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

February 14, 2012

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

Subject: WOLF CREEK GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000482/2011005

Dear Mr. Sunseri:

On December 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Wolf Creek Generating Station. The enclosed integrated inspection report documents the inspection findings, which were discussed on January 12, 2012, with Mr. S. Hedges, Site Vice President, and other members of your staff.

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

One self-revealing and three NRC identified findings of very low safety significance (Green) were identified during this inspection. All of these findings were determined to involve violations of NRC requirements. Additionally, the NRC has determined that a traditional enforcement Severity Level IV violation occurred.

Further, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. The NRC is treating these violations as non-cited violations (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest these non-cited violations, 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, 1600 E. Lamar Blvd., Arlington, TX 76011-4511; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Wolf Creek Generating Station.

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 the Wolf Creek Generating Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response 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/

Neil O'Keefe, Chief
Project Branch B
Division of Reactor Projects

Docket No.: 05000482
License No.: NPF-42

Enclosure: Inspection Report 05000482/2011005
w/Attachment: Supplemental Information

cc w/ encl: Electronic Distribution

Distribution:

Regional Administrator (Elmo.Collins@nrc.gov)
Deputy Regional Administrator (Art.Howell@nrc.gov)
DRP Director (Kriss.Kennedy@nrc.gov)
DRP Deputy Director (Troy.Pruett@nrc.gov)
DRS Director (Anton.Vegel@nrc.gov)
DRS Deputy Director (Tom.Blount@nrc.gov)
Senior Resident Inspector (Chris.Long@nrc.gov)
Resident Inspector (Charles.Peabody@nrc.gov)
WC Administrative Assistant (Shirley.Allen@nrc.gov)
Branch Chief, DRP/B (Neil O'Keefe@nrc.gov)
Senior Project Engineer, DRP/B (Leonard.Willoughby@nrc.gov)
Project Engineer, DRP/B (Nestor.Makris@nrc.gov)
Public Affairs Officer (Victor.Dricks@nrc.gov)
Public Affairs Officer (Lara.Uselding@nrc.gov)
Project Manager (Randy.Hall@nrc.gov)
Branch Chief, DRS/TSB (Ryan.Alexander@nrc.gov)
RITS Coordinator (Marisa.Herrera@nrc.gov)
Regional Counsel (Karla.Fuller@nrc.gov)
Congressional Affairs Officer (Jenny.Weil@nrc.gov)
OEMail Resource
ROPreports
ACES Branch Chief (Heather.Gepford@nrc.gov)
RIV/ETA/OEDO (Lydia.Chang@nrc.gov)
DRS/TSB STA (Dale.Powers@nrc.gov)

ML120450654

File located: R:_REACTORS_WC\2011\WC2001005-RP-cml.docx

SUNSI Rev Compl	☑Yes ☐ No	ADAMS	☑Yes ☐ No	Reviewer Initials	NFO
Publicly Avail	☑Yes ☐ No	Sensitive	☐ Yes☑No	Sens. Type Initials	NFO

SRI:DRP/B	RI:DRP/B	SPE:DRP	C:DRS/EB1	C:DRS/EB2
CLong	CPeabody	LWilloughby	TRFarnholtz	GBMiller
/RA via E/	***/RA via E/***	***/RA via E/***	***/RA/***	***/RA/***
2/6/12	2/6/12	2/9/12	2/9/12	2/8/12
C:DRS/OB	C:DRS/PSB1	C:DRS/PSB2	C:DRS/TSB	C:DRP/B
MSHaire	MCHay	GEWerner	RDAlexander	NO'Keefe
/RA SGarchow for/	***/RA/***	***/RA/***	***/RA/***	***/RA/***
2/9/12	2/9/12	2/9/12	2/9/12	2/10/12

OFFICIAL RECORD COPY T=Telephone E=E-mail F=Fax

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000482
License:	NPF-42
Report:	05000482/2011005
Licensee:	Wolf Creek Nuclear Operating Corporation
Facility:	Wolf Creek Generating Station
Location:	1550 Oxen Lane NE Burlington, Kansas
Dates:	October 1 to December 31, 2011
Inspectors:	C. Long, Senior Resident Inspector C. Peabody, Resident Inspector R. Deese, Senior Project Engineer L. Willoughby, Senior Project Engineer N. Makris, Project Engineer P. Elkmann, Senior Emergency Preparedness Inspector G. Guerra, CHP, Emergency Preparedness Inspector C. Steely, Operations Engineer D. Strickland, Operations Engineer
Approved By:	N. O'Keefe, Chief, Project Branch B, Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000482/2011005; 10/01/2011 – 12/31/2011; Wolf Creek Generating Station Integrated Resident and Regional Report; Maintenance Effectiveness, Plant Modifications, Surveillance Testing, Identification and Resolution of Problems, Event Follow-up.

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

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The inspectors reviewed a self-revealing, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with an improperly selected essential service water gasket that sprayed safety-related electrical equipment. On August 31, 2011, essential service water pump A was started and a 1 gpm leak from a bolted flange on the strainer was observed spraying a Class 1E supply transformer. The gasket was found to be broken due to excessive torque, and was replaced. Wolf Creek's apparent cause evaluation concluded that the cause of the gasket failure was not evaluating the suitability of existing gasket material to be used in conjunction with the new, hard Ceramalloy coating applied to the strainers as part of a design change in 2003. The strainer joints had been previously re-tightened to stop leakage without evaluating the cause.

  Selecting inappropriate gasket material, which led to repeated leaks and tightening until the gasket broke, was a performance deficiency. The performance deficiency is more than minor because it could be a precursor to a loss of essential service water event. Specifically, the water spray was wetting a transformer that could have cause the loss of the train A traveling screen, strainer, and ventilation. The inspectors used Inspection Manual Chapter 0609.04, and determined the issue was Green, or very low safety significance, because assuming worst case degradation, the finding did not affect train B. Also, train A essential service water was inoperable for less than its allowed outage time of 72 hours because it was successfully run the previous day. The finding had a cross-cutting aspect in the area of problem identification and resolution because Wolf Creek did not thoroughly evaluate the problem such that the resolutions address causes and extent of conditions, as necessary. Specifically the bolted flanges of the essential service water strainer A had leaked

multiple times over the past 2 years, but did not get evaluated because they were classified as 'find and fix.' [P.1(c)] (Section 1R12).

- Green. On June 13, 2011, the inspectors identified a non-cited violation of 10 CFR, Part 50, Appendix B, Criterion XVI, for an inadequate safety analysis of inadvertent operation of the emergency core cooling system. The inspectors identified that Updated Safety Analysis Report, Chapter 15.5.1, "Inadvertent Operation of the ECCS," was inadequate because it did not account for the effects of reactor coolant pump seal injection flow. Since the pressurizer would be nearly full when operators terminate safety injection flow, the added volume would eventually overfill the pressurizer. Relief of liquid by the pressurizer safety valves is not permissible by the Updated Safety Analysis Report and the Standard Review Plan because the event could then propagate to a loss of coolant accident. The inspectors also identified that Wolf Creek needed an additional time critical operator action to re-establish letdown to reduce pressurizer level. The inspectors identified that operators were not tested on these actions in the simulator. Wolf Creek evaluations in 2011 did not find the error in the safety analysis or operator training. Wolf Creek planned to re-perform this safety analysis and has changed its simulator training to include timing of safety injection termination and establishing letdown. This issue was entered in the corrective action program as condition report 40410.

  Failure to identify an inadequate safety analysis for inadvertent safety injection while comparing the plant response during an actual inadvertent safety injection to the safety analysis was a performance deficiency. This finding was more than minor because it impacted the design control attribute of the Initiating Events Cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors used Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," and determined that the issue required a Phase 3 analysis because it involved a primary system loss of coolant accident initiator that could exceed the technical specification limit for allowable leakage. The senior reactor analyst calculated a bounding incremental core damage probability of 9.0E-7 per year or very low safety significance. This finding had a cross-cutting aspect in the area of problem identification and resolution associated with problem evaluation. Specifically, condition reports 34964 and 35700 did not identify the issue although they were tasked with evaluating the March 19 event against the safety analysis. [P.1(c)] (Section 1R18)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, for the licensee's failure to adequately evaluate the effects of allowed technical specification frequency variations on plant equipment in design calculations. Specifically, significant affects on the Class 1E electrical equipment air conditioning units were observed which required licensee action. The reduced cooling capacity raised temperatures above the allowable limits for equipment in those rooms. This finding was entered into the licensee's corrective action program as condition report 2007-002734, for which the licensee performed a comprehensive analysis of the effects of frequency variation on safety-related equipment.

  Failure to adequately analyze the effects of allowable frequency variations on equipment performance was a performance deficiency. This finding is more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with Inspection Manual Chapter 0609.04, this finding was determined to be of very low safety significance (Green) because it did not create a loss of safety system function of a single train for greater than the technical specification allowed outage times, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding did not have a cross-cutting aspect because the most significant contributing cause did not reflect current licensee performance (Section 4OA2).

