



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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May 21, 2008

EA-08-052

Rick A. Muench, President and
Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
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SUBJECT: WOLF CREEK GENERATING STATION - NRC INTEGRATED INSPECTION
REPORT 05000482/2008002

Dear Muench:

On April 7, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Wolf Creek Generating Station. The enclosed report documents the inspection results, which were discussed on April 11, 2008, with Mr. Stephen Hedges 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. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, six NRC identified and two self-revealing findings of very low safety significance (Green) are documented in this report. All of these findings were determined to involve violations of NRC requirements. Additionally, three licensee-identified violations 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 made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

Docket No. 50-482
License No. NPF-42

Enclosure: Inspection Report 05000482/2008002
w/Attachment: Supplemental Information

cc w/enclosure:

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SRI:DRP/B	RI:DRP/B	C:DRS/EB1	C:DRS/EB2
SDCochrum	CMLong	RBywater	LJSmith
/RA/	/RA/	/RA/	/RA/ GAPick for
5/21/2008	5/21/2008	4/28/2008	4/30/2008
C:DRS/OB	C:DRS/PSB	ACES/SES	C:DRP/B
RELantz	MPShannon	MMVasquez	VGGaddy
/RA/	/RA/	/RA/	/RA/
4/29/2008	4/28/2008	5/13/2008	5/21/2008

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U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 50-482

License: NPF-42

Report: 5000482/2008002

Licensee: Wolf Creek Operating Corporation

Facility: Wolf Creek Generating Station

Location: 1550 Oxen Lane NE
Burlington, Kansas

Dates: January 1 to April 7, 2008

Inspectors: S. D. Cochrum, Senior Resident Inspector
C. M. Long, Resident Inspector
G. A. Pick, Senior Reactor Inspector
D. L. Stearns, Health Physics Inspector

Approved by: V. G. Gaddy, Chief, Project Branch B

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SUMMARY OF FINDINGS

IR 05000482/2008002; 1/01 - 4/07/08; Wolf Creek Generating Station; Fire Protection, Maintenance Risk Assessments and Emergent Work Control, Access Control to Radiologically Significant Areas, Event Followup and Other Activities.

This report covered a 3-month period of inspection by resident inspectors and regional specialists. The inspection identified eight Green findings, all 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 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a noncited violation of Technical Specification 5.4.1.d for failure to implement fire protection impairment control permit requirements and compensatory measures when operators received a trouble alarm on a fire detector in the auxiliary building. On January 26, 2008, operators discovered that Detector KC-104-XCH-ID-006 did not have a fire protection impairment control permit. This detector was adjacent to Detector KC-104-XSH-ID-007 which was already inoperable in Impairment 2008-020. The licensee's administrative procedure required fire detection in the area to be declared inoperable if two adjacent detectors are inoperable. This condition existed for approximately 24 hours and would have required a compensatory continuous fire watch for the period that both detectors were inoperable. The residents identified that the control room turnover checklist contains a section for listing the KC008 alarms; however, the two turnover checklists for the two shifts following the initial alarm did not identify Detector KC-104-XCH-ID-006 as a Detector KC-008 alarm.

The failure to implement fire protection impairment control permit requirements and establish compensatory measures for the auxiliary building 2026-foot level was considered a performance deficiency. The finding was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of protection against external factors and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, this issue relates to the protection against fire example of protection against external factors attribute because the detectors were inoperable without ensuring compensatory measures were in place. The finding was of very low safety significance because it involved compensatory measures for the fixed fire protection system and was assigned a low degradation rating since less than 10 percent of the fire detectors in the area were disabled. The finding has crosscutting aspects in the area of human performance associated with work practices because the licensee failed to apply appropriate human error techniques such as self and peer-checking techniques to avoid committing errors [H.4(a)] (Section 1R05).

- Green. A noncited violation of Technical Specification 3.8.1.B.4 was identified when the licensee performed elective maintenance in the switchyard and removed equipment from service that was prohibited by Technical Specifications while in an extended diesel generator outage.

The inspectors determined that the failure to implement requirements of Technical Specification 3.8.1.B.4 was a performance deficiency. The 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 was determined to be of very low safety significance because the issue resulted in the Train B offsite power being inoperable, but capable of supplying the safety bus for greater than 24 hours. Additionally, the cause of the finding has a human performance crosscutting aspect in the area associated with work control. Specifically, Wolf Creek did not ensure STS-IC-805B was appropriately coordinated within organizations to assure plant and human performance during the extended emergency diesel generator allowed outage time [H.3(b)] (Section 1R13).

- Green. The NRC identified a noncited violation of Technical Specification 5.4.1 for failure to follow the operability process on discovery of the centrifugal charging Pump A room cooler leak. On February 13, 2008, at 2:20 p.m., the control room was notified of a leak from the room cooler for the centrifugal charging pump. At that time, it could not be established if the leak would cause a loss of structural integrity of essential service water. Wolf Creek made no log entries at 2:20 p.m. stating its basis for immediate operability. At 3:50 p.m., Wolf Creek control room logs documented that centrifugal charging Pump A had a room cooler leak and structural integrity cannot be verified. Subsequent entry into Technical Specification 3.7.8 for the essential service water Pump A caused emergency diesel Generator A to be inoperable. Technical Specification 3.8.1, Condition I, states that with three alternating current sources inoperable (both emergency diesel generators and an offsite source), Technical Specification 3.0.3 shall be entered. Wolf Creek exited Technical Specification 3.0.3 at 4:13 p.m. when the inlet and outlet valves to centrifugal charging Pump A's room cooler were closed. The inspectors could not locate any justification produced by Wolf Creek for the room cooler's operability after 2:20 p.m.

The inspectors determined that the failure to follow the operability process is a performance deficiency. The inspectors determined that this finding was more than minor because if left uncorrected, it could become a more serious problem if the operability process is not correctly applied. The finding screened to Phase 2 because the finding represents an actual loss of safety function of a single train of high head injection. A bounding risk of Green results from the Phase 2 presolved worksheets using an exposure time of less than 3 days for the Centrifugal Charging Pump (CCP) A "[Fails to Run]." The inspectors also determined that the finding had a human performance crosscutting aspect in the area associated with decision making because the licensee failed to use conservative assumptions in its operability decision and apply a requirement to

demonstrate that the room cooler is operable in order to proceed rather than a requirement to demonstrate that it is inoperable [H.1(b)] (Section 4OA3.2(ii)).

- Green. The inspectors identified a noncited violation of 10 CFR Part 50 Appendix B Criterion XVI, "Corrective Action," because Wolf Creek failed to take timely corrective actions to prevent failure of the centrifugal charging pump A room cooler which resulted in a Notice of Enforcement Discretion (EA-08-052). The inspectors found that room Cooler SGL12A experienced leaks in October 1999, May 2003, October 2003, August 2004, October 2006, and again in February 2008. On March 14, 2007, Wolf Creek chose to delay SGL12A's replacement until Refueling Outage 16 due to the required length of time to replace the cooler. On February 13, 2008, a circumferential flaw on an H-bend was discovered in SGL12A preventing it from performing its safety function. Inspectors reviewed corrective action Procedure AP 28A-100, "Condition Reports," Revision 3 and found that a loss of a train to perform its safety function was considered a significant deficiency requiring corrective action to prevent recurrence. The inspectors reviewed this issue under Performance Improvement Requests 2005-2507 and 2004-0688, and Condition Report 2008-0467 and found that Wolf Creek designated prior failures nonsignificant.

The failure to take timely corrective actions within 9 years was a performance deficiency. 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). The finding screened to Phase 2 because the finding represents an actual loss of safety function of a single train of high head injection for greater than its Technical Specification 3.8.1.B.2 allowed outage time of 4 hours. Using an exposure time of less than 3 days for the scenario "Centrifugal Charging Pump PBG05A [Fails to Run]," a bounding risk of Green results from the Phase 2 presolved worksheets. Additionally, the cause of the finding has a human performance crosscutting aspect in the area associated with resources. Specifically, Wolf Creek did not ensure adequate resources to maintain long-term plant safety by minimizing the room coolers' long-standing issues and preventive maintenance deferrals [H.2(a)] (Section 4OA3.2(iii)).

- Green. The inspectors identified a noncited violation of Technical Specification 5.4.1.d because Procedure OFN RP 017, "Control Room Evacuation," Revision 21, failed to account for the needed actions to reestablish reactor coolant pump seal cooling. Failure to reestablish seal cooling in a timely manner could have resulted in a small break loss of coolant accident.

This performance deficiency resulted from an inadequate postfire safe shutdown procedure. The inspectors determined the finding is greater than minor in that it affected the ability to achieve and maintain hot shutdown following a control room fire. This finding is associated with the mitigating systems cornerstone attribute of protection against external factors (e.g. fire). This finding affected the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to external events (such as fire) to prevent undesirable consequences. In addition to the control room fire requiring

operators to evacuate the control room, the fire would have had to affect components located in two physically separated panels. The licensee has Institute of Electrical and Electronics Engineers Standard 383 qualified cables and conductors throughout the plant. The Phase 3 risk evaluation performed by the NRC senior reactor analyst determined this deficiency had very low risk significance (Section 4OA3.5).

- Green. The inspectors identified a noncited violation of License Condition 2.c(5) because the licensee failed to evaluate the impact of a motor-operated valve failure mechanism on their ability to implement postfire safe shutdown following a control room evacuation. The licensee determined that the failure mechanism affected 38 motor-operated valves and upon valve failure could affect their ability to implement their postfire safe shutdown procedure. A short circuit that bypassed the torque and/or limit switches could damage the valves and prevent repositioning of the valve in the postfire safe shutdown position.

The inspectors determined this was a performance deficiency because the licensee failed to ensure that components necessary to safely shutdown the reactor would remain operable following a fire. This deficiency was more than minor, in that, it had the potential to impact the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to external events (such as fire) to prevent undesirable consequences. In addition to the control room fire requiring operators to evacuate the control room, the fire would have had to affect components located in five different control panels. The Phase 3 risk evaluation performed by the NRC senior reactor analyst determined this deficiency had very low risk significance (Section 4OA5.2).

Cornerstone: Occupational Radiation Safety

- Green. The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.7.2.a for failure to evaluate changing radiological conditions and control an area as a locked high radiation area. Specifically, on October 17, 2007, dose rates in Room 7604 increased to levels requiring posting as a "Locked High Radiation Area," as a result of a vent and drain evolution. Dose rates reached a level of 1500 mRem/hour prior to the area being properly posted and controlled. This issue was entered into the licensee's corrective action program as Condition Report 2007-003934. Immediate corrective actions included posting and controlling the area as a locked high radiation area. Other corrective actions included changing the vent and drain process to change the vent path.

