UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 16, 2010

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

SUBJECT: WOLF CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE: DEVIATION FROM FIRE PROTECTION PROGRAM REQUIREMENTS (TAC NO. ME0797)

Dear Mr. Sunseri:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 191 to Renewed Facility Operating License No. NPF-42 for the Wolf Creek Generating Station (WCGS). The amendment consists of changes to the WCGS Updated Safety Analysis Report (USAR) in response to your application dated March 4, 2009, as supplemented by letters dated March 25 and November 17, 2010.

The amendment revises the fire protection program as described in the WCGS USAR. Specifically, a deviation from certain technical requirements to Title 10 of the *Code of Federal Regulations*, Part 50, Appendix R, Section III.G.2, as documented in Appendix 9.5E of the WCGS USAR, is requested regarding the use of operator manual actions in lieu of meeting circuit separation protection criteria. It also revises license condition 2.C.(5)(a) to include the deviation approved by this amendment request.

A copy of our related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

Balwant K. Singal

Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosures:
1. Amendment No. 191 to NPF-42
2. Safety Evaluation

cc w/encls: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 191
License No. NPF-42

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Wolf Creek Generating Station (the facility) Renewed Facility Operating License No. NPF-42 filed by the Wolf Creek Nuclear Operating Corporation (the Corporation), dated March 4, 2009, as supplemented by letters dated March 25 and November 17, 2010, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the plant licensing basis as indicated in the attachment to this license amendment and Paragraphs 2.C.(2) and 2.C.(5)(a) of Renewed Facility Operating License No. NPF-42 are hereby amended to read as follows:

   (2) Technical Specifications and Environmental Protection Plan

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 191, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. The Corporation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

   (5) Fire Protection (Section 9.5.1, SER, Section 9.5.1.8, SSER #5)

   (a) 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, and Amendment No. 191 subject to provisions b and c below.

3. The license amendment is effective as of its date of issuance and shall be implemented within 90 days of the date of issuance. Consistent with the requirements in 10 CFR 50.71(e), implementation shall include revision to the Wolf Creek Generating Station Updated Safety Analysis Report, Appendix 9.5E, Table 9.5E-1 to recognize the operator manual actions in lieu of meeting circuit separation protection criteria.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License and
Technical Specifications

Date of Issuance: December 16, 2010

ATTACHMENT TO LICENSE AMENDMENT NO. 191

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

DOCKET NO. 50-482

Replace the following pages of the Renewed Facility Operating License No. NPF-42 and Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are provided to maintain document completeness.

Renewed Facility Operating License

REMOVE	INSERT
4	4
5	5

Technical Specifications

REMOVE	INSERT
None	

(5) The Operating Corporation, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(6) The Operating Corporation, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission, now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The Operating Corporation is authorized to operate the facility at reactor core power levels not in excess of 3565 megawatts thermal (100% power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 191, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. The Corporation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Antitrust Conditions

Kansas Gas & Electric Company and Kansas City Power & Light Company shall comply with the antitrust conditions delineated in Appendix C to this license.

(4) Environmental Qualification (Section 3.11, SSER #4, Section 3.11, SSER #5)*

Deleted per Amendment No. 141.

*The parenthetical notation following the title of many license conditions denotes the section of the supporting Safety Evaluation Report and/or its supplements wherein the license condition is discussed.

(5) Fire Protection (Section 9.5.1, SER, Section 9.5.1.8, SSER #5)

(a) 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, and Amendment No. 191 subject to provisions b and c below.

(b) The licensee may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

(c) Deleted.

(6) Qualification of Personnel (Section 13.1.2, SSER #5, Section 18, SSER #1)

Deleted per Amendment No. 141.

(7) NUREG-0737 Supplement 1 Conditions (Section 22, SER)

Deleted per Amendment No. 141.

(8) Post-Fuel-Loading Initial Test Program (Section 14, SER Section 14, SSER #5)

Deleted per Amendment No. 141.

(9) Inservice Inspection Program (Sections 5.2.4 and 6.6, SER)

Deleted per Amendment No. 141.

(10) Emergency Planning

Deleted per Amendment No. 141.

(11) Steam Generator Tube Rupture (Section 15.4.4, SSER #5)

Deleted per Amendment No. 141.

(12) LOCA Reanalysis (Section 15.3.7, SSER #5)

Deleted per Amendment No. 141.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 191 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-42

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

1.0 INTRODUCTION

By letter dated March 4, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090771269), as supplemented by letters dated March 25 and November 17, 2010 (ADAMS Accession Nos. ML101040250 and ML103270416, respectively), Wolf Creek Nuclear Operating Corporation (WCNOC, the licensee) requested a license amendment for Wolf Creek Generating Station (WCGS), which proposed changes to the WCGS approved fire protection program (FPP), as described in the WCGS Updated Safety Analysis Report (USAR). Specifically, the licensee requested deviations from the FPP to allow the performance of operator manual actions (OMAs) to achieve and maintain safe shutdown in the event of a fire in lieu of meeting the circuit separation and protection requirements for Fire Areas A-1, A-11, A-16N, A-18, C-7, C-12, C-18, C-21 through C-24, C-30, C-33, and RB at the plant.

As part of its submittal, the licensee also requested U.S. Nuclear Regulatory Commission (NRC) staff review and approval of interim compensatory measures provided for Fire Area A-27, "Rod Drive MG Set Room (1403)," located on the 2,026-foot (ft) elevation of the Auxiliary Building. However, interim compensatory measures are outside the scope of this license amendment. The licensee was informed of this position by NRC staff letter dated January 29, 2010 (ADAMS Accession No. ML100271712), which stated that the use of interim compensatory measures should be implemented in accordance with the licensee's approved FPP.

The supplemental letters dated March 25 and November 17, 2010, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on April 21, 2009 (74 FR 18258)

2.0 REGULATORY EVALUATION

Regulatory requirements for fire protection are contained in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 in Section 50.48, "Fire protection," General Design Criterion 3,

"Fire protection," of Appendix A, and Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979." The circuit separation and protection requirements being addressed in this license amendment are specified in Section III.G.2 of Appendix R to 10 CFR Part 50.

Since WCGS was licensed after January 1, 1979, the licensee is not required to meet the circuit separation and protection requirements contained in 10 CFR Part 50, Appendix R, Section III.G.2 (III.G.2). However, the licensee committed to meeting the requirements of III.G.2 in its approved FPP, per License Condition 2.C(5) and Appendix 9.5E of the WCGS USAR. Therefore, the WCGS FPP must provide the established level of protection as intended by III.G.2.

In its response dated March 25, 2010, to the NRC staff's request for additional information (RAI) dated January 29, 2010, the licensee stated that it had revised its analysis of requested OMAs provided in its license amendment requested dated March 4, 2009. The licensee stated that the revised analysis "Post-Fire Safe Shutdown Operator Manual Actions, WIP-E-1F9900-004-A-1, Revision 1" (included as an Enclosure to its March 25, 2010, response) replaces the original analysis (WIP-E-1F9900-004-A-1, Revision 0) in its entirety.

The licensee also stated that the purpose of WIP-E-1F9900-004-A-1, Revision 1, was to evaluate the feasibility and reliability of OMAs relied on to ensure the capability to achieve and maintain hot standby conditions in response to a single fire event outside the control room. The licensee also stated that the requested OMAs were evaluated against the guidance contained in NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," October 2007 (ADAMS Accession No. ML073020676), which provides criteria acceptable to the NRC staff for justifying that OMAs are feasible and can reliably be performed under a wide range of plant conditions that an operator might encounter during a fire.

The OMAs addressed by this amendment have not been reviewed previously by the NRC. For plants licensed after January 1, 1979, the NRC uses the license amendment process under 10 CFR 50.90 to evaluate the use of OMAs. The purpose of the evaluation is to ensure that the OMAs do not represent an adverse effect on the ability of the plant to safely shutdown thereby maintaining adequate protection to the public health and safety.