Cornerstone: Miscellaneous

- Severity Level IV. The inspectors identified a Severity Level IV noncited violation of 10 CFR 50.73 because the licensee inappropriately retracted a licensee event report. On September 29, 2011, Wolf Creek issued Licensee Event Report 2011-004-01 which retracted the 10 CFR 50.73(a)(2)(v)(D) portion of the report for loss of both trains of automatic safety injection on March 19, 2011. The automatic functioning of safety injection is required by Technical Specification 3.3.2, function 1.b. Wolf Creek licensee event report 2011-004-00 was correct in its reporting the loss of safety function. In retracting this aspect, Wolf Creek credited manual action to restart safety injection and the long standing logic design. However, NUREG 1022, Section 3.2.7, specifies that inoperable systems required by the technical specifications be reported. This issue is entered into the licensee's corrective action program as condition report 46110.

  The inspectors reviewed this issue in accordance with Inspection Manual Chapter 0612 and the NRC Enforcement Manual and determined that traditional enforcement was applicable to this issue because the NRC's regulatory ability

was affected. Specifically, 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, and when this is not done, the regulatory function is impacted. The inspectors used the Enforcement Policy and the available risk information to conclude that this violation is appropriately characterized as Severity Level IV.

Cornerstone: Barrier Integrity

- Green. On November 14, 2011, the inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for pre-conditioning of the 480 Vac breaker for the containment cooling fan D prior to performance of the periodic functional test to satisfy Technical Requirements Manual Surveillance 3.8.11.3. Testing consisted of injecting a current in excess of the breaker's setpoint and measuring the response time. The licensee was observed to perform preventive maintenance activities consisted of cleaning, lubricating, inspecting, and calibrating the circuit breakers, then performed as-left surveillance testing. The inspectors concluded that the preventive maintenance activities were likely to positively impact the surveillance test results. The inspectors identified that the practice had occurred with other 480 Vac breakers because Wolf Creek personnel believed that the performance of as-left testing after preventive maintenance constituted a surveillance test.

  The inspectors determined that mixing preventive maintenance and surveillance testing such that the containment cooling fan breaker was preconditioned was a performance deficiency. The finding was more than minor because it could become a more safety significant concern if left uncorrected. Specifically, the programmatic practices could mask safety-related circuit breaker degradation. The inspectors evaluated the significance of this finding under the barrier integrity cornerstone using Phase 1 of Inspection Manual Chapter 0609.04, and determined that the finding had very low safety significance. Specifically, the finding does not represent a degradation of the radiological barrier function provided for the control room, auxiliary building, or spent fuel pool; or represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere; and does not represent an actual open pathway in the physical integrity of the reactor containment; or a heat removal component. The inspectors determined that the finding had a cross-cutting aspect in the area of human performance associated with work control. Specifically, the work order and procedures were performed with competing requirements such that workers had to choose the correct sequence of activities [H.3(b)] (Section 1R22).

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and condition report numbers is listed in (Section 4OA7).

REPORT DETAILS

Summary of Plant Status

Wolf Creek began the inspection period at 100 percent power. On October 14, 2011, a 200 MWe load reduction was performed to replace a main turbine combined intercept valve servo. On October 24, 2011, a 200 MWe load reduction was performed to replace two additional main turbine combined intercept valve servos. Reactor power remained at 100 percent for the replacements. On November 1, 2011, Wolf Creek reduced reactor power to 92 percent due to a fire in condensate pump motor B lower bearing. On November 5, 2011, Wolf Creek reduced reactor power to 88 percent to bring the new condensate pump motor B online. Later on November 5, 2011, Wolf Creek returned to 100 percent power. On December 4, Wolf Creek decreased power to 99 percent for turbine valve testing and returned to 100 percent. On December 5, 2011, Wolf Creek down powered again for turbine valve testing and replacement of a servo for the No. 2 main stop valve. Later on December 5, 2011, Wolf Creek returned to 100 percent power and remained there for the remainder of quarter.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

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

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

- Fire water system (winterization)
- Refueling and Condensate storage tanks (winterization)

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

b. Findings

No findings were identified.

1R04 Equipment Alignments (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- October 5, 2011, Turbine-driven auxiliary feedwater
- October 18, 2011, Centrifugal charging pump A

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, USAR, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

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

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Fire Inspection Tours

a. Inspection Scope

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

- October 3, 2011, Fire Area C-9, switchgear room 3301
- October 3, 2011, Fire Area D-1, diesel generator room 5203
- October 4, 2011, Fire Area C-10, switchgear room 3302
- October 4, 2011, Fire Area D-2, diesel generator room 5201

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

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

b. Findings

No findings were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On November 5, 2011, the inspectors observed a fire brigade drill. The observation evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes

evaluated were (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient firefighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of preplanned strategies; (9) adherence to the preplanned drill scenario; and (10) drill objectives.

These activities constitute completion of one annual fire protection inspection sample as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification (71111.11)

The licensed operator requalification program involves two training cycles that are conducted over a 2-year period. In the first cycle, the annual cycle, the operators are administered an operating test consisting of job performance measures and simulator scenarios. In the second part of the training cycle, the biennial cycle, operators are administered an operating test and a comprehensive written examination. For this annual inspection requirement, the licensee was in the first part of the training cycle.

.1 Annual Inspection

a. Inspection Scope

The inspector reviewed the results of the examinations and operating tests for Wolf Creek to satisfy the annual inspection requirements.

On November 10, 2011, the licensee informed the lead inspector of the following results:

- 9 of 9 crews passed the simulator portion of the operating test
- 45 of 46 licensed operators passed the simulator portion of the operating test
- 45 of 46 licensed operators passed the job performance measure portion of the examination

The individuals that failed the simulator scenario portion and job performance measure portion of the operating test were remediated, retested, and passed their retake operating tests.

The inspector completed one inspection sample of the annual licensed operator requalification program.

b. Findings

No findings were identified.

.1 Quarterly Inspection

a. Inspection Scope

On November 28, 2011, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

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

b. Findings

No findings were identified.

R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- Essential service water spray-down of safety-related electrical distribution components apparent cause evaluation review

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

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

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

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

b. Findings

Introduction. The inspectors reviewed a Green, self-revealing, non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," associated with an improperly selected essential service water gasket that sprayed safety-related electrical equipment.

Description. On August 31, 2011, essential service water pump A was started to support testing on dependent systems. The site watch entered the room immediately following the pump start and observed a water spray coming from the south bolted flange on the strainer that was spraying down Class 1E transformer XNG05E, which feeds the 480V Class 1E bus which powers all of the train A safety-related valves, the traveling screen, strainer, and ventillation at the essential service water intake structure. The watch notified the control room, who declared essential service water train A inoperable. The watch then placed a piece of unsecured plywood to redirect the spray away from equipment. The connection was unbolted, the gasket removed, and found to be broken due to over tightening. The gasket was replaced and the flange was re-bolted and verified to be free of leakage. Train A essential service water was declared operable on the afternoon of September 1, 2011. Visual inspections of the transformer did not indicate that any water penetrated the cover and no abnormalities were noted in the 480V Class 1E distribution bus that the transformer continued to supply.

The inspectors reviewed Wolf Creek's apparent cause evaluation completed on October 27, 2011. The evaluation concluded that the apparent cause of the gasket failure was not changing the gasket material to accommodate the Ceramalloy coating applied to the replacement strainers. The strainer was installed in April 2005. Non-leaking installed OEM gaskets used with Ceramalloy coatings are considered operable but degraded/non-conforming.

Inspectors reviewed the maintenance history of the strainers. A similar bolted connection on the north side of the Train A strainer (opposite side and separate joint) had been leaking periodically since September 2009. The bolts were tightened but the leakage continued. The leakage was finally addressed in May 2010 when the gasket material was changed to Gar-Lock GR, a material that is compatible with Ceramalloy. Since Ceramalloy is applied by hand and may have an uneven surface, a more pliable gasket is required. However, the May repair also uncovered damage to the Ceramalloy coating itself caused by over torque. During the most recent refueling outage in April 2011, the coatings were repaired and the gasket was replaced with an original equipment manufacturer (OEM) gasket which is not compatible. The OEM gasket leaked upon installation, but was tightened and the leakage stopped. Based on the evaluation performed in condition report 43270, future corrective actions include replacement of all strainer gaskets with Ceramalloy-compatible materials at the next reasonable opportunity. Leaks in the spring of 2011 were classified as 'find and fix' in condition reports 33427 and 38611 and therefore did not have causal evaluations.

Analysis. Selecting inappropriate gasket material, which led to repeated leaks and tightening until the gasket broke, was a performance deficiency. The performance deficiency is more than minor because it could be a precursor to a loss of essential

service water event. The inspectors evaluated the finding using the significance determination process Phase 1 worksheet outlined in Inspection Manual Chapter 0609, Attachment 4. The finding screened as Green, or very low safety significance because assuming worst case degradation, the finding would not have affected other mitigation systems resulting in a total loss of their safety function; because essential service water train B was not concurrently affected. Also, train A essential service water was inoperable for less than its allowed outage time of 72 hours as the train was run without leakage on August 30, 2011. The inspectors determined that the finding had a cross-cutting aspect in the area of problem identification and resolution because Wolf Creek did not thoroughly evaluate the problem such that the resolutions address causes and extent of conditions, as necessary. Specifically the bolted flanges of the essential service water strainer A had leaked multiple times over the past 2 years but did not get evaluated because they were classified as 'find and fix' [P.1(c)].

