



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

February 12, 2008

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 05000482/2007005

Dear Mr. Muench:

On December 31, 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 January 10, 2008, with Mr. Matt Sunseri and other members of your staff.

The inspection 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.

Based on the results of this inspection, four NRC identified and one self-revealing findings of very low safety significance (Green) are documented in this report. Two of these findings were determined to involve violations of NRC requirements. Additionally, one licensee-identified violation of very low safety significance is listed in this report. However, 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).

Wolf Creek Nuclear Operating Corporation -2-

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

Docket: 50-482
License: NPF-42

Enclosure:
NRC Inspection Report 05000482/2007005
w/attachment: Supplemental Information

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SISP Review Completed: VGG ADAMS: Yes No Initials: VGG
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SDCochrum:sa	CMLong	RLBywater	LJSmith
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REGION IV

Docket: 50-482

License: NPF-42

Report: 5000482/2007005

Licensee: Wolf Creek Nuclear Operating Corporation
Wolf Creek Generating Station

Location: 1550 Oxen Lane NE
Burlington, Kansas

Dates: October 7 through December 31, 2007

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D. Dumbacher, Senior Resident Inspector
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Approved By: V.G. Gaddy, Chief, Project Branch B

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SUMMARY OF FINDINGS

IR 05000482/2007005; 10/07/07 - 12/31/07; Wolf Creek Generating Station; Operability Evaluations, Postmaintenance Testing, Event Followup, and Other Activities.

This report covered a 3-month period of inspection by resident inspectors and regional specialists. The inspection identified five Green findings, two of which are 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's 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: Initiating Events

- Green. A self-revealing finding was identified for inadequate work instructions and poor work practices associated with trip circuit verification on the Central Chiller B which resulted in the Condensate Pump B trip and steam generator level transient. Procedure RNM C-1301, "Miscellaneous Relay and Meter Equipment," Revision 6, Step 8.3.2.8.h required, in part, that a jumper be installed from Terminals 3 to 4 on Relay 194 at Breaker PB00402 for the Central Chiller B (wire C280 and C281) which resulted in Condensate Pump B trip. However, this step was copied from a previous work order and not verified as appropriate for the testing being conducted. Step 8.3.2.8.h should have read, in part, to install jumpers from Terminals 7 to 8 (wire C284 and C285). Licensee reviews and walkdowns were also inadequate to identify the incorrect instructions due to workload, interruptions, and distractions during the work order review process. The evaluation also identified Performance Improvement Request 2002-1664 which discussed a similar event where copied information in a work order was incorrect and not identified in reviews. Corrective actions for this event included adding sign-off sections in RNM C-1301 for walkdowns/reviews to ensure work instructions were reviewed before work was performed. This issue was entered into the licensee's corrective action program as CR 2007-003759.

The failure to provide adequate work instructions is a performance deficiency. This finding was more than minor because it is associated with the procedure quality attribute of the Initiating Events Cornerstone and it affected the cornerstone objective to limit the likelihood of those events that upset plant stability. This finding was also associated with the procedure quality attribute for the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Because two cornerstones were affected, a Phase 2 analysis was required. The

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consequences were assessed using the Phase 2 pre-solved tables with the assistance of a Region IV senior reactor analyst. Although the likelihood of a trip was increased and the capability of the normal heat sink was reduced, the exposure time for this condition was less than 3 days and all other mitigation capabilities were maintained. Consequently, the finding was determined to be of very low safety significance. The cause of the finding has human performance crosscutting aspects in the area associated with work practices because the licensee failed to ensure that human error prevention techniques such as self/peer-checking and proper documentation of activities were used in the review of work activities such that they are performed safely [H.4(a)] (Section 4OA3.1).

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to follow procedure which required an evaluation of the Train B essential service water traveling screen wash Valve EF HV-92 and identical valves in the system after the Train A essential service water screen wash valve had failed. Wolf Creek did not enter its operability process but did tag Valve EF HV-92 open on September 13, 2007. An operability evaluation was completed on September 27, after Valve EF HV-92 was disassembled and found to have unacceptable disc material loss due to corrosion. Corrective actions from the September 27 evaluation include future disassembly of an identical valve in the essential service water system that shows degrading but operable performance. This issue was entered into the licensee's corrective action system as CRs 2007-00374 and -003462.

The failure to follow Procedure AP 26C-004, "Technical Specification Operability," which required an evaluation of Valve EF HV-92, is a performance deficiency. The finding is more than minor because if left uncorrected, the valve discs' corrosion would become a more significant safety concern. The finding was of very low safety significance because the issue resulted in Valve EF HV-92 being degraded, but did open even with significant material loss and is not related to a qualification or design deficiency, did not result in the loss of safety function for greater than 24 hours, and was not related to external events such as fires and floods. The cause of the finding had problem identification and resolution crosscutting aspects in the area associated with the corrective action program because the licensee failed to evaluate the failure mechanism completely, accurately, and in a timely manner commensurate with its safety significance [P.1(a)] (Section 1R15).

- Green. The inspectors identified a noncited violation of Technical Specification 3.8.1 for failure to perform an adequate common cause evaluation within 24 hours to demonstrate no common cause failure mechanism existed between the emergency diesel generators. After a failure of Emergency Diesel Generator A, Wolf Creek's common cause evaluation stated that the "Hypothesis" was that the diesel generator's digital reference unit had not been refurbished as recommended in an April 21, 2004, 10 CFR Part 21 notification

from Fairbanks Morse. The April 21 notification stated that Wolf Creek's digital reference units were affected by an integrated circuit contamination problem. Inspectors reviewed the April 21 notification and found that the slow start rpm ramp function was affected, however, the inspectors reviewed operating experience and other generic correspondence and found a 10 CFR Part 21 notification dated January 23, 2006, from Engine Systems, Inc., who is a vendor for digital reference units. The Engine Systems, Inc. notification describes a digital reference unit deficiency in which an integrated circuit manufacturing defect can cause failure of the engine load raise and lower signals to the electronic governor controller. The inspectors noted that the Engine Systems, Inc. failure mechanism was similar to Wolf Creek's observed failure on November 1, 2007. Both emergency diesel generators were found to be affected by the Engine Systems, Inc. notification. The issue was entered into the licensee's corrective action program as CR 2007-004190.

The inspectors determined that the failure to demonstrate, per Technical Specification 3.8.1 required actions B.3.1 or B.3.2, that no common cause failure existed for the emergency diesel generators is a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute for the Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was of very low safety significance because the issue resulted in the emergency diesel generator being degraded, but likely to start since only one prior failure had occurred and that failure could not be reproduced, did not result in the loss of safety function for greater than 24 hours, and was not related to external events such as fires and floods. The cause of the finding had problem identification and resolution crosscutting aspects in the area associated with the corrective action program because the licensee failed to evaluate the failure mechanism completely, accurately, and in a timely manner commensurate with its safety significance [P.1(a)] (Section 1R19(1)).

- Green. The inspectors identified a finding for failure to enter relevant emergency diesel generator operating experience into the corrective action program for evaluation, which allowed a manufacturing defect to result in a testing failure. Procedure AP 20E-001, Step 4.1.1, in part, directs the screening and review of operating experience from sources such as vendors, the NRC, and other utilities. Although, the inspectors found that Wolf Creek was not specifically listed as affected in the Engine Systems, Inc., 10 CFR Part 21 report, they had procured digital reference units that were listed by serial number on the Engine Systems, Inc. notification. The inspectors also found a Woodward service bulletin dated January 2006 that Wolf Creek had not reviewed addressing the same issue that listed digital reference units serial numbers affected which included Wolf Creeks digital reference units. This issue was entered into the licensee's corrective action program as CR 2007-004190.

The failure to enter publicly available operating experience directly applicable to Wolf Creek's emergency diesel generators into the corrective action program for evaluation, in accordance with Procedure AP 20E-001, Step 4.1.1, is a

performance deficiency. This finding was more than minor because it is associated with the equipment performance attribute for the Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding is of very low safety significance because the issue resulted in the emergency diesel generator being degraded, but likely to start even with an intermittent failure and is not related to a qualification or design deficiency, did not result in the loss of safety function for greater than 24 hours, and was not related to external events such as fires and floods. The cause of the finding has a problem identification and resolution crosscutting aspect in the area associated with the operating experience program because the licensee's operating experience process did not use operating experience information, including vendor recommendations, to support plant safety. Specifically, the licensee did not systematically collect, evaluate, and communicate relevant external operating experience to affected internal stakeholders in a timely manner [P.2(a)] (Section 1R19(2)).