3.0 TECHNICAL EVALUATION

3.1 Area Description

In its submittal, the licensee requested a deviation from certain technical requirements of III.G.2 (as documented in Appendix 9.5E of the WCGS USAR) to the extent that one of the redundant trains of systems necessary to achieve and maintain hot shutdown is not maintained free of fire damage in accordance with III.G.2 for a fire occurring in the following 14 Fire Areas:

Fire Area	Description
A-1	Auxiliary Building, 1974' El.; General Corridor
A-11	Auxiliary Building, 2000' El.; Cable Chase

Fire Area	Description
A-16N	Auxiliary Building, 2026' El.; General Corridor (A-16N is the North section of Fire area A-16 and is considered a separate area from the South section, A-16S, for the purposes of this review.
A-18	Auxiliary Building, 2026' El.; North Electrical Penetration Room
C-7	Control Building, 1984' El.; Cable Chase
C-12	Control Building, 2000' El.; North Cable Chase
C-18	Control Building, 2016' El.; Cable Chase
C-21	Control Building, 2032' El.; Lower Cable Spreading Room
C-22	Control Building, 2073'-6" El.; Upper Cable Spreading Room
C-23	Control Building, 2032' El.; South Cable Chase
C-24	Control Building, 2032' El.; North Cable Chase
C-30	Control Building, 2047'-6" El.; Cable Chase
C-33	Control Building, 2073'-6" El.; South Cable Chase
RB	Reactor Building General Area

A summary of the OMAs addressed by this amendment is provided in the following table:

OMA Number	Purpose	Fire-Affected Component(s)	Initiating Fire Area(s)	Action	Action Location
1	Isolate Letdown	BGLCV0459 BGLCV0460	A-1 A-11 A-18 C-7 C-12 C-18 C-21 C-24 RB	Close valve KAV0201 Reactor Building Instrument Air Outside Containment Isolation Valve	A-25
2	Control / isolate steam release through steam generator (SG) 'B' atmospheric relief valves (ARV) ABPV0002	Cables associated with SG 'B' ARV ABPV0002	A-16N	Use local controller ABFHC0002	A-23
3	Control / isolate steam release through SG 'C' ARV ABPV0003	Cables associated with SG 'C' ARV ABPV0003	A-16N	Use local controller ABFHC0003	A-23

OMA Number	Purpose	Fire-Affected Component(s)	Initiating Fire Area(s)	Action	Action Location
4	Fail SG 'D' ARV ABPV0004 to Closed position to isolate steam release	Cables associated with SG 'D' ARV ABPV0004	A-16N	Isolate air and nitrogen to atmospheric relief valve ABPV0004 by closing air supply valve KAV1 429 and nitrogen supply valve KAV1 365, and then bleeding air from the regulator	A-23
5	Terminate Train B Containment Spray	Cable associated with containment spray pump PEN01B and discharge valve ENHV0012 - Containment spray pump could spuriously start and discharge valve ENHV0012 could spuriously open. This would cause a containment spray actuation, which would divert refueling water storage tank (RWST) inventory to the containment sump.	C-22 C-23 C-30 C-33	Open Breaker NB0203	C-10
6	Terminate Train A Containment Spray	Cable associated with containment spray pump PEN01A and discharge valve ENHV0006 - Pump could spuriously start and discharge valve ENHV0012 could spuriously open, resulting in a containment spray actuation, which would divert RWST inventory to the containment sump.	C-18 C-21 C-24	Open Breaker NB0102	C-9

3.2 Defense-In-Depth Review

The regulations in 10 CFR 50, Appendix R, Section II.A, "Fire protection program," require that licensees ensure that the ability to achieve and maintain safe shutdown is preserved during and following a fire event by extending the concept of defense-in-depth:

- To prevent fires from starting;
- To detect rapidly, control, and extinguish promptly those fires that do occur; and
- To provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

The stated purpose of Section III.G.2 of Appendix R to 10 CFR Part 50 is to ensure that one of the redundant trains necessary to achieve and maintain hot shutdown conditions remains free of fire damage in the event of a fire. Section III.G.2 requires one of the following means to ensure that a redundant train of safe shutdown cables and equipment is free of fire damage, where redundant trains are located in the same fire area outside of primary containment:

a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier;

b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or

c. Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating, In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

In its submittal, the licensee stated that the requested deviations are from the technical requirements of III.G.2 as documented in Appendix 9.5E of the WCGS USAR and are not part of a methodology to shut down the plant from outside the control room. The licensee further stated that the control room (Fire Area C-27) is the only area at WCGS requiring an alternate shutdown capability described in Sections III.G.3 and III.L of Appendix R. In all cases, the identified OMAs mitigate conditions where the separation requirements of III.G.2 are not satisfied. The specific requirements of III.G.2 that are not met are identified in the Enclosure to the licensee's letter dated March 25, 2010, entitled "WIP-E-1F9900-004-A-1, Revision 1, "Post-Fire Safe Shutdown Operator Manual Actions."

The licensee further stated that the OMAs are feasible, reliable, and are not impacted by environmental conditions (radiation, lighting, temperature, humidity, smoke, toxic gas, noise,

and Halon fire suppression discharge) associated with fires in III.G.2 areas. The feasibility and reliability of each OMA was determined by demonstrating conformance with information contained in NUREG-1852.

In addition, WIP-E-1F9900-004-A-1, Revision 1, describes defense-in-depth fire protection features for each of the 14 fire areas identified in the request. For each fire area, WIP-E-1F9900-004-A-1 includes a description of the physical location and arrangement of equipment, combustible loading, ignition sources, fire protection features, and proximity of redundant safe shutdown equipment to in-situ hazards. The licensee stated that fire protection systems were predominantly installed per the National Fire Protection Association Code of record. The original installation of systems was accepted by the NRC staff in the WCGS Safety Evaluation Report and code deficiencies were evaluated for acceptability in Section 5.1.15 of WIP-E-1F9900-004-A-1 of the USAR. The licensee further stated that there are no code compliance items that present an adverse impact to the implementation of the requested OMAs.

3.2.1 Fire Prevention

In response to the NRC staff's requests for additional information dated January 29, 2010, the licensee revised the evaluation documented in calculation WIP-E-1F9900-004-A-1, Rev. 0, included in its original request dated March 4, 2009. For each fire area, the revised analysis dated March 25, 2010, describes the physical location and arrangement of equipment, combustible loading, ignition sources, fire protection features, and proximity of redundant safe shutdown equipment to in-situ hazards. In addition, for each fire area identified in the request, WIP-E-1F9900-004-A-1 includes an evaluation of fire effects on target cables taking into consideration ignition sources, in-situ combustibles, and transient combustibles. For each fire area, the analysis stated that the fire protection configuration achieves a level of protection commensurate with that intended by III.G.2.

The fire areas included in this amendment are not shop areas so hot work activities are infrequent. Administrative controls (e.g., hot work permits, fire watch, and supervisory controls) programs are in place if hot work activities do occur in non-shop areas. The administrative controls are described in the WCGS FPP, which is incorporated into the USAR. All areas contain at least minimal combustibles to support lighting and ventilation. The following table provides a description of other types of combustibles.

Fire Area	Discussion
A-1	Fire Area A-1 is the general corridor area on the 1974' elevation of the Auxiliary Building. The licensee stated that the fire area is separated from adjacent areas by 3-hour fire-rated barriers. General access to the cable chase is restricted by a normally locked fire door.
A-11	Fire Area A-11 is a single room cable chase located on the 2000' elevation of the Auxiliary Building within the North Pipe Penetration Room. The chase contains cable and normal room lighting only. All cable is Institute of Electrical and Electronics Engineers, Inc. (IEEE) Standard-383 rated and Fire Area A-11 is separated from adjacent areas by 3-hour fire-rated barriers. Under normal situations, no ignition sources are present within cable chases and introduction of a transient ignition source is administratively controlled.

Fire Area	Discussion
A-16N	Fire Area A-16 is the general corridor area on the 2026' elevation of the Auxiliary Building and is divided into two sections by a 20' wide combustible and fire hazard free zone. The North section (A-16N) starts from approximately 2' South of column line A7 and ends at the North wall at column line A1. The South section (A-16S) starts at column line A14 and runs North to approximately 2' South of column line A8. The area between A-16N and A-16S is a minimum of 20' in width and is considered an area free of combustibles and fire hazards. Fire Area A-16 is separated from adjacent areas by 3-hour fire-rated barriers. The 20' Combustible Control Zone separation area within Fire Area A-16 is administratively maintained to strictly control transient combustibles in the limiting separation area between redundant post-fire safe shutdown (PFSSD) circuits within the east corridor of Room 1408. In-situ combustibles within the Combustible Control Zone do not pose a fire propagation path that would affect both trains of redundant PFSSD equipment.
A-18	Fire Area A-18 is the North Electrical Penetration Room on the 2026' elevation of the Auxiliary Building. The fire area is separated from adjacent areas by 3-hour fire-rated barriers.
C-7	Fire Area C-7 is a single room cable chase located on the 1984' elevation of the Control Building. The chase contains cable only and is separated from adjacent areas by 3-hour fire-rated barriers. Under normal situations, no ignition sources are present within cable chases and introduction of a transient ignition source is administratively controlled. All cable is IEEE-383 rated.
C-12	Fire Area C-12 is a single room vertical cable chase located on the 2000' elevation of the Control Building. The chase contains cable and normal room lighting only. It is separated from adjacent areas by 3-hour fire-rated barriers. Under normal situations, no ignition sources are present within cable chases and introduction of a transient ignition source is administratively controlled. All cable is IEEE-383 rated.
C-18	Fire Area C-18 is a single room cable chase located on the 2016' elevation of the Control Building. The chase contains cable and normal room lighting only. It is separated from adjacent areas by 3-hour fire-rated barriers. Under normal situations, no ignition sources are present within cable chases and introduction of a transient ignition source is administratively controlled. All cable is IEEE-383 rated.
C-21	Fire Area C-21 is the Lower Cable Spreading Room on the 2032' elevation of the Control Building. The Room contains predominantly cable. It is separated from adjacent areas by 3-hour fire-rated barriers.
C-22	Fire Area C-22 is the Upper Cable Spreading Room on the 2073'-6" elevation of the Control Building. The Room contains predominantly cable. It is separated from adjacent areas by 3-hour fire-rated barriers.
C-23	Fire Area C-23 is a single room cable chase located on the 2032' elevation of the Control Building. The chase contains cable and normal room lighting only. It is separated from adjacent areas by 3-hour fire-rated barriers. The moderate combustible loading is attributed to the volume of cables in relation to the small floor area. Under normal situations, no ignition sources are present within cable chases and introduction of a transient ignition source is administratively controlled. All cable is IEEE-383 rated.

