



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

November 20, 2017

Mr. Adam C. Heflin, President,
Chief Executive Officer,
and Chief Nuclear Officer
Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION – NUCLEAR REGULATORY
COMMISSION TRIENNIAL FIRE PROTECTION INSPECTION
REPORT 05000482/2017008

Dear Mr. Heflin:

On October 19, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Wolf Creek Generating Station and discussed the results of this inspection with Mr. D. Mand, Director Engineering, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC team documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of the violations in this report, you should provide a written response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Wolf Creek Generating Station.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region IV, and the NRC resident inspector at the Wolf Creek Generating Station.

A. Heflin

2

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Gregory E. Werner, Chief
Engineering Branch 2
Division of Reactor Safety

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

Enclosure:
Inspection Report No. 05000482/2017008
w/Attachment: Supplemental Information

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000482

License: NPF-42

Report Nos.: 05000482/2017008

Licensee: Wolf Creek Nuclear Operating Corporation

Facility: Wolf Creek Generating Station

Location: P.O. Box 411
Burlington, KS 66839

Dates: October 2 through October 19, 2017

Team Leader: J. Mateychick, Senior Reactor Inspector

Inspectors: B. Correll, Reactor Inspector
G. Pick, Senior Reactor Inspector
S. Makor, Reactor Inspector

Accompanying Personnel: Ms. Noletu Moti, Chief Inspector, National Nuclear Regulator of the Republic of South Africa

Approved By: Gregory E. Werner, Chief
Engineering Branch 2
Division of Reactor Safety

Enclosure

SUMMARY

IR 05000482/2017008; 10/02/2017 – 10/19/2017; Wolf Creek Generating Station; Fire Protection (Triennial)

The report covers a two-week triennial fire protection team inspection by specialist inspectors from Region IV. Two findings which were non-cited violations were documented. The significance of inspection findings is indicated by their color (i.e., Green, White, Yellow, or Red) and determined using Inspection Manual Chapter 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The team identified a non-cited violation of License Condition 2.C.(5) for failure to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the licensee failed to adequately evaluate the potential impacts on post-fire safe shutdown of two motor operated valves spuriously closing due to fire damage.

The failure to adequately evaluate the impact of pressure operated relief valve block valves spuriously closing on post-fire safe shutdown was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Because the finding affected the ability to reach and maintain safe shutdown conditions in case of a fire that led to control room evacuation and because the Phase 2 methodology of Inspection Manual Chapter 0609, Appendix F, was not appropriate for this finding, a senior reactor analyst performed a Phase 3 evaluation to determine the risk significance. The analyst determined this finding was of very low risk significance (Green). There is no cross-cutting aspect associated with this finding since the performance deficiency is not reflective of present performance (i.e., the performance deficiency occurred more than 3 years ago). (Section 1R05.01)

- Green. The team identified a non-cited violation of License Condition 2.C.(5) for failure to provide emergency lighting along alternate routes plant operators are allowed to take during implementation of the procedure for control room evacuation due to fire.

The failure to provide 8-hour emergency lights along alternate routes used by operators during control room evacuation due to fire is a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external factors attribute of the Mitigating

Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, because it affected the ability to reach and maintain safe shutdown conditions in case of a fire. The team assigned the finding to the post-fire safe shutdown category since it impacted the alternate shutdown element. The issue screened to Green because the reactor would be able to achieve and maintain hot shutdown because the operators are required to carry flashlights. Specifically, the team had reasonable assurance that the operators would be able to complete the evacuation procedure using handheld flashlights to access safe shutdown equipment. The finding is assigned a cross-cutting aspect in the area of human performance, associated with training, because the operators are not being trained on the access and egress routes that are provided with 8-hour emergency lights during implementation of the control room evacuation procedure due to fire to ensure the time critical actions can be met (H.9). (Section 1R05.08)

B. Licensee-Identified Violations

None

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R05 Fire Protection (71111.05T)

This report presents the results of a triennial fire protection inspection conducted at Wolf Creek Generating Station in accordance with NRC Inspection Procedure 71111.05T, "Fire Protection (Triennial)," dated January 31, 2013. The inspection team evaluated the implementation of the approved fire protection program in selected risk-significant areas with an emphasis on the procedures, equipment, fire barriers, and systems that ensure the post-fire capability to safely shutdown the plant.

Inspection Procedure 71111.05T requires the selection of three to five fire areas and one or more mitigating strategies for review. The inspection team used the fire hazards analysis section of the Wolf Creek Generating Station Individual Plant Examination of External Events to select the following three risk-significant fire areas (inspection samples) for review:

Fire Area	Description
A-8	Auxiliary Building 2000' Elevation – General Area
A-17	South Electrical Penetration Room
A-21	Train B Control Room Ventilation Room

The inspection team evaluated the licensee's fire protection program using the applicable requirements, which included the plant's technical specifications, Operating License Condition 2.C.(5), NRC safety evaluations, 10 CFR 50.48, and Branch Technical Position 9.5-1. The team also reviewed related documents that included the Updated Safety Analysis Report, Section 9.5; the fire hazards analysis; and the post-fire safe shutdown analysis. Specific documents reviewed by the team are listed in the attachment.

Three fire area inspection samples and four mitigating strategy samples were completed.

.01 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team reviewed the piping and instrumentation diagrams, safe shutdown equipment list, safe shutdown design basis documents, and the post-fire safe shutdown analysis to verify that the licensee properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for fires in the selected fire areas. The team observed walkdowns of the procedures used for achieving and maintaining safe shutdown in the event of a fire to verify that the procedures properly implemented the safe shutdown analysis provisions.

For each of the selected fire areas, the team reviewed the separation of redundant safe shutdown cables, equipment, and components located within the same fire area. The

team also reviewed the licensee's method for meeting the requirements of 10 CFR 50.48, Branch Technical Position 9.5-1, Appendix A, and 10 CFR Part 50, Appendix R, Section III.G. Specifically, the team evaluated whether at least one post-fire safe shutdown success path remained free of fire damage in the event of a fire. In addition, the team verified that the licensee met applicable license commitments.

b. Findings

Introduction: The team identified a Green non-cited violation of License Condition 2.C.(5) for failure to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the licensee failed to adequately evaluate the potential impacts on post-fire safe shutdown of two motor operated valves spuriously closing due to fire damage.