- Green. The inspectors identified a finding for exceeding the calculated roof loading for the circulating water screen house. In May 2007, 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 8 inches of standing water and that the drains were blocked by debris. Subsequently on May 8, the drains were cleared and the roof was drained. A roof yield or collapse was assumed to result in the loss of both circulating water and normal service water. This issue was entered into the licensee corrective action program as CR 2007-001897 and -002599..

Exceeding the calculated allowable roof loading due to clogged drains is a performance deficiency. The finding is more than minor because it is associated with the equipment performance attribute for the Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, 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. This finding screened to a Phase 3 analysis because two or more cornerstones (Initiating Events and Mitigating Systems) were affected. The Region IV senior reactor analyst performed the Phase 3 analysis and determined it to be of very low safety significance (Section 4OA5).

B. Licensee-Identified Violations

Violations of very low safety significance which were identified by the licensee have 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 its corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

The plant started the inspection period at 100 percent rated thermal power and remained at or near this power level for the entire report period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment (71111.04)

Complete Walkdown

a. Inspection Scope

The inspectors: (1) reviewed plant procedures, drawings, the Updated Safety Analysis Report (USAR), Technical Specifications (TSs), and vendor manuals to determine the correct alignment of the system; (2) reviewed outstanding design issues, operator work arounds, and corrective action program documents to determine if open issues affected the functionality of the system; and (3) verified that the licensee was identifying and resolving equipment alignment problems.

- December 13, 2007, KA nitrogen system full alignment

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

Quarterly 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.

- October 23, 2007, Train A and B motor-driven auxiliary feedwater cubicles
- October 23, 2007, NK12 battery room
- October 23, 2007, Trains A and B 4160 volt engineered safety features switchgear rooms
- October 26, 2007, transformer yard
- October 30, 2007, upper cable spreading room Elevation 2073'
- October 30, 2007, south vertical cable chase, control building Elevation 2073'
- November 15, 2007, auxiliary building piping area 1988' level

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed seven samples.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

Semiannual Internal Flooding

a. Inspection Scope

The inspectors: (1) reviewed the USAR, the flooding analysis, and plant procedures to assess seasonal susceptibilities involving internal flooding; (2) reviewed the USAR and 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 below listed areas 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.

- July 26, 2007, primary chemistry lab flooding

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

Biennial Review

a. Inspection Scope

The inspectors reviewed design documents (e.g., calculations and performance specifications), program documents, test and maintenance procedures, and corrective action documents. The inspectors interviewed chemistry personnel, maintenance personnel, engineers, and program managers. When available, the inspectors reviewed additional nondestructive examination results for the selected heat exchangers that demonstrated structural integrity.

For heat exchangers directly connected to the safety-related service water system, the inspectors verified whether testing, inspection and maintenance, or the biotic fouling monitoring program provided sufficient controls to ensure proper heat transfer. Specifically, the inspectors reviewed: (1) heat exchanger test methods and test results from performance testing, (2) if necessary, heat exchanger inspection and cleaning methods and results, and (3) chemical treatments for microfouling and controls for macrofouling.

For heat exchangers directly or indirectly connected to the safety-related service water system, the inspectors verified the licensee: (1) performed condition monitoring and operation consistent with design assumptions in the heat transfer calculations; (2) evaluated the potential for water hammer, as applicable; (3) instituted appropriate chemistry controls for heat exchangers indirectly connected to the safety-related service water system; and (4) flow tested redundant and infrequently used heat exchangers at maximum design flow.

For the ultimate heat sink and its subcomponents, the inspectors verified the licensee established appropriate controls for macrofouling and biological fouling. Since the licensee had an underwater weir that ensured sufficient water would be available for 30 days following an accident, the inspectors: (1) verified the licensee checked for settling and sediment buildup every 5 years, (2) reviewed third party inspections of the ultimate heat sink, (3) verified the licensee dredged the channels to remove sediment and maintain the ultimate heat sink capacity, and (4) verified sufficient reservoir capacity existed.

The inspectors selected heat exchangers that ranked high in the plant specific risk assessment and were directly or indirectly connected to the safety-related service water system. The inspectors selected the following specific heat exchangers:

- EEG01B, component cooling water (CCW) heat Exchanger B
- EKJ03A/04A/06A, emergency diesel Generator (EDG) A coolers
- SGL15B, penetration room Cooler B

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed three samples.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Quarterly Inspection

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 involved:

- October 18, 2007, security events result in manual downpower
- October 25, 2007, loss of coolant accident during Mode 4 cooldown

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

.2 Annual Inspection

a. Inspection Scope

The inspector reviewed the annual operating examination test results for 2007. Since this was the first half of the biennial requalification cycle, the licensee was not required to administer a written examination. These results were assessed to determine if they were consistent with NUREG 1021, "Operator Licensing Examination Standards for Power Reactors," guidance and Inspection Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process," requirements. This review included examination of test results for a total of 50 licensed operators, a total of 9 crews, which included: shift-standing senior operators, staff

senior operators, shift-standing reactor operators, and staff reactor operators. All crews and individuals passed the requalification examinations.

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.

- October 25, 2007, reactor coolant system process instrumentation system review
- October 27, 2007, AB main steam isolation Valve AB-HV20 air regulator failure
- November 12, 2007, GN system control rod drive mechanism fans and containment cooler fans system review
- December 14, 2007, KA compressed air system

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

Emergent Work Control

For the three 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.

- October 27, 2007, steam Generator C main steam isolation Valve AB-HV20 air regulator failure
- October 29, 2007, penetration Room B cooler fan belt failure
- November 1, 2007, Train A EDG output breaker trip during surveillance testing

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed three samples.

b. Findings

On December 20, 2007, Wolf Creek was performing the monthly test of EDG B. Prior to the operator placing his hand on the RAISE/LOWER handswitch, the load made a step increase from 4.2 MWE to 7.2 MWE and did not respond to lower signals from the control room handswitch. The EDG was tripped shortly thereafter. Troubleshooting examined the digital reference units (DRUs), the 2301A electronic engine governor, and the Woodward electromechanical governor mounted on the engine. Wolf Creek found the voltage readings on various terminals to be acceptable. However, resistance measurements across the two terminals that connect the electronic engine control unit and the electromechanical governor was expected to be 35 ohms and was found to have infinite resistance, indicating an open circuit. The cover plate of the governor was removed and one wire was found to be disconnected from its terminal. Wolf Creek has not determined the cause for this failure or its impact on safety systems. During interviews, Wolf Creek engineering stated that the electromechanical portion of the governor would fail and the EDG mechanical portion of the governor would drive the EDG to its high speed and maximum fuel setpoint. Because the EDG was synchronized to the grid, the inspectors judged it reasonable that the EDG would not cause the grid to increase in frequency but that the EDG would carry an amount of load equivalent to the mechanical governor setpoint. The inspectors questioned the licensee on the impact if this failure occurred during a valid safety injection signal or loss of offsite power. The inspectors found that such a frequency variation had not been previously analyzed. If the EDG governor failed in the observed manor, the EDG may have driven the bus and the connected safety equipment to a frequency that exceeds the TS 3.8.1 limit and/or the currently analyzed limit.

This governor failure is being tracked by Wolf Creek in Condition Report (CR) 2008-000088. Since additional inspection is needed to evaluate the failure mode and significance of the failure, this issue is being treated as an Unresolved Item (URI) 05000482/2007005-01, EDG B governor failure effect on supplied equipment.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors: (1) reviewed plants 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.

- September 4, 2007, essential service water (ESW) Valve EF HV-91 testing
- November 15, 2007, Containment D cooler leak
- October 31, 2007, CCW magneblast circuit breaker replacement with Siemens breakers

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed three samples.

b. Findings

Failure to Evaluate ESW Valve Failure

Introduction: The inspectors identified a Green noncited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for failure to follow procedure which required an evaluation of the Train B ESW traveling screen wash valve after the Train A ESW screen wash valve had failed.

Description: Per control room logs, on September 2, 2007, at 8:40 p.m., the ESW A and EDG A were declared inoperable but available due to Valve EF HV-91 (Train A ESW traveling screen wash valve) failing its weekly stroke test. Valve EF HV-92 (Train B ESW traveling screen wash valve) was stroked just prior to Valve EF HV-91. Both valves open on the start of their respective ESW pump and spray the associated traveling screen to remove debris. On September 3, 2007, after disassembly of Valve EF HV-91, it was determined that the carbon steel disc had separated from the stainless steel stem. The separation occurred because the disc had corroded until it lost greater than 50 percent of its 'ears' or the material that latches to the stem.

