

Point of contact for this initiative is Sandra Morris (202) 358-0532, [Sandra.Morris@nasa.gov](mailto:Sandra.Morris@nasa.gov).

**William McNally,**

*Assistant Administrator for Procurement.*

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## NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

### Public Availability of the National Archives and Records Administration FY 2011 Service Contract Inventory

**AGENCY:** National Archives and Records Administration.

**ACTION:** Notice of public availability of FY 2011 Service Contract Inventory.

**SUMMARY:** In accordance with Section 743 of Division C of the Consolidated Appropriations Act of 2010 (Pub. L. 111-117), the National Archives and Records Administration (NARA) is publishing this notice to advise the public of the availability of its FY 2011 Service Contract inventory. This inventory provides information on service contract actions over \$25,000 that were made in FY 2011. The information is organized by function to show how contracted resources are distributed throughout the agency. The inventory has been developed in accordance with guidance issued on November 5, 2010 by the Office of Management and Budget's Office of Federal Procurement Policy (OFPP). OFPP's guidance is available at <http://www.whitehouse.gov/sites/default/files/omb/procurement/memo/service-contract-inventories-guidance-11052010.pdf>. NARA has posted its inventory and a summary of the inventory on the NARA homepage at the

following link: <http://www.archives.gov/contracts/>.

#### FOR FURTHER INFORMATION CONTACT:

Robert Singman, Deputy Director Acquisitions Division, National Archives and Records Administration, 8601 Adelphi Road, College Park, MD 20740-6001. Telephone: 301-837-0712. Email: [Robert.singman@nara.gov](mailto:Robert.singman@nara.gov).

Dated: February 3, 2012.

**Charles K. Piercy,**

*Executive Business Support Services.*

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## NUCLEAR REGULATORY COMMISSION

[Docket No. 50-247]

### Entergy Nuclear Indian Point 2, LLC; Entergy Nuclear Operations, Inc.; Indian Point Nuclear Generating Unit No. 2; Exemption

#### 1.0 Background

Entergy Nuclear Operations, Inc. (Entergy or the licensee) is the holder of Facility Operating License No. DPR-026, which authorizes operation of Indian Point Nuclear Generating Unit No. 2 (IP2). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC or the Commission) now or hereafter in effect.

IP2 is a pressurized-water reactor located approximately 24 miles north of the New York City boundary line on the east bank of the Hudson River in Westchester County, New York.

#### 2.0 Request/Action

Title 10 of the Code of Federal Regulations (10 CFR) part 50, Section 50.48(b), requires that nuclear power

plants that were licensed to operate before January 1, 1979, satisfy the requirements of 10 CFR part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," Section III.G, "Fire protection of safe shutdown capability." The circuit separation and protection requirements being addressed in this request for exemption are specified in Section III.G.2. Since IP2 was licensed to operate before January 1, 1979, IP2 is required to meet Section III.G.2 of Appendix R to 10 CFR part 50.

The underlying purpose of Section III.G of Appendix R to 10 CFR part 50 is to establish reasonable assurance that safe shutdown (SSD) of the reactor can be achieved and maintained in the event of a postulated fire in any plant area. Circuits which could cause maloperation or prevent operation of redundant trains of equipment required to achieve and maintain hot shutdown conditions as a result of fire in a single fire area must be protected in accordance with III.G.2. If conformance with the technical requirements of III.G.2 cannot be assured in a specific fire area, an alternative or dedicated shutdown capability must be provided in accordance with Section III.G.3, or an exemption obtained in accordance with 10 CFR 50.12, "Specific exemptions."

By letter dated March 6, 2009, Entergy requested an exemption from the requirements of 10 CFR part 50, Appendix R, in accordance with 10 CFR 50.12. Specifically, Entergy requested an exemption to allow the use of Operator Manual Actions (OMAs) in lieu of meeting certain technical requirements of III.G.2 in Fire Areas C, F, H, J, K, P, and YD of IP2. The table below provides the dates and topics of the submittals related to this request.

Subject	Author	Date	Description	ADAMS Accession
Exemption Request from Appendix R.	Entergy .....	March 6, 2009 .....	Original Submittal .....	ML090770151.
Revised Exemption Request.	Entergy .....	October 1, 2009 .....	Revision to March 2009 submittal, incorporated changes to Attachment 2, <i>Technical Basis in Support of Exemption Request</i> .	ML092810231
Request for Additional Information (RAI) #1.	NRC .....	January 20, 2010 .....	Request for information on the overall defense-in-depth for each fire zone..	ML100150128
RAI Response #1 .....	Entergy .....	May 4, 2010 .....	Response to the staff's January 20, 2010, RAI.	ML101320230
RAI #2 .....	NRC .....	August 11, 2010 .....	RAI on reactor coolant system makeup, separation distances, <i>etc</i> .	ML102180331
RAI Response #2 .....	Entergy .....	September 29, 2010 ....	Response to the staff's August 11, 2010, RAI ..	ML102930237
RAI #3 .....	NRC .....	December 16, 2010 .....	RAI on reactor coolant system makeup .....	ML103500204
RAI Response #3 .....	Entergy .....	January 19, 2011 .....	Responses to the staff's December 16, 2010, RAI.	ML110310013
Letter to revise previously submitted information.	Entergy .....	February 10, 2011 .....	Letter updating tables contained in previous submittals.	ML110540321

Subject	Author	Date	Description	ADAMS Accession
Letter to revise previously submitted information.	Entergy .....	May 26, 2011 .....	Letter updating tables contained in previous submittals.	ML11158A197

III.G.2 establishes various protection options for providing reasonable assurance that at least one train of systems, equipment, and cabling required to achieve and maintain hot shutdown conditions remains free of fire damage. In lieu of providing one of the means specified in the regulation, Entergy requests an exemption from III.G.2 to allow the use of OMAs to achieve and maintain hot shutdown conditions in the event of fire in seven fire areas at IP2, Fire Areas C, F, H, J, K, P, and YD. The licensee further subdivides these fire areas into one or more fire zones for analysis purposes.

**3.0 Discussion**

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. The licensee stated that special circumstances exist because the application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule.

In accordance with 10 CFR 50.48(b), nuclear power plants licensed to operate

before January 1, 1979, are required to meet Section III.G, of 10 CFR part 50, Appendix R. The underlying purpose of Section III.G of 10 CFR part 50, Appendix R, is to ensure that the ability to achieve and maintain SSD is preserved following a fire event. The regulation intends for licensees to accomplish this by extending the concept of defense-in-depth to:

- Prevent fires from starting.
- Rapidly detect, control, and extinguish promptly those fires that do occur.
- 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 SSD of the plant.

Section III.G.2 requires one of the following means to ensure that a redundant train of SSD 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 by a fire barrier having a 3-hour rating;
- b. Separation of cables and equipment by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards and with fire detectors and an automatic fire suppression system installed in the fire area; or

c. Enclosure of cables and equipment of one redundant train in a fire barrier having a 1-hour rating and with fire detectors and an automatic fire suppression system installed in the fire area.

In its March 6, 2009, and October 1, 2009, submittals, Entergy requested an exemption from certain technical requirements of III.G.2 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 one of the required means prescribed in III.G.2 in Fire Areas C, F, H, J, K, P, and YD. The licensee also listed an operator action to implement emergency operating procedure (EOP) 2-FR-H.1, "Response To Loss Of Secondary Heat Sink." The NRC does not consider implementing 2-FR-H.1 an OMA, as actions to establish reactor coolant system decay heat removal can be performed from the control room and there are redundant trains of equipment located outside of the fire area of fire origin.

Each OMA included in this review consists of a sequence of tasks that occur in various fire areas. The OMAs are initiated upon confirmation of a fire in a particular fire area, which the licensee has further subdivided into fire zones. Listed in the order of the fire area of fire origin, the OMAs included in this review are as follows:

OMA#	Area of fire origin	Area name	Operator manual actions
1 .....	C .....	Auxiliary Boiler Feed Pump Room, Elevation 18'-6" of the Auxiliary Feed Pump Building.	Implement EOP FR-H.1 as directed by EOPs and status trees if necessary to establish alternate secondary heat sink. Action performed from the control room, so the NRC does not consider this an OMA.
2 .....	.....	.....	Operate turbine-driven 22 auxiliary feedwater (AFW) pump upon reentry to the room following the initial hour of the fire scenario.
3 .....	.....	.....	Open or check open 22 AFW pump steam supply isolation valves PCV-1310A and PCV-1310B.
4 .....	.....	.....	Operate 22 AFW pump flow control valves FCV-405A (discharge to 21 steam generator (SG)), FCV-405B (discharge to 22 SG), FCV-405C (discharge to 23 SG), and/or FCV-405 to align AFW flow to selected steam generators.
5 .....	F .....	Primary Auxiliary Building and Fan House .....	Open HCV-142 bypass valve 227 to align charging pump makeup path to the Reactor Coolant System (RCS).

OMA#	Area of fire origin	Area name	Operator manual actions
6			Align charging pump suction source to the Refueling Water Storage Tank (RWST).
7			Transfer instrument buses 23 and 23A to alternate power.
8	H	Vapor (Reactor) Containment Building	Fail open valves 204A (charging flow to Loop 2 hot leg) and 204B (charging flow to Loop 1 cold leg) to align charging pump makeup path to the RCS.
9			Activate or enable Alternate Safe Shutdown System pneumatic instruments (steam generator level, pressurizer pressure and level) at Fan House local control panel.
10			Enable Alternate Safe Shutdown System source-range channel and Loop 21 and 22 hot leg (T <sub>H</sub> ) and cold leg (T <sub>C</sub> ) temperature channels.
11	J	Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building.	Trip breakers 52/5A and 52-SAC on Bus 5A and 52/6A and 52/TAO at Bus 6A and remove control power fuses.
12			Transfer Instrument Buses 23 and 23A to emergency power source.
13			Align charging pump suction to RWST.
14	K	Auxiliary Feed Pump Building (not including the AFW Pump Room).	Operate transfer switch EDC5 and close supply breaker at substation 12FD3 to transfer 21 AFW Pump to Alternate Safe Shutdown System power source.
15			Open 21 AFW pump recirculation bypass valve BFD-77.
16	P	Component Cooling Water (CCW) Pump Room	Transfer 23 CCW pump to Alternate Safe Shutdown System power feed followed by breaker closure at 12FD3.
17			Start Appendix R Diesel Generator (ARDG) if normal power and offsite power are lost.
18	YD	Outdoor (Yard) Area	Open HCV-142 bypass valve 227 to align charging pump makeup path to RCS.

In their submittals, the licensee described elements of their fire protection program that provide their justification that the concept of defense-in-depth that is in place in the above fire areas is consistent with that intended by the regulation. The licensee utilizes various protective measures to accomplish the concept of defense-in-depth. Specifically, the licensee stated that the purpose of their request was to credit the use of OMAs, in conjunction with other defense-in-depth features, in lieu of the separation and protective measures required by III.G.2 for a fire in the fire areas identified above.

In their March 6, 2009, and October 1, 2009, submittals, the licensee provided an analysis that described how fire prevention is addressed for each of the fire areas for which the OMAs may be required because the separation requirements for equipment and

electrical circuits required by III.G.2 are not met. Specifically, the licensee stated that noncombustible materials have been used to the maximum extent practicable and that the introduction of combustible materials into areas with safety-related equipment, including Fire Areas C, F, H, K, and P, is strictly controlled by administrative procedures. The administrative procedures govern the handling, storage, and limitations for use of ordinary combustible materials, combustible and flammable gases and liquids, and other combustible supplies. In addition, periodic fire prevention inspections are performed to assess compliance with Indian Point's programs for Control of Combustibles and Control of Ignition Sources. The licensee stated that the administrative controls are described in the IP2 Fire Protection Program (FPP), which is incorporated by reference into

the Updated Final Safety Analysis Report.

The licensee stated that both thermoplastic and thermoset low-voltage power, control, and instrument cables are installed at IP2. Since the thermoplastic insulated cables were manufactured and installed prior to the issuance of IEEE-383, a standard for nuclear plant cables, they were not qualified to that standard. In its May 4, 2010 letter, the licensee stated that these cables are constructed with an asbestos glass braid outer jacket which provides protection from flame spread. In addition, the licensee stated that the results of various tests, as well as an actual fire event during plant construction, have demonstrated the ability of this type of thermoplastic insulated cables to minimize the growth and spread of cable fires. The licensee also stated that the likelihood of self-

ignited cable fires is minimized by appropriately sized electrical protection devices (e.g., fuses and circuit breakers). The licensee stated that all cables installed after plant construction are thermoset cables which meet the IEEE-383 standard. The IEEE-383 standard includes fire-retardation characteristics.

All of the fire areas in the plant are comprised of one or more fire zones consisting of separate compartments or fire zone delineations based on spatial separation. In addition, the licensee stated that the localization of hazards and combustibles within each fire zone, combined with the spatial or physical barrier separation between zones, provides reasonable assurance that a fire that occurs within a particular zone will be confined to that zone. As such, the licensee provided a characterization of the defense-in-depth that is present in each of the fire zones containing multiple trains of SSD equipment. The licensee further stated that for each of the fire zones where OMAs are performed, the adequacy of non-rated fire barriers was evaluated to ensure that they can withstand the hazards associated with the area. Therefore, this review evaluates the defense-in-depth provided in each of the zones of concern.

In its submittals, the licensee provided a summary of plant-specific fire protection features provided for each fire zone identified in its request including an account of combustible loading (both fixed and transient), ignition sources, detection, suppression, administrative controls, and identified any additional fire protection features that may be unique to the fire zone, such as electrical raceway fire barriers. In its responses, the licensee stated that combustibles and sources of ignition are tightly controlled by administrative controls programs and that the areas included in this exemption are not shop areas so hot work activities (such as welding) are infrequent and appropriate administrative controls (e.g., hot work permits, fire watch, and supervisory controls) are in place if hot work activities do occur. The licensee also stated that the original installation of the suppression and detection systems was accepted by the NRC staff in safety evaluation reports (SERs) dated January 31, 1979, and a supplement dated October 31, 1980, and that there are no code compliance items that present an adverse impact to the implementation of the requested OMA. Within the fire zones of concern to its request, the licensee stated that fire-rated assemblies are only used and credited for intra-zone separation of redundant SSD equipment trains in part of Fire Area F

(Fire Zone 7A) and part of Fire Area P (Fire Zone 1). The fire-rated assemblies consist of a Hemyc Electrical Raceway Fire Barrier System (ERFBS) and have been evaluated to ensure they are adequate for the hazards of the areas of installation.

Entergy stated that for each of the fire areas addressed in this evaluation, Post-Fire Safe Shutdown (PFSSD) is principally accomplished by remaining in the Central Control Room (CCR) and conducting a normal (non-alternative) shutdown. In all cases, the identified OMA mitigate conditions where certain technical requirements of III.G.2 are not satisfied.

Entergy further stated that the OMA required for achieving and maintaining hot shutdown conditions are feasible, reliable, and are not impacted by environmental conditions (radiation, lighting, temperature, humidity, smoke, toxic gas, noise, fire suppression discharge, etc.) associated with fires in III.G.2 areas. The feasibility and reliability of the requested OMA are addressed in Section 4.0 of this evaluation.

#### *NRC Staff Observations*

In its May 4, 2010, response to RAI-07.1, the licensee stated that no credit was taken for immediate and proactive OMA response by plant operators upon the receipt of a fire detection alarm in any of the identified fire zones. Instead, the licensee stated that OMA are initiated upon the detection of operating abnormalities or failures caused by a postulated fire event. In this same response, the licensee stated that they conducted exercises using the plant simulator to evaluate the feasibility of the OMA where a fire condition or a spontaneous reactor trip caused by a fire was announced at the outset of the simulation followed by the failure of discrete components that are subject to impairment due to fire damage to cables or components resulting from a fire in the area of concern. For fires originating in fire zones lacking fire detection and/or automatic fire suppression systems, the NRC staff considers it improbable that the operators would properly identify that the indications were the result of a fire instead of some other fault. In addition, the operators would be delayed in positively identifying the location of the fire based on these indirect and ambiguous indicators. Therefore, for some scenarios involving fire zones that lack fire detection systems, operators are unlikely to identify and respond to a fire event in a manner that prompts them to perform certain OMA prior to a significant degradation of the plant's condition.

This becomes especially relevant for OMA that are required to be completed within a relatively short period of time, e.g., within about 30 minutes, or have limited margins available to complete the required actions.

For OMA that are required to be completed within a short period of time, the NRC staff evaluates if operators can reliably perform the OMA. In order to be able to perform OMA reliably, it is important that operators are able to promptly implement any required action based on clear indications. Indirect indicators and diagnostic analysis would result in delayed action to initiate the appropriate OMA and would impair their reliable completion. For example, loss of control or indication for a pump or other affected component could result from the power supply circuit breaker opening due to an electrical fault other than a fire, and the operator might delay taking actions for a fire while investigating other potential and more-likely causes. The NRC staff documented a position on procedures and training for such actions in Section 4.2.9 of NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," which notes that the procedures for reactive actions should clearly describe the indications which prompt initiation of the actions. Therefore, where OMA need to be performed within a short period of time, fire zones crediting those OMA are expected to have more robust defense-in-depth and clear, direct procedures than fire zones that have a significant margin in their OMA performance times.

