



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
REGION IV  
1600 EAST LAMAR BLVD  
ARLINGTON, TEXAS 76011-4511

July 5, 2012

EA-12-135

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

SUBJECT: WOLF CREEK GENERATING STATION – NRC PROBLEM IDENTIFICATION  
AND RESOLUTION INSPECTION REPORT 05000482/2012007 and NOTICE  
OF VIOLATION

Dear Mr. Sunseri:

On May 24, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed a biennial Problem Identification and Resolution inspection at your Wolf Creek Generating Station. The enclosed inspection report documents the inspection results, which the team discussed on May 24, 2012, with you and members of your staff.

This inspection was an examination of activities conducted under your license as they relate to problem identification and resolution and compliance with the Commission's rules and regulations and the conditions of your license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of activities, and interviews with personnel.

Based on the inspection sample, the inspection team concluded that the implementation of the corrective action program and overall performance related to identifying, evaluating, and resolving problems at Wolf Creek was adequate. Licensee-identified problems were generally entered into the corrective action program at a low threshold, though the team noted some exceptions, as documented in the enclosed report. Problems were generally prioritized and evaluated commensurate with the safety significance of the problems. And, though the team identified challenges to corrective action timeliness, most actions were implemented in a timely manner commensurate with their safety significance and addressed the causes of the problems. Lessons learned from industry operating experience were effectively reviewed and applied when appropriate. Audits and self-assessments were effectively used to identify problems and determine appropriate actions. Finally, the team determined that the station maintains a safety conscious work environment where employees feel free to raise nuclear safety concerns without fear of retaliation.

Six NRC-identified and two self-revealing findings of very low safety significance (Green) were identified during this inspection and are documented in the enclosed report.

Seven of these findings were determined to involve violations of NRC requirements. Additionally, the NRC determined that one Severity Level IV traditional enforcement violation occurred; this violation had no associated finding. The NRC is treating six of the eight violations as non-cited violations (NCVs), consistent with Section 2.3.2 of the Enforcement Policy.

Two of the findings that the NRC evaluated under the risk significance determination process as having very low safety significance (Green) did not meet the criteria to be treated as non-cited violations. The violations associated with both of these issues were evaluated in accordance with the NRC Enforcement Policy. The current version of this Policy is available on the NRC website at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. These violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. The violations are being cited in the Notice because after the violations were previously documented as non-cited violations, you failed to restore compliance within a reasonable time.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. Specifically, you are requested to provide a firm commitment as to when plant modifications will be completed to prevent future water hammer events in the essential service water system. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC's review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

If you contest any of these findings, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Wolf Creek.

If you disagree with a cross-cutting aspect assignment 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 Wolf Creek.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Dr. Dale A. Powers, Chief (Acting)  
Technical Support Branch  
Division of Reactor Safety

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

Enclosures:

1. Notice of Violation EA-12-135
2. Inspection Report 05000482/2012007  
w/ Attachments:
  1. Supplemental Information
  2. Information Request

cc w/ encls: Electronic Distribution for Wolf Creek

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ADAMS ACCESSION NUMBER: **ML12191A269**

SUNSI Rev Compl.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ADAMS	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Reviewer Initials	EAR
Publicly Avail.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sensitive	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Sens. Type Initials	EAR
RIV/DRS/TSB	DRS/EB2	DRS/OB	DRS/EB2	DRP/PBB	
ERuesch	SMakor	TFarina	MWilliams	LWilloughby	
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7/05/2012	6/27/2012	6/27/2012	7/3/2012	7/03/2012	
DRP/PBB	NRR/DRA/AHPB	C:DRP/PBB	C:ORA/ACES	AC:DRS/TSB	
CPeabody	KMartin	NO'Keefe	HGepford	DPowers	
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6/26/2012	6/21/12	7/03/2012	7/05/2012	7/05/2012	

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## NOTICE OF VIOLATION

Wolf Creek Nuclear Operating Company  
Wolf Creek Generating Station

Docket No: 50-482  
License No: NPF-42  
EA-12-135

During an NRC inspection, conducted from May 7 through 24, 2012, two violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

1. Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that in the case of significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

Contrary to the above, from December 4, 2009, to May 24, 2012, the licensee failed to assure that the cause of a significant condition adverse to quality was determined and corrective action was taken to preclude repetition. Specifically, after a water hammer event on August 19, 2009, the licensee failed to perform an adequate evaluation to determine the cause of water hammers and of internal corrosion in the essential service water system, and did not take corrective action to preclude repetition of additional water hammer events and system leaks. The condition recurred on January 13, 2012. This violation was identified on two occasions by the NRC as NCV 05000482/2009007-03 and VIO 05000482/2012007-03; the licensee failed to restore compliance.

2. Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected.

Contrary to the above, as of May 24, 2012, the licensee had failed to establish measures to assure that a condition adverse to quality was promptly corrected. Specifically, after identifying that safety-related spring-loaded tornado dampers required testing to verify operability, the licensee failed to implement procedures to test these dampers in the emergency diesel generator and essential service water rooms. This violation was previously identified by the NRC as NCV 05000482/2010007-02; the licensee failed to restore compliance.

These violations are associated with Green Significance Determination Process findings.

Pursuant to the provisions of 10 CFR 2.201, Wolf Creek Nuclear Operating Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region IV, and a copy to the NRC Resident Inspector Wolf Creek Generating Station, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to Notice of Violation EA-12-135," and should include: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous

docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time. If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response 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 website at [www.nrc.gov/reading-rm/pdr.html](http://www.nrc.gov/reading-rm/pdr.html) or [www.nrc.gov/reading-rm/adams.html](http://www.nrc.gov/reading-rm/adams.html), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the basis for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information).

Dated this 5th day of July, 2012.

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 50-482

License: NPF-42

Report: 05000482/2012007

Licensee: Wolf Creek Nuclear Operating Corporation

Facility: Wolf Creek Generating Station

Location: 1550 Oxen Lane SE  
Burlington, Kansas

Dates: May 7 through May 24, 2012

Team Leader: E. Ruesch, Senior Reactor Inspector

Inspectors: L. Willoughby, Senior Project Engineer  
C. Peabody, Resident Inspector  
M. Williams, Reactor Inspector  
T. Farina, Operations Engineer  
S. Makor, Reactor Inspector  
K. Martin, Human Factors Engineer

Accompanying Personnel: C. Franklin, General Engineer (NSPDP)

Approved By: Dr. Dale A. Powers, Chief (Acting)  
Technical Support Branch  
Division of Reactor Safety

## **SUMMARY OF FINDINGS**

IR 05000482/2012006; May 7, 2012 – May 24, 2012; Wolf Creek "Biennial Baseline Inspection of the Identification and Resolution of Problems."

The team inspection was performed by one senior reactor inspector, one senior project engineer, one resident inspector, one operations engineer, two reactor inspectors, and one human factors engineer. Two cited violations and six non-cited violations of very low safety significance (Green) were identified during this inspection. One severity level IV (SL-IV) violation was also identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG 1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### **Identification and Resolution of Problems**

The team reviewed approximately 300 condition reports, work orders, engineering evaluations, root and apparent cause evaluations, and other supporting documentation to determine if problems were being properly identified, characterized, and entered into the corrective action program for evaluation and resolution. The team reviewed a sample of system health reports, self-assessments, trending reports and metrics, and various other documents related to the corrective action program.

Based on these reviews, the team concluded that the licensee's corrective action program and its other processes to identify and correct nuclear safety problems were adequate to support nuclear safety. However, the team noted several challenges to licensee staff's willingness to use the corrective action program for problems that were perceived as minor. The team also noted several challenges to timely evaluations of adverse conditions. Further, the licensee had several long-standing issues which had been in process for several years without resolution.

The team also concluded that the licensee thoroughly evaluated industry operating experience for relevance to the facility, generally took prompt actions in response to relevant items, and entered them into the corrective action program as appropriate. The licensee used industry operating experience when performing root and apparent cause evaluations. The licensee performed effective audits and self-assessments, demonstrated by self-identification of marginally effective corrective action program performance and some identification of ineffective corrective actions. While there had been some weaknesses in the quality assurance organization's follow-up on audit findings, the team determined that recent program changes had addressed these issues.

Finally, the team determined that the station continued to maintain a safety conscious work environment. Employees felt free to raise nuclear safety concerns to the attention of management without fear of retaliation.



A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to adequately translate design information into procedures and requirements. Specifically, the licensee had information that its calculation for vital switchgear cooling included nonconservative assumptions. These assumptions called into question the ability of air conditioning systems to adequately cool Class 1E switchgear under all design conditions. The licensee failed to revise procedures to include compensatory actions necessary to ensure the vital switchgear remained operable. The licensee entered this finding in its corrective action program as condition report 53393.

The inspectors determined that the licensee's failure to adequately translate design information into procedures was a performance deficiency. The performance deficiency is more than minor because it affected the equipment performance attribute of the Mitigating Systems 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 team determined the finding was of very low safety significance (Green) because it did not represent a loss of system safety function, did not represent the actual loss of safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting aspect in the corrective action component of the problem identification and resolution cross-cutting area because the licensee failed to thoroughly evaluate the problem such that its resolution addressed its causes and extent of conditions (P.1(c)). (Section 4OA2.5.a)

- Green. The inspectors identified a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to take corrective action to preclude repetition of system leaks due to water hammer events in the essential service water system. Extensive inadequately evaluated corrosion in the system has led to multiple water-hammer-induced leaks of essential service water piping. These leaks were the subject of two previous violations issued by the NRC. The licensee failed to take timely corrective action to restore compliance. The licensee entered this finding in its corrective action program as condition report 53443.

The failure to preclude recurrence of water hammer in the essential service water system and the failure to take adequate corrective action to control internal pitting corrosion in essential service water system piping was a performance deficiency. The deficiency was more than minor because it is associated with the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. It is therefore a finding. Using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the finding was of very low safety significance

(Green) because the finding was a design or qualification deficiency that was confirmed not to result in loss of system operability or functionality. This finding has a cross-cutting aspect in the corrective action program component of the problem identification and resolution cross-cutting area because the licensee failed to take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance (P.1(d)). (Section 40A2.5.c)

- Green. The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to effectively correct deficient procedures regarding the use of clearance orders. A number of clearance-related problems revealed several deficiencies in procedures to ensure that safe tag-out of equipment occurred prior to the start of work, that independent reviews of qualified individuals were being completed during clearance order preparation, and that effective training was being conducted where performance gaps were identified. The licensee failed to correct these deficiencies in a timely manner. The licensee entered this finding in its corrective action program as condition report 53451.