Fire Area	Discussion
C-24	Fire Area C-24 is a single room (3504) cable chase located on the 2032' elevation of the Control Building. The chase contains cable and normal room lighting only. It is separated from adjacent areas by 3-hour fire-rated barriers. Under normal situations, no ignition sources are present within cable chases and introduction of a transient ignition source is administratively controlled. All cable is IEEE-383 rated.
C-30	Fire Area C-30 is a single room (3617) cable chase located on the 2047'-6" elevation of the Control Building. The chase contains cable and normal room lighting only. It is separated from adjacent areas by 3-hour fire-rated barriers. Under normal situations, no ignition sources are present within cable chases and introduction of a transient ignition source is administratively controlled. All cable is IEEE-383 rated.
C-33	Fire Area C-33 is a single room (3804) cable chase located on the 2073'-6" elevation of the Control Building. The chase contains cable and normal room lighting only. It is separated from adjacent areas by 3-hour fire-rated barriers.
RB	Fire Area RB is all elevations of the Reactor Building. The 4-ft-thick Reactor Building walls serve as the fire barrier separation from adjacent buildings. There are no fire-rated barrier walls or floors internal to the Reactor Building, though substantial barriers and spatial separations are provided within the building.

The NRC staff concludes that for all of the areas related to this amendment, the preventative measures combined with the limited fuel load and lack of ignition sources in the fire areas results in a low likelihood of a fire occurring and spreading to adjacent fire areas or equipment.

3.2.2 Detection, Control, and Extinguishment

WCGS has been divided into fire areas as described in the WCGS fire hazards analysis (FHA). Three-hour fire barriers are normally used to provide fire resistive separation between adjacent fire areas. In general, fire rated assemblies consist of reinforced concrete or concrete block walls which have commonly accepted fire endurance ratings based upon thickness.

The NRC staff evaluated the fire detection, control, and suppression systems associated with the areas related to this amendment. Unless noted otherwise in the table below, fire areas are provided with addressable ionization smoke detectors that annunciate an alarm in the control room and locally.

Fire Area	Detection, Control, and Extinguishment Capability
A-1	A wet pipe sprinkler system is installed in this area. The sprinkler system will aid in controlling the fire event until manual suppression can be applied, as necessary. Hose stations and portable extinguishers are also located throughout the area for manual fire fighting.
A-11	A wet pipe sprinkler protection is provided for the area. The sprinkler system will aid in controlling the fire event until manual suppression can be applied, as necessary. Fire extinguishers and hose stations are also provided in the general area for manual fire fighting.

Fire Area	Detection, Control, and Extinguishment Capability
A-16N	A pre-action sprinkler system is located in areas with high concentrations of cable trays. In addition to the ceiling level sprinkler system, the east corridor, from column line A1 to A4, is provided with an intermediate level sprinkler system, located below the lowest cable tray in the corridor. The pre-action sprinkler system will aid in controlling the fire event until manual suppression can be applied, as necessary. Fire extinguishers and hose stations are also provided in the area for manual fire fighting.
A-18	A total flooding Halon system is provided for the area. This area is also provided with a cross-zoned smoke detection system. Detection by either zone will alarm locally and in the control room. Activation by both zones will initiate the discharge of the Halon 1301 suppression system installed in this area. The Halon 1301 system serves the room with the exception of the electrical chase area and is capable of attaining a minimum 5-percent concentration. The system is designed to maintain at least a 5-percent concentration at the level of the highest combustible for a soak time of 10 minutes. An actuation station is provided to discharge the system manually. An automatic activation will sound a local alarm, close required ventilation dampers, shut off associated ventilation and/or air-conditioning fan motors, and discharge the system after an adequate time delay for evacuation. An automatic wet pipe sprinkler system serves the open cable chase in the northwest corner of the room. The sprinkler protection for the open cable chase and the general area Halon protection will aid in controlling the fire event until manual suppression can be applied, as necessary. Fire extinguishers and hose stations are also provided adjacent to the area for manual fire fighting.
C-7	A wet pipe sprinkler system is provided for the area. The sprinkler system will aid in controlling the fire event until manual suppression can be applied, as necessary. Fire extinguishers and hose stations are also provided in the adjacent area for manual fire fighting.
C-12, C-18, C-21, C-22, C-23, C-24, C-30, C-33	A wet pipe sprinkler system is provided for the area. The sprinkler system will aid in controlling the fire event until manual suppression can be applied, as necessary. Fire extinguishers and hose stations are also provided in the adjacent area for manual fire fighting.
RB	Linear heat detection is installed above each reactor coolant pump and in areas where cable trays are concentrated. Duct smoke detectors are provided for each containment cooler. Alarms are zoned, assisting prompt recognition of fire location. A fixed, manually-charged closed head sprinkler system is provided for the north and south cable penetration areas on the 2026' elevation. The sprinkler system, will aid in controlling the fire event within the cable penetration areas. Portable extinguishers and manual hose stations are also installed. The hose stations are spaced at no more than 100-ft intervals. The hose station locations are such that all accessible areas of the Reactor Building are adequately covered by at least one hose stream.

The NRC staff concludes that the fire detection, control, and suppression systems are appropriate to mitigate and contain the fire hazards in the 14 areas identified in the licensee's request.

3.2.3 Preservation of Safe Shutdown Capability

The NRC staff has evaluated the feasibility and reliability review provided by the licensee in its letter dated March 4, 2009, as supplemented by letters dated March 25 and November 17, 2010. The licensee's response also documents that fire response procedures are in place to ensure that clear and accessible instructions on how to perform the OMAs are available to the operators. All of the requested OMAs are directed by plant procedures, and the operators are trained in the use of the procedures. Specifically, procedure OFN KC-016, "Fire Response," is entered whenever a fire is reported to the control room by WCGS personnel or indication of a fire occurs on fire alarm panel KC008, located in the control room. Following validation of fire alarm, procedure OFN KC-016 directs that the fire brigade be dispatched. Immediately following fire brigade callout, procedure OFN KC-016 directs the operators to review potential OMAs for the fire-affected area. The specific OMAs are identified in an attachment to the procedure. This approach ensures that control room personnel are promptly made aware of potential OMAs, including the instrumentation that can be relied upon to assess the need for performing an OMA. The OMA review is a continuous action step within OFN KC-016, which means that the operator is responsible for observing the step for potential response throughout the fire event.

Expected environmental conditions for the OMA location and associated access and egress routes were also reviewed for acceptability. Environmental factors considered were radiation, lighting, temperature, humidity, smoke, toxic gas, noise, and Halon fire suppression discharge. The licensee's review concluded that operators performing the OMAs would not be exposed to adverse or untenable conditions during any particular OMA procedure. An action is considered feasible, if it is shown that it is possible to be performed within the available time (considering relevant uncertainties in estimating the time available). As compared to an action that is only feasible, an action is considered to be reliable as well if it is shown that it can be dependably and repeatedly performed within the available time, by different crews, under somewhat varying conditions that typify uncertainties in the available time and the time to perform the action, with a high success rate.