In the August 11, 2010 RAI-02.1 and RAI-06.1, and the December 16, 2010 RAI-01.1, the NRC staff requested that the licensee describe the spatial separation between redundant trains of equipment. However, the licensee's responses only provided information regarding the separation between ignition sources and safe shutdown equipment and no information regarding separation between redundant trains of equipment within the fire area. For example, in its September 29, 2010 response to RAI-06.1 the licensee stated that "The cables serving valves 204A and 204B are routed within Containment (Fire Area H) in raceways which are not separated by 20 feet at all locations, nor are other separation measures as prescribed by III.G.2 (f) provided." During a clarification call with the licensee, the licensee did not provide any dimensional data on train separation. Without dimensional data on train separation, the staff has conservatively assumed that there is no

discernable separation between redundant trains of equipment.

In addition, the licensee noted that the introduction of combustible materials into most areas included in its request was limited via administrative procedures such as EN-DC-161, "Control of Combustibles." The licensee stated that Fire Area J did not contain safety-related systems or components and was not addressed by this procedure. The NRC staff notes that the licensee requested OMAs for Fire Area J and that alternate shutdown equipment and several cables associated with normal safe-shutdown equipment are located in this area. The licensee stated that operator rounds are performed each shift in Fire Area J that would monitor the presence of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee stated that procedures OAP-017, "Plant Surveillance and Operator Rounds" and EN-MA-132, "Housekeeping," include guidance for monitoring general area cleanliness including monitoring for accumulations of combustibles. The NRC staff notes that the combustible material controls procedures for this fire area are not as robust as for safety-related areas, and therefore results in a reduction in the defense-in-depth for the impacted fire zones.

#### *Specific Area or Zone Discussion*

Each of the fire areas or zones included in this exemption is analyzed below with regard to how the concept of defense-in-depth is achieved for each area or zone and the role of the OMAs in the overall level of safety provided for each area or zone.

3.1 Fire Area C—Auxiliary Boiler Feed Pump Room, Elevation 18'–6" of the Auxiliary Feed Pump Building (Fire Zone 23—Auxiliary Boiler Feed Pump (ABFP) Room, Elevation 18'–6")

##### 3.1.1 Fire Prevention

Fire Area C consists of a single room (the ABFP Room or the Auxiliary Feedwater (AFW) Pump Room) and is designated as Fire Zone 23. Note that the pumps which supply water to the steam generators following a reactor trip are generically known as AFW pumps, but at IP2 they are also called Auxiliary Boiler Feed Pumps. The licensee stated that the fire loading in this area is low and that fixed combustibles consist of fire retardant cable insulation. The licensee stated that small quantities of lube oil and Class A combustibles are present but those do not pose a credible challenge to components of concern located in the zone. The licensee also

stated that the ignition sources in the area consist of cable runs, junction boxes, motors, pumps, and electrical panels.

##### 3.1.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 23 does not have a fire suppression system installed but does have an area-wide, ionization smoke detection system installed, which would provide early notification of a fire and assist in a prompt fire brigade response. The licensee also stated that the detection system was designed and installed in accordance with National Fire Protection Association (NFPA) standard NFPA 72D, 1975 Edition.

##### 3.1.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 23 has a ceiling height of approximately 14'–0" and an approximate floor area of 1,210 square feet. This fire zone contains the three AFW pumps (21, 22, and 23) and their discharge valves used to supply water to the steam generators for reactor coolant system decay heat removal when the normal feedwater system is not available, such as following a reactor trip. The licensee stated that a radiant energy shield is installed between 21 AFW pump and 23 AFW pump and that the power cables for 23 AFW pump are wrapped in Hemyc fire barrier material rated for 30 minutes. The licensee stated that damage to the control or instrument cables in the overhead trays could present an immediate impact on redundant AFW trains. As discussed in section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

##### 3.1.4 OMAs Credited for a Fire in Fire Area C (Fire Zone 23)

###### 3.1.4.1 OMA #1—Implement 2-FR-H.1 If Necessary to Establish Alternate Secondary Heat Sink

The licensee stated that for a worst case fire scenario, OMAs to restore AFW functionality would be implemented after a period of 1 hour following fire initiation. This time is provided to extinguish the fire and clear the smoke from the fire area. In the unlikely event that control and indication for all three AFW pumps is lost during the initial hour of a fire event, the licensee stated that Emergency Operating Procedure EOP 2-FR-H.1, "Response to Loss of Secondary Heat Sink," can be implemented to provide the reactor coolant heat removal function using the normal feedwater system or feed-and-

bleed cooling with safety injection pumps. Since actions to remove reactor coolant system decay heat can be performed from the CCR (no OMAs are required in the field), this action is included for completeness only. Since no exemption is being requested, this OMA is not part of this exemption. In a letter dated September 14, 1988, the licensee had described the use of EOP 2-FR-H.1 to the NRC, and by letter dated January 12, 1989, the NRC staff concluded that the licensee's clarifications to the fire protection program conformed with NRC fire protection guidelines and requirements and were acceptable, so the use of EOP 2-FR-H.1 is considered to already be part of the licensee's licensing basis.

###### 3.1.4.2 OMA #2—Operate 22 AFW Pump (Turbine-Driven)

The licensee stated that all three AFW pumps are within this area and associated cables are routed in this area. According to the licensee, the cables of concern are typically routed in rigid steel conduits and located between 8.9 feet and 10.8 feet above the floor. The OMAs for this area are only needed if all three AFW pumps are affected by the fire. The licensee stated that the diagnostic indicator for this scenario would be a loss of control or indication for 22 AFW pump from the CCR or indication of decreasing level in all steam generators as viewed at recorders LR-417, 427, 437, and 447. In the event that this does occur, OMAs #2, #3, and #4 are available to operate 22 AFW Pump. OMA #2 will open PCV-1139 to admit steam, operate HCV-1118 at the pump to control speed, and operate PCV-1213 as necessary to regulate pump bearing cooling water. Since these actions are required to be performed in the zone where the fire occurs, a 60-minute waiting period prior to operator reentry into the area is described in the submittal. The licensee stated that they allotted 60 minutes before performing OMA #2 to allow the fire brigade to perform its fire fighting operations and for the area to be made tenable prior to entering to perform certain OMAs. In Table RAI-08.1-1 of its February 10, 2011 submittal, the licensee indicated that the OMA initiator (postulated fire-induced failure) is located in Fire Zone 23 as is the OMA performance location. The licensee also provided a comment in the same table establishing the 60-minute duration of the waiting period.

If OMA #2 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, a 4.5-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period,

and that the required time to perform the action is 22 minutes, which results in a total required time of 82 minutes. The licensee is crediting the use of EOP 2-FR-H.1 until OMA #2, #3, and #4 can be accomplished. Since there is defense-in-depth including full area fire detection and limited combustibles, and EOP 2-FR-H.1 can be used to perform the reactor coolant system heat removal function while OMA #2 is being implemented, the NRC staff finds this OMA acceptable.

#### 3.1.4.3 OMA #3—Open or Check Open 22 AFW Pump Steam Supply Isolation Valves

This OMA is one of the three OMAs needed to operate the 22 AFW pump, as described in the previous section. OMA #3 would open the 22 AFW pump steam supply pressure control valves PCV-1310A and PCV-1310B in Fire Area K.

If OMA #3 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period, and that the required time to perform the action is 15 minutes, which results in a total required time of 19.5 minutes. The licensee is crediting the use of EOP 2-FR-H.1 until OMA #2, #3, and #4 can be accomplished. Since there is defense-in-depth including full area fire detection and limited combustibles, and EOP 2-FR-H.1 can be used to perform the reactor coolant system heat removal function while OMA #3 is being implemented, the NRC staff finds this OMA acceptable.

#### 3.1.4.4 OMA #4—Operate 22 AFW Pump Flow Control Valves To Align AFW Flow to Selected Steam Generators

This OMA is one of the three OMAs needed to operate the 22 AFW pump, as described in the previous sections. OMA #4 would operate FCV-405A (discharge to 21 SG) and FCV-405B (discharge to 22 SG) in the AFW Pump Room, upon reentry to the room following the initial 60-minute waiting period.

If OMA #4 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, a 4.5-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period, and that the required time to perform the action is 22 minutes, which results in a total required time of 82 minutes. The licensee is crediting the use of EOP 2-FR-H.1 until OMA #2, #3, and #4 can be accomplished. Since there is defense-in-depth including full area fire detection and limited combustibles, and EOP 2-FR-H.1 can be used to perform the reactor coolant system heat removal function while OMA #4 is being

implemented, the NRC staff finds this OMA acceptable.

#### 3.1.5 Conclusion for Fire Area C (Fire Zone 23)

The NRC staff had previously issued an exemption from III.G.2 for Fire Zone 23 in 1984 (ML003776266). In that exemption, the NRC staff found that the low fire load and features such as fire wrap on the 23 AFW pump cables justified an exemption. By letter dated January 12, 1989, the NRC staff concluded that the licensee's clarifications to the fire protection program, which in part described the use of EOP 2-FR-H.1, conform with NRC fire protection guidelines and requirements and were acceptable. The NRC staff notes that the fire detection in this fire zone will clearly alert the operators to take actions for a fire. Therefore, the NRC staff concludes that with the defense-in-depth including full area fire detection and limited combustibles, OMAs #2, #3, and #4, along with EOP 2-FR-H.1, are acceptable for maintaining the reactor coolant system heat removal function and that the III.G.2 exemption for Fire Zone 23 remains valid.

#### 3.2 Fire Area F—Primary Auxiliary Building and Fan House (Fire Zone 5A—Sampling Room, Elevation 80'-0")

##### 3.2.1 Fire Prevention

The licensee stated that the fire loading in this fire zone is moderate and that the fixed combustibles are primarily cable insulation. The licensee also stated that the ignition sources in the fire zone consists of cable runs, junction boxes, and electrical panels.

##### 3.2.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 5A does not have fire detection or fire suppression systems installed.

##### 3.2.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 5A has a ceiling height of approximately 14'-0" and an approximate floor area of 150 square feet. This fire zone contains cables which could affect the position of valves LCV-112B and LCV-112C. These valves provide water to the suction of the charging pumps. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

##### 3.2.4 OMAs Credited for a Fire in Fire Area F (Fire Zone 5A)

###### 3.2.4.1 OMA #6—Align Charging Pump Suction to Refueling Water Storage Tank (RWST)

The licensee stated that a postulated fire in Fire Area F could present the potential for immediate damage to the one charging pump (there are three charging pumps) that is normally in service during power operations by affecting the source of water to the suction of the pump. The licensee stated that the 21 Charging Pump is credited for accomplishing the RCS makeup function in the event of fire in Fire Area F. In the event that the 21 Charging Pump is in operation during a fire in Fire Area F, and fire damage causes valve LCV-112C to spuriously close, the 21 Charging Pump could be damaged due to a loss of suction. For a fire in Fire Area F, the licensee stated that alignment of the charging suction flowpath to the RWST is established by OMAs to close valve LCV-112C and open normally closed manual valve 288, which provides a bypass path around valve LCV-112B. To open valve 288, the licensee stated that operators must reenter Fire Area F following a fire.

If a fire were to occur in Fire Zone 5A and cause LCV-112C to spuriously close, the licensee stated that OMA #6 is available to restore or maintain the necessary function (RCS makeup) to the affected equipment (Charging Pumps) and align charging pump suction to the RWST by closing the volume control tank (VCT) outlet valve LCV-112C and opening RWST manual bypass valve 288. If OMA #6 becomes necessary, the licensee stated that they have assumed a 60-minute waiting period before re-entering the fire area, a 14-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period, and that the required time to perform the action is 18 minutes, which results in a total required time of 78 minutes, while the time available to restore makeup flow to the RCS is 75 minutes. Therefore, there is insufficient margin available to perform the OMA for all fire zones in Fire Area F.

##### 3.2.5 Conclusion for Fire Area F (Fire Zone 5A)

Since the licensee described postulated fire scenarios and Fire Zone 5A lacks an automatic fire detection or automatic suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment

remains free of fire damage or allow reentry to the area to perform OMAs. Additionally, OMA #6 cannot be completed in a timely manner for any fire in Fire Area F. Thus, OMA #6 does not provide assurance that safe shutdown capability will be maintained following the postulated fire events. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 5A and that an exemption from III.G.2 based on OMA #6 cannot be granted for Fire Zone 5A.

### 3.3 Fire Area F—Primary Auxiliary Building and Fan House (Fire Zone 6—22 Charging Pump Room, Elevation 80'–0")

#### 3.3.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation, lube oil, and plastic. Transient combustibles consist of trash, paint, lube oil, and radiation boundaries. The licensee also stated that the ignition source in the area is the 22 charging pump motor.

#### 3.3.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 6 has an automatic fire detection system installed but does not have an automatic fire suppression system installed. The licensee also stated that the detection system was designed and installed in accordance with NFPA 72D, 1975 Edition.

#### 3.3.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 6 has a ceiling height of approximately 15'–6" and an approximate floor area of 282 square feet. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment. The licensee stated that cable YZ1–JB5 associated with valve LCV–112C and cables PL2–M41 and PL2–M42 associated with instrument buses 23 and 23A are located in this area and that they are located 12 feet, 6.8 feet, and 15.6 feet, respectively, from the primary ignition source in the zone, the 22 charging pump motor.

#### 3.3.4 OMAs Credited for a Fire in Fire Area F (Fire Zone 6)

##### 3.3.4.1 OMA #6—Align charging pump suction to RWST

OMA #6 was evaluated in Sections 3.2.4.1 and 3.2.5 above. As stated in Section 3.2.4.1, there is insufficient

margin to perform OMA #6 for any fire zone in Fire Area F.

##### 3.3.4.2 OMA #7—Transfer Instrument Buses 23 and 23A to Alternate Power

The licensee stated that if indication of instrument buses 23 and 23A is lost in the CCR, OMA #7 may be necessary to transfer both buses to their alternate power supply. If OMA #7 becomes necessary, the licensee stated that they have assumed a 5.5-minute diagnosis period and that the required time to perform the action is 2 minutes, while the time available is 30 minutes, which results in 22.5 minutes of margin.

#### 3.3.5 Conclusion for Fire Area F (Fire Zone 6)

Since the licensee described postulated fire scenarios and Fire Zone 6 lacks an automatic fire suppression system and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage or allow reentry to the area to perform OMAs. The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 6. OMA #6 was found to be unacceptable for this fire zone. OMA #7 has insufficient time available considering the lack of fire suppression and therefore is unacceptable for this fire zone. Therefore, the staff finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 6.

### 3.4 Fire Area F—Primary Auxiliary Building and Fan House (Fire Zone 7A—Corridor, Elevation 80'–0")

#### 3.4.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation and electrical cabinets, and that transient combustibles consist of trash, flammable liquids, plastic, cellulose, and radiation boundaries. The licensee also stated that the ignition sources in the area consist of cable insulation, junction boxes, and electrical panels.

#### 3.4.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 7A has an automatic fire detection system installed but does not have an automatic fire suppression system installed. The licensee also stated that the detection system was designed and installed in accordance with NFPA 72D, 1975 Edition.

#### 3.4.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 7A has a ceiling height of approximately 16'–0" and an approximate floor area of 6,000 square feet. The licensee also stated that the power cable from transfer switch EDF–9 to 23 component cooling water CCW pump motor is wrapped with Hemyc fire barrier material rated for 30 minutes. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment. The licensee stated that cable YZ1–JB5 associated with valve LCV–112C and cables PL2–M41 and PL2–M42 associated with instrument buses 23 and 23A are located in this area.

#### 3.4.4 OMAs Credited for a Fire in Fire Area F (Fire Zone 7A)

##### 3.4.4.1 OMA #6—Align Charging Pump Suction to RWST

OMA #6 was evaluated in Sections 3.2.4.1 and 3.2.5 above. As stated in Section 3.2.4.1, there is insufficient margin to perform OMA #6 for any fire zone in Fire Area F.

##### 3.4.4.2 OMA #7—Transfer Instrument Buses 23 and 23A to Alternate Power

The licensee stated that if indication of instrument buses 23 and 23A is lost in the CCR, OMA #7 may be necessary to transfer both buses to their alternate power supply. If OMA #7 becomes necessary, the licensee stated that they have assumed a 5.5-minute diagnosis period and that the required time to perform the action is 2 minutes, while the time available is 30 minutes, which results in 22.5 minutes of margin.