On September 4, 2007, the inspectors questioned the shift manager as to the status of the Train B of ESW screen wash. The shift manager explained that Valve EF HV-92 was not affected because it had passed its weekly stroke test. The inspectors also questioned the applicability of such data given Valve EF HV-91's failure mode of corrosion. The shift manager also stated that the TS time of discovery had not begun

for Valve EF HV-92. No operability evaluation was commenced at this time. The inspectors reviewed Procedure AP 26C-004, "Technical Specification Operability," and found that Step 6.1.5 states, in part, that when problems are identified but the impact on a specified safety function is unknown, that further evaluation must be performed commensurate with safety significance. The inspector also reviewed Procedure AP 28-011, "Resolving Deficiencies Impacting SSCs [Systems Structures and Components]," Step 6.3.2, which states that such deficiencies shall be evaluated for operability and corrective action shall be initiated. The inspector also interviewed the maintenance rule engineer and found that these valves are not designated as a run-to-failure component.

Replacement of Valve EF HV-91 was performed and the postmaintenance test was completed satisfactorily at 4:40 p.m. on September 4. However, no additional evaluations were initiated. Based on NRC questions, Valve EF HV-92 was stroked open and tagged open with power removed on September 13. Valve EF HV-92 was re-stroked on September 25 and the data gathered from the stem's strain gauge indicated disc material loss, slippage between the stem and disc, and that failure was imminent. The disc was removed from Valve EF HV-92 on September 25 and the ESW B traveling screen was placed on constant spray, its safeguards position. An internal inspection of Valve EF HV-92 on September 25 indicated that the disc had lost greater than 50 percent of its 'ear' material. On September 27, 2007, Wolf Creek entered the operability process and a subsequent operability evaluation determined that a loss of greater than 50 percent of the disc's ear material exceeded the material loss acceptable for valve thrust forces calculated in EF-M-010, "Seismic/Weak-link Analysis for Valves EF HV-91, 92, & 97 and EFPDV0019 & 20 and EFHV0098." The evaluation also examined previously collected valve stem strain gauge data from the same type of valve installed in other portions of both trains of ESW. The evaluation found that the remaining valves would continue to be operable; however, one valve shows degrading but operable performance and was scheduled for an internal inspection. The inspectors found this evaluation to be reasonable to justify continued operability of the remaining valves.

Analysis: The inspectors determined that the failure to follow procedure which required an evaluation of Valve EF HV-92 was 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. In accordance with NRC Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," the inspectors determined that the finding was more than minor because if left uncorrected the valve discs' corrosion would become a more significant safety concern. 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 resulted in Valve EF HV-92 being degraded with significant material loss, the issue is not related to a qualification or design deficiency, did not result in the loss of safety function for greater than 24 hours, and was not related to external events such as fires and floods. The cause of the finding had problem identification and resolution crosscutting aspect in the area associated with the corrective action program because the licensee failed to evaluate

the failure mechanism completely, accurately, and in a timely manner commensurate with its safety significance [P.1(a)].

Enforcement: Title 10 of the CFR, Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be accomplished in accordance with procedures. Procedure AP 26C-004, "Technical Specification Operability," Step 6.1.5 states, in part, that when problems are identified but the impact on a specified safety function is unknown, that further evaluation must be performed commensurate with safety significance. Contrary to the above, from September 3-13, 2007, the licensee failed to adequately evaluate the condition of Valve EF HV-92 and identical valves in the ESW system. Specifically, the licensee did not follow Procedure AP 26C-004 for evaluating and correcting the observed ESW valve degradation that affected both trains. Because the licensee has entered the issue into their corrective action program as CRs 2007-003704 and -003462, and the finding is of very low safety significance, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000482/2007005-02, Failure to Evaluate ESW Valve Corrosion.

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.

- October 4, 2007, residual heat removal (RHR) Valve 8812A relay contact failure
- October 23, 2007, diesel fire pump
- October 23, 2007, Train B RHR postmodification testing
- October 25, 2007, centrifugal charging Pump B
- November 3, 2007, EDG A testing after DRU replacement
- November 14, 2007, EDG B testing after DRU replacement
- December 12, 2007, EDG A testing after 5-day maintenance outage

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed seven samples.

b. Findings

- (1) Introduction: The inspectors identified a Green NCV of TS 3.8.1 for failure to perform an adequate common cause evaluation within 24 hours to demonstrate no common cause failure mechanism existed between the EDGs.

Description: On November 1, 2007, Wolf Creek conducted surveillance testing of the EDG A. While raising load from 2 MWe, the generator tripped on reverse power. Wolf Creek began troubleshooting on the EDG electronic governor and DRUs. The reverse power relay was later determined to have operated correctly. On November 2, 2007, Wolf Creek documented a common cause evaluation to prove that the EDG B did not have the same type of failure mechanism. Wolf Creek's common cause evaluation stated that the "Hypothesis" was that the EDG A DRU had not been refurbished as recommended in an April 21, 2004, 10 CFR Part 21 notification from Fairbanks Morse which stated that Wolf Creek's DRUs were affected by an integrated circuit contamination problem. Fairbanks stated that the DRU's failure occurred within the first few hours of operation. However, on November 1, the EDG A DRU had approximately 200 hours of operation since replacement in 2005.

The inspectors reviewed the common cause evaluation and determined that the April 21, 2004, notification was related to the EDG rpm ramp feature used during slow starts. The notification stated that the engine rpm ramp feature is not needed for EDG fast starts during accident scenarios. However, the rpm ramp function was not observed to be affected during the failure at Wolf Creek as the EDG A was already running at 2MWe when the failure occurred. The inspectors questioned the control room operators as to the applicability of the April 21, 2004, notification since the rpm ramp feature was not observed to fail and if the EDG B should be run to demonstrate operability vice a common cause evaluation, as stated in TS 3.8.1 Required Action B.3.2. The inspectors were informed that the common cause evaluation was adequate and that an EDG B run was not needed. The DRU was replaced and the EDG A was successfully tested on November 3, 2007.

The inspectors reviewed operating experience and other generic correspondence and subsequently found a 10 CFR Part 21 notification dated January 23, 2006, from Engine Systems, Inc. (ESI), who is a vendor for DRUs. The ESI notification describes a DRU deficiency in which an integrated circuit manufacturing defect can cause failure of the engine load raise and lower signals to the electronic governor controller, but the emergency mode of operation is not affected because the raise and lower signals are not normally issued during emergency operation. The inspectors noted the ESI failure mechanism was similar to Wolf Creek's observed failure on November 1, 2007. However, Wolf Creek did not utilize the ESI notification in the November 2 common cause evaluation. The inspectors provided a copy of the ESI notification to Wolf Creek and upon review, Wolf Creek discovered that both EDGs were susceptible to the ESI Part 21 notification. More specifically, the DRUs installed in EDGs A and B on November 1, 2007, were susceptible to the ESI failure mechanism. The inspectors noted that the replacement DRU, obtained from the Callaway Plant, was not checked against any Part 21 notifications until questioned by the inspectors on November 5, 2007. The EDG A replacement DRU was checked on November 6, 2007, and was found to be refurbished with regard to both the Fairbanks and ESI notifications. Also,

the DRUs installed in the EDG B was found to be susceptible to the ESI notification. Inspectors again, questioned the operability of the EDG B. On November 6, 2007, Wolf Creek produced a second common cause evaluation which stated, per the ESI notification, that the emergency mode of operation is not affected because the raise and lower signals are not normally issued during emergency operation. Inspectors questioned Wolf Creek if there was any amplifying information regarding the unclear description that the raise and lower signals are not normally issued in emergency mode to determine if the emergency mode is unlikely to be affected or is not affected. The inspectors later discovered during interviews that the integrated circuits that contained the manufacturing defect were found throughout the DRUs, including the emergency mode circuitry. Wolf Creek contacted ESI, however, ESI declined providing any further information regarding the possible impact on emergency mode. Inspectors could not locate any industry documentation that demonstrated a failure of the DRUs in the emergency mode, given the intermittent nature of the failure.

Analysis: The inspectors determined that the failure to demonstrate, per TS 3.8.1, Required Actions B.3.1 or B.3.2, that no common cause failure existed for the EDGs was 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 Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, this issue relates to the availability and reliability examples of the equipment performance attribute because a latent common mode failure mechanism was not correctly evaluated or corrected and led to this failure.

