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10 CFR 50.12

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Oyster Creek Nuclear Generating Station
NRC Docket No. 50-219

Subject: Request for Exemption from 10 CFR 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability" (Phase 2)

Reference: Regulatory Issue Summary (RIS) 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions," dated June 30, 2006.

In accordance with 10 CFR 50.12, "Specific exemptions," Exelon Generation Company, LLC (Exelon) hereby requests an exemption from the provisions of 10 CFR 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability," for the use of operator manual actions for Oyster Creek Nuclear Generating Station (OCNGS) in lieu of the requirements of Section III.G.2. This exemption is being requested in accordance with the requirements of 10 CFR 50.12(a)(2)(ii) since the application of the regulation in this particular circumstance would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.

Regulatory Issue Summary (RIS) 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions," indicates that an approved exemption in accordance with the requirements of 10 CFR 50.12 is required for all operator manual actions credited for satisfying the requirements of Appendix R, Section III.G.2. This exemption request (Phase 2) is limited to those manual actions that were not included in a previous exemption request. Attachment 1 to this letter provides the detailed exemption request, including the basis for the exemption and the defense-in-depth review for each of the fire areas for which a manual action is required. Attachment 2 contains a list of the specific operator manual actions for which an exemption is being requested.

This exemption request will not result in undue risk to the public health and safety because Exelon has determined that the subject manual actions are feasible and the NRC has already found similar manual actions to be acceptable for use in achieving post-fire safe shutdown. In addition, the intent of 10CFR50, Appendix R, Section III.G.2, is to ensure one train of systems necessary to achieve and maintain hot shutdown will remain available in the event of a fire. The manual actions discussed in this exemption request provide that assurance. If manual actions are not used to meet the underlying purpose of the rule, modifications to: 1) provide additional fire suppression systems, detection systems, or fire barriers, or 2) reroute cables or wrap cables, that involve issues such as accessibility, dose, structural interferences, design limitations, ampacity derating, etc., would be required to achieve compliance. Such modifications represent an unwarranted burden on Exelon since they are not necessary to meet the underlying purpose of the rule. Therefore, the special circumstances for issuance of the

exemption are satisfied in accordance with the requirements of 10 CFR 50.12(a)(2)(ii), since application of the rule is not necessary to achieve the underlying purpose of the rule. In addition, the requested exemption is authorized by law and is consistent with the common defense and security. Therefore, the requirements of 10 CFR 50.12(a)(1) are satisfied.

The Fire Protection Program at OCNGS, including defense-in-depth features such as fire detection and suppression systems installed in specific fire areas/zones within the plant, has been previously reviewed and approved by the NRC in various fire protection SERs and exemptions, and found acceptable during fire protection related inspections. Due to the mitigating factors and existing defense-in-depth features already provided, as discussed in Attachment 1, the existing level of defense in depth is considered acceptable for the manual actions contained in this exemption request. Nonetheless, Exelon has decided to enhance the existing fire protection defense in depth by adding detection or suppression capability to certain fire areas/zones within the plant. The modifications to install this detection or suppression are discussed within the applicable fire area descriptions in Attachment 1.

This exemption request contains no new regulatory commitments.

Information supporting the exemption request is contained in Attachments 1 and 2 to this letter. Exelon requests approval of this exemption request by March 4, 2010.

If you have any questions or require additional information, please contact Glenn Stewart at 610-765-5529.

Respectfully,

Pamela B. Cowan (signature)

Pamela B. Cowan
Director, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments: 1. Operator Manual Actions Exemption Request
2. List of Operator Manual Actions

cc:	Regional Administrator - NRC Region I	w/attachments
	NRC Senior Resident Inspector – OCNGS	"
	NRC Project Manager, NRR – OCNGS	"
	Director, Bureau of Nuclear Engineering, New Jersey Department of Environmental Protection	"
	Mayor of Lacey Township, Forked River, New Jersey	"

ATTACHMENT 1

10 CFR 50.12 Exemption Request

Oyster Creek Nuclear Generating Station
Docket No. 50-219

Request for Exemption from 10 CFR 50, Appendix R,
Section III.G, "Fire Protection of Safe Shutdown Capability" (Phase 2)

