UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

February 11, 2011

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

Subject: WOLF CREEK GENERATING STATION - NRC INTEGRATED INSPECTION REPORT 05000482/2010005

Dear Mr. Sunseri:

On December 31, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Wolf Creek Generating Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on January 4, 2011, with you and other members of your staff.

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

Based on the results of this inspection, the NRC has identified 11 issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has determined that violations are associated with all of these issues. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as noncited violations, consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the violations or the significance of the noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the facility. In addition, if you disagree with the crosscutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Resident Inspector at the facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one for cases where a response is not required, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Sincerely,

/RA/

Donald Allen, Chief
Project Branch B
Division of Reactor Projects

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

Enclosure:
NRC Inspection Report 05000482/2010005
w/Attachment: Supplemental Information

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Publicly Avail	☑ Yes ☐ No	Sensitive	☐ Yes ☑ No	Sens. Type Initials	DBA

SRI:DRP/	RI:DRP/	SPE:DRP/	C:DRS/EB1	C:DRS/EB2
CLong	CPeabody	RDeese	TRFarnholtz	NFO'Keefe
/T-DBAllen for/	**/E-DBAllen for/**	**/RA/**	**/RA/**	**/RA/**
2/10/11	**2/10/11**	**2/8/11**	**2/7/11**	**2/7/11**
C:DRS/OB	C:DRS/PSB1	C:DRS/PSB2	C:DRS/TSB	C:DRP/
MSHaire	MPShannon	GEWerner	MCHay	DBAllen
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000482
License:	NPF-42
Report:	05000482/2010005
Licensee:	Wolf Creek Nuclear Operating Corporation
Facility:	Wolf Creek Generating Station
Location:	1550 Oxen Lane SE Burlington, Kansas
Dates:	October 1 through December 31, 2010
Inspectors:	C. Long, Senior Resident Inspector J. Drake, Senior Reactor Inspector L. Carson II, Senior Health Physicist J. Adams, Senior Reactor Inspector K. Clayton, Senior Operations Engineer C. Peabody, Resident Inspector T. Farina, Operations Engineer J. Groom, Resident Inspector D. Stearns, Health Physicist N. Green, Ph.D., Health Physicist W. Strickland, Operations Engineer G. Apger, Operations Engineer B. Correll, Reactor Inspector
Approved By:	D. Allen, Chief, Project Branch B Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000482/201005; 10/01/2010–12/31/2010; Wolf Creek Generating Station, Integ. Resid.& Regl. Report; Equip. Align., Lic. Oper. Requal.Prog., Op. Eval., Refuel & Out. Act., Surv. Testing, Rad. Gas.& Liq. Effl.Treat., Rad. Envir. Mon. Prog., & Event Flwp

The report covered a 3-month period of inspection by resident inspectors and an announced baseline inspections by region-based inspectors. Eleven Green noncited violations of significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The crosscutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Crosscutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving the licensee's failure to identify, document, and evaluate sources of boric acid leakage. During a boric acid walkdown and containment closeout tour on December 7, 2010, the inspectors identified a boric acid leak in an instrument line to the reactor coolant system loop 2 flow transmitters which had not been previously identified and documented by the licensee. As such, the licensee failed to accomplish the requirements of procedure AP 16F-001, "Boric Acid Corrosion Control Program," Revision 6A, step 6.1, which stated, in part, that sources of boron leakage shall be identified and documented in the applicable corrective action document. The licensee entered this finding into their corrective action system as Condition Report 31003 and replaced the leaking union.

  The finding was determined to be more than minor because it was associated with the Initiating Events Cornerstone attribute of human performance and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors used Inspection Manual Chapter 0609, and determined the finding was of very low safety significance (Green) because the issue would not result in exceeding the technical specification limit for identified reactor coolant system leakage or affect other mitigating systems resulting in a total loss of their safety function. The inspectors also determined that the finding had a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee did not have a sufficiently low threshold in order to identify boric acid

leaks during walkdowns [P.1.(a)] (Section 1R20).

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

  The inadequate procedural direction to establish maximum feedwater preheating is a performance deficiency. The performance deficiency is more than minor, therefore a finding, because it is associated with the Initiating Events Cornerstone attribute of procedure quality and it affects the objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04. This finding was determined to be of very low safety significance since the finding contributed to the likelihood of a reactor trip; however, it did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding had a crosscutting aspect in the area of problem identification and resolution associated with the operating experience component because Wolf Creek failed to institutionalize internal and external operating experience by changing plant procedures [P.2(b)] (Section 4OA3).

- Green. The inspectors identified a noncited violation of Technical Specification 5.4.1.a, "Procedures," for Wolf Creek Procedures GEN 00-003, "Hot Standby to Minimum Load," and SYS AE-121, "Turbine Driven Main Feedwater Pump Startup," being inadequate by failing to direct control room operators to establish a main feedwater pump speed that will allow the feed bypass regulating valves to control in the 60 to 80 percent open range, prior to raising power from 8 to 16 percent. Feed bypass regulating valve throttle characteristics are highly non-linear below this range which complicates manual and automatic control. This was a contributing factor in the October 17, 2010, reactor trip. A temporary change was made to the procedures that cautioned operating crews to ensure earlier establishment of optimal feedwater bypass control valve position. This issue was entered in the licensee's corrective action program as Condition Reports 29845 and 29846.

  The inadequate procedural direction to establish optimal bypass valve position at the correct time during the startup is a performance deficiency. The performance deficiency is more than minor, therefore a finding, because it is associated with the Initiating Events Cornerstone attribute of procedure quality and it affects the

objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04. This finding was determined to be of very low safety significance since the finding contributed to the likelihood of a reactor trip; however, it did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding had a crosscutting aspect in the area of problem identification and resolution associated with the operating experience component because Wolf Creek failed to institutionalize internal operating experience by changing plant procedures [P.2(b)] (Section 4OA3).

Cornerstone: Mitigating Systems

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

  The failure to properly evaluate the degraded condition of the essential service water piping was a performance deficiency. The inspector determined this finding was more than minor because it was associated with the human performance attribute of the Mitigating Systems Cornerstone , and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to events to prevent undesirable consequences. The inspector determined the significance of the finding using IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it did not represent an actual loss of safety function of a single train for greater than its technical specification allowed outage time. This finding had a crosscutting aspect in the human performance cross-cutting area, decision making component, because the licensee did not use conservative assumptions in its decision making when they initially used non-conservative values without adequate engineering justification to conclude that the train A essential service water piping met minimum wall thickness criteria for operability [H.1 (b)] (Section 1R04).

- Green. The inspector identified a Green noncited violation of 10 CFR 50, Appendix B, Criterion III, having very low safety significance for the licensee’s failure to ensure that applicable regulatory requirements and the design basis

were correctly translated into specifications, drawings, procedures and instructions. Wolf Creek failed to properly account for essential service water piping membrane stress and impact loads as required by the 1974 ASME Code, Section III, paragraphs ND-3112.4 and ND-3111. Specifically, the licensee's design calculations for the essential service water system did not account for the pressure fluctuations caused by a known column closure water hammer phenomena which occurs during a loss of offsite power or load sequencer testing. Wolf Creek has written Condition Report 33253 and plans to address the issue.

The licensee's failure to account for the pressure fluctuations caused by a known column closure water hammer phenomena in the design calculations for the essential service water system was a performance deficiency. This performance deficiency was more than minor and therefore a finding because it was associated with the human performance attribute of the Mitigating Systems Cornerstone, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspector determined the significance of the finding using IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined that the finding was of very low safety significance (Green) because it did not represent an actual loss of safety function of a single train for greater than its technical specification allowed outage time. This finding has a crosscutting aspect in the human performance cross-cutting area, associated with the decision making component, because the licensee used non-conservative values without adequate engineering justification to conclude that essential service water system piping met minimum wall thickness criteria for operability [H.1 (b)] (Section 1R04).

- Green. The inspectors identified a Green noncited violation of 10 CFR Part 55.49, "Integrity of Examinations and Tests," for the failure of the licensee to ensure that the integrity of the written examinations and the operating tests administered to licensed operators was maintained. Seven licensed operators received two dynamic scenarios for their operating tests that had been previously administered to other licensed operators in previous weeks for the 2009 operating tests. Also, six licensed operators for week 4 and 12 licensed operators for week 5 received written examinations during the 2010 examinations that contained more than 50 percent repeat questions from the previous week examinations. These failures resulted in a compromise of examination integrity because they exceeded the 50 percent overlap defined by ACAD 07-01, "Guidelines for the Continuing Training of Licensed Personnel," for this portion of the examination and operating tests, but did not lead to an actual effect on the equitable and consistent administration of the examination. This issue was entered into the licensee's corrective action program as Condition Report 00028854.

  The failure of the licensee's training staff to maintain the integrity of examinations administered to licensed operations personnel was a performance deficiency.

The performance deficiency is more than minor, and therefore a finding, because it adversely impacted the human performance attribute of the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, if left uncorrected, the finding could have become more significant in that allowing licensed operators to return to the control room without valid demonstration of appropriate knowledge on the biennial examinations and operating tests could be a precursor to a significant event if undetected performance deficiencies develop. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, and the corresponding Appendix I, "Licensed Operator Requalification Significance Determination Process," the finding was determined to have very low safety significance (Green) because the finding resulted in a compromise of the integrity of operating test dynamic scenarios and written examinations and compensatory actions were not immediately taken in 2009 (for the operating tests) and 2010 (for the written examinations) when the compromise should have been discovered. Because the equitable and consistent administration of the exam was not actually impacted by this compromise, it is being characterized as a Green noncited violation. This finding has a crosscutting aspect in the area of human performance associated with the resources component because the licensee did not ensure that the associated procedure used to create the examinations and operating tests was complete, accurate, and up to date to ensure that the 50 percent maximum overlap standard was not exceeded [H.2(c)] (Section 1R11).

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

  The failure to comply with the requirements of ASME Code Case N513-2, Section 2.0(e) was considered a performance deficiency. The finding is greater than minor because the failure to perform timely and adequate evaluations of

degraded, nonconforming, and unanalyzed conditions for operability, if left uncorrected, would have the potential to lead to a more significant safety concern. The finding is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and affects the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of this finding using Phase 1 of Inspection Manual Chapter 0609.04, and determined that the finding was of very low safety significance (Green) because the issue did not result in a loss of operability or functionality, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a crosscutting aspect in the area of problem identification and resolution associated with corrective action program component because operations and engineering personnel failed to thoroughly evaluate problems such that the resolutions addressed the cause and extent of condition [P.1(c)] (Section 1R15).

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

  The inadequate procedural direction after P-14 actuation is a performance deficiency. The performance deficiency is more than minor, and therefore a finding, because it is associated with the Mitigating Systems Cornerstone attribute of human performance and it affected the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings." This finding was determined to be of very low safety significance since the finding does not represent a loss of system safety function, nor does the finding represent actual loss of safety function for single train for a greater time than permitted by technical specifications. This finding had a crosscutting aspect in the area of human performance associated with the resources component because Wolf Creek failed to validate that the procedure would be successful in stabilizing the plant [H.2(c)] (Section 4OA3).

- Green. The inspectors identified a noncited violation of 10 CFR 55.46(c)(1)(i), "Simulator Fidelity," in that the licensee's simulation facility did not have adequate fidelity to simulate steam generator level oscillations that occur during startup and shutdown after a loss of feedwater preheat, thereby creating the possibility

for negative training. Specifically, two constants that are used in the model for the Westinghouse 7300 steam generator level control cards were improperly programmed in the simulator. The licensee changed the constants in the simulator model and initiated actions to ensure accurate low-power steam generator oscillation modeling. This issue was entered into the licensee's corrective action program as Condition Report 29541.

The failure to have a properly modeled simulation facility is a performance deficiency. The performance deficiency is more than minor, therefore a finding, because it is associated with the Mitigating Systems Cornerstone attribute of human performance and it affected the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings.” This finding was determined to be of very low safety significance because the finding neither represents a loss of system safety function, nor does it represent actual loss of safety function for single train for a greater time than permitted by technical specifications. This finding had a crosscutting aspect in the area of human performance associated with the resources component because Wolf Creek did not ensure the simulation facility was accurately modeling plant behavior [H.2(d)] (Section 4OA3).

Cornerstone: Public Radiation Safety

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

  The inspectors determined that failure to have procedures to prevent draining and venting radioactive systems to nonradioactive systems was a performance deficiency. The finding was more than minor because it impacted the program and process attribute of the Public Radiation Safety Cornerstone, and it adversely affected the cornerstone objective of ensuring adequate protection of public health and safety from exposure to radioactive material released into the public domain. Using the Public Radiation Safety Significance Determination

Process, the inspectors determined this finding to be of very low safety significance because this was not a failure to implement the effluent program, and it had no impact on public dose. In addition, this finding has a crosscutting aspect in the area of Human Performance related to the personnel work practices component. Specifically, the licensee failed to use self- and peer-checking human error prevention techniques and then proceeded in the face of uncertainty when unexpected plant conditions were known [H.4(a)] (Section 2RS06).

- Green. The inspectors identified a noncited violation of Technical Specification 5.4.1.a for failure to have adequate procedures for maintaining meteorological monitoring systems functional. The inspectors determined that procedures did not exist for maintaining the functionality or to declare one or more channels of wind instrumentation out of service pursuant to Technical Requirement 3.3.12. Consequently, both channels of the 10 meter wind direction instrumentation were not functional between April and October 2009. The licensee developed additional guidance for determining functionality of the instruments and immediately required the meteorological data to be reviewed on a more frequent basis to ensure validity. The licensee entered this issue into the corrective action program as Condition Report 00029337.

  The failure to have procedures to maintain meteorological monitoring functional is a performance deficiency. This finding is more than minor because it was associated with the Public Radiation Safety Cornerstone attribute of program and process and affected the cornerstone objective, in that, the failure to have adequate procedures to maintain meteorological monitoring instrumentation functional has the potential to impair public dose assessments of routine and accidental radioactive effluent releases. Using the Public Radiation Safety Significance Determination Process, the inspectors determined this finding to be of very low safety significance because this was not a failure to implement the effluent program, and it had no impact on public dose. This finding has a crosscutting aspect in problem identification and resolution area associated with the corrective action component because the licensee failed to implement a low threshold for completely and accurately identifying issues with the meteorological monitoring instrumentation in a timely manner [P.1(a)] (Section 2RS07).