This finding is greater than minor because it is associated with the occupational radiation safety program and process attribute and affected the cornerstone objective, in that, the failure to properly post and control access to a locked high radiation area has the potential to increase personnel dose. This occurrence involves the potential for unplanned, unintended dose. Utilizing Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that the finding was of very low safety significance because it did not involve; (1) as low as is reasonably achievable planning and controls, (2) an overexposure, (3) a substantial potential

for overexposure, or (4) an impaired ability to assess dose. This finding has a crosscutting aspect in the area of human performance associated with the work control component because licensee failed to appropriately plan work activities by incorporating job site conditions that may impact radiological safety [H.3(a)] (Section 2OS1(i)).

- Green. The inspectors reviewed a self-revealing noncited violation of Technical Specification 5.4.1 for failure to follow a licensee procedure. Specifically, on March 29, 2008, one of two radiographers conducting radiography operations in the quality control vault received a dose rate alarm on their electronic dosimeter. The two radiographers evaluated the dose received and decided to continue with radiography without notifying health physics personnel to evaluate the conditions. This issue was entered into the licensee's corrective action program as Condition Report 2008-001181. Immediate corrective actions included restriction of the radiographers to log onto the radiation work permit and discussions with the radiographers and the contractor's radiation safety officer. Long-term corrective action is still being evaluated.

This finding is greater than minor because it is associated with the occupational radiation safety program and process attribute and affected the cornerstone objective, in that, the failure to stop work and notify health physics personnel for assistance had the potential to increase personnel dose. This occurrence involves the potential for unplanned, unintended dose. Utilizing Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspector determined that the finding was of very low safety significance because it did not involve: (1) as low as is reasonably achievable planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the radiographer and assistant failed to contact health physics personnel to discuss the circumstances surrounding the unexpected dose rate alarm [H.1(a)] (Section 2OS1(ii)).

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. These violations and their 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. On January 11, 2008, the licensee performed a reactor shutdown due to voiding in emergency core cooling system (ECCS) piping. After determining the cause and restoring systems to operable, the plant was returned to full power on January 16, 2008. On March 17, 2008, a 13.8 kV transformer failure resulted in a plant trip. The plant remained shut down the rest of the report period and entered Refueling Outage 16 on March 22, 2008.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Seasonal Susceptibilities

a. Inspection Scope

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

- January 23, 2008, cold weather impact on essential service water (ESW)

Documents reviewed are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors completed a review of the licensee's readiness for impending adverse weather involving severe thunderstorms and heavy rains. The inspectors: (1) reviewed plant procedures, the Updated Safety Analysis Report (USAR), and Technical Specifications to ensure that operator actions defined in adverse weather procedures

maintained the readiness of essential systems; (2) walked down portions of the systems listed below to ensure that adverse weather protection features were sufficient to support operability, including the ability to perform safe shutdown functions; (3) reviewed maintenance records to determine that applicable surveillance requirements were current before the anticipated weather developed; and (4) reviewed plant modifications, procedure revisions, and operator work arounds to determine if recent facility changes challenged plant operation.

- January 7, 2008, severe thunderstorms caused the loss of two alert notification system sirens

Documents reviewed are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- February 11, 2008, Sharpe station alignment to Wolf Creek switchyard
- March 6, 2008, emergency diesel Generator (EDG) B while ESW A is inoperable
- March 12, 2008, motor-driven auxiliary feedwater Pump A while turbine-driven auxiliary feedwater (TDAFW) is inoperable

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, USAR, Technical Specification requirements, administrative Technical Specifications, outstanding work orders (WOs), condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization.

Documents reviewed are listed in the attachment.

The inspectors completed three samples.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- January 17, 2008, auxiliary building 1988' elevation
- January 31, 2008, auxiliary building 2026' elevation
- February 7, 2008, control building 2000' elevation
- March 10, 2007, turbine building 2037' elevation

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's individual plant examination of external events (IPEEE) with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples

b. Findings

Introduction. The inspectors identified a Green noncited violation (NCV) of Technical Specification 5.4.1.d for failure to implement fire protection impairment control permit

requirements and compensatory measures following a trouble alarm for a fire detector in the auxiliary building.

Description. On January 25, 2008, a fire protection trouble alarm came in on the fire alarm control Panel KC-008. The control room supervisor acknowledged the alarm associated with Detector KC-104-XCH-ID-006. Alarm Procedure ALR KC-008, "Fire Protection Panel KC-008 Alarm Response," Revision 15, Step 4.3.1 requires, in part, that a fire protection impairment permit be initiated for a smoke detector trouble alarm.

The control room supervisor reviewed the impairment log and found Impairment 2008-020 for a detector in the same location as the alarm. Based on this information, the control room supervisor did not initiate an impairment request. Alarming Detector KC-104-XCH-ID-006 was adjacent to Detector KC-104-XSH-ID-007 that was listed in Impairment 2008-020. However, the control room supervisor did not verify the alarming detector point was the same detector point listed in the impairment.

On January 26, 2008, while performing Procedure STN KC-008, "Fire Alarm Control Panel KC-008 Daily Check," Revision 7, which required operators to check KC-008 alarms and trouble points, it was discovered that Detector KC-104-XCH-ID-006 did not have a fire protection impairment control permit. This detector was adjacent to Detector KC-04-XSH-ID-07 which was already inoperable in Impairment 2008-020. Administrative Procedure AP 10-103, "Fire Protection Impairment Control," Revision 22, required fire detection in the area to be declared inoperable if two adjacent detectors are inoperable. This condition existed for approximately 24 hours and required a compensatory continuous fire watch for the period that both detectors were inoperable. Upon discovery, a continuous fire watch was stationed and emergent work was declared to clean the dirty detectors.

Procedure AP 21-001, "Conduct of Operations," Revision 39, requires, in part, that watch stations are responsible for reviewing and understanding pertinent information such as control room turnover checklists for shift relief and turnover. The procedure also states that shift turnover discussions should include reasons for alarms and status panel lights. The residents noted that the control room turnover checklist contains a section for listing the KC008 alarms; however, the two turnover checklists for the two shifts following the initial alarm did not identify Detector KC-104-XCH-ID-006 as a KC-008 alarm. The control room turnover checklist also has specific requirements to review fire protection permits and verify that KC-008 alarms are not disabled or disarmed without documentation. However, neither review discovered that the alarm did not have an impairment issued. Based on this information, the residents concluded that the licensee had two previous opportunities to identify the condition during control room turnovers. After reviewing the licensee's evaluation of the condition, the residents noted that these aspects were not identified in the evaluations' conclusions or corrective actions which focused on only the initial error performed by the operator. During interviews with control room operators, the inspectors noted that operators are trained to ask for and get peer checks for verification of alarms and disabled points but failed to utilize any human error prevention tools in this instance.

Analysis. The failure to implement fire protection impairment control permit requirements and establish compensatory measures for the auxiliary building 2026' level was considered a performance deficiency. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's

regulatory function, and the finding was not the result of any willful violation of NRC requirements or Wolf Creek procedures. The inspectors determined that the finding was more than minor because it was associated with the mitigating systems cornerstone attribute of protection against external factors and affected the cornerstone objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, this issue relates to the protection against fire example of protection against external factors attribute because the detectors were inoperable without ensuring compensatory measures where in place. The inspectors evaluated the significance of this finding using Phase 1 of Inspection Manual Chapter (IMC) 0609, Appendix F, "Fire Protection Significance Determination Process," the inspectors determined that the finding was of very low safety significance because it involved compensatory measures for the fixed fire protection system and was assigned a low degradation rating since less than 10 percent of the fire detectors in the area were disabled. The inspectors also determined that the finding has crosscutting aspects in the area of human performance associated with work practices because the licensee failed to apply appropriate human error techniques such as self- and peer-checking techniques to avoid committing errors [H.4(a)].

Enforcement. Technical Specification 5.4.1.d requires that written procedures be established, implemented, and maintained covering activities related to fire protection program implementation. Administrative Procedure AP 10-103, "Fire Protection Impairment Control," Revision 21, requires, in part, fire protection impairment control permit shall be prepared in order to determine the appropriate compensatory measures and track the impairment. Contrary to the above, on January 25, 2008, two fire detectors were inoperable in the auxiliary building 2026' level without implementing a fire protection impairment control permit and establishing compensatory measures. This issue and the corrective actions are being tracked by the licensee in Condition Report (CR) 2008-001657. Because the finding is of very low safety significance and has been entered into the corrective action program, this violation is being treated as an NCV 05000482/2008002-01, Failure to Implement Fire Protection Impairment Control Permit Requirements and Compensatory Measures.

1R11 Licensed Operator Requalification Program (71111.11)

Resident Inspector Quarterly Review (71111.11Q)

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:

- February 1, 2008, loss of residual heat removal (RHR) during shutdown conditions

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

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 Technical Specifications.

- November 27, 2007, service water Pump A trip due to SL41 bus transients

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

Risk Assessment and Management of Risk

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- March 17-22, 2008, weekly T-0 risk assessment profile
- February 12 and 13, 2008, STS IC-805B degraded grid voltage relay testing

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed Technical Specification requirements and walked down portions of redundant safety systems,

when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Emergent Work Control

For the emergent work activities listed below, the inspectors: (1) verified that the licensee performed actions to minimize the probability of initiating events and maintained the functional capability of mitigating systems and barrier integrity systems; (2) verified that emergent work-related activities such as troubleshooting, work planning/scheduling, establishing plant conditions, aligning equipment, tagging, temporary modifications, and equipment restoration did not place the plant in an unacceptable configuration; and (3) reviewed the corrective action program to determine if the licensee identified and corrected risk assessment and emergent work control problems.

- January 11, 2008, shutdown due to ECCS voiding
- March 11, 2008, scaffolding installation resulting in reactive load swings

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

b. Findings

Introduction. The inspectors identified a Green NCV of Technical Specification 3.8.1.B.4 in which the licensee removed equipment from service that was prohibited by Technical Specifications.