The team determined that the failure to correct an adverse trend in the use of clearance orders was a performance deficiency. This finding was more than minor because if left uncorrected, it could lead to a more significant safety concern. Specifically, continued failure to establish the correct clearance order boundaries could result in the loss of configuration control for systems required to maintain nuclear safety. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined that this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The team determined that this finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to ensure complete, accurate and up-to-date design documentation, procedures, and work packages were available and adequate to support nuclear safety (H.2(c)). (Section 40A2.5.d)

- Green. The team identified a non-cited violation of 10 CFR Part 50, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to establish adequate procedures for resolution of corrective actions. Specifically, the licensee failed to establish procedures to ensure that planned corrective actions were effectively implemented. The licensee entered this finding in its corrective action program as condition report 53432.

The failure to establish adequate procedures for resolution of corrective actions was a performance deficiency. This finding was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, failure to establish adequate procedures for resolution of corrective actions could result in important actions not being accomplished. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety

function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the decision making component of the human performance cross-cutting area because the licensee failed to demonstrate that nuclear safety is an overriding priority by making safety-significant or risk-significant decisions using a systematic process (H.1(a)). (Section 40A2.5.e)

- Green. The team identified a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to perform testing of safety-related spring-loaded tornado dampers in the emergency diesel generator and essential service water rooms. In 2008, the licensee identified that because the updated safety analysis report (USAR) incorrectly classified these active components as passive, they had not been included in a periodic testing or surveillance program. Since 2010, action items to test the dampers have received four due date extensions. Additionally, required training for this testing was completed and closed. However, no testing or surveillance was accomplished. This failure was the subject of a previous violation issued by the NRC. The licensee failed to take timely corrective actions to restore compliance. The licensee entered this finding in its corrective action program as condition report 53363.

The team determined that the licensee's failure to implement corrective action was a performance deficiency. This finding was more than minor because it affected the equipment reliability attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failure to implement this corrective action could result in reduced reliability of safety-related equipment during an event initiated by a tornado. Using Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined that this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and during a tornado, would not cause a plant trip if failed, would not degrade two or more trains of a multi-train safety system, and would not degrade one or more trains of a system that supports a safety system or function. This finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to provide complete, accurate, and up-to-date design documentation, procedures, and work packages were available and adequate to support nuclear safety (H.2(c)). (Section 40A2.5.f)

- Green. On February 23, 2011, a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was revealed when an anomalous start of component cooling water pump B indicated gas voiding in the component cooling water piping. This violation was due to the licensee's inadequate root cause evaluation and failure to prevent recurrence of the voiding that had previously occurred in May 2010. The licensee entered this finding in its corrective action program as condition report 33925.

The failure to properly identify design issues as a root cause and to take action to prevent the recurrence of a component cooling water system voiding was a performance deficiency. The performance deficiency is more than minor because it

impacted the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, excessive voiding of the component cooling water system could lead to lack of cooling to important safety-related components. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the issue was of very low safety significance (Green) because it did not represent a loss of system safety function or loss of a single train longer than its technical specification allowed outage time. This finding has a cross-cutting aspect in the corrective action program component of the problem identification and resolution cross-cutting area because the licensee failed to thoroughly evaluate a problem such that its resolution addressed its cause and extent of condition. Specifically, condition report 25918 did not properly identify design issues as a root cause requiring immediate system modifications to preclude recurrence (P.1(c)). (Section 4OA2.5.g)

- Green. The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to evaluate the suitability of nonsafety-related gaskets, o-rings, and seals installed in safety-related components. These nonsafety-related parts were originally installed due to erroneous Safety Classification Assessments. After determining that the parts were inappropriate in safety-related joints, the licensee failed to promptly correct the condition and failed to fully identify which components were affected. The licensee entered this finding in its corrective action program as condition report 53456.

The failure of the licensee to evaluate the suitability of the specific nonsafety-related material installed in safety-related equipment and to determine the extent to which this condition existed was a performance deficiency. This performance deficiency was more than minor because it affected the design control attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate evaluation of nonsafety-related gaskets, o-rings, and seals installed in safety-related equipment adversely affected the reliability of the affected systems. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the finding was of very low safety significance (Green) because the finding was a design or qualification deficiency confirmed not to result in loss of operability or functionality. This performance deficiency had a cross-cutting aspect in the corrective action program component of the problem identification and resolution cross-cutting area because the licensee did not take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity (P.1(d)). (Section 4OA2.5.h)

- Green. The team identified a finding for the licensee's failure to ensure that condition reports were initiated as required by procedure. The licensee's implementing procedure for its corrective action program did not contain clear guidance as to what conditions were required to be entered into the corrective action program, or how soon after discovery the condition report was required to be generated. The team identified several examples where condition reports were not generated, though it

appeared from the guidance that they were required. The licensee entered this finding in its corrective action program as condition report 53445.

The failure of licensee personnel to promptly initiate condition reports for identified issues, contrary to procedural requirements, is a performance deficiency. This performance deficiency is more than minor because if left uncorrected, it could lead to a more significant safety concern. Using Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined that this finding was of very low safety significance (Green) because it did not involve a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to ensure procedures necessary for complete, accurate, and up-to-date procedures were available and adequate to support nuclear safety. Specifically, the corrective action program procedure was vague in its guidance as to when a condition report was required (H.2(c)). (Section 4OA2.5.i)

#### Cornerstone: Miscellaneous

- SL-IV. The inspectors identified a non-cited violation of 10 CFR 50.73(a)(2)(i)(b) for the licensee's failure to submit a licensee event report upon discovery that a condition prohibited by technical specifications had existed in the preceding three years. On April 18, 2011, the licensee issued calculation GK-06-W, "SGK05A/B Class 1E Electrical Equipment Rooms A/C Units, Single Unit Operation Capability," Revision 2. This calculation concluded that with one of the two air conditioning units inoperable, the use portable fans and the opening of doors was required to maintain vital switchgear rooms below the maximum operability limits. The calculation further concluded that even with these compensatory actions, required temperatures could be maintained only if the temperature of all surrounding areas remained below 78°F. Calculation GK-06-W thus demonstrated that a single cooler was incapable of maintaining the switchgear rooms within technical specification limits, without compensatory actions. Because one of the two air conditioning units had been out of service on multiple occasions during the preceding three years with no compensatory actions taken, the condition was reportable. The licensee entered this finding in its corrective action program as condition report 53452.

The failure to submit a licensee event report was a performance deficiency. The team evaluated this performance deficiency using the NRC's significance determination process (SDP) and determined that it was of minor safety significance. It is therefore not associated with a finding or assigned a color. However, performance deficiencies which impact the NRC's regulatory ability are processed using traditional enforcement separately from the SDP evaluation. The NRC relies on the licensee to identify and report conditions or events meeting the criteria specified in regulations in order to perform its regulatory function. When this is not done, the regulatory function is impacted. Therefore, the team determined that this performance deficiency was most appropriately processed using traditional enforcement. Using the Enforcement Policy and the available risk information, the

inspectors concluded that this violation is a traditional enforcement violation of Severity Level IV. (Section 4OA2.5.b)

B. Licensee-Identified Violations

None

## REPORT DETAILS

### 4. OTHER ACTIVITIES (OA)

#### 4OA2 Problem Identification and Resolution (71152)

The team based the following conclusions on the sample of corrective action documents that were initiated in the assessment period, which ranged from May 26, 2010, to the end of the on-site portion of the this inspection on May 24, 2012.

#### .1 **Assessment of the Corrective Action Program Effectiveness**

##### a. Inspection Scope

The team reviewed approximately 300 corrective action program documents, including associated root cause, apparent cause, and direct cause evaluations, from approximately 25,000 that had been initiated between May 26, 2010, and May 24, 2012. The team focused its review on condition reports that were evaluated as significant to determine if problems were being properly identified, characterized, and entered into the corrective action program for evaluation and resolution. The team reviewed a sample of system health reports, operability determinations, self-assessments, trending reports and metrics, and other documents related to the corrective action program. The team evaluated the licensee's efforts in establishing the scope of problems by reviewing selected logs, work requests, self-assessments results, audits, system health reports, action plans, and results from surveillance tests and preventive maintenance tasks. The team reviewed work requests and attended the licensee's daily Screening Review Team (SRT) and Senior Leadership Review Team (SLRT) meetings to assess the reporting threshold, prioritization efforts, and significance determination process, as well as observing the interfaces with the operability assessment and work control processes. The team's review included verifying that the licensee considered the full extent of cause and extent of condition for problems as well as how the licensee assessed generic implications and previous occurrences. The team assessed the timeliness and effectiveness of corrective actions, completed or planned, and looked for additional examples of similar problems. The team conducted interviews with plant personnel to identify other processes that may exist where problems may be identified and addressed outside the corrective action program.

The team also reviewed corrective action documents that addressed past NRC-identified violations to ensure that the corrective action addressed the issues as described in the inspection reports. The inspectors reviewed a sample of corrective actions closed to other corrective action documents to determine whether corrective actions were still appropriate and timely.

The team considered risk insights from both the NRC's and Wolf Creek's risk assessments to focus the sample selection and plant tours on risk significant systems and components. Based on this review, samples reviewed by the team focused on, but were not limited to, the essential service water and emergency diesel generator systems. The team also expanded its review to include a five-year in-depth review of

the emergency diesel generator system to determine whether problems were being effectively addressed. The team conducted a walkdown of these systems to assess whether problems were identified and entered into the corrective action program.

b. Assessments

1. Assessment - Effectiveness of Problem Identification

The team concluded that in most cases, the licensee identified issues and adverse conditions in accordance with the licensee's corrective action program guidance and NRC requirements. The team determined that the licensee generally identified these problems at a low threshold and entered them into the corrective action program. The team further noted that the licensee's condition report initiation rate had increased significantly in recent years. This increase included a change in the condition report initiation process in 2010 that required all work orders to be initiated with a condition report, resulting in a large increase in the initiation rate. The average number of condition reports initiated per year had increased from fewer than 4000 in 2005 to over 8000 before the change was implemented. Under the new process in 2011, the licensee initiated over 15,000 condition reports.

The team noted that this high rate of condition report generation is generally a sign of a healthy corrective action program. However, the team identified several issues and adverse conditions that were not entered into the corrective action program. Some of these were the subject of finding FIN 2012007-09, included in this report. See section 4OA2.5.i.