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

The plant started the inspection period at 100 percent rated thermal power. On October 4, 2010, Wolf Creek reduced power when compliance with Technical Specifications 3.7.8 and 3.8.1 required the unit to be in Mode 3 for one inoperable train of essential service water. On October 6, 2010, the unit entered Mode 5 as directed by Technical Specifications 3.7.8 and 3.8.1 for one inoperable train of essential service water and one inoperable emergency diesel generator. On October 16, 2010, essential service water repairs were completed and the reactor was made critical. During plant startup, on October 17, 2010, Wolf Creek automatically tripped from 17 percent power. On October 18, 2010, Wolf Creek was made critical and achieved 100 percent power on October 20, 2010. On December 6, 2010, Wolf Creek began a down power as directed by Technical Specification 3.8.1 when emergency diesel generator A was not operable for 7 days. On December 6, 2010, Wolf Creek entered Mode 3. On December 8, repairs were complete and Wolf Creek was made critical. Wolf Creek reached 100 percent power on December 10, 2010, and remained there for the rest of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of the adverse weather procedures for seasonal low temperatures. The inspectors verified that weather-related equipment deficiencies identified during the previous year were corrected prior to the onset of seasonal extremes, and evaluated the implementation of the adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of, and during, the adverse weather conditions.

During the inspection, the inspectors focused on plant-specific design features and the procedures used by plant personnel to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the USAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. Specific documents reviewed during this inspection are listed in the attachment. The inspectors also reviewed corrective action program items to verify that plant personnel were identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems:

- Condensate storage tank and piping
- Refueling water storage tank and piping

These activities constitute completion of one readiness for seasonal adverse weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- August 3, 2010, vital switchgear and battery cooling units
- September 24, 2010, spent fuel pool to refueling water storage tank demineralizer system
- December 27, 2010, emergency diesel generator B while emergency diesel generator A was 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 affect 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, 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 inspected 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. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On December 9, 2010, the inspectors performed a complete system alignment inspection of the essential service water system to verify the functional capability of the system. The inspectors selected this system because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors inspected the system to review mechanical and electrical equipment line-ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. The inspectors reviewed a sample of past and outstanding work orders to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment-alignment problems were being identified and appropriately resolved. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

b. Findings

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

Introduction. The NRC identified a Green noncited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to properly evaluate a condition adverse to quality involving train A essential service water system. The licensee's failure to properly evaluate the degraded condition subsequently led to declaring the train inoperable from 2:20 p.m. until 10:21 p.m. on December 9, 2010.

Description. During a walkdown of the essential service water system on December 9, 2010, the inspector identified significant outer diameter corrosion on the train A essential service water supply piping at EF003HBC-30. This corrosion had been previously identified by the licensee in November 2009. The cause and extent of condition of the pitting corrosion of the essential service water piping was not fully addressed by the licensee due to inadequate analysis and lack of sufficient engineering justification for the assumptions used to evaluate the degradation. Specifically, the licensee's initial evaluation of the degraded condition was not conservative because the values used to conclude that adequate pipe wall thickness remained could not be supported with the information provided in the available supporting documents. The licensee used an

ultrasonic thickness measurement obtained from the curved section of the pipe elbow, which was greater than the nominal pipe wall thickness, to determine that the pipe had adequate wall thickness in the vicinity of the outer diameter pit corrosion.

The inspector challenged the use of the less conservative value without adequate justification since licensee procedure AP 26C-004, “Operability Determination And Functionality Assessment,” Section 4.3, Engineering Judgment, 3.d stated in part, “Engineering judgments that address reasonable expectation of operability, WCGS (Wolf Creek Generating Station) design basis or WCNOC (Wolf Creek Nuclear Operating Company) licensing basis are recorded in writing.” Section 6.1.2 stated in part, “The scope of an operability determination must be sufficient to address the capability of SSCs to perform their specified safety functions. The operability decision may be based on analysis, a test or partial test, experience with operating events, engineering judgment, or a combination of these factors, considering SSC functional requirements.” Section 6.2.5 stated in part, “The operability determination process prescribed in this procedure shall be used immediately upon the determination that a degraded or nonconforming condition exists that could affect the operability of an SSC.” Contrary to these expectations, the operability assessment failed to justify the use of the less conservative value for determining that the EF003HBC-30 section had sufficient remain pipe wall thick to met design requirements. As a result, the licensee was unable to ensure the pitting degradation did not reduce essential service water pipe wall thickness below the minimum allowed ASME code specifications. As immediate corrective action the licensee declared train A of the essential service water system inoperable from 2:20 p.m. until 10:21 p.m. on December 9, 2010 while measurements of the piping wall thickness were obtained. The licensee obtained ultrasonic measurements of the pipe wall thickness in the vicinity of the outer diameter pitting, and determined that minimum design wall thickness requirements for the system were met.

As documented in the addendum to Wolf Creek Condition Report 00018785, the Wolf Creek essential service water system has had a history of corrosion and leakage.

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

Enforcement. Title 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, in November 2009, when outer diameter pitting corrosion was identified on the supply line of the train A essential service water system, the licensee did not properly evaluate the degraded condition in accordance with AP 26C-004, "Operability Determination and Functionality Assessment." Because this violation was of very low safety significance (Green) and has been entered into the licensee's corrective action program as Condition Report 00031192, this violation is being treated as noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy. NCV 05000482/2010005-01, "Failure to Properly Identify and Evaluate Degraded Piping in the Train A Essential Service Water System."

2. Failure to Account for Water Hammer Stresses in Essential Service Water System Calculations

Introduction. The inspector identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to account for the essential service water pipe stresses caused by pressure fluctuations of the known column closure water hammer phenomena.

Description. The design of the load sequencing subjected the plant essential service water piping to a water column separation from the piping high point. With the current essential service water system design, every loss of offsite power at Wolf Creek would result in a water column separation and subsequent re-pressurization by the loss of normal service water pumps and the sequencing start of the essential service water pumps. This phenomenon was not specifically described in the licensee's Updated Final Safety Analysis Report, however, it had been clearly identified in previous Wolf Creek Condition Reports 28187, 12990, 9688, 2008-005075, 2008-004983, and 2008-001660. This was also evident by Wolf Creek's response to NRC Generic Letter 96-06, "Assurance of Equipment Operability and Containment Integrity during Design-Basis Accident Conditions," September 30, 1996. Additionally, there was external operating experience concerning water hammer phenomena and its impact on system piping. An event where a piping system suffered a water hammer related failure was documented in NRC Information Notice 98-31, Fire Protection System Design Deficiencies and Common-Mode Flooding of Emergency Core Cooling System Rooms at Washington Nuclear Project Unit 2.

Calculation Number 0420505-C-001, "Piping Reanalysis for Essential Service Water System, Train B Supply Line," stated in part, "Wolf Creek Nuclear Generating Station is designed to ASME Code, Section III Nuclear Power Components, 1974 and 1974 winter addenda and ANSI B31.1 1973 piping code including 1973 summer addendum. Piping analyses are performed to ensure that design Class II and III piping systems perform their safety-related functions during plant Normal, Upset and Faulted conditions. Pipes are subject to various loading conditions like Pressures, Dead Load, Thermal,

Earthquake and Seismic/Thermal Anchor Motions." The 1974 ASME code, Section III Paragraph ND-3112.4, "Design Allowable Stress Values," part c states, in part, "The wall thickness of a component computed by these rules shall be determined so that the maximum direct membrane stress due to any combination of loadings that are expected to occur simultaneously does not exceed the maximum allowable stress permitted at the temperature that is expected to be maintained in the metal under the condition of loading being considered." Section III Paragraph ND-3111, "Loading Criteria," of the ASME code, states in part, "The loading that shall be taken into account in designing a component shall include, but are not limited to, the following: (b) Impact loads, including rapidly fluctuating pressures."

WCN005-PR-0, a report from ENERCON, which addressed water hammer phenomena in the essential service water system, stated on page 6, "The results shown in the Table in Section 5.1 of the ALTRAN Report were reviewed and evaluated by an ENERCON structural expert. His opinion was that the loads shown were significant enough in every case to warrant further detailed analysis. This analysis requires the generation of a detailed FTH (Force Time History) that would result from the CCWH (column closure water hammer) generated in the ESW (essential service water) for a LOOP (loss of offsite power) event. The report recommended that these FTH's would then be evaluated using a structural piping program and the results added to the existing stresses. Ultimately a new stress analysis of record would be generated. This would be a revision of the existing one. Modifications to supports may be required to qualify the system." The analysis later stated, "To perform the reanalysis for the startup of the ESW pumps following a LOOP requires that Force Time Histories (FTH) be generated. These are required for the structural analysis."

The ALTRAN report referenced by ENERCON was report number 09-0223-TR-001 Revision 0. This report, on page 6 of 14, stated in part, "The water hammer pressures calculated are to be used for preliminary structural assessment of the piping system's ability to withstand this loading and to determine if a more detailed force time history needs to be generated." On page 7 the report continued, "Experience has shown that the concerns resulting from water hammer events are: (1) Over-pressure of pipes and components, e.g. ruptured tubes in heat exchangers, and (2) Pipe and component nozzle stress due to bending moments created by the CCWH force time history (FTH)."

Despite the internal and external operating experience, the licensee had not included these stresses induced on the essential service water piping in the design calculations. The basic engineering disposition written to address the potential effects of water hammer impact loads on the structural integrity of the pressure boundary did not include the pressure stresses induced in the pipe due to the water hammer phenomena. It stated, in part, "This Basic Engineering Disposition is to document that the potential effects of water hammer impact loads on the structural integrity of the pressure boundary have been evaluated for piping affected by pitting corrosion. Because water hammer pressure waves are of short duration and are self limiting (secondary) loads, assuring that the pitted pipe meets ASME Boiler and Pressure Vessel Code (Code) requirements for design loads is sufficient to conclude that the pressure boundary has sufficient margin to withstand impact from water hammer."

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

Enforcement. Title 10 CFR 50 Appendix B, Criterion III, "Design Control," requires, in part, that measures be established to assure that applicable regulatory requirements and the design basis, as defined in Section 50.2, and as specified in the license application, for those structures, systems and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. Further, Criterion III requires that the design control measures shall provide for verifying or checking the adequacy of designs. Title 10 CFR 50.2 defines design basis as that information which identifies the specific functions to be performed by a structure, system, or component of a facility. The licensee is committed to the1974 ASME code. Section III of the 1974 ASME code, Paragraph ND-3112.4, "Design Allowable Stress Values," part c states in part, "The wall thickness of a component computed by these rules shall be determined so that the maximum direct membrane stress due to any combination of loadings that are expected to occur simultaneously does not exceed the maximum allowable stress permitted at the temperature that is expected to be maintained in the metal under the condition of loading being considered." Section III Paragraph ND-3111, "Loading Criteria," of the ASME code, states in part, "The loading that shall be taken into account in designing a component shall include, but are not limited to, the following: (b) Impact loads, including rapidly fluctuating pressures." Contrary to the above, from June 4, 1985 to the present, the licensee did not include the pressures induced by the water hammer phenomena in the design calculation for the essential service water system. Because this violation was of very low safety significance (Green) and has been entered into the licensee's corrective action program as Condition Report 00033253, this violation is being treated as noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2010005-02, "Failure to Account for Water Hammer Stresses in Essential Service Water System Calculations".

1R05 Fire Protection (71111.05)

Quarterly Fire Inspection Tours

a. Inspection Scope

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

- October 17, 2010, 2000 foot elevation, containment
- November 9, 2010, auxiliary building 1974 foot elevation, boron thermal regeneration system rooms
- November 9, 2010, auxiliary building 1974 foot elevation, letdown heat exchanger room
- December 09, 2010, auxiliary building 2026 foot elevation, component cooling water pumps and heat exchangers

The inspectors reviewed areas to assess if licensee personnel 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 with later additional insights, their potential to affect equipment that 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. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the USAR, the flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems; inspected underground bunkers/manholes to verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for bunkers/manholes; and verified that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also inspected the areas listed below to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers. Specific documents reviewed during this inspection are listed in the attachment.

- October 28, 2010, auxiliary feedwater pump rooms

These activities constitute completion of one flood protection measures inspection sample as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed licensee programs, verified performance against industry standards, and reviewed critical operating parameters and maintenance records for the train A emergency diesel generator jacket water and lube oil heat exchangers (EKJ06A and EKJ04A, respectively), and the ultimate heat sink. The inspectors verified that performance tests were satisfactorily conducted for heat exchangers/heat sinks and reviewed for problems or errors, the licensee's heat exchanger inspections adequately assessed the state of cleanliness and tube wall integrity of their tubes; and the heat exchangers were correctly categorized under 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two heat sink inspection samples as defined in Inspection Procedure 71111.07-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Quarterly Review

a. Inspection Scope

On November 17, 2010, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance
- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to preestablished operator action expectations and successful critical task completion requirements. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one quarterly licensed-operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Biennial Inspection

a. Inspection Scope

To assess the performance effectiveness of the licensed operator requalification program, the inspectors conducted personnel interviews, reviewed both the operating tests and written examinations, and observed ongoing operating test activities.

The inspectors interviewed 10 licensee personnel, consisting of 4 operators, 3 instructors, 2 managers, and the simulator supervisor, to determine their understanding of the policies and practices for administering requalification examinations. The inspectors also reviewed operator performance on the written exams and operating tests. These reviews included observations of portions of the operating tests by the inspectors. The operating tests observed included 3 job performance measures and 2 scenarios that were used in the current biennial requalification cycle. These observations allowed the inspectors to assess the licensee's effectiveness in conducting the operating test to ensure operator mastery of the training program content. The inspectors also reviewed medical records of 5 licensed operators for conformance to license conditions and the licensee's system for tracking qualifications and records of license reactivation for 2 operators.

The results of these examinations were reviewed to determine the effectiveness of the licensee's appraisal of operator performance and to determine if feedback of performance analyses into the requalification training program was being accomplished. The inspectors interviewed members of the training department to assess the responsiveness of the licensed operator requalification program to incorporate the lessons learned from both plant and industry events. Examination results were also assessed to determine if they were consistent with the guidance contained in NUREG 1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1, and NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process."

In addition to the above, the inspectors reviewed examination security measures, simulator fidelity and existing logs of simulator deficiencies.

On October 26, 2010, the licensee informed the lead inspector of the following Unit 1 results for the 48 total licensed operators in the Licensed Operator Requalification Program:

- 9 of 9 crews passed the simulator portion of the operating test
- 48 of 48 licensed operators passed the simulator portion of the operating test
- 47 of 48 licensed operators passed the job performance measure portion of the examination
- 47 of 48 licensed operators passed the biennial written exam

The individuals that failed the applicable portions of their examinations and operating tests were remediated, retested, and passed their retake examinations/operating tests

The inspectors completed one inspection sample of the biennial licensed operator requalification program.

b. Findings

Failure to Maintain Operator Licensing Examination Integrity

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 55.49, "Integrity of Examinations and Tests," for the failure of the licensee to ensure that the integrity of the written examinations and the operating tests administered to licensed operators was maintained. Seven licensed operators received two dynamic scenarios for their operating tests that had been previously administered to other licensed operators in previous weeks for the 2009 operating tests. Also, 6 licensed operators for week 4 and 12 licensed operators for week 5 received written examinations during the 2010 examinations that contained more than 50 percent repeat questions from the previous week examinations. These failures resulted in a compromise of examination integrity because they exceeded the 50 percent overlap defined by ACAD 07-01, "Guidelines for the Continuing Training of Licensed Personnel," for this portion of the examination and operating tests, but did not lead to an actual effect on the equitable and consistent administration of the examination.