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 resulted in the EDG being declared inoperable, but likely to start since only one prior failure had occurred and that failure could not be reproduced. The inspectors could not prove that the DRU would fail on any given EDG start demand or under any specific circumstances. As such, the inspectors determined that the finding was of very low safety significance (Green) because it was not a design or qualification deficiency; it did not result in the actual loss of a safety function for at train or a system as defined in the plant specific risk-informed inspection notebook for greater than 24 hours, and was not related to external events such as fires and floods. The cause of the finding has a problem identification and resolution crosscutting aspect in the area associated with the corrective action program because the licensee failed to evaluate the failure mechanism completely, accurately, and in a timely manner commensurate with its safety significance [P.1(a)].

Enforcement: TS 3.8.1 Required Action B.3.1, requires the licensee to "Determine OPERABLE DG [EDG B] is not inoperable due to common cause failure." Alternatively, TS 3.8.1 Required Action B.3.2, requires the licensee to "Perform SR 3.8.1.2 [run the EDG B] for the OPERABLE DG." On November 2, 2007, the licensee chose to perform a common cause evaluation to demonstrate operability and not to run the EDG B.

Either required action may be performed provided they are within 24 hours of the initial failure. Contrary to the above, on November 2, 2007, the licensee failed to demonstrate that common cause failure could not occur. Specifically, the evaluation did not use correct information to explain the observed failure mechanism, and both EDGs were in fact susceptible to a 10 CFR Part 21 notification that Wolf Creek did not evaluate until November 6, 2007. Because the finding is of very low safety significance and has been entered into the corrective action program as CR 2007-004190, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000482/2007005-03: inadequate evaluation of EDG for common cause failure.

- (2) Introduction: The inspectors identified a Green finding for failure to enter relevant EDG operating experience (OE) into the corrective action program for evaluation, which allowed a manufacturing defect to result in a testing failure.

Description: On November 1, 2007, Wolf Creek conducted surveillance testing of the EDG A. While raising load from 2 MWe, load rapidly decreased and the generator tripped on reverse power. Wolf Creek declared the EDG inoperable and began troubleshooting the EDG electronic governor and DRU. Following troubleshooting, the reverse power relay was determined to have operated correctly. Using the NRC public website, the inspectors reviewed 10 CFR Part 21, "Reporting of Defects and Noncompliance," notifications for DRU defects and located ESI Report No. 10CFR 21-0091," dated January 23, 2006. The ESI notification describes a DRU deficiency in which an integrated circuit manufacturing defect can cause failure of the engine load raise and lower signals to the electronic governor controller. The inspectors noted this failure mechanism was similar to Wolf Creek's observed failure on November 1, 2007. The inspectors provided a copy of the ESI notification to Wolf Creek and upon review, Wolf Creek discovered that both EDGs were susceptible to the ESI 10 CFR Part 21 notification. More specifically, the DRU in the EDG A on November 1, 2007, was susceptible to the ESI notification failure mechanism. The inspectors and licensee searched the corrective action program database and found that this notification was not entered into the corrective action program or screened through Wolf Creek Procedure AP 20E-001, "Industry Operating Experience Program." Procedure AP 20E-001, Step 4.1.1, in part, directs the screening and review of OE from sources such as vendors, the NRC, and other utilities. Although, the inspectors found that Wolf Creek was not specifically listed as affected in the ESI 10 CFR Part 21, they had procured DRUs that were listed by serial number on the ESI notification. The inspectors also found a Woodward service bulletin dated January 2006 addressing the same issue that listed DRU serial numbers affected which included Wolf Creeks DRUs. Contrary to Procedure AP 20E-001, Step 4.1.1, Wolf Creek did not screen or review OE from the DRU vendors. The EDGs A and B DRUs were replaced on November 3 and 14, 2007, respectively.

Analysis: Using Procedure AP 20E-001, Step 4.1.1, the inspectors determined that the failure to enter into the corrective action program and evaluate publicly available OE directly applicable to Wolf Creek's EDGs was 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 Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, this issue relates to the availability and reliability examples of the equipment performance attribute because a failure mechanism was not correctly entered into the corrective action program and evaluated which led to this failure.

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 resulted in the EDG being degraded, but likely to start even with an intermittent failure and is not related to a qualification or design deficiency, did not result in the loss of safety function for greater than 24 hours, and was not related to external events such as fires and floods. The cause of the finding has a problem identification and resolution crosscutting aspect in the area associated with the OE program because the licensee's OE process did not use OE information, including vendor recommendations, to support plant safety. Specifically, the licensee did not systematically collect, evaluate, and communicate relevant external OE to affected internal stakeholders in a timely manner [P.2(a)].

Enforcement: No violation of regulatory requirements occurred because the OE program procedure is not required by Wolf Creek's license, TSs, or by regulation. This finding is also captured in the licensee's corrective action program under CR 2007-004190. Because the finding is of very low safety significance and has been entered into the corrective action program, this issue is being treated as a Finding (FIN) 05000482/2007005-04, Failure to Enter and Evaluate EDG Operating Experience in the Corrective Action Program.

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:

- October 30, 2007, EDG B air starting Tank KJ0717B relief valve testing
- November 9, 2007, power range adjustment to calorimetric
- November 9, 2007, main turbine valve stroke testing
- November 2, 2007, main steam insulation valve bypass valve inservice testing

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

b. Findings

No findings of significance were identified.

1EP1 Exercise Evaluation (71114.01)

a. Inspection Scope

The inspectors reviewed the objectives and scenario for the 2007 biennial emergency plan exercise to determine if the exercise would acceptably test major elements of the emergency plan. The scenario simulated an operating basis earthquake, a small steam generator primary-to-secondary leak that gradually escalated to a rupture, damage to the systems feeding water to the steam generators, an acid spill inside plant buildings, fuel damage, a steam line rupture outside containment, and a radiological release to the environment from the faulted steam generator to demonstrate the licensee's capabilities to implement the emergency plan.

The inspectors evaluated exercise performance by focusing on the risk-significant activities of classification, notification, protective action recommendations, and offsite dose consequences in the simulator control room and the following emergency response facilities:

- Technical Support Center
- Operations Support Center
- Emergency Operations Facility

The inspectors also assessed personnel recognition of abnormal plant conditions, the transfer of emergency responsibilities between facilities, communications, protection of emergency workers, emergency repair capabilities, and the overall implementation of the emergency plan.

The inspectors attended the postexercise critiques in each of the above facilities to evaluate the initial licensee self-assessment of exercise performance. The inspectors also attended a subsequent formal presentation of critique items to plant management.

The inspectors completed one sample during this inspection.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The drill listed below contributed to drill/exercise performance and emergency response organization performance indicators. The inspectors: (1) observed the training evolution to identify any weaknesses and deficiencies in classification, notification, and protective action requirements development activities; (2) compared the identified weaknesses and deficiencies against licensee identified findings to determine whether the licensee is properly identifying failures; and (3) determined whether licensee performance is in accordance with the guidance of the Nuclear Energy Institute (NEI) 99-02 document's acceptance criteria.

- November 21, 2007, simulator Mode 4 loss of offsite power followed by EDG failure

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Cornerstone: Mitigating Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators listed below for the period from July 2006 through May 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 NEI Document 99-02 to verify the basis in reporting for each data element.

- Mitigating systems performance index cooling water system
- Safety system functional failures

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 3 quarters. Also, the inspectors interviewed licensee personnel responsible for compiling the information.

Documents reviewed by the inspectors are listed in the attachment.

The inspector completed two samples.

b. Findings

No findings of significance were identified.

.2 Emergency Preparedness Cornerstone

a. Inspection Scope

The inspectors reviewed licensee performance indicators submittals for the period October 2006 through September 2007. The definitions and guidance of NEI Report 99-02, "Regulatory Assessment Indicator Guideline," Revisions 3 and 4, were used to verify the licensee's basis for reporting each data element to verify the accuracy of performance indicator data reported during the assessment period. The licensee's performance indicator data were also reviewed against the requirements of licensee Procedure AI 26A-004, "Emergency Planning Performance Indicators," Revisions 2 and 3.

- Drill and exercise performance
- Emergency response organization participation
- Alert and notification system reliability

The inspectors reviewed a 100 percent sample of drill and exercise scenarios, licensed operator simulator training sessions, notification forms, and attendance and critique records associated with training sessions, drills, and exercises conducted during the verification period. The inspectors reviewed 18 selected emergency responder qualification, training, and drill participation records. The inspectors reviewed a 100 percent sample of siren test and maintenance records and procedures. The inspectors also interviewed licensee personnel accountable for collecting and evaluating the performance indicator data.

Documents reviewed by the inspectors are listed in the attachment.