Enforcement. 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part that: "Measures shall also 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 the above, on February 14, 2003, Ceramalloy CL+ was approved for use on the essential service water flanges without evaluating the compatibility of the installed Durlon 8600 gaskets. As a result, the leakage from the flanged connection sprayed onto safety-related electrical equipment making essential service water train A inoperable on August 31, 2011. Because this finding is of very low safety significance and was entered into the licensee corrective action program as condition report 43270, this violation is being treated as a non-cited violation in accordance with Section 2.3.2 of the Enforcement Policy: NCV 05000482/2011005-01, "Failure to Evaluate Gasket Compatibility."

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

a. Inspection Scope

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

- October 24, 2011, Pressurizer backup heaters breaker relay wire damage
- December 12-18, 2011, Weekly risk assessment
- November 2, 2011, Condensate motor B replacement

The inspectors selected these activities based on potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance

work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

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

b. Findings

No findings were identified.

1R15 Operability Evaluations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- October 17, 2011, Residual heat removal room cooler vibrations
- December 14, 2011, Emergency core cooling system leakage to the refueling water storage tank and its impact control room operator dose

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

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

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

Permanent Modifications

a. Inspection Scope

The inspectors reviewed key affected parameters associated with energy needs, materials, replacement components, timing, heat removal, control signals, equipment protection from hazards, operations, flow paths, pressure boundary, ventilation boundary, structural, process medium properties, licensing basis, and failure modes for the permanent modifications listed below.

- Inadvertent emergency core cooling system start and change pressurizer safety valve setpoint, technical specifications, Amendment 133

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

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

b. Findings

Introduction. On June 13, 2011, the inspectors identified a Green non-cited violation of 10 CFR, Part 50, Appendix B, Criterion XVI, for the failure to identify and correct a condition adverse to quality involving an inadequate safety analysis for inadvertent operation of the emergency core cooling system and associated licensed operator training.

Description. In response to the March 19, 2011, inadvertent safety injection event and subsequent Licensee Event Report (LER) 2011-004-00, the inspectors reviewed USAR Chapter 15.5.1, and License Amendment 133. USAR Chapter 15.5.1 described the plant's safety analysis for inadvertent operation of the emergency core cooling system. On March 23, 2000, License Amendment 133 lowered the pressurizer safety valve lift setpoint and relaxed its allowable tolerance. This included revising USAR Chapter 15.5.1. With approval of License Amendment 133, the safety analysis limit for closing the boron injection tank outlet valves became 8 minutes from charging pump start.

Wolf Creek USAR, Section 15.5.1, required that the pressurizer safety valves not pass water because the pressurizer safety valves are not qualified to pass liquid. The valves passing liquid introduces the possibility of them sticking open or incurring seat damage. With the pressurizer full or water-solid, added liquid from charging pumps would cause a rapid increase in reactor coolant system pressure. After the injection is stopped, thermal expansion of the water contributes to a further increase in pressure and could relieve water by lifting the pressurizer safety valves. This series of events would escalate the event to a small break loss of coolant accident if the pressurizer safety valve sticks open. Under this hierarchy in Chapter 15, moderate frequency events such as inadvertent operation of the emergency core cooling system are not permitted to cascade to infrequent, more serious events, such as a small break loss of coolant accident. Lastly, the plant has two ASME code relief valves and two power operated relief valves. The power operated relief valves open at lower pressures but are not part of the safety analysis model.

The inspectors reviewed calculation AN-98-86, “Inadvertent Operation of the ECCS at Power Analysis in Response to PIR 98-0252,” revision 0, which was the basis for USAR Section 15.5.1. The inspectors also interviewed safety analysis engineers. The inspectors identified that Wolf Creek did not account for reactor coolant pump seal injection after the boron injection tank valves were closed. Computer code outputs showed no increase in pressurizer level after the boron injection tank valves were closed. After performing preliminary calculations to include seal injection, Wolf Creek had 4.6 minutes after the boron injection tank valves were shut until the pressurizer was full. This 4.6 minutes would be the time allowed to place letdown inservice and reduce pressurizer level. Otherwise, the safety valves will lift and potentially escalate the event. Thus, the event would continue until letdown or excess letdown was placed in service to reduce pressurizer level. The inspectors identified that the safety analysis did not ensure that Wolf Creek would not escalate an inadvertent safety injection to a small loss of coolant accident.

To assess risk, the inspectors requested to review the testing of operating crews’ times to terminate such an event. No timing data existed because operators were not timed in the simulator against this design basis event. A scenario was used by the training department, but there were no operator performance measures. Wolf Creek initiated corrective action to correct the deficient safety analysis and operator manual action timing. Wolf Creek ran several operating crews through scenarios involving the inadvertent operation of the emergency core cooling system on the simulator and timed them for shutting the boron injection tank valves and placing letdown in service. Crews met the timing requirement to shut the boron injection tank outlet valves, but some did not meet the timing requirement to establish letdown. The simulator did not exactly mimic the plant safety analysis as the steam dumps and atmospheric reliefs were enabled. In all cases, the pressurizer was not overfilled.

Wolf Creek did perform a root cause for the March 19 event in condition report 34964. That cause evaluation also initiated condition report 35700 to examine the safety analysis. Both were tasked with comparing real plant response with the safety analysis, but neither evaluation identified this problem. Wolf Creek initiated condition

report 40410, planned to re-perform the safety analysis, and tested reactor operators on this event.

Analysis. The failure to identify an inadequate safety analysis for inadvertent safety injection while comparing the plant response during an actual inadvertent safety injection to the safety analysis was a performance deficiency. This finding was more than minor because it impacted the design control attribute of the Initiating Events Cornerstone attribute of design control and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, it impacted the design control attribute because the inadvertent safety injection could propagate to a loss of coolant accident. The inspectors used Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," a significance determination screening was performed and screened the issue to a Phase 2 analysis because it is a primary system loss of coolant accident initiator that could exceed the technical specification limit for allowable leakage. There was no surrogate for this event in the Phase 2 presolved worksheets.

The senior reactor analyst performed a Phase 3 analysis. The analyst assumed an average per unit rate of inadvertent safety injections of 7E-2/yr. The analyst considered a major risk contributor to be a power operated relief valve that could potentially fail open and escalate the event to a small loss of coolant accident. The analyst used the SPAR model generic probability of a power operated relief valve of failure after passing water to be 0.19. The analyst used the SPAR model conditional core damage probability of a small break loss of coolant accident as 7.59E-4. Finally, the senior reactor analyst, in consultation with the senior resident, established an average probability of 0.1 for operators failing to initiate letdown in time to prevent solid plant conditions. Using the assumptions above, the conditional core damage probability is the product of the event frequency (7E-2/yr), the probability of at least one power operated relief valve failing open given that both power operated relief valves pass water (0.19), the conditional core damage probability of a small break loss of coolant accident (7.59E-4), and the probability that operators will fail to terminate the injection before the pressurizer goes solid and water passes through the power operated relief valves (0.1). The result is 1.01E-6. The baseline risk is a revision of the above by taking the nominal probability that operators will fail to initiate letdown in time given that the performance deficiency did not exist, or, in other words, given that the licensee had established a time limit for establishing letdown and modified procedures and training to that effect. The analyst assumed that the baseline probability would be best approximated as the nominal SPAR-H value of 1.1E-2. Therefore, the core damage probability (baseline core damage probability) is 1.1E-7. The incremental core damage probability is the difference in the two values, or 9.0E-7 which is very low safety significance. The senior reactor analyst identified no large early release implications because the core damage sequences did not involve a steam generator tube rupture or an inter-system loss of coolant accident.

This finding had a cross-cutting aspect in the area of problem identification and resolution associated with problem evaluation. Specifically, condition reports 34964 and

35700 did not identify the issue although they were tasked with evaluating the March 19 event against the safety analysis [P.1(c)].

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

Calculation AN-98-086, "Inadvertent Operation of the ECCS at Power Analysis in Response to PIR 98-0252," revision 0, was the basis for Section 15.5.1, of the USAR for inadvertent operation of the emergency core cooling system. USAR, Section 15.5.1, states that acceptability of the analysis was based on not overfilling the pressurizer in order to prevent escalating the event. Reactor operator testing for termination of the event is based on this analysis.

Contrary to the above, Wolf Creek failed to promptly identify and correct a condition adverse to quality. Specifically, from March 23, 2000, to the present, calculation AN-98-086 did not account for the added reactor coolant system inventory from reactor coolant pump seal injection after the boron injection tank valves are shut. Condition reports 34964 and 35700 failed to identify and correct the lack of seal injection.

This finding was entered into the licensee's corrective action program as condition report 40410. Because this finding was determined to be of very low safety significance (Green) and was entered into the licensee's corrective action program, this violation is being treated as a non-cited violation consistent with the NRC Enforcement Policy: NCV 05000482/2011005-02, "Failure to Account for RCP Seal Injection in Safety Analysis for Inadvertent Safety Injection."

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- October 4-5, 2011, Turbine-driven auxiliary feedwater pump inservice pump test after plant modification to install standby tank vacuum breaker valve
- December 5, 2011, Main turbine stop valve No. 2 after surveillance testing failure

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

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed

- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

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

These activities constitute completion of two post-maintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability

- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

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

- November 14, 2011, Containment cooler D fan circuit breaker testing
- November 25, 2011, STS AB-201D, Atmospheric relief valve testing
- November 28, 2011, STS IC-211A, Solid state protection system testing

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

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

b. Findings

Introduction. On November 14, 2011, the inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for maintenance activities that preconditioned the circuit breaker for containment cooling fan D prior to performance of the periodic functional test to satisfy Technical Requirements Manual Surveillance 3.8.11.3.