Description. On October 6, 2010, while performing a biennial requalification inspection in accordance with Inspection Procedure 71111.11, "Licensed Operator Requalification Program," the inspectors discovered that during the week of July 6, 2009, seven licensed operators received two dynamic scenarios for their operating test that had been previously administered to other licensed operators the weeks of June 1, 2009, and June 15, 2009. This resulted in this group of licensed operators receiving 100 percent overlap on their operating test dynamic scenarios. The licensee uses procedure AP 30B-001, "Licensed Operator Requalification Training Program," Revision 15, to compose and administer its examinations and operating tests. Prior to the inspectors' arrival onsite, a Condition Report 0028088 was written for the lack of direction on the 50 percent overlap requirement for the annual operating tests. However, because the overlap issue had already occurred for the operating test in 2009 and no compensatory actions were taken by the licensee in 2009 to correct the overlap issue on the operating tests, this constituted a compromise of examination integrity required by 10 CFR 55.49. None of the affected licensed operators were removed from shift in 2010 because they had already taken and passed their 2010 operating tests and these tests did not exceed the 50 percent overlap requirement. The licensee documented this issue in Condition Report 28854.

Between October 11, 2010, and December 1, 2010, the licensee evaluated this issue using an apparent cause evaluation and associated Condition Report 28854 to fully understand the extent of condition, the causal factors, and appropriate corrective actions. The inspectors noted that licensee training personnel performed a formal

briefing to all operations personnel prior to the administration of their 2009 operating test that specifically prohibited them from discussing the details of their test with other personnel. However, none of the licensed operators signed a security agreement documenting that they would not discuss the details of their test with other personnel. The licensee and the inspectors also reviewed the grading of the 2009 operating tests to determine if there was any discernable discrepancy in evaluated performance between the different weeks that would indicate that the equitable and consistent administration of the test had actually been affected. During this review the inspectors concluded that, although the integrity of the 2009 operating test was not maintained, no actual effect on the equitable and consistent administration of the 2009 operating test had occurred.

During the apparent cause review for the 2009 operating test and after the inspectors had left the site, the licensee discovered that the 2010 week 4 and week 5 biennial written examinations exceeded the 50 percent overlap requirements. The licensee called the NRC regional office and informed the inspectors of this issue and had completed their assessment that no noticeable increase in scores had occurred in subsequent weeks on the written examinations. The licensee decided to re-examine all of the operators that took the week 4 and week 5 written examinations with an examination composed entirely of new questions. This activity was completed on December 16, 2010, and all of the operators passed the new examination.

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

Enforcement. 10 CFR 55.49, "Integrity of Examinations," requires, in part, that facility licensees shall not engage in any activity that compromises the integrity of any application, test, or examination required by this part. The integrity of a test or

examination is considered compromised if any activity, regardless of intent, affected, or, but for detection, would have affected the equitable and consistent administration of the test or examination. This includes activities related to the preparation, administration, and grading of the tests and examinations required by this part. Contrary to the above, during the week 5 operating test scenarios for 2009, the licensee engaged in an activity that compromised the integrity of a test required by 10 CFR Part 55. Specifically, training personnel administered two scenarios to the week 5 crew of licensed operators that had been previously administered to other crews of licensed operators in previous weeks during the 2009 operating test cycle. This resulted in this group of licensed operators receiving 100 percent overlap from previous week operating test scenarios. Also contrary to the above, six licensed operators for week 4, and 12 licensed operators for week 5 received written examinations during the 2010 examinations that contained more than 50 percent repeat questions from the previous week examinations. Administering an operating test or a written examination with greater than 50 percent overlap from previously administered examinations or operating tests is considered a compromise of the integrity of the examination or test, in that, it is a practice that, but for detection, would affect the equitable and consistent administration of the these examinations or tests. The inspectors determined that the compromise of the 2009 operating test and the 2010 written examination did not result in an actual effect on the equitable and consistent administration of the test. Because this violation is of very low safety significance (Green) and has been entered into the licensee's corrective action program as Condition Report 28854, this violation is being treated as a noncited violation consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2010005-03, "Failure to Maintain Licensed Operator Examination Integrity."

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- October 15, 2010, control rod drive mechanism fans
- November 3, 2010, radiation Monitor GT RE-60
- November 10, 2010, containment sump differential pressure transmitters
- December 28, 2010, fire protection system main transformer deluge

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices

- Identifying and addressing common cause failures

- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or -(a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed licensee personnel'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 22, 2010, vital inverter NN13 failure
- October 7 – 9, 2010, orange inventory control shutdown risk
- November 8, 2010, weekly risk calculation
- November 23, 2010, potential underground leak

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4)

and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. 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 the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- June 29, 2010, essential service water through-wall leak
- September 13 and 14, 2010, guided wave essential service water pipe flaw evaluations
- October 2, 2010, essential service water underground leak
- October 9, 2010, check valve EM8815
- December 15, 2010, component cooling water pump B automatic start

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and USAR to the licensee personnel's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability

evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five operability evaluations inspection samples as defined in Inspection Procedure 71111.15-04

b. Findings

Introduction. On September 15, 2010, the inspectors identified a Green noncited violation of 10 CFR 50.55a(b)(5) for failing to implement the requirements of Code Case N513-2, Section 2.0(e).

Description. On June 29, 2010, Wolf Creek discovered a through-wall leak of a 30 inch diameter essential service water pipe. The flaw was evaluated using ASME Code Case N513-2. Code Case N513, Section 2.0(e) required the flaw be re-examined every 30 days unless a flaw growth evaluation is prepared to justify re-examination every 90 days. The evaluation is required to include corrosion rate and corrosion mechanism as required by 2.0(e). The inspectors reviewed Wolf Creek's evaluation performed under basic engineering disposition contained in sub-work order 10-330408-002. The disposition performed a flaw growth evaluation based on the corrosion through the pipe wall using the minimum allowable procurement thickness of the pipe as a starting point and assumed a linear degradation rate over the last 25 years. The disposition calculated a 15 mil per year through-wall corrosion rate and a 30 mil per year radial growth rate which was used to justify service until the next refueling outage. The inspectors did not find a discussion of the corrosion mechanism or a justification of the corrosion rate. The inspectors reviewed independent laboratory analyses of removed Wolf Creek piping samples that stated that microbiologically influenced corrosion was likely and that the corrosion likely progressed through-wall at a high rate.

On September 2, 2010, inspectors requested the flaw growth evaluation. The inspectors were directed to pipe repair engineering dispositions that included 20 mils per year corrosion rates to establish allowable time to repair the flaws. The inspectors could not find any basis for the 20 mils per year corrosion rate. Wolf Creek could not produce written technical discussion of the corrosion mechanism or rate. Wolf Creek could not produce empirical data from ultrasonic testing of known flaws at separate times to establish a corrosion rate. On September 15, 2010, Wolf Creek initiated Condition Report 28077 to locate the basis for the 20 mils per year corrosion rate.

Wolf Creek performed ultrasonic testing of the through-wall flaw again on September 29 and it was found satisfactory with little to no flaw growth around the weld. On September 30, 2010, an engineering disposition was created in response to Condition Report 28077 which included a corrosion evaluation. Key in that evaluation was empirical data of known essential service water pits to show an actual growth rate rather than one based strictly on undocumented engineering conjecture. The evaluation used the corrosion rate of 11 flaws which received ultrasonic exams. The corrosion rate was found to vary between -4mils/yr and 29 mils/yr. The evaluation also provided a more thorough description of the under-tubercle corrosion but did not confirm or deny the

presence of microbiologically influence corrosion. Wolf Creek engineering made an estimate of 50 mils/yr. This is not in accordance with WCRE-13 which stated that a 1.1 safety factor should be applied to the wear rate to determine remaining component life or time interval to repair. Wolf Creek initiated Condition Report 29528 regarding the missed compliance with Code Case N513.

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

Enforcement. Title 10 CFR 50.55a(b)(5) allows the use of Code Cases for conditions not addressed in the Code Editions and Addenda and allows implementation without prior NRC approval if the Code Case is referenced in Regulatory Guide 1.147. Code Case N513-2 is listed in Regulatory Guide 1.147. Code Case N513-2, Section 2.0(e) requires a 30-day flaw reinspection be performed. Alternatively, a 90 day flaw reinspection frequency is permissible provided a flaw growth and corrosion mechanism evaluation be performed. Contrary to the above, from July 29 through September 30, 2010, the licensee failed performed a 30 day inspection frequency and did not implement Section 2.0(e) of Code Case N-513-2. Specifically, a flaw growth evaluation including corrosion mechanism was not performed. Because of the very low safety significance of this finding and because the issue was entered into the corrective action program as Condition Reports 28077 and 29528, it is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2010005-04, "Failure to Evaluate Corrosion Mechanism in Accordance with Code Case N513."

1R18 Plant Modifications (71111.18)

.1 Temporary Modifications

a. Inspection Scope

To verify that the safety functions of important safety systems were not degraded, the inspectors reviewed the temporary modification identified as circulating water pump lube oil cooler.

The inspectors reviewed the temporary modification and the associated safety-evaluation screening against the system design bases documentation, including the USAR, and verified that the modification did not adversely affect the system availability. The inspectors also verified that the installation and restoration were consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modification was identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers.

These activities constitute completion of one sample for temporary plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

The inspectors reviewed key parameters associated with energy needs, materials, replacement components, timing, heat removal, control signals, equipment protection from hazards, operations, flow paths, pressure boundary, ventilation boundary, structural, process medium properties, licensing basis, and failure modes for the permanent modification identified as control rod drive mechanism housing clamp.

The inspectors verified that modification preparation, staging, and implementation did not impair emergency/abnormal operating procedure actions, key safety functions, or operator response to loss of key safety functions; postmodification testing will maintain the plant in a safe configuration during testing by verifying that unintended system interactions will not occur; systems, structures and components' performance characteristics still meet the design basis; the modification design assumptions were appropriate; the modification test acceptance criteria will be met; and licensee personnel identified and implemented appropriate corrective actions associated with permanent plant modifications. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample for permanent plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- October 6, 2010, essential service water train A pipe repair
- November 1, 2010, solid state protection steam generator lead/lag card replacement
- November 17, 2010, startup main feedwater pump
- November 23, 2010, load shedder and emergency load sequencer power supply replacement
- December 6, 2010, emergency diesel generator injector pump lockplate repairs

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following (as applicable):

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed
- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the USAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the outage safety plans and contingency plans for the forced outages conducted from October 5 to 15, October 16 and 17, and December 5 to 8, 2010, to confirm that licensee personnel 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 forced outages, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- 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.
- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Status and configuration of electrical systems to ensure that technical specifications and outage safety-plan requirements were met, and controls over switchyard activities.
- Monitoring of decay heat removal processes, systems, and components.
- Verification 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.
- Startup and ascension to full power operation, tracking of startup prerequisites, and walkdown of the primary containment to verify that debris had not been left which could block emergency core cooling system suction strainers.
- Licensee identification and resolution of problems related to refueling outage activities.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three refueling outage and other outage inspection samples as defined in Inspection Procedure 71111.20-05.

b. Findings

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to identify, document and evaluate sources of boric acid leakage.

Description. On December 7, 2010, the inspectors performed a boric acid walkdown of areas inside containment following an unanticipated entry into Mode 3, "Hot Standby," for a forced maintenance outage. During the inspector's containment closeout walkdown, a boric acid leak was identified in the reactor coolant system on the instrument lines to the loop 2 flow transmitters. Since the flow instruments are used as inputs to the reactor protection system, the location of the leak was unisolable from the reactor coolant system during normal plant operations. The leak is isolable from the reactor coolant system using isolation valves when the reactor is not critical. Following cleaning, the licensee determined that the leak was due to a through-wall flaw on a welded union in the instrument line. The inspectors noted that the boron leakage source was identified after the licensee had completed procedure STN PE-040G, "Transient Event Walkdown," Revision 3, which is used to document conditions within containment following a shutdown for a forced maintenance outage. The licensee's procedure required that if boric acid residues are detected on or in the vicinity of components, the leakage shall be evaluated in accordance with AP 16F-001, "Boric Acid Corrosion Control Program," Revision 6A. The licensee's failure to identify the boric acid leak on the instrument line to the reactor coolant system loop 2 flow transmitters is contrary to station procedure AP 16F-001, "Boric Acid Corrosion Control Program," Revision 6A, step 6.4, which required, in part, that sources of boron seepage or leakage shall be identified or verified and documented in the applicable corrective action document. Step 6.1, in part, stated that there is no minimum threshold for personnel to initiate corrective action.

Following evaluation of the leak, the licensee replaced the leaking union. The licensee entered the missed leakage source into their corrective action program and performed an extent of condition review to identify other possible missed boric acid leakage sources.

Analysis. The inspectors determined that the failure to identify a boric acid leak inside containment was contrary to station procedures and was a performance deficiency. Specifically, a boric acid leak on the reactor coolant system loop 2 flow transmitters was not identified and not documented in a corrective action document. The finding was determined to be more than minor because it was associated with the human performance attribute of the Initiating Events Cornerstone and affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors

used Inspection Manual Chapter 0609, “Significance Determination Process, Attachment 4, Phase 1 – Initial Screening and Characterization of Findings,” and determined the finding was of very low safety significance (Green) because the issue would not result in exceeding the technical specification limit for identified reactor coolant system leakage or effect other mitigating systems resulting in a total loss of their safety function. The inspectors also determined that the finding had a crosscutting aspect in the area of problem identification and resolution associated with the corrective action program component because the licensee did not have a sufficiently low threshold in order to identify boric acid leaks during walkdowns [P.1.(a)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” states, in part, that “Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.” Licensee procedure AP 16F-001, “Boric Acid Corrosion Control Program," Revision 6A, step 6.1, required, in part, that any amount of boric acid leakage shall be identified and documented in the applicable corrective action document and further evaluated in the boric acid control program. Contrary to the above, on December 7, 2010, the licensee failed to accomplish the requirements of procedure AP 16F-001. Specifically, the licensee failed to identify and document a source of boric acid leakage on the instrument line to the loop 2 reactor coolant system flow transmitters. Because this issue was determined to be of very low safety significance (Green) and was entered into the licensee’s corrective action program as Condition Report 31003, this violation is being treated as a noncited violation in accordance with Section 2.3.2 of the NRC Enforcement Policy:
NCV 05000482/2010005-05, “Failure to Identify Boric Acid Leak on Instrument Lines to Reactor Coolant System.”