The inspector completed three samples during this inspection.

b. Findings

No findings of significance were identified

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution 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 orders, problem evaluation reports, CRs 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.

b. Findings

No findings of significance were identified.

.2 Selected Issue Follow-up Inspection

a. Inspection Scope

In addition to the routine review, the inspectors selected the below listed issues for a more in-depth review. The inspectors considered the following during the review of the licensee's actions: (1) complete and accurate identification of the problem in a timely manner; (2) evaluation and disposition of operability/reportability issues; (3) consideration of extent of condition, generic implications, common cause, and previous occurrences; (4) classification and prioritization of the resolution of the problem; (5) identification of root and contributing causes of the problem; (6) identification of corrective actions; and (7) completion of corrective actions in a timely manner.

- 10 CFR Part 21 notification regarding ASCO hydramotors
- EDG intake header backing ring misalignment

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed two samples.

b. Findings

No findings of significance were identified.

.3 Heat Sink Problem Identification and Resolution Review

a. Inspection Scope

The inspectors evaluated licensee corrective actions related to the health of the ultimate heat sink during this inspection and reviewed other corrective actions since the last heat sink inspection in November 2005.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

.4 Emergency Preparedness Problem Identification and Resolution Review

a. Inspection Scope

The inspector reviewed performance and facility problems documented in the licensee's corrective action program and drill reports between January 2006 and October 2007, and selected eight items to verify effective corrective action through observation during the evaluated exercise. The inspectors also reviewed the licensee's CRs resulting from the November 6, 2007, biennial exercise to ensure the issues were accurately entered into the licensee's corrective action program.

Documents reviewed by the inspectors are listed in the attachment.

b. Findings

No findings of significance were identified.

.5 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 July through December 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 6 months.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

The inspectors noticed a negative trend in the area of operability evaluations. The inspectors found that Wolf Creek continues to identify issues requiring operability evaluations at an appropriate threshold; however, the inspectors found that inspector questioning affected 3 of the 21 operability evaluations during the second half of 2007. This is a continuing trend from the first half of 2007 in which inspector questioning affected 4 of 25 evaluations. This has not been identified as a trend by Wolf Creek.

The inspectors noticed a continuing negative trend in the area of clearance orders and plant status control issues. Three clearance order and two status control issues were considered significant or consequential in the second half of 2007. During the first half of 2007, one clearance order and no status control issues were considered significant or consequential. The licensee had previously identified trends in these areas and has completed several root causes in these areas. Corrective actions developed from the last apparent cause determination for clearance orders contained in Performance Improvement Request (PIR) 2006-001663 and corrective actions developed from an common cause analysis for plant status control issues are contained in CR 2006-00813; however, the current corrective actions have been slow to adequately correct the problems. CR 2007-004362 has been written to identify a continuing trend in clearance order and status control issues and perform a common cause analysis.

4OA3 Event Followup

.1 October 3, 2007, Condensate Pump B Trip

a. Inspection Scope

The inspectors responded to the control room and 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 inadequate work instructions and poor work practices associated with trip circuit verification on the Central Chiller B resulting in the Condensate Pump B trip and steam generator level transient.

Description: On October 3, 2007, breaker protection circuitry alarm and functional testing was being performed by instrumentation and control technicians per Work Order 06-284146 which included a modified Procedure RNM C-1301, "Miscellaneous Relay and Meter Equipment," Revision 6. While installing a jumper to simulate bus under voltage for the Central Chiller B, the breaker for the Condensate Pump B tripped resulting in a feedwater and steam generator level transient. The technicians contacted the control room immediately and control room operators were able to restore condensate, feed flow, and steam generator levels to normal.

Step 8.3.2.8.h of Procedure RNM C-1301 required, in part, that a jumper be installed from Terminals 3 to 4 on Relay 194 at Breaker PB00402 for the Central Chiller B (Wires C280 and C281). However, this step was copied from a previous work order and not verified as appropriate for the testing being conducted. Step 8.3.2.8.h should have read, in part, to install jumpers from Terminals 7 to 8 (Wires C284 and C285). The licensee's root cause evaluation determined that it is common practice to copy previous work orders, but the reviews and walkdowns were inadequate to identify the incorrect instructions due to workload, interruptions, and distractions during the review process. The work order reviewer stated there were several interruptions during the walk-down in order to perform other jobs and this led to crucial steps not being changed. The evaluation also identified PIR 2002-1664 which discussed a similar event where copied information in a work order was incorrect and not identified in reviews. Corrective actions for this event included adding sign-off sections in Procedure RNM C-1301 for walkdowns/reviews to ensure work instructions were reviewed before work was performed.

Analysis: The inspectors determined that the failure to provide adequate work instructions 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 procedure quality attribute of the Initiating Events Cornerstone and it affected the cornerstone objective to limit the likelihood of those events that upset plant stability. This finding also affected the procedure quality attribute for the Mitigating Systems Cornerstone and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

The inspectors evaluated the significance of this finding using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At Power Situations," and because two cornerstones were affected, a Phase 2 analysis was required. The finding was assessed using the Phase 2 presolved tables with the assistance of a Region IV senior reactor analyst. Although the likelihood of a trip was increased and the capability of the normal heat sink was reduced, the exposure time for this condition was less than 3 days and all other mitigation capabilities were maintained. Consequently, the finding was determined to be of very low safety significance (Green). The cause of the finding has human performance crosscutting aspects in the area associated with work practices because the licensee failed to ensure that human error prevention techniques such as self/peer-checking and proper documentation of activities were used in the review of work activities such that they are performed safely [H.4(a)].

Enforcement: No violation of regulatory requirements occurred because the finding involved nonsafety-related secondary plant equipment. This finding is captured in the licensee's corrective action program under CR 2007-003759. Because the finding is of very low safety significance and has been entered into the corrective action program, this issue is being treated as FIN 05000482/2007005-05, Inadequate Work Instructions Resulted in Condensate Pump Trip.

.2 (Closed) Licensee Event Report (LER) 05000482/2005005-00, Validation of Postfire Safe Shutdown Capabilities of Fire Area A-8

On September 29, 2005, the licensee identified conditions where a postulated design basis fire could cause the loss of a safe shutdown success path. Specifically, the licensee identified that a fire in Fire Area A-8 could cause the volume control tank outlet valves to fail to close. This could allow the hydrogen cover gas from the volume control tank to enter the centrifugal charging pumps, damage the pumps, and cause a loss of high head safety injection. This does not meet the licensee's requirement to implement 10 CFR Part 50, Appendix R, Section III.G, as reflected in License Condition 2.C.(5)(a).

The licensee stated this historical problem resulted, in part, from nonvalidated assumptions made by the architect engineer for their electrical fire hazards analysis at the time of construction and insufficiently documented at that time. Because of the historical nature of the issue, the licensee did not determine a root cause.

Compensatory measures involved a 1-hour fire watch for Fire Area A-8. Corrective actions included an evaluation of Fire Area A-8 to review for additional components that failed to meet the requirements of 10 CFR Part 50, Appendix R, Section III.G, and a plan to develop design change packages for any corrective measures needed.

The inspectors concluded the finding is more than minor because it is associated with the Mitigating Systems Cornerstone attribute of external factors and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspector determined the significance of this issue using IMC 0609, Appendix F, "Fire Protection Significance Determination Process." In accordance with Phase 2, Step 2.3, "Fire Scenario Identification and Ignition Source Screening," the inspector concluded the finding had very low safety significance. Specifically, identified fire ignition sources screened out in Task 2.3.4 and the highest heat release rate did not result in a damaging hot gas layer.

The licensee identified finding involved a violation of License Condition 2.C.(5)(a). The enforcement aspects of the violation are discussed in Section 4OA7. This licensee event report is closed.

4OA5 Other Activities

(Closed) URI 05000482/2007003-01, Circulating Water Screen House Overloading During Heavy Rains

a. Inspection Scope

In May 2007, 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 8 inches of standing water and that the drains were blocked by debris. Subsequently on May 8, the drains were cleared and the roof was drained. Additional followup was needed to determine the significance which resulted in the following finding. This URI is closed.

b. Findings

Introduction: Inspectors identified a Green finding for exceeding the calculated roof loading for the circulating water screen house.