Description: The licensee's post-fire safe shutdown analysis, Calculation XX-E-013, Revision 4, includes evaluations of power operated relief valves PCV-455A and PCV-456A, and power operated relief valve block valves HV-8000A and HV-8000B. Review of control circuits associated with power operated relief valve block valves HV-8000A and HV-8000B identified the potential for the valves to spuriously close due to the fire damage during a control room fire. The licensee's post-fire safe shutdown analysis did not address spurious closure to these valves. The team identified three concerns that could impact the post-fire safe shutdown of the plant.

- 1) Control circuit fire damage includes conductor combinations which could energize the valve's closing coil while bypassing the valve's torque and limit switches. This scenario would keep the valve's motor energized after the valve was fully closed. The motor would develop elevated torque in the stalled condition compared to normal valve operation. The potential impact of such elevated torque on the valves has not been evaluated. A small fraction of motor operated valves are subject to damage at stall torque including potential loss of pressure boundary integrity. This could result in reactor coolant system leakage as the power operated relief valve block valves HV-8000A and HV-8000B are the first valves in lines connected to the pressurizer.
- 2) For a fire in the control room resulting in a control room evacuation, hot shutdown conditions would be established using Procedure OFN RP-017, "Control Room Evacuation," Revision 49A. Cold shutdown would be achieved using Procedure OFN RP-017A, "Hot Standby to Cold Shutdown from Outside the Control Room Due to Fire," Revision 11C. Procedure OFN RP-017A installs temporary control circuit jumpers and manual electrical switches at an electrical panel to allow operation of two excess letdown valves and power operated relief valve PCV-456A. The power operated relief valve would be used to reduce reactor coolant system pressure during the cooldown. Spurious closure of power operated relief valve block valve HV-8000B would isolate power operated relief valve PCV-456A. Procedure OFN RP-017A does not address the potential for power operated relief valve block valve HV-8000B being closed and no valve position indication or controls have been provided outside of the control room.
- 3) Normally during a cooldown, cold overpressure protection is provided by an automatic system. The automatic system would not be available following a fire in the control room. Procedure OFN RP-017A, Step 18, stations an operator at

the temporary switch to manually operate power operated relief valve PCV-456A as directed by the operator at the auxiliary shutdown panel to provide cold overpressure protection when the cold leg temperature decreases below 375 °F. This function would not be effective if power operated relief valve block valve HV-8000B was closed.

The licensee entered this issue into the corrective action program as Condition Reports 00116489 and 00116786. The licensee established an hourly fire watch in the area of the control room behind the main control panel area as a compensatory measure. The control room main control panel area is continuously manned by operators. The licensee used the control room simulator to perform a cooldown from hot shutdown conditions to the temperature and pressure where the residual heat removal system could be initiated. The simulator personnel used only the systems and components credited to be available in Procedure OFN RP-017A, and power operated relief valve PCV-456A was not utilized. The cooldown took an extended period of almost 20 hours. The plant was maintained in a safe condition throughout the cooldown.

Analysis. The failure to adequately evaluate the impact of power operated relief valve block valves spuriously closing on post-fire safe shutdown was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The team evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013. Because it affected the ability to reach and maintain safe shutdown conditions in case of a fire that led to control room evacuation and the Phase 2 methodology of Inspection Manual Chapter 0609, Appendix F, was not appropriate for this finding, a senior reactor analyst performed a Phase 3 evaluation to determine the risk significance.

The senior reactor analyst assigned a generic fire ignition frequency for the control room ($F_{IF_{CR}}$), which was slightly higher than the value in Calculation AN-95-029, "Control Room Fire Analysis," Revision 1. The analyst multiplied the fire ignition frequency by a severity factor (SF) and a non-suppression probability indicating that operators failed to extinguish the fire within 20 minutes, assuming a 2-minute detection that required a control room evacuation (NP_{CRE}). The resulting control room evacuation frequency (F_{EVAC}) was:

$$\begin{aligned} F_{EVAC} &= F_{IF_{CR}} * SF * NP_{CRE} \\ &= 1.09E-2/year * 0.1 * 1.30E-2 \\ &= 1.42E-5/year \end{aligned}$$

The control room had a total of 103 cabinets. The analyst determined that a single fire in four of these cabinets could lead to the spurious operation of a power operated relief valve block valve. Therefore, a bounding change in core damage frequency for a control room fire that leads to evacuation and the spurious operation of a power operated relief valve block valve ($F_{EVAC+SPURIOUS}$) was determined to be:

$$\begin{aligned}
F_{\text{EVAC+SPURIOUS}} &= F_{\text{EVAC}} * 4 / 103 \\
&= 1.42\text{E-}5/\text{year} * 4 / 103 \\
&= 5.51\text{E-}7/\text{year}
\end{aligned}$$

This frequency was considered to be bounding since it assumed:

- 1) A fire in any of the applicable cabinets would cause the spurious operation of a power operated relief valve block valve
- 2) The conditional core damage probability given a control room fire with evacuation and the spurious operation of a power operated relief valve block valve was equal to one
- 3) The performance deficiency accounted for the entire change in core damage frequency (i.e., the baseline core damage frequency for this event was zero)

In accordance with the guidance in Inspection Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process," dated May 6, 2004, the senior reactor analyst screened the performance deficiency for its potential risk contribution to large early release frequency since the bounding change in core damage frequency provided a risk significance estimate greater than 1E-7/yr. Given that Wolf Creek has a large, dry containment and that control room evacuation sequences do not include steam generator tube ruptures or intersystem loss of coolant accidents, the analyst determined that this example was not significant with respect to large early release frequency. The analyst determined this finding was of very low risk significance (Green).

There is no cross-cutting aspect associated with this finding since the performance deficiency is not reflective of present performance (i.e., the performance deficiency occurred more than three years ago).