Description. On February 11, 2008, the licensee entered TS 3.8.1.B.4.2.2. This specification allowed an emergency diesel generator to be inoperable for up to 7 days during an once per cycle extended outage. On February 12 and 13, inspectors observed surveillance Procedure STS IC-805B, "Channel Calibration of NB02 Grid Degraded Voltage, Time Delay Trip," Revision 11, for testing of the Train B of degraded voltage relays for offsite power. Offsite power Train B was declared inoperable at 10:09 a.m. on February 12. On February 12, instrumentation and control (I&C) technicians partially completed STS 805B, but required clarification of their procedure and secured the test and restored the equipment to operable status. On February 13, offsite power Train B was again declared inoperable at 7:49 a.m. Inspectors reviewed Technical Specification Bases 3.8.1.B.4 which prohibits elective maintenance within the switchyard that would challenge offsite power while in the 7-day emergency diesel generator extended outage. Inspectors also reviewed the NRC Safety Evaluation Report (SER) for the 7 day EDG allowed outage time (Technical Specification 3.8.1.B.4.2.2) and found that Section 4.6.c, states: "The offsite power supply and switchyard conditions are conducive to an extend[ed] DG [completion time], which includes ensuring that switchyard access is restricted and no elective maintenance within the switchyard is performed that would challenge the offsite power availability." Additionally, Condition D of the Technical Specification Bases states that no equipment or systems assumed to be available for the extended EDG completion time are removed from service, which includes auxiliary feedwater, component cooling water, essential service water and their support systems. However, Wolf Creek removed one train of offsite power degraded voltage relays which affects offsite power to

Bus NB02 (Train B) which is a support system for the above equipment. The inspectors found that Procedure STS IC 805B permits the testing of degraded voltage relays only while the diesel is out of service. The inspectors determined that this practice is acceptable when performing offsite power maintenance under Technical Specification 3.8.1.B.4.1, but not Technical Specification 3.8.1.B.4.2.2 due to the increase in risk for the longer allowed outage period. Procedure STS IC-805B was not revised subsequent to issuance of License Amendment 163 and permitted the work to occur. Additionally, Procedure AP 22C-003, "Operational Risk Assessment Program," Revision 13, prohibits elective maintenance within the switchyard that would challenge offsite power during Technical Specification 3.8.1.B.4.2.2. Wolf Creek appropriately restricted access to the portion of the switchyard outside the protected area but did not appropriately restrict work for offsite power inside the protected area. The inspectors determined that challenges to offsite power can originate with elective maintenance inside the protected area. Inspectors found that Wolf Creek assessed risk under 10 CFR 50.65 a(4) for this evolution which resulted in elevating risk to 'yellow' during testing.

Analysis. The inspectors determined that the failure to follow the NRC SER and Technical Specification Bases for Technical Specification 3.8.1.B.4 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 an offsite power source was at greater risk of being lost.

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 Train B offsite power being inoperable, but capable of supplying the safety bus for greater than 24 hours. As such, under Phase 1 screening, the deficiency is not related to a qualification or design deficiency, it did not represent a loss of safety function for a train or system as defined in the plant specific risk-informed inspection notebook, and was not related to external events such as fires and floods. Additionally, the cause of the finding has human performance crosscutting aspects in the area associated with work control. Specifically, Wolf Creek did not ensure STS IC-805B was appropriately coordinated within organizations to assure plant and human performance during the extended EDG allowed outage time [H.3(b)].

Enforcement. Technical Specification 3.8.1, Condition B.4.2.2, permits one diesel generator to be inoperable for 7 days provided the limitations articulated in the NRC SER for License Amendment 163. The NRC SER requires that the offsite power supply and switchyard conditions be conducive to an extend[ed] diesel generator [completion time], which includes ensuring that switchyard access is restricted and no elective maintenance within the switchyard is performed that would challenge the offsite power availability. The NRC SER also requires support equipment to systems such as auxiliary feedwater, component cooling water, and ESW to be available. Contrary to the above,

on February 12 and 13, 2008, Wolf Creek performed elective maintenance on the Train B offsite power degraded voltage relays while the Train B emergency diesel generator was in an extended outage. Because the finding is of very low safety significance and has been entered into the corrective action program as CR 2008-001675, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000482/2008002-02, Performing Prohibited Elective Maintenance on Offsite Power During EDG Maintenance.

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 Technical Specifications; (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.

- January 22, 2008, containment sump fabrication and calculation errors
- February 13, 2008, CCP A room cooler leak
- February 28, 2008, ECCS voids
- March 11, 2008, safety injection tank nitrogen leak

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples.

b. Findings

An unresolved item (URI) was identified when an operability determination dated January 22, 2008, was required to ensure that latent fabrication and calculation errors did not create unacceptable reductions in net positive suction head requirements for pumps in emergency core cooling systems. This new design information was associated with the already installed containment recirculation sump strainer modification. The associated vendor calculation, TD 6002 05, for clean strainer head loss omitted the head loss component associated with the orifices located in the strainer support plate. The size of the orifice beneath each strainer tube was not large enough to prevent head loss in excess of the net positive suction head required per the design conditions defined in the purchase specification supplied to the strainer vendor. The additional head loss due to the calculation correction was 2.28 feet. This resulted in required net positive suction head being less than available. Wolf Creek performed an operability determination review to demonstrate that the head loss margin could be recovered. The operability determination on January 22, 2008, addressed the smaller

support plate orifice holes by using additional margin gained by separating the head loss of the RHR and containment spray piping systems to demonstrate lower losses and additional water inventory in containment prior to containment spray swapover to the sump. Wolf Creek is replacing the strainer support plate with larger orifices to regain head loss margin in Refueling Outage 16. However, additional concerns were provided to the licensee by the vendor on April 1, 2008, addressing nonconservative temperature correction through the orifices. Subsequent to this, the licensee will need to perform additional analyses to determine if negative margin existed during the last cycle and if the new orifice holes will provide positive margin. At the completion of the inspection period, there were still unresolved questions about the assumptions and results associated with the calculations used for regaining net positive suction head margin. These concerns require additional inspection and, when completed, the inspection results will require significance determination. This issue is considered unresolved pending additional NRC review of Wolf Creek operability determination calculations: URI 05000483/2008002-03, Containment Sump Net Positive Suction Head Losses.

1R18 Plant Modifications (71111.18)

.1 Permanent Modification Review

- a. The inspectors reviewed key affected parameters associated with energy needs, materials/replacement components, timing, heat removal, control signals, equipment protection from hazards, operations, flowpaths, pressure boundary, ventilation boundary, structural, process medium properties, licensing basis, and failure modes for the one modification listed below. The inspectors verified that: (1) modification preparation, staging, and implementation does not impair emergency/abnormal operating procedure actions, key safety functions, or operator response to loss of key safety functions; (2) postmodification testing will maintain the plant in a safe configuration during testing by verifying that unintended system interactions will not occur, SSC performance characteristics still meet the design basis, the appropriateness of modification design assumptions, and the modification test acceptance criteria has been met; and (3) the licensee has identified and implemented appropriate corrective actions associated with permanent plant modifications

- March 6, 2008, containment spray recirculation piping for full flow testing

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.2 Temporary Modification Review

a. Inspection Scope

The inspectors reviewed plant drawings, procedure requirements, and Technical Specifications to ensure that the below temporary modification was properly implemented. The inspectors: (1) verified that the modification did not have an affect on

system operability/availability, (2) verified that the installation was consistent with the modification documents, (3) ensured that the post installation test results were satisfactory and that the impact of the temporary modification on permanently installed SSC's were supported by the test, (4) verified that the modifications were identified on control room drawings and that appropriate identification tags were placed on the affected drawings, and (5) verified that appropriate safety evaluations were completed. The inspectors verified that licensee identified and implemented any needed corrective actions associated with temporary modifications.

- January 22, 2008, safety injection room cooler temporary modification procedure
- February 6, 2008, rod control circuitry monitoring equipment for troubleshooting

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed two samples.

b. Findings

No findings of significance were identified

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.

- January 31, 2008, safety injection Pump A run following planned maintenance
- February 15, 2008, EDG B run following planned maintenance
- March 5, 2008, centrifugal charging Pump A following planned maintenance

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed three samples.

b. Findings

No findings of significance were identified.

1R20 Outage Activities (71111.20)

.1 Refueling Outage Activities

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for Wolf Creek Refueling Outage 16 that started on March 22, 2008, and continued into the next period, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense in depth. During the refueling outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Licensee configuration management, including maintenance of defense in depth commensurate with the outage safety plan for key safety functions and compliance with the applicable Technical Specifications when taking equipment out of service.
- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error.
- Controls over the status and configuration of electrical systems to ensure that Technical Specification and outage safety plan requirements were met, and controls over switchyard activities.
- Monitoring of decay heat removal processes, systems, and components.
- Controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system.
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss.
- Controls over activities that could affect reactivity.
- Maintenance of secondary containment as required by Technical Specifications.
- Refueling activities, including fuel handling and sipping to detect fuel assembly leakage.

- Licensee identification and resolution of problems related to refueling outage activities.

The inspectors will complete this sample in the next quarter.

b. Findings

No findings of significance were identified.

.2 Other Outage Activities

a. Inspection Scope

The inspectors evaluated forced outage activities for an unscheduled outage that began on January 11, 2008, and continued through January 16, 2008, due to a Technical Specification required shutdown for voiding in ECCSs. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule. The inspectors observed or reviewed the reactor shutdown and cooldown, outage equipment configuration, risk management, electrical lineups, selected clearances, control and monitoring of decay heat removal, control of containment activities, and identification and resolution of problems associated with the outage. The inspectors observed portions of the reactor startup and heatup.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified for the forced outage. Aspects of the ECCS voiding will be contained in NRC Special Inspection Report 05000482/2008-008.

.3 Other Outage Activities

a. Inspection Scope

The inspectors evaluated forced outage activities for an unscheduled outage that began on March 17, 2008, due to a reactor trip due to XPB03 transformer failure, and continued through the start of Refueling Outage 16. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule. The inspectors observed or reviewed the reactor shut down and cool down, outage equipment configuration and risk management, electrical lineups, selected clearances, control and monitoring of decay heat removal, control of containment activities, and identification and resolution of problems associated with the outage.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified for the forced outage. Additional aspects of the plant trip are in Section 4OA3.3.

1R22 Surveillance Testing (71111.22)

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and Technical Specification requirements:

- January 26, 2008, emergency exhaust system run
- February 11-15, 2008, offsite power alignment Technical Specification surveillance
- February 18, 2008, STS BG-002, ECCS vent and void checks
- March 6, 2008, EDG A biennial 24-hour endurance and load test

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: any preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as left setpoints were within required ranges; the calibration frequency was in accordance with Technical Specifications, the USAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met Technical Specification requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of the safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the corrective action program.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed four samples

b. Findings

No findings of significance were identified.

.2 In-service Testing Surveillance

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and Technical Specification requirements:

- January 23, 2008, inservice testing of residual heat removal Pump B
- February 5, 2008, inservice testing of atmospheric relief Valve D

The inspectors observed in-plant activities and reviewed procedures and associated records to determine whether: any preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as left setpoints were within required ranges; and the calibration frequency were in accordance with Technical Specifications, the USAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met Technical Specification requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers (ASME) Code, and reference values were consistent with the system design basis; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the corrective action program. Documents reviewed are listed in the attachment.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed two samples.

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.