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the USAR, procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment

- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- August 15, 2010, ultimate heat sink sedimentation monitoring
- October 5, 2010, STN PE-40G, QC containment walkdown
- October 15, 2010, STN EJ-002, containment debris walkdown
- October 18, 2010, reactor coolant system unidentified leak rate calculation
- October 21, 2010, STS EN-003A, containment spray additive system flow test
- October 21, 2010, STS EN-100A, containment spray pump inservice test
- November 22, 2010, STS EJ-100A, resident heat removal system inservice pump A test
- November 24, 2010, STS IC-211A, solid state protection system testing

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of eight surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational and Public Radiation Safety

2RS06 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

This area was inspected to: (1) ensure the gaseous and liquid effluent processing systems are maintained so radiological discharges are properly mitigated, monitored, and evaluated with respect to public exposure; (2) ensure abnormal radioactive gaseous or liquid discharges and conditions, when effluent radiation monitors are out of service, are controlled in accordance with the applicable regulatory requirements and licensee procedures; (3) verify the licensee's quality control program ensures the radioactive effluent sampling and analysis requirements are satisfied so discharges of radioactive materials are adequately quantified and evaluated; and (4) verify the adequacy of public dose projections resulting from radioactive effluent discharges. The inspectors used the requirements in 10 CFR Part 20; 10 CFR Part 50, Appendices A and I; 40 CFR Part 190; the offsite dose calculation manual, and licensee procedures required by the technical specifications as criteria for determining compliance. The inspectors interviewed licensee personnel and reviewed and/or observed the following items:

- Radiological effluent release reports since the previous inspection and reports related to the effluent program issued since the previous inspection, if any
- Effluent program implementing procedures, including sampling, monitor setpoint determinations and dose calculations
- Equipment configuration and flow paths of selected gaseous and liquid discharge system components, filtered ventilation system material condition, and significant changes to their effluent release points, if any, and associated 10 CFR 50.59 reviews
- Selected portions of the routine processing and discharge of radioactive gaseous and liquid effluents (including sample collection and analysis)
- Controls used to ensure representative sampling and appropriate compensatory sampling
- Results of the interlaboratory comparison program

- Effluent stack flow rates
- Surveillance test results of technical specification-required ventilation effluent discharge systems since the previous inspection
- Significant changes in reported dose values, if any
- A selection of radioactive liquid and gaseous waste discharge permits
- Part 61 analyses and methods used to determine which isotopes are included in the source term
- Offsite dose calculation manual changes, if any
- Meteorological dispersion and deposition factors
- Latest land use census
- Records of abnormal gaseous or liquid tank discharges, if any
- Groundwater monitoring results
- Changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater, if any
- Identified leakage or spill events and entries made into 10 CFR 50.75(g) records, if any, and associated evaluations of the extent of the contamination and the radiological source term
- Offsite notifications~~,~~ and reports of events associated with spills, leaks, or groundwater monitoring results, if any
- Audits, self-assessments, reports, and corrective action documents related to radioactive gaseous and liquid effluent treatment since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one required sample, as defined in Inspection Procedure 71124.06-05.

b. Findings

Introduction.

Inspectors reviewed a self-revealing Green noncited violation of Technical Specification 5.4.1.a for failure to establish and implement written procedures to prevent

draining and venting radioactive systems into nonradioactive systems as necessary to prevent the spread of contamination and unplanned releases of licensed material to the environment.

Description. On October 21, 2009, the licensee notified the NRC that the nonradioactive auxiliary building sump and turbine building wastewater components had become contaminated with radioactive liquid from the reactor water makeup system. An auxiliary building operator connected a hose to a radioactive system and connected it to another hose that had been routed into the auxiliary building area 5 sump which is a nonradioactive system. The operator drained an estimated 800 to 1000 gallons of reactor coolant through the reactor water makeup and chemical and volume control systems into the auxiliary building area 5 sump. The auxiliary building area 5 sump transferred its contents to the turbine building contaminating the following: turbine building sump, condenser pit sump, low total suspended solids tank, and oily waste intercept tank. When the turbine building sump pump started to transfer the radioactive liquid to the uncontaminated wastewater retention basin, wastewater radiation monitor RE95 alarmed and isolated the discharge at the Hi-Hi setting of 7.25E-5 uCi/ml. At this point the control room became aware of this event.

This event was entered into the corrective action program as Condition Reports 20995 and 20999 and in the 2009 Annual Radiological Release Effluents Report. An apparent cause evaluation was performed as part of Condition Report 20999. The operator and radiation protection technician involved in the event were coached on expectations to drain radioactive systems into contaminated floor drains. According to the licensee, neither the operator nor the radiation protection technician verified where the second hose was routed. The apparent cause evaluation determined that the licensee did not have procedural guidance for preventing contamination of systems. The licensee implemented written instructions and established required reading for operators regarding draining and venting contaminated systems. A decontamination recovery plan was implemented, and floor drain hubs were repainted to aid in preventing personnel from making similar mistakes in the future. The decontamination and operational recovery from the event resulted in a limited use of the turbine building wastewater system from October 21, 2009, to March 10, 2010. On March 10, 2010, the licensee determined that the turbine building sump was no longer contaminated.

The inspectors identified a number of concerns with the apparent cause evaluation as follows:

- The evaluation did not address that the operations department was draining the reactor coolant system while the auxiliary building operator was venting and draining the reactor water makeup system. The potential consequences of draining reactor coolant into the turbine building and out to the wastewater retention basin was not addressed.

- The design weaknesses regarding the lack of a radiation monitor and isolation feature for the auxiliary building area 5 sump was not raised.

- NRC Inspection and Enforcement Bulletin 80-10 explains ways to minimize cross-contamination between systems, but this operating experience was not included as part of the evaluation.

- The evaluation did not include a detailed timeline of the event, and it did not include volume or quantity of radioactive material released during the recovery operation which is important to the radiological effluent programs.

- The corrective actions only addressed operations department training and procedural changes. None of the other working groups' procedures or training were revised as part of the corrective actions.

- Based on reviewing procedure AI-028A-010, Revision 6, "Screening Condition Reports," Attachment B, "Risk Informed Classification of Conditions," the inspectors determined that the apparent cause evaluation of this event should have been a root cause evaluation.

Based on the inspectors' concerns with adequacy of the licensee's corrective actions and apparent cause evaluation, the licensee initiated Condition Report 29295.

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

Enforcement. Technical Specification 5.4.1.a requires that procedures be established, implemented and maintained as recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, February 1978, Appendix A. Sections 3 and 7 of Appendix A, requires, in part, procedures and instructions for filling, venting, and draining systems and controlling radioactivity released to environment. Contrary to the above, on October 21, 2009, during a venting operation, the licensee drained radioactive systems into nonradioactive systems without adequate procedures to control the release of radioactivity. Because the finding is of very low safety significance and has been entered into the corrective action program as Condition Reports 20995, 20999, and 29295, this violation is being treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy:
NCV 05000482/2010005-06, "Failure to Have Procedures to Prevent Draining Radioactive Systems into Nonradioactive Systems."

2RS07 Radiological Environmental Monitoring Program (71124.07)

a. Inspection Scope

This area was inspected to: (1) ensure that the radiological environmental monitoring program verifies the impact of radioactive effluent releases to the environment and sufficiently validates the integrity of the radioactive gaseous and liquid effluent release program; (2) verify that the radiological environmental monitoring program is implemented consistent with the licensee's technical specifications and/or offsite dose calculation manual, and to validate that the radioactive effluent release program meets the design objective contained in Appendix I to 10 CFR Part 50; and (3) ensure that the radiological environmental monitoring program monitors noneffluent exposure pathways, is based on sound principles and assumptions, and validates that doses to members of the public are within the dose limits of 10 CFR Part 20 and 40 CFR Part 190, as applicable. The inspectors reviewed and/or observed the following items:

- Annual environmental monitoring reports and offsite dose calculation manual
- Selected air sampling and thermoluminescence dosimeter monitoring stations
- Collection and preparation of environmental samples
- Operability, calibration, and maintenance of meteorological instruments
- Selected events documented in the annual environmental monitoring report which involved a missed sample, inoperable sampler, lost thermoluminescence dosimeter, or anomalous measurement
- Selected structures, systems, or components that may contain licensed material and has a credible mechanism for licensed material to reach ground water
- Records required by 10 CFR 50.75(g)
- Significant changes made by the licensee to the offsite dose calculation manual as the result of changes to the land census or sampler station modifications since the last inspection
- Calibration and maintenance records for selected air samplers, composite water samplers, and environmental sample radiation measurement instrumentation
- Interlaboratory comparison program results
- Audits, self-assessments, reports, and corrective action documents related to the radiological environmental monitoring program since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one required sample as defined in Inspection Procedure 71124.07-05.

b. Findings

Introduction. The inspectors identified a Green noncited violation of Technical Specification 5.4.1.a for failure to have adequate procedures for maintaining meteorological monitoring equipment functional.

Description. Section 2.3.3.1 of the USAR states that the operational meteorological monitoring system is designed to provide a reliable system in accordance with Regulatory Guide 1.23 (Safety Guide 23), Revision 0, "Onsite Meteorological Program." USAR, Section 2.3.3.7.2.4 states that the operational meteorological program, including operating procedures, meets the recommendations of Regulatory Guide 1.23. Regulatory Guide 1.23 outlines a suitable onsite meteorological program needed to estimate potential radiation doses to the public as a result of both routine and accidental release of radioactive effluents to the atmosphere, as well as assess other environmental effects. In accordance with Regulatory Guide 1.23, meteorological instruments are inspected and serviced at a frequency which will maintain at least a 90 percent data recovery and minimize extended periods of instrument outage.

The inspectors reviewed the 2009 Annual Radiological Release Effluent Report that stated the licensee failed to meet the 90 percent data recovery of meteorological data for the 2009 calendar year. The meteorological data recovery was found to be only 74.4 percent. In most cases, redundant sensors and recorders at appropriate locations may be used to achieve the required data recovery and minimize the gap that could exist because of instrument failures in the primary system. However, both the primary and secondary wind direction instruments at the 10 meter elevation of the onsite meteorological tower were found to simultaneously yield invalid data for a significant period of time. Therefore, a period of time existed when both 10 meter wind direction sensors (i.e., a wind vane and a sonic instrument) were deemed not functional. The inspectors reviewed the annual meteorological database and the entries for condition A of Technical Requirement 3.3.12 made for nonfunctional channels. The inspectors found that the 10 meter wind direction sensors were not functional for approximately 25 percent of the year and determined that both instrument channels were not functional for at least 65 days from April to October 2009.

Technical Surveillance Requirement 3.3.12 states that the meteorological instruments (i.e., wind speed, wind direction, and air temperature-ΔT) should be checked for functionality on a daily basis and calibrated on a semi-annual basis. According to the action requirement for condition A of Technical Requirement 3.3.12, if one channel fails, the licensee is required to restore that failed channel to a functional status within 7 days. Condition B states that if this restoration is not accomplished, or if both channels fail simultaneously, then the licensee is required to initiate a condition report immediately. The inspector discussed these requirements with the technicians responsible for maintaining the wind direction sensors. The inspectors noted that in 2009 numerous entries to Technical Requirement 3.3.12, condition A, occurred for failure of one

meteorological channel. However, the inspectors determined that the licensee failed to implement Technical Requirement 3.3.12, condition B. Specifically, the technicians failed to identify that both wind direction channels were not functional when the instruments returned invalid data for an extended period of time between April 2009 and October 2009. The inspectors also determined that the instruments were not yielding valid data when operators conducted the daily functional check. The tolerance band for wind direction values for both 10 meter height sensors was not stringent enough. Additionally, this tolerance band was not included in procedures to implement and maintain meteorological monitoring instrumentation functional. Also, there was no reference to the technical requirements made in the procedure(s) so that a condition report would be initiated immediately consistent with requirements listed in Technical Requirement 3.3.12, condition B.

The licensee developed additional guidance for determining functionality of the instruments and immediately required the meteorological data to be reviewed on a more frequent basis to ensure validity. The licensee entered this issue into the corrective action program as Condition Report 00029337.

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

Enforcement. Technical Specification 5.4.1.a requires written procedures be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, “Quality Assurance Program Requirements (Operation),” Revision 2, February 1978. Section 7.h, “Meteorological Monitoring,” of Appendix A, requires procedures for meteorological monitoring. Contrary to this requirement, on October 20, 2010, inspectors determined that procedures had not been established to maintain functionality of meteorological monitoring equipment. Specifically, the licensee did not have a procedure that could determine functionality of one or more channels of wind instrumentation and declare them out of service pursuant to Technical Requirement 3.3.12. Consequently, for at least 65 days between April and October of 2009, both channels of the 10 meter wind direction instrumentation were not functional. Because this violation is of very low safety significance and was entered into the corrective action program as Condition Report 00029337, this violation is being

treated as a noncited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2010005-07, "Failure to Have Adequate Procedures for Meteorological Monitoring."

2RS08 Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08)

a. Inspection Scope

This area was inspected to verify the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material. The inspectors used the requirements of 10 CFR Parts 20, 61, and 71 and Department of Transportation regulations contained in 49 CFR Parts 171-180 for determining compliance. The inspectors interviewed licensee personnel and reviewed the following items:

- The solid radioactive waste system description, process control program, and the scope of the licensee's audit program
- Control of radioactive waste storage areas including container labeling/marking and monitoring containers for deformation or signs of waste decomposition
- Changes to the liquid and solid waste processing system configuration including a review of waste processing equipment that is not operational or abandoned in place
- Radio-chemical sample analysis results for radioactive waste streams and use of scaling factors and calculations to account for difficult-to-measure radionuclides
- Processes for waste classification including use of scaling factors and 10 CFR Part 61 analysis
- Shipment packaging, surveying, labeling, marking, placarding, vehicle checking, driver instructing, and preparation of the disposal manifest
- Audits, self-assessments, reports, and corrective action reports radioactive solid waste processing, and radioactive material handling, storage, and transportation performed since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one required sample as defined in Inspection Procedure 71124.08-05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the 3rd Quarter 2010 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 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 were identified.