#### 3.4.5 Conclusion for Fire Area F (Fire Zone 7A)

Since the licensee described postulated fire scenarios and Fire Zone 7A lacks an automatic fire suppression system and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage or allow reentry to the area to perform OMAs. The NRC staff finds that the defense-in-depth is insufficient demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 7A. OMA #6 was found to be unacceptable for this fire zone. OMA #7 has insufficient time available considering the lack of fire suppression and therefore is unacceptable for this fire zone. Therefore, the staff finds that

an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 7A.

### 3.5 Fire Area F—Primary Auxiliary Building and Fan House (Fire Zone 22A—Valve Corridor, Elevation 98'–0")

#### 3.5.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that there are no fixed or transient combustibles in this zone, except for small amounts of cable insulation. The licensee also stated that the ignition sources in the area consist of electrical cabinets.

#### 3.5.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 22A does not have an automatic fire detection or automatic suppression system installed.

#### 3.5.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 22A has a ceiling height of approximately 14'–0" and an approximate floor area of 115 square feet. The licensee stated that if cables for LCV–112C are affected, it may be necessary to align an alternate water supply to the charging pump suction. The licensee stated that cables associated with valves LCV–112C and LCV–112B are located in Fire Zone 22A.

#### 3.5.4 OMAs Credited for a Fire in Fire Area F (Fire Zone 22A)

##### 3.5.4.1 OMA #6—Align charging pump suction to RWST

OMA #6 was evaluated in Sections 3.2.4.1 and 3.2.5 above. As stated in Section 3.2.4.1, there is insufficient margin to perform OMA #6 for any fire zone in Fire Area F.

##### 3.5.5 Conclusion for Fire Area F (Fire Zone 22A)

Since the licensee described postulated fire scenarios and Fire Zone 22A lacks any automatic fire detection or automatic suppression system, it is possible that a fire would not be extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage or allow reentry to the area to perform OMAs. Additionally, there is insufficient margin available for the OMA credited in this area to provide assurance that safe shutdown capability will be maintained following the postulated fire events. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 22A and

that an exemption from III.G.2 based on OMA #6 cannot be granted for Fire Zone 22A.

### 3.6 Fire Area F—Primary Auxiliary Building and Fan House (Fire Zone 27A—Corridor, Elevation 98'–0")

#### 3.6.1 Fire Prevention

The licensee stated that the fire loading in this area is moderate and that the fixed combustibles in this zone consist of cable insulation, vinyl covers, control cabinets and panels, plastic, and office supplies and that transient combustibles consist of trash, rubber, paint, and radiation boundaries. The licensee also stated that the ignition sources in the area consist of cable, junction boxes, dry transformers, motor control center (MCC) vertical panels, and electrical panels.

#### 3.6.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 27A has an automatic fire detection system installed but does not have an automatic fire suppression system installed. The licensee also stated that the detection system was designed and installed in accordance with NFPA 72D, 1975 Edition.

#### 3.6.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 27A has a ceiling height of approximately 15'–0" and an approximate floor area of 5,450 square feet. The licensee stated that cables associated with valves LCV–112C, LCV–112B, HCV–142 and 227 are also located in this fire zone. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

#### 3.6.4 OMAs Credited for a Fire in Fire Area F (Fire Zone 27A)

##### 3.6.4.1 OMA #5—Align Charging Pump Makeup Path to RCS

The licensee stated that in order to ensure a reliable charging makeup path to the reactor coolant system (RCS), air-operated valve HCV–142 must remain open or bypass valve 227, which is normally motor-operated and normally closed, must be opened. The licensee stated that air-operated valve HCV–142 is assumed to fail closed as designed in response to a loss of instrument air. The licensee stated that if HCV–142 were to close in response to a loss of instrument air, and cables for valve 227 are damaged in a manner that causes normally closed motor-operated valve 227 to remain closed and unable to be

opened remotely from the CCR, OMA #5 would be used to locally open bypass valve 227 in Fire Area A to restore or maintain a reliable charging pump flow path to the RCS.

If OMA #5 becomes necessary, the licensee stated that they have assumed a 60-minute waiting period before re-entering the fire area, a 14-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period, and that the required time to perform the action is 14 minutes, which provides a total required time of 74 minutes while the time available is 75 minutes, which provides 1 minute of margin. Although there is fire detection in this zone, the NRC staff finds that 1 minute of margin is insufficient to ensure the OMA can be accomplished reliably. Therefore, the NRC staff finds that OMA #5 is unacceptable for a fire which initiates in Fire Zone 27A or for any fire zone in Fire Area F.

##### 3.6.4.2 OMA #6—Align Charging Pump Suction to RWST

OMA #6 was evaluated in Sections 3.2.4.1 and 3.2.5 above. As stated in Section 3.2.4.1, there is insufficient margin to perform OMA #6 for any fire zone in Fire Area F.

#### 3.6.5 Conclusion for Fire Area F (Fire Zone 27A)

Since the licensee described postulated fire scenarios and Fire Zone 27A lacks an automatic fire suppression system and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage or allow reentry to the area to perform OMAs. Also, the NRC staff finds that OMAs #5 and #6 are unacceptable for a fire which initiates in Fire Zone 27A or for any fire zone in Fire Area F. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 27A and that an exemption from III.G.2 based on OMA #5 and #6 cannot be granted for Fire Zone 27A.

### 3.7 Fire Area F—Primary Auxiliary Building and Fan House (Fire Zone 33A—MCC 26AA and MCC 26BB Room, Elevation 98'–0")

#### 3.7.1 Fire Prevention

The licensee stated that the fire loading in this area is moderate and that the fixed combustibles in this zone consist of cable insulation and electrical panels and that transient combustibles consist of trash, paint, and radiation



boundaries. The licensee also stated that the ignition sources in the area consist of cables, junction boxes, dry transformers, MCC vertical panels, and electrical cabinets.

### 3.7.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 33A does not have an automatic fire detection or automatic suppression system installed.

### 3.7.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 33A has an approximate floor area of 1,122 square feet and is open to Fire Zone 27A above. The licensee stated that cables associated with charging pump makeup valves HCV-142 and 227 are located in this fire zone. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

### 3.7.4 OMA's Credited for a Fire in Fire Area F (Fire Zone 33A)

#### 3.7.4.1 OMA #5—Align Charging Pump Makeup Path to RCS

OMA #5 was evaluated in Section 3.6.4.1 above. As stated in Section 3.6.4.1, 1 minute of margin for OMA #5 is too low to credit OMA #5 as being a reliable method of restoring the charging pump flow path to the RCS for any fire zone in Fire Area F.

### 3.7.5 Conclusion for Fire Area F (Fire Zone 33A)

Since the licensee described postulated fire scenarios and Fire Zone 33A lacks an automatic fire detection system or automatic suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage or allow reentry to the area to perform OMA's. There is insufficient margin available for OMA #5 for any fire in Fire Area F to provide assurance that safe shutdown capability will be maintained following the postulated fire events. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 33A and that an exemption from III.G.2 based on OMA #5 cannot be granted for Fire Zone 33A.

3.8 Fire Area F—Primary Auxiliary Building and Fan House (Fire Zone 59A—Fan House Elevation 72'-0", 80'-0", and 92'-0")

#### 3.8.1 Fire Prevention

The licensee stated that the fire loading in this area is high and that the fixed combustibles in this zone consist of charcoal and cable insulation and that transient combustibles consist of trash, paint, and radiation boundaries. The licensee also stated that the ignition sources in the area consist of electrical cabinets.

#### 3.8.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 59A has a partial automatic fire suppression system installed at the charcoal filter housings and a partial automatic fire detection system installed that consists of Thermistor wire for the charcoal filters and an ionization detector outside the charcoal filter enclosure on the 72'-0" elevation. The licensee also stated that the detection system was designed and installed in accordance with NFPA 72D, 1967 Edition and the fire suppression system was designed and installed in accordance with NFPA 13, 1972 Edition and NFPA 15, 1969 Edition. The partial fire detection system may not be effective at detecting fires in other areas of this fire zone, as it is located on the lower level of the fire zone.

#### 3.8.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 59A has an approximate floor area of 1,400 square feet and an approximate ceiling height of 29'-0". Fire Zone 59A contains cable ECD3-EXF6/2, which is associated with motor-operated valve 227.

### 3.8.4 OMA's Credited for a Fire in Fire Area F (Fire Zone 59A)

#### 3.8.4.1 OMA #5—Align Charging Pump Makeup Path to RCS

OMA #5 was evaluated in Section 3.6.4.1 above. As stated in Section 3.6.4.1, 1 minute of margin for OMA #5 is too low to credit OMA #5 as being a reliable method of restoring the charging pump flow path to the RCS for any fire zone in Fire Area F.

### 3.8.5 Conclusion for Fire Area F (Fire Zone 59A)

Since the licensee described postulated fire scenarios and Fire Zone 59A has a high combustible loading and lacks an automatic fire detection system or automatic suppression system throughout the zone, except where

installed at the charcoal filters, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage or allow reentry to the area to perform OMA's. There is insufficient margin available for OMA #5 for any fire in Fire Area F to provide assurance that safe shutdown capability will be maintained following the postulated fire events. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 59A and that an exemption from III.G.2 based on OMA #5 cannot be granted for Fire Zone 59A.

3.9 Fire Area H—Containment Building (Fire Zone 70A—23 and 24 Reactor Coolant Pump Area, Elevation 46'-0")

#### 3.9.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles in this zone consist of cable insulation and reactor coolant pump (RCP) lube oil and that transient combustibles are administratively controlled. The licensee also stated that the ignition sources in the area consist of cables, junction boxes, and RCP motors.

#### 3.9.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 70A has a partial automatic fire detection system installed that consists of ionization detectors located over RCPs 23 and 24 but does not have an automatic fire suppression system. The licensee also stated that the detection system was designed and installed in accordance with NFPA 72D, 1975 Edition.

#### 3.9.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 70A has an approximate floor area of 3,320 square feet and an approximate ceiling height of 25'-8". The licensee also stated that there is an oil collection system provided for RCPs 23 and 24. The licensee stated that cable Y15-H50 for valve 204B and cable Y17-H55 for valve 204A are located in this zone. Valve 204A is an air-operated valve which allows charging pump flow to an RCS hot leg. Valve 204B is an air-operated valve which allows charging pump flow to an RCS cold leg. The licensee stated that cables and components associated with redundant trains of normal instrumentation required to support normal safe

shutdown operations are located in this zone. The normal safe shutdown instrumentation potentially affected by fire includes:

- SG wide range level: LT-417D, LT-427D, LT-437D, LT-447D
- Pressurizer level: LT-459, LT-460, LT-461, LT-462
- Source-range neutron monitoring: N-31, N-32
- RCS loop hot and cold leg temperatures: TE-411 A/1, TE-413, TE-422A/1, TE-423, TE-431A/1, TE-433, TE-440A/1, TE-443

### 3.9.4 OMA's Credited for a Fire in Fire Area H (Fire Zone 70A)

#### 3.9.4.1 OMA #8—Align Charging Pump Makeup Path to RCS

It is possible that a fire in this zone could result in a loss of a reliable charging makeup path to the RCS due to air-operated charging system valves 204A and 204B spuriously closing. The licensee stated that normal reactor coolant makeup to the RCS may be established via hot leg injection through valve 204A or cold leg injection through valve 204B and that in order to accomplish this, normal reactor coolant makeup air-operated charging system valves 204A and 204B would need to be failed open by de-energizing 125VDC control power in the CCR or by closing the air supply isolation valve IA-501, which is outside the containment building, to isolate instrument air.

Procedure 2-ONOP-FP-001 includes preemptive actions to establish the charging makeup path by failing open charging injection valves 204A and 204B. This is accomplished by removing DC control power to the valves by pulling the control power fuses in the CCR or tripping breakers 5 and 15 on 125 VDC DP 21 and 22, respectively. Procedure 2-AOP-SSD-1 includes actions to close the air supply isolation valve IA-501, and the loss of air pressure will cause valves 204A and 204B to fail open.

If a fire were to occur and causes valves 204A and 204B to remain closed, the licensee stated that OMA #8 is available to align the charging pump makeup path to the RCS. If OMA #8 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 14 minutes, which results in a total required time of 28 minutes while the time available is 75 minutes, which provides 47 minutes of margin.

3.9.4.2 OMA's #9 and #10—Activate or Enable Alternate Safe Shutdown System Pneumatic Instruments and Enable Alternate Safe Shutdown System Source-Range Channel and Loop 21 and 22 hot and cold leg Temperature Channels

In the event that a fire in Fire Area H disables redundant trains of normal safe shutdown instrumentation identified in Section 3.9.3, the licensee may make use of OMA's performed in a different fire area to place in service Alternate Safe-Shutdown System instruments which have been separated from the normal shutdown instruments in accordance with III.G.2(f). The licensee also stated that in locations where normal and alternate shutdown instrument cables are separated by less than 20 feet, the cables of the alternate shutdown instruments are protected by a radiant energy shield as required to meet III.G.2(f). The Alternate Safe Shutdown System instrument channels include:

- RCP Loop 21 and 22 hot and cold leg temperature (TE-5139, TE-5140, TE-5141, TE-5142),
- SG 21 and 22 level (LT-5001, LT-5002),
- Pressurizer level (LT-3101), pressurizer pressure (PT-3105), and
- Source range neutron monitoring (NE-5143)

The licensee stated that cables associated with Loop 21 and 22 hot and cold leg temperature channels TE-5139, 5140, 5141, 5142, and source-range channel NE-5143 are routed into containment through penetration H20, and are protected with a radiant energy shield throughout the containment annulus area, where they are in proximity to cable trays or conduits containing the corresponding normal RCS loop temperature channels. The licensee also stated that there are no cables associated with the balance of the alternate SSD instruments (LT-5001, LT-5002, PT-3105, and LT-3101), since these channels utilize pneumatically-operated transducers. The licensee stated that the Alternate Safe Shutdown System pneumatic instrumentation can be expected to remain operable despite fire-induced failure of the redundant electrically-operated instrumentation, since the Alternate Safe Shutdown System instruments do not utilize any electrical components or cables.

In addition, the licensee stated that all four RCPs are equipped with RCP lube oil collection systems which capture any leakage from credible leak sites and transport it to collection tanks located outside the bioshield wall in Fire Zone 77A.

In the event that redundant trains of normal shutdown instrumentation are damaged by a fire, OMA's #9 and #10 are available to activate the following Alternate Safe Shutdown System instruments:

- Pneumatic instruments
  - SG level (LT-5001, LT-5002),
  - Pressurizer pressure (PT-3105), and
  - Pressurizer level (LT-3101)
- Source-range channel (NE-5143), and
- Loop 21 and 22 hot leg (Th) and cold leg (Tc) temperature channels (TE-5139, TE-5140, TE-5141, TE-5142)

Procedure 2-AOP-SSD-1 includes actions to place these Alternate Safe Shutdown System instruments in service. If OMA's #9 and #10 become necessary, the licensee stated that they have assumed less than 1 minute for diagnosis, with the normal instruments assumed to be failed at the start of the event, and that the required time to perform the action is 13 minutes for the pneumatic instruments. The shortest timeline is to monitor level in the SGs, which could approach boil-dry conditions within 34 minutes. This results in 21 minutes of margin for the pneumatic instruments. The five electronic instruments are then energized by the same operator who made the pneumatic instruments operable, so it takes 24 minutes to put the electronic instruments in service. However, the electronic instrument readings are not needed until later in the scenario. This results in a total required time of 13 minutes while the time available is 34 minutes, which provides 21 minutes of margin.

### 3.9.5 Conclusion for Fire Area H (Fire Zone 70A)

Given the low combustible fuel loading, the oil collection system for the RCPs, automatic smoke detection system, large volume of the space, and preemptive nature of the OMA's, it is unlikely that a fire would occur and go undetected and not be extinguished in a reasonable amount of time to ensure that at least one train of equipment necessary for safe shutdown remains free of fire damage. In the unlikely event that a fire does occur and causes damage that necessitates OMA's #8, #9, and #10, the actions are clear and proceduralized with 47 minutes of margin for OMA #8 and 21 minutes of margin for OMA's #9 and #10, available to provide assurance that safe shutdown capability will be maintained following the postulated fire events. Therefore, the NRC staff finds that there is adequate defense-in-depth provided for Fire Zone 70A and that OMA's #8, #9, and #10 are acceptable for the purpose of providing the level of

protection intended by the regulation, and that an exemption from III.G.2 based on these OMAs is granted for Fire Zone 70A.

3.10 Fire Area H—Containment Building (Fire Zone 71A—21 and 22 Reactor Coolant Pump Area, Elevation 46'–0")

#### 3.10.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles in this zone consist of cable insulation, RCP lube oil, and other miscellaneous combustibles and that transient combustibles are administratively controlled. The licensee also stated that the ignition sources in the area consist of cables, junction boxes, RCP motors, and pumps.

#### 3.10.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 71A has a partial automatic fire detection system installed that consists of ionization detectors located over RCPs 21 and 22 but does not have an automatic fire suppression system. The licensee also stated that the detection system was designed and installed in accordance with NFPA 72D, 1975 Edition.