Description. On November 14, 2011, while observing the performance of work order 11-340328, the inspectors questioned the practice of performing the 5-year breaker preventive maintenance prior to performing the containment penetration conductor overcurrent protection functional test for the 480 Vac breaker for containment cooling fan D.

Step 1.3 of work order 11-340328 specified taking as-found breaker trip data to prevent preconditioning, but workers marked this step "not applicable". This test was intended to satisfy Technical Requirements Surveillance 3.8.11.4 to perform breaker functional testing. Step 1.4 then specified performing preventive maintenance in accordance with manufacturer's recommendation, which was intended to satisfy Technical Requirements Surveillance 3.8.11.4. Step 1.5 of work order 11-340328-000

then specified performing as-left testing per station Procedure STS IC-921 and RNM C-0566.

The licensee performed apparent cause evaluation 45816 to determine why workers had marked step 1.3 of work order 11-340328-000 “not applicable”, and determined that technicians thought that the preventive maintenance activity was the surveillance test. The apparent cause also found that it was a routine practice to not perform as-found breaker testing, which contributed to technicians marking the steps N/A as necessary and routine.

The inspectors identified the following concerns with the testing:

- The as-found testing, even if it had been performed, would not have met the technical requirement manual surveillance requirement. The inspectors identified that station Procedure MPE E017Q-04 performed limited as-found testing for the degraded voltage trip settings, but that testing was not sufficient to meet the requirement stated in Technical Requirements Manual Surveillance 3.8.11.3. Specifically, the as-found testing failed to perform the long time-delay test, the short time-delay test, the instantaneous pickup test, or the ground fault time-delay test.

- Performing preventive maintenance prior to the as-left testing resulted in preconditioning of the breaker such that the more thorough as-found test did not represent the in-service condition of the breaker. Specifically, the preventive maintenance included cycling the breaker multiple times, performed cleaning, lubrication, and clearance adjustments, if needed.

- The as-left testing was more complete, but since the preventive maintenance was likely to have improved the performance of the breaker, the as-left test results did not represent the in-service condition of the breaker.

The inspectors reviewed the regulatory positions and guidance on the subject of preconditioning that are contained in NRC Inspection Manual Part 9900: Technical Guidance, “Maintenance - Preconditioning of Structures, Systems, and Components Before Determining Operability,’ and concluded that this example did not meet NRC expectations with respect to preventing preconditioning.

The inspectors determined that the licensee had scheduled the preventive maintenance and the functional testing together for efficiency purposes. The inspectors reviewed the work orders performed on the set of nine similar breakers included in this technical requirement manual requirement and identified that the full functional surveillance test had been performed after the 5-year breaker inspection and preventive maintenance procedure in each case. The licensee entered this issue into the corrective action program as condition report 46079.

Although the observed breaker work on November 14, 2011, involved preconditioning, the inspectors did not identify any concern that the lack of a full as-found test would have

impacted the operability of the containment fan cooler. The inspectors reviewed documentation for nine additional breakers and found no operability concerns.

The inspectors reviewed Procedure AP 16B-003, "Planning and Scheduling of Preventive Maintenance," Revision 3, and found that surveillance testing was included in the definition of preventive maintenance, and surveillance tests were coded in the work control system as preventive maintenance. The inspectors concluded that this was potentially misleading, since surveillance tests were intended to demonstrate the continue operability or functionality of equipment and do not to counteract the effects of aging, as stated in AP 16B-003. The inspectors concluded that the fact that the licensee's maintenance and testing program blurred the distinction between surveillance testing and preventative maintenance, and their practice of scheduling surveillance testing together with preventive on the same breakers contributed to the workers' error as well as the preconditioning of the breakers. The licensee entered this issue into the corrective action program as condition report 47377.

Analysis. The inspectors determined that mixing preventive maintenance and surveillance testing such that the containment cooling fan breaker was preconditioned was a performance deficiency. The finding is more than minor because it could become a more safety-significant concern if left uncorrected. Specifically, the programmatic practices could mask safety-related circuit breaker degradation. The inspectors evaluated the significance of this finding under the barrier integrity cornerstone using Phase 1 of Inspection Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and determined that the finding was determined to have very low safety significance, Green, because the finding does not represent a degradation of the radiological barrier function provided for the control room, auxiliary building, or spent fuel pool; or represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere; or does not represent an actual open pathway in the physical integrity of the reactor containment or a heat removal component. The inspectors determined that this finding had a cross-cutting aspect in the area of human performance associated with work control. Specifically, the work order and procedures were performed with competing requirements such that workers had to choose the correct sequence of activities [H.3(b)].

Enforcement. 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in the applicable design documents. Contrary to the above, on November 14, 2011, the licensee failed to establish a testing program that assured that 480 Vac breakers will perform satisfactorily in service, and on November 14, 2011, failed to perform testing in accordance with testing procedures. Specifically, the licensee performed preventive maintenance for the containment penetration breakers prior performing sufficient as-found surveillance testing to meet Technical Requirement Manual Surveillance 3.8.11.3. Also, on November 14, 2011, the workers violated step 1.3 of work order 11-340328 requiring as-found testing by marking this step as not applicable. Because the finding is of very low safety significance and has

been entered into the licensee's corrective action program as condition report 46079, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000482/2011005-03, "Preconditioning of 480 Vac Breakers Prior to Required Surveillance Testing."

1EP1 Exercise Evaluation (71114.01)

a. Inspection Scope

The inspectors reviewed the objectives and scenario for the 2011 biennial emergency plan exercise to determine if the exercise would acceptably test major elements of the emergency plan. The scenario simulated a fire affecting safety-related equipment, loss of a vital electrical bus, an earthquake causing a loss-of-offsite power and damage to reactor fuel, and a radiological release to the environment via a steam generator tube rupture and the turbine-driven auxiliary feedwater pump exhaust to demonstrate the licensee's capability to implement their emergency plan.

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

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

The inspectors also assessed recognition of, and response to, abnormal and emergency plant conditions, the transfer of decision-making authority and emergency function responsibilities between facilities, onsite and offsite communications, protection of emergency workers, emergency repair evaluation and capability, and overall implementation of the emergency plan to protect public health and safety and the environment. The inspectors reviewed the current revision of the facility emergency plan, emergency plan implementing procedures associated with operation of the licensee's emergency response facilities, procedures for the performance of associated emergency functions, and other documents as listed in the attachment to this report.

The inspectors compared the observed exercise performance with the requirements in the facility emergency plan, 10 CFR 50.47(b), 10 CFR Part 50, Appendix E, and with the guidance in the emergency plan implementing procedures and other federal guidance.

The inspectors attended the post-exercise critiques in each emergency response facility to evaluate the initial licensee self-assessment of exercise performance. The inspectors also attended a subsequent formal presentation of critique items to plant management. The specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.01-05.

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspector performed an onsite review of the Wolf Creek Generating Station Emergency Plan, Revision 11, submitted by letter dated September 20, 2011. This revision removed the Anderson County reception center and directed all evacuees to the Lyon County reception center, replaced the use of funeral directors for transporting non-ambulatory evacuees with Coffey County public transportation or medical transportation services, replaced Kansas City Power and Light employees as rumor control monitors with Wolf Creek Nuclear Generating Station employees, and made other administrative changes.

This revision was compared to its previous revision, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, and to the standards in 10 CFR 50.47(b) to determine if the revision adequately implemented the requirements of 10 CFR 50.54(q). This review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.04-05.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on October 12, 2011, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered

them into the corrective action program. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the third quarter 2011 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, “Performance Indicator Program.”

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

b. Findings

No findings were identified.

.2 Safety System Functional Failures (MS05)

a. Inspection Scope

The inspectors sampled licensee submittals for the safety system functional failures performance indicator for the period from the fourth quarter 2010 through the third quarter 2011. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 6, and NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 50.73." The inspectors reviewed the licensee’s operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports, and NRC integrated inspection reports for the period of October 2010 through September 2011, to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and one was identified. Specific documents reviewed are described in the attachment to this report.

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

b. Findings

A finding related to safety system functional failures is documented in Section 4OA3.6. No other findings were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - residual heat removal system performance indicator for the period from the fourth quarter 2010 through the third quarter 2011. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of October 2010 through September 2011, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

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

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - cooling water systems performance indicator for the period from the fourth quarter 2010 through the third quarter 2011. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of October 2010

through September 2011, to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

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

b. Findings

No findings were identified.