.2 Safety System Functional Failures (MS05)

a. Inspection Scope

The inspectors sampled licensee submittals for the safety system functional failures performance indicator for the period from the 4th quarter 2009 through the 3rd quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73." The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports, and NRC integrated inspection reports for the period of October 1, 2009, through September 30, 2010, 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. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one safety system functional failures sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index - Emergency ac Power System (MS06)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - emergency ac power system performance indicator for the period from the 4th quarter 2009 through the 3rd quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, mitigating systems performance index derivation reports, issue reports, event reports, and NRC integrated inspection reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one mitigating systems performance index emergency ac power system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.4 Mitigating Systems Performance Index - High Pressure Injection Systems (MS07)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - high pressure injection systems performance indicator for the period from the 4th quarter 2009 through the 3rd quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one mitigating systems performance index high pressure injection system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.5 Mitigating Systems Performance Index - Heat Removal System (MS08)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - heat removal system performance indicator for the period from the 4th quarter 2009 through the 3rd quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, mitigating systems performance index derivation reports, and NRC integrated inspection reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one mitigating systems performance index heat removal system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.6 Mitigating Systems Performance Index - Residual Heat Removal System (MS09)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - residual heat removal system performance indicator for the period from the 4th quarter 2009 through the 3rd quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of October 1, 2009,

through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one mitigating systems performance index residual heat removal system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.7 Mitigating Systems Performance Index - Cooling Water Systems (MS10)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - cooling water systems performance indicator for the period from the 4th quarter 2009 through the 3rd quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of October 1, 2009, through September 30, 2010, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. 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. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one mitigating systems performance index cooling water system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings 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 Identification and Resolution of Problems

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. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because 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 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. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of June 2010 through December 2010 although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and maintenance rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

These activities constitute completion of one single semi-annual trend inspection sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

.4 In-depth Review of Operator Workarounds

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting the lower core flow anomaly causing spurious control rod steps into the core. The inspectors reviewed the work around and burden program to track the progress of using new computer points to discriminate between the lower core flow anomaly and other potential causes of inward rod steps. The inspectors also reviewed other workarounds and burdens and their impact on licensed and non-licensed operators.

These activities constitute completion of one in-depth review of operator workarounds as one in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

.5 Selected Issue Followup of Substantive Cross-Cutting Issues

a. Inspection Scope

Per Inspection Manual Chapter 0305, Section 13.03.a.4, bullet two, the inspectors conducted an indepth annual sample using Inspection Procedure 71152, "Identification and Resolution of Problems," to evaluate the licensee's progress in addressing the substantive crosscutting issues. The NRC's assessment letter dated September 1, 2010, identified substantive crosscutting issues in problem identification and resolution. The inspectors reviewed Wolf Creek's September 30, 2010, response to the NRC's September 1, 2010, mid-cycle assessment letter. The inspectors observed post trip review meetings, all hand meetings, reviewed condition reports, interviewed personnel, and reviewed self assessments. Inspectors also reviewed Wolf Creek's presentation during the May 11, 2010 Annual Assessment Public Meeting, the August 25, 2010 public meeting, and the November 30, 2010 public meeting.

These activities constitute completion of one indepth annual problem identification and resolution sample as defined in IP 71152-05.

b. Observations

Problem Identification and Resolution

The NRC's September 1, 2010, assessment letter identified two themes within the area of problem identification and resolution. The inspectors conducted their own trend reviews. The Wolf Creek's May 26 letter showed that the condition report initiation rate was increasing due to a lowered threshold for condition report initiation. During 2010, there were a large number of Green noncited violations and findings. Over thirty total findings with most being NRC-identified. This tracks with Wolf Creek's increased condition report initiation rate. The inspectors found that the licensee's efforts to increase scrutiny of products through additional management reviews, plant safety review committee, engineering standards team, and others has not produced improved results. This endeavor still requires improved implementation since the essential service water, reactor trip, and operability evaluation findings in this report have had heavy management involvement.

The re-writing of the corrective action program in April 2009 and then re-writing the corrective action program again in October 2010 has been a positive step in lowering the threshold on condition report initiation, improving the quality of evaluations, and tracking corrective actions. Prior to October 2010, Wolf Creek had several stop gap measures to ensure that problems would not be lost between the work control, corrective action, and operability determination programs. The change should be roughly equivalent in output, but the most recent change to align with Regulatory Issue Summary 2005-20 should simplify the processes. Inspectors have observed that this alignment with Regulatory

Issue Summary 2005-20 has had the desired effect to increase the emphasis on objectively evaluating problems and fixing them at the next available opportunity. This effort, combined with corrective actions that resulted from the Biennial Problem Identification and Resolution team observations, has resulted in an increased effort to reduce long standing maintenance backlogs. Trending capabilities have now been incorporated in the corrective action software and many of Wolf Creek's new internal metrics have thresholds lower than the NRC's on items such as cross cutting aspects, licensee event report timeliness, and operability evaluation completeness. Many of Wolf Creek's new and more extensive internal indicators are greater-than-green, as shown in the November 30, 2010 public meeting presentation slides.

Inspectors have noted a trend of increasing technical discussion performed in immediate and prompt operability determinations with a more focused discussion on the problem. This is an improvement over the past practices of stating the applicable USAR information with a short description of why the component is operable.

Human Performance

Wolf Creek initiated a root cause for Condition Report 23032 to stem the increase in problem identification and resolution and human performance cross cutting issues. The evaluation was re-performed after a self assessment revealed that it was not effective in stopping the longstanding trend. Wolf Creek's corrective actions have focused on organizational change, human performance, and continuous learning objectives. In response to entering Column III of the NRC Action Matrix, Wolf Creek implemented a Station Recovery Program which largely reincorporated and repackaged the same objective themes of organizational change, human performance, and continuous learning. Wolf Creek has identified the causes of their performance shortfalls, however the solutions are defined in programmatic and general terms. Issues identified in Wolf Creek's quarterly corrective actions roll-up reports were often leading indicators outlining that the corrective actions are not being addressed in a timely manner. The most notable instance was the need to improve the process of assessment of degraded and non-conforming conditions to align with Regulatory Issue Summary 2005-20. While this was identified as a weakness in all four quarters, it was not corrected until the 4th quarter, 2010, after a large number of NRC-identified violations and operating events. There was also a major difference in the quality of corrective action self assessment (roll-up) reports between the major departments of Operations, Maintenance, and Engineering. The Operations department was a clear leader in this area and was the only department to make critical conclusions about the state of their programs. Maintenance failed to recognize significant challenges within their department. Engineering acknowledged the existence of gaps to excellence but did not elaborate on significant trends or solutions. Both Maintenance and Engineering outlined the path to success as merely participating in the corrective action program. Wolf Creek did have initiatives in 2010 to identify each department's procedures needed for improvement, but most departments only identified corrective action procedure compliance as their need for improvement. Many of Wolf Creek's major corrective actions initiatives are focused on the senior management levels and are not producing effective results on the frontlines. This is consistent with the results of working level focus group interviews conducted for the Biennial Problem Identification and Resolution inspection in July 2010.

Overall, increased Wolf Creek management attention to these efforts has driven many improvements and changes since the corrective action program was rewritten starting in January 2009, and the inspectors have observed increasing management attention ever since.

c. Findings

No findings of significance were identified.

4OA3 Event Follow-up (71153)

.1 October 17, 2010 Reactor Trip

a. Inspection Scope

On October 17, 2010, the resident inspectors responded to the control room when Wolf Creek automatically tripped from 17 percent power. The inspectors reviewed control room logs, plant computer data, and interviewed senior reactor operators regarding plant performance. The inspectors reviewed plant operating practices regarding methods of feedwater heating during low power operation. Region IV sent a focused baseline inspection team consisting of two operator licensing inspectors to complete the inspection sample.

From October 25 to 28, 2010, the two regional inspectors reviewed the actions taken by the licensee before and after the reactor trip event on October 17, 2010. From interviews with several members of the operating crew and plant data before and after the event, the inspectors independently reviewed the sequence of events:

- The crew assumed the watch with reactor power at 7 percent on the condenser steam dumps, the turbine warmed up, and one main feed pump operating at 5000 rpm. This main feed pump speed would be the optimal speed for approximately 50 percent power, but not for 7 percent; therefore, the feed bypass regulating valves were not operating in their optimal linear region (between 60 to 80 percent open). In fact they were operating in a highly nonlinear region of the throttling curve. Additionally, steam generator blowdown was not in service, and feed preheating was being provided by main steam to the 6A/B and 7A/B heaters. Feed temperature was approximately 320°F which was optimal for continued startup according to one crew member. There was a forecast chemistry hold due to steam generator chemistry at approximately 30 percent power.

- The crew slowly established a target 100,000 lbm/hr total blowdown flow throughout the event. However, blowdown preheat was not placed into service. This would have required aligning blowdown flash tank vent to the heater drain tank and then to the 5A/B heaters.

- The crew began a 29 minute power ascension to 17 percent power using steam

dumps. After starting the power increase, feed flow began to increase. One operator stated that the preheating steam controllers that controlled steam to the 6A/B and 7A/B heaters were at 100 percent output. However, this supplied insufficient heating to maintain feed temperature as feed flow increased.

- Feed temperature decreased throughout the power ascension to approximately 260°F. As the feedwater temperature decreased steam generator level oscillations began in all four generators, and as the temperature approached 260°F, the amplitudes of oscillation increased. Throughout the event, steam generator B level oscillation had the largest amplitude.

- The crew attempted to stabilize the level oscillations in steam generator B by placing the controller in manual and back to auto after making adjustments to feed flow. The graphs of feed flow show large swings in flow which indicates the operator was not effectively controlling that flow, and the actions were exacerbating pressure and temperature induced oscillations in steam flow which increased shrink and swell induced oscillations in level.

- At approximately 17 percent power, steam generator B experienced the last swell in level which reached the P-14, high steam generator level setpoint. This caused a feedwater isolation signal as well as the main turbine and feed pump turbine to trip. Auxiliary feedwater started after the feed pump turbine tripped. Because the steam dumps were operating in steam pressure mode, steam flow exceeded available auxiliary feed flow. The operating crew initially attempted to lower reactor power with control rods. They realized that the lack of feed flow would prevent recovery before an automatic trip occurred and attempted to manually trip the reactor; however, steam generator level reached the low level reactor trip setpoint, and an automatic reactor trip occurred.

The inspectors interviewed system engineers and instrumentation and controls technicians to determine whether equipment malfunction could have been a contributor to the event. The inspectors considered feed bypass level control valves, steam generator blowdown control as well as the Westinghouse 7300 level controllers in the scope of the potentially malfunctioning equipment. The inspectors also reviewed several condition reports and event follow-up reports relating to steam generator level control oscillations while transitioning through this region of power during startup and shutdown. The inspectors interviewed simulator instructors, members of training management, observed simulator performance, and attempted to validate procedures in the simulator that could have been used after P-14 actuated. The inspectors also interviewed members of the root cause analysis team and reviewed the root-cause progress completed at the time.

These activities constitute completion of one sample in accordance with Inspection Procedure 71153-05, “Follow-up of Events and Notices of Enforcement Discretion.”

b. Findings

1. Inadequate Procedures for Establishing Feedwater Preheat

Introduction. The inspectors identified a Green noncited violation of Technical Specification 5.4.1.a, "Procedures," for Wolf Creek procedures GEN 00-003, "Hot Standby to Minimum Load," and SYS AE-200, "Feedwater Preheating During Plant Startup and Shutdown," being inadequate by failing to require maximum feedwater preheating. This could lead to a reactor trip caused by steam generator level oscillations attributable to low feedwater temperature.

Description. On October 17, 2010, Wolf Creek operations personnel were continuing a reactor startup that had been initiated by another crew. They assumed the watch with reactor power at 7 percent. Feedwater temperature was approximately 320°F, and feedwater preheating was being provided by main steam to the 6A/B and 7A/B feedwater heaters. The controllers that controlled steam to the feedwater heaters were at maximum output. Blowdown preheat was not in service. Prerequisite 5.14 of procedure GEN 00-003 directed placing feedwater preheating in service in accordance with SYS AE-200. Precaution 4.1 of procedure SYS AE-200 listed the preferred methods and sequence of establishing adequate feedwater preheating. The first method of preheating would use blowdown preheating. Because the precaution stated "preferred," the control room personnel elected to not establish blowdown preheating prior to power ascension. Additionally, GEN 00-003 did not caution the crew to ensure maximum feedwater preheating was in service which would have required aligning blowdown preheating. Dating back to 1985, there have been numerous occasions where inadequate feedwater preheating caused oscillations in steam generator levels during both startup and shutdown. During interviews with control room personnel, all of the operators understood, before this event, the need to have maximum feedwater preheating prior to power ascension. Because neither procedure adequately addressed maximum feedwater preheating, the operators raised power to between 15 and 17 percent without maximizing feedwater preheating.

As feedwater flow increased throughout the power ascension, feedwater temperatures decreased due to a lack of adequate feedwater preheating. As feedwater temperatures decreased, oscillations in all four steam generators began, and as temperature approached 260°F, the amplitude of oscillations became larger. Steam generator B had the most severe oscillations, and the control room crew attempted to dampen the oscillations by taking manual control of bypass feed regulating valve B. Because of the challenges of manually controlling steam generator level that is experiencing severe shrink and swell oscillations, the P14 permissive actuated on the last swell in level which ultimately led to a reactor trip on Lo-Lo steam generator level. The licensee made a temporary change to the procedure that cautioned operating crews to maintain maximum feedwater preheating, and entered this issue in the corrective action program as Condition Reports 29845 and 29846.

Analysis. The inadequate procedural direction to establish maximum feedwater preheating is a performance deficiency. The performance deficiency is more than minor,

therefore a finding, because it is associated with the Initiating Events Cornerstone attribute of procedure quality and it affects the objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings." This finding was determined to be of very low safety significance (Green) since the finding contributed to the likelihood of a reactor trip, however, it did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding had a crosscutting aspect in the area of problem identification and resolution associated with the operating experience component because Wolf Creek failed to institutionalize internal and external operating experience by changing plant procedures [P.2(b)].

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires that written procedures be established and implemented covering activities specified in Appendix A of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," February 1978. Regulatory Guide 1.33, Appendix A, Section 2.b, requires general operating procedures for plant startup from hot standby to minimum load. Contrary to the above, Wolf Creek did not adequately establish GEN 00-003 and SYS AE-200 because both procedures failed to ensure operating personnel would establish maximum feedwater preheating in order to prevent or minimize steam generator level oscillations. Because this finding is of very low safety significance and the licensee has entered this issue into the corrective action program as Condition Reports 29845 and 29846, this violation is being treated as a noncited violation in accordance with Section 2.3.2 of the Enforcement Policy: NCV 05000482/2010005-08, "Inadequate Procedures for Establishing Feedwater Preheat."

2. Inadequate Procedures to Ensure Proper Main Feed Pump Speed During Startup

Introduction. The inspectors identified a Green noncited violation of Technical Specification 5.4.1.a, "Procedures," for Wolf Creek procedures GEN 00-003, "Hot Standby to Minimum Load," and SYS AE-121, "Turbine Driven Main Feedwater Pump Startup," being inadequate by failing to direct control room operators to establish a main feedwater pump speed that will allow the feed bypass regulating valves to control in the 60 to 80 percent open range, prior to raising power from 8 to 16 percent. Feed bypass regulating valve throttle characteristics are highly nonlinear below this range which complicates manual and automatic control.