#### 3.10.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 71A has an approximate floor area of 3,320 square feet and an approximate ceiling height of 25'8". The licensee also stated that there is an oil collection system provided for RCPs 21 and 22. The licensee stated that cable Y15–H50 for valve 204B and cable Y17–H55 for valve 204A are located in this zone. Valve 204A is an air-operated valve which allows charging pump flow to an RCS hot leg. Valve 204B is an air-operated valve which allows charging pump flow to an RCS cold leg. As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

#### 3.10.4 OMAs Credited for a Fire in Fire Area H (Fire Zone 71A)

##### 3.10.4.1 OMA #8—Align Charging Pump Makeup Path to RCS

As discussed in Section 3.9.4.1 above, if a fire were to occur and causes valves 204A and 204B to remain closed, the licensee stated that OMA #8 is available to align the charging pump makeup path to the RCS. If OMA #8 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to

perform the action is 14 minutes, which results in a total required time of 28 minutes while the time available is 75 minutes, which provides 47 minutes of margin.

#### 3.10.5 Conclusion for Fire Area H (Fire Zone 71A)

Given the low combustible fuel loading, the oil collection system for the RCPs, automatic smoke detection system, large volume of the space, and preemptive nature of OMA #8, it is unlikely that a fire would occur and go undetected and not be extinguished in a reasonable amount of time to ensure that at least one train of equipment necessary for safe shutdown remains free of fire damage. In the unlikely event that a fire does occur and causes damage that necessitates OMA #8, the actions are clear and proceduralized with 47 minutes of margin available to provide assurance that safe shutdown capability will be maintained following the postulated fire events. Therefore, the NRC staff finds that there is adequate defense-in-depth provided for Fire Zone 71A and that OMA #8 is acceptable for the purpose of providing the level of protection intended by the regulation, and that an exemption from III.G.2 based on OMA #8 is granted for Fire Zone 71A.

#### 3.11 Fire Area H—Containment Building (Fire Zone 72A—Outer Annulus, Elevation 46'0")

##### 3.11.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles in this zone consist of cable insulation and that transient combustibles are administratively controlled. The licensee also stated that the ignition sources in the area consist of cables.

##### 3.11.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 72A does not have an automatic fire detection or automatic suppression system installed.

##### 3.11.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 72A has an approximate floor area of 1,100 square feet and an approximate ceiling height of 22'0". The licensee stated that cables for valve 204B and valve 204A are located in this zone. Valve 204A is an air-operated valve which allows charging pump flow to an RCS hot leg. Valve 204B is an air-operated valve which allows charging pump flow to an RCS cold leg. As discussed in Section 3.0 above, the

licensee did not demonstrate any separation between credited and redundant trains of equipment.

#### 3.11.4 OMAs Credited for a Fire in Fire Area H (Fire Zone 72A)

##### 3.11.4.1 OMA #8—Align Charging Pump Makeup Path to RCS

As stated in Section 3.9.4.1 above, if a fire were to occur and causes valves 204A and 204B to remain closed, the licensee stated that OMA #8 is available to align the charging pump makeup path to the RCS. If OMA #8 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 14 minutes, which results in a total required time of 28 minutes while the time available is 75 minutes, which provides 47 minutes of margin.

#### 3.11.5 Conclusion for Fire Area H (Fire Zone 72A)

Since the licensee described postulated fire scenarios and Fire Zone 72A lacks an automatic fire detection system or automatic suppression system, and any discernable separation between the credited and redundant equipment in the area, it is credible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 47 minutes of margin available for OMA #8, Fire Zone 72A still lacks adequate defense-in-depth. Therefore, the staff finds that Fire Zone 72A's defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved. As such, OMA #8 is unacceptable for the purpose of providing the level of protection intended by the regulation and an exemption from III.G.2 based on OMA #8 cannot be granted for Fire Zone 72A.

#### 3.12 Fire Area H—Containment Building (Fire Zone 75A—Outer Annulus, Elevation 46'–0")

##### 3.12.1 Fire Prevention

The licensee stated that the fire loading in this area is moderate and that the fixed combustibles in this zone consist of cable insulation and that transient combustibles are administratively controlled. The licensee also stated that the ignition sources in the area consist of cables and junction boxes.

##### 3.12.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 75A does not have an automatic fire

detection or automatic suppression system installed.

### 3.12.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 75A has an approximate floor area of 1,100 square feet and an approximate ceiling height of 22'-0". The licensee also stated that the Alternate Safe Shutdown System instrumentation cabling is protected with a radiant energy shield. The licensee stated that cables and components associated with redundant trains of normal instrumentation required to support normal safe shutdown operations are located in this zone. The normal safe shutdown instrumentation potentially affected by fire in Fire Area H includes:

- SG wide range level: LT-417D, LT-427D, LT-437D, LT-447D
- Pressurizer level: LT-459, LT-460, LT-461, LT-462
- Source-range neutron monitoring: N-31, N-32
- RCS loop hot and cold leg temperatures: TE-411 A/1, TE-413, TE-422A/1, TE-423, TE-431A/1, TE-433, TE-440A/1, TE-443

The licensee stated that cable Y15-H50 for valve 204B and cable Y17-H55 for valve 204A are located in this zone. As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

### 3.12.4 OMAs Credited for a Fire in Fire Area H (Fire Zone 75A)

#### 3.12.4.1 OMA #8—Align Charging Pump Makeup Path to RCS

As stated in Section 3.9.4.1 above, if a fire were to occur and causes valves 204A and 204B to remain closed, the licensee stated that OMA #8 is available to align the charging pump makeup path to the RCS. If OMA #8 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 14 minutes, which results in a total required time of 28 minutes while the time available is 75 minutes, which provides 47 minutes of margin.

#### 3.12.4.2 OMAs #9 and #10—Activate or Enable Alternate Safe Shutdown System Pneumatic Instruments and Enable Alternate Safe Shutdown System Source-Range Channel and Loop 21 and 22 Hot and Cold Leg Temperature Channels

As discussed in Section 3.9.4.2 above, in the event that a fire in Fire Area H disables redundant trains of normal safe shutdown instrumentation identified in Section 3.9.3, the licensee may make

use of OMAs performed in a different fire area to place in service Alternate Safe Shutdown System instruments which have been separated from the normal shutdown instruments in accordance with III.G.2(f). The licensee also stated that in locations where normal and alternate shutdown instrument cables are separated by less than 20 feet, the cables of the alternate shutdown instruments are protected by a radiant energy shield as required to meet III.G.2(f).

If OMAs #9 and #10 become necessary, the licensee stated that they have assumed less than 1 minute for diagnosis, with the normal instruments assumed to be failed at the start of the event, and that the required time to perform the action is 13 minutes for the pneumatic instruments. The shortest timeline is to monitor level in the SGs, which could approach boil-dry conditions within 34 minutes. This results in 21 minutes of margin for the pneumatic instruments. The five electronic instruments are then energized by the same operator who made the pneumatic instruments operable, so it takes 24 minutes to put the electronic instruments in service. However, the electronic instrument readings are not needed until later in the scenario. This results in a total required time of 13 minutes while the time available is 34 minutes, which provides 21 minutes of margin.

### 3.12.5 Conclusion for Fire Area H (Fire Zone 75A)

Since the licensee described postulated fire scenarios and Fire Zone 75A has a moderate combustible fuel loading, lacks an automatic fire detection system or automatic suppression system, and any discernable separation between the credited and redundant equipment in the area, it is credible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 47 minutes of margin available for OMA #8 and 21 minutes of margin available for OMAs #9 and #10, Fire Zone 75A still lacks adequate defense-in-depth. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 75A and that OMAs #8, #9, and #10 are unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 75A.

### 3.13 Fire Area H—Containment Building (Fire Zone 77A—Outer Annulus)

#### 3.13.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles in this zone consist of cable insulation and that transient combustibles are administratively controlled. The licensee also stated that the ignition sources in the area consist of cables and junction boxes.

#### 3.13.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 77A does not have an automatic fire detection or automatic suppression system installed.

#### 3.13.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 77A has an approximate floor area of 950 square feet and an approximate ceiling height of 22'-0". The licensee stated that cables and components associated with redundant trains of normal instrumentation required to support normal safe shutdown operations are located in this zone. The normal safe shutdown instrumentation potentially affected by fire in Fire Area H includes:

- SG wide range level: LT-417D, LT-427D, LT-437D, LT-447D
- Pressurizer level: LT-459, LT-460, LT-461, LT-462
- Source-range neutron monitoring: N-31, N-32
- RCS loop hot and cold leg temperatures: TE-411 A/1, TE-413, TE-422A/1, TE-423, TE-431A/1, TE-433, TE-440A/1, TE-443

The licensee stated that cable Y15-H50 for valve 204B and cable Y17-H55 for valve 204A are located in this zone. As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

### 3.13.4 OMAs Credited for a Fire in Fire Area H (Fire Zone 77A)

#### 3.13.4.1 OMA #8—Align Charging Pump Makeup Path to RCS

As stated in Section 3.9.4.1 above, if a fire were to occur and causes valves 204A and 204B to remain closed, the licensee stated that OMA #8 is available to align the charging pump makeup path to the RCS. If OMA #8 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 14 minutes, which results in a total required time of 28 minutes while the time available is 75

minutes, which provides 47 minutes of margin.

#### 3.13.4.2 OMAs #9 and #10—Activate or Enable Alternate Safe Shutdown System Pneumatic Instruments and Enable Alternate Safe Shutdown System Source-Range Channel and Loop 21 and 22 Hot and Cold Leg Temperature Channels

As discussed in Section 3.9.4.2 above, in the event that a fire in Fire Area H disables redundant trains of normal safe shutdown instrumentation identified in Section 3.9.3, the licensee may make use of OMAs performed in a different fire area to place in service Alternate Safe-Shutdown System instruments which have been separated from the normal shutdown instruments in accordance with III.G.2(f). The licensee also stated that in locations where normal and alternate shutdown instrument cables are separated by less than 20 feet, the cables of the alternate shutdown instruments are protected by a radiant energy shield as required to meet III.G.2(f).

If OMAs #9 and #10 become necessary, the licensee stated that they have assumed less than 1 minute for diagnosis, with the normal instruments assumed to be failed at the start of the event, and that the required time to perform the action is 13 minutes for the pneumatic instruments. The shortest timeline is to monitor level in the SGs, which could approach boil-dry conditions within 34 minutes. This results in 21 minutes of margin for the pneumatic instruments. The five electronic instruments are then energized by the same operator who made the pneumatic instruments operable, so it takes 24 minutes to put the electronic instruments in service. However, the electronic instrument readings are not needed until later in the scenario. This results in a total required time of 13 minutes while the time available is 34 minutes, which provides 21 minutes of margin.

#### 3.13.5 Conclusion for Fire Area H (Fire Zone 77A)

Since the licensee described postulated fire scenarios and Fire Zone 77A lacks an automatic fire detection or automatic suppression system, and any discernable separation between the credited and redundant equipment in the area, it is credible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 47 minutes of margin available for OMA #8 and 21 minutes of margin available for OMAs

#9 and #10, Fire Zone 77A still lacks adequate defense-in-depth. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 77A and that OMAs #8, #9, and #10 are unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 77A.

#### 3.14 Fire Area H—Containment Building (Fire Zone 84A—22 Containment Fan Cooler Unit Area, Elevation 68'–0")

##### 3.14.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles in this zone consist of cable insulation and that transient combustibles are administratively controlled. The licensee also stated that the ignition sources in the area consist of cables.

##### 3.14.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 84A does not have an automatic fire detection or automatic suppression system installed.

##### 3.14.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 84A has an approximate floor area of 910 square feet and an approximate ceiling height of 27'–0". The licensee stated that cable Y15–H50 for valve 204B and cable Y17–H55 for valve 204A are located in this zone. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

##### 3.14.4 OMAs Credited for a Fire in Fire Area H (Fire Zone 84A)

###### 3.14.4.1 OMA #8—Align Charging Pump Makeup Path to RCS

As stated in Section 3.9.4.1 above, if a fire were to occur and causes valves 204A and 204B to remain closed, the licensee stated that OMA #8 is available to align the charging pump makeup path to the RCS. If OMA #8 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 14 minutes, which results in a total required time of 28 minutes while the time available is 75 minutes, which provides 47 minutes of margin.

##### 3.14.5 Conclusion for Fire Area H (Fire Zone 84A)

Since the licensee described postulated fire scenarios and Fire Zone 84A lacks an automatic fire detection or automatic suppression system, and any discernable separation between the credited and redundant equipment in the area, it is credible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 47 minutes of margin available for OMA #8, Fire Zone 84A still lacks adequate defense-in-depth. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 84A and that OMA #8 is unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 84A.

#### 3.15 Fire Area H—Containment Building (Fire Zone 85A—Incore Detector Drive Area, Elevation 68'–0")

##### 3.15.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles in this zone consist of cable insulation and that transient combustibles are administratively controlled.

##### 3.15.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 85A does not have an automatic fire detection or automatic suppression system installed.

##### 3.15.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 85A has an approximate floor area of 560 square feet and an approximate ceiling height of 27'–0". The licensee stated that cable Y15–H50 for valve 204B and cable Y17–H55 for valve 204A are located in this zone. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

##### 3.15.4 OMAs Credited for a Fire in Fire Area H (Fire Zone 85A)

###### 3.15.4.1 OMA #8—Align Charging Pump Makeup Path to RCS

As stated in Section 3.9.4.1 above, if a fire were to occur and causes valves 204A and 204B to remain closed, the licensee stated that OMA #8 is available

to align the charging pump makeup path to the RCS. If OMA #8 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 14 minutes, which results in a total required time of 28 minutes while the time available is 75 minutes, which provides 47 minutes of margin.

### 3.15.5 Conclusion for Fire Area H (Fire Zone 85A)

Since the licensee stated that a fire in this zone could result in a loss of a reliable charging makeup path to the RCS and Fire Zone 85A lacks an automatic fire detection or suppression system, and any discernable separation between the credited and redundant equipment in the area, it is credible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 47 minutes of margin available for OMA #8, Fire Zone 85A still lacks adequate defense-in-depth. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 85A and that OMA #8 is unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 85A.

## 3.16 Fire Area H—Containment Building (Fire Zone 87A—Outer Annulus, Elevation 46'–0")

### 3.16.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles in this zone consist of MCCs and instrument racks and that transient combustibles are administratively controlled. The licensee also stated that the ignition sources in the area consist of MCCs.

### 3.16.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 87A does not have an automatic fire detection or automatic suppression system installed.

### 3.16.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 87A has an approximate floor area of 434 square feet and an approximate ceiling height of 22'–0", which is partially open to the containment dome at the 95'–0" elevation. The licensee stated that cables and components

associated with redundant trains of normal instrumentation required to support normal safe shutdown operations are located in this zone. The normal safe shutdown instrumentation potentially affected by fire in Fire Area H includes:

- SG wide range level: LT–417D, LT–427D, LT–437D, LT–447D
- Pressurizer level: LT–459, LT–460, LT–461, LT–462
- Source-range neutron monitoring: N–31, N–32
- RCS loop hot and cold leg temperatures: TE–411 A/1, TE–413, TE–422A/1, TE–423, TE–431A/1, TE–433, TE–440A/1, TE–443

The licensee stated that cable Y15–H50 for valve 204B and cable Y17–H55 for valve 204A are located in this zone. As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

### 3.16.4 OMAs Credited for a Fire in Fire Area H (Fire Zone 87A)

#### 3.16.4.1 OMA #8—Align Charging Pump Makeup Path to RCS

As stated in Section 3.9.4.1 above, if a fire were to occur and causes valves 204A and 204B to remain closed, the licensee stated that OMA #8 is available to align the charging pump makeup path to the RCS. If OMA #8 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 14 minutes, which results in a total required time of 28 minutes while the time available is 75 minutes, which provides 47 minutes of margin.

#### 3.16.4.2 OMAs #9 and #10—Activate or Enable Alternate Safe Shutdown System Pneumatic Instruments and Enable Alternate Safe Shutdown System Source-Range Channel and Loop 21 and 22 Hot and Cold Leg Temperature Channels

As discussed in Section 3.9.4.2 above, in the event that a fire in Fire Area H disables redundant trains of normal safe shutdown instrumentation identified in Section 3.9.3, the licensee may make use of OMAs performed in a different fire area to place in service Alternate Safe Shutdown System instruments which have been separated from the normal shutdown instruments in accordance with III.G.2(f). The licensee also stated that in locations where normal and alternate shutdown instrument cables are separated by less than 20 feet, the cables of the alternate shutdown instruments are protected by

a radiant energy shield as required to meet III.G.2(f).

If OMAs #9 and #10 become necessary, the licensee stated that they have assumed less than 1 minute for diagnosis, with the normal instruments assumed to be failed at the start of the event, and that the required time to perform the action is 13 minutes for the pneumatic instruments. The shortest timeline is to monitor level in the SGs, which could approach boil-dry conditions within 34 minutes. This results in 21 minutes of margin for the pneumatic instruments. The five electronic instruments are then energized by the same operator who made the pneumatic instruments operable, so it takes 24 minutes to put the electronic instruments in service. However, the electronic instrument readings are not needed until later in the scenario. This results in a total required time of 13 minutes while the time available is 34 minutes, which provides 21 minutes of margin.