Description: In May 2007, Wolf Creek received heavy rains and water leaks from the circulating water screen house roof were observed. No roof damage was visually observed. The roof drains are described in Drawing A-121 and SPEC A-3862 with domed drain covers which were missing. On May 31, 2007, the dome drain covers were replaced. The steel screens inside the drains became plugged with debris because outer dome covers over the screens were missing. Inspectors found that 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 rains, Wolf Creek re-evaluated the impact of 8 inches of water on the roof. The 8 inches of water exceeded the calculated design stress of approximately 16 ksi for the roof's most limiting I-beam. 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. All of the circulating water pump circuit breakers and the feeder circuit Breaker 4-26 for Bus SL-31 are located directly below the most limiting I-beam. 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 8 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 8 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 reoccurred as Wolf Creek experienced heavy rains but only minor water ponding was observed. Mechanics subsequently resealed 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. Wolf Creek subsequently added tar to the gravel roof to prevent such an effect.

Analysis: The inspectors determined that exceeding the calculated allowable roof loading due to clogged drains 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 Mitigating Systems Cornerstone; and, it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, this issue relates to the loss of heat sink example of the external factors attribute because a roof collapse would likely prevent the circulating water and service water pumps from running. The inspectors also 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. For the Initiating Events Cornerstone as well, this issue relates to the loss of heat sink example of the external factors attribute because a roof collapse would likely prevent the circulating water and service water pumps from running.

The inspectors evaluated the significance of this finding using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." Under Phase 1, the finding screened to a Phase 3 analysis because two or more cornerstones (Initiating Events and Mitigating Systems) were affected. The Region IV senior reactor analysts performed the Phase 3 analysis using the Wolf Creek standardized plant analysis risk model that included an external events evaluation. The Region IV senior reactor analysts assumed the following in the Phase 3 significance determination process: (1) the collapse of the roof structure would cause an unrecoverable loss of all normal service water pumps and circulating water pumps. A reactor trip would result from a loss of the condenser and a main turbine trip; (2) an accumulation of 19 inches of water on the roof would cause the roof to collapse. Lesser accumulations would exceed the design stress of the supporting beams but would not cause yielding; (3) the roof drains were completely clogged for 1 year prior to the May 2007 event. This is a bounding assumption; (4) no credit is applied for roof leakage that would lessen the water accumulation and cue the need to inspect the roof, although such leaks did occur routinely following major rainstorms; (5) based on review of precipitation data for the region, the accumulation of water to a 19-inch level would necessarily result from a short-term rainstorm or cluster of storms because evaporation rates of approximately 4-12 inches per month would preclude long-term accumulation; and (6) to determine a bounding frequency of rainstorm events that could result in a

19-inch accumulation of the roof, the 100 year (1895-1994) precipitation data from Ottawa, Kansas, (approximately 20 miles northwest of the plant) was used. No monthly precipitation totals were greater than 19 inches for any given month; however, to account for overlap, all months that were in excess of 10 inches were noted. Occasions with 2 consecutive months of greater than 10 inches of rain were considered potential candidates for causing sufficient accumulations to fail the roof. Two of these situations occurred during the 100-year review period. Therefore, the probability that during a 1-year period with the drains clogged that precipitation will result in a roof accumulation in excess of 19 inches is 2/100 or 0.02. This is a bounding assumption. The standardized plant analysis risk model for Wolf Creek, Revision 3.31, was used to estimate a conditional core damage probability for the expected plant response to a roof collapse. The model was run in SAPHIRE with transients set at 1.0/yr. All normal service water and circulating water pumps were failed. Only transient sequences were quantified, average test and maintenance was assumed, and a truncation of E-12 was used. The result was $2.076E-5$ /yr. This result is equivalent to a conditional core damage probability for a plant trip with the noted equipment failures. The major cutsets contributing to the change in risk were turbine-driven auxiliary feedwater faults combined with a loss of ventilation to the Class 1E switchgear rooms. The risk increase for the finding primarily results from the unavailability of the turbine-driven feedwater pumps (loss of condenser) as a backup to auxiliary feedwater. Condensate pumps are not modeled. Also, the startup feedwater pump is made unavailable from the loss of normal service water. Using Assumption No. 5 and the conditional core damage probability, the delta core damage frequency of the finding is $(0.02)(2.076E-5) 4.15E-7$ /yr. The analyst considered this to be a bounding result based on the nature of the assumptions. Lastly, the core damage states resulting from the transient sequences associated with this finding do not result in a large early release according to IMC 0609, Appendix H.

Enforcement: No violation of regulatory requirements occurred because this finding is related to the nonsafety normal service water system which provides cooling to nonsafety and safety-related risk significant loads. This issue and the corrective actions are being tracked by Wolf Creek in CRs 2007-001897 and -002599. Because the finding is of very low safety significance and has been entered into the corrective action program, the issue is being treated as a finding: FIN 05000482/2007005-06, Clogged Drains Cause Circulating Water Roof Loads to Exceed Design.

4OA6 Meetings, Including Exit

On November 7, 2007, the inspector discussed the inspection results of the licensed operator annual requalification examination telephonically with Mrs. Mona Guyer, Operations Training Superintendent. The licensee acknowledged the findings presented in both the briefing and the final exit meeting. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On December 14, 2007, the inspectors presented the results of biennial heat sink inspection to Mr. S. E. Hedges, Vice President, Oversight, and other members of licensee management. The licensee acknowledged the information presented.

On December 20, 2007, the inspector presented the results of the postfire safe shutdown capabilities review telephonically to Mr. M. Sunseri, Vice President,

Operations and Plant Manager, and other members of the staff who acknowledged the findings. The inspector confirmed that no proprietary information was reviewed.

On January 10, 2008, the resident inspectors presented the inspection results of the resident inspections to Mr. M. Sunseri, Vice President Operations and Plant Manager, and other members of the licensee's management staff. The licensee acknowledged the findings presented. The inspectors noted that while proprietary information was reviewed, none would be included in this report.

4OA7 Licensee-Identified Violations

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

- License Condition 2.C.(5)(a) requires the licensee to maintain in effect all provisions of the approved fire protection program described in listed regulatory documents. The provisions included the requirements of 10 CFR Part 50, Appendix R, Section III.G. Contrary to the requirements of Section III.G.1, on September 29, 2005, the licensee identified that a fire in Fire Area A-8 could prevent the volume control tank outlet valves from closing. The failure to close could allow the hydrogen cover gas from the volume control tank to enter the centrifugal charging pumps, damage the pumps, and cause a loss of high head safety injection. The licensee documented this issue in their corrective action program as PIR 2005-2757.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

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

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000482/2007005-01	URI	EDG B Governor Failure Effect on Supplied Equipment (Section 1R13)
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Opened and Closed

05000482/2007005-02	NCV	Failure to Evaluate ESW Valve Corrosion (Section 1R15)
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05000482/2007005-03	NCV	Inadequate Evaluation of EDG for Common Cause Failure (Section 1R19(1))
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05000482/2007005-04	FIN	Failure to Enter and Evaluate EDG Operating Experience in Corrective Action Program (Section 1R19(2))
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05000482/2007005-05	FIN	Inadequate Work Instructions Resulted in Condensate Pump Trip (Section 4OA3.1)
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05000482/2007005-06	FIN	Clogged Drains Cause Circulating Water Roof Loads to Exceed Design (Section 4OA5)
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Closed

05000482/2005-005-00	LER	Validation of Postfire Safe Shutdown Capabilities of Fire Area A-8 (Section 4OA3.2)
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05000482/2007003-01	URI	Circulating Water Screen House Overloading During Heavy Rains (Section 4OA5)
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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 1R04: Equipment Alignment

Engineering Disposition, "Relocate I/P From The ARVs, ABPV001 Thru 004," Revision 6

Work Order 06-289610-000

Work Request 07-063628

Calculation KA-03-W, "KA System Back-up Nitrogen Accumulators," Revision 1

Engineering Disposition, "Relocate I/P From The ARVs, ABPV001 Thru 004," Revision 6

CKL NT-120, "Nitrogen System Normal Valve Lineup," Revision 23

CKL KA-121, "Instrument Air Valve Lineup," Revision 9A

M-13KA47, "Small Piping Isometric Nitrogen Back-Up Gas Supply Auxiliary BLDG.," Revision 8

M-13KA46, "Small Piping Isometric N2 Back-Up Gas Supply Auxiliary BLDG. & Turbine BLDG.," Revision 9

M-13KA51, "Small Piping Isometric N2 Back-Up Gas Supply Auxiliary Building," Revision 1

D-79-600, "25 ft3 Gas Accumulator Bechtel Power Company (SNUPPS)," Revision 5

Section 1R05: Fire Protection

Fire Hazard Analysis Fire Area H-1, Revision 0

Prefire Plan, Auxiliary Building Prefire Plans, Revision 6

Prefire Plan, Fire Protection Water Supply and Hydrant Locations, Revision 0

STN FP-815A, "Heat Trip Actuation Device Operational Test Zones BZ 503, 016/SZ 1-5Z47,1-2Z28, 'A' Train Emergency Diesel Generator and ESF Transformer," Revision 3