Enforcement: License Condition 2.C.(5) states, "The Operating Corporation shall maintain in effect all provisions of the approved fire protection program as described in the standardized nuclear unit power plant system plant (SNUPPS) Final Safety Analysis Report (FSAR) for the facility through Revision 17, the Wolf Creek site addendum through Revision 15, as approved in the Significant Event Report (SER) through Supplement 5, Amendment No. 189, Amendment No. 191, Amendment No. 193, Amendment No. 205, and Amendment No. 214."

Updated Safety Analysis Report Appendix 9.5E compares the fire protection program to 10 CFR 50, Appendix R, requirements. Appendix R, Section III.L, "Alternative and Dedicated Shutdown Capability," requires the ability to achieve and maintain hot standby conditions and achieve cold shutdown conditions within 72 hours. The comparison table, the licensee states: (1) The auxiliary shutdown panel provides a means of achieving and maintaining hot shutdown, and (2) cold shutdown can be achieved and maintained from outside the control room by additional manual operator actions at local control sites.

Contrary to the above, from initial operation to October 19, 2017, the licensee failed to fully implement the approved fire protection program. Specifically, the licensee failed to adequately evaluate the impact of the power operated relief valve block valves HV-8000A and HV-8000B spuriously closing on post-fire safe shutdown and the impact on the ability to achieve and maintain hot standby conditions and achieve cold shutdown conditions within 72 hours.

Because this violation was of very low safety significance, has been entered into the corrective action program as Condition Reports 00116489 and 00116786, and the licensee has a fire watch in the control room as a compensatory measure until corrective actions can be taken, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000482/2017008-01, "Inadequate Evaluation of Spurious Valve Operation."

.02 Passive Fire Protection

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe the material condition and configuration of the installed fire area boundaries (including walls, fire doors, and fire dampers), and verify that the electrical raceway fire barriers were appropriate for the fire hazards in the area. The team compared the installed configurations to the approved construction details, supporting fire tests, and applicable license commitments.

The team reviewed inspection records for a sample of penetration seals, fire doors, and fire dampers in the selected fire areas.

b. Findings

No findings were identified.

.03 Active Fire Protection

a. Inspection Scope

The team reviewed the design, maintenance, testing, and operation of the fire detection and suppression systems in the selected fire areas. The team verified the automatic detection systems and the manual and automatic suppression systems were installed, tested, and maintained in accordance with the National Fire Protection Association code of record or approved deviations, and that each suppression system was appropriate for the hazards in the selected fire areas.

The team walked down accessible portions of the detection and suppression systems in the selected fire areas. The team also walked down major system support equipment in other areas (e.g., fire pumps and Halon supply systems) to assess the material condition of these systems and components.

The team reviewed the flow and pressure tests for the electric and diesel fire pumps to verify that the pumps met their design requirements. The team also reviewed the halon suppression functional tests to verify that the system capability met the design

requirements.

The team assessed the fire brigade capabilities by reviewing training and qualification records. The team also reviewed pre-fire plans and smoke removal plans for the selected fire areas to determine if appropriate information was provided to fire brigade members and plant operators to identify safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire safe shutdown capability.

The team observed an unannounced fire drill and subsequent drill critique on October 17, 2017, using the guidance contained in Inspection Procedure 71111.05AQ, "Fire Protection Annual/Quarterly," dated September 30, 2010. The team observed fire brigade members fight a simulated fire in the turbine building. The team verified that the licensee identified problems, openly discussed them in a self-critical manner at the drill debrief, and identified appropriate corrective actions. Specific attributes evaluated included: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate firefighting techniques; (4) sufficient firefighting equipment was 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 areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

b. Findings

No findings were identified.

.04 Protection from Damage from Fire Suppression Activities

a. Inspection Scope

The team performed plant walkdowns and document reviews to verify that redundant trains of systems required for hot shutdown, which are located in the same fire area, would not be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. Specifically, the team verified:

- A fire in one of the selected fire areas would not directly, through production of smoke, heat, or hot gases, cause activation of suppression systems that could potentially damage all redundant safe shutdown trains.
- A fire in one of the selected fire areas, or the inadvertent actuation or rupture of a fire suppression system would not directly cause damage to all redundant trains (e.g., sprinkler-caused flooding of other than the locally affected train).
- Adequate drainage was provided in areas protected by water suppression systems.

b. Findings

No findings were identified.

.05 Alternative Shutdown Capability

a. Inspection Scope

Review of Methodology

The team reviewed the safe shutdown analysis, operating procedures, piping and instrumentation drawings, electrical drawings, the Updated Safety Analysis Report, and other supporting documents to verify that hot and cold shutdown could be achieved and maintained from outside the control room for fires that require evacuation of the control room, with or without offsite power available.

The team conducted plant walkdowns to verify that the plant configuration was consistent with the description contained in the safe shutdown and fire hazards analyses. The team focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor decay heat removal, process monitoring instrumentation, and support systems functions.

The team also verified that the systems and components credited for shutdown would remain free from fire damage. Finally, the team verified that the transfer of control from the control room to the alternative shutdown location would not be affected by fire-induced circuit faults (e.g., by the provision of separate fuses and power supplies for alternative shutdown control circuits).

Review of Operational Implementation

The team verified that licensed and non-licensed operators received training on alternative shutdown procedures. The team also verified that sufficient personnel to perform an alternative shutdown were trained and available onsite at all times, exclusive of those assigned as fire brigade members.

The team performed a timed walkdown of the alternative shutdown procedure with licensed and non-licensed operators to determine the adequacy of the procedure. The team verified that the operators could reasonably be expected to perform specific actions within the time required to maintain plant parameters within specified limits. Time critical actions that were verified included restoring electrical power, establishing control at the remote shutdown and local shutdown panels, establishing reactor coolant makeup, and establishing decay heat removal.

The team also reviewed the periodic testing of the alternative shutdown transfer capability and instrumentation and control functions to verify that the tests were adequate to demonstrate the functionality of the alternative shutdown capability.

b. Findings

No findings were identified.