Each OMA included in this amendment consists of a sequence of tasks that occur in various fire areas and are initiated upon confirmation of a fire in a particular fire area. Timing associated

with each of the OMAs is discussed in detail in Section 3.3 of this safety evaluation. Listed in the order of the area of fire origin, the OMAs included in this amendment are as follows:

OMA Number	Initiating Fire Area	Action	Discussion
1	A-1 A-11 A-18 C-7 C-12 C-18 C-21 C-24 RB	Close valve KAV0201 Reactor Building Instrument Air Outside Containment Isolation located in South Pipe Penetration Room to cause letdown valves BGLCV0459 and BGLCV0460 to fail closed.	A fire in any of the identified areas could cause a loss of inventory through the letdown flow path as cables for letdown isolation valves BGLCV0459 and BGLCV0460 are routed in a common enclosure in cable trays. Letdown isolation is required to prevent reactor coolant system (RCS) flow diversion. The licensee stated that pressurizer level and volume control tank (VCT) level indication provide a suitable capability for operators to diagnose the failure of letdown to isolate and the required instrumentation has been assured to remain available (i.e., protected) in all areas where letdown may not isolate due to fire damage. The exact protected instrumentation that remains undamaged and available for diagnostic use is given to the operators in the fire response procedure, OFN KC-016. The licensee stated that closing instrument air valve KAV0201 will cause BGLCV0459 and BGLCV0460 to fail closed within 3 minutes following isolation of instrument air. This action will also fail air to all air-operated components within the Reactor Building. However, the licensee stated that the loss of air to other components will not have an adverse impact on safe shutdown. The licensee stated that when letdown is the only flow diversion event, it can remain open for 180 minutes without any adverse consequences to safety. A fire in Fire Areas A-18, C-18, C-21, and C-24 could cause concurrent opening of atmospheric relief valves and letdown isolation valves BGLCV0459 and BGLCV0460. For these cases, the licensee stated that letdown can remain open for 50 minutes, without any adverse consequences to safety. A fire in Fire Area RB (Reactor Building General Area) could cause the excess letdown flowpath isolation valves BGHV8153A and BGHV8154A to open concurrently with BGLCV0459 and BGLCV0460. For this case, the licensee stated that excess letdown may remain open provided letdown is isolated in 120 minutes. The licensee stated that the times vary from Fire Area to Fire Area because the postulated spurious operations differ. The licensee further stated that the times utilized in its evaluation of OMAs (WIP-E-1F9900-004-A-1) are bounded by the times determined by the thermal hydraulic analysis which considered other potential multiple spurious operations.

OMA Number	Initiating Fire Area	Action	Discussion
2	A-16N	Use local controller ABFHC0002 in Fire Area A-23 to control / isolate steam release through atmospheric relief valve (ARV) for SG B	A fire in Fire Area A-16N could damage cables associated with SG ARVs ABPV0002 (SG 'B'), ABPV0003 (SG 'C'), and ABPV0004 (SG 'D'). SG ARV ABPV0002 is controlled/isolated by manipulation of ABFHCO002 in Fire Area A-23. SG ARV ABPV0003 is controlled/isolated by manipulation of ABFHCO003 in Fire Area A-23. SG ARV ABPV0004 is isolated by closing air supply valve KAV1 429 and nitrogen supply valve KAV1 365, and then bleeding air from the regulator in Fire Area A-23. WCNOC stated that the three ARVs can remain open or closed for at least 200 minutes and that the time margin for OMA performance is 136 minutes.
3		Use local controller ABFHC0003 in Fire Area A-23 to control / isolate steam release through RV for SG C	
4		Isolate air and nitrogen to atmospheric relief valve ABPV0004 in Fire Area A-23 to fail closed	
5	C-22 C-23 C-30 C-33	Open Breaker NB0203 in Fire Area C-10 to terminate Train B Containment Spray	Containment spray pump PEN01B could spuriously start and discharge valve ENHV0012 could spuriously open due to fire-induced cable damage, resulting in containment spray actuation, thereby diverting RWST inventory to the containment sump. Opening 4.16 kilovolt (kV) breaker NB0203 in FA C-10 will stop containment spray pump PEN01B. WCNOC stated that Thermal hydraulic analysis confirms containment spray can operate for 60 minutes before RWST level will be below that required for cold shutdown. The time margin for OMA performance is 39 minutes.
6	C-18 C-21 C-24	Open Breaker NB0102 in Area C-9 to terminate Train A Containment Spray	Containment spray pump PEN01A could spuriously start and discharge valve ENHV0006 could spuriously open due to fire-induced cable damage resulting in containment spray actuation and, thereby, divert RWST inventory to the containment sump. Opening 4.16 kV breaker NB0102 located on 4.16 kV bus NB01 within Fire Area C-9 will stop containment spray pump PEN01B. WCNOC stated that containment spray can operate for 60 minutes before RWST level will be below that required for cold shutdown. The time margin for OMA performance is 39 minutes.

Fire Area A-1 Auxiliary Building, 1,974-ft Elevation; General Corridor

OMA No. 1

Cables associated with letdown isolation valves BGLCV0459 and BGLCV0460 may be damaged in this area, preventing these valves from being closed from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for both BGLCV0459 and BGLCV0460 are in the same cable tray within the fire area. The licensee stated that letdown is not required for post-fire safe shutdown (PFSSD). However, letdown isolation is required to prevent RCS flow diversion.

The licensee used zone of influence guidance contained in Appendix F of NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," to determine whether damage to the target cables would be expected, considering the ignition sources, *in-situ* combustibles, and transient combustibles in the area. For Fire Area A-1, this evaluation determined that there is reasonable assurance that a credible fire event within the area would not result in fire-induced equipment maloperation warranting OMA implementation. The results of this evaluation, combined with the available fire protection features described above, provide assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cables are lost due to a fire in Fire Area A-1, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that valves BGLCV0459 and BGLCV0460 can be isolated by closing instrument air supply valve KAV0201 located in the South Pipe Penetration Room on the 2,000-ft elevation of the Auxiliary Building. This removes air to BGLCV0459, BGLCV0460, and all air-operated components within the Reactor Building.

Fire Area A-11 Auxiliary Building, 2,000-ft Elevation; Cable Chase

OMA No. 1

Cables associated with letdown isolation valves BGLCV0459 and BGLCV0460 may be damaged in this area, preventing these valves from being closed from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for both BGLCV0459 and BGLCV0460 are in the same cable tray within the fire area. The licensee stated that letdown is not required for PFSSD. However, letdown isolation is required to prevent RCS flow diversion.

Other than plant lighting, there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within Fire Area-11 is extremely low since Fire Area-11 is normally locked and access is restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition, combined with the fire protection features described above, provide assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area A-11, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that valves BGLCV0459 and BGLCV0460 can be isolated by closing

instrument air supply valve KAV0201 located in the South Pipe Penetration Room on the 2,000-ft elevation of the Auxiliary Building. This removes air to BGLCV0459, BGLCV0460, and all air-operated components within the Reactor Building.

Fire Area A-16N Auxiliary Building, 2,026-ft Elevation; General Corridor

OMA Nos. 2, 3, and 4

Cables associated with SG atmospheric relief valves (ARV) ABPV0002 (SG 'B'), ABPV0003 (SG 'C'), and ABPV0004 (SG 'D') may be damaged, preventing control of theses valves from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for ABPV0002, ABPV0003, and ABPV0004 follow the same general routing along the northeast and east corridors. The ARV cables are in multiple raceways and the horizontal separation distance is approximately 5 feet. Typical vertical separation is approximately 8 feet between the cable tray for ABPV004 and the conduits for ABPV002 and ABPV003.

The licensee stated that ARV maloperation would not impact the ability to achieve and maintain hot standby even if all three ARVs spuriously opened or failed closed as a result of fire. However, since the use of the safety valves is not a preferred method for maintaining post-fire hot standby, OMAs are credited to address fire-induced spurious operation of the ARVs.

In the unlikely event that ARV ABPV0002, ABPV0003, or ABPV0004 are impacted by fire in Fire Area A-16N, OMAs are available to restore or maintain the necessary function to the affected equipment. Specifically, ARV ABPV0002 can be controlled/isolated by manipulation of local controller ABFHCO002 in Fire Area 23 (OMA No. 2); ARV ABPV0003 can be controlled/isolated by manipulation of local controller ABFHCO003 located in Fire Area-23 (OMA No. 3); and ARV ABPV0004 can be isolated in Fire Area 23 by closing air supply valve KAV1 429 and nitrogen supply valve KAV1 365, and then bleeding air from the regulator (OMA No. 4).

Fire Area A-18 Auxiliary Building, 2,026-ft Elevation; North Electrical Penetration Room

OMA No. 1

Cables associated with letdown isolation valves BGLCV0459 and BGLCV0460 may be damaged in this area, preventing these valves from being closed from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for both BGLCV0459 and BGLCV0460 are in the same cable tray within the fire area. The licensee stated that letdown is not required for PFSSD. However, letdown isolation is required to prevent RCS flow diversion.