- January 31, 2008, loss of all annunciators followed by loss of all offsite power

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

Review of Licensee Performance Indicators for the Occupational Exposure Cornerstone

a. Inspection Scope

This area was inspected to assess the licensee's performance in implementing physical and administrative controls for airborne radioactivity areas, radiation areas, high radiation areas, and worker adherence to these controls. The inspectors used the requirements in 10 CFR Part 20, the Technical Specifications, and the licensee's procedures required by Technical Specifications as criteria for determining compliance. During the inspection, the inspectors interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspectors performed independent radiation dose rate measurements and reviewed the following items:

- Performance indicator events and associated documentation packages reported by the licensee in the occupational radiation safety cornerstone

- Controls (surveys, posting, and barricades) of radiation, high radiation, or airborne radioactivity areas
- Radiation work permits, procedures, engineering controls, and air sampler locations
- Conformity of electronic personal dosimeter alarm set points with survey indications and plant policy; workers' knowledge of required actions when their electronic personnel dosimeter noticeably malfunctions or alarms
- Barrier integrity and performance of engineering controls in airborne radioactivity areas
- Physical and programmatic controls for highly activated or contaminated materials (nonfuel) stored within spent fuel and other storage pools.
- Self-assessments, audits, licensee event reports (LERs), and special reports related to the access control program since the last inspection
- Corrective action documents related to access controls
- Licensee actions in cases of repetitive deficiencies or significant individual deficiencies
- Radiation work permit briefings and worker instructions
- Adequacy of radiological controls, such as required surveys, radiation protection job coverage, and contamination control during job performance
- Dosimetry placement in high radiation work areas with significant dose rate gradients
- Changes in licensee procedural controls of high dose rate - high radiation areas and very high radiation areas
- Controls for special areas that have the potential to become very high radiation areas during certain plant operations
- Posting and locking of entrances to all accessible high dose rate - high radiation areas and very high radiation areas
- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements

Documents reviewed by the inspector are listed in the attachment.

The inspector completed 20 of the required 21 samples.

b. Findings

- .1 Introduction. A self-revealing NCV of Technical Specification 5.7.2.a was reviewed involving the failure to evaluate changing radiological conditions in Room 7604 and control the area as a locked high radiation area. The violation had very low safety significance.

Description. On September 26, 2007, mixed bed Demineralizer A was sluiced to the primary spent resin storage tank. During a followup survey, a localized concentration of resin was identified in the common sluice header in the 2022' pipe chase of the radioactive waste building. Operations was unable to perform a lineup to remove the resin because a procedure for that evolution did not exist. It was decided to leave the resin in place since it was in a remote location, the area was being controlled as a locked high radiation area, and it would be removed during the next resin sluice evolution.

On October 15, 2007, Clearance Order EC-N-005 was developed to vent and drain a section of piping in preparation for work on Valve ECV0081. The vent path for Clearance Order EC-N-005 was through Valve ECV0079, located in Room 7604, which ties into the common resin sluice header. Dose rates in Room 7604 are typically in the range of 8 – 10 mRem/hour. The clearance order group was not informed of the localized concentration of resin remaining in the sluice header. In preparation for hanging the clearance, operations radioactive waste personnel and health physics personnel discussed the dose rates in the affected areas, valve manipulations, and that the vent path was hard piped and would not require a temporary hose connection.

On the morning of October 16, 2007, a radwaste person performing routine evolutions entered Room 7604 and immediately received a dose rate alarm on his electronic dosimeter. The operator immediately exited the room and notified health physics personnel. An evaluation of the individual's electronic dosimeter indicated he had entered an area with a dose rate of 74 mRem/hour. The dosimeter had been set to alarm at 50 mRem/hour. Radiological surveys of the area taken at 9 a.m. on October 16 indicated dose rates as high as 197 mRem/hour. The area was immediately posted as a high radiation area. At this time, the licensee did not understand the cause of the increased radiation levels. Followup surveys were taken at 9 a.m. on October 17 and indicated that dose rates had increased to 1500 mRem/hour requiring posting and control as a locked high radiation area. The area was immediately posted and controlled as a locked high radiation area. Subsequent surveys showed dose rates reached a maximum of 2500 mRem/hour before a temporary instruction was written to flush the resin from the common sluice header.

The inspectors determined that health physics personnel failed to perform timely surveys to identify and control a locked high radiation area. Corrective actions included immediately posting and controlling the area as a locked high radiation area and developing a temporary procedure to flush the resin from the common sluice header to the spent resin storage tank.

Analysis. This finding is more minor because it is associated with the occupational radiation safety program and process attribute and affected the cornerstone objective, in that, the failure to properly post and control access to a locked high radiation area has the potential to increase personnel dose. This occurrence involves the potential for

unplanned, unintended dose. Utilizing IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspector determined that the finding was of very low safety significance because it did not involve: (1) as low as is reasonably achievable (ALARA) planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. This finding has a crosscutting aspect in the area of human performance associated with the work control component because the licensee failed to appropriately plan work activities by incorporating job site conditions that may impact radiological safety [H.3(a)].

Enforcement. Technical Specification 5.7.2.a requires that the entryway to high radiation areas with dose rates greater than 1.0 Rem/hour be conspicuously posted as a high radiation area and shall be provided with a locked or continuously guarded door or gate. Contrary to this requirement, the licensee failed to perform a timely survey of Room 7604 and evaluate changing radiological conditions which, required the room to be posted and controlled as a "Locked High Radiation Area." Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as CR 2007-003934, this violation is being treated as an NCV consistent with Section VI.A of the Enforcement Policy: NCV 05000482/2008002-04, Failure to Control Area as a Locked High Radiation Area.

- .2 Introduction. The inspectors reviewed a self-revealing NCV of Technical Specification 5.4.1 for failure to follow a licensee procedure.

Description. On March 29, 2008, while performing radiography at the quality control vault, a radiographer assistant received a dose rate alarm on his electronic dosimeter. Radiography evolutions at the site are controlled using a radiation work permit provided by the health physics department. Radiation Work Permit 08-3021 established a dose rate alarm setpoint of 500 mRem/hour. The radiography crew properly secured the radiography source and performed surveys of the source camera. The radiographer and assistant reviewed the dose received by each individual as indicated on their electronic dosimeters and, without notifying health physics personnel, decided to continue with radiography. The alarm condition was noted when the radiographer and assistant returned to access control to sign off of the radiation work permit. A review of the dosimeters indicated that the assistant received a total dose of 2.0 mRem with a peak dose rate of 512 mRem/hour and the radiographer received 2.9 mRem with a peak dose rate of 476 mRem/hour. Immediate corrective actions included restriction of the radiographers to log onto the radiation work permit and discussions with the radiographers and the contractor's radiation safety officer. Long-term corrective action is still being evaluated.

Analysis. This finding is greater than minor because it is associated with the occupational radiation safety program and process attribute and affected the cornerstone objective, in that the failure to stop work and notify health physics personnel for assistance had the potential to increase personnel dose. This occurrence involves the potential for unplanned, unintended dose. Utilizing IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that the finding was of very low safety significance because it did not involve: (1) ALARA planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. This finding has a crosscutting aspect in the area of human performance associated with the decision making component because the radiographer and assistant failed to contact health physics

personnel to discuss the circumstances surrounding the unexpected dose rate alarm [H.1(a)].

Enforcement. Technical Specification 5.4.1 requires procedures be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Appendix A. Section 7 of Appendix A recommends radiation protection procedures for personnel monitoring. Licensee Procedure AP 25B-100, "Radiation Worker Guidelines," Section 6.2.8 states, in part, "If an individual's electronic dosimeter alarms, the worker shall notify coworkers/health physics and exit the area. Health physics personnel will then evaluate radiological conditions prior to the continuation of work." Contrary to this requirement, the radiographer and assistant failed to notify health physics personnel prior to resuming work activities. Because this failure to follow a procedure is of very low safety significance and has been entered into the licensee's corrective action program as CR 2008-001181, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000482/2008002-05, Failure to Follow Procedure.

2OS2 ALARA Planning and Controls (71121.02)

Inspection Planning

a. Inspection Scope

The inspectors assessed licensee performance with respect to maintaining individual and collective radiation exposures ALARA. The inspectors used the requirements in 10 CFR Part 20 and the licensee's procedures required by Technical Specifications as criteria for determining compliance. The inspector interviewed licensee personnel and reviewed:

- Outage or on-line maintenance work activities scheduled during the inspection period and associated work activity exposure estimates, which were likely to result in the highest personnel collective exposures
- Site-specific ALARA procedures
- Integration of ALARA requirements into work procedure and radiation work permit documents
- Workers' use of the low-dose waiting areas
- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas
- Self-assessments, audits, and special reports related to the ALARA program since the last inspection
- Resolution through the corrective action process of problems identified through postjob reviews and postoutage ALARA report critiques
- Corrective action documents related to the ALARA program and followup activities, such as initial problem identification, characterization, and tracking

- Effectiveness of self-assessment activities with respect to identifying and addressing repetitive deficiencies or significant individual deficiencies

Documents reviewed by the inspector are listed in the attachment.

The inspector completed 5 of the required 15 samples and 4 of the optional samples.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Data Submission

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the 4th quarter 2007, performance indicators for any obvious inconsistencies prior to its public release in accordance with IMC 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings of significance were identified.

.2 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams per 7000 critical hours performance indicator for the period from the 4th quarter 2006 through the 4th quarter 2007. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Revision 5 of the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC Inspection reports for the period of January 1, 2006, through December 31, 2007, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.3 Unplanned Scrams with Complications

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams with complications performance indicator for the period from the 4th quarter 2006 through the 4th quarter 2007. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Revision 5 of the NEI Document 99 02, "Regulatory Assessment Performance Indicator Guideline," were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC Integrated Inspection reports for the period of January 1, 2006, through December 31, 2007, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.4 Unplanned Transients per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned transients per 7000 critical hours performance indicator for the period from the 4th quarter 2006 through the 4th quarter 2007. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Revision 5 of the NEI Document 99 02, "Regulatory Assessment Performance Indicator Guidelines," were used. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports and NRC integrated inspection reports for the period of January 1, 2006, through December 31, 2007, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.5 Occupational Radiation Safety

a. Inspection Scope

The inspectors reviewed licensee documents for occupational exposure control effectiveness from July 1 through December 31, 2007. The review included corrective action documentation that identified occurrences in locked high radiation areas (as defined in the licensee's technical specifications), very high radiation areas (as defined in 10 CFR 20.1003), and unplanned personnel exposures (as defined in NEI 99-02, "Regulatory Assessment Indicator Guideline," Revision 5). Additional records reviewed included ALARA records and whole body counts of selected individual exposures. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the performance indicator data. In addition, the inspector toured plant areas to verify that high radiation, locked high radiation, and very high radiation areas were properly controlled. Performance indicator definitions and guidance contained in NEI 99-02, Revision 5, were used to verify the basis in reporting for each data element.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.6 Public Radiation Safety

a. Inspection Scope

The inspectors reviewed licensee documents for Radiological Effluent Technical specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences from July 1 through December 31, 2007. Licensee records reviewed included corrective action documentation that identified occurrences for liquid or gaseous effluent releases that exceeded performance indicator thresholds and those reported to the NRC. The inspector interviewed licensee personnel that were accountable for collecting and evaluating the performance indicator data. Performance indicator definitions and guidance contained in NEI 99-02, Revision 5, were used to verify the basis in reporting for each data element.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified

4OA2 Identification and Resolution of Problems (71152)

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection

.1 Routine Review of Items Entered Into the Corrective Action Program

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's corrective action program as a result of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished through inspections of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.3 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors selected the corrective action report listed below for a more indepth 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.