ALR KC-888, Fire Protection Panel KC-008 Alarm Response, Revision 15

Fire Hazard Analysis, Fire Area CST & RWST, Revision 0

Work Order 06-284430-000 and 06-284436-000

Drawing E-OFO221, "Fire Detection/Protection System-Yard Transformer Area EL. 2000'-0",
Revision 5

E-1F9910, Fire Area Yard-ESF, Revision 2

CR

2007-002929

Work Request

07-063647

Procedure

OFN ST-003, "Natural Events," Revision 13A

Drawings

M-13EF01, "Piping Isometric Essential Service Water System Control Bldg. A & B Train",
Revision 11

M-13EA01, "Piping Orthographic Service Water System Communication Corridor," Revision 6

Miscellaneous

Wolf Creek Generating Station Individual Plant Examination Summary Report, September 1992

Section 1R06: Flood Protection Measures

CR

2007-002929

Work Request

07-063647

Procedures

OFN ST-003, "Natural Events," Revision 13A

Drawings

M-13EF01, "Piping Isometric Essential Service Water System Control Bldg. 'A' & 'B' Train",
Revision 11

M-13EA01, "Piping Orthographic Service Water System Communication Corridor," Revision 6

Miscellaneous

Wolf Creek Generating Station Individual Plant Examination Summary Report, September 1992

Section 1R07: Heat Sink Performance

Procedures and Instructions

AI 07A-008, "Lake Water Chemical Treatment Program," Revision 14

AP 23L-001, "Lake Water Systems Corrosion and Fouling Mitigation Program," Revision 2

AP 23L-002, "Heat Exchanger Program," Revision 2

AP 28A-100, "Condition Reports," Revision 4

QCP-20-518, "Visual Examination of Heat Exchangers and Piping Components," Revision 5

STN PE-033, "CCW Heat Exchanger Performance Test," Revisions 9, 10, and 11

STN PE-036, "Safety Related Room Cooler Heat Transfer Verification and Performance Trending", Revision 13, February 2, 2007

STN PE-037A, "ESW Train A Heat Exchanger Flow and DP Trending," Revision 12A

Performance Improvement Requests

2002-02377	2004-00688	2005-02507	2005-02525
2005- 03378	2005- 03392	2005-03408	

CRs

2006-00686	2006-01095,	2006-01836	2006-01644
2006-02159	2006-02446	2006-02466	2006-02469
2006-03244	2006-04212	2007-00510	2007-01118
2007-01457	2007-01681	2007-02164	2007-02184
2007-02924	2007-04212		

Calculations

EG-06-W, "Component Cooling Water System Calculation," Revision W-4

E-M-032-000-CN002

KJ-M-010, "Tube Plugging Criteria for EDG Heat Exchangers: Intercooler, Lube Oil Cooler and Jacket Water Cooler," Revision 0

KJ-M-011, "EKJ03A/B Thermal Performance Calculation," Revision 0

SA-89-017, "NSA Calculation Package: Evaluation of CCW & RHR Heat Exchange Performance for the Extended Fuel Operating Cycle (18 Months)," Revision 0

Z065-C-001, "Evaluation of Annual UHS Sediment Measurements," Revisions 9 and 10

Change Packages

010112, "EKJ03A/B, EKJ04A/B Tube Sheet Hole Size Use-As-Is," Revision 1

010214, "Room Cooler Pitting Acceptance Criteria," Revision 1

011149, "Revise Surveillance Frequency for SR Water Control Structures and Reservoir C-404," Revision 0

011464, "Turbine Building Cathodic Protection," Revision 0

011960, "EKJ03A Tube Sheet Hole Dimensions," Revision 0

011987, "EKJ03A/B Replacement Heat Exchangers," Revision 5

Maintenance Work Orders

98-203723-001	04-258491-001	04-261661-000	05-273887-000
05-270546-000	05-270546-006	05-270546-009	05-270546-010
05-270546-015	05-270546-016	05-270546-020	06-285315-000
06-289790-000	06-289790-002	07-296812-000	

Heat Exchanger Tests

Results of CCW Heat Exchanger Performance Test , May 10, 2005

Results of CCW Heat Exchanger Performance Test, November 2, 2006

Results of ESW Train A Heat Exchanger Flow and DP Trending, July 31, 2007

Results of ESW Train A Heat Exchanger Flow and DP Trending, September 6, 2007

Results of ESW Train A Heat Exchanger Flow and DP Trending, October 18, 2007

Miscellaneous

"SY-07 Lake Water Program" Health Report, October 2007

Certified Material Test Report 34542

DWG M-12KJ01, "Piping & Instrumentation Diagram: Standby Diesel Generator Cooling Water System," Revision 9

DWG M-1HX001, "Heat Exchanger Sheet Tube Map"

EKJ06A, EKJ04A and EKJ03A Visual Examinations and Eddy Current Tests, December 2007

2004 Ultimate Heat Sink Hydrogeologic Bathymetric Mapping - Post Dredge, Sheets 1 and 2

EPRI NP-7552, "Heat Exchanger Performance Monitoring Guidelines," December 1991

Generic Letter 89-13, "Service Water System Problems Affecting Safety Related Equipment," July 18, 1989

Generic Letter 89 13, Supplement 1, "Service Water System Problems Affecting Safety-Related Equipment," April 4, 1990

Letter ET 06-0007, "EDG Heat Exchanger Project," Revision 0

Letter ET 90-0023, Response to Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," January 30, 1990

Letter ET 94-0075, "Final Response to Generic Letter 89 13," November 28, 1994

Letter ET 94-0012, "Updated Response to Generic Letter 89 13," February 18, 1994

Letter ET 97-0035, "Updated Response to Generic Letter 89 13," April 23, 1997

Letter ET 99-0042, "Updated Response to Generic Letter 89 13," November 17, 1999

NUREG/CR-5685, "Generic Service Water System Risk Based Inspection Guide"

Self-Assessment Detail Report: "Lake Water Corrosion, Fouling and Chemistry" (Assessment No. 76; Report ID ASS02), April 26, 2007

Specifications for the RHR and electrical penetration room coolers, and component cooling water heat exchangers

Training Records for technicians performing Eddy Current Testing on Room Cooler EGG01B

Updated Final Safety Analysis Report, Sections 9.2.1, "Station Service Water System;" 9.2.2, "Essential Service Water System;" and 9.2.5, "Ultimate Heat Sink"

Valve performance data for valves: EVHV-0026, -0033, -0038, -0052, -0059, and -0098

Vendor Manual M-018C-00002, "Intercooler Heat Exchanger," Revision W01

Vendor Manual M-075-019-02, "Instruction Manual for Closed Cooling Water Heat Exchangers," Revision 1B

WCEM-05-012, "Microfouling, Asiatic Clam and Zebra Mussel Control Program," Revision 1

WCNOC-22, "Periodic Surveillance Report for Ultimate Heat Sink and Associated Safety Related Structures," Revisions 0 and 15

WCRE-013, "Lake Water Piping Structural Integrity Program," Revision 2

Section 1R11: Licensed Operator Requalification Program

AP 21-001, "Conduct of OPS," Revision 36A
AI 21-100, "Operations Guidance and Expectations," Revision 8
Operations Requalification Cycle 07-01, Revision 0
APF 06-02-001, "Emergency Action Levels," Revision 8
EPP 06-06, "Protective Action Recommendations," Revision 4
Scenarios for training conducted: October 18, and 25, 2007

Section 1R12: Maintenance Effectiveness

Maintenance Rule Scoping Evaluation for System BB - Reactor Coolant System

Maintenance Rule Scoping Evaluation for System INS -Reg. Guide 1.97
Instrumentation

Attachment B, "Functional Failure Determination Checklist," to ED 23M-050, "Engineering Desktop Instruction Monitoring Performance to Criteria and Goals,"

Performance Improvement Request

2007-1952	2007-1953	2007-2100	2007-2141
96-2671			

Work Request

07-061766	07-061883	07-061884	07-060117
07-060141	07-060514	07-059846	

Calculation AN-99-031, "Development of PSA based Reliability Performance Criteria for Maintenance rule," Revision 0.