.06 Circuit Analysis

a. Inspection Scope

The team reviewed the post-fire safe shutdown analysis to verify that the licensee identified the circuits that may impact the ability to achieve and maintain safe shutdown. The team verified, on a sample basis, that the licensee properly identified the cables for equipment required to achieve and maintain hot shutdown conditions in the event of a fire in the selected fire areas. The team verified that these cables were either adequately protected from the potentially adverse effects of fire damage or were analyzed to show that fire-induced circuit faults (e.g., hot shorts, open circuits, and shorts to ground) would not prevent safe shutdown.

The team's evaluation focused on the cables of selected components from the auxiliary feedwater, chemical volume and control, essential service water, main steam atmospheric vent, and main steam isolation systems. For the sample of components selected, the team reviewed electrical elementary and block diagrams, and identified power, control, and instrument cables necessary to support their operation. In addition, the team reviewed cable routing information to verify that fire protection features were in place as needed to satisfy the separation requirements specified in the fire protection license basis. Specific components reviewed by the team are listed in the attachment.

b. Findings

No findings were identified.

.07 Communications

a. Inspection Scope

The team inspected the contents of designated emergency storage lockers and reviewed the alternative shutdown procedure to verify that portable radio communications and fixed emergency communications systems were available, operable, and adequate for the performance of designated activities. The team verified the capability of the communication systems to support the operators in the conduct and coordination of their required actions. The team also verified that the design and location of communications equipment such as repeaters and transmitters would not cause a loss of communications during a fire. The team discussed system design, testing, and maintenance with the system engineer.

b. Findings

No findings were identified.

.08 Emergency Lighting

a. Inspection Scope

The team reviewed the portion of the emergency lighting system required for alternative shutdown to verify that it was adequate to support the performance of manual actions required to achieve and maintain hot shutdown conditions, and to illuminate access and

egress routes to the areas where manual actions would be required. The team evaluated the locations and positioning of the emergency lights during a walkdown of the alternative shutdown procedure.

The team verified that the licensee installed emergency lights with an 8-hour capacity, maintained the emergency light batteries in accordance with manufacturer recommendations, and tested and performed maintenance in accordance with plant procedures and industry practices.

b. Findings

Introduction. The team identified a Green non-cited violation of License Condition 2.C.(5) for the failure to provide emergency lighting along alternate routes potentially taken by plant operators performing a post-fire safe shutdown following a control room evacuation due to fire. Specifically, the licensee does not train operators performing a post-fire safe shutdown to use the routes provided with emergency lighting.

Description. During a fire in the control room requiring evacuation, the operators would enter Procedure OFN RP-017, "Control Room Evacuation," Revision 49A. The procedure directed operators to perform local actions in the plant and the auxiliary shutdown panel to bring the plant to a stable, hot standby condition. This procedure was required to be implemented with and without offsite power available. Without offsite power, the normal plant lighting would be lost and the operators would be required to rely on emergency lighting units. Title 10 CFR Part 50, Appendix R, Section III.J requires emergency lighting units, with at least an 8-hour battery power supply, be provided in all areas needed for operation of safe shutdown equipment, and in access and egress routes thereto. The licensee provided 8-hour battery powered emergency lighting for all required safe shutdown components and had demonstrated using plant lighting drawings to have emergency lighting units along credited access and egress routes for the safe shutdown components for each OFN RP-017 operator attachment. The plant operators were unaware of these credited access and egress routes because the licensee did not provide training to the plant operators to take the credited, lighted paths, and allowed the operators to take alternate routes to access safe shutdown components.

During a control room fire requiring evacuation and coincident with a loss of offsite power, the operators would be required to implement Procedure OFN RP-017 using the emergency lighting provided to satisfy the requirements of Appendix R, Section III.J. The operators would be expected to traverse these designated lighted paths to ensure the plant is brought to a safe shutdown condition within the times assumed in the thermal-hydraulic analysis, SA-08-006, "RETRAN-3D Post-Fire Safe Shutdown (PFSSD) Consequence Evaluation for a Postulated Control Room Fire," Revision 3. Because the licensee did not train the operators on where these credited, lighted routes are located, the licensee could not ensure the time-critical operator actions can be completed during an actual control room evacuation due to fire, coincident with a loss of offsite power and normal lighting. The licensee did not provide 8-hour battery powered emergency lighting along the alternate routes taken by the operators during walk downs of Procedure OFN RP-017.

The licensee entered this issue into the corrective action program as Condition Report 00116410 to address the training of the operators on the lighted routes or to

provide emergency lighting along these alternate routes that meet 10 CFR Part 50, Appendix R, Section III.J, to ensure the procedure was implemented in the required times.

Analysis. The failure to provide 8-hour emergency lights along all access and egress paths operators are allowed to take while performing a post-fire safe shutdown is a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, because it affects the ability to reach and maintain safe shutdown conditions in case of a fire. The team assigned the finding to the post-fire safe shutdown category since it impacted the alternate shutdown element. The issue screened to Green in Inspection Manual Chapter 0609, Appendix F, Attachment 1, Question 1.3.1 A, because the operators are required to carry flashlights during normal day-to-day operations. Specifically, the team had reasonable assurance that the operators would be able to complete the evacuation procedure using handheld flashlights to access safe shutdown equipment. The finding is assigned a cross-cutting aspect in the area of human performance, associated with training, because the operators are not being trained on the access and egress routes that are provided with 8-hour emergency lights during implementation of the control room evacuation procedure due to fire, to ensure the time critical actions can be met (H.9).

Enforcement. License Condition 2.C.(5) states, "The Operating Corporation shall maintain in effect all provisions of the approved fire protection program as described in the SNUPPS Final Safety Analysis Report for the facility through Revision 17, the Wolf Creek site addendum through Revision 15, as approved in the SER through Supplement 5, Amendment No. 189, Amendment No. 191, Amendment No. 193, Amendment No. 205, and Amendment No. 214."