- March 10, 2008, CR 2008-000790, automatic voltage control affected by scaffold construction

The above constitutes completion of one indepth problem identification and resolution sample.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.4 Routine Review of Items Entered into the Corrective Action Program for Access Control to Radiologically Significant Areas and ALARA Planning and Controls

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's corrective action program as a result of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter.

b. Findings

No findings of significance were identified.

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

.1 Technical Specification 3.0.3 Plant Shutdown due to ECCS voiding

a. Inspection Scope

The inspectors responded to the control room on January 11, 2008, 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.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

No findings of significance were identified.

.2 Notice of Enforcement Discretion (NOED) 08-4-001: NOED for Wolf Creek Nuclear Operating Corporation CCP A Room Cooler Leak on February 13, 2008

a. Inspection Scope

On February 13, 2008, EDG B was out of service for planned maintenance, also one offsite power source was out of service for I&C testing on the Train B degraded voltage relays. On February 13, 2008, at 2:20 p.m., the Wolf Creek control room received a report of a water leak from the room cooler for CCP A. At 3:50 p.m. on February 13, 2008, a circumferential flaw on an H-bend was discovered in SGL12A that resulted in the NOED request. The inspectors reviewed the compensatory actions described in the NOED. The inspectors observed the just-in-time training for the reactor operators which consisted of the key operator actions that required a higher degree of assurance for success to mitigate the NOED risk. Inspectors reviewed the offsite power surveillances, the Sharpe station availability rounds, and the protected equipment signs.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

- .1 The inspectors questioned two operators regarding the just-in-time training for the most risk significant reactor operator manual actions as shown in the Wolf Creek risk analysis. The inspectors found that the operators had difficulty recalling the training objectives. Subsequently, Wolf Creek re-briefed the control room crew on those manual actions.

Because this deficiency with the compensatory actions was resolved at approximately the same time (within minutes) of the expiration of the 4-hour allowed outage time, and before the Technical Specification requirement to be in Mode 3 within the subsequent 6 hours, the inspectors judged the deficiency to be minor.

- .2 February 13, 2008, failure to establish reasonable expectation of operability

Introduction: A Green NRC identified NCV of TS 5.4.1 for failure to follow the operability process on discovery of the CCP A room cooler leak.

Description: On February 13, 2008, EDG B was out of service for planned maintenance, also one offsite power source was out of service for I&C testing on the Train B degraded voltage relays. On February 13, at 2:20 p.m., the Wolf Creek control room received a report of a water leak from the room cooler for CCP A. At 2:20 p.m., it could not be established if the leak would cause a loss of structural integrity of the ESW system. Wolf Creek Procedure AP 26C-004, "Technical Specification Operability," Step 6.2.1 requires continued operability decisions be made in the shift manager's log. Wolf Creek made no log entries at 2:20 p.m. stating the basis for immediate operability. At 3:50 p.m. Wolf Creek control room logs state that CCP A had a room cooler leak and structural integrity cannot be verified. Subsequent entry into TS 3.7.8 for the Pump ESW A caused EDG A to be inoperable. TS 3.8.1, Condition I, states, that with three alternating current sources inoperable, (both EDGs and on offsite source) TS 3.0.3 shall be entered. Wolf Creek entered TS 3.0.3 at 3:50 p.m. and exited TS 3.0.3 at 4:13 p.m. when the inlet and outlet valves to CCP A's room cooler were closed. These log entries were 'after the fact' log entries made at approximately 5 p.m. to reflect the above sequence.

From interviews with control room operators on shift during this time, operators believed that the most limiting TS action statement was TS 3.8.1.B.4.2.2 which is 4 hours. This was due to the fact that operators made an assumption that the leakage was not through wall and that the cooler was operable prior to visual examination or other factual information. The inspectors judged that, since structural integrity could not be assured at 2:20 p.m., the room cooler was inoperable, as stated later in the Wolf Creek control room logs. The inspectors could not locate any justification produced by Wolf Creek for the room cooler's operability after 2:20 p.m. In consultation with the Office of Nuclear Reactor Regulation TS branch, the inspectors judged that it was not appropriate to make such assumptions and wait for 1.5 hours to ascertain the nature of the leak when entry into TS 3.0.3 would have been necessary and required action to be initiated within 1 hour to place the unit in Mode 3 within 7 hours. Inspectors reviewed Part 9900, "Technical Guidance for Operability and for cases of ASME Code Class 3 leaks." Part 9900 Technical Guidance states, in part, that an immediate operability declaration shall be made with a reasonable expectation for continued operability within a period commensurate with safety. During interviews, Wolf Creek staff stated that they had not considered the extensive internal OE on through wall room cooler leaks during initial operability reviews.

Analysis: The inspectors determined that the failure to follow the operability process 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 if left uncorrected, it could become a more significant safety concern if the operability procedures are not correctly applied. 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 screened to Phase 2 because the finding represents an actual loss of safety function of a single train of high head injection. A bounding risk of Green results from the Phase 2 presolved worksheets. This result was obtained by using an exposure time of less than 3 days for the scenario: "Centrifugal Charging Pump PBG05A [Fails to Run]." The inspectors also determined that the finding had crosscutting aspects in the human performance area associated with decision making because the licensee failed to use conservative assumptions in its operability decision and apply a requirement to demonstrate that the room cooler is operable is in order to proceed rather than assuming that it is operable with no supporting information [H.1(b)].

Enforcement: TS 5.4.1.a requires procedures be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Appendix A. Appendix A, Section 1, recommends administrative procedures for safe operation of the plant. Procedure AP 26C-004, "Technical Specification Operability," Revision 16 implements this requirement and states, in part, that continued operability decisions shall be made in the shift manager's log. Contrary to the above, on February 13, 2008, at 2:20 p.m. CST, Wolf Creek did not implement its operability procedure and establish operability for the CCP A room cooler. Because the finding is of very low safety significance and has been entered into the corrective action program as CR 2008-001647, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000482/2008002-06, "Failure to Establish Reasonable Expectation of Operability."

.3 Untimely Corrective Actions for CCP A Room Cooler Leads to NOED

Introduction: On February 13, 2008, the inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to take timely corrective actions to prevent failure of the CCP A room cooler which resulted in the NOED.

Description: The inspectors found that room Cooler SGL12A experienced leaks in October 1999, May 2003, October 2003, August 2004, October 2006, and again in February 2008. SGL12A was installed at the time of plant startup in 1985. On February 13, 2008, a circumferential flaw on an H-bend was discovered in SGL12A. Wolf Creek subsequently initiated CR 2008-000467.

Problem Identification Reports (PIRs) 2005-2507 and 2004-0688 identified that leaks for all room coolers had been an ongoing problem since at least April 2002. PIR 2004-0688 raised the eddy current minimum wall thickness acceptance criteria from 0-20 percent. PIR 2005-2507 corrective actions had scheduled room Cooler SGL12A for replacement on April 2, 2007, with a new stainless steel unit not susceptible to wall thinning leaks. PIR 2005-2507 remains open for these corrective actions. On March 14, 2007,

Wolf Creek chose to delay SGL12A's replacement until Refueling Outage 16 due to the required length of time to replace the cooler. SGL12A was then rescheduled for replacement on March 22, 2008, the next refueling outage. The inspectors could not locate an engineering evaluation to justify the replacement extension. During interviews, Wolf Creek engineers stated that there is no formal failure analysis for the H-bend failures. On February 13, 2008, SGL12A experienced its third H-bend through wall leak and its sixth overall leak. The H-bend was then replaced as an interim measure. Inspectors reviewed corrective action Procedure AP 28A-100, "Condition Reports," Revision 3 and found that a loss of a train to perform its safety function is considered a significant deficiency requiring corrective action to prevent recurrence. The inspectors reviewed PIRs 2005-2507 and 2004-0688, and CR 2008-0467 and found that Wolf Creek designated each as nonsignificant which did not require actions to prevent recurrence. Wolf Creek has subsequently implemented the corrective action identified in PIR 2005-2507 to replace the SGL12A with a stainless steel unit during Refueling Outage 16.

Analysis: The failure to take timely corrective actions 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 corrected in timely fashion 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 screened to Phase 2 because the finding represents an actual loss of safety function of a single train of high head injection, for greater than its Technical Specification 3.8.1.B.2 allowed outage time of 4 hours. Using an exposure time of less than 3 days for the scenario "Centrifugal Charging Pump PBG05A [Fails to Run]," a bounding risk of Green results from the Phase 2 presolved worksheets. Additionally, the cause of the finding has crosscutting aspects in the human performance area associated with resources. Specifically, Wolf Creek did not ensure adequate resources to maintain long-term plant safety by minimizing the room coolers' long-standing issues and preventive maintenance deferrals [H.2(a)].

Enforcement: 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that for significant conditions adverse to quality, measures shall assure the cause is determined and that actions are taken to preclude repetition. Corrective Action Procedure AP 28-100, "Condition Reports," Revision 3 states that a loss of a train to perform its safety function is considered a significant deficiency requiring corrective action to prevent recurrence. Contrary to the above, from October 23, 1999, to February 13, 2008, ECCS room Cooler SGL12A experienced multiple leaks. Specifically, the licensee did not take corrective actions for approximately 9 years to prevent the recurrence of leaks for Room Cooler SGL12A leading to the inoperability of a train of ECCS equipment. This issue and the corrective actions are being tracked by Wolf Creek in CR 2008-001673. Because the violation was of very low safety significance and the issue was captured in the licensee's corrective action program, this violation is

being treated as an NCV consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000482/2008002-07, Untimely Corrective Actions for CCP Room Cooler Leads to NOED (EA-08-052).

.3 March 17, 2008, Reactor Trip due to XPB03 transformer trip

a. Inspection Scope

The inspectors responded to the control room on March 17, 2008, due to a reactor trip from the XPB03 transformer trip, 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. The inspectors observed the reactor shutdown and cooldown.

Documents reviewed by the inspectors are listed in the attachment.

The inspectors completed one sample.

b. Findings

On March 17, 2008, plant operators observed that steam generator water level was lowering and main feed pump speed was decreasing. Based on these indications, Wolf Creek operators manually tripped the plant. Posttrip immediate actions and followup actions were completed without deviation. An auto actuation of auxiliary feed water occurred due to low/low steam generator water levels as expected but no other ECCS or engineered safety feature actuations occurred. All plant equipment responded as expected.

Following the trip, control room operators observed indications that the plant had experienced a loss of the XPB03 13.8 kV to 4.16 kV nonsafety transformer which powers PB003 4.16 kV nonsafety bus. Approximately 12 hours prior to the transformer trip, Wolf Creek had removed from service XPB04 transformer for planned maintenance and cross connected XPB04 transformer PB004 bus loads to the XPB03 transformer PB003 bus. This arrangement powered all three condensate pumps from the PB003 4.16 kV bus. The PB003 bus powers condensate Pumps A and C and the PB004 bus powers condensate Pump B. The XPB03 transformer trip resulted in losing power to all three condensate pumps which tripped the main feed pumps on low suction pressure.

