of NRC requirements. Because of the very low safety significance and because the findings were entered into your corrective action program, the NRC is treating these violations as noncited violations consistent with Section VI.A of the NRC Enforcement Policy. If you contest these noncited violations, you should provide a response within 30 days of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, U.S. 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, and its enclosure, 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 Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

Vincent G. Gaddy, Chief
Project Branch B
Division of Reactor Projects

Docket: 50-482
License: NPF-42

Enclosure:
NRC Inspection Report 05000482/2007003
w/Attachments:
1. Supplemental Information
2. Security Related Information

cc w/o Attachment 2:
Vice President Operations/Plant Manager
Wolf Creek Nuclear Operating Corp.
P.O. Box 411
Burlington, KS 66839

Jay Silberg, Esq.
Shaw Pittman, LLP
2300 N Street, NW
Washington, DC 20037

Supervisor Licensing
Wolf Creek Nuclear Operating Corp.
P.O. Box 411
Burlington, KS 66839

Chief Engineer
Utilities Division
Kansas Corporation Commission
1500 SW Arrowhead Road
Topeka, KS 66604-4027

Office of the Governor
State of Kansas
Topeka, KS 66612

Attorney General
120 S.W. 10th Avenue, 2nd Floor
Topeka, KS 66612-1597

County Clerk
Coffey County Courthouse
110 South 6th Street
Burlington, KS 66839-1798

Chief, Radiation and Asbestos
Control Section
Kansas Department of Health and
Environment
Bureau of Air and Radiation
1000 SW Jackson, Suite 310
Topeka, KS 66612-1366

Ronald L. McCabe, Chief
Technological Hazards Branch
National Preparedness Division
DHS/FEMA
9221 Ward Parkway
Suite 300
Kansas City, MO 64114-3372

Electronic distribution by RIV:
Regional Administrator **(BSM1)**
DRP Director **(ATH)**
DRS Director **(DDC)**
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Resident Inspector **(CXL1)**
SRI, Callaway **(MSP)**
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DRS STA **(DAP)**
D. Pelton, OEDO RIV Coordinator **(DLP1)**
ROPreports
WC Site Secretary **(SLA2)**
W. A. Maier, RSLO **(WAM)**
R. E. Kahler, NSIR **(REK)**

Report and Security Related OUO Attachments:
SUNSI Review Completed: MPS ADAMS: ■ Yes ☐ No Initials: _MPS
☐ Publicly Available ■ Non-Publicly Available ■ Sensitive ☐ Non-Sensitive

Report:
SUNSI Review Completed: VGG ADAMS: ■ Yes ☐ No Initials: VGG
■ Publicly Available ☐ Non-Publicly Available ☐ Sensitive ■ Non-Sensitive

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SDCochrum:sa	CMLong	DAPowers*	LJSmith*
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C:DRS/OB	C:DRS/PSB	C:DRP/B	
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	50-482
License:	NPF-42
Report:	5000482/2007003
Licensee:	Wolf Creek Nuclear Operating Corporation Wolf Creek Generating Station
Location:	1550 Oxen Lane NE Burlington, Kansas
Dates:	April 8 through July 7, 2007
Inspectors:	S. D. Cochrum, Senior Resident Inspector C. M. Long, Resident Inspector M. Haire, Senior Reactor Inspector J. Cruz, Chief, Operations Branch NSIR
Approved By:	V.G. Gaddy, Chief, Project Branch B

Enclosure

CONTENTS

SUMMARY OF FINDINGS

IR 05000482/2007003; 04/08/07 - 07/07/07; Wolf Creek Generating Station; Maintenance Risk Assessments and Emergent Work Control, Operability Evaluations, Postmaintenance Testing, Event Followup.

This report covered a 3-month period of inspection by resident inspectors, a regional inspector, and a headquarters inspector. The inspection identified five Green findings, four of which were noncited violations. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." 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 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A noncited violation of 10 CFR 50.65(a)(4) was identified for failure to adequately assess and manage the increase in risk during observation of a scheduled emergency diesel generator surveillance. On January 4, 2007, inspectors observed the emergency diesel Generator A hot start surveillance test and questioned plant operators regarding operability in Modes 1 or 2 of the emergency diesel generator while paralleled with the grid based on operating experience. The inspectors noted that operations personnel did not have a written set of steps or procedures identified for restoration of the emergency diesel generator, and would have to diagnose what restoration activities would have to be taken at the time of an emergency start demand based upon the step of the surveillance procedure in effect at the time the emergency start demand occurred. The inspectors also identified that operations personnel were unaware of the limiting response time for operator manual actions specified in Amendment 154 that approved testing in Modes 1 or 2. Wolf Creek has developed manual actions for restoration of the emergency diesel generator during testing.

  The failure to adequately assess and manage the increase in risk for the use of operator manual actions to ensure emergency diesel generator availability during surveillance testing was a performance deficiency. The finding is similar to the minor example 7(g) and is more than minor because it is associated with the Mitigating Systems cornerstone attribute of protection against external factors, and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. The finding was of very low safety significance because the magnitude of the calculated risk deficit was less than 1×10^{-6} and other risk management actions were in place. (Section 1R13)

Cornerstone: Initiating Events

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Conditions Adverse to Quality," involving Wolf Creek's failure to identify and correct the cause of the reactor coolant pump (RCP) thermal barrier component cooling water heat exchanger outlet valves stroking closed on high flow. Specifically, between 2001 and 2007, Wolf Creek experienced repeated cases of the RCP thermal barrier component cooling water heat exchanger outlet valves stroking closed when two component cooling water pumps are started during train swaps. Wolf Creek evaluated the issue after inspector questioning but did not review the impact of the valves stroking closed during design basis events or accidents and the operators' ability to open them given the valves circuit breakers opening. Wolf Creek has further condition reports open on this finding.

  The failure to identify and correct the condition adverse to quality of ensuring RCP 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 is 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 their safety function. The cause of the finding has problem identification and resolution crosscutting aspects in the area of corrective action because Wolf Creek did not thoroughly evaluate the issue such that the resolution addressed the extent of conditions given multiple opportunities documented in the corrective action program (P.1(c)). (Section 1R15)

- Green. A self-revealing finding for failing to identify degraded circulating water pump auto transformers during inspections in April 2007. Specifically, Wolf Creek failed to adequately inspect and identify signs of overheating and degradation during inspection of the excitation auto transformers for the circulating water pumps. Consequently, the unidentified degraded condition resulted in the circulating water Pump A tripping and an automatic turbine load reduction on May 25, 2007. Wolf Creek has replaced the failed auto transformer and is planning a modification to increase the size of the transformers to reduce overheating.