Operator Manual Actions Exemption Request

ATTACHMENT 1
OPERATOR MANUAL ACTIONS EXEMPTION REQUEST

CONTENT OF EXEMPTION REQUEST

Attachment 1

I. Specific Exemption Request
II. Basis for Exemption Request
III. Overview of Operator Manual Actions
   A. Fire Area/Zone Description with tabulation of operator manual actions credited for each area/zone.
   B. Detailed Evaluation of Operator Manual Actions including Combined Operator Manual Action Tables
   C. Review of Operator Manual Actions against NUREG-1852
   D. Defense in Depth
IV. Environmental Assessment
V. Conclusion
VI. References

Attachment 2

- List of Operator Manual Actions being addressed by this exemption request.
- Individual assessment of each Operator Manual Action.

I. SPECIFIC EXEMPTION REQUEST

In accordance with 10 CFR 50.12, "Specific exemptions," Exelon Generation Company, LLC hereby requests an exemption from the requirements of 10 CFR 50, Appendix R (Reference 1), Section III.G, "Fire Protection for Safe Shutdown Capability," for Oyster Creek Nuclear Generating Station (OCNGS) to the extent that operator manual actions are necessary to achieve and maintain hot shutdown for fire areas in which both trains of safe shutdown cables/equipment are routed through the same fire area.

Background:

The criteria for granting specific exemptions from 10 CFR 50 regulations are specified in 10 CFR 50.12. In accordance with 10 CFR 50.12(a)(1), the NRC is authorized to grant an exemption upon determining that the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security.

Regulatory Issue Summary (RIS) 2006-10 (Reference 2) documents the NRC position relative to the use of operator manual actions as part of a compliance strategy to meet the requirements of 10 CFR 50, Appendix R, Section III.G.2. The RIS states that plants which credit manual actions for Section III.G.2 compliance obtain specific NRC approval for the manual action via the exemption process in accordance with the requirements of 10 CFR 50.12. This exemption request is limited to those operator manual actions that were not included in a previous exemption request.

II. BASIS FOR EXEMPTION REQUEST

This exemption request (Phase 2) includes those operator manual actions credited for 10 CFR 50, Appendix R, Section III.G.2 compliance, which were not previously submitted to the NRC for review

and approval. The basis for this exemption request is the special circumstances cited in 10 CFR 50.12 (a)(2)(ii): "Application of the regulation in the particular circumstance would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule." The intent of 10 CFR 50, Appendix R, Section III.G.2, is to ensure the ability to achieve and maintain safe shutdown in the event of a fire. The manual actions discussed in this exemption request provide that assurance. If manual actions are not used to meet the underlying purpose of the rule, modifications to: 1) provide additional fire suppression systems, detection systems, or fire barriers, or 2) reroute cables or wrap cables, that involve issues such as accessibility, dose, structural interferences, design limitations, ampacity derating, etc., would be required to achieve compliance. Such modifications represent an unwarranted burden on Exelon since they are not necessary to meet the underlying purpose of the rule. Therefore, the special circumstances for issuance of the exemption are satisfied in accordance with the requirements of 10 CFR 50.12(a)(2)(ii), since application of the rule is not necessary to achieve the underlying purpose of the rule.

This exemption request provides the documentation necessary to demonstrate the feasibility and reliability of the operator manual actions. As defined in NUREG-1852 (Reference 3), a "'feasible action' is one that is analyzed and demonstrated as being able to be performed within an available time so as to avoid a defined undesirable outcome. A "reliable action" is a feasible action that is analyzed and demonstrated as being dependably repeatable within an available time, so as to avoid a defined adverse consequence, while considering varying conditions that could affect the available time and/or the time to perform the action." A final aspect of operator manual actions that will be addressed in this exemption request is defense-in-depth. Specifically, this aspect will consider the fire protection features such as detection, suppression, physical separation and combustible loading in the fire areas under consideration (i.e., the initiating fire area).