### 3.16.5 Conclusion for Fire Area H (Fire Zone 87A)

Since the licensee described postulated fire scenarios and Fire Zone 87A lacks an automatic fire detection or suppression system, and any discernable separation between the credited and redundant equipment in the area, it is credible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 47 minutes of margin available for OMA #8 and 21 minutes of margin available for OMAs #9 and #10, Fire Zone 87A still lacks adequate defense-in-depth. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 87A and that OMAs #8, #9, and #10 are unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 87A.

## 3.17 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 17—Turbine Oil Reservoir Area, Elevation 15'–0" Unit 2 Turbine Building)

### 3.17.1 Fire Prevention

The licensee stated that the fire loading in this area is high and that the

fixed combustibles in this zone consist of lube oil, fuel oil, and welding leads and that transient combustibles consist of trash, cardboard, lube oil, fiberglass, rubber, wood, and plastic. The licensee also stated that the ignition sources in the area consist of electrical cabinets. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN-DC-161. However, operator rounds performed each shift provide for the monitoring of combustibles that could challenge fire safety. In addition, the licensee stated that procedures OAP-017, "Plant Surveillance and Operator Rounds" and EN-MA-132, "Housekeeping" include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

### 3.17.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 17 has an automatic thermal fire detection system installed throughout the zone and an automatic aqueous foaming foam spray system installed at the turbine lube oil reservoir. The licensee also stated that the detection system was designed and installed in accordance with NFPA 72D, 1967 Edition and the fire suppression system was designed and installed in accordance with NFPA 16, 1968 Edition.

### 3.17.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 17 has an approximate floor area of 968 square feet and an approximate ceiling height of 37'-0". The licensee stated that cable JC2-YA9, which is associated with Buses 5A and 6A, is routed through Fire Zones 17, 47A, and 50A and that ignition sources in the zone located less than 20 feet horizontally from cable JC2-YA9 consists of electrical cabinets, motors, and MCCs. According to the licensee, the electrical cabinets are separated from the cable by approximately 3.8 feet horizontally and 1.9 feet vertically or greater and six motors are located above the cable routing separated from the cable by approximately 2.1 feet horizontally or greater. The licensee also stated that the turbine lube oil reservoir is located in Fire Zone 17. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

### 3.17.4 OMAs Credited for a Fire in Fire Area J (Fire Zone 17)

#### 3.17.4.1 OMA #11—Trip Breakers 52/5A and 52-SAC on Bus 5A and 52/6A and 52/TAO at Bus 6A and Remove Control Power Fuses

The licensee stated that offsite power is the preferred lineup for supplying the 480V loads on Buses 2A, 3A, 5A, and 6A. In the event that offsite power is not available due to fire, the licensee stated that the Emergency Diesel Generators (EDGs) are credited to supply 480V loads on Buses 2A, 3A, 5A, and 6A. The licensee also stated that a fire in Fire Zone 17 which damages certain cables associated with 480V Buses 5A and/or 6A could prevent loading of Buses 5 and 6 from the EDGs, and thereby, result in a loss of 480V power from the affected bus(es). Since a fire in Fire Zone 17 may impact the availability of offsite power, the licensee stated that they assume offsite power is unavailable at the start of the fire event.

In the event that a fire occurs and damages the cables identified above, the licensee stated that OMA #11 is available to restore or maintain power by tripping breakers 52/5A and 52-SAC on Bus 5A and Breakers 52/6A and 52/TAO at Bus 6A in the 480V Switchgear Room (Fire Area A) and removing their control power fuses. The licensee stated that loss of power to the affected buses is detected by loss of indication in the CCR. Loss of power to Bus 5A or Bus 6A causes operators to immediately enter procedure 2-AOP-480V-1. The procedure directs operators to locally inspect the switchgear, at which time any remaining untripped breakers (*i.e.*, 52/5A, 52-SAC, 52/6A, 52/TAO) would be noted and locally tripped as necessary. If OMA #11 becomes necessary, the licensee stated that they have assumed that a loss of offsite power occurs at the beginning of the fire event and that the required time to perform the action is 10 minutes while the time available is 60 minutes, which provides 50 minutes of margin. The NRC staff finds that OMA #11 has acceptable margin for all fire zones in Fire Area J.

### 3.17.5 Conclusion for a Fire in Fire Area J (Fire Zone 17)

Given the fire detection system, automatic fire suppression system, and large volume of the space, it is unlikely that a fire would occur and go undetected and not be extinguished in a reasonable amount of time to ensure that at least one train of equipment necessary for safe shutdown remains free of fire damage. In the unlikely event that a fire does occur and causes damage

that necessitates OMA #11, the action is clear and proceduralized with 50 minutes of margin available to provide assurance that safe shutdown capability will be maintained following the postulated fire events. Therefore, the NRC staff finds that there is adequate defense-in-depth provided for Fire Zone 17 and that OMA #11 is acceptable for the purpose of providing the level of protection intended by the regulation, and that an exemption from III.G.2 based on OMA #11 is granted for Fire Zone 17.

### 3.18 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 19—Station Air Compressor Area, Elevation 15'-0" Unit 2 Turbine Building)

#### 3.18.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that the primary fixed combustible in this zone is lube oil, which is contained in the turbine lube oil piping system, and that transient combustibles consist of trash, cleaning rags, lube oil, and paint. The licensee also stated that the ignition sources in the area consist of a motor, a compressor, and an electrical cabinet. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN-DC-161. However, operator rounds performed each shift provide for the monitoring of combustibles that could challenge fire safety. In addition, the licensee stated that procedures OAP-017, "Plant Surveillance and Operator Rounds" and EN-MA-132, "Housekeeping" include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

#### 3.18.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 19 does not have a fire detection or automatic fire suppression system installed.

#### 3.18.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 19 has an approximate floor area of 798 square feet and an approximate ceiling height of 21'-0". The licensee stated that a fire in Fire Area J which damages certain cables associated with 480V Buses 5A and/or 6A could prevent loading of Buses 5A and 6A from the EDGs, and thereby, result in a loss of



480VAC power from the affected bus(es). According to the licensee, cables associated with Buses 5A and 6A are located in this fire zone. The licensee stated that cable AG5-XA5, which is associated with Bus 5A, is located in Fire Zone 19. The licensee also stated that the ignition sources in the zone located less than 20 feet horizontally from cable AG5-XA5 consist of seven electrical cabinets, a 150kVA dry transformer, three motors, and an MCC. According to the licensee, three electrical cabinets are located under the cable separated by approximately 3 feet vertically or greater, the remaining four electrical cabinets are separated from the cable by approximately 2 feet horizontally or greater, the 150 kVA dry transformer is separated from the cable by approximately 1.6 feet horizontally and 6.7 feet vertically, the motors are separated from the cable by approximately 4.6 feet horizontally or greater, and the MCC is separated from the cable by approximately 7.5 feet horizontally.

The licensee stated that cables PC9-XA5/1 and PC9-XA5/2, which are associated with Bus 5A, are routed between two junction boxes in Fire Zone 19 for approximately 2 feet. The licensee also stated that the ignition sources in the zones located less than 20 feet horizontally from the cable consist of three motors, which are all separated from the cables by approximately 4.6 feet horizontally or greater. The licensee also stated that cable XA5-WU9, associated with Bus 5A, is routed in Fire Zone 19 from east to west terminating at the Station Air Compressor. The licensee stated that the ignition sources in the zone located less than 20 feet horizontally from the cable consist of two motors, which are separated from the cable by approximately 4.6 feet horizontally or greater. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

### 3.18.4 OMA's Credited for a Fire in Fire Area J (Fire Zone 19)

#### 3.18.4.1 OMA #11—Trip Breakers 52/5A and 52-SAC on bus 5A and 52/6A and 52/TAO at bus 6A and Remove Control Power Fuses.

OMA #11 was evaluated in Section 3.17.4.1 above. As stated in Section 3.17.4.1, OMA #11 has acceptable margin for all fire zones in Fire Area J.

### 3.18.5 Conclusion for Fire Area J (Fire Zone 19)

Since the licensee described postulated fire scenarios and Fire Zone 19 lacks an automatic fire detection or automatic fire suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 50 minutes of margin available for OMA #11, Fire Zone 19 still lacks adequate defense-in-depth. Therefore, the staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 19 and that OMA #11 is unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 19.

### 3.19 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 25—23 Battery Room, Elevation 33'-0" of the Unit 1 Superheater Building)

#### 3.19.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that the primary fixed combustibles in this zone are batteries and cable insulation and that transient combustibles are administratively controlled. The licensee also stated that the ignition sources in the area consist of batteries and electrical cabinets. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN-DC-161. However, operator rounds performed each shift provide for the monitoring of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee stated that procedures OAP-017, "Plant Surveillance and Operator Rounds" and EN-MA-132, "Housekeeping" include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

#### 3.19.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 25 does not have a fire detection or

automatic fire suppression system installed.

#### 3.19.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 25 has an approximate floor area of 92 square feet and an approximate ceiling height of 10'-0". The licensee stated that cables EDB8-EPB3, EGA9-EDB8/4, and EGA9-EDB8/5 are routed through Fire Zone 25 in rigid steel conduit and that since cables EGA9-EDB8/4 and EGA9-EDB8/5 originate inside the battery room at the batteries, there is no separation between the cables and the batteries. The licensee also stated that ignition sources in the zone located less than 20 feet horizontally from cable EDB8-EPB3 consist of an MCC, a 45kVA dry transformer, and two electrical cabinets. According to the licensee, the MCC is separated from the cable by approximately 18.5 feet horizontally, the transformer is separated from the cable by approximately 13.6 feet horizontally, one electrical cabinet is separated from the cable by approximately 12.8 feet horizontally, and the second electrical cabinet is separated from the cable by approximately 5.5 feet horizontally. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

#### 3.19.4 OMA's Credited for a Fire in Fire Area J (Fire Zone 25)

##### 3.19.4.1 OMA #12—Transfer Instrument Buses 23 and 23A to Emergency Power Source

The licensee stated that instrument buses 23 and 23A could experience a loss of their normal power source (125 VDC power panel 23) as a result of fire in Fire Zone 25. If this were to occur, the licensee stated that OMA #12 is available to swap Instrument Buses 23 and 23A to their backup power source (MCC-29A). If OMA #12 becomes necessary, the licensee stated that they have assumed a 5.5-minute diagnosis period and that the required time to perform the action is 2 minutes while the time available is 30 minutes, which provides 22.5 minutes of margin.

#### 3.19.5 Conclusion for Fire Area J (Fire Zone 25)

Since the licensee described postulated fire scenarios and Fire Zone 25 lacks an automatic fire detection or automatic fire suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure



that at least one train of equipment remains free of fire damage following a fire event. Although there is 22.5 minutes of margin available for OMA #12, Fire Zone 25 still lacks adequate defense-in-depth. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 25 and that OMA #12 is unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on OMA #12 cannot be granted for Fire Zone 25.

**3.20 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 39A—Mezzanine Floor, Elevation 36'–9" Unit 2 Turbine Building)**

#### 3.20.1 Fire Prevention

The licensee stated that the fire loading in this zone is moderate and that the fixed combustibles in this zone consist of cable insulation, plastic, and cellulose and that transient combustibles in this zone consist of trash, wood, and lube oil. The licensee also stated that the ignition sources in this zone consist of cables, junction boxes, electrical cabinets, and motors. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN–DC–161. However, operator rounds performed each shift provide for the monitoring of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee stated that procedures OAP–017 (Plant Surveillance and Operator Rounds) and EN–MA–132 (Housekeeping) include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

#### 3.20.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 39A does not have a fire detection or automatic fire suppression system installed.

#### 3.20.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 39A has an approximate floor area of 7,592 square feet and an approximate ceiling height of 16'–0". The licensee stated that cable AG5–XA5, which is associated with instrument buses 23 and

23A and buses 5A and 6A, is located in Fire Zone 39A. The licensee also stated that the ignition sources in the zone located less than 20 feet horizontally from cable AG5–XA5 consist of seven electrical cabinets, a 150 kVA dry transformer, three motors, and an MCC. According to the licensee, three electrical cabinets are located under the cable separated by approximately 3 feet vertically or greater, the remaining four electrical cabinets are separated from the cable by approximately 2 feet horizontally or greater, the 150 kVA dry transformer is separated from the cable by approximately 1.6 feet horizontally and 6.7 feet vertically, the motors are separated from the cable by approximately 4.6 feet horizontally or greater, and the MCC is separated from the cable by approximately 7.5 feet horizontally. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

#### 3.20.4 OMAs Credited for a Fire in Fire Area J (Fire Zone 39A)

##### 3.20.4.1 OMA #11—Trip breakers 52/5A and 52–SAC on bus 5A and 52/6A and 52/TAO at bus 6A and Remove Control Power Fuses

OMA #11 was evaluated in Section 3.17.4.1 above. As stated in Section 3.17.4.1, OMA #11 has acceptable margin for all fire zones in Fire Area J.

##### 3.20.4.2 OMA #12—Transfer Instrument Buses 23 and 23A to Emergency Power Source

The licensee stated that instrument buses 23 and 23A could experience a loss of their normal power source (125 VDC power panel 23) as a result of fire in Fire Zone 39A. If this were to occur, the licensee stated that OMA #12 is available to swap Instrument Buses 23 and 23A to their backup power source (MCC–29A). If OMA #12 becomes necessary, the licensee stated that they have assumed a 5.5-minute diagnosis period and that the required time to perform the action is 2 minutes while the time available is 30 minutes, which provides 22.5 minutes of margin.

#### 3.20.5 Conclusion for Fire Area J (Fire Zone 39A)

Since the licensee described postulated fire scenarios and Fire Zone 39A lacks an automatic fire detection or automatic fire suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment

remains free of fire damage following a fire event. Although there is 50 minutes of margin available for OMA #11 and 22.5 minutes of margin available for OMA #12, Fire Zone 39A still lacks adequate defense-in-depth. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 39A and that OMAs #11 and #12 are unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 39A.

**3.21 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 43A—Ground Floor, Elevation 15–0" Unit 2 Turbine Building)**

#### 3.21.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that the fixed combustibles in this zone consist of cable insulation, lube oil, plastic, wood, electrical panels, and cabinets and that the transient combustibles in this zone consist of trash, cardboard drums, cleaning rags, lube oil, plastic, fiberglass ladders, and paint. The licensee also stated that the ignition sources in this zone consist of cables, junction boxes, MCC, motors, pumps, electrical cabinets, high voltage arcing faults, and an air dryer. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN–DC–161. However, operator rounds performed each shift provide for the monitoring of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee stated that procedures OAP–017 (Plant Surveillance and Operator Rounds) and EN–MA–132 (Housekeeping) include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

#### 3.21.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 43A does not have a fire detection or automatic fire suppression system installed.

#### 3.21.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 43A has an approximate floor area of

6,600 square feet and an approximate ceiling height of 21'-0". The licensee stated that cable JC2-YA9, which is associated with Buses 5A and 6A, is routed through Fire Zone 43A in a tray located approximately 15 feet above the floor and that ignition sources in the zone located less than 20 feet horizontally from the cable consist of two MCCs, an air dryer skid, 6.9 kV switchgear, and an electrical cabinet. According to the licensee, the MCCs are located under the cable routing separated from the cable by approximately 7.7 feet vertically, the air dryer skid is separated from the cable by approximately 6.1 feet horizontally, the electrical cabinet is separated from the cable by approximately 2 feet horizontally and 9.2 feet vertically, and the 6.9 kV switchgear is separated from the cable by approximately 0.7 feet horizontally and 7.7 feet vertically.

The licensee also stated that cable AC4-BA6 is routed through Fire Zone 43A in a tray located approximately 12 feet above the floor and that ignition sources in the zone located less than 20 feet horizontally from the cable consist of 6.9 kV switchgear and an electrical cabinet. According to the licensee, the 6.9 kV switchgear is separated from the cable by zero feet horizontally and approximately 3.7 feet vertically and the electrical cabinet is separated from the cable by approximately 6 feet horizontally.

The licensee also stated that cable AA3-BA5 is associated with instrument buses 23 and 23A and is routed through Fire Zone 43A in tray located approximately 14 feet above the floor and that ignition sources in the zone located less than 20 feet horizontally from the cable consist of 6.9 kV switchgear and an electrical cabinet. According to the licensee, the 6.9 kV switchgear is separated from the cable by approximately 0 feet horizontally and 5 feet vertically and the electrical cabinet is separated from the cable by approximately 3 feet horizontally and 7 feet vertically.