.5 Drill/Exercise Performance (EP01)

a. Inspection Scope

The inspectors sampled licensee submittals for the drill and exercise performance, performance indicator for the period April 2010 through September 2011. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI, Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revisions 5 and 6, were used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator; assessments of performance indicator opportunities during pre-designated control room simulator training sessions, performance during the 2011 biennial exercise, and performance during other drills. The specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the drill/exercise performance sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.6 Emergency Response Organization Drill Participation (EP02)

a. Inspection Scope

The inspectors sampled licensee submittals for the emergency response organization drill participation performance indicator for the period April 2010 through September 2011. To determine the accuracy of the performance indicator data reported during

those periods, performance indicator definitions and guidance contained in NEI, Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, was used. The inspectors reviewed the licensee’s records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator, rosters of personnel assigned to key emergency response organization positions, and exercise participation records. The specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the emergency response organization drill participation sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.7 Alert and Notification System (EP03)

a. Inspection Scope

The inspectors sampled licensee submittals for the alert and notification system performance indicator for the period April 2010 through September 2011. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI, Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5, was used. The inspectors reviewed the licensee’s records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator and the results of periodic alert notification system operability tests. The specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the alert and notification system sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of January 2011 through June 2011 although some examples expanded beyond those dates where the scope of the trend warranted.

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

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

b. Findings

No findings were identified.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

The inspectors performed a review of URI 2007-006-10 concerning the effects of allowed frequency on the electrical busses on plant equipment. The URI documented that during a loss of offsite power event with the emergency diesel generators supplying plant loads, the output frequency of the supplied power would be allowed to vary from 58.8 hertz to 61.2 hertz by Technical Specification 3.8.1. While the licensee had addressed some impacts, the team noted that the general plant-wide effect of the allowed frequency variation had not been completely addressed in the design calculations of the facility. The team opened an unresolved item and the licensee conducted further analyses to address the team's concern.

The inspectors reviewed the licensee's evaluation and supporting calculations to determine the potential effects. For any effects that had more than negligible impact on the equipment capability and performance, the inspectors reviewed the licensee's actions to address the impacts.

b. Findings

Introduction. The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” in that, the licensee did not adequately evaluate that allowed technical specification frequency variation had been completely addressed in the design calculations. The inspectors closed URI 05000482/2007006-10, “Effect of Emergency Diesel Generator Frequency Variation on Supplied Equipment.”

Description. The inspectors reviewed calculation 25360-000-MOC-AN-00001, “Emergency Diesel Generator Frequency Variation Impact Evaluation,” Revision 000, which the licensee used to evaluate the affects of allowed technical specification frequency variation on safety-related plant equipment. The evaluation reviewed the performance of over 70 pumps, compressors, fans, heaters, and motors which were affected. The affects on flow, head, horsepower, speed, as well as others affects were considered. The inspectors noted that most of the affects on the majority of the components were very small and did not represent a significant impact on equipment performance. In reviewing the evaluation, inspectors concluded that one specific effect had an important impact on equipment performance.

The inspectors noted the calculated design room temperatures for the engineered safety features switchgear rooms would be higher due to the reduced cooling ability of the Class 1E electrical equipment air conditioning units which cool those rooms. The new higher temperatures were greater than the worst case calculated design maximum allowed temperatures by 1.1°F for the train A room and 1.2°F for the train B room. The licensee initiated action to change the maximum allowed design temperature to address this condition.

Analysis. Failure to adequately analyze the effects of allowable frequency variations on equipment performance was a performance deficiency. This finding is more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," this finding was determined to be of very low safety significance (Green) because it did not create a loss of safety system function of a single train for greater than the technical specification allowed outage times, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding did not have a cross-cutting aspect because the issue did not reflect current licensee performance.

Enforcement. The inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, which states, in part, that “measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.” Contrary to the above, the licensee failed to establish measures to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Specifically, prior to

September 3, 2009, the impact on safety-related equipment of operating within the allowable technical specification operating band for electrical power frequency had not been adequately translated into the station's design calculations to demonstrate adequate equipment performance throughout the entire allowable frequency band. This finding was entered into licensee's corrective action program as condition report 2007-002734. Because this violation was 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 the NRC Enforcement Policy:
NCV 05000482/2011004-04, "Inadequate Evaluation of Effects of Emergency Diesel Generator Frequency Variation on Supplied Equipment."

URI 05000482/2007-006-10 is closed.

.5 Selected Issue Follow-up Inspection

a. Inspection Scope

The inspectors reviewed condition reports and corrective actions associated with the cross-cutting theme of H.2.b, "Training Resources," identified in the NRC's September 1, 2011, Mid-Cycle Assessment letter (ADAMS accession number ML112440318). The inspectors reviewed the evaluations and corrective actions performed as part of condition reports 38758 and 43372 and interviewed personnel to assess the licensee's progress in addressing this cross-cutting theme.

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

.b Findings and Observations.

On May 5, 2011, Wolf Creek initiated condition report 38758 in response to a trend of findings with H.2.b cross-cutting aspects. On September 2, 2011, Wolf Creek initiated condition report 43372 to address the cross-cutting theme described in the mid-cycle assessment letter. The NRC letter stated that, although the cross-cutting theme existed, the NRC did not open a substantive cross-cutting issue a reasonable duration of time had not passed to determine the effectiveness of the licensee's efforts to address the declining trend. Condition report 43372 was closed to condition report 38758. The licensee completed a basic common cause analysis (level 4) on October 31, 2011. Wolf Creek examined the four findings and their respective apparent cause evaluations in the theme for common factors and concluded that no common theme existed among these four findings. Wolf Creek attributed the discrepancy between the common cause and the NRC's identification of a theme to be inadequate assignment of aspects by the NRC and untimely follow up of preliminary findings by Wolf Creek management. No corrective actions were assigned from condition report 38758. Wolf Creek's basic common cause evaluation disputed the H.2.b, training resources for three of the four apparent causes because the safety culture evaluations identified no evidence related to the training aspect. The evaluation was unable to validate the NRC theme.

The inspectors concluded that Wolf Creek was taking actions to improve training. Several actions were initiated that included:

- Wolf Creek established precise control of evolutions as an objective for simulator training and in-plant evolutions. This included having senior reactor operators specify operating bands for key parameters.

- Critiques of licensed operators during simulator training were required to be more rigorous. Simulator performance that does not meet expectations gets prompt feedback and the scenario is re-performed to verify that objectives are met. Once objectives are met, the scenario is performed again to ingrain the lesson.

- Three managers were assigned to each operations crew to conduct training and in-plant observations of crew performance.

The inspectors observed operating crews in the plant during the November 1, 2011, condensate pump trip. Wolf Creek operators had previously received repetitive practice with this scenario in the simulator. Wolf Creek chose this scenario based on operating experience from another plant. The inspectors observed good performance on November 1, 2011, when the crew effectively responded such that no steam generator level deviation alarms were received. Although these actions were taken in response to non-NRC assessments, they are producing observable results.

No findings were identified.

.6 In-depth Reviews of Operator Workarounds

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting the use of manual actions during planned testing of 4160V safety bus relay testing. Actions were relied upon to re-install fuses to re-enable the sync-check function should offsite power be lost during the testing. The inspectors reviewed the operator work around and burden program that tracks actions necessary for operator work around and burden. The inspectors reviewed manual actions used during essential service water system flushes. The inspectors walked down the main and various local control board locations to identify undocumented operator work around or burdens. The inspectors reviewed non-licensed operator local equipment reading logs to assess additional actions placed on them for degraded equipment. The inspectors also reviewed other operator workarounds and burdens and their impact on licensed and non-licensed operators.

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

b. Findings

No findings were identified.

4OA3 Event Follow-up (71153)

.1 Introduction. The inspectors identified a Severity Level IV noncited violation of 10 CFR 50.73, in which the licensee inappropriately retracted an event meeting the reportability criteria.

Description. While performing the initial cooldown to enter a planned refueling outage on March 19, 2011, Wolf Creek received an automatic safety injection signal when steam line pressure decreased at a rapid rate and tripped the rate-sensitive C steam line low pressure bistable. The inspectors reviewed two issues related to this event, which was previously discussed in NRC Inspection Report 2011-003 and 2011-004 (ADAMS accession numbers ML112240223 and ML113140484).

In accordance with emergency operating procedures, operators blocked automatic actuation logic for both trains of automatic safety injection and stopped injection to prevent overfilling the pressurizer. Operator logs noted that both trains of engineered safety features actuation system logic were inoperable per Technical Specification 3.3.2, function 1.b.

The inspectors noted that Technical Specification 3.3.2 allows only one train to be inoperable in Mode 3, but while operators have made a valid entry into emergency operating procedures, Technical Specification compliance is suspended. However, when operators subsequently exited emergency operating procedures at 5:20 a.m., both trains of safety injection were still inoperable. Because this condition violated Technical Specification 3.3.2, a violation occurred. This violation is documented in Section 4OA7.

Inspectors concluded entry into Technical Specification 3.0.3 was an inappropriate alternative to staying in Emergency Operating Procedure ES-03, “SI Termination,” and returning safety injection to a standby alignment. Operators were able to reset the safety injection actuation logic and return both trains to standby 1 hours and 39 minutes after exiting the emergency operating procedures.

On May 18, 2011, Wolf Creek submitted licensee event report 2011-004-00 per 10 CFR 50.73(a)(2)(v)(D), among other criteria, to report that this event had disabled both trains of automatic safety injection. This criterion requires reporting events or conditions that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

On September 29, 2011, Wolf Creek issued revised licensee event report 2011-004-01 to retract the report of a loss of a safety function under 10 CFR 50.73(a)(2)(v)(D). Wolf Creek stated that the system safety function was maintained by manual action per the instructions in emergency operating procedures.