III. OVERVIEW OF OPERATOR MANUAL ACTIONS

OCNGS utilizes operator manual actions as part of the post-fire safe shutdown strategy for Appendix R compliance. The operator manual actions are included in the OCNGS Specification For Post-Fire Safe Shutdown Program Requirements (Reference 4), which is part of the OCNGS Updated Final Safety Analysis Report. The operator manual actions that are addressed by this exemption are listed in Attachment 2.

The manual actions used at OCNGS can be divided into several categories:

- Manual actions used to support Alternate/Dedicated Shutdown. Appendix R permits operator manual actions for Section III.G.3 compliance and as such, exemptions from Appendix R are not required.
- Manual actions that were specifically approved by the NRC in an exemption. Since these operator manual actions were already approved, no further consideration by the NRC is required.
- Manual actions that were previously found acceptable by the NRC in an SER but were not approved by an exemption. In accordance with RIS 2006-10, an exemption request is required for this category of operator manual actions. An exemption request for the OCNGS operator manual actions that are within this category (Phase 1) was submitted to the NRC by letter dated March 3, 2009 (Reference 5).
- Manual actions that were not previously approved by the NRC by an exemption or found acceptable by the NRC in a SER are the subject of this exemption request (Phase 2).

There are 18 operator manual actions that are addressed by this exemption request that are utilized for numerous fire areas/zones as listed in Attachment 2. The operator manual actions can be divided into the following general categories based on the type of action taken. This list divides the operator manual actions into single basic activities; however, some of the operator manual actions may be a combination of these basic activities:

- Circuit breaker manipulation (trip open or close)
- Remove fuse
- Confirm breaker status
- Monitor local gauge
- Operate a control and transfer switch on a panel
- Manually operate valve
- Manually position ventilation damper
- Connect (plug-in) air cylinder to valve accumulator
- Install portable ventilation equipment

The Fire Protection Program at OCNGS, including defense-in-depth features such as fire detection and suppression systems installed in specific fire areas/zones within the plant, has been previously reviewed and approved by the NRC in various fire protection SERs and exemptions, and found acceptable during fire protection related inspections. Due to the mitigating factors and existing defense-in-depth features already provided, as discussed in Section III.A, the existing level of defense in depth is considered acceptable for the manual actions contained in this exemption request. Nonetheless, Exelon has decided to enhance the existing fire protection defense in depth by adding detection or suppression capability to certain fire areas/zones within the plant. The modifications to install this detection or suppression are discussed within the applicable fire area descriptions within Section III.A below.

Attachment 2 provides a concise list of the operator manual actions that are being addressed by this exemption request. These manual operator actions are required as a result of changes to the original safe shutdown analysis, or were implied in the original safe shutdown analysis but for which an SER does not exist. Also, following the table in Attachment 2 is an individual assessment of each operator manual action, which includes a brief discussion of why an exemption for each of these actions is being requested.

A. FIRE AREA/ZONE DESCRIPTIONS

There are 35 initiating fire areas/zones included in this exemption request. An initiating fire area is the area where a fire, that requires the manual action to be performed, originates. A brief description of each fire area is provided below. This information provides a summary of the type of fires that are postulated to occur in each area and the type of combustibles located in each area. Detection and suppression systems that are installed in the fire area are also discussed. The information provided was obtained and summarized from the current OCNGS FHAR, Section 7 (Reference 6). Section 7 of the FHAR is divided up by fire area/zone and then each fire area/zone has subsections providing an area description (references fire area layout drawings that are contained in Attachment B of the FHAR), equipment located in the area, fire hazards, fire protection, safe shutdown method/strategy, exemptions for the area, evaluations applicable to the area and the analysis/conclusion for the area.