The licensee's initial draft investigation of the cause of the transformer trip determined that two phases of the XPB03 transformer 4.16 kV output cables had overheated and failed. Additional investigation into the cable failures discovered that two multi-directional conductor connectors used to terminate two phases of the 1000 million circular mils (MCM) 4.16 kV bus cables were installed using the incorrect configuration. The cable connector had been installed using a 1500-2000 MCM configuration which resulted in the conductor connector bottoming out before applying sufficient compression to ensure adequate connection to the cable.

Pending completion of the licensee's root cause determination and consequence assessment by a Region IV Senior Reactor Analyst, additional inspection of the finding is needed to determine significance. This issue is considered unresolved pending additional NRC review of Wolf Creek root cause determination. This issue will be tracked as: Unresolved Item (URI) 05000483/2008002-08, Transformer Trip Resulted in an Unplanned Reactor Trip and Forced Outage.

.4 (Closed) LER 05000482/2008-001-00, CCP A Room Cooler Out of Service Longer Than Allowed Under Technical Specification 3.8.1.B.2

The inspectors reviewed LER 05000482/2008-001-00 to verify that the cause of the Train A CCP exceeding its allowed outage time was identified and that corrective actions were appropriate. See Section 4OA3.3 for additional information on the event and enforcement actions taken. See also "Notice of Enforcement Discretion for Wolf Creek Nuclear Operating Corporation Regarding Wolf Creek Generating Station [TAC No MD8098, NOED No. 08-4-001]," under ADAMS Accession No. ML080520023 for more information regarding the NOED. This LER is closed.

.5 (Closed) LER 05000482/2005-006-00: Unanalyzed Condition Related to Loss of Reactor Coolant Pump Seal Cooling during a Postulated Appendix R Fire Event

Introduction. The inspectors identified an NCV of Technical Specification 5.4.1.d because Procedure OFN-RP-017, "Control Room Evacuation," Revision 21, failed to ensure that operators took the required actions to reestablish reactor coolant pump seal cooling in a timely manner. Failure to establish seal cooling in a timely manner could have resulted in a small break loss of coolant accident. This finding was determined to be of very low risk significance (Green).

Description. While timing operator actions during a 2005 triennial fire protection inspection (NRC Inspection Report 05000482/2005008, Section 1R05.6.b(2)), the inspectors determined that control room operators could not reestablish seal cooling to the reactor coolant pumps in a timely manner. The failure to reestablish seal cooling within 21 minutes would degrade the seals and could result in a small break loss of coolant accident. The delay in reestablishing seal cooling to the reactor coolant pumps allows the seals to overheat and the subsequent flow of relatively cool water shatters the seals and allows for excessive leakage. Specifically, the inspectors postulated circuit failures that required operators to start the Train B EDG manually, as specified in Procedure OFN-RP-017, Attachment C, Step 10, and manually open Valve BN-LCV-112E, Train B CCP suction from the refueling water storage tank, as specified in Attachment C, Step 24.

The licensee indicated that they had planned to revise Procedure OFN-RP-017 in response to information contained in Information Notice 2005 14, "Fire Protection Findings on Loss of Seal Cooling to Westinghouse Reactor Coolant Pumps," dated June 5, 2005, and Westinghouse WCAP-16396 NP, "Reactor Coolant Pump Seal Performance for Appendix R Assessments," dated January 2005. The licensee reported that the NRC used a more conservative approach to develop the time line for reestablishing seal cooling to the reactor coolant pumps than they had previously used.

The failure to ensure that operators could reestablish seal cooling to the reactor coolant pumps within the prescribed time could cause failure of the pump seals and increase the

leakage upon reestablishing the cooling such that pressurizer level would decrease below the indicating range. The licensee documented this deficiency in their corrective action program as PIR 2005-03209. The licensee modified Procedure OFN-RP-017 to require operators to trip the reactor coolant pumps immediately.

The inspectors reviewed the physical configuration of the control room and verified that a fire would have to affect two separate panels and disable specific components on the panels. The control switch for the charging pump suction valve is located on Panel RL001 and the control switch for the Train B EDG is located on Panel RL015. The top of Panel RL015 opens to the ceiling (i.e. the floor of the upper cable spreading room) although penetrations are sealed. The inspectors verified that approximately 3 feet separates the front of Panel RL015 from the rear of Panel RL001 and that 7 feet separate the switches on the separate panels. Panel RL001 has a top vent that allows heat to escape. Neither panel has front vents; consequently, air does not readily flow through the panels. Channels separate the Trains A and B components within each panel. Because of the channel separation within each panel, a high likelihood exists that the Train A components would be available.

Analysis. This performance deficiency resulted from an inadequate postfire safe shutdown procedure. The inspectors determined the finding is more than minor in that it affected the ability to achieve and maintain hot shutdown following a control room fire. This finding is associated with the mitigating systems cornerstone attribute of protection against external factors (e.g. fire). This finding affected the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to external events (such as fire) to prevent undesirable consequences. Consequently, the inspectors evaluated these deficiencies using IMC 0609, Appendix F. The inspectors determined that this procedure deficiency had more than minor impact on the ability to implement the postfire safe shutdown procedure; consequently, the inspectors assigned the issue a moderate degradation rating. The deficiency required a Phase 3 evaluation since Appendix F did not explicitly apply to fires that result in evacuating the control room.

The NRC senior reactor analyst assigned a generic fire ignition frequency for the control room which was slightly higher than the value in the IPEEE for Severe Accident Vulnerabilities. The analyst multiplied the fire ignition frequency by a severity factor and a nonsuppression probability indicating that operators failed to extinguish the fire within 20 minutes assuming 2 minute detection that requires a control room evacuation. The resulting evacuation frequency is:

Control Room Evacuation Frequency = fire ignition frequency for the control room * severity factor * NP control room evacuation =

Control Room Evacuation Frequency = $1.09E-02/\text{year} * 0.1 * 1.30E-02 = 1.42E-05/\text{year}$

The analyst estimated the probability of a fire induced failure as a two wire short and determined this probability to be 0.6 squared for a resulting probability of 0.36. The analyst calculated the resulting frequency of occurrence by multiplying the control room evacuation frequency by the two wire short for a value of $5.10E-06/\text{year}$.

The analyst determined the delta conditional core damage probability by subtracting the base case conditional core damage probability (0.1) from the assumed fire damage

conditional core damage probability (1.0) for a value of (0.9). The bounding delta conditional core damage frequency for a 1 year exposure is the frequency of occurrence (5.10E-06/year) multiplied by the delta conditional core damage probability (0.9) for a value of 4.59E-06.

The analyst then qualitatively assessed the probability that the specific fires necessary would occur. The fire had to affect components located in two physically separated panels, as described below:

- On Panel RL015 the protected Train B diesel generator control power and the Train A diesel generator control power prior to the transfer. Affecting both components separated by 1.32 meters has a low likelihood.
- On Panel RL001 are the controls and valves for the centrifugal charging pumps that provide seal cooling to the reactor coolant pumps. A distance of 3 feet separated the front of Panel RL015 from the rear of Panel RL001; in addition, a distance of 7 feet separated the switches on Panel RL001 and the switches on Panel RL015.

The licensee installed fire resistant cables qualified in accordance with Institute of Electrical and Electronics Engineers (IEEE) Standard 383-1974, "IEEE Standard for Type Test of Class IE Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations," throughout the plant.

The analyst referred to NUREG/CR-6850, "Fire PRA Methodology for Nuclear Power Facilities," Section 11.5.2 and the test results described in NUREG/CR-4527, "An Experimental Investigation of Internally Ignited Fires in Nuclear Power Plant Control Cabinets: Parts 1 and 2," to characterize the effects of cabinet spacing. The analyst determined that NUREG/CR-6850 discussed that the review of control room fires determined that none of the fires affected components beyond the point of ignition and that in all cases operators extinguished the fires with hand held extinguishers. The testing results reported in NUREG/CR-4527, Section 4.2.2, indicated that fire growth depended on ventilation flow through the cabinet to provide fresh oxygen and fire spread to an adjacent cabinet is very dependent upon the location of the cabinet, the barriers between the cabinets, and the qualification of the wires. The laboratory performed the testing on adjacent cabinets with one inch separation and single and double walls. The testing demonstrated that the worst-case spread of fire outside a cabinet occurred with unqualified cables and only extended 0.5 meters.

Considering the distance between the cabinets of 1 meter and the use of qualified cables, the analyst concluded that it would be highly unlikely for a fire to move from one cabinet to another within the 20 minute period before operators suppressed the fire or restored seal injection. Because of the separation, the analyst concluded that the qualitative factors would reduce the bounding value such that this deficiency had very low risk significance (Green). This finding did not have crosscutting aspects since the performance deficiency occurred outside of the assessment period.

Enforcement. Technical Specification 5.4.1.d states the licensee will establish, implement, and maintain procedures for implementing the fire protection program. Procedure OFN-RP-017, "Control Room Evacuation," Revision 21, specified requirements to reestablish seal cooling to the reactor coolant pumps. Contrary to the

above, the inspectors determined that operators could not implement the steps of Procedure OFN-RP-017 within the critical time to prevent seal damage, which would result in a small break loss of coolant accident. Because this finding is of very low safety significance and the licensee entered the deficiency into the corrective action program, the inspectors considered this issue as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000482/2008002-09, Failure to Reestablish Timely Seal Cooling for the Reactor Coolant Pumps.

.6 (Closed) LER 05000482/2005-007-00: Unanalyzed Condition Related to Loss of EDG Field Flashing during an Appendix R Fire Event

Introduction: The inspectors documented the enforcement related to this LER in Section 4OA7. This LER is closed.

Description: Because of the 2005 NRC triennial fire protection inspection, the licensee reviewed actions specified in Procedure OFN-RP-017 to ensure operators could implement the actions in the time specified. During review of the procedure, the licensee evaluated the EDG start circuits to determine if a control room fire affected their operability. From review of the circuits, the licensee determined that the automatic start circuits remained unaffected. However, while reviewing circuits associated with field flashing, the licensee determined that control circuit fuses could blow if the fire causes a short to ground in certain cables and that the loss of control power will prevent field flashing.

As immediate corrective actions, the licensee staged replacement fuses for each diesel generator, added steps in Procedure OFN-RP-017 directing the use of the fuses for a field flash circuit failure, and initiated PIR 2005-3333.

Analysis: The performance deficiency associated with this finding involved failure to have an adequate postfire safe shutdown procedure for response to a control room fire. This finding is more than minor because it is associated with mitigating systems cornerstone attribute of protection from external factors (fire) and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

On Panel RL015 the licensee had separated the hand switches for the Trains A and B EDG by 52 inches (~1.32 m). A fire affecting the hand switches could fail the corresponding field flash relay fuse locally and render the affected EDG(s) inoperable. Further, a fire in Panel RL015 could cause a loss of offsite power. The licensee assigns the Train B as the safe shutdown path for a control room fire and does not credit any Train A components.