The inspectors reviewed the documented basis for the retraction, and reviewed NUREG 1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 2. Section 3.2.7, provided specific guidance for reportability under 50.73(a)(2)(v), specified that inoperable systems required by the technical specifications are to be reported. This section gave examples that would be reportable that included:

- An event or condition that disables multiple trains of a system because of a single cause

- An event or condition that alone could have prevented fulfillment of a safety function

The inspectors concluded that disabling the automatic actuation feature of the safety injection system met both of these criteria when these systems were required by technical specifications to be in standby and operable. This section of NUREG 1022 also gave examples that would not be reportable, which included:

- Removal of a system from service as part of a planned evolution for maintenance or surveillance testing when done in accordance with an approved procedure and the plant's technical specifications.

The inspectors concluded that this example was also pertinent in that the example was not reportable if done in accordance with technical specifications. As noted above, operators did not comply with the Mode 3 requirements in Technical Specification 3.3.2 function 1.b to maintain two trains of safety injection operable, so this could not be used as a basis for concluding that this issue was not reportable.

The inspectors also concluded that crediting manual action to retract a report under 50.73(a)(2)(v)(D) was inappropriate. The inspectors consulted with the NRC Office of Nuclear Reactor Regulation, who agreed with the inspectors' application of the rule and NUREG 1022.

The incorrect retraction of the licensee event report was entered into the corrective action program as condition report 46110. Wolf Creek subsequently corrected the report by submitting licensee event report 2011-004-02 on December 28, 2011. The inspectors determined that this revised report correctly reported all 10 CFR 50.73 aspects to the March 19, 2011, safety injection event.

Inspectors concluded that the Licensee Event Report 2011-004-00 was correct and the 10 CFR 50.73(a)(2)(v)(D) loss of safety function should not have been retracted. Inspectors reviewed NRC Enforcement Policy Section 6.9 and found that examples 9 and 10 applied for a Severity Level IV non-cited violation for an inaccurate licensee event report.

Analysis. The inspectors reviewed the issue in accordance with Inspection Manual Chapter 0612 and the NRC Enforcement Manual and determined that traditional enforcement was applicable to this issue because the NRC's regulatory ability was affected. Specifically, 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, and when this is not done, the regulatory function is impacted.

The senior reactor analyst determined that given that the safety injection system was inoperable for 1 hour and 39 minutes ($t_{Exposure}$), the risk significance of this issue was very low.

Because the violation had no more than very low safety significance, was not repetitive or willful, and was entered into the corrective action program, this violation is being treated as a Severity Level IV noncited violation consistent with the NRC Enforcement Policy.

Enforcement. Title 10 CFR 50.73(a)(1) requires, in part, that the holder of an operating license under this part licensees shall submit a licensee event report for any event of the type described in this paragraph within 60 days after the discovery of the event. Title 10 CFR 50.73(a)(2)(v) requires, in part, that the licensee shall report any events or conditions that could have prevented the fulfillment of the safety function of structures or systems that are needed to …(D) mitigate the consequences of an accident. Contrary to the above, on September 29, 2011, Wolf Creek failed to report an event that could have prevented fulfillment of the safety function of systems that are needed to mitigate the consequences of an accident. Specifically, Wolf Creek incorrectly partially retracted licensee event report 2011-004-00, which had been submitted for both trains of automatic safety injection being inoperable that which could have prevented the fulfillment of a safety function that is needed to mitigate the consequences of an accident since both trains of automatic safety injection were inoperable. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as condition report 46110, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy:
NCV 05000482/2011004-05, "Incorrect Retraction of an Event that Could Have Prevented Fulfillment of a Safety Function."

Licensee event reports 2011-004-00, 01, and 02 are closed.

4OA6 Meetings

Exit Meeting Summary

The lead inspector obtained the final annual examination results and telephonically exited with Mr. B. Evenson, requalification supervisor, on November 10, 2011. The inspector did not review any proprietary information during this inspection.

On November 17, 2011, the inspectors presented the onsite emergency preparedness inspection results to Mr. M. Sunseri, President and Chief Executive Officer, and other members of the licensee's staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 12, 2012, the resident inspectors discussed the inspection results with Mr. S. Hedges, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors acknowledged review of proprietary material during the inspection which was returned to the licensee. On February 13, 2012, the resident inspectors discussed the inspection results for Section 4OA3.3 with Mr. S. Hedges, Site Vice President. The inspector did not review any proprietary information during this inspection.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section 2.3.2 of the NRC Enforcement Policy for being dispositioned as non-cited violations.

.1 Licensee event reports 2011-004-00, 01, and 02 were made due to several aspects of the March 19, 2011, safety injection. All three versions of the licensee event report stated that both trains of safety injection were inoperable between 5:20 a.m. and 6:39 a.m. The licensee identified this as a violation of Technical Specification 3.3.2 function 1.b which only allows one train to be out of service. The inspectors concluded that the violation was more than minor because it represented a loss of safety function. A phase 3 risk analysis was performed by a senior reactor analyst in accordance with Manual Chapter 0609 Appendix A. The analyst concluded that the probability of an event requiring safety injection was lower than the white significance threshold, and hence the significance is green. This issue was documented in the licensee's corrective action program as condition reports 34987 and 34964.

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel
T. Baban, Manager, Systems Engineering
P. Bedgood, Manager, Radiation Protection
M. Bove, Senior Valve Engineer
J. Broschak, Vice President, Engineering
R. Clemons, Vice President, Strategic Projects
T. East, Superintendent, Emergency Planning
R. Evenson, Requalification Program Supervisor
R. Flannigan, Manager, Nuclear Engineering
J. Harris, System Engineer
S. Hedges, Site Vice President
S. Henry, Operations Manager
R. Hobby, Licensing Engineer
D. Hooper, Supervisor, Regulatory Affairs
T. Jensen, Manager, Chemistry
T. Just, Senior Technician, Chemistry
J. Keim, Support Engineering Supervisor
S. Koenig, Manager, Corrective Actions
M. McMullen, Technician, Engineering
C. Medency, Supervisor, Radiation Protection
W. Muilenburg, Licensing Engineer
R. Murray, Simulator Supervisor
B. Norton, Manager, Engineering Programs
E. Ray, Manager, Training
L. Ratzlaff, Manager, Maintenance
L. Rockers, Licensing Engineer
R. Ruman, Manager, Quality
G. Sen, Regulatory Affairs Manager
R. Smith, Plant Manager
L. Solorio, Senior Engineer
A. Stull, Vice President, Chief Administrative Officer
M. Sunseri, President and Chief Executive Officer
J. Truelove, Supervisor, Chemistry
J. Weeks, System Engineer
M. Westman, Assistant to Site Vice President
R. Zyduck, Manager, Design Engineering

NRC Personnel
C. Henderson, Reactor Inspector
K. Bucholtz, NRR/DSS/STSB

LIST OF ITEMS OPENED AND CLOSED

Opened and Closed

05000482/2011005-01	NCV	Failure to Evaluate Gasket Capability (Section 1R12)
05000482/2011005-02	NCV	Failure to Account for RCP Seal Injection in Safety Analysis for Inadvertent Safety Injection (Section 1R18)
05000482/2011005-03	NCV	Preconditioning of 480 Vac Breakers Prior to Required Surveillance Testing (Section 1R22)
05000482/2011005-04	NCV	Inadequate Evaluation of Effects of Emergency Diesel Generator Frequency Variation on Supplied Equipment (Section 4OA2.4)
05000482/2011005-05	NCV	Incorrect Retraction of an Event that Could Have Prevented Fulfillment of a Safety Function (Section 4OA3.6)

Closed

05000482/2007006-10	URI	Effect of Emergency Diesel Generator Frequency Variation on Supplied Equipment (Section 4OA2.4.)
05000482/2008-002-01, -02	LER	Technical Specification Allowed Outage Time Exceeded Due to Room Cooler Leak (Section 4OA3.4)
05000482/2009007-08	URI	Uncontrolled and Unanalyzed Room Environment Following a Complete Loss of Offsite Power (Section 40A3.7)
05000482/2010-010-00 -01	LER	Inadequate Analysis Results in a Component Cooling Water Train to be Declared Inoperable (Section 4OA3.5)
05000482/2011-004-00 01, -02	LER	Automatic Safety Injection Actuation Due to Operating Crew Failure to Follow Procedure (Section 4OA3.6)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

PROCEDURES

NUMBER	TITLE	REVISION
CKL BN-120	Refueling Water Storage System Lineup	14A
STN GP-001	Plant Winterization	43

Section 1R01: Adverse Weather Protection

PROCEDURES

NUMBER	TITLE	REVISION
CKL AN-120	Demineralized Water Transfer and Storage System Lineup	22
CKL FB-10	Auxiliary Steam System Normal Lineup	34
CKL AP-120	Condensate Storage and Transfer System Valve Lineup	18A
STN FP-209	Fire Pump	17
SYS FP-290	Temporary Fire Pump Operations	9
CKLZL9279	Temporary Diesel Fire Pump Winter Checks	76