Maintenance Rule Final Scoping Evaluation AB-05

Work Orders

07-298545-000	07-296463-000	07-292308-000	07-291903-000
07-291889-000	07-301051-001	07-301051-011	07-293935-000

07-293935-003	07-294968-003	07-294968-000	07-295395-000
07-295396-000	05-270547-001	06-287445-000	05-271470-000

Miscellaneous

INC C-1000, "Calibration of Miscellaneous Components," Revision 7

STS AB-201A, "Main Steam Isolation Bypass Inservice Valve Test," Revision 14

Calculation E-11005, "List of Loads Supplied by Emergency Diesel Generator," Revision 32

Maintenance Rule Final Scope Evaluation GN-03

Maintenance Rule Final Scope Evaluation GN-01

Maintenance Rule Final Scope Evaluation GN-02

Maintenance Rule Final Scope Evaluation GN-04

Maintenance Rule Final Scope Evaluation GN-06

Maintenance Rule Final Scope Evaluation GN-08

BD-EMG ES-04, "Natural Circulation Cooldown," Revision 8

Engineering Disposition 116451-10

USAR 1.2.9.6, Compressed Air Systems

EDI 23M-050, "Engineering Desktop Instruction Monitoring Performance to Criteria Goals,"
Revision 3

Maintenance Rule Final Scope Evaluation KA-01

Maintenance Rule Final Scope Evaluation KA-03

Maintenance Rule Final Scope Evaluation KA-04

Maintenance Rule Final Scope Evaluation KA-06

CRs

2007-000860	2007-000879	2007-000897	2007-000943
2007-000988	2007-004154		

Miscellaneous

M-12KA01, "Piping & Instrumentation Diagram Compressed Air System," Revision 27

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Operational Risk Assessment, Schedule Week 404
STN AB-003, "Main Steam Iso Vlv Acc Discharge," Revision 11

CRs

2007-004045 2007-004056 2007-004098 2007-004084

2007-004075

Miscellaneous

AP 16E-002, "Post Maintenance Testing Development," Revision 6A
Commercial Grade Dedication Evaluation Number 021-E-0003
Calculation GL-M-002, "Calculate tube plugging allowance for Aerofin (Cu-Ni) coils for Electrical Penetration Room Coolers (SGL15A & SGL15B)," Revision 0
MPE RC-001, "Room Cooler Maintenance," Revision 8B

Work Orders

07-300584-000 07-300584-001 07-300584-002 07-292506-000
06-282700-000 07-297055-000

Miscellaneous

M-612-010-2, "39E Air Handling Units," Revision 2

USAR Figure 6.2.1-80, "Main Steam Line Break Analysis, Case 9, Containment Temperature," Revision 6

Design Specification for Room Coolers for the Wolf Creek Generating Station, Revision 9
Procedures

APF 22C-003-001, "Operational Risk Assessment," Revision 0, September 2-4, 2007

APF 21-001-02, "Control Room Turnover Checklist," Revision 23, September 2-4, 2007

APF 21-001-06, "Site Operator Relief Checklist," Revision 5, September 2-4, 2007

AP 22C-003, "Operational Risk Assessment Program," Revision 11

AIF 22C-006-01, "Checklist for Emergent Work," Revision 4, September 2, 2007

PSA-05-0020, "WCGS PRA Basic Event Data Files," Appendix E, Revision 1

Section 1R15: Operability Evaluations

Procedure STS KJ-001A , Integrated D/G and Safeguards Actuation test, Train A performed on November 12, 2003

Procedure MPEE009Q-03, Inspection and testing of Siemens vacuum circuit breakers

Work Orders 03-253210, 03-25931 and 01-224513 demonstrating verification of charging spring times for selected Siemens vacuum circuit breakers

Drawing E-11005, List of loads supplied by EDG

PIR 2003-3463, CCW pump breaker design issue

Technical Requirements Manual 3.4.17, "Structural Integrity"

Technical Requirements Manual Bases 3.4.17, "Structural Integrity"

CRs

2007-004329

2007-003704

2007-003462

Miscellaneous

TR 3.4.17 Engineering Review Process

SYS EF-201, "ESW Screen Wash Operation," Revision 14

Calculation EF-M-010, "Seismic/Weak-link Analysis for Valves EF HV-91, 92, & 97 and EFPDV0019 & 20. and EFHV0098," Revision 1

AI 23D-003, "MOV Trending and Periodic Verification Program," Revision 1

AP 23D-001, "Motor Operated Valve Program," Revision 2

WO 07-299834-000

STN EF-201, "ESW System Valve Test," Revision 2A

Section 1R19: Postmaintenance Testing

Performance Improvement Request 2007-3829

STS BG-100B, "Centrifugal Charging System B Train Inservice Pump Test," Revision 34

STN FP-211, "Diesel Driven Fire Pump 1FP01PB Monthly Operation and Fuel Level Check,"
Revision 15

STS EJ-100B, "RHR System Inservice Pump B Test," Revision 31

TMP 07-025, "EJ FCV-611 Retest," Revision 0

TMP 07-014, "BN HV-8812B Retest," Revision 0B

Work Orders

07-299955-000	07-063761	07-301016-000	07-300862-001
07-300862-002	07-300768-001	07-301379-001	06-286736-001
06-286765-001	06-286737-001	07-298218-001	

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STS KJ-015B, "Manual/Auto Fast Start, Sync & Loading of EDG NE02," Revision 25A
STS KJ-015A, "Manual/Auto Fast Start, Sync & Loading of EDG NE01," Revision 24
STS IC-615A, "Slave Relay Test K615 Train A Safety Injection," Revision 20
MPE NE-002, "Governor Adjustments For Emergency Diesel Generator NE02," Revision 8
MPE NE-003, "Governor Adjustments For Emergency Diesel Generator NE01," Revision 7
AP 20E-001, "Industry Operating Experience Program," Revision 9

CRs

2007-004117	2007-000279	2007-004190	2007-004117
2007-004190	2007-004471		

Miscellaneous

Performance Improvement Request 2004-1160

Calculation XX-E-014, "Analysis For NB Buses as Powered from Remote Generation,"
Revision 0

Calculation XX-E-014 Attachment 9 "OTI Sharpe Generation Station - Development & Testing
of ETAP User-Defined Dynamic Models (UDM)," Revision 0

SYS KJ-200, "Inoperable Emergency Diesel," Revision 13

ET 07-0054, "69 kV Transmission Line from Wolf Creek"

STS IC-615A, "Slave Relay Test K615 Train A Safety Injection," Revision 20

SYS KJ-123, "Post Maintenance Run of Emergency Diesel Generator A," Revision 38

MPM M018Q-01, "Standby Diesel Generator Inspection," Revision 12

Section 1R22: Surveillance Testing

Work Orders

07-296486-000	05-279238-000	05-279238-001	05-279238-002
05-279238-003	05-79238-004		

Section 1EP1: Exercise Evaluation

AP 06-002, Wolf Creek Nuclear Generating Station Emergency Plan, Revision 8

AP 14B-003, "Spill and Release Reporting," Revision 6

AP 31B-002, "Chemical Release and Response," Revision 2

EMG E-0, "Reactor Trip or Safety Injection," Revision 19

EMG FR-H, "Response to Loss of Secondary Heat Sink," Revision 18A

EPP 06-001, "Control Room Operations," Revision 10

EPP 06-002, "Technical Support Center Operations," Revision 22A

EPP 06-003, "Emergency Operations Facility Operations," Revision 14A

EPP 06-004, "Public Information Organization," Revision 14

EPP 06-005, "Emergency Classification," Revision 3

EPP 06-006, "Protective Action Recommendations," Revision 4

EPP 06-007, "Emergency Notifications," Revision 12

EPP 06-009, "Drill and Exercise Requirements," Revision 4

EPP 06-010, "Personnel Accountability and Evacuation," Revision 5

EPP 06-011, "Emergency Team Formation and Control," Revision 5

EPP 06-012, "Dose Assessment," Revision 9

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A-0119, "Circulating Water Screenhouse Roof Plan," Revision D
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CRs

2007-003310

2007-002599

2007-001897

Wolf Creek Generating Electric Station Individual Plant Examination of External Events (IPEEE)

LIST OF ACRONYMS

CCW	component cooling water
CFR	Code of Federal Regulations
CR	condition report
DRUs	digital reference units
EDG	emergency diesel generator
ESI	Engine Systems, Inc.
ESW	essential service water
FIN	finding
IMC	inspection manual chapter
LER	licensee event report
NCV	noncited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OE	operating experience
PIR	performance improvement request
RHR	residual heat removal
SSC	structure, system, and component
TS	Technical Specifications
URI	unresolved item
USAR	Updated Safety Analysis Report