The IPEEE assigns a fire frequency of $9.45E-05/\text{yr}$ for a single control room panel. To bound this assessment, the analyst assumed that fires in adjacent cabinets could spread one cabinet over; therefore, the analyst increased the fire frequency by a factor of 3 to $2.84E-04/\text{yr}$. Using NUREG/CR-6850, the analyst estimated the risk of losing both Trains A and Train B EDG. Specifically, using NUREG/CR-6850, Appendix L, "Appendix for Chapter 11, Main Control Board Fires," Figure L-1, the analyst determined the likelihood of disabling both hand switches separated by 1.32 meters. The value determined from the figure accounted for the nonsuppression probability and the severity factor. Multiplying the likelihood value of $1.00E-03$ resulted in a fire frequency affecting

both emergency diesel generators as 2.84E-07/yr. Fires originating in other locations would not result in a change to the risk significance of the finding.

The analyst made a bounding assumption that fire damage to the Train B EDG field flash circuit would not be recovered and that the unprotected Train A EDG would also be lost. However, in the base case (without the performance deficiency), the analyst assumed the Train B EDG would always be recovered. The TDAFW pump will fail upon loss of direct current power. This leaves only the recovery of offsite power as a means to avoid core damage. In general, the actions to restore offsite power would entail very simple breaker manipulations and it is likely that at least 4 hours would be available, except in the rare cases where the TDAFW pump fails.

Using the SPAR-H human performance method, the analyst applied full credit for diagnosis and computed an action human reliability analysis value of 2E-02 for the short-term sequence associated with TDAFW failure and 2E-03 TDAFW success. Both assume high stress and the available time accounts for the order of magnitude difference. The Wolf Creek SPAR model assigns an overall probability of 2.2E-02 that the TDAFW pump will not be available for mitigation. This results in the following two sequences that comprise the bounding estimate of the delta core damage frequency (the exposure period of the finding is 1 year):

Auxiliary feedwater unavailable: $(2.84E-07/yr) (2.2E-02) (2E-02) = 1.25E-10$

Auxiliary feedwater success: $(2.84E-07/yr) (2E-03) = 5.64E-10$

The analyst determined a bounding risk estimate of 6.89E-10/yr. and has minimal affect on large early release frequencies. Therefore, the analyst concluded this issue had very low risk significance (Green). The inspectors determined this finding had no crosscutting aspect since it did not reflect current licensee performance.

Enforcement: The inspectors documented this licensee identified violation in Section 4OA7.

.7 (Closed) LER 05000482/2006-001-00: Potential for Fire Induced Damage to Motor Operated Valves during an Appendix R Fire Event

This licensee initiated this LER to document that a control room fire could affect 40 motor-operated valves. This LER described the same issue as URI 05000482/2005008-06, "Failure to Evaluate Adequately Fire Protection Program Deficiencies," which was closed in Section 4OA5.2. This LER is closed.

.8 (Closed) LER 05000482/2006-002-00: Potential for Fire Induced Damage to Class 1E Electrical Equipment Air Conditioning Units during an Appendix R Event

On May 24, 2006, while performing a postfire safe shutdown review for Fire Area C-35, the licensee discovered an unanalyzed condition. A fire in this area could prevent operation of both Class 1E electrical equipment air conditioning units if a fire damaged the automatic fire isolation circuit on the fan units. The loss of the Class 1E air conditioning units would not directly result in loss of capability to shut down the facility safely. Rather, room heating beyond design limits could reduce the life of electrical components within the switchgear.

As immediate corrective actions, the licensee established a continuous fire watch for Fire Area C-35, initiated a temporary change to Procedure OFN-KC-016, "Fire Response," and staged jumpers. The licensee included this deficiency in their corrective action program as CR 2006-000551. Long-term corrective actions involved installing a bypass switch on Panel RP068.

Disposition of this LER is in Section 4OA7. This LER is closed.

4OA5 Other Activities

.1 (Closed) Apparent Violation 05000482/2005008-05: Inadequate Alternative Shutdown Procedure

The issue documented by this apparent violation is the same issue discussed in LER 05000482/2005-006-00, "Unanalyzed Condition Related to Loss of RCP Seal Cooling during a Postulated Appendix R Fire Event," in Section 4OA3.5. The inspectors discussed the enforcement for this event in Section 4OA3.5. This apparent violation is closed.

.2 (Closed) Unresolved Item 05000482/2005008-06: Failure to Adequately Evaluate Fire Protection Program Deficiencies

Documents reviewed by the inspectors are listed in the attachment.

Introduction. The inspectors identified an NCV of License Condition 2.c(5) because the licensee failed to evaluate the impact of a motor operated valve failure mechanism on their ability to implement postfire safe shutdown following a control room evacuation. The licensee determined that the failure mechanism affected 38 motor-operated valves and upon failure could affect their ability to implement their postfire safe shutdown procedure. This finding was determined to be of very low risk significance (Green).

Description. During a triennial fire inspection in 2005 (NRC Inspection Report 5000482/2005008), the inspectors determined that the licensee had not effectively reviewed industry operating experience information on two previous occasions. Consequently, the licensee failed to determine the population of motor operated valves that would be susceptible to mechanistic damage. The damage could result if fire induced short circuits bypassed the torque and limit switches. The inspectors identified four valves that could have had their protection bypassed and operators would need to operate them following a control room fire, as specified in Procedure OFN-RP-017.

The NRC issued Information Notice 92-18, "Potential for Loss of Remote Shutdown Capability during a Control Room Fire," which described conditions related to a control room fire that causes operators to evacuate the control room. Specifically, a fire in the control room could cause hot short circuits between control wiring and power sources for motor-operated valves needed for safe shutdown and operated from remote locations. However, hot short circuits combined with the absence of thermal overload, torque switch and limit switch protection, could cause valve damage before the operator shifted control of the valves to the remote shutdown panel.

The licensee identified 38 Train B motor-operated valves potentially affected and initiated PIR 2005-3314 to resolve this deficiency. The licensee developed a modification that altered the control circuit for each valve to prevent a control room fire from bypassing the torque/limit switches or failing the thermal overload.

During this inspection, the inspectors verified that the motor-operated valves resided on five control panels. The inspectors evaluated the physical separation of the safety related postfire safe shutdown train from the opposite safety-related train controls and the separation among the safety related and nonsafety-related controls. The inspectors also considered remaining capability from other systems on separate panels. Functions related to postfire safe shutdown needed to achieve and maintain hot shutdown were located on four control room panels. Specifically, the motor-operated valves could affect the following functions on the listed panels:

- Panel RL001 – charging/letdown and seal injection flow to the reactor coolant pumps,
- Panel RL005 – auxiliary feedwater flow suction valves from the condensate storage tank and the essential service water system,
- Panel RL017 – residual heat removal valves needed to achieve cold shutdown,
- Panel RL018 – boron injection valves used in maintaining pressurizer level, and
- Panel RL019 – essential service water and component cooling water valves. The limiting valves on this panel to cause a loss of function involve the control switches for the critical loop discharge and return valves for both component cooling water safety related trains.

The inspectors confirmed that the licensee used cables with the following characteristics;

- The licensee utilized IEEE-383 qualified wire insulation and cable jackets.
- The valves had seven conductor cable wiring that required a smart hot short from one conductor to the other.
- The valves had control power transformers.

Analysis. The inspectors determined this was a performance deficiency because the licensee failed to ensure that components necessary to safely shutdown the reactor would remain operable following a fire. This deficiency was more than minor in that it had the potential to impact the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to external events (such as fire) to prevent undesirable consequences.

The NRC senior reactor analyst assigned a generic fire ignition frequency for the control room (FIFCR), which was slightly higher than the value in the IPEEE. The analyst multiplied the fire ignition frequency by a severity factor and a nonsuppression probability indicating that operators failed to extinguish the fire within 20 minutes assuming 2 minute detection that requires a control room evacuation (NPCRE). The resulting evacuation frequency is:

Control Room Evacuation Frequency = FIFCR * SF * NPCRE =

Control Room Evacuation Frequency = 1.09E-02/year * 0.1 * 1.30E-02 = 1.42E-05/year

The analyst estimated the probability of a fire induced failure as a two wire short and determined this probability to be 0.6 squared for a resulting probability of 0.36. The analyst calculated the resulting frequency of occurrence by multiplying the control room evacuation frequency by the two wire short for a value of 5.10E-06/year.

The control room had 103 panels with the wiring and circuits for the affected valves residing in five panels. Therefore, the probability that a control room fire would affect the panels of interest is 4.85E-02. The resulting mitigation frequency is the frequency of occurrence multiplied by the partial fraction represented by the affected cabinets for a value of 2.47E-07.

Given that the change in core damage frequency would be determined by multiplying the mitigation frequency value determined above by a conditional core damage probability equal to or less than one, the analyst determined this deficiency had very low risk significance (Green). This finding did not have crosscutting aspects since the performance deficiency occurred outside of the assessment period.

Enforcement. License Condition 2.c(5) states that the licensee shall maintain in effect all provisions of the approved fire protection program as described in the licensee's USAR. The USAR, Appendix 9.5A, Table 9.5a-1, Section C.8 states that the licensee will promptly identify and correct deficiencies that affect fire protection. 10 CFR Part 50.48, requires all plants to meet Appendix R, Section III.G. Section III.G.1.a requires that one train of safe shutdown equipment be capable of achieving and maintaining hot shutdown conditions from either the control room or the emergency control station(s) and shall be free of fire damage. Contrary to the above, the inspectors determined that the licensee failed to ensure that, following a control room fire, operators would be able to manipulate postfire safe shutdown motor-operated valves because of damage caused by fire. Because the licensee included this deficiency in their corrective action program and because the deficiency had very low safety significance, the inspectors considered this issue as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000482/2008002-10, Failure to Analyze Motor-Operated Valve Circuits.

40A6 Meetings, Including Exit

On February 20, 2008, the inspectors presented the results of the fire protection inspection open item review and closeout to Mr. L. Ratzlaff, Manager, Support Engineering, and other members of licensee management. The licensee acknowledged the information presented.

On April 4, 2008, the inspectors presented the occupational radiation safety inspection results to Mr. M. Sunseri and other members of his staff who acknowledged the findings. The inspector confirmed that proprietary information was not provided or examined during the inspection.

On April 11, 2008, the resident inspectors presented the inspection results of the resident inspections to Mr. S. Hedges, Vice President Oversight, 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 violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned NCVs.