In addition, ARV ABPV0002 could also spuriously open as a result of fire in Fire Area A-18. Although the licensee's thermal hydraulic analysis determined that no operator action is required to achieve and maintain hot standby with a spuriously open ARV, a spuriously open ARV concurrent with letdown does affect the available time for isolating letdown valves BGLCV0459 and BGLCV0460. The cable for ABPV002 is located in conduit and the minimum separation distance between this conduit and the cable tray containing cables associated with BGLCV0459 and BGLCV0460 is approximately 13 feet with intervening combustibles in the form of cables between the raceways.

The licensee used zone of influence guidance contained in Appendix F of NRC IMC 0609, "Significance Determination Process," to determine whether damage to the target cables would be expected, considering the ignition sources, in-situ combustibles, and transient combustibles in the area. For Fire Area A-18, this evaluation determined that there is reasonable assurance that a credible fire event within the area would not result in fire-induced equipment maloperation warranting OMA implementation. The results of this evaluation, combined with the available fire protection features described above, provide assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area A-18, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that valves BGLCV0459 and BGLCV0460 can be isolated by closing instrument air supply valve KAV0201 located in the South Pipe Penetration Room on the 2,000-ft elevation of the Auxiliary Building. This removes air to BGLCV0459, BGLCV0460, and all air-operated components within the Reactor Building.

Fire Area C-7 Control Building, 1,984-ft Elevation; Cable Chase

OMA No. 1

Cables associated with letdown isolation valves BGLCV0459 and BGLCV0460 may be damaged in this area, preventing these valves from being closed from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for both BGLCV0459 and BGLCV0460 are in the same cable tray within the fire area. The licensee stated that letdown is not required for PFSSD. However, letdown isolation is required to prevent RCS flow diversion.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within Fire Area C-7 is extremely low since it is normally locked and access restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition, combined with the fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-7, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that valves BGLCV0459 and BGLCV0460 can be isolated by closing instrument air supply valve KAV0201 located in the South Pipe Penetration Room on the 2,000-ft elevation of the Auxiliary Building. This removes air to BGLCV0459, BGLCV0460, and all air-operated components within the Reactor Building.

Fire Area C-12 Control Building, 2,000-ft Elevation; North Cable Chase

OMA No. 1

Cables associated with letdown isolation valves BGLCV0459 and BGLCV0460 may be damaged in this area, preventing these valves from being closed from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for both BGLCV0459 and BGLCV0460 are in the same cable tray within the fire area. The licensee stated that letdown is not required for PFSSD. However, letdown isolation is required to prevent RCS flow diversion.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within Fire Area C-12 is extremely low since it is normally locked and access restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition, combined with the fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-12, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that valves BGLCV0459 and BGLCV0460 can be isolated by closing instrument air supply valve KAV0201 located in the South Pipe Penetration Room on the 2,000-ft elevation of the Auxiliary Building. This removes air to BGLCV0459, BGLCV0460, and all air-operated components within the Reactor Building.

Fire Area C-18 Control Building, 2,016-ft Elevation; Cable Chase

OMA No. 1

Cables associated with letdown isolation valves BGLCV0459 and BGLCV0460 may be damaged in this area, preventing these valves from being closed from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for both BGLCV0459 and BGLCV0460 are in the same cable tray within the fire area. The licensee stated that letdown is not required for PFSSD. However, letdown isolation is required to prevent RCS flow diversion.

In addition, ARV ABPV0001 could also spuriously open as a result of fire in Fire Area C-18. The licensee's thermal hydraulic analysis determined that no operator action is required to achieve and maintain hot standby with a spuriously open ARV. However, a spuriously open ARV concurrent with letdown does affect the available time for isolating letdown valves BGLCV0459 and BGLCV0460. The cable for ABPV002 is located in conduit.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within the fire area is extremely low since it is normally locked and access restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition,

combined with the fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-18, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that valves BGLCV0459 and BGLCV0460 can be isolated by closing instrument air supply valve KAV0201 located in the South Pipe Penetration Room on the 2,000-ft elevation of the Auxiliary Building. This removes air to BGLCV0459, BGLCV0460, and all air-operated components within the Reactor Building.

OMA No. 6

Containment spray pump PEN01A could spuriously start and discharge valve ENHV0006 could spuriously open due to fire-induced cable damage. This would result in containment spray actuation which would divert RWST inventory to the containment sump. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as control cables for the spurious start of PEN01A and spurious closure of ENHV0006 are located in separate cable trays having less than 20 feet of horizontal separation within the same cable chase. Horizontal spatial separation between the trays of concern is approximately 5 feet with multiple cable trays presenting intervening combustibles between the identified trays. The trays of concern are located on the north side of the cable chase.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within the fire area is extremely low since it is normally locked and access restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition, combined with the fire protection features described above, provides assurance that the fire redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-18, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that containment spray pump PEN01A can be stopped by opening breaker NB0102 located on 4.16 kV bus NB01 in Fire Area C-9.

<u>Fire Area C-21 Control Building 2,032-ft Elevation; Lower Cable Spreading Room</u>

OMA No. 1

Cables associated with letdown isolation valves BGLCV0459 and BGLCV0460 may be damaged in this area, preventing these valves from being closed from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for both BGLCV0459 and BGLCV0460 are routed in two trays, one below the other, within a multi-cable tray stack. Vertical separation distance between the two trays is less than 12 inches. The licensee stated that letdown is not required for PFSSD. However, letdown isolation is required to prevent RCS flow diversion.

In addition, ARVs ABPV0001 and ABPV0003 could also spuriously open as a result of fire in Fire Area C-21. The licensee's thermal hydraulic analysis determined that no operator action is required to achieve and maintain hot standby with two open ARVs. However, spurious operation, concurrent with letdown, does affect the available time for isolating letdown valves BGLCV0459 and BGLCV0460.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. The licensee used zone of influence guidance contained in Appendix F of NRC IMC 0609, "Significance Determination Process," to determine whether damage to the target cables would be expected, considering the ignition sources, in-situ combustibles, and transient combustibles in the area. For Fire Area C-21, this evaluation determined that there is reasonable assurance that a credible fire event within the area would not result in fire-induced equipment maloperation warranting OMA implementation. The results of this evaluation, combined with the available fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-21, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that valves BGLCV0459 and BGLCV0460 can be isolated by closing instrument air supply valve KAV0201 located in the South Pipe Penetration Room on the 2,000-ft elevation of the Auxiliary Building. This removes air to BGLCV0459, BGLCV0460, and all air-operated components within the Reactor Building.

OMA No. 6

Containment spray pump PEN01A could spuriously start and discharge valve ENHV0006 could spuriously open due to fire-induced cable damage. This would result in containment spray actuation which would divert RWST inventory to the containment sump. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as control cables that may cause the spurious start of PEN01A and spurious closure of ENHV0006 are predominantly routed in two trays, one below the other, within a multi-cable tray stack. Vertical separation distance between the two trays is less than 12 inches.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. The licensee used zone of influence guidance contained in Appendix F of NRC IMC 0609, "Significance Determination Process," to determine whether damage to the target cables would be expected, considering the ignition sources, in-situ combustibles, and transient combustibles in the area. For Fire Area C-21, the licensee's evaluation determined that that there is reasonable assurance that a credible fire event within the area would not result in fire-induced equipment maloperation warranting OMA implementation. The results of this evaluation, combined with the available fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-21, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically,

the licensee stated that containment spray pump PEN01A can be stopped by opening breaker NB0102 located on 4.16 kV bus NB01 in Fire Area C-9.

Fire Area C-22 Control Building, 2,073-ft-6-in Elevation; Upper Cable Spreading Room

OMA No. 5

Containment spray pump PEN01B could spuriously start and discharge valve ENHV0012 could spuriously open due to fire-induced cable damage. This would result in containment spray actuation which would divert RWST inventory to the containment sump. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as control cables that may cause the spurious start of PEN01A and spurious closure of ENHV0006 are predominantly routed in two trays, one below the other, within a multi-cable tray stack. Vertical separation distance between the two trays is less than 12 inches.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. The licensee used zone of influence guidance contained in Appendix F of NRC IMC 0609, "Significance Determination Process," to determine whether damage to the target cables would be expected, considering the ignition sources, in-situ combustibles, and transient combustibles in the area. For Fire Area C-22, the licensee's evaluation determined that that there is reasonable assurance that a credible fire event within the area would not result in fire-induced equipment maloperation warranting OMA implementation. The results of this evaluation, combined with the available fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-22, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that containment spray pump PEN01B can be stopped by opening breaker NB0203 located on 4.16 kV bus NB02 in Fire Area C-10.