OCNGS fire area boundaries utilized for fire safe shutdown analysis purposes were approved in the SER dated March 24, 1986 in Section 7.1 (Reference 7) and the NRC stated the following:

> "In the April 3, 1985 report, the licensee described the non-fire-rated walls and floor/ceilings which bounded certain fire areas. The licensee stated that a number of these fire area boundaries contain unprotected openings such as stairways, hatchways and pipe penetrations. We have expressed our concerns to the Licensee that, because of these openings, a fire might spread from one area to the next and damage systems that are needed to achieve and maintain safe-shutdown conditions. We stated that where a fire area was protected by an automatic fire suppression system, we did not expect fire to spread through these openings into adjoining locations. Therefore, in areas protected by automatic fire suppression system, the presence of unprotected openings in walls and floor/ceilings and negligible safety significance. We also stated that in those areas where fire could spread into adjoining locations but safe-shutdown could still be achieved, the presence of unprotected openings had no safety significance. We defined this situation to be those areas where the adjacent fire area(s) contains no required shutdown related equipment or where the nearest shutdown related system is more than 50 feet horizontally from any unprotected opening in the walls or ceiling that define those areas.
>
> "For all other areas we recommended that the licensee protect the openings to prevent fire spread. The licensee committed to seal such unprotected openings with at least 6-inches of a fire-rated silicone foam. Where the use of such foam would not be viable, such as at open stairways or hatchways, the licensee committed to install an automatic sprinkler system to protect the opening that conforms to the appropriate sections of NFPA standard No. 13. These commitments were by letter dated October 9, 1985. Because these commitments provide us with reasonable assurance that fire will not spread into adjoining plant fire areas, we find them acceptable."

The description of each initiating fire area/zone below also provides a discussion of the required operator manual action that this exemption applies to and the reason for the operator manual action. Some of the operator manual actions are repeated in numerous fire areas/zones because of the fire safe shutdown analysis assumptions. For example, instrument air is assumed to be lost for the majority of the fire areas/zones (unless otherwise demonstrated available by analysis), which causes the need to recharge the accumulator for isolation condenser makeup valves V-11-34 or V-11-36 (refer to manual action Nos. 17 and 18 in Attachment 2). These actions essentially duplicate Abnormal Operating Procedure (ABN) contingency actions for a loss of instrument air, which is readily diagnosed from the Control Room due to the numerous indications and symptoms available. There is also significant time available to perform the actions. If a fire occurred in an area and was not immediately discovered, any delay in the entry into the appropriate Fire Support Procedure (FSP) or delay in suppression of the fire would not significantly affect the performance of these operator actions, as the ABNs would direct the same actions to be performed, regardless of the cause of the malfunction (i.e., fire or otherwise).

Fire Area AB-FA-13

Auxiliary Boiler House fire area is remotely located from the Reactor Building with open spatial separation of at least 65 feet. The boiler house is also detached from the Railroad Airlock by approximately 10 feet. The boiler house is unprotected sheet metal with concrete floors containing two package boilers with feed pumps and exhaust stack. Combustibles in this area include diesel fuel oil contained in piping/pumps (for heating boiler and piping/pumps to transfer fuel oil to the emergency diesel) and cable insulation. The fire loading is "low" as defined in the FHAR. A rate compensated/fixed temperature thermal detection system is installed in the building and will sound an alarm in the Augmented Off-Gas (AOG) Building and in the Control Room. A hydrant and hose

house are located nearby and a hose station is located inside the boiler house. Portable fire extinguishers are located in the area. Manual suppression efforts from the hose station and nearby hydrant or the portable extinguishers will contain the fire to the Auxiliary Boiler House. Separation from adjacent areas would prevent the spread of fire to any adjacent area. No Fire Safe Shutdown equipment or cables are located in this area.

The following table provides a summary of the manual action for AB-FA-13 by Action Number as identified in Attachment 2 of this letter.