Description. During the October 17, 2010, event, the operating crew assumed the watch with reactor power at approximately 7 percent. The turbine-driven main feedwater pump had been started by the previous crew, and was operating at approximately 5000 rpm. In this condition, the feed bypass regulating valves were operating below the optimal 60 to 80 percent open region. The inspectors tested this in the simulator, and the valves were about 40 percent open. During interviews, only one member of the control room staff would state that the valves were out of the optimal positions. When one turbine-driven main feedwater pump is started, SYS AE-121, step 6.1.27.3 for pump A (6.2.27.3 for pump B) directed the operator to manually adjust the master speed controller to

optimize feedwater differential pressure as necessary. There was no direction to establish optimal feedwater bypass regulating valve position in this procedure; however, the direction to establish optimal regulating valve position was in GEN 00-003 at step 6.48 when power is to be stabilized between 15 and 20 percent. However, at the time of the event, the crew had not reached step 6.48, and no prior procedural direction existed to establish optimal valve position. The control room staff would have to read ahead to anticipate that this was a requirement.

When the oscillations began after the power ascension, the balance-of-plant operator attempted to dampen steam generator B level oscillations by placing its regulating valve into manual and then back to automatic after making adjustments. Because the valve was not in its optimal position, the throttling response would have been highly nonlinear which was evidenced by large step changes in feedwater flow during this period. These actions exacerbated the shrink and swell induced level oscillations because large amounts of feed would tend to cool the generator, causing pressure to lower to some value less than steam header pressure. At this point, steaming would sharply decrease, and level would shrink. The instinctive operator response would be to increase feed flow. Also, when a large reduction in feedwater flow occurs the generator temperature tends to increase; therefore, its pressure would rise causing a rapid increase in steaming and a swell in the level. The instinctive operator response would be to further decrease feeding. Both of these operator responses are incorrect and would lead to increasing amplitudes of oscillation. During this event the amplitude reached the P-14 high steam generator level setpoint in steam generator B. The licensee made a temporary change to the procedures that cautioned operating crews to ensure earlier establishment of optimal feedwater bypass control valve position, and entered this issue in the corrective action program as Condition Reports 29845 and 29846.

Analysis. The inadequate procedural direction to establish optimal bypass valve position at the correct time during the startup is a performance deficiency. The performance deficiency is more than minor, therefore a finding, because it is associated with the Initiating Events Cornerstone attribute of procedure quality and it affects the objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors evaluated the significance of this finding using Inspection Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings.” This finding was determined to be of very low safety significance (Green) since the finding contributed to the likelihood of a reactor trip, however, it did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding had a crosscutting aspect in the area of problem identification and resolution associated with the operating experience component because Wolf Creek failed to institutionalize internal operating experience by changing plant procedures [P.2(b)].

Enforcement. Technical Specification 5.4.1.a, “Procedures,” requires that written procedures be established and implemented covering activities specified in Appendix A of Regulatory Guide 1.33, “Quality Assurance Program Requirements (Operation),” February 1978. Regulatory Guide 1.33, Appendix A, Section 2.b, requires general operating procedures for plant startup from hot standby to minimum load. Contrary to

the above, Wolf Creek did not adequately establish GEN 00-003 and SYS AE-121 because both procedures failed to ensure operating personnel would establish optimal feed bypass regulating valve control with control of feedwater pump speed before transitioning power through the highly unstable steam generator level control region. Because this finding is of very low safety significance (Green) and the licensee has entered this issue into the corrective action program as Condition Reports 29845 and 29846, this violation is being treated as a noncited violation in accordance with Section 2.3.2 of the Enforcement Policy: NCV 05000482/2010005-09, "Inadequate Procedures to Ensure Proper Main Feed Pump Speed During Startup."

3. Inadequate Procedure for Steam Generator Hi-Hi Turbine Trip

Introduction. The inspectors identified a Green noncited violation of Technical Specification 5.4.1.a, "Procedures," for Wolf Creek Procedure ALR 00-112A, "Steam Generator Level Hi-Hi Turbine Trip," being inadequate when reactor power exceeds the capabilities for the auxiliary feedwater system to maintain adequate heat sink.

Description. On October 17, 2010, Wolf Creek control room operations personnel were preparing to perform testing on the main turbine prior to connecting the main generator to the power grid. Reactor power was approximately 15 percent and steam generator B level was not controlling correctly in automatic. All four steam generators were experiencing increasing level oscillations; however, steam generator B level oscillations had the largest amplitude. The control room operators placed steam generator B level control bypass valve in manual and were unable to prevent a steam generator hi-hi turbine trip. This P-14 signal also caused the main feedwater pumps to trip and a feedwater isolation signal. The main feedwater pumps' tripping caused the motor-driven auxiliary feedwater pumps to start, blowdown to isolate and steam generator sample to isolate. At this time, reactor power was much greater than the capacity of auxiliary feedwater pump capability to maintain steam generator levels. The control room crew was inserting control rods in an attempt to reduce reactor power to be within the capability of the auxiliary feedwater pumps. The reactor automatically tripped on steam generator lo-lo level approximately 2 minutes after the P-14 signal.

Wolf Creek Procedure ALR 00-112A was the procedural direction for the control room staff for this situation, prior to the reactor trip. Step 1 required that the reactor be tripped either automatically or manually if reactor power is 50 percent or greater. When the reactor power is below 50 percent, no reactor trip was required. Steps 3, 4, and 5 verified turbine trip, feedwater isolation and the motor-driven auxiliary feedwater pumps running. Step 6 directed the crew to maintain reactor power less than 2 percent in manual rod control. The inspectors observed this scenario on the plant simulator and concluded it is not possible to reduce power fast enough to prevent an automatic trip, even starting from approximately 15 percent power. It is not a conservative decision to challenge an automatic reactor trip during this inadequate steam generator feed capacity event. A manual reactor trip should be directed when the power level is much greater than the auxiliary feedwater pump capacity; therefore, the procedural directions were inadequate. The licensee incorporated guidance in their startup training to trip the

reactor when inadequate feedwater flow exists after P-14 actuation. This issue was entered in the corrective action program as Condition Report 29540.

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

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires that written procedures be established and implemented covering activities specified in Appendix A of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," February 1978. Regulatory Guide 1.33, Appendix A, Section 6.j, required operating procedures for loss of feedwater or feedwater system failures. Contrary to the above, Wolf Creek did not adequately establish a procedure for loss of feedwater in ALR 00-112A. This procedure directed the control room operators to attempt to prevent a reactor trip, instead of conservatively directing a manual reactor trip when the feed capability is much less than that which would be required to maintain steam generator level. Because this finding is of very low safety significance and the licensee has entered this issue into the corrective action program as Condition Report 29540, this violation is being treated as a noncited violation in accordance with Section 2.3.2 of the Enforcement Policy: NCV 05000482/2010005-10, "Inadequate Procedure for Steam Generator Hi-Hi Turbine Trip."

4. Inadequate Simulation Facility Fidelity

Introduction. The inspectors identified a Green noncited violation of 10 CFR 55.46 (c)(1)(i), "Simulator Fidelity," in that the licensee's simulation facility did not have adequate fidelity to simulate steam generator level oscillations that occur during startup and shutdown after a loss of feedwater preheat, thereby creating the possibility for negative training. Specifically, two constants that are used in the model for the Westinghouse 7300 steam generator level control cards were improperly programmed in the simulator. This issue was entered into the licensee's corrective action program as Condition Report 29286.

Description. After the October 17, 2010, event and due to the transient response of the steam generator level control loop in the plant, a member of the licensee's staff determined that actual controller setpoints for the bypass feed regulating valves did not

match what was documented in the licensee's total plant setpoint document. The in-plant controllers had been tuned during startup testing, and those setpoints were not documented in the total plant setpoint document. However, the simulator did have the Westinghouse 7300 controller settings that are listed in the total plant setpoint document.

Based on this, the behavior of the controllers differed between the plant and simulator model. This was evident when the inspectors asked the licensee to demonstrate transient steam generator level response with the in-plant settings programmed into the model. The levels did oscillate; however, the oscillations were dampened over time which indicated that additional tuning was required. Any Just-In-Time Training that occurred in the simulator had the possibility of providing negative training when operating on the bypass feed regulating valves. Specifically, licensed operators interviewed as part of this inspection noted that the simulator was benign when operating in the region where highly unstable level control is likely to occur in the plant. The licensee changed the constants in the simulator model and initiated actions to ensure accurate low-power steam generator level oscillation modeling. This issue was entered in the corrective action program as Condition Report 29541.

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

Enforcement. Title 10 CFR 55.46 (c)(1)(i) states in part that a facility licensee shall have a simulation facility with sufficient fidelity to allow conduct of the evolutions listed in 10 CFR 55.59 (c)(3)(i)(A) through (AA) which include startups and shutdowns. Contrary to the above, for several years the licensee had incorrect modeling parameters for steam generator level control, in that the simulator could not model the steam generator oscillation phenomena observed in the plant while operating through low powers. Because this finding is of very low safety significance and the licensee has entered this issue into the corrective action program as Condition Report 29541, this violation is being treated as a noncited violation in accordance with Section 2.3.2 of the Enforcement Policy: NCV 05000482/2010005-11, "Inadequate Simulation Facility Fidelity."

4OA5 Other Activities

.1 Temporary Instruction 2515/180, Inspection of Procedures and Processes for Managing Fatigue

a. Inspection Scope

On September 23, 2010, the inspectors reviewed Wolf Creek Nuclear Operating Corporation procedures and policies to confirm that the Fitness for Duty program adequately implemented fatigue management requirements for individuals subject to 10 CRF Part 26, subpart I. The inspectors confirmed that the licensee had procedures in place that described:

- The process to be followed after any individual makes a self-declaration that he or she is not fit to safely and competently perform his or her duties for any part of a working tour as a result of fatigue;
- The process for implementing the work hour controls;
- The process for conducting fatigue assessments, and
- Disciplinary actions that may be imposed on an individual following a fatigue assessment, and the conditions and considerations for taking those disciplinary actions.

The inspectors reviewed the licensee's training program to verify implementation and testing of specified knowledge and abilities specified in 10 CFR 26.203(c)(1) and (c)(2). The inspectors confirmed that the licensees' process for developing the annual Fitness for Duty report include provisions for documenting the summary of instances where work hour controls were waived.

The inspectors also confirmed that the licensee had a process in place to retain the following records for at least 3 years or until the completion of all related legal proceedings, whichever is later:

- Work hours for individuals who are subject to the work hour controls
- Shift schedules and shift cycles of individuals who are subject to the work hour controls
- Waivers and the bases for the waivers
- Work hour reviews
- Fatigue assessments.

These activities constitute completion of Temporary Instruction 2515/180, Inspection of Procedures and Processes for Managing Fatigue.

a. Findings

No findings were identified.

4OA6 Meetings

Exit Meeting Summary

On October 8, 2010, the inspectors discussed the results of the licensed operator requalification program inspection with Mr. S. Henry, Operations Manager, and other members of the licensee's staff. The lead inspector obtained the final biennial examination results and telephonically exited with Ms. M. Guyer, Operations Superintendent, on December 16, 2010. The licensee representatives acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On October 22, 2010, the inspectors presented the results of the radiation safety inspection to Mr. M. Sunseri, President and Chief Executive Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On October 29, 2010, the inspectors presented the results of the triennial review of heat sink performance to Mr. S. Hedges, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On November 4, 2010, during a telephonic exit meeting, the inspectors presented the results of the Focused Baseline and Event Follow-up inspection to Mr. Russell Smith, Plant Manager, and other members of your staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On December 10, 2010, the inspector presented the results of the essential service water focused baseline inspection to Mr. S. Hedges, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 4, 2011, the resident inspectors presented their inspection results to Mr. M. Sunseri, President and Chief Executive Officer, and other members of the licensee staff. On February 9, the resident inspectors re-exited with Mr. S. Hodges, Site Vice President. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials

examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel
P. Bedgood, Manager, Radiation Protection
S. Hedges, Site Vice President
T. Just, Senior Technician, Chemistry
C. Medenciy, Supervisor, Radiation Protection
W. Muilenburg, Licensing Engineer
T. Rice, Manager, Environmental Management
D. Hooper, Supervisor, Regulatory Affairs
M. Lanier, Technician, I&C
M. McMullen, Technician, Engineering
R. Hobby, Licensing Engineer
M. Sunseri, President and Chief Executive Officer
J. Truelove, Supervisor, Chemistry
G. Pendergrass, Director of Engineering
J. Pankaskie, Engineering Supervisor
J. Weeks, System Engineer
J. Keim, Support Engineering Supervisor
S. Henry, Operations Manager
R. Gardner, Plant Manager
M. Westman, Training Manager
M. Guyer, Operations Superintendent
R. Evenson, Requalification Program Supervisor
R. Murray, Simulator Supervisor
L. Rockers, Licensing Engineer

NRC Personnel
C. Long, Senior Resident Inspector
C. Peabody, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000482-2010005-01	NCV	Failure to Properly Identify and Evaluate Degraded Piping in the Train A Essential Service Water System (Section 1R04)
05000482-2010005-02	NCV	Failure to Account for Water Hammer Stresses in Essential Service Water System Calculations (Section 1R04)
05000482-2010005-03	NCV	Failure to Maintain Operator Licensing Examination Integrity (Section 1R11)
05000482-2010005-04	NCV	Failure to Evaluate Corrosion Mechanism in Accordance with Code Case N513 (Section 1R15)
05000482-2010005-05	NCV	Failure to Identify Boric Acid Leak on Instrument Lines to Reactor Coolant System (Section 1R20)
05000482-2010005-06	NCV	Failure to Have Procedures to Prevent Draining Radioactive Systems into Nonradioactive Systems (Section 2RS06)
05000482-2010005-07	NCV	Failure to Have Adequate Procedures for Meteorological Monitoring (Section 2RS07)
05000482/2010005-08	NCV	Inadequate Procedures for Establishing Feedwater Preheat (Section 4OA3)
05000482/2010005-09	NCV	Inadequate Procedures to Ensure Proper Main Feed Pump Speed During Startup (Section 4OA3)
05000482/2010005-10	NCV	Inadequate Procedure for Steam Generator Hi-Hi Turbine Trip (Section 4OA3)
05000482/2010005-11	NCV	Inadequate Simulation Facility Fidelity (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

PROCEDURES

NUMBER	TITLE	REVISION
STN GP-001	Plant Winterization	42A
SYS EF-205	ESW/Circ Water Cold Weather Operations	25