Condition Reports

43710 43967 43969 46292

Section 1R04: Equipment Alignment

PROCEDURES

NUMBER	TITLE	REVISION
STS AL-103	TDAFW Pump Inservice Pump Test	48
CKL EM-120	Safety Injection System Lineup Checklists	25C
CKL BG-130	Chemical and Volume Control System Switch and Breaker Lineup	30
CKL BN-120	Refueling Water Storage System Lineup	14A
CKL EJ-120	RHR System Lineup	39A
STS AL-103	TDAFW Pump Inservice Pump Test	48

DRAWINGS

NUMBER	TITLE	REVISION
M-12AL01	Auxiliary Feedwater Piping &Instrumentation Diagram	16
M-12EM02	Piping & Instrumentation Diagram High Pressure Coolant Injection System	19

Condition Report

44891

Section 1R05: Fire Protection

PROCEDURES

NUMBER	TITLE	REVISION
E-1F9905	Fire Hazard Analysis	0
AP 10-106	Fire Preplans	11

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	DATE
	Fire Drill Scenario and Critique Report	November 5, 2011

Section 1R11: Licensed Operator Requalification Program

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
LR3406001	Secondary/Primary Precise Control Lab	000
	Operating Test Results	November 10, 2011

Section 1R12: Maintenance Effectiveness

Condition Reports

43270 43271 43750

Work Orders

11-340398-000 11-340468-001

DRAWING

NUMBER	TITLE	REVISION
M-154-0K050	Horizontal Automatic Strainer Schematic R.P. Adams Model 26”/30” HDWS-80	W02

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

PROCEDURES

NUMBER	TITLE	REVISION
RNM C-0577	General Electric IAC Induction Disc Overcurrent Relay	4A
MPE ML-001	Motor Sampline and Lubrication PM Activity on Various Equipment	13A
E-012.3-008	Allis-Chambers VersaPac Vertical Induction Motors	
M-007-00029	Instruction Manual for Condensate Pumps	W11

Condition Reports

45026	45333	45435	45438	

Work Orders

09-314493-000	09-314493-002	09-314493-005	09-314493-008	09-320992-000
10-335217-000	10-335217-001			

MISCELLANEOUS DOCUMENT

NUMBER	TITLE	REVISION
	Weekly Risk Assessment – Safety Monitor Profile Core Damage Frequency versus Time, 2011 Work Week 412	0

DRAWINGS

NUMBER	TITLE	REVISION
M-007-00012	APKD Pump	W06
M-007-00001	General Arrangement	W07
E-012.2-00024	Outline Induction Motor	W04

Section 1R15: Operability Evaluations

NUMBER	TITLE	REVISION
I-ENG-003	Vibration Monitoring and Analyses	5A
OE BN-11-011	Operability Evaluation	0
EMG E-O	Reactor Trip or Safety Injection	26

Condition Reports

31436	44833	46927	46952	

Valve ID

ENV0099	ENV0101	ENHV0015	ENHV0016	BNV0011
BN8717	BG8546A	BG8546B	BNV0013	BNV0014
BNV0011	EJ8958AEJ8958B	BNHV8812A	BNHV8812B	EMHV8814A
EMHV8814B	BNLCV0112D	BNLCV0112E	BNV0014	BNV0001
ENV0024	ENV0025			

Performance Improvement Request

97-4124

Section 1R18: Plant Modifications

NUMBER	TITLE	REVISION / DATE
ET 99-0025	Application for Amendment to Technical Specification Section 3.4.10, Pressurizer Safety Valves	October 21, 1999
	Issuance of Amendment RE: Pressurizer Safety Valves (TAC No. MA6969)	March 23, 2000
AI 21-016	Operator Time Critical Actions Validation	4
WO 11-0024	Licensee Event Report 2011-004-00, Automatic Safety Injection Actuation Due to Operating Crew Failure to Follow Procedure	May 18, 2011
LR5002026	Inadvertent Safety Injection Lab	2
LO4710528	Safety Injection Recovery and Termination	14

DRAWING

NUMBER	TITLE	REVISION
Figure 15.5-2	Inadvertent Operation of ECCS During Power Operation	17

MISCELLANEOUS

NUMBER	TITLE	REVISION
AN-98-086	Calculation Sheet	0

MISCELLANEOUS

NUMBER	TITLE	REVISION
Figure 15.5-1	USAR – Increase in Reactor Coolant Inventory	4
00078.00.0004	Duke Engineering & Services, D&ES Document NO: 00078.00.0004-F08-001	0
Table 15.5-1	USAR – Time Sequence of Events for Incidents Which Result in an Increase in Reactor Coolant Inventory	17
Regulatory Guide 1.70,	Standard Format and Content of Safety Analysis Reports for Nuclear Power Plans LWR Edition	2
NUREG-0800	Inadvertent Operation of ECCS and Chemical and Volume Control System Malfunction That Increases Reactor Coolant Inventory, July 1981	1
AN-98-08600039340	Inadvertent Operation of the ECCS at Power analysis in Response to PIR 98-0252	0

Condition reports

41125	1998-1008	34964	35700	40410

Section 1R19: Postmaintenance Testing

PROCEDURES

NUMBER	TITLE	REVISION
APF 05-002-08	Install Turbine-Driven Auxiliary Feedwater Pump Standby Tanks	03
STS AL-103	Turbine-Driven Auxiliary Feedwater Pump Inservice Pump Test	48
APF 05-002-08	Install Turbine-Driven Auxiliary Feedwater Pump Standby Tanks	03
STS AC-001	Main Turbine Valve Cycle Test	26

Work Orders

11-349189-000	11-349189-001	11-349189-002	11-348747-000

Section 1R22: Surveillance Testing

PROCEDURES

NUMBER	TITLE	REVISION
STS AB-201D	Atmospheric Relief Valve Inservice Valve Test	26
STS IC-921	Containment Penetration Conductor Overcurrent Protection Functional Tests of 480 Volt Breakers	3
RNM C-0566	GE Power Sensor Solid State Trip Device High Current Test	9B
STS MT-028	5 Year Breaker Inspection	24
MPE E017Q-04	Circuit Breaker Test for AKR 50 and AKR 30 Breakers	25

Condition Reports

45816 45819 46079

Work Orders

11-340328-000	11-340327-000	08-308384-000	08-308380-000	08-310548-000
09-317257-000	09-316970-000	09-320274-000	09-320396-000	10-327635-000
10-323377-000	11-346052-000			

Section 1EP1: Exercise Evaluation

PROCEDURES

NUMBER	TITLE	REVISION
EPP 06-01	Control Room Operations	14A
EPP 06-02	Technical Support Center Operations	30A
EPP 06-03	Emergency Operations Facility Operations	19
EPP 06-05	Emergency Classification	4B
EPP 06-06	Protective Action Recommendations	7A
EPP 06-07	Emergency Notifications	19

Section 1EP1: Exercise Evaluation

PROCEDURES

NUMBER	TITLE	REVISION
EPP 06-09	Drill and Exercise Requirements	5
EPP 06-10	Personnel Accountability and Evacuation	9
EPP 06-11	Emergency Team Formation and Control	8
EPP 06-13	Exposure Control and Personnel Protection	6
AP 17C-028	Emergency Response Duties and Responsibilities	12
AP 28A-100	Condition Reports	14
	Scenario Timeline for the November 1, 2011, Exercise	
	Scenario Timeline for the October 12, 2011, Exercise	
	Scenario Timeline for the June 6, 2009, Exercise	
	Scenario Timeline for the November 6, 2007, Exercise	
	Evaluation Report for the Drill conducted October 12, 2011	
	Evaluation Report for the Drill conducted September 27, 2011	
	Evaluation Report for the Drill conducted September 20, 2011	
	Evaluation Report for the Drill conducted January 13, 2011	
	Evaluation Report for the Drill conducted January 11, 2011	
	Evaluation Report for the Drill conducted August 3, 2010	
	Evaluation Report for the Drill conducted July 20, 2010	

Section 1EP1: Exercise Evaluation

PROCEDURES

NUMBER	TITLE	REVISION
	Evaluation Report for the Drill conducted April 27, 2010	
	Evaluation Report for the Drill conducted March 23, 2010	
	Training Needs Analysis 2011-1334-1, Dose Assessment under Loss of Power Conditions	

Condition Reports

45872	45873	45884	45885	45886
45887	45892	45893	45895	45899
45903	45906	45908	45917	45919
45920	45921	45924	45925	45926
45928	45929	45930	45932	45928
45929	45930	45932	45933	45945
45964	45995	45996	45997	45998
46000	46001	46002	46004	46081

Section 1EP6: Drill Evaluation

MISCELLANEOUS

NUMBER	TITLE	DATE
Team B	Emergency Planning Drill	October 12, 2011

Section 4OA1: Performance Indicator Verification

PROCEDURES

NUMBER	TITLE	REVISION
AI 26A-004	Emergency Planning Performance Indicators	5
EPP 06-05	Emergency Classification	4B
EPP 06-06	Protective Action Recommendations	7A
EPP 06-07	Emergency Notifications	19
EPP 06-19	Alert and Notification System Sirens	6
EPP 06-22	Tone Alert Radio Maintenance and Compensating Measures	5

MISCELLANEOUS DOCUMENTS

NUMBER	TITLE	REVISION
	Wolf Creek Generating Station Emergency	11
Table CW-3	Unreliability Data for Essential Service Water and Component Cooling Water-Page 61	6
Table RHR-3	Unreliability Data for RHR-Page 47	6