TABLE AB-FA-13

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Area CW-FA-14

Circulatory Water Intake fire area is an outside area greater than 100 ft. from any building except for the fish sample pool enclosure that is located in this area; however, this enclosure is constructed of non-combustible material. Combustible loading consists of transformer oil and electrical motors. The Unit Substation (USS) transformers (1A3 and 1B3) are filled with Dow Corning 561 Silicon transformer oil. This material has characteristics that minimize the likelihood of a fire involving the insulating oil itself. A review of vendor information indicates that the flash and fire points are almost twice as high as other transformer oils, but more importantly, the heat release rate is almost 10 times lower, and any postulated fire originating at the transformer itself would tend to be limited in duration and would not involve sustained burning of the silicon oil. This judgment is supported by testing performed in 1977 by Industrial Risk Insurers of DC-561, which showed that the fluid tended to form a crust and self-extinguish (Reference 8). Based on the characteristics of the silicon fluid, any postulated fire event is expected to be very short in duration. No specific quantification of fire loading is considered necessary for this structure because it is an open structure with nothing to contain the heat release in the event of a fire. Manual suppression is provided by a hydrant and hose house within approximately 100 feet of the area and fire extinguishers. Transformers have dikes to contain the oil to the immediate area. A Security Officer stationed in a tower frequently monitors this area so any fire of significance would be detected rapidly.

The following table provides a summary of the manual action for CW-FA-14 by Action Number as identified in Attachment 2 of this letter.

TABLE CW-FA-14

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Area DG-FA-15

Emergency Diesel Generator Room No. 1 fire area is part of the Emergency Diesel Generator building. Emergency Diesel Generator Room No. 1 is separated from other fire areas, i.e.,

Emergency Diesel Generator Room No. 2 (DG-FA-17) and Emergency Diesel Fuel Oil Storage Area (FS-FA-16) with rated fire barriers. Fire loading consists of diesel fuel, diesel lube oil and nominal electrical equipment including cables. Fire loading is "low" as defined in the FHAR. Thermally activated rate-of-rise fire detection is installed throughout the general area and smoke detection systems are installed in the switchgear cubicle; both sound an alarm in the Control Room and at the local panel. A fire hydrant and hose house with Aqueous Film-Forming Foam (AFFF) supply are located nearby. Portable fire extinguishers are located in the area. Manual suppression utilizing hose lines and AFFF in conjunction with the rated fire barriers will contain a loss to one diesel generator unit. Emergency power will still be available from the other diesel generator.

The following table provides a summary of the manual action for DG-FA-15 by Action Number as identified in Attachment 2 of this letter.

TABLE DG-FA-15

ACTION #	Manual Action Required
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Area NR-FA-20
New Radwaste fire area is separated from other fire areas by open space of at least 50 feet. This area contains pumps, tanks, evaporators and other waste treatment equipment. Combustible loading consists of health physics supplies, lubricating oils (minor amounts of lubricants enclosed in valve gear boxes, pump bearings, etc.), ion exchange resin, cable, paper products, and wood products. Fire loading is "low" as defined in the FHAR. Area-wide detection is made up of both thermal (rate compensated/fixed temperature) and smoke detectors and these detectors sound alarms locally and in the Control Room. Portable fire extinguishers and outside hose houses are available for manual suppression. The fire detection system will provide early warning of a fire to allow utilization of manual suppression. A fire will be contained within the area and will have no effect on safe shutdown. No Fire Safe Shutdown equipment or cables are located in this area.

The following table provides a summary of the manual action for NR-FA-20 by Action Number as identified in Attachment 2 of this letter.

TABLE NR-FA-20

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Area OB-FA-9
The Office Building is a three story facility enveloped by the Reactor Building (RB-FA-1) on the east side, the Turbine Building (TB-FA-11) on the west side, and the service area (OB-FA-10) on the north side. The Office Building is considered a light hazard occupancy with limited amounts of combustibles, primarily paper and furnishings. The overall combustible loading for this fire area is

"low" as defined in the FHAR. The building's materials of construction are non-combustible with the shell structure being reinforced concrete and the highly compartmentalized interior being hollow concrete block or sheetrock. Smoke-detectors are installed in the hallway on each floor. Detector actuation sounds an alarm locally and in the Control Room. Fire extinguishers are provided on each floor and hose stations are provided on the second and third floors. A fire hydrant is available for use from outside on the first floor.

The following table provides a summary of the manual action for OB-FA-9 by Action Number as identified in Attachment 2 of this letter.