  The failure to perform adequate inspections of the circulating water Pump A excitation auto transformer was considered a performance deficiency. The finding is more than minor because it is associated with the Initiating Events Cornerstone because the deficiency 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 issue did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation

equipment or functions would not be available. The cause of the finding has human performance crosscutting aspects in the area of work practices because Wolf Creek did not follow maintenance procedures and did not ensure oversight of work activities such that nuclear safety was supported (H.4(b)). (Section 4OA3)

Cornerstone: Barrier Integrity

- Green. The inspectors identified a noncited violation of Technical Specification 5.4.1.a in which Wolf Creek did not implement a preventive maintenance procedure to mitigate Train B emergency exhaust system fan bearing vibrations which resulted in a degraded condition. Specifically, the vendor manual directs lubrication every 3 to 12 months (3 to 6 months for average conditions being room temperature and clean conditions) to prevent oxidation and breakdown of the grease; however, the Wolf Creek recurring preventive maintenance was set to lubricate the bearings every three years. This recurring preventive maintenance was not sufficient to ensure the bearings remained adequately lubricated. It was not until NRC questioning that Wolf Creek generated a condition report to review the past condition of the bearings and the appropriateness of the recurring lubrication interval for the bearings.

  The licensee's failure to implement preventive maintenance to ensure the fan bearings were adequately lubricated is a performance deficiency. The finding is more than minor because it is associated with the barrier performance attribute of the Barrier Integrity Cornerstone; and, it affected the cornerstone objective to maintain radiological barrier functionality of the auxiliary and fuel building. The finding is of very low safety significance because the issue only represents a degradation of the radiological barrier function provided for the auxiliary or fuel building barriers to mitigate airborne radionuclides from emergency core cooling system pump cubicles or a fuel handling accident, respectively. The cause of the finding has problem identification and resolution crosscutting aspects in the area of corrective action because Wolf Creek did not evaluate or resolve the causes of repeated bearing degradation by thoroughly evaluating problems such that the resolutions address causes and extent of the conditions (P.1(c)). (Section 1R15)

- Green. The inspectors identified a noncited violation of 10 CFR, Part 50, Appendix B, Criterion XI, "Test Control," in which Wolf Creek did not implement controlled testing of the Train B emergency exhaust system fan to demonstrate operability prior to returning the fan to service after bearing replacement. Specifically, on June 12, 2007, Wolf Creek restored the B emergency exhaust system fan to service without implementing the postmaintenance testing described in Procedure AP 16E-002, "Postmaintenance Testing Development," Revision 6A. Upon review of the postmaintenance testing, the fan failed the vibration portion of the testing and Wolf Creek did not perform an operability evaluation in accordance with Procedure AP 28-001, "Operability Evaluations."

Based on inspector questioning, Wolf Creek performed the correct postmaintenance testing and an operability evaluation. These issues are under evaluation in the Wolf Creek corrective action program.

The failure to follow test control procedures for the safety-related B emergency exhaust system fan prior to declaring it operable is a performance deficiency. The finding is more than minor because it is associated with the Barrier performance attribute of the Barrier Integrity Cornerstone; and, it affected the cornerstone objective to maintain radiological barrier functionality of the auxiliary and fuel building. The finding is of very low safety significance because the issue represents a degradation of only the radiological barrier function provided for the auxiliary or fuel building barriers to mitigate airborne radionuclides from emergency core cooling system pump cubicles or a fuel handling accident. The cause of the finding has human performance crosscutting aspects in the area of decision making because Wolf Creek did not initially conduct an adequate test and then failed to question the failed postmaintenance test by making a safety-significant or risk-significant decision using proceduralized systematic processes, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained (H.1(a)). (Section 1R19)

REPORT DETAILS

Summary of Plant Status

Wolf Creek began the period at full rated thermal power and operated at full power for the entire report period, except for three power reductions. On May 16, reactor power was reduced to approximately 90 percent due to loss of the 345kV Rosehill offsite power line. The reactor was returned to full power later the same day following restoration of the power line. On May 25, reactor power was reduced to approximately 90 percent due to an automatic turbine load reduction due to the unplanned trip of one circulating water pump. The reactor was returned to full power following repairs later the same day. On June 11, reactor power was reduced to approximately 90 percent due to entry into an off-normal procedure and was returned to full power approximately four hours later.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Seasonal Susceptibilities

a. Inspection Scope

The inspectors completed a review of the licensee's readiness of seasonal susceptibilities involving extreme high temperatures. The inspectors: (1) reviewed plant procedures, the Updated Safety Analysis Report (USAR), and Technical Specifications (TS) to ensure that operator actions defined in adverse weather procedures maintained the readiness of essential systems; (2) walked down portions of the systems listed below to ensure that adverse weather protection features were sufficient to support operability including the ability to perform safe shutdown functions; (3) evaluated operator staffing levels to ensure the licensee would maintain the readiness of essential systems required by plant procedures; and (4) reviewed the corrective action program to determine if the licensee identified and corrected problems related to adverse weather conditions.

- May 29, 2007, hot weather operations for emergency diesel generators (EDG)

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors completed a review of the licensee's readiness for impending adverse weather involving severe thunderstorms and heavy rains. The inspectors: (1) reviewed plant procedures, the USAR, and TS to ensure that operator actions defined in adverse weather procedures maintained the readiness of essential systems; (2) walked down portions of the systems listed below to ensure that adverse weather protection features were sufficient to support operability, including the ability to perform safe shutdown functions; (3) reviewed maintenance records to determine that applicable surveillance requirements were current before the anticipated weather developed; and (4) reviewed plant modifications, procedure revisions, and operator work arounds to determine if recent facility changes challenged plant operation.

- May 6, 2007, essential service water and site area drains

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

Partial System Walkdowns

a. Inspection Scope

The inspectors: (1) walked down portions of the four risk important systems listed below and reviewed plant procedures and documents to verify that critical portions of the selected systems were correctly aligned, and (2) compared deficiencies identified during the walkdown to the licensee's USAR and corrective action program to ensure problems were being identified and corrected.

- April 16, 2007, essential service water system during engineered safety features actuation system testing
- April 25, 2007, Train A centrifugal charging pump while centrifugal charging Pump B is out of service
- May 2, 2007, Train B EDG while Train A EDG is out of service
- May 4, 2007, Train B component cooling water (CCW) while Train A CCW is out of service

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

Routine Inspection

a. Inspection Scope

The inspectors walked down the plant areas listed below to assess the material condition of active and passive fire protection features, their operational lineup, and their operational effectiveness. The inspectors: (1) verified that transient combustibles and hot work activities were controlled in accordance with plant procedures; (2) observed the condition of fire detection devices to verify they remained functional; (3) observed fire suppression systems to verify they remained functional; (4) verified that fire extinguishers and hose stations were provided at their designated locations and that they were in a satisfactory condition; (5) verified that passive fire protection features (electrical raceway barriers, fire doors, fire dampers, steel fire proofing, penetration seals, and oil collection systems) were in a satisfactory material condition; (6) verified that adequate compensatory measures were established for degraded or inoperable fire protection features; and (7) reviewed the corrective action program to determine if the licensee identified and corrected fire protection problems.