2. Assessment - Effectiveness of Prioritization and Evaluation of Issues

In general, the licensee adequately performed and documented evaluations of conditions adverse to quality during this assessment period. However, the team noted that the licensee had some challenges with timeliness of evaluations:

- The station's evaluation timeliness goal was 30 days for all corrective action program cause evaluation products. The average age at closure for these evaluations was 43 days in March and 53 days in April. The licensee had documented this in condition report 52961.
- Condition report 51292 was initiated anonymously on April 5, 2012, documenting multiple past-due corrective actions. This condition report went past due on May 9, 2012, with no actions taken.
- Many condition reports had multiple due date extensions for their corrective actions. Many actions were not completed until well after the 120-day base completion metric; in the sample of higher-tier corrective action program documents the team reviewed, few significant actions were completed within 120 days. Two examples follow:
  - Condition report 34987 identified three deficiencies in procedures for recovery from a safety injection actuation. It took 30 days for the condition



report to be approved and then six more months to implement the procedure changes.

- Condition report 34964 included an action to track completion of an action from CR 37931. After several extensions of the latter action, the actions were completed nine months after the deficiencies were identified that the actions were designed to address. The team concluded that these corrective actions were untimely.

Additionally, the team reviewed several condition reports that involved potential challenges to operability. The team assessed the quality, timeliness, and prioritization of these operability assessments. In general, the licensee completed these operability assessments adequately and evaluated operability appropriately.

### 3. Assessment – Effectiveness of Corrective Action Program

Overall, the team concluded that the licensee generally developed appropriate corrective actions to address problems. However, the team identified a number of corrective actions associated with conditions adverse to quality that were not completed in a timely manner:

- The average age of corrective actions to prevent recurrence (CAPRs) was 428 days in March 2012, having increased from 180 days in November 2011. The station's goal is to complete CAPRs within 180 days when they do not require an outage or other long-term constraint.
- In March 2012, the station had 52 open condition reports associated with NRC-issued findings. The average age of these condition reports was 438 days.
- After determining that nonsafety-related gaskets had been installed in safety-related components, the licensee took some actions to replace these materials, but did not track these actions through the corrective action program. Further, the licensee inappropriately determined that because the gaskets had not yet leaked, they would not leak under any service condition until the next time maintenance was performed on the affected joint. This performance deficiency is the subject of a non-cited violation documented in section 4OA2.5.h.
- The licensee failed to take timely corrective actions to prevent water-hammer-induced leaks from the essential service water system. This is further discussed in section 4OA2.5.c of this report.
- Similarly, after identifying voiding in the component cooling water system, the station failed to adequately identify the cause of the voiding and to take appropriate actions to prevent its recurrence. The team documented this issue as a self-revealing non-cited violation in section 4OA2.5.g of this report.

- The licensee identified that safety-related tornado dampers on the essential service water and emergency diesel generator buildings required periodic testing, and that this testing had never been performed. Although this condition was originally identified by the licensee in 2008, and was documented by the NRC as a violation in a 2010 report, the licensee took no actions to correct this deficiency. This is further discussed in section 4OA2.5.f of this report.

Additionally, the team identified several instances where identified corrective actions, which had been approved by the station's corrective action review board (CARB), were unilaterally canceled—or were marked as complete with no action taken—by the condition report owner. The team determined that the licensee's failure to ensure corrective actions were accomplished was a violation of NRC requirements; this violation is further discussed in section 4OA2.5.e of this report.

## **.2 Assessment of the Use of Operating Experience**

### **a. Inspection Scope**

The team examined the licensee's program for reviewing industry operating experience, including reviewing the governing procedure and self assessments. The team reviewed a sample of condition reports examining operating experience documents that had been issued during the assessment period to assess whether the licensee had appropriately evaluated the notification for relevance to the facility. The inspectors also examined whether the licensee had entered those items into their corrective action program and assigned actions to address the issues. The inspectors reviewed a sample of root cause evaluations and significant condition reports to evaluate whether the licensee had appropriately included industry operating experience.

### **b. Assessment**

Overall, the team determined that the licensee had appropriately evaluated industry operating experience for relevance to the facility, and had entered applicable items in the corrective action program. The team observed several interactions in management meetings where operating experience information was discussed in near-real time, and where prompt action was taken to determine whether the station was vulnerable to a similar adverse condition. The team determined that this was a highly effective method of incorporating operating experience into plant operations. The team noted that both internal and external operating experience was being incorporated into lessons learned for training and in pre-job briefs for routine and non-routine tasks.

## **.3 Assessment of Self-Assessments and Audits**

### **a. Inspection Scope**

The inspectors reviewed a sample of licensee self-assessments and audits to assess whether the licensee was regularly identifying performance trends and effectively addressing them. The inspectors also reviewed audit reports to assess the effectiveness of assessments in specific areas. The specific self-assessment documents and audits reviewed are listed in Attachment 1.

b. Assessment

The inspectors concluded that the licensee had an effective self-assessment process. Licensee management was involved in developing the topics and objectives of self-assessments. Attention was given to assigning team members with the proper skills and experience to do effective self-assessments and to include people from outside organizations. Audits were self-critical and identified deficiencies in various programs such as the corrective action program and several root cause evaluations. While the team identified that there had been some weaknesses in the quality assurance organization's follow-up of audit findings, recent changes to the licensee's quality programs had addressed and begun to correct many of these issues.

**.4 Assessment of Safety-Conscious Work Environment**

a. Inspection Scope

The team conducted ten focus groups that included more than 60 individuals from a cross-section of functional organizations: engineering, operations, maintenance, quality programs (quality assurance, quality verification, and quality control), health physics, and chemistry. Both supervisory and non-supervisory personnel were included, though separate focus groups were conducted for supervisors. The discussions assessed whether conditions existed that would challenge an effective safety conscious work environment (SCWE). The team also interviewed the ombudsman—Wolf Creek's employee concerns program manager—and reviewed the last two safety culture self-assessment documents.

b. Assessment

Overall, the team concluded that a safety conscious work environment exists at Wolf Creek. Employees demonstrated familiarity with the various avenues available to raise safety concerns. They appeared comfortable with submitting all nuclear safety issues.

The team noted a potential vulnerability in the licensee's safety conscious work environment in discussions with security personnel. There was a perception among some members of the plant staff that management was not willing to address security-related issues with the same rigor with which it addressed issues of nuclear safety not related to physical security. Also, security personnel stated that they generally did not write condition reports, but rather passed the comments along to supervisors who would enter them into the corrective action program.

Overall, individuals were familiar with the employee concerns program and its location on site. There was visibility of the program throughout the site; the resolutions of anonymous issues were reported site-wide through an article in the site newsletter. Many of the individuals interviewed had had direct interactions with the ombudsman with varying degrees of satisfaction. Some personnel were unsure of the ombudsman's authority to resolve issues raised through him. But personnel understood and were confident in the confidentiality of the program.

Site personnel were required to participate in a read and sign training annually which covers the SCWE policies. Many individuals who were interviewed were familiar with this training and with the overall message in the training. But not everyone was familiar with the details of the policy. None of the individuals interviewed cited any examples of harassment, intimidation, retaliation or discrimination or any negative reactions from management when individuals raised nuclear safety concerns. The message from management that nuclear safety is more important than production goals was well-received by plant personnel. Finally, individuals indicated that if they were to believe unsafe conditions existed, they would feel comfortable stopping work without fear of retaliation, even if such actions would prolong an outage or extend a planned schedule.

## **.5 Specific Issues Identified During This Inspection**

### **a. Inadequate Procedure for Compensatory Measures**

Introduction. The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to adequately translate design information into procedures and requirements. Specifically, the licensee had information that its calculation for vital switchgear cooling included nonconservative assumptions. These assumptions called into question the ability of air conditioning systems to adequately cool Class 1E switchgear under all design conditions. However, the licensee failed to revise procedures to include compensatory actions necessary to ensure the vital switchgear remained operable.

Description. Wolf Creek is designed with two vital switchgear air conditioning units. Each air conditioning unit cools one vital 4160V switchgear room, two sets of vital dc battery rooms, and two sets of vital dc switchgear. In 2010, the NRC identified that the heat transfer calculation for the sizing of these units was inadequate (see NCV 2011002-05). In reviewing the licensee's corrective actions for this violation, the team reviewed the licensee's compensatory actions and calculation GK-06-W, "SGK05A/B Class 1E Electrical Equipment Rooms A/C Units, Single Unit Operation Capability," Revision 2. This calculation concluded that using portable fans and opening the room doors would maintain temperatures in the switchgear rooms below 104°F for at least 7 days if temperatures in all surrounding areas remained below 78°F.

However, the team identified several examples that contradicted or failed to incorporate the evaluated design requirements in calculation GK-06-W:

- The compensatory measures identified in procedure SYS GK-200, "Inoperable Class 1E A/C Unit," Revision 24, were not consistent with the conclusions in calculation GK-06-W. Step 5.3 of SYS GK-200 stated, "IF desired, THEN portable fans and ducting are available." This allowed portable fans to be optionally installed at the operators' discretion, contradicting the assumptions of the calculation.
- The bases for Technical Requirement (TR) 3.7.23 stated, "With the interior doors opened as described above, portable fans may be installed to facilitate air circulation among rooms; however, this is not required based on operating experience."

- A note in TR 3.7.23 required entry into the associated technical specification (TS) action statements—TS 3.8.4 for dc power sources, TS 3.8.7 for inverters, and TS 3.8.9 for electrical distribution systems—when room temperature was equal to or greater than 104°F. However, calculation GK-06-W only demonstrated that operability of these systems can be maintained with a single operable air conditioning unit when (1) portable fans are installed prior to the evaluated transient and (2) surrounding areas remain below 78°F.
- The box fans used in the compensatory actions to maintain operability of safety-related equipment relied on nonsafety-related power. This power supply would not be available under all design basis conditions where the compensatory actions would be required.
- The box fans and trunks were not modeled in calculation GK-06-W to demonstrate operability.

These discrepancies resulted in non-conservative entry assumptions into technical specification action statements and invalid assumptions of continued operability.

Analysis. The inspectors determined that the licensee's failure to adequately translate design information into procedures was a performance deficiency. The performance deficiency is more than minor because it affected the equipment performance attribute of the Mitigating Systems 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 team determined the finding was of very low safety significance (Green) because it did not represent a loss of system safety function, did not represent the actual loss of safety function of a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting aspect in the corrective action component of the problem identification and resolution cross-cutting area because the licensee failed to thoroughly evaluate the problem such that its resolution addressed its causes and extent of conditions (P.1(c)).