Section 4OA2: Identification and Resolution of Problems

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
	Station Roll-up Performance Results, Wolf Creek Generating Station, 1st Quarter 2011	May 2, 2011
	Station Roll-up Performance Results, Wolf Creek Generating Station, 2nd Quarter 2011	August 4, 2011
STN BG-202	Chemical & Volume System Valve Test	1
AI 22A-001	Operator Work Arounds/Operator Burdens/Control Room Deficiencies	10
	Control Room Turnover Checklist	February 8, 2011
	Control Room Turnover Checklist	February 7, 2011
STS IC-208B	4KV Loss of Voltage & Degraded Voltage TADOT NB02 Bus – Separation Group 4	4A
	Control Room Logs –	February 7, 2007
	On the Spot Change 11-0090	
	On the Spot Change 11-0095	
	Online Operational Focus Priorities	
AP 28A-100	Condition Reports	15A
	Basic Gap Analysis Checklist and Basic Gap Analysis Methodology	
	Wolf Creek Generating Station Cause Evaluation (BLL)	

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
AI 13E-015	Wolf Creek Leadership & Accountability Model	5
AP 30A-002	Management Oversight of Accredited Training Program	37
AI 21-015	Observation and Crew Improvement Expectations	14A
	Review AI 21-018, Simulator Critiques, Attachment A to focus crew on identifying Gaps to Excellence	
	LOR/NSO Requal/SM/STA, Cycle 11-NAT	

Condition Reports

15727	31763	34900	34900-02	38758
43372	44889	46333	17534	19865
19875				

CALCULATIONS

NUMBER	TITLE	REVISION
XX-E-009	Undervoltage / Degraded Voltage Protection	1
SA-91-016	Calculation Change Notice for the Impact of the Diesel Generator Degraded Frequency on the Performance of the ECCS Pumps	3
EJ-30	RHR Pumps A & B NPSH	1
013106	Change Package for the Evaluation of Maximum RPM for CGK04A & CGK04B	September 3, 2009

Work Orders

11-347351-001 09-074869

Design Review Request

10-2394

Section 4OA3: Event Follow-Up

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
	Wolf Creek Generation Station, Licensee Event Report 2011-004-01, Automatic Safety Injection Actuation Due to Operating Crew Failure to Follow Procedure	September 29, 2011
	Virgil C Summer Nuclear Station Unit 1 Licensee Event Report 2011-003-01, Inadvertent Safety Injection During Reactor Startup Due to Excessive Differential Steam Line Pressure	May 27, 2011
	North Anna Power Station, Unit 2, Licensee Event Report 2007-003-00, Automatic Reactor Trip Due to Invalid Safety Injection Relay Actuations	June 29, 2007
	Wolf Creek Generation Station, Licensee Event Report 2011-004-00 and 01, Automatic Safety Injection Actuation Due to Operating Crew Failure to Follow Procedures	March 19, 2011
	Surrey Power Station, Unit 2, Licensee Event Report 2011-002-00, Spurious Safety Injection Results in Exceeding Pressurizer Heatup Rate	May 26, 2011
	Control Room Log	March 19, 2011
LER 2011-004-00	Automatic Safety Injection Actuation Due to Operating Crew Failure to Follow Procedure	May 18, 2011
B.3.3.2-8	ESFAS Instrumentation	1
	USAR Section 7.2,7.3, 7.4 and 7.5	
USAR Table 7.3-10	Device Level Manual Override Failure Modes and Effects Analysis	0
USAR Table 1.7-1 (Sheet 12-13)	Updated Safety Analysis Report	15
IE Bulletin 80-06	Engineered Safety Feature (ESF) Reset Controls	March 13, 1980
Regulatory Guide 1.47	Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems	May 1973
LER 2011-002-00	Diesel Generator Declared Inoperable Due to Inadequate Installation of a Fuel-Rack Control Pin	April 25, 2011

Section 4OA3: Event Follow-Up

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
ML082480411	Undetectable Failure in Engineered Safety Features Actuation System	November 7, 1979
Table 1.7	USAR	
Chapter 18.1-17/22	USAR	19
Section 13-12 to 13-14	Wolf Creek SSER 5	
Page 32	Wolf Creek SER: Reanalysis of Transients and Accidents; Development of Emergency Operating Procedures	
	March 1985 – Supplement No. 5 to NUREG-0881	
KMLNRC 83-150	Letter KMLNRC 83-132 dated 10/14/83 from GLKoester, KG&E to HRDenton, NRC	November 28, 1983
KMLNRC 84-130	Letter KMLNRC 84-048 dated 4/4/84 from GLKoester, KG&E, to HRDenton, NRC	August 14, 1984
	Supplemental Safety Evaluation Report by the Office of Nuclear Reactor Regulation in the Matter of Westinghouse Owners Group Emergency Response Guidelines	December 26, 1985
	WOG Emergency Response Guidelines Supplemental Safety Evaluation of Revision 1	July 7, 1986
NRCLK 85-274	Issuance of Facility Operating License NPF – Wolf Creek Generating Station, Unit 1	June 4, 1985
NRCLK 86-278	Wolf Creek Generating Station – Amendment No. 4 to Facility Operating License NPF-42	November 4, 1986
SLNRC 84-121	Task Analysis for SNUPPS DCRDR	October 10, 1984
SLNRC 85-11	Task Analysis for SNUPPS DCRDR	April 1, 1985
SLNRC 85-12	Task Analysis for SNUPPS DCRDR	April 26, 1985
SLNRC 85-15	Task Analysis for SNUPPS DCRDR	May 24, 1985
NRCLK 85-213	Request for Additional Information Regarding functional and Task Analysis	August 30, 1985

Section 4OA3: Event Follow-Up

MISCELLANEOUS

NUMBER	TITLE	REVISION / DATE
KLMNRC 85-245	NRC Letter Dated August 30, 1985, from RJYoungblood to GLKoester, KG&E	November 4, 1985
KMLNRC 86-203	License Condition 2.C.(7), Attachment 3, Item (1) Functional and Task Analysis	November 5, 1986
NRCLK 86-304	NRC Letter Dated December 2, 1986, from PWO'Conner to GLKoester, KG&E	December 2, 1986
WO 11-0014	Licensee Event Report 2010-010-01, Inadequate Analysis Results in a Component Cooling Water Train to be Declared Inoperable	March 25, 2011
TMO 10-017-EG-03	EG System (Radwaste Building loop); HB system, PG01802, EGFSHL0055	

DRAWINGS

NUMBER	TITLE	REVISION
M-767-0177-06	Solid State Protection System Interconnection Diagram	W06
M-744-00018	SNUPPS Projects Functional Diagram Index and Symbols	W06
M0744-00019	SNUPPS Projects Functional Diagram Reactor Trip Signals	W07
M-744-00024	SNUPPS Projects Functional Diagram Steam Generator Trip Signals	W06
M-744-00025	SNUPPS Projects Functional Diagram Safeguards Actuation Signals	W07
Figure 7.3-1	Engineered Safety Features Actuation System (BOP) Sheet 1	0
Figure 7.3-3	Engineered Safeguards Test Cabinet (Index, Notes, and Legend)	0
J-104-00390	Logic Block Diagram ESFAS	W08
E-13SB17	Schematic Diagram Safety Injection (RWST) Reset Switch/Switchover Status Indicator	0

Reportability Evaluation Request

2011-040

Work Orders

10-324471-000 10-334560-010 10-334560-011 10-334560-019 10-334560-020

LIST OF ACRONYMS

ac	alternating current
ADAMS	Agency Wide Document Access & Management System
AP	administraive procedure
ASME	American Society of Mechanical Engineers
BLL	basic level
BOP	balance of plant
CCW	component cooling water
CFR	Code of Federal Regulations
CRDM	control rod drive mechanism
dc	direct current
DCRDR	design change request
ECCS	emergency core cooling system
EDG	emergency diesel generator
EPRI	Electric Power Research Institute
ESF	engineered safety feature
ESFAS	engineered safety feature actuation system
FWIS	feedwater isolation system
GE	General Electric
HVAC	heat, ventilation, and air conditioning
JIT	just-in-time
LER	licensee event report
LOR	licensed operator requalification
LTOP	low temperature overpressure protection
LWR	light water reactor
NAT	nuclear accreditation training
NCV	non-cited violations
NEI	Nuclear Energy Institute
NOED	notice of enforcement discretion
NRC	Nuclear Regulatory Commission
NPF	nuclear power facility
NSO	nuclear station operator
OEM	original equipment manufacturer
PARS	publicly available records
PM	preventive maintenance
PRT	pressurizer relief tank
RCP	reactor coolant pump
RCS	reactor coolant system
RHR	residual heat removal
RPM	revolutions per minute
RPV	Reactor pressure vessel

RTP	rated thermo power
RWST	refueling water storage tank
SACRG	severe accident control room guideline
SAMG	severe accident management guide
SM	shift manage
SSER	supplemental safety evaluation report
STA	shift technical advisor
STS	surveillance technical specification
TADOT	Trip actuation device operability test
TDAFW	turbine-driven auxiliary feedwater
URI	unresolved item
USAR	Updated Safety Analysis Report
UT	Ultrasonic testing
VT	Visual test
WOG	Westinghouse Owners Group