Updated Safety Analysis Report, Section 9.5.3.2.3, "Emergency Lighting System," states in part, "In the event of a control room evacuation, the emergency lighting provides access to the areas and lighting within the areas where operator actions are required. These provisions meet the requirements of 10 CFR 50, Appendix R, Paragraph III.J." Title 10 Part 50, Appendix R, Section III.J requires emergency lighting units, with at least an 8-hour battery power supply, be provided in all areas needed for operation of safe shutdown equipment, and in access and egress routes thereto.

Contrary to the above, the licensee failed to provide emergency lighting along all access and egress routes to safe shutdown equipment. Specifically, prior to October 2017 Wolf Creek Generating Station did not provide emergency lighting along the access routes operators took when performing Procedure OFN RP-017, "Control Room Evacuation," Revision 49A.

Because this finding was of very low safety significance and has been entered into the licensee's corrective action program as Condition Report 00116410, and the licensee was evaluating training to ensure operators took the credited access and egress routes, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of

the NRC Enforcement Policy: NCV 05000482/2017008-02, "Failure to Provide Adequate Emergency Lighting."

.09 Cold Shutdown Repairs

a. Inspection Scope

The team verified that the licensee identified repairs needed to reach and maintain cold shutdown and had dedicated repair procedures, equipment, and materials to accomplish these repairs. Using these procedures, the team evaluated whether these components could be repaired in time to bring the plant to cold shutdown within the time frames specified in their design and licensing bases. The team verified that the repair equipment, components, tools, and materials needed for the repairs were available and accessible onsite.

b. Findings

No findings were identified.

.10 Compensatory Measures

a. Inspection Scope

The team verified that compensatory measures were implemented for out-of-service, degraded, or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g., detection and suppression systems and equipment; passive fire barriers; or pumps, valves, or electrical devices providing safe shutdown functions). The team also verified that the short-term compensatory measures compensated for the degraded function or feature until appropriate corrective action could be taken, and that the licensee was effective in returning the equipment to service in a reasonable period of time.

b. Findings

No findings were identified.

.11 Review and Documentation of Fire Protection Program Changes

a. Inspection Scope

The team reviewed changes made to the approved fire protection program since November 6, 2014. The team verified that the changes did not constitute an adverse effect on the ability to safely shutdown.

b. Findings

No findings were identified.

.12 Control of Transient Combustibles and Ignition Sources

a. Inspection Scope

The team reviewed the licensee's approved fire protection program, implementing procedures and programs, for the control of ignition sources and transient combustibles. The team assessed the licensee's effectiveness in preventing fires and in controlling combustible loading within limits established in the fire hazards analysis. The team performed plant walkdowns to independently verify that transient combustibles and ignition sources were being properly controlled in accordance with the administrative controls.

b. Findings

No findings were identified.

.13 Alternative Mitigation Strategy Inspection Activities

a. Inspection Scope

The team reviewed the licensee's implementation of guidance and strategies intended to maintain or restore core, containment, and spent fuel pool cooling capabilities under the circumstances associated with the potential loss of large areas of the plant due to explosions or fire as required by 10 CFR 50.54(hh)(2).

The team verified that the licensee implemented and maintained adequate procedures, maintained and tested equipment necessary to properly implement the strategies, and ensured station personnel were knowledgeable and capable of implementing the procedures. The team performed a visual inspection of portable equipment used to implement the strategy to ensure the availability and material readiness of the equipment, including the adequacy of portable pump trailer hitch attachments, and verify the availability of onsite vehicles capable of towing the portable pump. The team assessed the offsite ability to obtain fuel for the portable pump and foam used for firefighting efforts. The strategy and procedure selected for this inspection sample included:

- Attachment P – Manual Operation of the Turbine-Driven Auxiliary Feedwater Pump
- Attachment R – Auxiliary Feedwater Alternate Suction from Fire Protection Standpipe
- Attachment V – Containment Flood Using Fire Protection Hydrant
- Attachment W – Containment Flood Using Fire Truck

Four mitigating strategy samples were completed.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES [OA]

4OA2 Problem Identification and Resolution (71152)

Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team selected a sample of condition reports associated with the licensee's fire protection program to verify that the licensee had an appropriate threshold for identifying deficiencies. The team reviewed the corrective actions proposed and implemented to verify that they were effective in correcting identified deficiencies. The team evaluated the quality of recent engineering evaluations through a review of condition reports, calculations, and other documents during the inspection.

b. Findings

No findings were identified.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153)

(Closed) Licensee Event Report 05000482/2014-005-00: Post-Fire Safe Shutdown Latent Design Issue May Impact Ability to Achieve Safe Shutdown.

This licensee event report documented that during a review of external operating experience, the licensee identified that portions of the control circuits for the turbine generator direct current emergency lube oil pump and the emergency direct current seal oil pump were not properly fused to prevent overload and possible secondary fires that could impact the ability to achieve post-fire safe shutdown. The licensee determined that the control circuit design for the turbine generator direct current emergency lube oil pump and the emergency direct current seal oil pump needed to be considered for post-fire safe shutdown impact.

The licensee documented the issue in Condition Report 88168. As an immediate corrective action and as a compensatory measure, the licensee established roving fire watches in the fire areas containing the circuits. The licensee developed Change Package Engineering Disposition, 014816, which will provide permanent protection by installing control power fuses on the turbine generator direct current emergency lube oil pump and the emergency direct current seal oil pump circuits. The licensee plans to install the design change in the spring of 2018 during outage.

The team performed a detailed review of the information in this license event report, the condition report, design documents, and drawings related to the planned circuit modifications. The team discussed the issue with plant personnel to gain an understanding of the actions taken to address the issue. The team determined the modification will correct the deficiency. The team verified that the licensee established appropriate compensatory measures, corrective actions, and planned modifications.

No violation of NRC requirements were identified.

Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The team presented the inspection results to Mr. D. Mand, Director Engineering, and other members of the licensee staff at an exit meeting on October 19, 2017. The licensee acknowledged the findings presented.