- April 11, 2007, auxiliary building 2047' elevation
- May 3, 2007, control room and control building 2047' elevation
- May 8, 2007, circulating water screen house and diesel-driven fire pump room
- June 5, 2007, auxiliary building 2033' elevation
- June 20, 2007, 2026' level of containment building
- June 14, 2007, fuel building 2047' Elevation A and B emergency exhaust system (EES) rooms

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed six samples.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

Annual External Flooding

a. Inspection Scope

For the area listed below, the inspectors: (1) reviewed the USAR, the flooding analysis, and plant procedures to assess seasonal susceptibilities involving external flooding; (2) reviewed the corrective action program to determine if the licensee identified and corrected flooding problems; (3) inspected underground bunkers/manholes to verify the adequacy of (a) sump pumps, (b) level alarm circuits, (c) cable splices subject to submergence, and (d) drainage for bunkers/manholes; (4) verified that operator actions for coping with flooding can reasonably achieve the desired outcomes; and (5) walked down the areas listed below to verify the adequacy of (a) equipment seals located below the flood line, (b) floor and wall penetration seals, (c) watertight door seals, (d) common drain lines and sumps, (e) sump pumps, level alarms, and control circuits, and (f) temporary or removable flood barriers.

- May 7, 2007, circulating water screen house during heavy rains

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

On May 7, Wolf Creek received heavy rains and water leaks from the circulating water screen house roof were observed. On May 8, 2007, it was observed that the roof of the circulating water screen house had accumulated approximately eight inches of standing water and that the drains were blocked by debris. That same day, the drains were cleared and the roof was drained. It was not until inspector questioning that the design calculation for the roof's steel structure was reviewed for possible impacts; however, no roof damage was visually observed. The roof drains are described in Drawing A-121 and SPEC A-3862 with domed drain covers. The steel screens inside the drains became plugged with debris because outer dome covers over the screens were missing. On May 31, 2007, the dome drain covers were replaced.

A work order was written in May 2001 because of standing water on the circulating water screen house roof caused by clogged drains due to missing dome covers. The debris was removed from the clogged drains in June 2001; however, the missing dome shaped drain covers were not replaced until after the May 7, 2007, occurrence.

Based on the inspectors questioning of the May 2007 rains, Wolf Creek evaluated the impact of eight inches of water on the roof. The eight inches of water exceeded the design stress of approximately 16 ksi for the roof's most limiting I-beams. However, after reviewing the calculation, the loading did not exceed the yield stress for the A36 steel used in the most limiting I-beam of the roof. Directly below the most limiting I-beam is located all of the circulating water pump circuit breakers and the feeder circuit Breaker 4-26 for Bus SL-31. Bus SL-31 feeds the normal service water Pumps B and C

and the electric fire water pump. Calculation A-3862-02 W01 describes the design stress for the load bearing steel structure of the circulating water screen house.

Calculation A-3862-02 W01 provides for roof loading of snow, but not for standing water since the roof is designed with water drains. This calculation allows for a roof load of 20 pounds per square foot or approximately 3.8 feet of snow. The 3.8 feet of snow is approximately 3.8 inches of standing water. Thus, the added weight of eight inches of water was in excess of the loading specified in Calculation A-3862-02 W01. Based on the onsite meteorological tower, winds during the time the eight inches of standing water were on the roof ranged from 0 to 20 mph, however, this was determined not to be a significant contributor to roof stresses.

On May 26, 2007, inspectors walked down the circulating water screen house roof to see the new dome covers and found them to be covered with insect debris. On May 26, 27, and 28 this issue re-occurred as Wolf Creek experienced heavy rains but only minor water depth was observed. Mechanics subsequently re-cleared the roof drains. This occurrence also called into question the ability of the dome covers to prevent roof gravel from migrating downstream to the drains because the gravel is smaller than the dome cover grating.

This issue and the corrective actions are being tracked by Wolf Creek in Condition Reports 2007-001897 and -002599. Since additional inspection is needed to evaluate the facts and significance of all instances, this issue is being treated as an Unresolved Item (URI) 05000482/2007003-01, circulating water roof loading exceeds design.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

The inspectors observed testing and training of senior reactor operators and reactor operators to identify deficiencies and discrepancies in the training, to assess operator performance, and to assess the evaluator's critique. The training scenario is listed below.

- June 7, 2007, loss of stator cooling followed by anticipated transient without scram

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors reviewed the maintenance activities listed below to: (1) verify the appropriate handling of structure, system, and component (SSC) performance or condition problems; (2) verify the appropriate handling of degraded SSC functional performance; (3) evaluate the role of work practices and common cause problems; and (4) evaluate the handling of SSC issues reviewed under the requirements of the maintenance rule, 10 CFR Part 50, Appendix B, and TSs.

- June 26, 2006, containment personnel hatch failure
- June 14, 2007, EES B fan bearing replacement

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

Risk Assessment and Management of Risk

The inspectors reviewed the assessment activities listed below to verify: (1) performance of risk assessments when required by 10 CFR 50.65 (a)(4) and licensee procedures prior to changes in plant configuration for maintenance activities and plant operations; (2) the accuracy, adequacy, and completeness of the information considered in the risk assessment; (3) that the licensee recognizes, and/or enters as applicable, the appropriate licensee-established risk category according to the risk assessment results and licensee procedures; and (4) that the licensee identified and corrected problems related to maintenance risk assessments.

- April 16, 2007, weekly risk for Work Week 7203 risk
- June 8, 2007, normal charging pump out of service due to balance line crack
- January 4, 2007, EDG A hot start surveillance test

Emergent Work Control

For the emergent work activities listed below, the inspectors: (1) verified that the licensee performed actions to minimize the probability of initiating events and maintained the functional capability of mitigating systems and barrier integrity systems; (2) verified that emergent work-related activities such as troubleshooting, work planning/scheduling, establishing plant conditions, aligning equipment, tagging, temporary modifications, and equipment restoration did not place the plant in an

unacceptable configuration; and (3) reviewed the corrective action program to determine if the licensee identified and corrected risk assessment and emergent work control problems.

- April 10, 2007, low flow service water pump discharge valve failure
- May 31, 2007, 69kv potential transformer failure emergent switchyard work

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed five samples.

b. Findings

EDG Availability During Surveillance Testing

The inspectors reviewed and observed the licensee's actions to ensure EDG availability during surveillance testing activities. The licensee's evaluation of plant risk, risk management, scheduling, and configuration control for the scheduled EDG surveillances were assessed against the criteria of 10 CFR 50.65(a)(4), Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants," and Section 11 to the final revision of NUMARC 93-01.

Introduction: A Green noncited violation (NCV) of 10 CFR 50.65(a)(4) was identified by the inspectors for failure to adequately assess and manage the increase in risk during scheduled EDG surveillances. Specifically, the inspectors identified that the licensee did not have manual operator actions in place to ensure EDG availability during the surveillance testing and did not meet the requirements of NUMARC 93-01, Section 11.