Fire Area Fire Area C-23 Control Building, 2,032-ft Elevation; South Cable Chase

OMA No. 5

Containment spray pump PEN01B could spuriously start and discharge valve ENHV0012 could spuriously open due to fire-induced cable damage. This would result in containment spray actuation which would divert RWST inventory to the containment sump. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as control cables that may cause the spurious start of PEN01A and spurious closure of ENHV0006 are located in separate cable trays having a horizontal spatial separation of approximately 5 feet.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within the fire area is extremely low since it is normally locked and access restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition,

combined with the fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-23, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that containment spray pump PEN01B can be stopped by opening breaker NB0203 located on 4.16 kV bus NB02 in Fire Area C-10.

Fire Area C-24 Control Building 2,032-ft Elevation; North Cable Chase

OMA No. 1

Cables associated with letdown isolation valves BGLCV0459 and BGLCV0460 may be damaged in this area, preventing these valves from being closed from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for both BGLCV0459 and BGLCV0460 are routed in the same raceway. The licensee stated that letdown is not required for PFSSD. However, letdown isolation is required to prevent RCS flow diversion.

In addition, ARV ABPV0001 could also spuriously open as a result of fire in Fire Area C-24. The licensee's thermal hydraulic analysis determined that no operator action is required to achieve and maintain hot standby with an open ARV. However, spuriously opening of an ARV concurrent with letdown does affect the available time for isolating letdown valves BGLCV0459 and BGLCV0460.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within the fire area is extremely low since it is normally locked and access restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition, combined with the fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-24, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that valves BGLCV0459 and BGLCV0460 can be isolated by closing instrument air supply valve KAV0201 located in the South Pipe Penetration Room on the 2,000-ft elevation of the Auxiliary Building. This removes air to BGLCV0459, BGLCV0460, and all air-operated components within the Reactor Building.

OMA No. 6

Containment spray pump PEN01A could spuriously start and discharge valve ENHV0006 could spuriously open due to fire-induced cable damage. This would result in containment spray actuation which would divert RWST inventory to the containment sump. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as control cables that may cause the spurious start of PEN01A and spurious closure of ENHV0006 are routed in two trays that in close proximity to each other.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within the fire area is extremely low since it is normally locked and access restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition, combined with the fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-24, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that containment spray pump PEN01A can be stopped by opening breaker NB0102 located on 4.16 kV bus NB01 in Fire Area C-9.

Fire Area C-30 Control Building, 2,047-ft-6-in elevation; Cable Chase

OMA No. 5

Containment spray pump PEN01B could spuriously start and discharge valve ENHV0012 could spuriously open due to fire-induced cable damage. This would result in containment spray actuation which would divert RWST inventory to the containment sump. The fire barrier and spatial separation requirements of III.G.2, are not satisfied, as control cables that may cause the spurious start of PEN01A and spurious closure of ENHV0006 are located in separate cable trays having a horizontal spatial separation of approximately 5 feet.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within the fire area is extremely low since it is normally locked and access restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition, combined with the fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-30, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that containment spray pump PEN01B can be stopped by opening breaker NB0203 located on 4.16 kV bus NB02 in Fire Area C-10.

Fire Area C-33 Control Building, 2,073-ft-6-in Elevation; South Cable Chase

OMA No. 5

Containment spray pump PEN01B could spuriously start and discharge valve ENHV0012 could spuriously open due to fire-induced cable damage. This would result in containment spray actuation which would divert RWST inventory to the containment sump. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as control cables that may cause the spurious start of PEN01A and spurious closure of ENHV0006 are routed in separate cable trays

that are in close proximity to each other, having a worst-case horizontal separation of approximately 1 ft.

The licensee stated that all cables are IEEE-383 qualified and there are no fixed ignition sources within the cable chase that would likely initiate a fire event warranting OMA implementation. In addition, the likelihood of a transient combustible-induced fire within the fire area is extremely low since it is normally locked and access restricted to occasions associated with periodic area inspections and surveillance activities. The low likelihood of fire ignition, combined with the fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area C-33, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that containment spray pump PEN01B can be stopped by opening breaker NB0203 located on 4.16 kV bus NB02 in Fire Area C-10.

Fire Area RB Reactor Building General Area

OMA No. 1

Cables associated with letdown isolation valves BGLCV0459 and BGLCV0460 may be damaged in this area, preventing these valves from being closed from the control room. The fire barrier and spatial separation requirements of III.G.2 are not satisfied, as the cables for both BGLCV0459 and BGLCV0460 are routed in the same raceway. The licensee stated that letdown is not required for PFSSD. However, letdown isolation is required to prevent RCS flow diversion.

The licensee stated that all cables are IEEE-383 qualified. The noteworthy ignition sources within the Reactor Building are the reactor coolant pumps (RCPs). A fire involving RCPs A, B and C could affect cables associated with letdown isolation valves BGLCV0459 and BGLCV0460. These cables are run in conduit in the vicinity of RCPs B and C and cable tray in the vicinity of RCP A. Based on the results of a circuit analysis, the licensee stated that fire damage to the letdown cables in proximity to the RCPs will not result in the inability to close the letdown valves from the control room.

In addition, the licensee stated that the likelihood of a transient combustible-induced fire within the fire area is extremely low since personnel access within the Reactor Building is strictly limited during normal power operations. The licensee further stated that the few work activities conducted do not result in appreciable transient combustible introduction, as each item taken into the Reactor Building must be accounted for as a part of foreign material control. Therefore, the likelihood of a transient combustible fire within the Reactor Building at normal power is very low. The low likelihood of fire ignition, combined with the fire protection features described above, provides assurance that the redundant trains would not be damaged.

In the unlikely event that both trains of cable are lost due to a fire in Fire Area RB, an OMA is available to restore or maintain the necessary function to the affected equipment. Specifically, the licensee stated that valves BGLCV0459 and BGLCV0460 can be isolated by closing instrument air supply valve KAV0201 located in the South Pipe Penetration Room on the

2,000-ft elevation of the Auxiliary Building. This removes air to BGLCV0459, BGLCV0460, and all air-operated components within the Reactor Building.

3.3 Feasibility and Reliability of the Operator Manual Actions

This analysis postulates that OMAs may be needed to assure safe shutdown capability in addition to the traditional fire protection features described above. NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," provides criteria and associated technical bases for evaluating the feasibility and reliability of post-fire OMAs in nuclear power plants. The following provides the WCGS analysis of these criteria for justifying the OMAs specified in this amendment.

3.3.1 Bases for Establishing Feasibility and Reliability

The licensee's analysis addresses factors such as environmental concerns, equipment functionality and accessibility, available indications, communications, portable equipment, personnel protection equipment, procedures and training, staffing, and demonstrations.

In its letter dated March 25, 2010, the licensee stated that environmental factors such as radiation, lighting, temperature, humidity, smoke, toxic gas, noise, and Halon fire suppression discharge were evaluated and found to not represent a negative impact on the operators' abilities to complete the OMAs. The licensee stated that radiation conditions within the areas of concern will not be adversely affected by the fire and subsequent spurious equipment operation.

The licensee also confirmed that each of the OMA locations addressed by this amendment are provided with emergency lighting that illuminates both the potential egress paths and the component requiring OMA manipulation. The licensee also confirmed that temperature and humidity conditions will not challenge the operators performing the OMAs. Additionally, the licensee indicated that heat and smoke or gas generation from a fire will not impact the operator performing the OMAs. This is further supported by the fact that the locations of the postulated fire events are in different fire areas than the locations for where the actions are performed. For each of the 14 fire areas identified above, the licensee stated that habitable environmental conditions will be present for performance of the requested OMAs.

The licensee stated that equipment credited for implementation of OMAs was reviewed to ensure it is accessible, available, and not damaged by the effects of the fire. In addition, the licensee indicated that procedures are in place, in the form of fire response procedures, to ensure that clear and accessible instructions on how to perform the OMAs are available to the operators.

All of the requested OMAs are directed by plant procedures and the operators are trained in the use of the procedures. Specifically, procedure OFN KC-016, "Fire Response," is entered whenever a fire is reported to the control room by WCGS personnel or indication of a fire occurs on fire alarm panel KC008, which is located in the control room. Following validation of a fire alarm, procedure OFN KC-016 directs that the fire brigade be dispatched. Immediately following fire brigade callout, OFN KC-016 directs the operators to review potential OMAs for the fire-affected area. The licensee stated that each OMA was reviewed to ensure it is included within procedure OFN KC-016. Training for the procedure is on a biennial cycle. The

procedure is also exercised during fire brigade drill activities that involve postulated fires affecting PFSSD success path. To ensure that control room personnel are promptly made aware of potential OMAs, including the instrumentation that can be relied upon to assess the need for performing the OMA, the specific OMAs are identified in an attachment to the procedure.