The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

D. Bowers, Manager Maintenance
M. Boyce, Director Engineering Projects
A. Broyles, Manager Information Services
A. Bush, Information Services Technician
K. Clark, Fire Protection Technician
J. Cuffe, Supervisor Radiation Protection
G. Earhart, Fire Protection Engineer
J. Edwards, Manager Operations
R. Fincher, Manager Quality
B. Fox, Contract Fire Protection Engineer
K. Gibbon, Fire Protection Engineer
C. Hafenstine, Manager Nuclear and Regulatory Affairs
D. Hall, Manager Strategic Projects
P. Herrman, Manager Design Engineering
R. Jung, Fire Brigade Instructor
J. Keating, Reactor Operator, Operations Support
J. Knust, Licensing
D. Mand, Director Engineering
J. McCoy, Vice President Engineering
N. Mefford, Senior Nuclear Station Operator
A. Meyer, Reactor Operator
W. Mulenburg, Supervisor Licensing
M. Parsons, Senior Nuclear Station Operator
M. Payne, Reactor Operator
G. Pendergrass, Manager Performance Improvement
E. Peterson, Employee Concerns Program Coordinator
M. Skiles, Manager Security
T. Slenker, Supervisor Operations Support
S. Smith, Plant Manager
J. Strahm, Senior Reactor Operator
J. Suter, Fire Protection Supervisor
G. Turner, Reactor Operator
W. Wilkins, Fire Protection Engineer

NRC Personnel

D. Dodson, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000482/2017008-01	NCV	Inadequate Evaluation of Spurious Valve Operation (Section 1R05.01)
05000482/2017008-02	NCV	Failure to Provide Adequate Emergency Lighting (Section 1R05.08)

LIST OF DOCUMENTS REVIEWED

Cable Routing Data Components

BBPCV455A	BBPCV456A	BBHV8000A	BBHV8000B
BGLCV0112C	NB0209	NB0212	

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-1F9905	Fire Hazard Analysis	8
FL-03	Flooding of Individual Auxiliary Bldg Rooms	1
KC-M-006	Water-Based Fire Protection System & Standpipe Hydraulic Calculation	1
WCNOC-CP-002	Wolf Creek Fire Protection Transient Analysis With RETRAN-3D	1
XX-E-013	PFSSD Analysis	4

Completed Surveillance Tests

<u>Number</u>	<u>Title</u>	<u>Date</u>
MEC-004	Fire Extinguisher Inspections (Special Scope – ESW & Power Block)	July 6, 2015
MEC-004	Fire Extinguisher Inspections (Special Scope – ESW & Power Block)	September 12, 2016
MEC-004	Fire Extinguisher Inspections (Special Scope – ESW & Power Block)	April 24, 2017
STN FP-204	Fire Protection System C-Factor Test	September 14, 2009
STN FP-204	Fire Protection System C-Factor Test	June 18, 2015

Completed Surveillance Tests

<u>Number</u>	<u>Title</u>	<u>Date</u>
STN FP-206	Spray & Sprinkler System (FP) Functional Testing – Wet-Pipe	October 19, 2016
STN FP-208	Hose Rack Visual Inspection	July 6, 2017
STN FP-209	Fire Pump Performance & Sequential Start Test	June 20, 2017
STN FP-211	Diesel Fire Pump 1FP01PB Monthly Operation & Fuel Level Check	June 6, 2016
STN FP-211	Diesel Fire Pump 1FP01PB Monthly Operation & Fuel Level Check	August 29, 2016
STN FP-211	Diesel Fire Pump 1FP01PB Monthly Operation & Fuel Level Check	April 28, 2017
STN FP-211	Diesel Fire Pump 1FP01PB Monthly Operation & Fuel Level Check	September 28, 2017
STN FP-212	Electric Motor-Driven Fire Pump 1FP01PA Monthly Operation	June 20, 2015
STN FP-212	Electric Motor-Driven Fire Pump 1FP01PA Monthly Operation	August 16, 2016
STN FP-212	Electric Motor-Driven Fire Pump 1FP01PA Monthly Operation	April 11, 2017
STN FP-212	Electric Motor-Driven Fire Pump 1FP01PA Monthly Operation	September 14, 2017
STN FP-216	Spray & Sprinkler System Functional Testing – Pre-Action	October 21, 2016
STN FP-225	Fire Barrier Inspection	May 23, 2016
STN FP-404A	Halon Main Bank Tank Weight & Pressure Checks	September 23, 2016
STN FP-404B	Halon Reserve Bank Tank Weight & Pressure Checks	August 10, 2017
STN FP-405B	Halon System South Electrical Penetration Room (KC 226)	May 3, 2016

Completed Surveillance Tests

<u>Number</u>	<u>Title</u>	<u>Date</u>
STN FP-430	Fire Hose Station Coupling Gaskets & Hose Reracking	February 3, 2017
STS RP-004	Auxiliary Shutdown Panel & Control Switch Test	November 15, 2016
STS RP-004	Auxiliary Shutdown Panel & Control Switch Test	May 6, 2015
STN FP-431	Fire Hose Station Valve Operability & Hose Replacement/Hydro	September 23, 2015
STN FP-440	Fire Door Visual Inspection	August 3, 2017
STN FP-450	Fire Damper Inspection & Drop Test	July 28, 2016
STN FP-452	Fire Barrier Penetration Seals Inspection	April 17, 2017
STN FP-600	Fire Pump Diesel Fuel Storage Tank	September 14, 2017
STN FP-817A	Trip Actuating Device Operational Test for Bechtel Zones 100, 103, 104, 105, 106, 107, 112, 113, & 114	August 8, 2017
STN FP-817D	Trip Actuating Device Operational Test for Bechtel Zones 108, 109, 110, 101, 117, 118, & 119	January 4, 2017

Condition Reports

98488	00116392*	00116315*	00116369*	00116410*	00116408*
00116406*	00116405*	00116404*	00116411*	00116419*	00116418*
00116483	00116425*	00116423*	00116420*	00116489*	00105031
00105032	00105003	00105034	00113882	00115586	00116830*

*Issued as a result of inspection activities.