The licensee also stated that cable AD1-BA8 is associated with instrument buses 23 and 23A and is routed through Fire Zone 43A in tray located approximately 14 feet above the floor and that ignition sources in the zone located less than 20 feet horizontally from the cable consist of 6.9 kV switchgear and an electrical cabinet. According to the licensee, the 6.9 kV switchgear is separated from the cable by approximately 0 feet horizontally and 5.6 feet vertically and the electrical cabinet is separated from the cable by approximately 6 feet horizontally.

The licensee stated that cable ECE19-MN3/01, which is associated with valve LCV-112B, is routed through Fire Zone 43A in a cable tray located approximately 13 feet above the floor and that ignition sources in the zone located less than 20 feet horizontally from the cable consist of an MCC, an air dryer skid, 6.9 kV switchgear, a portable Duraline power station, and an electrical cabinet. According to the licensee, the MCC is separated from the cable by approximately 3.2 feet horizontally and 0 feet vertically, the air dryer skid is separated from the cable by approximately 7.7 feet horizontally and 2.6 feet vertically, the electrical cabinet is separated from the cable by approximately 2 feet horizontally and 7.3 feet vertically, the 6.9 kV switchgear is separated from the cable by approximately 0.7 feet horizontally and 5.8 feet vertically, and the Duraline power station is separated from the cable by approximately 19.5 feet horizontally.

As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

#### 3.21.4 OMA's Credited for a Fire in Fire Area J (Fire Zone 43A)

##### 3.21.4.1 OMA #11—Trip Breakers 52/5A and 52-SAC on Bus 5A and 52/6A and 52/TAO at Bus 6A and Remove Control Power Fuses

OMA #11 was evaluated in Section 3.17.4.1 above. As stated in Section 3.17.4.1, OMA #11 has acceptable margin for all fire zones in Fire Area J.

##### 3.21.4.2 OMA #12—Transfer Instrument Buses 23 and 23A to Emergency Power Source

The licensee stated that Instrument buses 23 and 23A could experience a loss of their normal power source (125 VDC power panel 23) as a result of fire in Fire Zone 43A. If a fire were to occur and causes a loss of offsite power and damages the cables identified above, the licensee stated that OMA #12 is available to swap Instrument Buses 23 and 23A to their backup power source (MCC-29A). If OMA #12 becomes necessary, the licensee stated that they have assumed a 5.5-minute diagnosis period and that the required time to perform the action is 2 minutes while the time available is 30 minutes, which provides 22.5 minutes of margin.

##### 3.21.4.3 OMA #13—Align Charging Pump Suction to RWST

The licensee stated that fire-induced cable damage may render alternate charging pump suction supply valve LCV-112B (normally closed RWST

outlet valve) inoperable. In the event that cable failures have rendered LCV-112B inoperable, local valve manipulations are required to support alignment of the charging pump suction to the alternate source, the RWST.

If a fire were to occur and renders the alternate charging pump suction supply valve LCV-112B inoperable, the licensee stated that OMA #13 is available to locally close valve LCV-112C and open manual valve 288 to provide a bypass around RWST outlet valve LCV-112B and provide water to the charging pump suction. If OMA #13 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 18 minutes while the time available is 75 minutes, which provides 43 minutes of margin.

#### 3.21.5 Conclusion for Fire Area J (Fire Zone 43A)

Since the licensee described postulated fire scenarios and Fire Zone 43A lacks an automatic fire detection or automatic fire suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 50 minutes of margin available for OMA #11, 22.5 minutes of margin available for OMA #12, and 43 minutes of margin available for OMA #13, Fire Zone 43A lacks adequate defense-in-depth. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 43A and that OMA's #11, #12, and #13 are unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on these OMA's cannot be granted for Fire Zone 43A.

3.22 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 45A—Ground Floor, Elevation 15'-0" and 3'-3" of the Unit 2 Turbine Building)

#### 3.22.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that the fixed combustibles in this zone consist of cable insulation, lube oil, vinyl insulation, and hydrogen and that the transient combustibles in this zone

consist of trash, cardboard drums, lube oil, fiberglass ladders, paint, and radiation boundaries. The licensee also stated that the ignition sources in this zone consist of cables, junction boxes, MCC, motors, pumps, and electrical cabinets. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN-DC-161. However, operator rounds performed each shift provide for the monitoring of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee stated that procedures OAP-017 (Plant Surveillance and Operator Rounds) and EN-MA-132 (Housekeeping) include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

### 3.22.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 45A does not have a fire detection or automatic fire suppression system installed.

### 3.22.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 45A has an approximate floor area of 5,380 square feet and an approximate ceiling height of 12'-4". The licensee stated that cable AG5-XA5, which affects buses 5A and 6A, is located in Fire Zone 45A and that ignition sources in the zone located less than 20 feet horizontally from cable AG5-XA5 consist of seven electrical cabinets, a 150KVA dry transformer, three motors, and an MCC. According to the licensee, three electrical cabinets are located under the cable separated by approximately 3 feet vertically or greater, four electrical cabinets are separated from the cable by approximately 2 feet horizontally or greater, the 150KVA dry transformer is separated from the cable by approximately 1.6 feet horizontally and 6.7 feet vertically. The motors are separated from the cable by approximately 4.6 feet horizontally or greater, and the MCC is separated from the cable by approximately 7.5 feet horizontally. As discussed in Section 3.0 above, the licensee could not demonstrate any separation between credited and redundant trains of equipment.

### 3.22.4 OMAs Credited for a Fire in Fire Area J (Fire Zone 45A)

#### 3.22.4.1 OMA #11—Trip Breakers 52/5A and 52-SAC on Bus 5A and 52/6A and 52/TAO at Bus 6A and Remove Control Power Fuses

OMA #11 was evaluated in Section 3.17.4.1 above. As stated in Section 3.17.4.1, OMA #11 has acceptable margin for all fire zones in Fire Area J.

#### 3.22.5 Conclusion for Fire Area J (Fire Zone 45A)

Since the licensee described postulated fire scenarios and Fire Zone 45A lacks an automatic fire detection or automatic fire suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 50 minutes of margin available for OMA #11, Fire Zone 45A still lacks adequate defense-in-depth. The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 45A and that OMA #11 is unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on OMA #11 cannot be granted for Fire Zone 45A.

### 3.23 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 46A—Ground Floor, Elevation 12'-0" and 3'-3" Unit 2 Turbine Building)

#### 3.23.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that the fixed combustibles in this zone consist of cable insulation and lube oil and that the transient combustibles in this zone consist of trash, cleaning rags, lube oil, and paint. The licensee also stated that the ignition sources in this zone consist of cables, junction boxes, motors, pumps, and electrical cabinets. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN-DC-161. However, operator rounds performed each shift provide for the monitoring of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee

stated that procedures OAP-017, "Plant Surveillance and Operator Rounds," and EN-MA-132, "Housekeeping," include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

#### 3.23.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 46A does not have a fire detection or automatic fire suppression system installed.

#### 3.23.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 46A has an approximate floor area of 12,350 square feet and an approximate ceiling height of 12'-4". The licensee stated that cable JC2-YA9, which is associated with Buses 5A and 6A, is routed through Fire Zone 46A in a tray located approximately 15 feet above the floor and that ignition sources in the zone located less than 20 feet horizontally from the cable consist of two MCCs, an air dryer skid, 6.9kV switchgear, and an electrical cabinet. According to the licensee, the MCCs are located under the cable routing separated from the cable by approximately 7.7 feet vertically, the air dryer skid is separated from the cable by approximately 6.1 feet horizontally, the electrical cabinet is separated from the cable by approximately 2 feet horizontally and 9.2 feet vertically, and the 6.9kV switchgear is separated from the cable by approximately 0.7 feet horizontally and 7.7 feet vertically.

The licensee also stated that cable JB1-L91, which is associated with instrument buses 23 and 23A, is routed through the Fire Zone 46A.

The licensee also stated that cable ECE19-MN3/01, which is associated with valve LCV-112B, is routed through Fire Zone 46A in a cable tray located approximately 13 feet above the floor and that ignition sources in the zone located less than 20 feet horizontally from the cable consist of an MCC, an air dryer skid, 6.9kV switchgear, a portable Duraline power station, and an electrical cabinet. According to the licensee, the MCC is separated from the cable by approximately 3.2 feet horizontally and 0 feet vertically, the air dryer skid is separated from the cable by approximately 7.7 feet horizontally and 2.6 feet vertically, the electrical cabinet is separated from the cable by approximately 2 feet horizontally and 7.3 feet vertically, the 6.9kV switchgear is separated from the cable by approximately 0.7 feet horizontally and 5.8 feet vertically, and the Duraline power station is separated from the

cable by approximately 19.5 feet horizontally.

As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

### 3.23.4 OMAs Credited for a Fire in Fire Area J (Fire Zone 46A)

#### 3.23.4.1 OMA #11—Trip Breakers 52/5A and 52—SAC on Bus 5A and 52/6A and 52/TAO at Bus 6A and Remove Control Power Fuses

OMA #11 was evaluated in Section 3.17.4.1 above. As stated in Section 3.17.4.1, OMA #11 has acceptable margin for all fire zones in Fire Area J.

#### 3.23.4.2 OMA #12—Transfer Instrument Buses 23 and 23A to Emergency Power Source

The licensee stated that instrument buses 23 and 23A could experience a loss of their normal power source (125 VDC power panel 23) as a result of fire in Fire Zone 46A. If this were to occur, the licensee stated that OMA #12 is available to swap instrument buses 23 and 23A to their backup power source (MCC–29A). If OMA #12 becomes necessary, the licensee stated that they have assumed a 5.5-minute diagnosis period and that the required time to perform the action is 2 minutes while the time available is 30 minutes, which provides 22.5 minutes of margin.

#### 3.23.4.3 OMA #13—Align Charging Pump Suction to RWST

The licensee stated that fire-induced cable damage may render alternate charging pump suction supply valve LCV–112B (normally closed RWST outlet valve) inoperable. In the event that cable failures have rendered LCV–112B inoperable, this valve is required to be opened to support alignment of charging pump suction to the alternate source, the RWST.

If a fire were to occur and it renders alternate charging pump suction supply valve LCV–112B inoperable, the licensee stated that OMA #13 is available to locally close valve LCV–112C and open manual valve 288 to provide a bypass around RWST outlet valve LCV–112B and provide water to the charging pump suction. If OMA #13 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 18 minutes while the time available is 75 minutes, which provides 43 minutes of margin.

### 3.23.5 Conclusion for Fire Area J (Fire Zone 46A)

Since the licensee described postulated fire scenarios and Fire Zone

46A lacks an automatic fire detection or automatic fire suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 50 minutes of margin available for OMA #11, 22.5 minutes of margin available for OMA #12, and 43 minutes of margin available for OMA #13, Fire Zone 46A still lacks adequate defense-in-depth. The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 46A and that OMAs #11, #12, and #13 are unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 46A.

### 3.24 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 47A—Ground Floor, Elevation 15'–0" Unit 2 Turbine Building)

#### 3.24.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that the fixed combustibles in this zone consist of cable insulation and that the transient combustibles in this zone consist of trash, lube oil, rubber hose, and paint. The licensee also stated that the ignition sources in this zone consist of cables, junction boxes, MCC vertical panels, and electrical cabinets. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN–DC–161. However, operator rounds performed each shift provide for the monitoring of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee stated that procedures OAP–017 (Plant Surveillance and Operator Rounds) and EN–MA–132 (Housekeeping) include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

#### 3.24.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 47A does not have a fire detection or

automatic fire suppression system installed.

#### 3.24.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 47A has an approximate floor area of 5,175 square feet and an approximate ceiling height of 37'–0". The licensee stated that cable JC2–YA9, which is associated with Buses 5A and 6A, is located in Fire Zone 47A in a cable tray located approximately 8 feet above the floor and that ignition sources in the zone located less than 20 feet horizontally from cable JC2–YA9 consist of electrical cabinets, motors, and MCCs. According to the licensee, the electrical cabinets are separated from the cable by approximately 3.8 feet horizontally and 1.9 feet vertically and the MCCs are located under the cable separated from the cable by approximately 0.2 feet vertically. As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

#### 3.24.4 OMAs Credited for a Fire in Fire Area J (Fire Zone 47A)

##### 3.24.4.1 OMA #11—Trip Breakers 52/5A and 52—SAC on Bus 5A and 52/6A and 52/TAO at Bus 6A and Remove Control Power Fuses

OMA #11 was evaluated in Section 3.17.4.1 above. As stated in Section 3.17.4.1, OMA #11 has acceptable margin for all fire zones in Fire Area J.

##### 3.24.5 Conclusion for Fire Area J (Fire Zone 47A)

Since the licensee described postulated fire scenarios and Fire Zone 47A lacks an automatic fire detection or automatic fire suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 50 minutes of margin available for OMA #11, Fire Zone 47A still lacks adequate defense-in-depth. The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 47A and that OMA #11 is unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on OMA #11 cannot be granted for Fire Zone 47A.

3.25 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 50A—Mezzanine Floor, Elevation 36'–9" Unit 2 Turbine Building)

#### 3.25.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that the fixed combustibles in this zone consist of cables, plastic, cellulose, and office materials and that the transient combustibles in this zone consist of trash, vinyl covers, lube oil, and paint. The licensee also stated that the ignition sources in this zone consist of cables, junction boxes, dry transformers, motors, pumps, and electrical cabinets. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN–DC–161. However, operator rounds performed each shift provide for the monitoring of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee stated that procedures OAP–017 (Plant Surveillance and Operator Rounds) and EN–MA–132 (Housekeeping) include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

#### 3.25.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 50A does not have a fire detection or automatic fire suppression system installed.

#### 3.25.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 50A has an approximate floor area of 1,550 square feet and an approximate ceiling height of 16'–0". The licensee stated that cable JC2–YA9, which is associated with Buses 5A and 6A, is located in Fire Zone 50A in a cable tray located approximately 8 feet above the floor and that ignition sources in the zone located less than 20 feet horizontally from cable JC2–YA9 consist of electrical cabinets, motors, and MCCs. According to the licensee, the electrical cabinets are separated from the cable by approximately 3.8 feet horizontally and 1.9 feet vertically and a motor is located under the cable separated by approximately 5.2 feet vertically. The licensee also stated that cable AG5–XA5, which is associated with instrument buses 23 and 23A, is

routed through the Fire Zone 50A and that ignition sources in the zone located less than 20 feet horizontally from the cable consist of electrical cabinets, a dry transformer, motors, and an MCC. According to the licensee, three of the electrical cabinets are located under the cable separated from the cable by approximately 3 feet vertically or greater, another four electrical cabinets are separated from the cable by approximately 2 feet horizontally or greater, the dry transformer is separated from the cable by approximately 1.6 feet horizontally and 6.7 feet vertically, the motors are separated from the cable by approximately 4.6 feet horizontally or greater, and the MCC is separated from the cable by approximately 7.5 feet horizontally. As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

#### 3.25.4 OMAs Credited for a Fire in Fire Area J (Fire Zone 50A)

3.25.4.1 OMA #11—Trip Breakers 52/5A and 52–SAC on bus 5A and 52/6A and 52/TAO at bus 6A and Remove Control Power Fuses

OMA #11 was evaluated in Section 3.17.4.1 above. As stated in Section 3.17.4.1, OMA #11 has acceptable margin for all fire zones in Fire Area J.

3.25.4.2 OMA #12—Transfer Instrument Buses 23 and 23A to Emergency Power Source

The licensee stated that instrument buses 23 and 23A could experience a loss of their normal power source (125 VDC power panel 23) as a result of fire in Fire Zone 50A. If this were to occur, the licensee stated that OMA #12 is available to swap Instrument Buses 23 and 23A to their backup power source (MCC–29A). If OMA #12 becomes necessary, the licensee stated that they have assumed a 5.5–minute diagnosis period and that the required time to perform the action is 2 minutes while the time available is 30 minutes, which provides 22.5 minutes of margin.

#### 3.25.5 Conclusion for Fire Area J (Fire Zone 50A)

Since the licensee described postulated fire scenarios and Fire Zone 50A lacks an automatic fire detection or automatic fire suppression system and a robust combustible controls program, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a

fire event. Although there are 50 minutes of margin available for OMA #11 and 22.5 minutes of margin available for OMA #12, Fire Zone 50A still lacks adequate defense-in-depth. The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 50A and that OMAs #11 and #12 are unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 50A.

3.26 Fire Area J—Unit 1 Control Room, Turbine Building, Superheater Building, Nuclear Service Building, Chemical Systems Building, Administration Building, Screenwell House, and Unit 2 Turbine Building (Fire Zone 270—General Area of the 33' Elev. of the Unit 1 Superheater Bldg.)

#### 3.26.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that the fixed combustibles in this zone consist of cables and that the transient combustibles in this zone consist of trash, cardboard drums, a flammable liquid cabinet, plastic, wood, and paint. The licensee also stated that the ignition sources in this zone consist of cables, junction boxes, dry transformers, motors, a battery charger, an MCC vertical panel, and electrical cabinets. The licensee further stated that since Fire Area J does not contain safety-related structures, systems or components, it is not subject to the explicit transient combustible controls of procedure EN–DC–161. However, operator rounds performed each shift provide for the monitoring of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee stated that procedures OAP–017 (Plant Surveillance and Operator Rounds) and EN–MA–132 (Housekeeping) include guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles.