Section 1R04: Equipment Alignment

Drawings

NUMBER	TITLE	REVISION
C-K201	ESWS Yard Pipelines and Electrical Duct Banks Plans Sections and Schedules	8
C-K202	ESWS Yard Pipelines and Electrical Duct Banks Plans Sections and Schedules	9
C-K203(Q)	ESWS Yard Pipelines and Electrical Duct Banks Plans Sections and Schedules	3
C-K204(Q)	ESWS Yard Pipelines Sections, and Details	7
C-K205	ESWS Yard Pipelines Sections, and Details	11
C-K208	ESWS Yard Pipelines Valve House Plans, Sections and Details	6
C-K211	ESWS Yard Pipelines Sections, and Details	7
C-K213	ESWS Yard Pipelines Valve House Plans, Sections and Details	15
C-KC401	ESWS Discharge Structure Concrete Neat Line and Reinforcing Plan Sections and Details	1
C-KC305	ESWS Pump House Concrete Neat Line Longitudinal Sections and Details	13
M-2	ESWS Pump House and Ultimate Heat Sink	E
M-12EF01	Piping and Instrumentation Diagram Essential Service Water System	21
M-12EF02	Piping and Instrumentation Diagram Essential Service Water System	26
M-13EF01	Piping Isometric Essential Service Water System Control Building A and B Train	15
M-13EF02	Piping Isometric Essential Service Water System Auxiliary Building A Train Supply	9
M-13EF03	Piping Isometric Essential Service Water System Auxiliary Building A Train Return	18
M-13EF04	Piping Isometric Essential Service Water System Auxiliary Building B Train Supply	10
M-13EF05	Piping Isometric Essential Service Water System Auxiliary Building B Train Return	10

Section 1R04: Equipment Alignment

Drawings

NUMBER	TITLE	REVISION
M-13EF06	Piping Isometric Essential Service Water System Auxiliary Building A and B Train Supply and Return	15
M-13EF07(Q)	Piping Isometric Essential Service Water System Control Building Diesel Generator Cooler A and B Train Supply and Return	1
M-13EF08	Piping Isometric Essential Service Water System Diesel Generator Building	1
M-13EF09(Q)	Small Piping Isometric Essential Service Water System Auxiliary Building A Train Supply and Return	0
M-13EF10	Small Pipe Isometric Essential Service Water Pipe Chase Vents and Drains B Train Auxiliary Building	4
M-13EF11(Q)	Small Pipe Isometric Essential Service Water Pipe Chase Vents and Drains A Train Auxiliary Building	0
M-13EF12(Q)	Piping Isometric Essential Service Water Fuel Building	5
M-13EF13	Small Piping Isometric Miscellaneous Details Essential Service Water System	7
M-13EF14	Piping Isometric Essential Service Water System Class IE Switchgear Air Conditioning Condenser Control Building A Train	5
M-13EF15	Piping Isometric Essential Service Water System Class IE Switchgear Air Conditioning Condenser Control Building B Train	5
M-13EF16	Piping Isometric Essential Service Water System Turbine Building	4
M-13EF17	Piping Isometric Essential Service Water System Turbine Building	1
M-K2EF03	Piping and Instrumentation Diagram Essential Service Water System	10
M-KC0111	ESWS Pump House Piping Plan	24
M-KC0911	ESWS Pump House Piping Sections	1
S-0080	Ultimate Heat Sink Plan and Sections	14
A-1325	Control & Diesel Gen. Buildings & Communication Corridor – Floor Plans El. 2000’ -0” & El. 2016’ - 0”	5

Section 1R04: Equipment Alignment

Drawings

NUMBER	TITLE	REVISION
A-1326	Architectural Control & Diesel Gen. Bldgs. & Communication Corridor Floor Plans El. 2032' -0" & El. 2047'-0"	2
N/A	SGK04A, SGK04B, SGK05A, & SGK05B Conditioning Condensers Models WCI-3500-6A & WCI-4000-6A	3

PROCEDURES

NUMBER	TITLE	REVISION
AI 28A-001	Level 1 CR Evaluation	12
AI 28A-007	Level 2 CR Evaluation	4
AP 23L-001	Lake Water Systems Corrosion And Fouling Mitigation Program	2
AP 23L-003	Buried Piping And Tanks Program	0
AP 28-001	Operability Evaluations	18
AP 28A-l00	Condition Reports	13
WCRE-13	Lake Water Systems Structural Integrity Program	2
CKL-EF-120	Essential Service Water Valve, Breaker and Switch Lineup	43B
CKL-KJ-121	Diesel Generator NE01 and NE02 Valve Checklist	28A

CALCULATIONS

NUMBER	TITLE	REVISION / Date
94100-C-01	Thermal Hydraulic Analysis For Water Hammer Of The Essential Service Water System	March, 1995
0420505-C-002	Evaluation of Localized Pipe Wall Thinning in Essential Service Water System Train "B" for Reinforcement Repairs for P-009A	7/8

CALCULATIONS

NUMBER	TITLE	REVISION / Date
0420505-C-002	Piping Reanalysis for Essential Service Water System, Train B Return Line	0
0420505-C-001	Piping Reanalysis for Essential Service Water System, Train B Supply Line	0
GK-06-W	SGK05A/B Class 1E Electrical Equipment Rooms A/C Units, Single Unit Operation Capability	1
E-G-5-W	Determination of the heat load due to electrical equipment in Rooms 3301, 3302, 3404, 3405, 3407, 3408, 3410, 3411, 3413, 3414	3

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

NUMBER	TITLE	DATE
SEL 98·019	Lake Water Systems Corrosion and Fouling Monitoring Programs	May 22,1998
SEL 00-010	Macrofouling and Lake Water Chemical Treatment	May 12, 2000

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
57809	Metallurgical Failure Evaluation Of A Corroded 30" Elbow From The Outlet Side Of The Self-Cleaning Strainer Of An ESW Line	November 25, 2009
57652	Metallurgical Investigation Of A Corroded 18" Welded Pipe, 150-Hbc-18 From A ESW Lake Water Line	October 27, 2009
WCNOO6-PR-01	Project Report For Wolf Creek Generating Station Analysis Of Water Hammer Issues	0
98-00089	Evaluation of Underground Essential Service Water Pipeline Leak	September 29, 1997
SWO 09-319429-001	EF049HBC-8” ESW Leak Encapsulation	0
USAR	Wolf Creek Updated Safety Analysis Report	23
	Wolf Creek Generating Station Technical Specifications	March 05, 2010
M-12EF01	PID for Essential Service Water Sheets 1,2,3	21
OE EF-09-007	Essential Service Water System Operability Evaluation	4
M-622.1(Q)	Packaged Air Conditioning Units Specification (SNUPPS)	8
622.1A-00089	Metrex Valve Direct Acting Series	0
622.1A-00001	SGK05A & SGK05B Air Conditioner Refrigeration Schematic	7

CONDITION REPORTS

00005144	00014616	00018217	00018785	00019248
000 21127	00022239	00023032	00026446	00027075
00027288	00028187	00028474		

Section 1R05: Fire Protection

MISCELLANEOUS

NUMBER	TITLE	REVISION
AP 10-106	Fire Preplans	7
E-1F9905	Fire Hazard Analysis	0
FPPM-001	Auxiliary Bldg El. 1974’	2

Section 1R06: Flood Protection Measures

DRAWINGS

NUMBER	TITLE	REVISION
M-12AL01	Piping & Instrumentation Diagram Auxiliary Feedwater System	10
M-12AP01	Piping & Instrumentation Diagram Condensate Storage and Transfer System	8
M-12AD02	Piping & Instrumentation Diagram Condensate System	9
M-12AD01	Piping & Instrumentation Diagram Condensate System	5

Section 1R07: Heat Sink Performance

PROCEDURES

NUMBER	TITLE	REVISION
AP 23L-002	Exchanger Program	3A
AP 28D-001	Assessment Process	12B
QCP-20-514	Current Testing	5B
QCP-20-518	Visual Examination of Heat Exchangers and Piping Components	5A
STN PE-037A	ESW Train A Heat Exchanger Flow and DP Trending	14

CALCULATIONS

NUMBER	TITLE	REVISION
EF-M-014	UHS Thermal Analysis Review for Power Rerate	01
KJ-M-010	Tube Plugging Criteria for Emergency Diesel Generator Heat Exchangers – Intercooler, Lube Oil Cooler and Jacket Water Cooler	00
KJ-M-012	EKJ03A/B Thermal Performance Calculation	0
KJ-MW-004	Diesel Generator Jacket Water Heat Exchanger	0

	Tube Plugging Criteria for EKJ06A and B	
KJ-MW-008	DG Intercooler Heat Exchanger and Lube Oil Heat Exchanger Minimum Tube Wall Thickness (EKJ03A, B, 4A, & 4B	0
KJ-S-006	EKJ04A/B ASME Code Design Report and Seismic Qualification Report for Wolf Creek Diesel Generator Lube Oil Heat Exchangers Section III – Class 3	01

DRAWINGS

NUMBER	TITLE	REVISION/ DATE
	Use of Hydrographic Survey Methods in the Ultimate Heat Sink	August 16, 2010
C-101	2010 Hydrographic Survey of the Ultimate Heat Sink and ESWS Intake Channel - Site Plan	0
C-102	2010 Hydrographic Survey of the Ultimate Heat Sink and ESWS Intake Channel - Cross Sections	0
M1HX001	Heat exchanger Tube Sheet Map Diesel Generator Lube Oil Cooler A (North End)	63
M-1HX001	Heat Exchanger Tube Sheet Map Diesel Generator Jacket Water Heat Exchanger A (East End)	63
S-0080	Ultimate Heat Sink Plan & Sections	14
S-81	Ultimate Heat Sink Dam Plan, Profile & Section Wolf Creek Generating Station Unit 1 Kansas Gas and Electric Company, Kansas City Power and Light Company	G

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
ED CP-011149	Revise Surveillance Freq. For SR Water Control Structures And Reservoir, C-404	0
ET-900023	Letter from F. T. Rhodes to NRC, Docket No. 50-482: Response to Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment	January 1, 1990

ET-94-0012	Letter from F. T. Rhodes to NRC, Docket No. 50-482: Updated Response to Generic Letter 89-13	February 18, 1994
ET-94-0075	Letter from F. T. Rhodes to NRC, Docket No. 50-482: Final Response to Generic Letter 89-13	November 28, 1994
ET-99-0042	Letter from R. A. Muench to NRC, Docket No. 50-482: Updated Response to Generic Letter 89-13	November 17, 1999
FSAR Section 9.2.5	Ultimate Heat Sink	18
GL 89-13	Service Water System Problems Affecting Safety-Related Equipment	July 18, 1989
M-018-01507	Jacket Water Cooler Heat Exchanger Specification Sheet	W01
M-018E	Design Specification for Replacement Jacket Water Heat Exchangers ASME Code Section III Class 3	01
OE UH-10-011	Ultimate Heat Sink and UHS channel	2
P.O. No. 750835/0	Wolf Creek Nuclear Operating Corporation Hydrographic Survey of UHS Reservoir and ESWS Intake Channel at the Wolf Creek Generating Station, Burlington, Kansas	August 20, 2010
SEL 08 - 128	Heat Exchanger Program - 2008	December 19, 2008
SEL 2010-179	Eddy Current Balance of Plant Self-Assessment	September 29, 2010
SEL 94-022	Self Assessment of the Balance of Plant Eddy Current Function	July 8, 1994
WCNOC-22	2007 Thru 2009 Periodic Surveillance Report for Ultimate Heat Sink and Associated Safety-Related Structures	16

Work Orders

04-259617-000	06-281668-000	07-298370-004	07-298370-005	07-298370-007
07-298370-010	07-298370-011	07-301309-000	07-301310-000	07-301312-000
07-301322-000	07-301343-000	09-315420-004	09-315420-005	09-315420-011
09-319729-000	10-326575-000			

Condition Reports

00027220 00027243

Section 1R11: Licensed Operator Requalification

PROCEDURES

NUMBER	TITLE	REVISION
AP-30B-001	Licensed Operator Requalification Program	15
AI-30B-005	Conduct of Simulator Activities for Licensed Operator	14A
APF-30E-006-01	Training	8
APF-30B-001-01	Control of Training Program Content	4
APF-30B-001-02	SRO Active Status Restoration	0
AI-30C-001	RO Active Status Restoration	12
AI-30C-004	Continued Assurance of Simulator Fidelity	5A
AI-30C-005	Simulator Real Time Capacity Testing	8A
AI-30C-006	Simulator Steady State Testing	9A
AI-30C-007	Simulator Transient Testing Simulator Reactivity Testing	2A
LR 1435601	Operator Training Materials: Emergency Notifications Forms Exercise	6

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
Written Exams	2010 Exam-Weeks 1-6 Biennial Exams (RO and SRO)	October 2010
JPM's	2010 Exam -Weeks 1-6	October 2010
JPM's	2009 Exam - Weeks 1-6	September 2009
LOCT Matrix	2 year Sample Plan	N/A
WC LER's	All 21 LER's from 2008-2010	N/A
SEL 2009-142	71111.11 Self-Assessment Report	May 2009
Simulator Test	Steady State 100 percent Power Test	August 2010
Simulator Test	Core Physics Test	August 2010
Simulator Test	Main Steam Line Break (TT8)	August 2010
Simulator Test	Loss of Coolant Accident (TT9)	August 2010

CONDITION REPORTS

00009693 00015190 00028088 00014294 00019308
00028284

Section 1R12: Maintenance Effectiveness

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
GN-03	Final Scope Evaluation – Containment Cooling System CRDM Area Cooling Function	October 15, 2010
KC-07	Final Scope Evaluation – Fire Protection System Main Transformer Deluge Function	December 12, 2010
EDI 23M-050	Functional Failure Determination Checklist for CTRE0060, Containment High Range Area Monitor	June 30, 2010
SP-02	Maintenance Rule Final Scope Evaluation, Radiation Monitoring System, Function SP-02,	N/A
K01-049	10 CFR Part 21 Notification for Rosemount Pressure Transmitters	December 6, 2010
SWO 09-320601	Engineering Disposition; Replacements for Obsolete Yokogawa Chart Recorders	May 13, 2010

CONDITION REPORTS

00029005	00026279	00039793	00029826	00029841
2007-004657	2008-070836			

WORK ORDERS

07-301852-000	07-301854-000	07-301854-002	10-329161-000	10-323257-001

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

PROCEDURES

NUMBER	TITLE	REVISION / DATE
AN-99-031 Sheet C-36	Maintenance Rule Reliability Criteria Estimation	0
AP 22B-001	Outage Risk Management	12
AP 21E-001	Clearance Orders	25B
AP 24G-001	Dedication of Commercial Grade Items	6A
APF 22B-001-05	Shutdown Risk Assessment MODE 5 Loops Filled	10/8/2010