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CD-7W	Condensate Transfer & Storage System, Condensate Storage Tank Level	0
CD-170W Sh2 of 2	Auxiliary Feedwater System Auxiliary Feedpump Suction Pressure Turbine Driven Pump	0
E-1F1301	Fire Detection/Protection System – Auxiliary Bldg EL 2000'-0"	6
E-1F1401	Fire Detection/Protection System – Auxiliary Bldg EL 2026'-0"	5

<u>Drawings</u>		
<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-1F1501	Fire Detection/Protection System – Auxiliary Bldg EL 2047’-6”	2
E-1F9301	PFSSD Logic Diagram Reactor Coolant Makeup Function	5
E-1L8900	Lighting Notes, Symbols, & Details	78
E-1C8900	Communication System Notes, Symbols, & Details	37
E-1L1101	Lighting, Grounding, & Communications Auxiliary & Reactor Bldgs Plan 1974’-0”	13
E-1L1202	Lighting, Grounding, & Communications Auxiliary & Reactor Bldgs Plan 1988’-0” & 2013’-0”	06
E-1L1303	Lighting, Grounding, & Communications Auxiliary & Reactor Bldgs Plan 2000’-0”	33
E-1L1404	Lighting, Grounding, & Communications Auxiliary & Reactor Bldgs Plan 2026’-0”	17
E-1L1505	Lighting, Grounding, & Communications Auxiliary & Reactor Bldgs Plan 2047’-6”	16
E-1L3101	Lighting, Grounding, & Communications Comm. Corr, Control & Diesel Generator Bldgs Plan 1974’-0” & 1984’-0”	23
E-1L3302	Lighting, Grounding, & Communications Comm. Corr, Control & Diesel Generator Bldgs Plan 2000’-0” & 2016’-0”	21
E-1L3604	Lighting, Grounding, & Communications Comm. Corr, Control & Diesel Generator Bldgs Plan 2047’-6”	30
E-1L4302	Lighting, Grounding, & Communications Turbine Bldg Ground Floor Plan 2000’-0”	11
E-1L4401	Lighting, Grounding, & Communications Turbine Bldg Mezzanine Floor Plan 2033’-0”	11
E-1L4402	Lighting, Grounding, & Communications Turbine Bldg Mezzanine Floor Plan 2033’-0”	06
E-1RI321(Q)	Raceway Plan Auxiliary Bldg Area 2 EL. 2000’-0”	2
E-1R1341	Raceway Plan Auxiliary Bldg Area 4 EL. 2000’-0”	03

<u>Drawings</u>		
<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-1R1431	Raceway Plan Auxiliary Bldg Area-3 EL. 2026'-0"	03
E-1R1433A	Exposed Conduit Auxiliary Bldg Area-3 EL. 2026'-0"	12
E-1R1433C	Exposed Conduit Aux Bldg Area 3 EL 2026	5
E-1R1901	Raceway Sects. & Dets Auxiliary Bldg	0
E-13AL07B	Schematic Diagram Instrumentation & Alarms (SH. 2B)	00
E-13AP02	Schematic Diagram Condensate Transfer & Storage Alarms & Instrumentation	01
E-13BB40	Schematic Diagram Pressurizer Power Relief Valves	7
E-13BG12A	Schematic Diagram Volume Control Tank Outlet Isolation Valve	8
E-13KJ03A	Schematic Diagram Diesel Gen. KKJ01B Engine Control (Start/Stop Circuit)	18
E-13NB14	Class IE Bus NB02 Feeder Brkr. 152NB0209	08
E-13NB15	Schematic Diagram Class IE Bus NB02 Feeder Brkr. 152NB0212	7
M-0023, Sheet 1	Piping & Instrumentation Diagram Fire Protection System (FP)	66
M-0023, Sheet 2	Piping & Instrumentation Diagram Fire Protection System (FP)	28
M-12AB01, Sheet 1	Piping & Instrumentation Diagram Main Steam System	16
M-12AB02	Piping & Instrumentation Diagram Main Steam System	15
M-12AL01, Sheet 1	Piping & Instrumentation Diagram Auxiliary Feedwater System	28
M-12BB01, Sheet 1	Piping & Instrumentation Diagram Reactor Coolant System	35
M-12BB02	Piping & Instrumentation Diagram Reactor Coolant System	26
M-12BG01	Piping & Instrumentation Diagram Chemical & Volume Control System	19

<u>Drawings</u>		
<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-12BG02	Piping & Instrumentation Diagram Chemical & Volume Control System	18
M-12BG03	Piping & Instrumentation Diagram Chemical & Volume Control System	48
M-12BG04	Piping & Instrumentation Diagram Chemical & Volume Control System	07
M-12BG05	Piping & Instrumentation Diagram Chemical & Volume Control System	24
M-12BM01	Piping & Instrumentation Diagram Steam Generator Blowdown System	20
M-12BN01	Piping & Instrumentation Diagram Borated Refueling Water Storage System	18
M-12BN01	Piping & Instrumentation Diagram Steam Generator Blowdown System	
M-12EF01	Piping & Instrumentation Diagram Essential Service Water System	29
M-12EF02	Piping & Instrumentation Diagram Essential Service Water System	42
M-12EG01	Piping & Instrumentation Component Cooling Water System	24
M-12EG02	Piping & Instrumentation Component Cooling Water System	27
M-12EG03	Piping & Instrumentation Component Cooling Water System	19
M-12KC01	Piping & Instrumentation Diagram Fire Protection Turbine Bldg	20
M-12KC02	Piping & Instrumentation Diagram Fire Protection	22
M-12KC03	Piping & Instrumentation Diagram Fire Protection	10
M-12KC05	Piping & Instrumentation Diagram Fire Protection	3
M-650A-00006	North & South Area Cable Chases – Auxiliary Bldg	W08