#### 3.26.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 270 does not have a fire detection or automatic fire suppression system installed.

#### 3.26.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 270 has an approximate floor area of 13,000 square feet and an approximate ceiling height of 19'–0". The licensee also stated

that cables EDB8–EPB3, associated with instrument buses 23 and 23A, are routed through the Fire Zone 270 in rigid steel conduit and that ignition sources in the zone located less than 20 feet horizontally from the cables consist of electrical cabinets, a dry transformer, batteries, and an MCC. According to the licensee, one of the electrical cabinets is separated from the cables by approximately 12.8 feet horizontally, another electrical cabinet is separated from the cables by approximately 5.5 feet horizontally, the dry transformer is separated from the cables by approximately 13.6 feet horizontally, the MCC is separated from the cables by approximately 18.5 feet horizontally, and there is no separation between the cables and the batteries since the cables originate at the batteries.

As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

#### 3.26.4 OMAs Credited for a Fire in Fire Area J (Fire Zone 270)

##### 3.26.4.1 OMA #12—Transfer Instrument Buses 23 and 23A to Emergency Power Source

The licensee stated that Instrument buses 23 and 23A could experience a loss of their normal power source (125 VDC power panel 23) as a result of fire in Fire Zone 270. If this were to occur, the licensee stated that OMA #12 is available to swap Instrument Buses 23 and 23A to their backup power source (MCC–29A). If OMA #12 becomes necessary, the licensee stated that they have assumed a 5.5-minute diagnosis period and that the required time to perform the action is 2 minutes while the time available is 30 minutes, which provides 22.5 minutes of margin.

##### 3.26.5 Conclusion for Fire Area J (Fire Zone 270)

Since the licensee described postulated fire scenarios and Fire Zone 270 lacks a fire detection or automatic fire suppression system and a robust combustible controls program, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there are 22.5 minutes of margin available for OMA #12, Fire Zone 270 still lacks adequate defense-in-depth. The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for

a fire in Fire Zone 270 and that OMA #12 is unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on OMA #12 cannot be granted for Fire Zone 270.

#### 3.27 Fire Area K—Auxiliary Feed Pump Building (not Including the AFW Pump Room) (Fire Zone 60A—Chemical Addition Area, Elev. 33'–0")

##### 3.27.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that there are no fixed combustibles in this zone and that the transient combustibles in this zone consist of trash, fiber drums, and paint. The licensee also stated that the ignition sources in this zone consist of motors, blowers, and electrical cabinets.

##### 3.27.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 60A does not have a fire detection or automatic fire suppression system installed.

##### 3.27.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 60A has an approximate floor area of 1,210 square feet and an approximate ceiling height of 8'–6". The licensee stated that cables LL8–JF5 for FCV–406A, LL9–JF9 for FCV–406C, JB1–YN9 for FCV–1121, and JB1–PT1/2 and PT1–A16 associated with 21 AFW pump are routed through Fire Zone 60A in rigid steel conduit that runs vertically from floor to ceiling and that ignition sources in the zone located less than 20 feet horizontally from the cables consist of one electrical cabinet and four motors. According to the licensee, the electrical cabinet is separated from the cables by approximately 7 feet horizontally and the motors are separated from the cables by approximately 5.5 feet horizontally or greater.

The licensee also stated that cables PU9–JF9 for FCV–406D, PU9–JH1 for FCV–406B, PU9–JG2 for FCV–406A, and PU9–JF2 for FCV–406C are routed through Fire Zone 60A in a combination of rigid steel conduits and a cable tray that runs from floor to ceiling and that ignition sources in the zone located less than 20 feet horizontally from the cables consist of two electrical cabinet and four motors. According to the licensee, the electrical cabinet is separated from the cables by approximately 7 feet horizontally or greater and the motors are separated from the cables by approximately 1.6 feet horizontally.

As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

#### 3.27.4 OMAs Credited for a Fire in Fire Area K (Fire Zone 60A)

##### 3.27.4.1 OMA #14—Transfer 21 AFW Pump to Alternate Safe Shutdown System Power Source

If a fire were to occur and it causes damage to the cables associated with the 21 AFW pump normal power supply, the licensee stated that OMA #14 is available to operate transfer switch EDC5 and close the supply breaker at substation 12FD3 to transfer 21 AFW pump to the Alternate Safe Shutdown System power supply. If OMA #14 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 34 minutes, which provides 12.5 minutes of margin.

##### 3.27.4.2 OMA #15—Open 21 AFW Pump Recirculation Bypass Valve (BFD–77)

If a fire were to occur and it causes damage to the cables associated with the 21 AFW pump recirculation valve, FCV–1121, the licensee stated that OMA #15 is available to open the 21 AFW pump recirculation bypass valve BFD–77. If OMA #15 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 5 minutes while the time available is 34 minutes, which provides 24.5 minutes of margin.

##### 3.27.5 Conclusion for Fire Area K (Fire Zone 60A)

Since the licensee described postulated fire scenarios and Fire Zone 60A lacks an automatic fire detection or automatic fire suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 12.5 minutes of margin available for OMA #14 and 24.5 minutes of margin available for OMA #15, Fire Zone 60A still lacks adequate defense-in-depth.

The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 60A and that OMAs #14 and #15 are unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore,

the NRC staff finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 60A.

3.28 Fire Area K—Auxiliary Feed Pump Building (not Including the AFW Pump Room) (Fire Zone 65A—Main Steam and Feedwater Valve Area 43'-0", 65'-0", and 74'-0")

#### 3.28.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that fixed combustibles in this zone consist of wood and that the transient combustibles in this zone consist of trash and paint. The licensee also stated that the ignition sources in this zone consist of a transformer and electrical cabinets.

#### 3.28.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 65A does not have a fire detection or automatic fire suppression system installed.

#### 3.28.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 65A has an approximate floor area of 1,210 square feet and an approximate ceiling height of 43'-0". The licensee stated that cables PU9-JF9 for FCV-406D, PU9-JH1 for FCV-406B, PU9-JG2 for FCV-406A, PU9-JF2 for FCV-406C, LL8-JF5 for FCV-406A, LL9-JF9 for FCV-406C, JB1-YN9 for FCV-1121, and JB1-PT1/2 and PT1-A16 associated with 21 AFW pump are routed through Fire Zone 65A in rigid steel conduit that runs vertically from the floor to a height of approximately 6.5 feet to 8.5 feet above the floor before exiting the zone and that ignition sources in the zone located less than 20 feet horizontally from the cables consist of two switches. According to the licensee, the switches are separated from the cables by approximately 2.5 feet horizontally. As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

#### 3.28.4 OMAs Credited for a Fire in Fire Area K (Fire Zone 65A)

##### 3.28.4.1 OMA #14—Transfer 21 AFW Pump to Alternate Safe Shutdown System Power Source

If a fire were to occur and it causes damage to the cables associated with the 21 AFW pump normal power supply, the licensee stated that OMA #14 is available to operate transfer switch EDC5 and close supply breaker at substation 12FD3 to transfer 21 AFW pump to the Alternate Safe Shutdown

System power supply. If OMA #14 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 34 minutes, which provides 12.5 minutes of margin.

##### 3.28.4.2 OMA #15—Open 21 AFW Pump Recirculation Bypass Valve (BFD-77)

If a fire were to occur and it causes damage to the cables associated with the 21 AFW pump recirculation valve, FCV-1121, the licensee stated that OMA #15 is available to open the 21 AFW pump recirculation bypass valve BFD-77. If OMA #15 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 5 minutes while the time available is 34 minutes, which provides 24.5 minutes of margin.

#### 3.28.5 Conclusion for Fire Area K (Fire Zone 65A)

Since the licensee described postulated fire scenarios and Fire Zone 65A lacks an automatic fire detection or automatic fire suppression system, and any discernable separation between the credited and redundant equipment in the area, it is possible that a fire would not be detected and extinguished in a reasonable amount of time to ensure that at least one train of equipment remains free of fire damage following a fire event. Although there is 12.5 minutes of margin available for OMA #14 and 24.5 minutes of margin available for OMA #15, Fire Zone 65A still lacks adequate defense-in-depth. The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 65A and that OMAs #14 and #15 are unacceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 65A.

#### 3.29 Fire Area P—Component Cooling Pump Room, Elevation 68'-0"—PAB (Fire Zone 1—Component Cooling Pump Room, Elevation 68'-0"—PAB)

##### 3.29.1 Fire Prevention

The licensee stated that the fire loading in this zone is low and that there are no fixed combustibles in this zone and that the transient combustibles in this zone consist of trash, radiation boundaries, and paint. The licensee also stated that the ignition sources in this zone consist of electric motors and pumps.

##### 3.29.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 1 has an area-wide, fire detection system installed but does not have an automatic fire suppression system installed. The licensee also stated that the fire detection system is designed and installed in accordance with NFPA 72D, 1975 Edition.

##### 3.29.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 1 has an approximate floor area of 710 square feet and an approximate ceiling height of 12'-0". The licensee stated that power supply cables for 21, 22, and 23 component cooling water (CCW) pumps are located in this zone in rigid steel conduit for each motor and that the conduit for 23 CCW Pump is wrapped with an ERFBS rated for 30 minutes. The licensee also stated that the pumps are located approximately 10 feet from each other and that a radiant energy shield is installed between the 22 CCW pump and the 23 CCW pump. In addition, the licensee stated that the ignition sources in the zone consist of the three CCW pumps and two electrical cabinets. According to the licensee, the conduits for 21 and 22 CCW pumps are routed vertically from the motors to approximately 8.8 feet above the floor and are separated by approximately 0.5 feet horizontally, the cable for 23 CCW pump rises vertically from the motor to approximately 9.5 feet above the floor, and that the conduit for the 22 CCW Pump crosses over the 21 CCW Pump. Also according to the licensee, the electrical cabinets are separated from the 21 and 22 CCW pump power cables by approximately 19.5 feet horizontally or greater, one of the electrical cabinets is located directly under the 23 CCW pump power cable separated by approximately 5.2 feet vertically, and the other electrical cabinet is separated from the 23 CCW pump power conduit by approximately 3.8 feet horizontally and 4.1 feet vertically. As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

##### 3.29.4 OMAs Credited for a Fire in Fire Area P (Fire Zone 1)

##### 3.29.4.1 OMA #16—Transfer 23 CCW Pump to Alternate Safe Shutdown System Power Feed if Normal Power or Control Is Lost

The licensee stated that the CCW pump room contains all three CCW pumps and that power to the CCW pumps is normally supplied from the



480V switchgear. The licensee also stated that the Alternate Safe Shutdown System provides the capability to use individual components as required to meet specific plant shutdown goals and that to ensure the availability of at least one CCW pump for SSD in the event that the normal power supply is disabled as a result of a fire, Alternate Safe Shutdown System power can be supplied to CCW pump 23 through manual transfer switch EDF9 which is hardwired to Alternate Safe Shutdown System bus 12FD3 at the Alternate Safe Shutdown System load center, where starting and stopping 23 CCW pump can be accomplished.

In the unlikely event that a fire occurs and causes a loss of all three trains of normal power, the licensee stated that OMA #16 is available to align the 23 CCW pump to an alternate power supply, thereby recovering one of the redundant CCW trains. If OMA #16 becomes necessary, the licensee stated that they have assumed a 24-minute diagnosis period and that the required time to perform the action is 7 minutes while the time available is greater than 60 minutes, which provides 29 minutes of margin.

#### 3.29.4.2 OMA #17—Start Appendix R Diesel Generator (ARDG) if Normal Power and Offsite Power Are Lost

The licensee confirmed that Fire Area P presents no impact to cables or components associated with the onsite power supplied by the safety-related EDGs 21, 22, and 23. In the event that it is desired or necessary to utilize the ARDG, the licensee stated that it would only be in response to CCR operators observing the loss of indication for power availability to all 480V safety-related buses. The licensee also stated that there are no credible fire scenarios that would necessitate this OMA.

In the unlikely event that a fire occurs and causes a loss of both normal and offsite power supply, the licensee stated that OMA #17 is available to start the ARDG. If OMA #17 becomes necessary, the licensee stated that they have assumed that offsite power is unavailable at the outset of the event and that the required time to perform the action is 17 minutes while the time available is 60 minutes, which provides 43 minutes of margin.

#### 3.29.5 Conclusion for Fire Area P (Fire Zone 1)

Given the low combustible fuel loading, ERFBS and radiant energy shield noted above, and the automatic fire detection system, it is unlikely that a fire would occur and go undetected and not be extinguished in a reasonable

amount of time to ensure that at least one train of equipment necessary for safe shutdown remains free of fire damage. For OMA #17, the NRC staff finds that a fire in Fire Zone 1 should not affect power availability on the 480V safety-related buses, and therefore OMA #17 would not be required. In the unlikely event that a fire does occur and causes damage that necessitates the use of OMA #16, there is 29 minutes of margin available to provide assurance that safe shutdown capability will be maintained following the postulated fire events. The NRC staff had previously issued an exemption from III.G for Fire Zone 1 in 1984 (ML003776266). In that exemption, the NRC staff found that the low fire load, the fire detection system, and features such as fire wrap on the 23 CCW pump cables from transfer switch EDF-9 and the non-combustible fire barriers in the room justified an exemption. The NRC staff finds that there is adequate defense-in-depth provided for Fire Zone 1 and that OMA #16 is acceptable for the purpose of providing the level of protection intended by the regulation. Therefore, the NRC staff finds that the previous III.G.2 exemption for Fire Zone 1 remains valid.

#### 3.30 Fire Area YD—Exterior Yard (Fire Zone 900—Yard)

##### 3.30.1 Fire Prevention

The licensee stated that this zone is an outdoor area with minimal fixed combustibles and that any ignition sources would be transient in nature. The licensee also stated that although this zone contains minimal fixed combustibles, postulated fire scenarios would involve transient materials and ignition sources.

##### 3.30.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 900 does not have a fire detection or automatic fire suppression system installed.

##### 3.30.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 900 is an outside area with no walls or ceiling and open to the exterior so it is unlikely that smoke or heat would accumulate in the zone to cause damage to equipment not exposed directly to a fire. The licensee stated that Fire Zone 900 contains cable ECD3-EXF6/2, which is associated with motor-operated valve 227, and is routed outside through rigid steel conduit from approximately 12 feet above the floor at elevation of 98' which is also the roof of 80' elevation to approximately elevation 104' where it

enters the fan house. As discussed in Section 3.0 above, the licensee did not demonstrate any separation between credited and redundant trains of equipment.

#### 3.30.4 OMAs Credited for a Fire in Fire Area YD (Fire Zone 900)

##### 3.30.4.1 OMA #18—Align Charging Pump Makeup Path to RCS

The licensee stated that in order to ensure a reliable charging makeup path to the RCS, air-operated valve HCV-142 must remain open or motor-operated bypass valve 227, which is normally closed, must be opened and that air-operated valve HCV-142 is assumed to fail closed as designed in response to a loss of instrument air. The licensee stated that OMA #18 is only required if normal flowpath valve HCV-142 fails closed and that spurious isolation of the charging makeup path to the RCS is identified in the CCR by operators confirming that a charging pump is in operation, but pressurizer level is decreasing. Since no CCR pressurizer level indicating channels have cables routed through Fire Area YD, the CCR indication of pressurizer level can be expected to remain unaffected and operable in the event of a fire in Fire Zone 900.

In the unlikely event that a fire occurs and causes damage to cable ECD3-EXF6/2 and causes HCV-142 to close in response to a loss of instrument air, the licensee stated that OMA #18 is available to align charging makeup path to RCS by manually opening bypass valve 227 to mitigate a spuriously closed HCV-142 and restore or maintain a reliable charging makeup path to the RCS. If OMA #18 becomes necessary, the licensee stated that they have assumed a 14-minute diagnosis period and that the required time to perform the action is 14 minutes while the time available is greater than 75 minutes, which provides 47 minutes of margin.

##### 3.30.5 Conclusion for Fire Area YD (Fire Zone 900)

Given the low combustible fuel loading and outdoor nature of the zone, it is unlikely that a fire would occur and damage cable ECD3-EXF6/2. In the unlikely event that a fire does occur and causes damage that necessitates the use of OMA #18, there is 47 minutes of margin available to provide assurance that safe shutdown capability will be maintained following the postulated fire events. The NRC staff finds that there is adequate defense-in-depth provided for Fire Zone 900 and that OMA #18 is acceptable for the purpose of providing the level of protection intended by the



regulation. Therefore, the NRC staff finds that an exemption from III.G.2 based on OMA #18 is granted for Fire Zone 900.