Description: On January 4, 2007, inspectors conducting an observation of the EDG A hot start surveillance test questioned plant operators regarding operability of the EDG while paralleled with the grid. This question was based on the review of River Bend Station operating experience during which it was discovered that the EDG was operated in the test mode with the nonsafety trips still active and may trip in response to a required emergency mode of operation. Wolf Creek entered the operator evaluation into their corrective action program and took immediate compensatory actions to declare the EDG inoperable during subsequent testing. Following completion of an operability review, Wolf Creek concluded that the EDG is operable based on an Office of Nuclear Reactor Regulation (NRR) safety evaluation and issuance of Amendment 154 for TS 3.8.1 and 3.8.4 dated July 12, 2004, that concluded it was acceptable to perform EDG surveillances in Modes 1 and 2 with manual operator actions in place. The inspectors consulted with NRR and determined this was the correct conclusion.

Based on review of Amendment 154, the inspectors identified that operations personnel did not have a written set of steps, or a written procedure, specifically identified for restoration of the EDG in the event of an emergency start demand during testing. Further, the inspectors noted that operations personnel would have to essentially diagnose what restoration activities would be taken at the time of an emergency start demand based upon the step within the surveillance test procedure at the time that the emergency start demand occurred. The inspectors also identified that operations

personnel were unaware of the limiting response time for operator manual actions specified in Amendment 154. In this case, Amendment 154 listed several minutes as the time to restore EDG power to its associated bus under certain accident conditions. The inspectors determined, based upon a review of the purposed manual operator actions, that, although the manual actions appeared reasonable; they may have required more than several minutes to complete due to the fact that no training had been conducted and none of the operations crew had been briefed on the EDG restoration actions needed before or during any of the surveillance tests.

Analysis: The inspectors determined that the failure to adequately assess and manage the increase in risk for the use of operator manual actions to ensure EDG availability during surveillance testing was a performance deficiency. Specifically, the licensee failed to implement the use of operator manual actions to ensure component availability referenced the requirements contained in Section 11 of NUMARC 93-01, which, in part, states:

"Systems, structures, or components out of service for testing are considered unavailable, unless the test configuration is automatically overridden by a valid starting signal, or the function can be promptly restored either by an operator in the control room or by a dedicated operator stationed locally for that purpose. Restoration actions must be contained in a written procedure, must be uncomplicated (a single action or a few simple actions), and must not require diagnosis or repair. Credit for a dedicated local operator can be taken only if (s)he is positioned at the proper location throughout the duration of the test for the purpose of restoration of the train should a valid demand occur. The intent of this paragraph is to allow licensees to take credit for restoration actions that are virtually certain to be successful (i.e., probability nearly equal to 1) during accident conditions."

In accordance with NRC Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," the inspectors determined that the finding was similar to the minor example 7(g) and was of more than minor significance in that the licensee failed to adequately implement and manage risk compensatory measures for key safety functions (i.e., the use of operator manual actions to ensure component availability) associated with the EDG. Additionally, the finding was more than minor because it was associated with the Mitigating Systems cornerstone attribute of protection against external factors and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Subsequently, the inspectors determined that the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," and conducted a characterization and initial screening. Because the finding was associated with maintenance risk management, IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," was used to assess the significance.

Using data from the licensee's probabilistic risk assessment and in consultation with a NRC Region IV senior reactor analyst, the inspectors reviewed the actual incremental core damage probability calculated by the licensee's risk analyst for the finding, conservatively assuming both EDGs would have not been restored to operation with manual actions from August 2004 to January 2007, during surveillance testing. Based

on the magnitude of the calculated risk deficit being less than 1 x 10^{-6} and other risk management actions that were in place, the inspectors concluded that the finding is of very low safety significance.

Enforcement: The Maintenance Rule, 10 CFR 50(a)(4), states that: "Before performing maintenance activities (including but not limited to surveillance, postmaintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." Contrary to this requirement, the licensee did not effectively manage the increase in risk resulting from the maintenance activity. Specifically, from August 2004 to January 2007, during surveillance testing of both EDG's, the licensee failed to adequately assess and manage the increase in risk that resulted from the surveillance activity. Operator manual actions intended to maintain EDG availability and manage the risk associated with the surveillance test were not implemented in accordance with established industry standards and regulatory guides. The licensee entered this issue into their corrective action program as Condition Report 2007-000368. Corrective actions planned and completed by the licensee included development and training of operator manual actions to ensure availability during testing. Because the licensee has entered the issue into their corrective action program and the finding is of very low safety significance, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: (NCV) 05000482/2007003-02, failure to implement manual actions.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors: (1) reviewed plant status documents such as operator shift logs, emergent work documentation, deferred modifications, and standing orders to determine if an operability evaluation was warranted for degraded components; (2) referred to the USAR and design basis documents to review the technical adequacy of licensee operability evaluations; (3) evaluated compensatory measures associated with operability evaluations; (4) determined degraded component impact on any TSs; (5) used the significance determination process to evaluate the risk significance of degraded or inoperable equipment; and (6) verified that the licensee has identified and implemented appropriate corrective actions associated with degraded components.

- May 7, 2007, diesel-driven fire pump room intake damper panel auto-open feature
- May 9, 2007, CCW thermal barrier heat exchanger outlet valves breakers opening
- May 14, 2007, EDG nonemergency shutdown remain active during testing
- June 15, 2007, Train B EES following bearing replacement

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

b. Findings

(1) CCW Thermal Barrier Heat Exchanger Outlet Valves

Introduction: The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Conditions Adverse to Quality," for failure to identify and correct the condition adverse to quality with the CCW thermal barrier heat exchanger outlet valves to ensure reactor coolant pump (RCP) seal cooling.

Description: On February 14, 2007, the inspectors questioned if the licensee had written a condition report and evaluated TS requirements regarding the CCW to the RCP thermal barrier heat exchanger motor-operated outlet valves circuit breakers opening during swapping of the inservice CCW pump. Wolf Creek subsequently initiated Condition Report 2007-000597. Wolf Creek Condition Report 2007-000597 concluded that the circuit breakers tripped because each valve has a 10-second delay associated with initiating a 'close' signal when high flow is sensed. Thus, while attempting to open a valve after 10 seconds of stroking open, a high flow is sensed, the valve stops opening, and attempts to reverse direction and close. Reversing directions causes the motor to draw excess amperage and causes the circuit breaker to trip. The inservice train of CCW is declared inoperable because TS Surveillance Requirement 3.7.1 cannot be met with the valves failed in mid-position until the respective circuit breaker can be re-closed. The inspectors reviewed this information and agreed, however Condition Report 2007-000597, stopped short of reviewing the impact of the valves stroking closed during design basis events or accidents and the operators ability to open them given the valves circuit breakers opening. These conditions would be present when two CCW pumps start and flow to radioactive waste processing is isolated.