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-650A-00047	Lower Cable Spreading Room Area EL 2032'-0" Pre-action System	W10
M-650A-00052	Auxiliary Bldg Cable Trays EL 2000'-0"	W08
M-658-00058	Electrical Penetration Room #1 (South Penetration) Auxiliary Bldg EL 2026'-0"	W04
WIP-E-13CB03-002-A-1	Schematic Diagram Emergency Bearing Oil Pump	00
WIP-E-13CD02-003-A-1	Schematic Diagram Emergency Seal Oil Pump	00
WIP-E-13CD04-002-A-1	Schematic Diagram Hydrogen Seal Oil Alarms	00
WIP-E-13CD05-001-A-1	Schematic Diagram Emergency Seal Oil Pump	00
WIP-M-830-00015-W12-A-1	Outline Schematic & Connection Diagram for IC-4061-TI D.C. Magnetic Starter	00
WIP-M-840-00009-W13-A-1	Schematic Diagram (Hydrogen & Stator Cooling)	00
8025-C-KG1202	Site Plan	57

Engineering Information Records

<u>Number</u>	<u>Title</u>	<u>Revision</u>
E-1F9915	Design Basis Document for ORN RP-017, Control Room Evacuation	9
SA-08-006	RETRAN-3D PFSSD Consequence Evaluation for a Postulated Control Room Fire	3
E-1L8900	Lighting Notes, Symbols, & Details	78
E-1C8900	Communication Notes, Symbols, & Details	37

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
AP 10-106	Fire Areas 8, 17, & 21 Fire Preplans	18A
E-1F9900	PFSSD Operator Manual Actions	9

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
E-1F9910	PFSSD Area Analysis	14
E-1F9915	Design Basis Document for Procedure OFN RP-017	9
EPRI TR-106826	Battery Performance Monitoring by Internal Ohmic Measurements	December 1996
Lesson Plan LO1732427	OFN RP-017, Control Room Evacuation	013
Lesson Plan LR5002020	OFN RP-017 SRO/RO Actions	002
Lesson Plan FB 1231426	Fire Control Part 2 of 2	October 26, 2016
NFPA 24 – 1977	Outside Protection	
NFPA 25 – 2002	Standard for the Inspection, Testing, & Maintenance of Water-Based Fire Protection Systems	
NRC Letter Singal to Sunseri	Wolf Creek Generating Station – Issuance of Amendment RE: License Amendment Request for Use of Fire-Resistive Electric Cable (TAC No. ME2966)	November 30, 2010
NRC Letter Singal to Sunseri	Wolf Creek Generating Station – Issuance of Amendment RE: Deviation From Fire Protection Requirements (TAC No. ME0797)	December 16, 2010
NRC Letter Singal to Sunseri	Wolf Creek Generating Station – Issuance of Amendment RE: Removing High/Low Pressure Designation From the Pressurizer Power-Operated Relief Valves (TAC No. ME3766)	March 9, 2011
NRC Letter Lyon to Sunseri	Wolf Creek Generating Station – Issuance of Amendment RE: Deviation From Fire Protection Requirements for Volume Control Outlet Valves (TAC No. ME9823)	August 23, 2013
NRC Letter Lyon to Heflin	Wolf Creek Generating Station – Issuance of Amendment RE: Revise the Fire Protection Program Related to Alternative Shutdown Capability (TAC No. ME3112)	September 11, 2015
PIR 2000-3699	NFPA 14-1976 code deficiency evaluations	December 13, 2000
PIR 2001-0045	NFPA 13-1976 code deficiency evaluations	January 9,

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
		2001
QH-2017-1504	Fire Protection Program Quick Hit Assessment Report	
USAR Appendix 9.5A	Design Comparison to Regulatory Positions of Regulatory Guide 1.120, Revision 1, dated November 1977 titled, "Fire Protection Guidelines for Nuclear Power Plants"	30
USAR Appendix 9.5B	Fire Hazards Analysis	30
USAR Appendix 9.5D	WCGS fire Protection Comparison to 10 CFR 50 Appendix R	30
USAR Section 9.5.1	Fire Protection Systems	30
WCNOC-171	PFSSD Associated Circuits Study	5
	List of fire protection codes committed to by Wolf Creek	
	List of modifications reviewed by fire protection personnel since last triennial	
	List of deviations from the fire codes	
	Maintenance Rule performance criteria & system status	
	Wolf Creek Fire Protection Program Regulatory Bases	4

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AI 26A-003	Regulatory Evaluations (Other Than 10 CFR 50.59)	16
AP 05-001	Change Package Planning & Implementation	10
AP 05-005	Design, Implementation, & Configuration Control of Modifications	26
AP 05D-001	Calculations	20
AP 10-100	Fire Protection Program	20A
AP 10-101	Control of Transient Ignition Sources	23

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AP 10-102	Control of Combustible Materials	20
AP 10-103	Fire Protection Impairment Control	32
AP 10-105	Fire Protection Training & Drills	22
AP 15C-002	Procedure Use & Adherence	42A
AP 22C-003	On-Line Nuclear Safety & Generation Risk Assessment	22
EDMG-001	Extensive Damage Mitigation Guideline (EDMG)	6
EDMG-T01	EDMG Tool Box	18
IP-ENG-001	Standard Design Process	0
MPE BA-010	Preventive Maintenance on Teledyne Emergency Lighting	26
OFN KC-016	Fire Response	47
OFN RP-017	Control Room Evacuation	49A
OFN RP-017A	Hot Standby to Cold Shutdown from Outside the Control Room Due to Fire	11C
STN GP-009	Emergency Radio & Equipment Check & Verification	74

Vendor Document

<u>Number</u>	<u>Title</u>	<u>Revision</u>
H-409B-28	Motorola MCS 2000 Models II & III User Guide	W01

Work Orders

13-366874-000	13-366880-000	14-395892-000	14-396226-000
15-408746-000	15-408746-050	15-408746-051	15-408746-054
15-408746-055	15-408746-064	15-408746-073	15-408746-080
5-409192-0001	16-117085-000	16-117085-000	16-410063-000
16-411189-000	16-412934-00	16-413319-000	16-414877-000
16-416416-000	16-417181-000	16-417458-000	16-417777-001
16-418207-001	16-418842-000	16-420346-000	16-420347-000
16-420377-000	16-420378-000	16-420614-000	16-420670-000
16-420703-000	17-422275-000	17-422280-000	17-423414-000
17-420951-000	17-426953-000	17-426954-000	

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 TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000482/2017008 –
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