	(Completed)	
APF 22B-001-10	Shutdown Safety Function Status and Assessment Summary (Completed)	October 6, 2010
APF 22B-001-10	Shutdown Safety Function Status and Assessment Summary (Completed)	October 7, 2010
APF 22B-001-10	Shutdown Safety Function Status and Assessment Summary (Completed)	October 8, 2010
APF 22B-001-10	Shutdown Safety Function Status and Assessment Summary (Completed)	October 9, 2010
APF 22B-001-10	Shutdown Safety Function Status and Assessment Summary (Completed)	October 10, 2010
CHGINV	Preventative Maintenance Background Information Battery Chargers and Inverters	1
F-OP-S-008	Clearance Order for EJ-HV-8811A; Prevent Opening on Spurious SI signal	October 4, 2010
F-OP-S-008A	Clearance Order for EJ-HV-8811A; Prevent Opening on Spurious SI signal	October 10, 2010
F-OP-S-014	Clearance Order for EJ-HV-8811B; Prevent Opening on Spurious SI signal	October 4, 2010
F-OP-S-014A	Clearance Order for EJ-HV-8811B; Prevent Opening on Spurious SI signal	10/10/2010
GEN 00-006	Hot Standby to Cold Shutdown	74
WCNOC Memo	Plant Health Finance Subcommittee Meeting Minutes	June 6, 2007
LR 5002006	Operator Training Materials Loss of Vital Instrument Bus	9
NO 63-000-00	Turbine Building Operator OJT/TPE Completion Guide	10
NSID-TB-87-09	Westinghouse Technical Bulletin Re: Inverter Maintenance Guidelines	0
SY1506300	Operator Training Materials DC and Instrument Power, Class IE	14
TMO 10-006-NN-00	Temporary Modification Order: NN13 Transformer Replacement Alternate Configuration	0

CONDITION REPORTS

PIR 2005-0676	PIR 2005-0858	AR 00024352	AR 00024387	AR 00024398
AR 00024399	AR 00024400	AR 00024407	AR 00024425	AR 00026072

AR 00027513 AR 00028754 AR 00028757 AR 00028770

WORK ORDER

10-326824-000 10-326824-001 10-326824-002 10-326824-004 10-326824-006
10-330674-000

Section 1R15: Operability Evaluations

NUMBER	TITLE	REVISION
AP 26C-004	Operability Determination and Functionality Assessment	21
AP 28-001	Operability Evaluations	18
LR1006001	Operator Training Materials: Technical Specification Operability	6

CONDITION REPORTS

CR 2008-00469 AR 00028677 AR 00029464

Section 1R18: Plant Modifications

NUMBER	TITLE	REVISION / DATE
SWO 05-274124-007	Engineering Disposition: Reactor Vessel Head Thermal Insulation Replacement, Change Package 011603	May 14, 2007
SWO 10-334099-001	Engineering Disposition: Evaluation of Misaligned Reactor Vessel Head Top Dome Mirror Insulation	October 9, 2010
DCP 05017	Canopy Seal Clamp Assemblies	September 21, 1994
M-164-00043	Mirror Insulation Diamond Power Babcock and Wilcox	B

CONDITION REPORTS

AR 00023472

WORK ORDER

09-321551-008

Section 1R19: Postmaintenance Testing

PROCEDURES

NUMBER	TITLE	REVISION / DATE
MGE TL-001	Wiring Termination and Lug Connector Installation	15
RNM C-0064	KGB1907 Power Supply Acceptance Test	0
STN AE-007	Startup Main Feedwater Pump Operational Test	0
STS IC-208A	4KV Loss of Voltage and Degraded Voltage Trip Actuation Device Operability Test (Completed Partial)	November 23, 2010
STS KJ-015A	Manual/Auto Fast Start, Sync and Loading of EDG NE01	29
INC C-0026	7300 Lead/Lag Card (NLL-G01 Artwork Revision 12)	2
STS IC-507E	Channel Calibration Steamline Pressure Instrumentation Protection Set	4B

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
E-13NF01	Schematic Diagram Load Shedder / Emergency Load Sequencer	3
Engineering Disposition	Interim Operation with a degraded condition. Leak on the Jacket Water Heat Exchanger tube side drain stub	December 7, 2010

CONDITION REPORTS

00030972

WORK ORDER

10-328886-000 10-334871-000 10-334871-001 10-331046-002

Section 1R20: Refueling and Other Outage Activities

MISCELLANEOUS

NUMBER	TITLE	REVISION
AP 16F-001	Boric Acid Corrosion Control Program	6A
STN PE-040G	Transient Event Walkdown	3

Section 1R20: Refueling and Other Outage Activities

MISCELLANEOUS

NUMBER	TITLE	REVISION
J-14BB04	Instrument Isometric Dwg. Reactor Coolant Loop 2 Crossover Leg	1
P08468-4	Colt Pielstick – PC-2.5V Renewal Parts List	

WORK ORDERS

10-335970-000

Section 1R22: Surveillance Testing

PROCEDURES

NUMBER	TITLE	REVISION / DATE
STS EJ-100A	RHR System Inservice Pump A Test (Completed)	November 22, 2010
STS EN-003A	Train A Spray Additive system Flow Test	3
STS EN-100A	Containment Spray Pump A Inservice Pump Test	20
STS IC-211A	Actuation Logic Test Train A Solid State Protection System (Completed)	November 24, 2010
STS BB-006	RCS Water Inventory Balance Using the NPIS Computer	October 18, 2010
STS BB-006	RCS Water Inventory Balance Using the NPIS Computer	October 21, 2010
AP 29G-001	RCS Unidentified Leak Rate Monitoring Program	2

Condition Report

00029562

Section 2RS06: Radioactive Gaseous and Liquid Effluent Treatment

PROCEDURES

NUMBER	TITLE	REVISION
AI 07-007	Onsite Groundwater Protection Program Monitoring	0
AI 21-100	Operations Guidance and Expectations	18A
AI 28A-010	Screening Condition Reports	5
AP 02-002	Chemistry Surveillance Program	34
AP 07B-001	Radioactive Release	18
AP 07B-001	Offsite Dose Calculation Manual	6
AP 07B-005	Onsite Groundwater Protection Program Monitoring	0
AP 15C-001	Procedure Writer's Guide	22B
AP 15C-002	Procedure Use and Adherence	31
AP 28A-100	Conditions Reports	12
SJ-144	Sampling Instructions	0A

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

NUMBER	TITLE	DATE
09-09-EM	Quality Assurance Audit Report of Environmental Management	September 29, 2008
10-08-EM	Quality Assurance Audit Report of Environmental Management	October 16, 2010

CONDITION REPORTS

00015980	00016025	00016129	00018501	00020995
00020999	00023788	00029295	00029301	

10 CFR 50.75 g CONDITION REPORTS

00020999

RELEASE PERMITS

2009-076	2009-077	2010-001	2010-022	2010-054
2010-073				

IN-PLACE FILTER TESTING RECORDS

SYSTEM	TEST	DATE
Control Room Pressurization; Train "B"	Charcoal Adsorber Leak Test	March 21, 2010
Control Room Filtration; Train "A"	Charcoal Adsorber Leak Test	May 7, 2010
Control Room Filtration; Train "B"	Charcoal Adsorber Leak Test	April 17, 2009
Emergency Exhaust; Train "B"	Charcoal Adsorber Leak Test	March 17, 2010
Aux Normal Exhaust	Charcoal Adsorbent Sampling	January 20, 2009

MISCELLANEOUS DOCUMENTS

TITLE	DATE
Radiochemistry Cross Check Program 3rd Quarter 2009	August 14, 2009
2008 Annual Radiological Effluent Release Report	
2009 Annual Radiological Effluent Release Report	

Section 2RS07: Radiological Environmental Monitoring Program

PROCEDURES

NUMBER	TITLE	REVISION
AI 07B-002	Review of Radiological Environmental Laboratory Analysis Results	9A
AI 07B-004	Reporting Requirements of the Radiological Environmental Monitoring Program	11A
AI 07B-005	Radiological Environmental Monitoring Program Implementation	18
AI 07B-009	Collection, Preparation and Shipment of Sediment and Soil Samples	7A
AI 07B-011	Collection, Preparation and Shipment of Water Samples	11A
AI 07B-012	Collection, Preparation and Shipment of Crop, Vegetable, Fruit and Pasture Samples	8A
AI 07B-015	Land Use Census	9A
AI 07B-034	Radiological Environmental Monitoring Program Air Sampling	8
AI 07B-035	REMP Optically Stimulated Luminescence (OSL) Dosimeters	3

AP 07B-004	Offsite Dose Calculation Manual (Radiological Environmental Monitoring Program)	16A
AP 07E-001	Validation of Meteorological Data	2A
AP 20A-003	QA Audit Requirements, Frequencies, and Scheduling	21
STS IC-890B	Channel Calibration of Wind Direction/Deviation Meteorological Instrumentation	15
STS IC-890C	Channel Calibration of 10M/60M Ambient and Differential Temperature Instrumentation	18

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

NUMBER	TITLE	DATE
09-09-EM	Quality Assurance Audit Report of Environmental Management	September 29, 2008
NUPIC-2428	Evaluation Report of Environmental, Inc	October 11, 2009
NUPIC-4560	Evaluation Report of F&J Specialty Products, Inc.	October 11, 2009
NUPIC-4059	Evaluation Report of Landauer Inc.	November 10, 2009
10-08-EM	Quality Assurance Audit Report of Environmental Management	October 16, 2010

CONDITION REPORTS

00013139	00014025	00014206	00014944	00015157
00017798	00017921	00017922	00018083	00019804
00022550	00022598	00024499	00029238	00029337

CALIBRATION AND MAINTENANCE RECORDS

NUMBER	TITLE	DATE
Serial No. 3143	Calibration Certificate of Conformance	November 17, 2008
Serial No. 3143	Calibration Certificate of Conformance	September 2, 2009
Serial No. 3143	Calibration Certificate of Conformance	July 21, 2010

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION/DATE
Section 2.3.3	Updated Safety Analysis Report: Onsite Meteorological Measurement Programs	21
AIF 07B-034-03	Air Sampler History Log (Sampler No. 8123, 8365, 8366, 8402, 8403, 8405, 8406)	2
	2009 Land Use Census Report	September 30, 2009
	2008 Annual Radiological Environmental Operating Report	April 15, 2009
	2009 Annual Radiological Environmental Operating Report	April 15, 2010
	2009 Annual Radioactive Effluent Release Report	April 15, 2010
AIF 07B-034-02	Air Sample Volume Review Worksheet (Sampler Location No. 2, 18, 32, 37, 49, and 53)	October 19, 2010

Section 2RS08: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

PROCEDURES

NUMBER	TITLE	REVISION
RPP 07-110	Solid Radwaste Packaging	8
RPP 07-123	Preparation and Shipment of Radioactive Waste and Material	1
RPP 07-130	Verification of Free Standing Water in High Integrity Containers	3
RPP 07-140	Mixed Waste Handling, Inspection & Storage	6
RPP 07-210	Storage of Radioactive Waste in the Interim Storage Facility	2
RPP 07-211	Inventory Surveillance of the Interim On-Site Storage Facility	2
AP 31A-100	Solid Radwaste Process Control Program	7

AUDITS, SELF-ASSESSMENTS, AND SURVEILLANCES

NUMBER	TITLE	DATE
08-10 PC	Wolf Creek Quality Assurance Audit Report; Process Control Program	September 26, 2008

CONDITION REPORTS

002238	003250	004190	004316	004392
004393	004444	004447	004461	000007
000808	001190	001203		

RADIOACTIVE MATERIAL SHIPMENTS

NUMBER	TITLE	DATE
9 R 22	Type A Shipment; RT-10 Sealed Source	June 23, 2009
9 R 44	Radioactive Material LSA-II; UN 3321	November 5, 2009
10 R 11	Radioactive Material LSA-II; UN 3321	February 17, 2010
10 R 15	Radioactive Material LSA-II; UN 3321	March 3, 2010
10 R 23	Radioactive Material LSA-II; UN 3321	April 13, 2010

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION
HW 8115901	Training Material; Wolf Creek Hazardous Material Transportation Security Plan	2
HW1215801	Training Material; HP Radwaste Regulations and Requirements	11

Section 4OA1: Performance Indicator Verification

PROCEDURES

NUMBER	TITLE	REVISION
AP 26A-007	NRC Performance Indicators	7
WCNOC-163	Mitigating System Performance Index (MSPI) Basis Document	6

Section 4OA2: Identification and Resolution of Problems

MISCELLANEOUS

NUMBER	TITLE	DATE
	Station Roll-up Performance Results Wolf Creek Generating Station 4th Quarter 2009	January 31, 2010
	Station Roll-up Performance Results Wolf Creek Generating Station 1st Quarter 2010	April 30, 2010
	Station Roll-up Performance Results Wolf Creek Generating Station 2nd Quarter 2010	July 31, 2010
	Station Roll-up Performance Results Wolf Creek Generating Station 3rd Quarter 2010	October 6, 2010

CONDITION REPORTS

29091	29112	29128	29141	29158
29159	29269	29175	29181	29127
29130	29136	29139	29044	

Section 4OA3: Event Follow-Up

PROCEDURES

NUMBER	TITLE	REVISION
AP 13-001	Fatigue Management	16
APF 13-001-01	Work Hour Limit Waiver	13
APF 13-001-04	Fatigue Assessment	2
AP 01A-001	Fitness for Duty Program	21B
GEN 00-003	Hot Standby to Minimum Load	72
SYS AE-121	Turbine Driven Main Feedwater Pump Startup	31
SYS AE-200	Feedwater Preheating During Plant Startup and Shutdown	24A

PROCEDURES

NUMBER	TITLE	REVISION
ALR 00-112A	Steam Generator Level Hi-Hi Turbine Trip	6

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
SEL 2010-160	10CFR Part 26 Fatigue Management Self-Assessment	
	10CFR26 KA and NANTeL Exam Objective Matrix	
	Fitness for Duty / Fatigue Management Policy	
Audit Report 10-11-FM	Quality Assurance Audit Report Fatigue Management Program	June 7, 2010
LR5005005	Just In Time Training – Practice Startup	8
	2010-1248-1, 2 and 3 Training Needs Analyses	October 18, 2010

CONDITION REPORTS

29286	19314	19284	29418	29419
29845	29846	29540	29541	

PERFORMANCE IMPROVEMENT REQUEST

2004-1977	2004-0857	2004-2917

SIMULATOR MODIFICATION PACKAGES

93-077	93-158	93-175	95-073	98-032

Section 4OA5: Other Activities

PROCEDURES

NUMBER	TITLE	REVISION
AP 13-001	Fatigue Management	16
APF 13-001-01	Work Hour Limit Waiver	13
APF 13-001-04	Fatigue Assessment	2
AP 01A-001	Fitness for Duty Program	21B

MISCELLANEOUS

NUMBER	TITLE	DATE
SEL 2010-160	10CFR Part 26 Fatigue Management Self-Assessment	
	10CFR26 KA and NANTeL Exam Objective Matrix	
	Fitness for Duty / Fatigue Management Policy	
Audit Report 10-11-FM	Quality Assurance Audit Report Fatigue Management Program	June 7, 2010