During the inspection, the inspectors interviewed engineering personnel who evaluated Condition Report 2007-000597. Wolf Creek found that in this part of the system, opening the valve causes a flow perturbation which causes a sensed high flow condition, which causes the valve to stroke closed again after a 10-second delay (described above). Condition Report 2007-000597 describes procedural adherence as a cause when swapping the running CCW pump because the operators did not observe the note in Procedure SYS EG-201 to wait for flow to stabilize after a pump swap and then re-establish thermal barrier cooling. The inspectors found this guidance to be inadequate given that no wait time is specified, and no flow conditions for the flow elements are specified other than waiting for stable flow. The inspectors could not find any guidance for this issue elsewhere in the alarm response procedure, the off-normal procedure, or the emergency operating procedures for the CCW system. Therefore, in the absence of such unwritten guidance, the inspectors determined that the valves may not be re-opened in a timely manner to re-establish seal cooling, if needed. Further, the inspectors found that the notes in Procedure EG-201 acknowledge that the valves will close with two CCW pumps running.

The inspectors reviewed other work orders and condition reports related to this issue that were also limited in scope and did not fully address this issue. A previous operability evaluation stated that this issue is of very low safety significance because RCP seal injection is also available. The Wolf Creek plant safety analysis identifies providing RCP seal cooling in a timely manner as the most safety significant operator action. The failure mode of this issue is not identified in the plant safety analysis and this issue is not proceduralized outside SYS EG-201 as outlined above.

Additionally, the inspector and the licensee judged it reasonable that the RCP CCW heat exchanger outlet valves will stroke closed on a loss of offsite power and/or a safety injection signal due to the higher than normal flow created by having two CCW pumps start. Thus, this method of RCP seal cooling is removed because it has been demonstrated that re-opening these valves is difficult. Therefore, the CCW thermal barriers may not be able to fulfill their function to remain open for cooling of the RCP seals during design basis accidents and events because they will stroke closed on high flow when both CCW pumps start. RCP seal cooling is necessary to preclude a seal loss of coolant accident.

The inspectors reviewed various logs, work orders, work requests, and condition reports on this issue dating back to 2001. In some occurrences, the inspector found that during CCW pump swap, the flow element on the down stream containment isolation valve was also actuated and caused the associated valve to stroke closed. The inspector found that these CCW valves are safety related as specified in USAR Section 9.2.2.2.1. Section 5.1.1.2.2 describes thermal barrier heat exchangers and seal injection as diverse methods to assure RCP seal cooling. Lastly, the inspectors found in Section 9.2.2.2.3 of the USAR the CCW system is described as being able to provide cooling for its loads, including the thermal barriers, to achieve emergency cold safe shutdown with a single active component failure. The inadvertent automatic misoperation of these valves is contrary to these USAR sections.

Analysis: The inspectors determined that the failure to identify and correct the condition adverse to quality of ensuring RCP seal cooling as described in the USAR, is a performance deficiency. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements or Wolf Creek procedures. The inspectors determined that this finding was 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. Specifically, this issue relates to the reliability example of the equipment performance attribute because the valves have demonstrated a history of inappropriately stroking closed and being difficult to re-open when both trains of CCW pumps are started, which is similar to design basis events and accidents.

The inspectors evaluated the significance of this finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined that the finding is of very low safety significance because assuming worst case degradation, the finding would not result in exceeding the TS limit for identified RCS leakage and would not have likely affected other mitigation systems

resulting in a total loss of their safety function because seal injection was available. The inspectors determined that this finding has problem identification and resolution crosscutting aspects in the area of corrective action because Wolf Creek did not thoroughly evaluate the issue such that the resolution addressed the extent of conditions given multiple opportunities documented in the corrective action program. This includes properly evaluating for operability and conditions adverse to quality (P.1(c)).

Enforcement: 10 CFR Part 50, Appendix B, Criterion XVI, "Conditions Adverse to Quality," requires that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. Contrary to the above, the licensee did not promptly identify and correct a condition adverse to quality. Specifically, from 2001 to 2007, Wolf Creek did not identify the cause of the RCP thermal barrier CCW heat exchanger outlet valves stroking closed on high flow which would be experienced during design basis accidents and events. This issue and the corrective actions are being tracked by the licensee in Condition Reports 2007-002064 and -002601. Because the violation was of very low safety significance and the issue was captured in the licensee's corrective action program, this violation is being treated as a NCV consistent with Section VI.A of the NRC Enforcement Policy: (NCV) 05000482/2007003-03, failure to identify cause of CCW valve closures.

(2) Emergency Exhaust System (EES) following bearing replacement

Introduction: The inspectors identified a Green NCV of TS 5.4.1.a in which Wolf Creek did not implement adequate preventive maintenance procedures to mitigate Train B EES fan bearing vibrations which resulted in a degraded condition.

Description: On June 13, 2007, the inspectors observed maintenance and testing on Train B EES fan bearing replacement due to high bearing vibrations. Based on the inspectors' visual inspection of the fan shaft and bearings, excess heat and wear were visually apparent on the removed bearings and shaft. Damage from fretting and oxidation, and metal particles were observed by the inspector. The bearing replacement was completed on June 14, 2007.

The inspectors conducted a review of the history of the emergency exhaust fan bearings and noted several previous replacements due to high vibrations. The inspectors also reviewed the preventive maintenance activities which identified that the fan bearings received lubrication every 3 years, however, the vendor manual directs lubrication every 3 to 12 months (3 to 6 months for average conditions being room temperature and clean conditions) to prevent oxidation and breakdown of the grease. The recurring preventive maintenance was set to lubricate the bearings every three years. The inspectors also found that the vendor manual directs an evaluation of grease condition that is pushed out of the bearings in combination with operating bearing temperature and environmental conditions to determine the correct lubrication periodicity. It was not until inspector questioning that Wolf Creek generated a condition report to review the past condition of the bearings and the appropriateness of the recurring lubrication interval for the bearings.

The inspectors found that the licensee has missed previous opportunities to implement an effective preventive maintenance activity for the emergency exhaust fan bearings. In March and October 1999, work requests were written for inspection and then replacement of the Train B EES fan bearings due to observed excess vibrations and noise. The bearings were subsequently replaced on May 22, 2000, due to excess vibrations. In February 2005, the fan bearings were replaced again due to excess vibrations. On January 25, 2007, the bearings were lubricated due to a recurring work order to do so every 1,092 days or 3 years. It was also noted that there appeared to be a lack of grease in the bearings. On May 3, 2007, the bearings were lubricated, when the fan was observed to have excess vibration and noise. Hardened grease and metal particles were also observed coming from the bearings as described in a work order written on May 28, 2007. These work orders resulted in replacement of the bearings on June 13 and 14, 2007. The immediate corrective action for these instances of excess vibrations was to replace the bearings, however, the inspectors found no subsequent reviews were conducted via the corrective action program to determine a cause.