#### **4.0 Feasibility and Reliability of the Operator Manual Actions**

Based on Section 3.0 above, several areas where OMAs are credited were found acceptable. The OMAs credited in those areas were then evaluated for feasibility and reliability. This analysis postulates that OMAs may be necessary to assure SSD 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 licensee's justification for the OMAs specified in this exemption.

##### *4.1 Bases for Establishing Feasibility*

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, and staffing and demonstrations. In its submittals, the licensee stated that environmental factors such as radiation, lighting, temperature, humidity, smoke, toxic gas, noise, and 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 normal 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 exemption are provided with emergency lighting that illuminates both the potential ingress and 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. For those specific cases in which it is necessary to reenter the fire area no less than 1 hour after the postulated fire event, the licensee stated that sufficient time is available to initiate smoke/heat venting through fixed ventilation systems and augmented by portable smoke ejectors, consistent with the Pre-

Fire Plans, to ensure operator habitability to implement the necessary OMAs. In addition, the licensee stated that pre-staged self-contained breathing apparatus (SCBA), sufficient to equip the full operating crew, are available for deployment in response to post-fire environmental conditions.

The licensee stated that equipment credited for implementation of OMAs was reviewed to ensure it is accessible, available, and not damaged by the affects of the fire. Where ladders are required for access to components to perform OMAs, appropriate ladders are staged in accordance with plant procedures and the presence of these ladders is verified periodically in accordance with plant surveillance procedures. Any tools that are required in support of post-fire hot shutdown OMAs are pre-staged at the locations where they would be used. These consist of common tools such as wrenches, banding cutters, and pliers. Where special tools or equipment are required, the licensee stated that they are designated for post-fire cold shutdown repairs, and the necessary tools and supplies are pre-staged in designated locations. The staging of necessary tools is confirmed via periodic surveillance.

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 manual actions are available to the operators. The licensee stated that all of the requested OMAs are directed by plant procedures, and the operators are trained in the use of the procedures. Specifically, the licensee stated that post-fire operator manual actions are clearly defined in procedures 2-ONOP-FP-001 and 2-AOP-SSD-1. Most OMAs required for the III.G.2 fire areas are directed by Off-Normal Operating Procedure 2-ONOP-FP-001. Where CCR controls and indications are not assured to be reliably operable, the licensee stated that sufficiently detailed guidance is provided in procedure 2-AOP-SSD-1 to direct the operators to an alternate component or operating method that is assured to be available and viable for the specific fire scenario under consideration. Initial and periodic requalification operator training is provided on these procedures, consistent with standard licensed and non-licensed operator training programs.

The licensee stated that key diagnostic instrumentation is expected to remain available in the CCR to alert operators to implement the contingency OMAs as credited in the IP2 Appendix

R SSD Analysis. Key indicators that trigger the need for local operator intervention for the credited set of OMAs include not only the RCS and secondary system instrumentation, but also the failure of components to respond or reliably indicate status in the CCR. The licensee further stated that based on field notes compiled from simulator exercises in which bounding fire area scenarios were modeled, the available CCR instruments and indicators, combined with operator response in accordance with EOPs, AOPs, fire SSD procedures, and other supporting procedures, are sufficient to ensure timely diagnosis of conditions requiring the dispatch of operator(s) to perform the credited OMAs outside the CCR. With the exception of those OMAs found to lack adequate time margin, the NRC staff determined that diagnosis and initiation times, in conjunction with the available margin, were acceptable.

With regard to communications, the licensee stated that reliance is placed on radios for communication between plant operators during a post-fire shutdown event. Radio repeaters are located outside the protected area and are not subject to disruption caused by fire events within the protected area. The repeaters are also equipped with uninterruptible power supplies to ensure continued operation in the event of the loss of normal power to the buildings in which they are located. Field verifications of radio system functionality have validated that communications between the designated control and monitoring locations are feasible and reliable.

The licensee stated that the manual action sequences in all of the III.G.2 areas are considered to be bounded by the sequences represented by alternate shutdown (III.G.3) Fire Area A. With regard to staffing, the licensee stated that timed field walkthroughs of Abnormal Operating Procedure 2-AOP-SSD-1 have been performed to validate that the number of operators available on the watch staff (7) can safely accomplish all required actions within the required time period to meet Appendix R SSD performance goals. The licensee stated that the broad set of OMAs required in implementing alternate shutdown procedure 2-AOP-SSD-1 bounds the smaller set of manual actions credited for coping with III.G.2 fire area scenarios and that most OMAs required for the III.G.2 fire areas are directed by Off-Normal Operating Procedure 2-ONOP-FP-001.

Additionally, the licensee stated that post-fire OMAs have been validated through timed operator walkthroughs, using as the basis an enveloping

scenario addressed by 2-AOP-SSD-1. When utilizing 2-AOP-SSD-1, the most challenging set of local manual operator actions (number of actions and time sensitivity of actions) is presented to the operations shift crew, and this set of actions is considered to adequately bound the limited set of manual actions that are credited in 2-ONOP-FP-001. The licensee also stated that the timed walkthroughs of 2-AOP-SSD-1 have consistently demonstrated that the key SSD tasks (e.g., restoration of RCS makeup; restoration of AFW to SGs; mitigation of key potential spurious actuation concerns) can be accomplished in a timely manner to meet the Appendix R SSD performance goals.

The licensee stated that none of the OMA operating locations are difficult to access, and the required operations are straightforward manual actions that do not require any special tools, processes, or unique personal capabilities. Specifically, the OMAs entail:

- Manual operation of valves (manual valves, as well as operation of air-operated valves and motor-operated valves via hand wheels or installed jacking devices).
- Local manual trip or closure of circuit breakers.
- Manual control of the turbine-driven AFW pump.

The licensee further stated that none of the requested OMAs involve complex instruction sets, the installation or removal of jumpers, or any actions requiring uniquely specialized knowledge or fine motor skills. The OMA task assignments are within the capability of any licensed operator or nuclear plant operator, as applicable to his or her responsibility set. As such, the challenge presented for completion of these basic tasks within the

prescribed time limits is within the capability of the standard IP2 operating crew. The licensee further stated that in addition to the validation of key OMAs credited in alternate SSD procedure 2-AOP-SSD-1, the plant simulator was utilized to perform evaluations of bounding III.G.2 fire scenarios, and based on the field notes compiled from these exercises, there is reasonable assurance that conditions requiring the implementation of the identified OMAs can be identified and mitigated in a sufficiently timely manner to ensure Appendix R performance goals are met. However, certain OMAs were found to lack adequate margin due to the prompt nature of the action or because the NRC staff concluded there was a lack of time available to perform an OMA where reentry to a fire area is required. These cases are indicated below.

4.2 Feasibility

The licensee’s analysis demonstrates that, with exceptions, the OMAs can be diagnosed and executed within the amount of time available to complete them. The licensee’s analysis also demonstrates that various factors, as discussed above, have been considered to address uncertainties in estimating the time available. The licensee stated that the credited OMAs have been demonstrated to be feasible through timed evolutions performed using a combination of simulator drills and dispatch of operators to simulate performance of the OMAs within the physical plant. In most cases, the OMAs are completed, with margin remaining, within the time constraints established by the supporting SSD thermal-hydraulic analyses. The licensee stated that the time values have been shown to be consistently achievable, and the operations resource demand required to

support any one of the fire area scenarios is a fraction of the 7-operator complement available to support an SSD scenario. However, OMA #6 requires operators to reenter a fire area following a fire event to perform an OMA and the licensee failed to account for the 60-minute waiting period in their required time. Because of this, this OMA was determined to be infeasible and has been noted as such in the table below. The available margin is indicated as a negative number where an OMA credited in a particular area was found to be infeasible and therefore unreliable as well. Other OMAs were determined to be feasible but not reliable since only nominal margin is available to complete them.

The following table summarizes the “required time” versus “available time” 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 zones and includes diagnosis time, implementation time, and uncertainty time. The indicated “available time” is the time by which the action must be completed in order to meet the assumptions in plant analyses. The NRC staff finds that the required time to perform the actions is reasonable as the licensee has verified these times in simulator scenarios and by simulating performance in the plant. Where reentry to a fire area is required to perform an OMA, a 60-minute waiting period is also included in the required time and the diagnosis period for these instances was assumed to occur concurrent with the waiting period. Finally, the times noted below should be considered with the understanding that the manual actions are a fall back in the unlikely event that the fire protection defense-in-depth features are insufficient.

Fire area	Fire zones <sup>1</sup>	OMA ID <sup>2</sup>	OMA summary	Required time (min) <sup>3</sup>	Available time (min)	Available margin (min)
C .....	23 .....	41	Implement EOP 2-FR-H.I .....	NA	NA	NA
		2	Operate turbine-driven 22AFW pump .....	82	>60	<sup>5</sup> >0
		3	Open 22 AFW pump steam supply isolation valves PCV-1310A and PCV-1310B..	19.5	>60	>40.5
		4	Operate TDAFW flow valves FCV-405A,B,C and/or D to align TDAFW to selected SGs.	82	>60	<sup>5</sup> >0
F .....	27A, 33A, 59A .....	5	Align Charging flow to RCS .....	74	75	<sup>6</sup> 1
	5A, 6, 7A, 22A, 27A	6	Align Charging Suction To RWST .....	78	75	<sup>6</sup> -3
	6, 7A .....	7	Transfer Inst. Buses 23/23A to alternate power.	7.5	30	22.5

Fire area	Fire zones <sup>1</sup>	OMA ID <sup>2</sup>	OMA summary	Required time (min) <sup>3</sup>	Available time (min)	Available margin (min)
H .....	70A, 71 A, 72A, 75A, 77A, 84A, 85A, 87A.	8	Align charging pump makeup path to RCS	28	75	47
	70A, 75A, 77A, 87A	9	Enable Alternate Safe Shutdown System Pneumatic Instruments.	13	34	21
		10	Enable Alternate Safe Shutdown System source range channel.	23	34	11
J .....	17,19 39A, 43A, 45A, 46A, 47A, 50A.	11	Trip breakers 52/5A and 52–SAC on Bus 5A and 52/6A and 52/TAO on Bus 6A and remove control power fuses.	10	60	50
	25, 39A, 43A, 46A, 50A, 270.	12	Transfer Inst. Buses 23/23A to alternate power.	7.5	30	22.5
	43A, 46A .....	13	Align charging pump suction source to RWST.	32	75	43
K .....	60A 65A .....	14	Transfer 21 AFW to Alternate Safe Shutdown System power source.	21.5	34	12.5
		15	Open 21 AFW recirc. bypass valve BFD–77.	9.5	34	24.5
P .....	1 .....	16	Transfer 23 CCW pump to Alternate Safe Shutdown System power.	31	>60	29
		17	Start ARDG if normal power and offsite power are lost.	17	60	43
YD .....	900 .....	18	Align charging pump makeup path to RCS	28	75	47

<sup>1</sup> Fire Areas are areas of fire origin; Indicated Fire Zones contain the cables or equipment whose damage due to fire may require implementation of the OMAs.

<sup>2</sup> Operator Action ID designators (1, 2, 3 etc.) were assigned by the NRR reviewer.

<sup>3</sup> Total of simulator-based diagnosis was added to the field-based time to travel to the OMA location, complete the OMA, confirm the action, and notify the CCR of completion as well as the 60-minute waiting period as discussed above.

<sup>4</sup> Action A—Implementation of EOP 2–FR–H.1 is not a requested OMA since these are proceduralized control room actions— identified here for completeness only.

<sup>5</sup> Operators use procedure EOP 2–FR–H.1 to extend the available time.

<sup>6</sup> OMAs determined to be infeasible or unreliable.

4.3 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 fire area having the potential to initiate the need for an OMA, the licensee considered uncertainties associated with estimating how long it takes to diagnose and execute operator manual actions.

Where the licensee demonstrated that adequate margin was available, the required completion times noted in the table above provide reasonable assurance that the OMAs can reliably be performed under a wide range of conceivable conditions by different plant crews because the completion

times, in conjunction with the available 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. As noted in the table above, several of the OMAs included in this review were found to be 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). However, OMA #6 was found to be infeasible and therefore unreliable as well. Other OMAs were determined to be feasible but not reliable since only nominal margin is available to complete them. The OMA found to be infeasible and unreliable is indicated by a negative available margin

value in the table above and those OMAs found to be feasible but unreliable are those indicated by footnote #6 to the table above but with a positive available margin value.

4.4 Summary of Defense-in-Depth and Operator Manual Actions

In summary, the defense-in-depth concept for a fire in the fire areas included in the table below 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. For these particular fire zones and the OMAs credited in them and found acceptable in Sections 3.0 and 4.0 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 SSD capability in the event of a fire in the analyzed fire areas. The

remaining zones included in the licensee's request were found to provide an inadequate level of defense-in-depth or safety margin and as such the requested OMAs for these zones are not approved for permanent use. The table below summarizes which fire zones are granted exemptions from III.G.2.

Fire zone	Area of fire origin	Exemption approved for this fire zone
23	C	Previous exemption remains valid
5A	F	No
6	F	No
7A	F	No
22A	F	No
27A	F	No
33A	F	No
59A	F	No
70A	H	Yes
71A	H	Yes
72A	H	No
75A	H	No
77A	H	No
84A	H	No
85A	H	No
87A	H	No
17	J	Yes
19	J	No
25	J	No
39A	J	No
43A	J	No
45A	J	No
46A	J	No
47A	J	No
50A	J	No
270	J	No
60A	K	No
65A	K	No
1	P	Previous exemption remains valid
900	YD	Yes

4.5 Authorized by Law

This exemption would allow IP2 to rely on specific OMAs, as discussed in Sections 3.0 and 4.0 above, in conjunction with the other installed fire protection features, to ensure that at least one means of achieving and maintaining safe 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 the analyzed fire zones. As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR part 50. The NRC staff has determined that granting of this exemption, as limited by the staff's analysis will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the exemption is authorized by law.

4.6 No Undue Risk to Public Health and Safety

The underlying purpose of 10 CFR part 50, Appendix R, Section III.G is to ensure that at least one means of achieving and maintaining safe shutdown remains available during and following a postulated fire event. Based on the above, no new accident precursors are created by the use of the specific OMAs, in conjunction with the other installed fire protection features, in response to a fire in the analyzed fire zones. Therefore, the probability of postulated accidents is not increased. Also based on the above, the consequences of postulated accidents are not increased. Therefore, there is no undue risk to public health and safety.

4.7 Consistent With Common Defense and Security

This exemption would allow IP2 to credit the use of the specific OMAs, in conjunction with the other installed fire protection features, in response to a fire in the analyzed fire zones, discussed above, in lieu of meeting the requirements specified in III.G.2. This change to the operation of the plant has no relation to security issues. Therefore, the common defense and security is not diminished by this exemption.

4.8 Special Circumstances

One of the special circumstances described in 10 CFR 50.12(a)(2)(ii) is that the application of the regulation is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR part 50, Appendix R, Section III.G is to ensure that at least one means of achieving and maintaining safe shutdown remains available during and following a postulated fire event. While the licensee does not comply with the explicit requirements of Section III.G.2, the approved OMAs, in conjunction with the other installed fire protection features, provide a method to ensure that a train of equipment necessary to achieve and maintain safe shutdown of the plant will be available in the event of a fire in these fire zones. The NRC staff concludes that the application of the regulation is not necessary to achieve the underlying purpose of the rule for the plant configurations approved in this exemption. Therefore special circumstances exist, as required by 10 CFR 50.12(a)(2)(ii), that warrant the issuance of this exemption.

5.0 Conclusion

Based on all of the features of the defense-in-depth concept discussed for the fire zones listed in Section 4.4 of this exemption, the NRC staff concludes

that the use of specific OMAs found acceptable in Sections 3.0 and 4.0 of this evaluation, in these particular instances and in conjunction with the other installed fire protection features, in lieu of strict compliance with the requirements of III.G.2, will allow IP2 to meet the underlying purpose of the rule for those fire zones. The use of other specific OMAs in certain fire zones were found to be not acceptable, as discussed in Sections 3.0 and 4.0 of this evaluation, and as such, are not approved by this exemption.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security and that special circumstances are present to warrant issuance of the exemption. Therefore, the Commission hereby grants Entergy an exemption from the requirements of Section III.G.2 of Appendix R of 10 CFR part 50, to utilize the OMAs approved above at IP2.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (76 FR 74832).

This exemption is effective upon issuance.

Dated at Rockville, Maryland this first day of February, 2012.

For the Nuclear Regulatory Commission.

**Michele G. Evans,**

*Director, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation.*

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**NUCLEAR REGULATORY COMMISSION**

[Docket No. 72-26; NRC-2011-0110]

**Pacific Gas and Electric Company, Diablo Canyon Independent Spent Fuel Storage Installation; Notice of Issuance of Amendment to Materials License No. SNM-2511**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Notice of issuance of license amendment.

**FOR FURTHER INFORMATION CONTACT:** John Goshen, Project Manager, Division of Spent Fuel Storage and Transportation, Office of Nuclear Material Safety and Safeguards, Mail Stop EBB-3D-02M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.