Enforcement. Title 10 of the Code of Federal Regulations (CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires in part that activities affecting quality 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, and drawings. Contrary to this requirement, from 2010 through May 2012, the licensee failed to prescribe an activity affecting quality in an instruction, procedure, or drawing appropriate to the circumstances. Specifically, procedure SYS GK-200, "Inoperable Class 1E A/C Unit," Revision 24, failed to provide reasonable assurance that the electrical systems would be maintained operable under postulated conditions. Because this violation was determined to be of very low safety significance (Green) and was entered into the licensee's corrective action program as condition report 53393, this violation is being treated as a non-cited violation in accordance with section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2012007-01, "Inadequate Procedure to Implement Compensatory Measures."

b. Failure to Report Conditions that Could have Prevented Fulfillment of a Safety Function

Introduction. The inspectors identified a Severity Level IV non-cited violation of 10 CFR 50.73(a)(2)(i)(b) for the licensee's failure to submit a licensee event report upon discovery that a condition prohibited by technical specifications had existed in the preceding three years. On April 18, 2011, the licensee issued calculation GK-06-W, "SGK05A/B Class 1E Electrical Equipment Rooms A/C Units, Single Unit Operation Capability," Revision 2. This calculation concluded that with one of the two air conditioning units inoperable, the use of portable fans and the opening of doors was required to maintain vital switchgear rooms below the maximum operability limits. The calculation further concluded that even with these compensatory actions, required temperatures could be maintained only if the temperature of all surrounding areas remained below 78°F. Calculation GK-06-W thus demonstrated that a single cooler was incapable of maintaining the switchgear rooms within technical specification limits, without compensatory actions. Because one of the two air conditioning units had been out of service on multiple occasions during the preceding three years with no compensatory actions taken, the condition was reportable.

Description. On September 22, 2010, the licensee identified from operating experience that with one Class 1E Electrical Equipment A/C train nonfunctional, single failure protection would no longer exist for this support function. The licensee's reportability evaluation determined that the Class 1E electrical equipment rooms cooled by SGK05A/B had not exceeded technical specification temperature limits. The licensee incorrectly determined that because temperatures had not exceeded limits, a condition prohibited by Technical Specifications had not existed. The licensee thus incorrectly concluded that the condition did not require a report to the NRC.

On April 18, 2011, the licensee issued GK-06-W, "SGK05A/B Class 1E Electrical Equipment Rooms A/C Units, Single Unit Operation Capability," Revision 2. This calculation concluded that with one of the two air conditioning units inoperable, the use of portable fans and the opening of doors was required to maintain vital switchgear rooms below the maximum operability limits. The calculation further concluded that even with these compensatory actions, required temperatures could be maintained only if the temperature of all surrounding areas remained below 78°F.

The team concluded that this calculation demonstrated that with one cooler out of service, the licensee was unable to provide reasonable assurance that room temperatures could be maintained within technical specification operability limits without compensatory actions. Operation with one cooler out of service would thus require entry into the action statements of technical specifications 3.8.4 for dc power sources, 3.8.7 for inverters, and 3.8.9 for electrical distribution systems. The shortest of these action statements requires plant shutdown within eight hours. The licensee's reportability evaluation determined that one cooler had been removed from service for more than two hours on multiple occasions in the preceding three years. This represented a condition prohibited by technical specification and required a report to the NRC in accordance with 10 CFR 50.73 requirements.

Analysis. The failure to submit a licensee event report was a performance deficiency. The team evaluated this performance deficiency using the NRC's significance determination process (SDP) and determined that it was of minor safety significance. It is therefore not associated with a finding or assigned a color. However, performance deficiencies which impact the NRC's regulatory ability are processed using traditional enforcement separately from the SDP evaluation. The NRC relies on the licensee to identify and report conditions or events meeting the criteria specified in regulations in order to perform its regulatory function. When this is not done, the regulatory function is impacted. Therefore, the team determined that this performance deficiency was most appropriately processed using traditional enforcement. Using Enforcement Policy section 6.9, the inspectors concluded that this violation is a traditional enforcement violation of Severity Level IV.

Enforcement. Title 10 CFR 50.73(a)(2)(i)(B) requires, in part, that licensees submit a Licensee Event Report to the NRC within 60 days of discovery of any operation or condition which was prohibited by the plant's Technical Specifications and that occurred within three years of the date of discovery. Contrary to this requirement, in September 2010, the licensee failed to report to the NRC within 60 days of discovery a condition that was prohibited by the plant's Technical Specifications that had occurred within three years of the date of discovery. Specifically, the licensee failed to report a condition in which it could not provide reasonable assurance of the operability of Class 1E switchgear for greater than its technical specification allowed outage time. The licensee documented this issue in its corrective action program as condition report 53452. Reviewing the finding using the NRC's Enforcement Policy and the available risk information, the team concluded that this violation is appropriately characterized as Severity Level IV. Because it is a Severity Level IV violation and was entered into the corrective action program, this violation is being treated as a non-cited violation, consistent with section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2012007-02, "Failure to Report Conditions that Could Have Prevented Fulfillment of a Safety Function."

c. Failure to Take Timely Corrective Actions to Preclude Repetition of a Significant Condition Adverse to Quality

Introduction. The inspectors identified a Green violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to take corrective actions to preclude repetition of system leaks due to water hammer events in the essential service water system. Extensive inadequately evaluated corrosion in the system has led to multiple water-hammer-induced leaks of essential service water piping. These leaks were the subject of two previous violations issued by the NRC. However, the licensee failed to take timely corrective actions to restore compliance.

Description. During normal operations, normal service water supplies components in the essential service water system. During a loss of off-site power, normal service water pumps stop. Approximately twenty-five seconds later, after the emergency diesel generators start and power the emergency buses, the essential service water pumps start to provide cooling water to the essential service water loads. During these twenty-five seconds when no pumps are running, the essential service water system partially drains. The starting of the essential service water pumps rapidly fills the system and

causes water hammer—a rapid pressure spike. This pressure spike can cause leaks in eroded or corroded sections of essential service water piping.

On August 19, 2009, Wolf Creek Station experienced a loss of off-site power. As a result of pump cycling during the event, several water-hammer-induced leaks were initiated in degraded essential service water system piping.

As a result of the 2009 event, the licensee initiated a program to non-destructively inspect the above ground large bore piping and accessible portions of essential service water piping located in underground bunkers. This program was intended to collect and analyze data to determine when repairs were required and when sections of piping would require replacement. The program was supposed to track the repaired and replaced portions of piping. After discovering leaks in buried essential service water piping, ground-penetrating radar was used to confirm these leaks; the ground-penetrating radar was incorporated into the program.

On January 13, 2012, Wolf Creek experienced another loss of off-site power. Similar to the 2009 event, this loss of off-site power caused a water hammer of sufficient magnitude to cause a through-wall leak in corroded essential service water piping. This leak occurred in the riser piping of the Train C containment cooler. Though this piping is part of the essential service water flowpath, it was not scoped into the licensee's inspection and tracking program. The licensee's system designation for the piping changed at the flange joints between essential service water and the containment coolers. Containment coolers were never included in the non-destructive inspection program.

The team determined that the licensee's corrective actions from the August 2009 loss-of-off-site-power event, which developed the non-destructive inspection program of the essential service water system, were inadequate because the inspection program did not include the containment coolers. Additionally, the team noted that the program did not accurately track and document which sections of essential service water piping had been inspected and which had not. At the conclusion of the inspection, the licensee was developing a design change to mitigate the impact of pump restarts on the essential service water system. The licensee was also performing localized pipe repairs on corroded areas while evaluating which sections of pipe require larger-scale replacement.

The NRC previously issued Wolf Creek two violations for failure to adequately evaluate the essential service water system for corrosion and for the effects of water hammer on corroded areas: NCV 05000482/2009007-03 was identified during a special inspection following the 2009 water hammer event; VIO 05000482/2010006-05 was identified during the 2010 problem identification and resolution inspection. The second violation was cited because the licensee failed to restore compliance within a reasonable time following the identification of the first violation. Because the licensee still has not restored compliance, this violation is also cited.

Analysis. The failure to preclude recurrence of water hammer in the essential service water system and the failure to take adequate corrective action to control internal pitting corrosion in essential service water piping was a performance deficiency. The deficiency was more than minor because it is associated with the equipment performance attribute



of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. It is therefore a finding. Using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the finding was of very low safety significance (Green) because the finding was a design or qualification deficiency that was confirmed not to result in loss of system operability or functionality; the January 12, 2012, leak was too small to cause a loss of system function. This finding has a cross-cutting aspect in the corrective action program component of the problem identification and resolution cross-cutting area because the licensee failed to take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance (P.1(d)).

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that in the case of significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to this requirement, from August 19, 2009, through May 25, 2012, the licensee failed to assure that the cause of a significant condition adverse to quality was determined and corrective action was taken to preclude repetition. Specifically, water hammer in a safety-related system that leads to through-wall leaks from corroded piping is a significant condition adverse to quality. On August 19, 2009, a loss-of-off-site-power event caused a water hammer in safety-related essential service water piping. This water hammer resulted in a leak from corroded portions of piping. The licensee failed to take corrective action to preclude repetition of additional water hammer events and system leaks due to internal pitting corrosion in the essential service water system. This was demonstrated on January 13, 2012, when a loss-of-off-site-power event caused a water hammer event and system leak due to internal pitting corrosion in the essential service water system. The finding has been entered into the licensee's corrective action program as condition report 53443. Due to the licensee's failure to restore compliance within a reasonable time following previous NCV 05000482/2009007-03 and VIO 05000482/2012006-05, this violation is being cited in a Notice of Violation consistent with Section 2.3.2 of the NRC Enforcement Policy: VIO 05000482/2012007-03, "Failure to Take Timely Corrective Action to Preclude Repetition."

d. Untimely Corrective Actions

Introduction. The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to effectively correct deficient procedures regarding the use of clearance orders. A number of clearance-related problems revealed several deficiencies in procedures to ensure that safe tag-out of equipment occurred prior to the start of work, that independent reviews of qualified individuals were being completed during clearance order preparation, and that effective training was being conducted where performance gaps were identified. The licensee failed to correct these deficiencies in a timely manner. This finding was entered into the licensee's corrective action program as condition report 53451.