Analysis: The inspectors determined that the failure to establish preventive maintenance to ensure the fan bearings were adequately lubricated is a performance deficiency. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements or Wolf Creek procedures. The inspectors determined that this finding was more than minor because it is associated with the barrier performance attribute of the Barrier Integrity Cornerstone; and, it affected the cornerstone objective to maintain radiological barrier functionality of the auxiliary and fuel building. Specifically, this issue relates to the fan example of the SSC's barrier performance attribute because the licensee's maintenance regime was ineffective in preventing, recurring bearing degradation and was inconsistent with the vendor manual.

The inspectors evaluated the significance of this finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined that the finding was of very low safety significance (Green) because the issue represents a degradation of the radiological barrier function provided for the auxiliary or fuel building barriers to mitigate airborne radionuclides (i.e., a 10 CFR Part 100 release) from emergency core cooling system pump cubicles or a fuel handling accident, respectively. The inspectors determined that this finding has problem identification and resolution crosscutting aspects in the area of corrective action because Wolf Creek did not evaluate or resolve the causes of repeated bearing degradation by thoroughly evaluating problems such that the resolutions address causes and extent of the conditions. This includes properly classifying, prioritizing, and evaluating for operability and reportability conditions adverse to quality (P.1(c)).

Enforcement: TS 5.4.1.a, requires procedures described in Regulatory Guide 1.33, February 1978. Regulatory Guide 1.33 directs maintenance procedures to be developed in Section 9.b. The preventive maintenance activities for the EES fan are contained in the Buffalo Forge vendor manual which directs bearing lubrication every 3 to 12 months. Contrary to the above, written procedures established to ensure the

bearings were adequately lubricated were not adequate. Specifically, from 2000 to 2007, Wolf Creek power did not establish an adequate preventive maintenance program to lubricate the emergency exhaust fans. This issue and the corrective actions are being tracked by the licensee in Condition Report 2007-001352. Because the violation was of very low safety significance and the issue was captured in the licensee's corrective action program, this violation is being treated as a NCV consistent with Section VI.A of the NRC Enforcement Policy: (NCV) 05000482/2007003-04, failure to establish an adequate preventive maintenance program.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors selected the below listed postmaintenance test activities of risk significant systems or components. For each item, the inspectors: (1) reviewed the applicable licensing basis and/or design-basis documents to determine the safety functions; (2) evaluated the safety functions that may have been affected by the maintenance activity; and (3) reviewed the test procedure to ensure it adequately tested the safety function that may have been affected. The inspectors either witnessed or reviewed test data to verify that acceptance criteria were met, plant impacts were evaluated, test equipment was calibrated, procedures were followed, jumpers were properly controlled, the test data results were complete and accurate, the test equipment was removed, the system was properly realigned, and deficiencies during testing were documented. The inspectors also reviewed the USAR and corrective action program to determine if the licensee identified and corrected problems related to postmaintenance testing.

- April 18, 2007, stator water cooling Pump B following planned maintenance
- June 5, 2007, Valve EFHV 0059 following contactor board replacement
- June 12, 2007, steam generator atmospheric relief Valve B after packing adjustment
- June 13, 2007, EES fan B after bearing replacement
- June 27, 2007, safety injection Pump B run following planned maintenance

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed five samples.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR, Part 50 Appendix B, Criterion XI, "Test Control," in which Wolf Creek did not implement controlled testing of the Train B EES fan to demonstrate operability prior to returning the fan to service.

Description: After bearing replacement on June 13, 2007, for excessive bearing vibration, the Train B EES fan was restored to operable status at 11:31 a.m. on June 14, 2007, prior to formal vibration testing. A work order was performed to test the current draw on the fan's motor to test for excess drag which may result in a higher than normal motor current. The inspectors questioned control room operators as to the status of Train B EES fan being operable with no vibration testing. The inspector found that the fan was declared operable based on informal testing (i.e., vibration readings taken by the test engineer on his own volition and were not documented in a work control process) and communication between the senior reactor operator and the test engineer. Inspectors judged the motor current test not to be of sufficient scope to demonstrate that the bearing replacement was performed satisfactorily. Vibration testing was formally conducted under a postmaintenance test work order late on June 14, approximately 12 hours after being declared operable. On June 15, the inspector continued to question the postmaintenance test for bearing vibrations after the fan was run for several hours. The inspector reviewed the bearing vibration readings that were formally taken under a postmaintenance test work order after the fan was declared operable. This work order showed the vibrations had decreased to 0.609 ips (inches per second), however this value is in the 'action' regime for vibration monitoring and the fan failed the postmaintenance test criteria of 0.425 ips (the action level lower limit). The 0.609 ips result was recognized by the test engineer; however, the fan was still considered operable. The inspector questioned the senior reactor operator and engineering supervisor as to the operability of the fan and asked if an operability evaluation was conducted regarding the failed test and degraded condition. The evaluation was not performed until after inspector questioning. Procedure AP 28-001, "Operability Evaluations," directs degraded conditions of TS equipment, such as the Train B EES fan, be evaluated to assure operability. On June 15, 2007, Operability Evaluation 07-056 was performed and found that the Train B EES fan's vibration postmaintenance test failure was acceptable to assure operability. In parallel, and based on inspector questioning of the postmaintenance test adequacy, Wolf Creek realized that the requirements of Procedure AP 16E-002, "Post Maintenance Testing Development," Revision 6A, were not carried out to test fan air flow rate, bearing vibrations, and bearing temperature. These missed tests were then carried out June 15 satisfactorily.

Analysis: Inspectors determined that the failure to follow test control procedures for the safety-related B EES fan prior to declaring it operable is a performance deficiency. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements or Wolf Creek procedures. The inspectors determined that this finding is more than minor because it is associated with the barrier performance attribute of the Barrier Integrity Cornerstone; and, it affected the cornerstone objective to maintain radiological barrier functionality of the auxiliary and fuel building. Specifically, this issue relates to the fan example of the SSC's barrier performance attribute because the Wolf Creek's postmaintenance testing did not demonstrate operability.

The inspectors evaluated the significance of this finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined that the finding was of very low safety significance because the issue represents a degradation of the radiological barrier function provided for the auxiliary or fuel building barriers to mitigate airborne radionuclides (i.e., a 10 CFR Part 100 release) from emergency core cooling system pump cubicles or a fuel handling accident, respectively. The inspectors determined that this finding has human performance crosscutting aspects in the area of decision making because Wolf Creek did not initially conduct an adequate test and then failed to question the failed postmaintenance test by making a safety-significant or risk-significant decision using proceduralized systematic processes, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained (H.1(a)).