The licensee further stated that the OMA review is a continuous action step within OFN KC-016, which means that the operator is responsible for observing the step for potential response throughout the fire event. The exact protected instrumentation that remains undamaged and available for diagnostic use is given to the operators in the fire response procedure, OFN KC-016. In summary, for each fire area having a potential OMA, procedure OFN KC-016 identifies the following:

- OMAs that are required to achieve PFSSD hot standby,
- OMAs to mitigate spurious equipment operation, and
- Available diagnostic instrumentation to aid in determining the need to perform OMA.

The licensee stated that the availability of relevant diagnostic indications was reviewed to ensure operators would be able to:

- Detect and diagnose fire location
- Assess the need to perform an OMA
- Direct personnel performing an OMA
- Provide feedback to the operators, if not directly observable, to verify that the OMA has provided the expected result and that the manipulated equipment will remain in the desired position.

With regard to communications, the licensee stated that communications systems, including the plant's public address system (Gaitronics) and the radio system communication systems, were reviewed to ensure that an acceptable communication method is available to perform the requested OMAs. Although the communication system is not specifically hardened for post-fire survivability, the radio and Gaitronics systems are robustly designed such that one or the other is likely to remain available following most fire scenarios. In the event that both systems are inoperable, face-to-face communication, and adequate time, is available to dispatch the safe shutdown operators from the control room to perform the tasks and return to the control room for reassignment when the task is complete. The on-shift operator responsible for OFN KC-016 OMAs, is trained to respond to the control room for instruction when a fire brigade callout announcement is made for a fire event. This approach allows the control room operators to provide initial face-to-face direction to the operator responsible for implementing the OMAs.

The licensee stated that portable equipment needed to successfully implement the OMAs was identified and reviewed for availability and dedication. In addition, the on-shift operator responsible for implementing OMAs identified in OFN KC-016 is required to carry a hand tool for cutting wire tab type locking devices on components that potentially would be required to be manipulated, a master key to unlock electronic card reader-controlled doors, a flashlight, and a

key for ABFHCO002 and ABFHCO003 enclosure housings. The licensee also stated that personnel protective equipment required to support the performance of the requested OMAs has been identified and assessed for availability.

With regard to staffing, the licensee stated that manpower requirements for OMA implementation were identified and reviewed against the information contained in NUREG-1852 to ensure that an adequate number of qualified personnel will be available so that hot standby conditions can be achieved and maintained in the event of a fire. One operations individual is assigned responsibility for procedure OFN KC-016, prior to taking the shift watch. This assignment is documented on the Shift Managers Relief Checklist (APF 21-001-01) and the assigned operator has no control room, fire brigade, security, or emergency planning responsibility.

Additionally, the licensee stated that the OMA response outside the control room was reviewed to determine that it could be successfully performed (to the extent practical) within the time constraints of this analysis. Multiple operations personnel were timed in the simulated performance of the OMAs. The starting point for the timing evolution was the Work Control Center (Room 3613), which is adjacent to the control room on the 2,047-ft elevation of the Communications Corridor. Where multiple OMAs were involved for a particular fire area, the timing for each OMA was initiated from Room 3613 to account for each OMA response originating from the control room in the event that the fire affects radio and Gaitronics communication capability.

3.3.1.1 Feasibility

For each of the fire areas addressed by this amendment, the required OMA completion time limits versus the time before the action becomes critical to safely shutting down the unit were reviewed. The following methodology was applied for each fire area where fire-induced spurious equipment operation could result in the need to perform a mitigating OMA to ensure PFSSD capability.

1. The equipment that could spuriously operate as a result of the fire is identified and the consequence of the spurious actuation(s) is evaluated.

2. An appropriate mitigating OMA was identified and its location determined.

3. An event timeline was developed for each fire area necessitating OMA implementation. The timeline was based on a thermal hydraulic analysis (WCNOC-CP-002) developed by the licensee to assess plant performance when an OMA was credited in response to fire-induced spurious equipment operation. For each fire area, fire-induced spurious equipment operations were postulated to occur simultaneously at fire initiation. In addition, the licensee's event timeline starts at fire initiation.

4. The timeline results were reviewed to determine if adequate time is available to ensure feasibility of the OMA.

5. The timeline results were reviewed to determine if adequate time margin is available to ensure reliability of the OMA.

6. The expected environmental conditions for the OMA locations and associated egress routes were reviewed for acceptability.

7. Equipment credited for implementation of OMAs was reviewed to ensure it is accessible, available, and not damaged by the effects of the fire.

8. The availability of relevant diagnostic indications was reviewed. This review was performed to ensure operators would be able to:

   - Detect and diagnose a fire and its location
   - Assess the need to perform the OMA
   - Direct personnel performing the OMA
   - Provide feedback to other operators in the field, if not directly observable, to verify that the OMA has provided the expected result and the manipulated equipment will remain in the desired position.

9. Communication equipment was reviewed to ensure an acceptable communication method is available to the extent it is needed.

10. Portable equipment needed to successfully implement the OMA was identified and reviewed for availability and dedication to PFSSD, where appropriate.

11. Personnel protective equipment required to support the performance of the OMAs is identified and assessed for availability, where appropriate.

12. Each OMA was reviewed to ensure it is included within the fire response procedure developed to ensure the availability of a PFSSD success path following a fire outside the control room (OFN KC-016, Fire Response).

13. The manpower requirements for OMA implementation were identified and reviewed against Operations staffing level. Consistent with NUREG-1852 guidance, the licensee did not credit the use of control room or fire brigade personnel for performing OMAs.

14. Performance of all OMAs was demonstrated. Specifically, the OMA responses outside the control room were reviewed to determine that they could be successfully performed within the time constraints of the licensee's analysis. The licensee stated that multiple operations personnel were timed in the simulated performance of the OMAs, and any limitations (environmental, personnel protective equipment, tools, etc.) identified as applicable to the performance of the OMAs were addressed.

15. Fire protection defense-in-depth objectives were assessed for each fire area where an OMA is credited for PFSSD.

This approach is considered to be an appropriate approach to analyzing the timelines associated with each of the OMAs with regard to the feasibility and reliability of the actions included in this amendment.

The following table summarizes the "required" versus "allowable" times for each OMA. The indicated "required time" is the time needed to complete all actions that may be required as a result of fire in each of the identified fire areas. The required time shown in the table includes Diagnosis Time, Implementation Time, and Uncertainty Time.

Fire Area of Fire Origin	OMA	Required Time (min)	Allowable Time (min)	Margin (min)	Margin (%)
A-1	Isolate Letdown by closing valve KAV0201 (Reactor Building Instrument Air Outside Containment Isolation Valve)	39	180	141	78
A-11	Isolate Letdown by closing valve KAV0201 (Reactor Building Instrument Air Outside Containment Isolation Valve)	42	180	138	77
A-16N	Control / isolate steam release through SG 'B'ARV ABPV0002	64	200	136	68
	Control / isolate steam release through SG 'C' ARV ABPV0003				
	Fail SG 'D' ARV ABPV0004 to Closed position to isolate steam release				
A-18*	Isolate Letdown by closing valve KAV0201 (Reactor Building Instrument Air Outside Containment Isolation Valve)	35	50	15	30
C-7	Isolate Letdown by closing valve KAV0201 (Reactor Building Instrument Air Outside Containment Isolation Valve)	37	180	143	79
C-12	Isolate Letdown by closing valve KAV0201 (Reactor Building Instrument Air Outside Containment Isolation Valve)	37	180	143	79
C-18*	Isolate Letdown by closing valve KAV0201 (Reactor Building Instrument Air Outside Containment Isolation Valve)	47	50	3	6
	Open Breaker NB0102 to terminate Train A Containment Spray				

Fire Area of Fire Origin	OMA	Required Time (min)	Allowable Time (min)	Margin (min)	Margin (%)
C-21*	Isolate Letdown by closing valve KAV0201 (Reactor Building Instrument Air Outside Containment Isolation Valve)	42	50	8	16
	Open Breaker NB0102 to terminate Train A Containment Spray				
C-22	Open Breaker NB0203 to Terminate Train B Containment Spray	21	60	39	65
C-23	Open Breaker NB0203 to Terminate Train B Containment Spray	26	60	34	57
C-24*	Isolate Letdown by closing valve KAV0201 (Reactor Building Instrument Air Outside Containment Isolation Valve)	47	50	3	6
	Open Breaker NB0102 to terminate Train A Containment Spray				
C-30	Open Breaker NB0203 to Terminate Train B Containment Spray	34	60	26	43
C-33	Open Breaker NB0203 to Terminate Train B Containment Spray	26	60	34	57
RB	Isolate Letdown by closing valve KAV0201 (Reactor Building Instrument Air Outside Containment Isolation Valve)	91	120	29	24

**See Section 3.3.1.1 Reliability for more information.*

As discussed above, a fire in Fire Areas A-1, A-11, A-18, C-7, C-12, C-18, C-21, or C-24 may require an operator to isolate letdown by closing Reactor Building Instrument Air Isolation Valve KAV0201. The licensee stated that closing KAV0201 will cause letdown isolation valves BGLCV0459 and BGLCV0460 to fail to the closed position in less than three minutes. For Fire Areas A-18, C-18, C-21, and C-24, this action may need to be completed within 50 minutes if the fire also caused a concurrent opening of atmospheric relief valves ABPV0002, ABPV0001, or ABPV0003. This is the most limiting time constraint of the requested OMAs. The licensee stated that pressurizer level and VCT level indicators are available and provide an adequate method for operators to diagnose a failure of letdown isolation valves BGLCV0459 and BGLCV0460 to close. Only one operator would be required and it would take approximately 15 minutes for access to the area and to perform the action (i.e., close Reactor Building Instrument Air Isolation KAV0201). The time sensitivity of these OMAs is further discussed with regard to feasibility and reliability below.