Description. The team determined that effective corrective actions had not been implemented in a reasonable time following identification of an adverse trend in clearance order performance during maintenance of both safety-related and nonsafety-

related systems. On September 21, 2010, clearance order D-QA-N-041 included a tag-out of breaker 8 for the replacement of a light socket. When proceeding with the work, a live-dead-live test indicated that the circuit was still energized. Further examination revealed that the wrong breaker had been tagged open. The licensee documented this error in condition report 28224 and performed a root cause evaluation. Though the event evaluated in the root cause did not involve safety-related equipment, the evaluation documented a history of work order preparation errors, inadequate clearance order boundaries, and negative feedback on the use of clearance orders from self-assessments and surveys. These included a number of issues with safety-related systems. Corrective actions included procedure changes and training. However, the root cause indicated that corrective actions to prevent recurrence were not effective. The most recent post-training survey, completed in February 2012, indicated that the Clearance Order Group had not noticed a change or improvement since the training on the revised procedures. This resulted in training needs analysis (TNA) 2012-1087-1, which was delayed from being reviewed by management for several months due to the station's forced outage in early 2012. The team determined that effective corrective actions had not been timely implemented.

Analysis. The team determined that the failure to correct an adverse trend in the use of clearance orders when performing maintenance on safety-related systems was a performance deficiency. This finding was more than minor because if left uncorrected, it could lead to a more significant safety concern. Specifically, continued failure to establish the correct clearance order boundaries could result in the loss of configuration control for systems required to maintain nuclear safety. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined that this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The team determined that this finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to ensure complete, accurate and up-to-date design documentation, procedures, and work packages were available and adequate to support nuclear safety (H.2(c)).

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, from September 2010 through February 2012, the licensee failed to assure that measures were established to assure that a condition adverse to quality was promptly corrected. Specifically, following identification of an adverse trend in the effective use of clearance orders for safety-related and nonsafety-related equipment maintenance, the licensee failed to implement corrective action to ensure safe tag-out of equipment had occurred prior to the start of work, that independent reviews of qualified individuals were being completed in the clearance order preparation, and that effective training was being conducted where performance gaps were identified. This finding was entered into the licensee's corrective action program as condition report 53451. Because this finding is of very low safety significance (Green) and has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation

consistent with section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2012007-04, "Untimely Corrective Action."

e. Failure to Establish Procedures to Ensure Completion of Corrective Actions

Introduction. The team identified a Green non-cited violation of 10 CFR Part 50, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to establish adequate procedures for resolution of corrective actions. Specifically, the licensee failed to establish procedures to ensure that planned corrective actions were effectively implemented. This finding was entered into the licensee's corrective action program as condition report 53432.

Description. The team identified two examples where the licensee had failed to establish procedures to ensure that corrective actions were completed as intended:

Attachment G to Procedure AP 28A-100, "Condition Reports," Revision 16, noted that level 3 (apparent cause) condition reports fall under the oversight of the corrective action review board (CARB). Paragraph 6.14.1.2 of this procedure required that the condition report owner ensure that actions have been satisfactorily performed prior to closing the action. Contrary to this, on June 8, 2011, actions 02-06, 02-07, and 02-08 of apparent cause 34661 to add caution statements or notes to work order templates or instructions were closed by the assigned action owner without the procedure changes being made. In the closure documentation, the action owner stated that he did not feel the changes should be made to the documents listed. Instead, the action owner added a document to the maintenance history noting a need for these notes. However, the team noted that there was no procedural requirement that such comments from maintenance history be incorporated into new work orders. Rather, procedure AI 16C-007, "Work Order Planning," Revision 31, noted that when developing a work instruction, a check for existing instructions or procedures and a review of maintenance history were among a six-page list of "elements to consider" for the planners. The most recent revision of AI 16C-007—Revision 38—contained identical language.

Corrective actions for the apparent cause documented in condition report 27015 included action 02-03 to investigate plants that received violations for not having evaluations for crimping failure on the external Emergency Diesel Generator exhaust. On September 10, 2010, this item was closed by the assigned action owner citing a statement in the updated safety analysis report (USAR) that diesel operation inhibition was extremely unlikely due to tornado missiles. Closure of this item due to existing USAR reference did not meet the intent of evaluating other plant violations for vulnerabilities at Wolf Creek. The original actions were assigned by the station's CARB, a management-level group. The action owner closing the item with no actions completed did so at a lower organizational level; there was no management or CARB review of this closure. It should also be noted that the historical USAR reference does not necessarily negate the need for a current evaluation of crimping.

Analysis. The failure to establish adequate procedures for resolution of corrective actions was a performance deficiency. This finding was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, failure to establish adequate procedures for resolution of corrective actions

could result in important actions not being accomplished. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the decision making component of the human performance cross-cutting area because the licensee failed to demonstrate that nuclear safety is an overriding priority by making safety-significant or risk-significant decisions using a systematic process (H.1(a)).

Enforcement. Title 10 CFR Part 50, Criterion V, "Corrective Action," requires, in part, that activities affecting quality be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with those instructions, procedures, and drawings. Contrary to this requirement, on September 10, 2010, and June 8, 2011, the licensee failed to ensure that activities affecting quality were prescribed in documented procedures and accomplished in accordance with those procedures. Specifically, the licensee failed to establish adequate procedures to ensure that corrective actions were completed as intended. Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as condition report 53432, this violation is being treated as a non-cited violation consistent with section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2012007-05, "Failure to Establish Procedures to Ensure Completion of Corrective Actions."

f. Failure to Implement Corrective Actions to Test Safety-Related Equipment

Introduction. The team identified a Green violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to perform testing of safety-related spring-loaded tornado dampers in the emergency diesel generator and essential service water rooms. In 2008, the licensee identified that because the updated safety analysis report (USAR) incorrectly classified these active components as passive, they had not been included in a periodic testing or surveillance program. Since 2010, action items to test the dampers have received four extensions. Additionally, required training for this testing was completed and closed. No testing or surveillance had been accomplished. This failure was the subject of a previous violation issued by the NRC. However, the licensee failed to take timely corrective actions to restore compliance.

Description. The Wolf Creek emergency diesel generator room and essential service water room ventilation system design includes four spring-loaded dampers that are required to automatically close in the event of high differential pressures associated with a design basis tornado. The safety function of these dampers is to protect the heating ventilation and air conditioning system ductwork and components from postulated high-pressure differentials. In 2008, Wolf Creek personnel identified that these dampers had been incorrectly classified as passive components and were not being periodically tested; Condition Report 2008-003276 was initiated to revise Procedure MPE VD-001, "Ventilation Damper Maintenance," to accomplish testing. Later in 2008, the procedure was updated and the corrective action was closed. However, no action was taken to ensure that the required testing would be performed as part of the scheduled preventive maintenance activities.

In 2010, the NRC issued a violation (NCV 05000482/2010007-02) for the licensee's failure to implement the planned corrective actions. On September 20, 2010, the licensee initiated condition report 28185, noting that the procedure change was never communicated to the planners and that there was no corrective action initiated to write a work order for the testing. Condition report 29602 was written in October 2010 documenting NCV 2010007-02. Since 2010, corrective actions from these condition reports have received four due date extensions. No testing or surveillance had ever been accomplished.

This finding was entered into the licensee's corrective action program as condition report 53363.

Analysis. The team determined that the licensee's failure to implement corrective action was a performance deficiency. This finding was more than minor because it affected the equipment reliability attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failure to implement this corrective action could result in reduced reliability of safety-related equipment during an event initiated by a tornado. Using Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined that this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and during a tornado, would not cause a plant trip if failed, would not degrade two or more trains of a multi-train safety system, and would not degrade one or more trains of a system that supports a safety system or function. This finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to provide complete, accurate, and up-to-date design documentation, procedures, and work packages available and adequate to support nuclear safety (H.2(c)).

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures be established to assure that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, from 2008 through May 2012, the licensee failed to establish measures to assure that a condition adverse to quality was promptly identified and corrected. Specifically, the licensee failed to assure that the identified emergency diesel generator and essential service water pump room tornado damper testing deficiency was corrected. This finding was entered into the licensee's corrective action program as condition report 53363. Because the licensee failed to restore compliance in a timely manner after this condition was identified as a non-cited violation in inspection report 05000482/2010007, this violation is being cited in a Notice of Violation consistent with Section 2.3.2 of the NRC Enforcement Policy: VIO 05000482/2012007-06, "Failure to Implement Corrective Actions to Test Safety-Related Equipment."

g. Failure to Determine the Cause of a Significant Condition Adverse to Quality

Introduction. On February 23, 2011, a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was revealed when an anomalous start of component cooling water (CCW) pump B indicated gas voiding in the CCW piping. This

violation was due to the licensee's inadequate root cause evaluation and failure to prevent recurrence of the voiding that had previously occurred in May 2010.

Description. On May 24, 2010, the licensee observed acoustic anomalies during the start of a test of CCW pump A. During investigation, ultrasonic testing revealed multiple voids in the pump suction piping, the pump discharge piping, and the shell side of the residual heat removal heat exchanger. The licensee took immediate corrective action to vent the voids where possible; however, they were unable to get the piping sufficiently vented to justify continued operability. Train A CCW was declared inoperable on June 3, 2010.

On September 1, 2010, the licensee completed a root cause evaluation of this event. The evaluation identified the root cause was personnel's misconceptions and misunderstanding of gas voiding and gas accumulation within the CCW piping. Specifically, the evaluation identified that operators and engineers believed that the system was self-venting through the CCW surge tank. Further, personnel did not understand the mechanisms of void formation (i.e., gas coming out of solution with increases in temperature). The licensee identified plant design issues only as a contributing cause, not as a root cause. The licensee failed to recognize that without system modifications to install additional high point vents, there would not be a significant reduction in the likelihood of this voiding condition occurring, regardless of the knowledge level of personnel. While the action plan did specify evaluation and installation of such vents, implementation was deferred until the next scheduled outage in March 2011 despite a forced outage opportunity in October 2010.

On February 23, 2011, Wolf Creek experienced a similar anomalous start of CCW pump B. During this event, the CCW system pressure dropped such that the second pump on the train started automatically. Once again, ultrasonic readings confirmed unsatisfactory voiding and the CCW train was declared inoperable. On July 24, 2011, Wolf Creek completed another root cause analysis as part of condition report 33925. This root cause evaluation properly identified the plant design issues as the root cause. By the time the root cause evaluation was completed, the additional eight high-point vents had already been installed during the Spring 2011 refueling outage. Since the installation of the additional vents, routine CCW void monitoring has identified only very small voids well below the established operability limits.