Enforcement: 10 CFR Part 50, Appendix B, Criterion XI, “Test Control” requires, in part, that a test program shall be established to assure that all testing required to demonstrate that SSC will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Wolf Creek Procedure AP 16E-002, “Post Maintenance Testing Development,” Revision 6A, implements the requirements stated in Criterion XI. Contrary to the above, the licensee did not implement a test program to demonstrate that the Train B EES fan will perform satisfactorily while in service. Specifically, on June 13 and 14, 2007, Wolf Creek power did not establish operability of the fan by testing those parameters affected by the bearing replacement as described in Procedure AP 16E-002 prior to declaring the B EES fan operable. This issue and the corrective actions are being tracked by the licensee in Condition Report 2007-002411. Because the violation was of very low safety significance and the issue was captured in the licensee’s corrective action program, this violation is being treated as a NCV consistent with Section VI.A of the NRC Enforcement Policy: (NCV) 05000482/2007003-05, failure to follow test control procedures to demonstrate operability.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the USAR, procedure requirements, and TSs to ensure that the listed below surveillance activities demonstrated that the SSC’s tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the following significant surveillance test attributes were adequate: (1) preconditioning; (2) evaluation of testing impact on the plant; (3) acceptance criteria; (4) test equipment; (5) procedures; (6) jumper/lifted lead controls; (7) test data; (8) testing frequency and method demonstrated TS operability; (9) test equipment removal; (10) restoration of plant systems; (11) fulfillment of American Society of Mechanical Engineers code requirements; (12) updating of performance indicator data; (13) engineering evaluations, root causes, and bases for returning tested SSCs not meeting the test acceptance criteria were correct; (14) reference setting data; and (15) annunciators and alarms setpoints. The inspectors also verified that the licensee identified and implemented any needed corrective actions associated with the surveillance testing:

- May 2, 2007, EDG A run
- May 1, 2007, Train A 4160 kV trip operational test
- May 10, 2007, reactor control rod exercise test
- May 11, 2007, containment spray additive tank vacuum relief valve test
- April 19, 2007, residual heat removal inservice Valve B testing

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed five samples.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed plant drawings, procedure requirements, and TS to ensure that the below temporary modification was properly implemented. The inspectors: (1) verified that the modification did not have an affect on system operability/availability, (2) verified that the installation was consistent with the modification documents, (3) ensured that the post installation test results were satisfactory and that the impact of the temporary modification on permanently installed SSC's were supported by the test, (4) verified that the modifications were identified on control room drawings and that appropriate identification tags were placed on the affected drawings, and (5) verified that appropriate safety evaluations were completed. The inspectors verified that licensee identified and implemented any needed corrective actions associated with temporary modifications.

- April 25, 2007, hour meter installed on Class 1E air conditioner compressor

The inspectors completed one sample.

b. Findings

No findings of significance was identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators below for the period from July 1, 2006, through March 31, 2007. The inspectors verified: (1) the accuracy of the performance indicator data reported during that period and (2) used the performance indicator definitions and guidance contained in Nuclear Energy Institute

Document 99-02, “Regulatory Assessment Indicator Guidelines,” Revision 4, to verify the basis in reporting for each data element.

Cornerstone: Mitigating Systems

- Migrating system performance index (MSPI) high pressure safety injection system
- MSPI AC power system

The inspectors reviewed operator log entries, daily shift manager reports, plant computer data, corrective action documents, maintenance action item paperwork, maintenance rule data, and performance indicator data sheets to determine whether the licensee adequately verified the performance indicators listed above. This number was compared to the number reported for the performance indicator during the past three quarters. Also, the inspectors interviewed licensee personnel responsible for compiling the information.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolutions of Problems

a. Inspection Scope

The inspectors performed a daily screening of items entered into the licensee's corrective action program. This assessment was accomplished by reviewing work requests, work orders, performance improvement requests, and attending corrective action review and work control meetings. The inspectors: (1) verified that equipment, human performance, and program issues were being identified by the licensee at an appropriate threshold and that the issues were entered into the corrective action program; (2) verified that corrective actions were commensurate with the significance of the issue; and (3) identified conditions that might warrant additional followup through other baseline inspection procedures.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.2 Semiannual Trend Review

a. Inspection Scope

The inspectors completed a semiannual trend review of repetitive or closely-related issues that were documented in trend reports, problem lists, performance indicators, health reports, quality assurance audits, corrective action documents, corrective maintenance documents, and departmental self-assessments and interviewed selected licensee staff to determine if any adverse trends existed. Additionally, the inspectors reviewed the licensee's trending efforts to identify trends that might indicate the existence of more safety-significant issues. The inspectors' review consisted of the 6-month period from January to July 2007. When warranted, some of the samples expanded beyond those dates to fully assess the issue. The inspectors also reviewed corrective action program items associated with the below listed issues. The inspectors compared and contrasted their results with the results contained in the licensee's quarterly trend reports. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy. These areas were chosen based on information gathered by the inspectors during daily plant status reviews over the previous six months.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings and Observations

No findings of significance were identified. However, during the review the inspectors noted the following trends:

- The inspectors found that Wolf Creek continues to identify issues requiring operability evaluations at an appropriate threshold; however, the inspectors found that inspector questioning drove 4 of the 25 operability evaluations thus far in 2007.

- The inspectors noted a decrease in 480V and 4160V circuit breaker corrective maintenance.

- The inspectors found that the majority of Wolf Creek's unplanned TS action statement entries are for essential service water leaks and low pressure for the nitrogen accumulators of the main steam isolation valves and feedwater isolation valves.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153)

.1 May 25, 2007 circulating water Pump A trip due to Auto Transformer Failure

a. Inspection Scope

The inspectors reviewed: (1) operator logs, plant computer data, and/or strip charts for the above listed event to evaluate operator performance in coping with nonroutine events and transients; (2) verified that operator actions were in accordance with the response required by plant procedures and training; and (3) verified that the licensee has identified and implemented appropriate corrective actions associated with personnel performance problems that occurred during the event.

b. Findings

Introduction: A self-revealing Green finding was identified for the failure to perform adequate inspections of the Circulating Water Pump (CWP) A excitation auto transformer in accordance with maintenance procedures. The inadequate inspections allowed an unrecognized degraded condition to exist that resulted in the trip of the CWP A and plant transient.

Description: On May 25, 2007, the CWP A tripped which resulted in a drop of condenser vacuum and reduction in main generator load. After the plant was stabilized, troubleshooting of the CWP A discovered that the excitation auto transformer had failed based on winding discoloration and damage in the area where the brush contacts the transformer. The CWP B and C auto transformers were inspected for similar damage. The CWP B transformer was subsequently replaced based on similar winding damage and discoloration. Since the CWP C auto transformer had been replaced due to the same type of failure in October 2006 and showed little discoloration, it was not replaced following inspections prior to restoring the plant back to full power.

On October 7, 2006, the CWP C tripped unexpectedly while shutting down for a refueling outage. Troubleshooting identified damage to the excitation auto transformer and associated wiring resulting from an overcurrent condition. Review of the licensee's apparent cause determined that the failure was caused by the transformer operating at the top of the maximum amperage range which resulted in overheating of the winding and increased resistence at the brush/winding interface causing winding failure. The corrective actions included a plant modification to increase the size of the auto transformers and inspection of the CWP A and B auto transformers for similar degradation.