The licensee's analysis demonstrates that, for the expected scenarios, the OMAs can be diagnosed and executed within the time available to complete them and that various factors, as discussed above, have been considered to address uncertainties in estimating the time available. Therefore, the OMAs included in this review are feasible because there is adequate

time available for the operators to perform the required OMAs to achieve and maintain hot shutdown following a fire.

3.3.1.2 Reliability

As stated in NUREG-1852, for a feasible action to be performed reliably, it should be shown that there is adequate time available to account for uncertainties not only in estimates of the time available, but also in estimates of how long it takes to diagnose and execute the OMAs (e.g., as based, at least in part, on a plant demonstration of the action under non-fire conditions). To confirm reliability, for each of fire area having the potential to initiate an OMA, the licensee considered uncertainties associated with estimating how long it takes to diagnose and execute operator manual actions.

As indicated in Section 3.3.1.1 above, the OMAs for a fire in Fire Areas A-18, C-18, C-21, and C-24 have the most limiting time constraint. The postulated scenarios for these OMAs assumes that a fire causes an atmospheric relief valve (ABPV0002, ABPV0001, or ABPV0003) to open concurrently with letdown isolation valves BGLCV0459 and BGLCV0460. In this case, the mitigating OMAs would need to be completed within 50 minutes. The most limiting cases occur in Fire Areas C-18 and C-24 which have a margin of 3 minutes. However, this limited margin is based on using the most limiting information from the licensee. For example, if the licensee postulated up to 30 minutes for diagnosis, the required time below includes the full 30 minutes. In addition, all of the required actions are of low complexity, involving the manipulation of valves or circuit breakers. The licensee stated that pressurizer level and VCT level indicators are available and provide an adequate method for operators to diagnose a failure of letdown isolation valves BGLCV0459 and BGLCV0460 to close. Only one operator would be required and it would take approximately 15 minutes to access the area and to perform the action (i.e., close Reactor Building Instrument Air Isolation KAV0201). Application of "uncertainty time" provides additional assurance that even OMAs having a small time margin (e.g., Fire Areas C-24 and C-18) can be successfully performed with a high rate of success. Finally, these numbers should not be considered without the understanding that the OMAs are a fall back in the unlikely event that the fire protection features and redundancies discussed above are insufficient. The time-authenticated demonstrations presented in the licensee's analysis provide assurance that the OMAs are capable of being performed within the available time so as to avoid a defined undesirable outcome (i.e., they are feasible) and can be performed within a timeframe that allows for adequate time margin to cover potential variations in plant conditions and human performance (i.e., they are reliable).

The completion times noted in the Section 3.3.1.1 above provide reasonable assurance that the OMAs can reliably be performed under a wide range of conceivable conditions by different plant crews because it, in conjunction with the time margins associated with each action and other installed fire protection features, account for sources of uncertainty such as variations in fire and plant conditions, factors unable to be recreated in demonstrations and human-centered factors. Therefore, the OMAs included in this review are reliable because there is adequate time available to account for uncertainties not only in estimates of the time available, but also in estimates of how long it takes to diagnose a fire and execute the OMAs (e.g., as based, at least in part, on a plant demonstration of the actions under non-fire conditions).

3.4 Conclusion of Technical Evaluation

This amendment would allow WCGS to rely on OMAs, in conjunction with the other installed fire protection features, to ensure that at least one means of achieving and maintaining hot shutdown remains available during and following a postulated fire event, as part of its fire protection program, in lieu of meeting the requirements specified in III.G.2 for a fire in Fire Areas A-1, A-11, A-16N, A-18, C-7, C-12, C-18, C-21 through C-24, C-30, C-33, and RB at the plant.

In summary, the defense-in-depth concept for a fire in Fire Areas A-1, A-11, A-16N, A-18, C-7, C-12, C-18, C-21 through C-24, C-30, C-33, and RB at the plant provides a level of safety that results in the unlikely occurrence of fires; rapid detection, control, and extinguishment of fires that do occur; and the protection of structures, systems, and components important to safety. As discussed above, the licensee has provided preventative and protective measures in addition to feasible and reliable OMAs that together demonstrate the licensee's ability to preserve or maintain safe shutdown capability at WCGS in the event of a fire in Fire Areas A-1, A-11, A-16N, A-18, C-7, C-12, C-18, C-21 through C-24, C-30, C-33, and RB at the plant.

In its letter dated November 17, 2010, the licensee provided its proposed changes to Renewed Facility Operating License No. NPF-42. The revised license condition is described in Section 3.5 of this safety evaluation. The NRC staff has reviewed the revised license condition and concluded that the change is acceptable.

As part of its submittal, the licensee also requested NRC staff review and approval of interim compensatory measures provided for Fire Area A-27, "Rod Drive MG Set Room (1403)," located on the 2,026-ft elevation of the Auxiliary Building. However, interim compensatory measures are outside the scope of this license amendment. By letter dated January 29, 2010, the licensee was informed that the interim compensatory measures are outside the scope of this license amendment request and the use of interim compensatory measures should be implemented in accordance with the licensee's approved FPP.

3.5 Revised License Condition 2.C.(5)(a)

In its letter dated November 17, 2010, the licensee proposed the following revised license condition to include the deviation approved by this amendment request.

(5) Fire Protection (Section 9.5.1, SER, Section 9.5.1.8, SSER #5)

(a) 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, and Amendment No. 191 subject to provisions b and c below.

The NRC staff has reviewed the revised license condition and concluded that the change is acceptable.

4.0 REGULATORY COMMITMENTS

Plant modifications for Fire Area A-27 are being implemented to eliminate the need for OMAs.

In its letter dated March 4, 2009, the licensee made a regulatory commitment to maintain a compensatory fire watch in Fire Area A-27 until change package 012418 is field implemented. However, as described in Section 3.4 above, Fire Area A-27 is outside the scope of this amendment request.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Kansas State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding published in the *Federal Register* on April 21, 2009 (74 FR 18258). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Brian Metzger

Date: December 16, 2010

December 16, 2010

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

SUBJECT: WOLF CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE: DEVIATION FROM FIRE PROTECTION PROGRAM REQUIREMENTS (TAC NO. ME0797)

Dear Mr. Sunseri:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 191 to Renewed Facility Operating License No. NPF-42 for the Wolf Creek Generating Station (WCGS). The amendment consists of changes to the WCGS Updated Safety Analysis Report (USAR) in response to your application dated March 4, 2009, as supplemented by letters dated March 25 and November 17, 2010.

The amendment revises the fire protection program as described in the WCGS USAR. Specifically, a deviation from certain technical requirements to Title 10 of the *Code of Federal Regulations*, Part 50, Appendix R, Section III.G.2, as documented in Appendix 9.5E of the WCGS USAR, is requested regarding the use of operator manual actions in lieu of meeting circuit separation protection criteria. It also revises license condition 2.C.(5)(a) to include the deviation approved by this amendment request.

A copy of our related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosures:
1. Amendment No. 191 to NPF-42
2. Safety Evaluation

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BNetzger, NRR/DRA/AFPB

ADAMS Accession No. ML103090262 *Memo dated October 15, 2010

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	DRA/AFPB/BC	OGC, NLO	NRR/LPL4/BC	NRR/LPL4/PM
NAME	BSingal	JBurkhardt	AKlein*	BMizuno	MMarkley	BSingal
DATE	11/18/10	11/8/10	10/15/10	11/29/10	12/16/10	12/16/10

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