The team determined that the corrective actions to install the required vents were not implemented timely to prevent recurrence. The root cause performed under condition report 33925 also identified the inadequacies in evaluation and actions implemented by condition report 25918. However, because the significant condition adverse to quality recurred, the inspectors determined that the finding was self-revealing rather than licensee-identified.

Analysis. The failure to properly identify design issues as a root cause and to take action to prevent the recurrence of a CCW system voiding was a performance deficiency. The performance deficiency is more than minor because it impacted the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, excessive voiding of the

CCW system could lead to lack of cooling to important safety-related components. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the issue was of very low safety significance (Green) because it did not represent a loss of system safety function or loss of a single train for longer than its technical specification allowed outage time. This finding has a cross-cutting aspect in the corrective action program component of the problem identification and resolution cross-cutting area because the licensee failed to thoroughly evaluate a problem such that its resolution addressed its cause and extent of condition. Specifically, condition report 25918 did not properly identify design issues as a root cause requiring immediate system modifications to preclude recurrence (P.1(c)).

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that for significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and that corrective actions are taken that preclude repetition. Contrary to this requirement, from May 24, 2010, through February 23, 2011, the licensee failed to assure that the cause of a significant condition adverse to quality was determined and that corrective actions were taken to preclude repetition. Specifically, voiding of the CCW system that could lead to lack of cooling to important safety related components is a significant condition adverse to quality. After a May 2010 CCW voiding event, the licensee failed to preclude repetition of this voiding by taking appropriate corrective actions; voiding recurred in February 2011. Because this finding was determined to be of very low safety significance (Green) and was entered into the licensee's corrective action program as condition report 33925, this violation is being treated as a non-cited violation consistent with section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2012007-07, "Failure to Determine the Cause of Component Cooling Water System Voiding."

h. Failure to adequately evaluate the suitability of nonsafety-related gaskets, o-rings, and seals installed in safety-related equipment and to identify extent of the condition

Introduction. The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to evaluate the suitability of nonsafety-related gaskets, o-rings, and seals installed in safety-related components. These nonsafety-related parts were originally installed due to erroneous Safety Classification Assessments (SCAs). After determining that the parts were inappropriate in safety-related joints, the licensee failed to promptly correct the condition and failed to fully identify which components were affected.

Description. On September 21, 2010, a licensee maintenance planner recognized that during planned maintenance, a nonsafety-related (NSR) pump casing gasket had been installed on the safety-related (SR) jacket water keep-warm pump for emergency diesel generator (EDG) B. The planner initiated condition report 28208 to address the issue.

The NSR gasket had been approved for use in SCA 91-0408, a generic SCA for gaskets. The SCA was written by a vendor and approved for use in August 1991. It permitted the use of nonsafety-related gaskets in safety-related systems that only interface with water or steam, where those systems had unlimited make-up capability. This SCA assumed that "all water and steam systems are capable of making up water and steam gasket leakage losses." The EDG jacket water cooling system has makeup capability provided

by the demineralized water storage and transfer system. This system is not safety-related and cannot be assumed to be available during a design-basis accident. Therefore, the application of SCA 91-0408 to allow nonsafety-related gaskets to be used in the safety-related EDG jacket water cooling system was inappropriate. More broadly, this SCA and various locally-generated subcomponent SCAs were used to place nonsafety-related gaskets, o-rings, and seals in many other safety-related systems, some of which also may not have unlimited makeup capability. This was identified by the licensee in the root cause evaluation conducted under condition report 28208.

In response to this condition, all nonsafety-related SCAs associated with safety-related components were reviewed by the licensee, and administratively revised or replaced if found to be faulted. Nonsafety-related gaskets, o-rings, and seals which were determined to be inappropriately installed were replaced with safety-related material on the EDG system only. This effort to replace nonsafety-related components did not extend to the other affected safety-related systems; the licensee did not review work history to determine which components in the affected systems actually contained nonsafety-related material. For example, SCA 10-0086 covers gaskets in the emergency fuel oil system. This SCA was administratively revised because of an inadequate nonsafety-related evaluation, but the nonsafety-related gaskets in that system were not specifically identified or replaced. Other affected systems include, among others, the reactor coolant system, the residual heat removal system, the essential service water system, and the auxiliary feedwater system. Engineering Disposition/Configuration Change Package 13716 described below was generated as justification.

The licensee approved Engineering Disposition/Configuration Change Package 13716 to address the inappropriate installation of nonsafety-related gaskets, o-rings, and seals in safety-related equipment due to the erroneous application of SCA 91-0408. Revision 3 of this Engineering Disposition allowed the facility to “use-as-is” the affected gaskets until the next planned work in which the affected joints were to be opened. At that time, the gaskets would be replaced; the licensee concluded that no new field work was needed to address the non-conformance. The licensee did not evaluate exactly which components were affected by this SCA, but rather justified generic acceptance of all NSR gaskets, o-rings, and seals if they had not leaked prior to refueling outage 18. The licensee cited historic non-leakage, skill of the craft of maintenance persons installing the gaskets, and historic high acceptance rate of nonsafety-related gaskets during commercial grade dedication as sufficient evidence that the affected components were acceptable for continued use until eventual replacement at indeterminate dates.

The licensee defined critical gasket acceptance characteristics by citing EPRI TE CGIGA01, “Commercial Grade Item Evaluation for Gaskets, Non-Metallic and Spiral Wound.” Critical characteristics for acceptance were (emphasis added):

- Markings → indication the proper item was received
- Configuration → proper fit-up
- *Material* → *the most important characteristic* as it covers a significant number of critical characteristics for design, such as compressibility, creep relaxation, pressure rating and resistance to internal and external elements.



- Thickness → ensures sealability and pressure retention. Inadequate thickness = poor seal. Excessive thickness = reduced resistance to internal / external pressure due to large force acting radially.

The team noted in the above statement that the most important acceptance characteristic for gaskets was “material ... such as compressibility, creep relaxation, pressure rating and resistance to internal and external elements.” None of the justifications for accepting continued usage of the non-conforming components can adequately verify these material characteristics without knowing what materials were actually installed. Additionally, the licensee cited USA 5059 Resource Manual, “Applying 10 CFR 50.59 to Compensatory Actions to Address Nonconforming or Degraded Conditions,” Section 4.2.5, as their method for addressing the non-conformance. This section allowed three courses of action for addressing non-conforming conditions; the licensee chose to employ the first of the three, which reads:

If the licensee intends to restore the SSC back to its as-designed condition then this corrective action should be performed in accordance with 10 CFR 50 Appendix B (*i.e., in a timely manner commensurate with safety*). This activity is not subject to 10 CFR 50.59. (emphasis added)

NRC Inspection Manual Part 9900, Section 7.2, “Timing of Corrective Actions,” requires that “The licensee should establish a schedule for completing a corrective action when an SSC is determined to be degraded or nonconforming.” The team determined that an indefinite replacement schedule dependent upon the regular course of maintenance for unidentified nonconforming components did not meet the definition of “timely.” This approach will also not allow the licensee to know when conformance has been restored, because the actual extent of the condition is not known. The licensee documented this issue in Condition Report 53456.

Analysis. The failure of the licensee to evaluate the suitability of the specific nonsafety-related material installed in safety-related equipment and to determine the extent to which this condition existed was a performance deficiency. This performance deficiency was more than minor because it affected the design control attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inadequate evaluation of nonsafety-related gaskets, o-rings, and seals installed in safety-related equipment adversely affected the reliability of the affected systems. Using Manual Chapter 0609.04, “Phase 1 - Initial Screening and Characterization of Findings,” the team determined that the finding was of very low safety significance (Green) because the finding was a design or qualification deficiency confirmed not to result in loss of operability or functionality. This performance deficiency had a cross-cutting aspect in the corrective action program component of the problem identification and resolution cross-cutting area because the licensee did not take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity (P.1(d)).

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III “Design Control,” requires, in part, that measures be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-

related functions of the structures, systems and components. Contrary to this requirement, on September 12, 2011, the licensee failed to establish measures for the selection and review for suitability of application of materials and parts that are essential to the safety-related functions of structures, systems, and components. Specifically, the licensee approved Engineering Disposition/Configuration Change Package 013716, Revision 3, which allowed nonsafety-related gaskets, o-rings, and seals to remain installed in safety-related piping joints until such time as the affected joints were next opened in the normal course of maintenance; the engineering disposition did not identify the specific components affected or the suitability of the installed materials. Because this finding is of very low safety significance (Green) and was entered into the corrective action program as condition report 53456, this violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000482/2012006-08, "Failure to Adequately Evaluate the Suitability of Nonsafety-related Gaskets, O-Rings, and Seals Installed in Safety-Related Equipment and to Identify Extent of the Condition."

i. Inappropriately High Threshold for Condition Report Initiation

Introduction. The team identified a Green finding for the licensee's failure to ensure that condition reports were initiated as required by procedure. The licensee's implementing procedure for its corrective action program did not contain clear guidance as to what conditions were required to be entered into the corrective action program, or how soon after discovery a condition report was required to be generated. The team identified several examples where condition reports were not generated, though it appeared from the guidance that one was required.

Description. Step 6.2.1 of the licensee's condition reporting procedure, AP 28A-100, "Condition Reports," Revision 15A, requires personnel to promptly initiate a condition report "for equipment, human, organizational, program, process, or procedure performance issues." Contrary to this requirement, the team identified a number of examples where, prior to May 24, 2012, licensee personnel failed to initiate a condition report:

- On May 10, 2012, during a walkdown of emergency core cooling system (ECCS) pumps in response to industry operating experience, an operator noted several oil leaks that appeared to be long-standing but were not documented in an open condition report, work order, or work request. The team determined that these oil leaks were "adverse conditions" as defined in AP 28A-100, and should therefore have been documented in the corrective action program.
- Also on May 10, 2012, during the ECCS walkdown, the operator noted at least two deficiency tags that were old, faded, and unreadable. While the operator took action to replace the tags with readable ones, no condition report was initiated to document the existence of the old, worn tags. The team determined that the condition of these tags indicated an issue either (a) of operators and engineers not routinely reading the tags to ensure existing leaks had not worsened or (b) of complacency on the part of plant personnel to the tags deteriorating to an unreadable condition. Thus the team concluded that the licensee failed to initiate a condition report for a human performance issue as required by AP 28A-100.

- In condition report 51480, initiated on April 11, 2012, the licensee identified an undocumented diesel fuel oil leak that was found with an absorbant pad underneath it to collect the leaking oil. The team determined that the existence of the absorbant pad indicated that the leak had been previously discovered by licensee personnel, but that the personnel had failed to document the adverse condition in the corrective action program.