The same type of transformer visual inspections conducted following the October 7, 2006, CWP C failure were performed on CWP A on April 4 and CWP B on April 11, 2007, under Work Orders 07-293278-000 and 07-293281-000, respectively. Both work orders contained instructions to inspect per the notes of the system engineer. Step 2 of the notes states, "Inspect the brush and coil for signs of overheating, arcing, worn brush, or any damage." Both work orders also contained instructions to replace the transformer if any anomalies or degradation was identified. However, no specific guidance or details were given in the work orders on documentation of the inspections.

The work orders' documentation of the inspection contained only minimal information such as "performed work steps," and "completed PMT." Since system engineering was not present during the inspections and only reviewed this minimal information documented in the work orders, engineering determined that the auto transformers were not degraded and no further inspections or replacements were scheduled based on a predicted but not planned plant modification to replace the transformers by the end of 2007.

Following the May 25, 2007, failure, the inspectors interviewed the electricians that performed the inspections. The electricians reviewed the pictures of the CWP A and B auto transformers that were replaced on May 25, 2007, based on signs of overheating and discoloration of the windings. The electricians stated that similar conditions were found during inspections in April 2007, but they did not replace the windings or document this condition in the work order. After discussions with system engineering about the failed transformer and pictures, engineering stated they would have required the CWP A and B auto transformers to have been replaced based on observed conditions in April 2007.

Analysis: The failure to preform adequate inspections of the CWP A excitation auto transformer in accordance with maintenance procedures is considered a performance deficiency. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements or Wolf Creek procedures. The inspectors determined that this finding is more than minor because it is associated with the Initiating Events Cornerstone. The Initiating Events Cornerstone was affected because the deficiency 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 the significance of this finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined that the finding was of very low safety significance (Green) because the issue did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. The inspectors determined that this finding has human performance crosscutting aspects in the area of work practices because Wolf Creek did not follow maintenance procedures and did not ensure oversight of work activities such that nuclear safety was supported (H.4(b)).

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Enforcement: No violation of regulatory requirements occurred. Because the finding occurred on nonsafety but risk significant secondary plant equipment and the licensee entered it into the correction action program as Performance Improvement Request 2007-002182, this issue is being treated as a Finding:
(FIN) 05000482/2007003-06, inadequate inspections of circulating water pump auto transformers.

.2 Licensee Response to an Aircraft Near-Flyover Event, Entry into an Off-Normal Procedure, and Declaration of a Notice of Unusual Event, June 11, 2007

a. Inspection Scope

The resident inspectors responded to the plant immediately following the aircraft near-flyover event on June 11, 2007. The inspectors conducted an assessment of licensee performance by implementing Inspection Procedure 71153 to: (1) review operator logs, plant computer data, strip charts, and the procedures implemented; (2) verify that licensee actions were in accordance with the prescribed procedures and regulatory requirements; and (3) verified that the licensee identified and evaluated appropriate corrective actions to address performance issues.

Additional inspectors were sent to the facility to provide assistance to the resident inspectors and gather lessons-learned. The additional effort included a detailed evaluation of the event time-line, communications (both internal to the facility and external), and the effectiveness of decision-making during and after the event.

b. Findings and Observations

The inspectors found that appropriate actions were set into motion by several federal agencies, the military, and local law enforcement to protect against a potential small aircraft threat to the facility. These actions were initiated because a small aircraft pilot's communications were misunderstood. Nevertheless, the potential threat was quickly evaluated by the licensee and federal officials to not be an actual threat to the facility.

The initiation of communications between the licensee and the appropriate federal agencies was successful in clearly communicating the potential threat in a timely fashion and facilitated the implementation of pre-planned and practiced actions. These actions included a number of pre-planned activities focused on the mitigation of the perceived threat, protection of property, and the local public. The inspectors found that pre-planned actions such as the development of clear lines of communications, pre-positioning resources, and plant procedure implementation were appropriate and implemented in a timely fashion.

Due to the sensitive nature of the inspection and results, specific observations are attached to this inspection report and will be withheld from public disclosure in accordance with 10 CFR 2.390, "Public inspections, exemptions, and requests for withholding." The specific observations are provided to support licensee and agency lessons learned activities for this event.

There were no findings of significance identified.

4OA6 Meetings, Including Exit

The resident inspectors presented the inspection results of the resident inspections to Mr. Brad Norton, Acting Vice President Operations and Plant Manager, and other members of the licensee's management staff on July 11, 2007. The licensee acknowledged the findings presented. The inspectors noted that while proprietary information was reviewed, none would be included in this report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. A. Muench, President and Chief Executive Officer
M. Sunseri, Vice President Oversight
K. A. Harris, Director, Performance Improvement and Learning
S. E. Hedges, Vice President Operations and Plant Manager
K. Scherich, Director Engineering
T. East, Manager, Emergency Planning
P. Bedgood, Superintendent, Chemistry/Radiation Protection

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000482/2007003-01	URI	Circulating water roof loading exceeds design (Section 1R06)

Opened and Closed

05000482/2007003-02	NCV	Failure to implement manual actions (Section 1R13)
05000482/2007003-03	NCV	Failure to identify cause of component cooling water valve closures (Section 1R15(1))
05000482/2007003-04	NCV	Failure to establish an adequate preventive maintenance program (Section 1R15(2))
05000482/2007003-05	NCV	Failure to follow test control procedures to demonstrate operability (Section 1R19)
05000482/2007003-06	FIN	Inadequate inspections of circulating water pump auto transformers (Section 4OA3.1)

LIST OF DOCUMENTS REVIEWED

In addition to the documents referred to in the inspection report, the following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

Section 1R01: Adverse Weather Protection

SYS EF-205, "ESW/CIRC Water Cold Weather Operations," Revision 19
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SYS EG-120, "Startup of a Residual Heat Removal Train," Revision 44

CKL EF-120, "Essential Service Water Valve, Breaker and Switch Lineup," Revision 41

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A-0119, “Circulating Water Screenhouse Roof Plan,” Revision D
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SYS CE-120, "Stator Cooling Water System Operation," Revision 26
I-ENG-003, "Vibration Monitoring and Analysis," Revision 4
STS AB-201D, "Atmospheric Relief Valve Inservice Valve Test," Revision 19

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Section 4OA1: Performance Indicator Verification

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AP 26A-007, NRC Performance Indicators, Revision 5
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Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

AP 15C-002, Procedure Use and Adherence, Revision 22
AP 21-001, Conduct of Operations, Revision 36
AP 22-001, Conduct of Pre-Job Briefs and Post-Job Briefs, Revision 8
Flux Maps 100 percent reactor power
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LIST OF ACRONYMS

CFR	*Code of Federal Regulations*
CCW	component cooling water
CWP	circulating water pump
EDG	emergency diesel generator
EES	emergency exhaust system
FIN	finding
IMC	inspection manual chapter
MSPI	mitigating system performance index
NCV	noncited violation
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
RCP	reactor coolant pump
RCS	reactor coolant system
SSC	structure, system, and component
TS	Technical Specification
URI	unresolved item
USAR	Updated Safety Analysis Report