- Licensee Technical Specification 5.7.1.b states in part that access to high radiation areas with dose rates not exceeding 1.0 Rem/hour at 30 centimeters from the radiation source shall be controlled by means of a radiation work permit that includes specification of radiation dose rates in the immediate work area and other appropriate radiation protection equipment and measures. Contrary to these regulations, on January 13, 2008, two quality control inspectors entered a pipe chase, a posted high radiation area, on the 1988' elevation of the auxiliary building using the wrong radiation work permit. The radiation work permit used by the licensee inspectors did not allow entry into a high radiation area. The violation was entered into the licensee's corrective action program as CR 2008-00112. The finding was determined to be of very low safety significance because it did not involve: (1) ALARA planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose.
- Technical Specification 5.4.1.d specified that the licensee have fire protection procedures established, maintained, and implemented. Procedure OFN-RP-017, "Control Room Evacuation," Revision 21, specified actions for a fire in the control room. Contrary to this requirement, the licensee determined that the procedure failed to provide mitigating actions for a failure of the field flash relay control circuit because of possible fire damage. As described in Section 4OA3.6, this finding was of very low safety significance.
- Title 10 of the Code of Federal Regulations, 10 CFR 50.48, requires all plants to meet Appendix R, Section III.G. Appendix R, Section III.G.2, specified that for equipment and cables of redundant trains of systems necessary to achieve and maintain hot shutdown located within the same fire area outside of primary containment shall be separated by one of the means specified or a diverse means implemented. Contrary to this requirement, the licensee did not provide the required separation and had not implemented a diverse means to ensure the required Class 1E air conditioning units would remain functional. This finding had a low degradation rating because of the very low likelihood of occurrence and the ability to achieve safe shutdown did not become directly affected; consequently, the deficiency had very low safety significance. The licensee included this item in their corrective action program (refer to Section 4OA3.8)

SUPPLEMENTAL INFORMATION

- KEY POINTS OF CONTACT

Licensee

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

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000482/2008002-03	URI	Containment sump net positive suction head losses. (Section 1R15)
05000482/2008002-08	URI	Transformer trip resulted in an unplanned reactor trip and forced outage (Section 4OA3.3)

Opened and Closed

05000482/2008002-01	NCV	Failure to implement fire protection impairment control permit requirements and compensatory measures. (Section 1R05)
05000482/2008002-02	NCV	Performing prohibited elective maintenance on offsite power during EDG maintenance. (Section 1R13)
05000482/2008002-04	NCV	Failure to control area as a locked high radiation area. (Section 2SO1(1))
05000482/2008002-05	NCV	Failure to follow Procedure. (Section 2SO1(2))
05000482/2008002-06	NCV	Failure to establish reasonable expectation of operability (Section 4OA3.2(2))
05000482/2008002-07	NCV	Untimely corrective actions for CCP room cooler leads to NOED. (Section 4OA3.2(3))
05000482/2008002-09	NCV	Failure to reestablish timely seal cooling for the reactor coolant pumps (Section 4OA3.5)

05000482/2008002-10 NCV Failure to analyze motor-operated valve circuits
(Section 4OA5.2)

Closed

05000482/2008-001-00 LER CCP A Room Cooler Out of Service Longer Than Allowed
Under Technical Specification 3.8.1.B.2 (Section 4OA3.4)

05000482/2005-006-00 LER Unanalyzed Condition Related to Loss of Reactor Coolant
Pump Seal Cooling during a Postulated Appendix R Fire
Event (Section 4OA3.5)

05000482/2005-007-00 LER Unanalyzed Condition Related to Loss of EDG Field
Flashing during an Appendix R Fire Event
(Section 4OA3.6)

05000482/2006-001-00 LER Potential for Fire Induced Damage to Motor Operated
Valves during an Appendix R Fire Event (Section 4OA3.7)

05000482/2006-002-00 LER Potential for Fire Induced Damage to Class 1E Electrical
Equipment Air Conditioning Units during an Appendix R
Event (Section 4OA3.8)

05000482/2005008-05 AV Inadequate Alternative Shutdown Procedure
(Section 4OA5.1)

05000482/2005008-06 URI Failure to Adequately Evaluate Fire Protection Program
Deficiencies (Section 4OA5.2)

LIST OF DOCUMENTS REVIEWED

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

Section 1R01: Adverse Weather

Procedures

STN EF-020B, ESW Train B Warming Line Verification, Revision 6
SYS EF-205, ESW/CIRC Water Cold Weather Operations, Revision 19
AI 14-006, Severe Weather, Revision 7

Section 1R04: Equipment Alignment

Procedures

CKL EF-120, Essential Service Water Valve, Breaker and Switch Lineup, Revision 41
SYS KJ-121, Diesel Generator Lineup for Auto Ops, Revision 39

Work Order

06-289610-000

Work Request

07-063628

Miscellaneous

Engineering Disposition, Relocate I/P From The ARVs, ABPV001 Thru 004, Revision 6
Wolf Creek Generating Station USAR, Revision 19

Section 1R05: Fire Protection

Procedures

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

AP 10-106, Fire Preplans, Revision 5

OFN ST-003, Natural Events, Revision 13A

STN FP-815A, Heat Trip Actuation Device Operational Test Zones BZ 503,
016/SZ1-5Z47,1-2Z28, [A] Train Emergency Diesel Generator and ESF Transformer,
Revision 3

Condition Report

2007-002929

Work Request

07-063647

Work Orders

06-284430-000 06-284436-000

Drawings

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

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

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

Miscellaneous

Wolf Creek Generating Station Individual Plant Examination Summary Report, September 1992
Post Fire Safe Shutdown Area Analysis, E-1F9910, Revision 2

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

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

Section 1R11: Operator Requalification

Procedures

AI 21-100, Operations Guidance and Expectations, Revision 8

AP 21-001, Conduct of OPS, Revision 36A

APF 06-02-001, Emergency Action Levels, Revision 8

EDI 23M-050, Monitoring Performance to Criteria and Goals, Revision 3

EPP 06-06, Protective Action Recommendations, Revision 4

Miscellaneous

Operations Requalification Cycle 07-01, Revision 0

Section 1R12: Maintenance Effectiveness

Performance Improvement Requests

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

Work Requests

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

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

Condition Reports

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

Maintenance Rule

Maintenance Rule Scoping Evaluation for System BB - Reactor Coolant System
Maintenance Rule Scoping Evaluation for System INS -Reg. Guide 1.97 Instrumentation
Maintenance Rule Final Scoping Evaluation AB-05
Maintenance Rule Final Scope Evaluation GN-01
Maintenance Rule Final Scope Evaluation GN-02
Maintenance Rule Final Scope Evaluation GN-03
Maintenance Rule Final Scope Evaluation GN-04
Maintenance Rule Final Scope Evaluation GN-06
Maintenance Rule Final Scope Evaluation GN-08
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

Miscellaneous

EDI 23M-050 Attachment B, Functional Failure Determination Checklist

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

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

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

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

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

AIF 22C-006-01, Checklist for Emergent Work, Revision 4, September 2, 2007
AP 16E-002, Post Maintenance Testing Development, Revision 6A
AP 22C-003, Operational Risk Assessment Program, Revision 11
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
APF 22C-003-001, Operational Risk Assessment, Revision 0, September 2-4, 2007
MPE RC-001, Room Cooler Maintenance, Revision 8B
PSA-05-0020, WCGS PRA Basic Event Data Files, Appendix E, Revision 1
STN AB-003, Main Steam Iso Vlv Acc Discharge, Revision 11

Condition Reports

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

2007-004075

Work Orders

07-300584-000 07-300584-001 07-300584-002 07-292506-000

06-282700-000 07-297055-000

Miscellaneous

Operational Risk Assessment, Schedule Week 404

Commercial Grade Dedication Evaluation Number 021-E-0003

Calculation GL-M-002, Calculate tube plugging allowance for Aero-fin (Cu-Ni) coils for --
Electrical Penetration Room Coolers (SGL15A & SGL15B), Revision 0

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

Section 1R15: Operability Evaluations

Procedures

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

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

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

STS BG-002, ECCS Valve Check and System Vent, Revision 25

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

Condition Reports

2007-004329

2007-003704

2007-003462

Work Orders

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

Miscellaneous

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

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

OP EVAL Evaluation of as found voids in ECCS suction piping

Section 1R18: Plant Modifications

Procedure

Procedure AP 29B-002, ASME Code Testing of PUMPS and Valves, Revision 6

Miscellaneous

Engineering Permanent Modification Change Package No. 12179, Remote Racking Device – 4.16 kV 1E Switchgear NB001 and NB002, Revision 1

Temporary Modification Order 07-010-RP for 7300 System Cabinets 8 & 9, RP 044

Inservice Testing program Third 10-Year Interval, Containment Spray Pump Full Flow Testing Line, Revision 5

WCOP-02, Revision 14, IST Program Plan

Section 1R19: Postmaintenance Testing

Procedures

AP 20E-001, Industry Operating Experience Program, Revision 9

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

MPE NE-002, Governor Adjustments For Emergency Diesel Generator NE02, Revision 8

MPE NE-003, Governor Adjustments For Emergency Diesel Generator NE01, Revision 7

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

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

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

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

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

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

SYS KJ-200, Inoperable Emergency Diesel, Revision 13

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	

Condition Reports

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

Miscellaneous

Performance Improvement Request 2004-1160

Performance Improvement Request 2007-3829

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

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

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

Section 1R22: Surveillance Testing

Procedures

STS AB-201D :Atmospheric Relief Valve Inservice Valve Test, Revision 20

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

STS GG-001A, "Exhaust Filtration System Train A, 10-Hour Operability Test," Revision 19B

STS KJ-011A, DG NE01 24-Hour Run, Revision 19

ZL-005A, A EDG Operating Log, Revision 1A-Calculation sheet M-JE-321, Revision 2

Work Orders

07-296486-000	05-279238-000	05-279238-001	05-279238-002
05-279238-003	05-79238-004	36022	

Section 1EP6: Drill Evaluation

Procedures

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

APF 21-001-02, Control Room Turnover Checklist

EPF 06-007-01, Wolf Creek Generating Station Emergency Notification, Revision 9

EPP 06-005, Emergency Classification, Revision 3

EPP 06-007, Emergency Notifications, Revision 12

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

OFN NB-0034, Loss of All AC Power Shutdown Conditions, Revision 19

OFN NB-0030, Loss of AC Emergency Bus NB01 (NB02), Revision 10

Miscellaneous

Scenarios and Drill Evaluations, for drill conducted: January 31, 2008

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Work Requests

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Condition Reports

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LIST OF ACRONYMS

ALARA	as low as is reasonably achievable
ASME	American Society of Mechanical Engineers
CCP	centrifugal charging pump
CFR	Code of Federal Regulations
CR	condition report
ECCS	emergency core cooling system
EDG	emergency diesel generator
ESW	essential service water
FIFCR	fire ignition frequency for the control room
I&C	instrumentation and control
IEEE	Institute of Electrical and Electronics Engineers
IMC	inspection manual chapter
IPEEE	individual plant examination of external events
LER	licensee event report
MCM	million circular mils
NCV	noncited violation
NEI	Nuclear Energy Institute
NOED	Notice of Enforcement Discretion
NPCRE	control room evacuation
NRC	Nuclear Regulatory Commission
PIR	performance improvement request
RHR	residual heat removal
SSC	structure, system, and component
SER	Safety Evaluation Report
TDAFW	turbine-driven auxiliary feedwater
URI	unresolved item
USAR	Updated Safety Analysis Report