The team further noted two potential discrepancies in procedure AP 28A-100 that could cause confusion:

First, step 6.1.1 of AP 28A-100 states, “Anyone *can*, and is *expected to*, initiate a Condition Report (CR) when they discover an Adverse Condition” (emphasis added). Adverse condition is defined in Attachment B as one of seven conditions or trends and is amplified with a 42-item list of examples. However, as noted above, step 6.2.1 of AP 28A-100 states the requirement that personnel “*shall* promptly initiate a CR for equipment, human, organizational, program, process, or procedure performance issues” (emphasis added). The team determined that the difference in language between the two procedure steps indicated that step 6.2.1 was a requirement while step 6.1.1 was not.

Second, step 6.2.4 of AP 28A-100 reads, “If the issue has any potential to impact the plant or personnel safety, initiation shall not be later than the end of the work shift.” The team determined that the conditional statement required the condition report initiator to perform a field evaluation of an adverse condition to determine whether or not it might impact safety. The initiator may not be the most knowledgeable individual about the identified condition or the most qualified to evaluate it. The initiator may therefore incorrectly decide that there is no potential safety impact and opt to delay entering the condition into the corrective action program. The team determined that this could lead to a potentially safety-significant condition not being promptly addressed.

Analysis. The failure of licensee personnel to promptly initiate condition reports for identified issues, contrary to procedural requirements, is a performance deficiency. This performance deficiency is more than minor because if left uncorrected, it could lead to a more significant safety concern. Using Inspection Manual Chapter 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” the team determined that this finding was of very low safety significance (Green) because it did not involve a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the resources component of the human performance cross-cutting area because the licensee failed to ensure procedures necessary for complete, accurate, and up-to-date procedures were available and adequate to support nuclear safety. Specifically, the corrective action program procedure was vague in its guidance as to when a condition report was required (H.2(c)).

Enforcement. There was no identified violation of NRC requirements associated with this finding. The licensee documented this deficiency in its corrective action program as Condition Report 53445. Because this finding did not involve a violation of regulatory

requirements and had very low safety significance (Green), it is identified as a finding: FIN 05000482/2012007-09, "Inappropriate Threshold for Condition Report Initiation."

## **.6 Miscellaneous Issue Follow-Up**

### **a. (Closed) URI 05000482/2012008-06, Review Actions to Correct Water Hammer Events in the ESW System**

Unresolved Item (URI) 05000482/2012008-06 documents long-standing problems of water hammer events in the essential service water system and the concern that the actions to correct this problem have not been timely. The team determined that the licensee's efforts to correct a water hammer problem in the essential service water system warranted additional NRC review and follow-up because this phenomenon has repetitively challenged the integrity of a risk-significant safety-related system.

This URI was evaluated as part of the violation documented in section 4OA2.5.c of the report. URI 05000482/2012008-06 is closed.

### **b. (Closed) URI 05000482/2012008-07, Review ESW Piping Corrosion Inspections**

URI 05000482/2012008-07 documented why previous efforts were not sufficient to detect corrosion problems before they developed into leaks and that water hammer events made leaks more likely. The team determined that the licensee's failure to examine the condition of vendor-supplied piping associated with the containment coolers as well as other areas of ESW piping warranted additional NRC review and follow-up.

This URI was evaluated as part of the violation documented in section 4OA2.5.c of the report. URI 05000482/2012008-07 is closed.

## **4OA6 Meetings**

### **Exit Meeting Summary**

On May 24, 2012, the team presented the inspection results to Mr. M. Sunseri, President and Chief Executive Officer, and other members of the licensee staff. Licensee management acknowledged the issues presented. The inspector asked the licensee's management 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

T. Baban, Manager Systems  
K. Hargis, Supervisor Corrective Action  
L. Hauth, Work Control Senior Reactor Operator  
S. Henry, Manager Operations  
J. Isch, Superintendant Operations Work Controls  
W. Muilenburg, Supervisor Licensing  
E. Peterson, Ombudsman  
R. Rumas, Manager Quality  
G. Sen, Manager Regulatory Affairs  
J. Yunk, Manager Corrective Action

#### NRC personnel

C. Long, Senior Resident Inspector

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

#### Opened

05000482/2012007-03	VIO	Failure to Take Timely Corrective Action to Preclude Repetition (Section 4OA2.5.c)
05000482/2012007-06	VIO	Failure to Implement Procedures to Test Safety-Related Equipment (Section 4OA2.5.f)

#### Opened and Closed

05000482/2012007-01	NCV	Inadequate Procedure to Implement Compensatory Measures (Section 4OA2.5.a)
05000482/2012007-02	NCV	Failure to Report Conditions that Could have Prevented Fulfillment of a Safety Function (Section 4OA2.5.b)
05000482/2012007-04	NCV	Untimely Corrective Action (Section 4OA2.5.d)
05000482/2012007-05	NCV	Failure to Complete Corrective Actions (Section 4OA2.5.e)
05000482/2012007-07	NCV	Failure to Prevent Recurrence of Component Cooling Water System Voiding (Section 4OA2.5.g)
05000482/2012007-08	NCV	Failure to Adequately Evaluate the Suitability of Nonsafety-related Gaskets, O-Rings, and Seals Installed in Safety-Related Equipment and to Identify Extent of the Condition (Section 4OA2.5.h)
05000482/2012007-09	FIN	Inappropriately High Threshold for Condition Report Initiation (Section 4OA2.5.i)

### Closed

05000482/2012008-06 URI Review Actions to Correct Water Hammer Events in the ESW System (Section 4OA2.6.a)  
05000482/2012008-07 URI Review ESW Piping Corrosion Inspections (Section 4OA2.6.b)

### Discussed

None

## **LIST OF DOCUMENTS REVIEWED**

### CONDITION REPORTS

11247	25866	26712	28077	29163	31783	34620	40842	49716
12913	25867	26752	28088	29164	31818	34661	40933	50271
15077	25868	26753	28175	29252	31839	34896	40959	51292
20099	25869	26760	28187	29464	31848	34900	41151	51480
20153	25870	26826	28208	29467	32081	34902	41569	51931
20717	25871	26855	28224	29538	32227	34964	41613	51949
21039	25872	26940	28234	29559	32228	34987	41853	51951
21703	25873	27015	28252	29601	32233	35341	41975	51982
22296	25874	27027	28303	29602	32487	35343	41997	52917
22989	25880	27032	28346	30151	32680	36600	42349	52918
23024	25881	27034	28367	30201	32689	36973	42537	52981
23108	25882	27073	28376	30219	32761	36992	42618	52984
23110	25883	27077	28403	30235	32792	36993	42635	52985
23331	25884	27106	28474	30374	32886	36994	42737	53005
23992	25885	27108	28539	30566	32887	36996	43265	53047
24073	25886	27110	28562	30610	33199	37244	43278	53051
24183	25887	27145	28564	30918	33253	37374	43435	53058
24646	25888	27147	28575	31024	33258	37690	43515	53061
25058	25896	27172	28579	31039	33357	37931	44963	53062
25224	25918	27336	28620	31136	33395	38593	45320	53064
25228	25951	27484	28644	31193	33603	38965	45333	53200
25353	26001	27603	28652	31265	33773	39173	45758	53319
25404	26050	27605	28722	31428	33909	39187	45839	53342
25460	26070	27650	28854	31430	33925	39338	46131	53363
25463	26216	27718	28945	31432	33982	39494	46137	53369

CONDITION REPORTS

25478	26223	27949	28959	31557	34029	39995	46163	53390
25498	26302	27976	28990	31586	34206	40047	46814	53393
25658	26335	27982	29027	31617	34267	40219	47094	53394
25848	26354	28046	29105	31626	34455	40555	47813	53407
25863	26651	28048	29108	31641	34463	40707	47993	53456
25864	26678	28050	29152	31745	34465	40802	48141	53458
25865	26686	28067	29162	31746	34604	40841	49276	

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
AI 14-006	Severe Weather	12
AI 16C-006	MPAC Work Request/Work Order Process Controls	19
AI 16C-007	Work Order Planning	31
AI 16C-007	Work Order Planning	38
AI 20-001	WCNOC Quality Oversight Report	3
AI 20-004	QA Continuous Improvement	3
AI 20A-005	Quality Assurance Standards and Expectations	1A
AI 20E-001	Industry Operating Experience Group	8
AI 21D-006	Response to Plant Status Control Problems	8
AI 21D-007	Response to Clearance Order Issues	6
AI 21E-003	Clearance Order Improvement	3
AI 22A-001	Operator Work Arounds/Burdens/Control Room Deficiencies	10A
AI 22C-016	Unit Condition and Operational Residual Risk	0
AI 28A-010	Screening Condition Reports	11
AI 28A-010	Screening Condition Reports	12
AI 28A-023	Evaluation of Maintenance Rule Functional Failure CRs	2A
AI 28A-100	Cause Evaluations	0
AI 28A-100	Cause Evaluations	1A
AI 28A-100	Condition Reports	15A
AI 29B-003	Guidance to Prevent Unacceptable Preconditioning Prior to Testing	2
AI 30E-003	Training Needs Analysis/Design Scope and Planning	14

## PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
AI-28A-100	Cause Evaluations	0
AIF-16C-011-02	Walkdown Form	----
AP 05J-001	Quality Group D (Augmented) Quality Program Requirements	5
AP 10-002	Fire Protection Program Requirements	7
AP 14A-003	Scaffold Construction and Use, For Category I Building and Structures	18A
AP 14A-004	Scaffold Construction and Use, For Non-Category I Building and Structures	2
AP 15C-002	Procedure Use and Adherence	35
AP 15C-004	Preparation, Review and Approval of Procedures, Instructions and Forms	41
AP 20-001	Quality Stop Work and Escalation Processes	5
AP 20A-003	QA Audit Requirements, Frequencies and Scheduling	22
AP 20A-004	Conduct of Internal Audits	15
AP 20A-006	QA Issue Development, Reporting and Follow-up Processes	14
AP 20A-008	QA Surveillance and Station Monitoring Program	13
AP 20A-009	Quality Organization	4A
AP 20E-001	Industry Operating Experience Program	20
AP 20G-001	Control of Inspection Planning and Inspection Activities	13
AP 21-001	Conduct of Operations	54A
AP 21D-005	Plant Component Status Control	12
AP 21E-001	Clearance Orders	30
AP 21I-001	Temporary Modifications	8A
AP 22-001	Conduct of Pre-Job and Post-Job Briefs	13
AP 23-008	Equipment Reliability Program	4
AP 23E-001	Emergency Diesel Generator Reliability Program	7A
AP 24E-006	Replacement Item Selection	4
AP 28-007	Nonconforming and Degraded Conditions	9
AP 28A-100	Condition Reports	15A



## PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
AP 28A-100	Condition Reports	16
AP 30D-010	Supplemental Personnel Training and Qualification	9
AP 30G-001	Training, Qualification, and Certification of Audit Personnel	8
AP 30G-002	Training by Quality	4C
AP-13-001	Fatigue Management	18
APF 22-001-01	Pre-Job Brief Checklist	16
APF 26A-003-01	Applicability Determination	12
APF 26B-003-01	USAR Change Request for 9.4 Tornado Damper	5
APF 30E-004-01	Basic Bearing and Lubrication Lesson Plan: Fabricate and Install Threaded Piping	5
APF 30E-004-01	Corrective Action Program Leadership Process/Software Training	4
GEN 00-004	Power Operation	69
GEN 00-005	Minimum Load to Hot Standby	71
I-ENG-004	Lubricating Oil Analysis	4
MGE LT-008	Routine Electrical Limitorque Operator Maintenance	6
MPM LT-001	Limitorque Operator Minor Maintenance, Lubrication, and Inspection	13A
OFN AF-025	Unit Limitations	37
OFN BB-031	Shutdown LOCA	21
OFN MA-001	Load Rejection or Turbine Trip	17
OFN RP-013	Control Room Not Habitable	17
OFN RP-013A	Hot Standby to Cold Shutdown from Outside the Control Room	1
OFN RP-014	Hot Standby to Cold Shutdown from Outside the Control Room	14
OFN RP-017	Control Room Evacuation	40
SEC 50-123	Security of Normal Requirements	23
STN AC-007	Turbine Overspeed Trip Test	28
STS AB-205	Main Steam System Inservice Valve Test	29

## PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
STS AB-206	Main Steam System Inservice Valve Test (MSIVs Retest)	8
STS AC-001	Main Turbine Valve Cycle Test	26
STS PE-007	Periodic Verification of Motor Operated Valves	4
SYS AB-120	Main Steam and Steam Dump Startup and Operations	30A
SYS BG-201	Shifting Charging Pumps	50
WCQPM	Wolf Creek Quality Program Manual	8

## OPERATIONAL BURDENS / WORK-AROUNDS / CONTROL ROOM DEFICIENCIES

11-OW108	11-OB107	10-CRD120	11-CRD118	12-CRD119
12-OW101	11-OB125	08-CRD100	11-CRD195	12-CRD122
	10-OB117	12-CRD111	11-CRD203	

## WORK ORDERS

08-305414	11-340104	11-346698	11-346174
10-325126	10-325125	10-325123	10-324270
08-308675	08-308676	08-308673	07-294389
09-322158-002	09-322158-001	10-325122	08-305212

## MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
	Corrective Action Backlog Reduction Initiative	2
	Corrective Action Recovery Monitoring Metrics	March 2012
	Corrective Action Recovery Monitoring Metrics	April 2012
	New Employee Orientation Checklist	11/10/11
	QA Audit 12-04-CAP Corrective Action Program Exit	
	QA Audit Report 12-04-12: Corrective Action Program	5/21/12
	Reportability Evaluation Request 2010-079	9/22/10
	Temporary Modifications Log	

# MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
----	Control Room Deficiency / Operator Workaround / Operator Burden / Work Request Tag Log	5/11/2012
----	EDG SCA Review – Procurement Engineering	----
----	EDG System Performance Team Charter	----
----	Emergency Diesel Generator Reliability / Availability Improvement Plan	6
----	Management Review Meeting Presentation: EDG Reliability Improvement Program	3/23/2012
----	NSR SCA in SR System Review – Procurement Engineering	----
----	Operations Crews D and E Work Hours: 1/5/2012 to 1/27/2012	----
----	WCNOC Westinghouse Sensitivity Study for MSPI Margin	----
10-04-CAP	Quality Assurance Audit Report Corrective Action Program	6/7/10
10-07-FP	Quality Assurance Audit Report Fire Protection Program	10/05/10
10-11-FM	QA Audit Report of Fatigue Management Program	6/7/2010
11-03-SEC	Quality Assurance Audit Report Security	4/5/11
11-04-ENG	Quality Assurance Audit Report Engineering Programs	9/14/11
11-05-SEC	Quality Assurance Audit Report Security Program	7/19/11
11-06-EP	Quality Assurance Audit Report Emergency Preparedness Program	8/18/11
11-07-QA	Quality Assurance Audit Report Quality Assurance Program	9/9/11
12-04 CAP	Corrective Action Program	4/25/2012
2010-1195-8	Status Control Training	8/2/2010
2011-1175-1	Status Control Training Rev 1	7/12/2011
2011-1205-1	Status Control Errors Continue	7/29/2011
2011-1375-1	Status Control Training	12/20/2011

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
APF 05-002-01	Engineering Screening: NSR Gaskets Installed in SR Equipment. CCP 13716	0
APF 20-002-01	Plant Personnel Statements: January 2012 Post-Trip Interviews (13)	10
CCP 13716	NSR Gaskets Installed in SR Equipment	Revs 1-3
CR 40555	Class 1E equipment temperatures on loss of A/C unit	0
NO1131601	NSO Watchstanding Principles	1
OP1333201	Plant Status Control	0
PI 113 18 01	Overview of Trending Process for Corrective Action Program	000
QA-OBS-54464	Fatigue Management	----
SA-2012-0021	2012 Mid Cycle Self Assessment	2/17/2012
SCA-91-0408	Safety Classification Analysis 91-0408	Revs 4-6
SEL 2009-150	Corrective Action Program Improvements	8/17/2009
TNA 2011-1002-1	Procedure Changes Gap	
TNA 2012-1087-1	Extra COW Training Needed	
WCNOC-12-21456	Life Cycle Management Plan for Emergency Diesel Generators	April 2012

**Information Request  
February 8, 2012  
Biennial Problem Identification and Resolution Inspection  
May 7 - May 25, 2012  
Wolf Creek Generating Station  
Inspection Report 05000482/2012007**

This inspection will cover the period from May 26, 2010 to May 25, 2012. All requested information should be limited to this period or to the date of this request unless otherwise specified. To the extent possible, the requested information should be provided electronically in Adobe PDF or Microsoft Office format. Lists of documents should be provided in Microsoft Excel or a similar sortable format.

A supplemental information request will likely be sent during the week of April 30, 2012.

Please provide the following no later than April 16, 2012:

1. Document Lists

Note: For these summary lists, please include the document/reference number, the document title or description of the issue, initiation date, current status, and long text descriptions of the issues.

- a. Summary list of all corrective action documents related to significant conditions adverse to quality that were opened, closed, or evaluated during the period
- b. Summary list of all corrective action documents related to conditions adverse to quality that were opened or closed during the period
- c. Summary lists of all corrective action documents which were upgraded or downgraded in priority/significance during the period
- d. Summary list of all corrective action documents that subsume or "roll up" one or more smaller issues for the period
- e. Summary lists of operator workarounds, engineering review requests and/or operability evaluations, temporary modifications, and control room and safety system deficiencies opened, closed, or evaluated during the period
- f. Summary list of plant safety issues raised or addressed by the Employee Concerns Program (or equivalent)
- g. Summary list of all Apparent Cause Evaluations completed during the period
- h. Summary list of all Root Cause Evaluations planned or in progress but not complete at the end of the period

2. Full Documents with Attachments

- a. Root Cause Evaluations completed during the period
- b. Quality assurance audits performed during the period

- c. All audits/surveillances performed during the period of the Corrective Action Program, of individual corrective actions, and of cause evaluations
- d. Corrective action activity reports, functional area self-assessments, and non-NRC third party assessments completed during the period (do not include INPO assessments)
- e. Corrective action documents generated during the period for the following:
  - i. All Cited and Non-Cited Violations issued to Wolf Creek Generating Station
  - ii. All Licensee Event Reports issued by Wolf Creek Generating Station
- f. Corrective action documents generated for the following, if they were determined to be applicable to Wolf Creek Generating Station (for those that were evaluated but determined not to be applicable, provide a summary list):
  - i. NRC Information Notices, Bulletins, and Generic Letters issued or evaluated during the period
  - ii. Part 21 reports issued or evaluated during the period
  - iii. Vendor safety information letters (or equivalent) issued or evaluated during the period
  - iv. Other external events and/or Operating Experience evaluated for applicability during the period
- g. Corrective action documents generated for the following:
  - i. Emergency planning drills and tabletop exercises performed during the period
  - ii. Maintenance preventable functional failures which occurred or were evaluated during the period
  - iii. Adverse trends in equipment, processes, procedures, or programs which were evaluated during the period
  - iv. Action items generated or addressed by plant safety review committees during the period

### 3. Logs and Reports

- a. Corrective action performance trending/tracking information generated during the period and broken down by functional organization
- b. Corrective action effectiveness review reports generated during the period
- c. Current system health reports or similar information

- d. Radiation protection event logs during the period
- e. Security event logs and security incidents during the period (sensitive information can be provided by hard copy during first week on site)
- f. Employee Concern Program (or equivalent) logs (sensitive information can be provided by hard copy during first week on site)
- g. List of Training deficiencies, requests for training improvements, and simulator deficiencies for the period

4. Procedures

- a. Corrective action program procedures, to include initiation and evaluation procedures, operability determination procedures, apparent and root cause evaluation/determination procedures, and any other procedures which implement the corrective action program at Wolf Creek Generating Station
- b. Quality Assurance program procedures
- c. Employee Concerns Program (or equivalent) procedures
- d. Procedures which implement/maintain a Safety Conscious Work Environment

5. Other

- a. List of risk significant components and systems
- b. Organization charts for plant staff and long-term/permanent contractors

Note: "Corrective action documents" refers to condition reports, notifications, action requests, cause evaluations, and/or other similar documents, as applicable to Wolf Creek Generating Station.

As it becomes available, but no later than April 16, 2012, this information should be uploaded onto the Certrec IMS website. When these documents have been compiled (and by April 17, 2012), please download these documents onto a CD or DVD and send 4 copies via overnight carrier to:

Ron Cohen  
U.S. NRC Region IV  
1600 East Lamar Blvd.  
Arlington, TX 76011-4511

Please note that the NRC is not able to accept electronic documents on thumb drives or other similar digital media. However, CDs and DVDs are acceptable.