TABLE OB-FA-9

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone OB-FZ-6A

This fire zone is the "A" 480V Switchgear room. It is separated from the "B" 480V Switchgear Room (OB-FZ-6B), Turbine Building (TB-FA-11) and Reactor Building (RB-FA-1) by fire rated barriers. The significant combustible loading is from transformer oil and cable insulation. There are also minor amounts of ordinary combustibles (paper and plastic). The fire loading is "moderate" as defined in the FHAR. The Unit Substation 1A2 transformer is filled with Dow Corning 561 Silicon transformer oil. This material has characteristics that minimize the likelihood of a fire involving the insulating oil itself. A review of vendor information indicates that the flash and fire points are almost twice as high as other transformer oils, but more importantly, the heat release rate is almost 10 times lower, and any postulated fire originating at the transformer itself would tend to be limited in duration and would not involve sustained burning of the silicon oil. This judgment is supported by testing performed in 1977 by Industrial Risk Insurers of DC-561, which showed that the fluid tended to form a crust and self-extinguish (Reference 8). Based on the characteristics of the silicon fluid, any postulated fire event is expected to be very short in duration. A fixed, total flooding, automatic Halon 1301 extinguishing system is installed throughout the zone. The system has reserve capacity for a full second discharge. A cross-zoned detection system consisting of ionization and photoelectric detectors is installed which sounds an alarm locally and in the Control Room upon operation of one detector in either detection zone. Detectors actuate the Halon system, shut down ventilation fans, and close ventilation system isolation dampers upon activation of a detector in the second zone. Remote alarms to the Control Room indicate fire condition, Halon discharge and local panel trouble. Portable fire extinguishers are provided in the area and adjacent areas for manual fire fighting. Hose lines are available from a nearby Turbine Building hose station and from outside fire hydrants and hose houses.

The following table provides a summary of the manual actions for OB-FZ-6A by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE OB-FZ-6A

ACTION #	Manual Action Required
4	Open breaker to close V-2-90 to prevent drain down of Condensate Storage Tank due to damage on instrument cables or loss of power supply on the hotwell level control circuits.
10	Trip Containment Spray Pumps at USS 1B2 and pull fuses to prevent damage to the pump.
16	Manually manipulate valves V-9-11, V-9-9, and V-11-247 to align firewater to the CST to makeup (contingency action).
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone OB-FZ-6B

This fire zone is the "B" 480V Switchgear rooms. It is separated from the "A"480V Switchgear Room (OB-FZ-6A), Turbine Building (TB-FA-11) and Reactor Building (RB-FA-1) by fire rated barriers. The significant combustible loading is from transformer oil and cable insulation. There are also minor amounts of ordinary combustibles (paper and plastic). The fire loading is "moderate" as defined in the FHAR. The Unit Substation 1A2 transformer is filled with Dow Corning 561 Silicon transformer oil. This material has characteristics that minimize the likelihood of a fire involving the insulating oil itself. A review of vendor information indicates that the flash and fire points are almost twice as high as other transformer oils, but more importantly, the heat release rate is almost 10 times lower, and any postulated fire originating at the transformer itself would tend to be limited in duration and would not involve sustained burning of the silicon oil. This judgment is supported by testing performed in 1977 by Industrial Risk Insurers of DC-561, which showed that the fluid tended to form a crust and self-extinguish (Reference 8). Based on the characteristics of the silicon fluid, any postulated fire event is expected to be very short in duration. A fixed, total flooding, automatic Halon 1301 extinguishing system is installed in the switchgear room. The system has reserve capacity for a full second discharge. A cross-zoned detection system consisting of ionization and photoelectric detectors is installed which sounds an alarm locally and in the Control Room upon operation of one detector in either detection zone. Detectors actuate the Halon system, shut down ventilation fans, and close ventilation system isolation dampers upon activation of a detector in the second zone. Remote alarms to the Control Room indicate fire condition, Halon discharge and local panel trouble. Portable fire extinguishers are provided in the area and adjacent areas for manual fire fighting. Hose lines are available from a nearby Turbine Building hose station and from outside fire hydrants and hose houses.

An enhancement is being planned to install a new damper control switch in the Control Room so that manual operation of dampers DM-56-15, DM-56-16 and DM-56-17 will not be required from outside of the Control Room. In the interim, an exemption is being requested for the operator manual actions listed below.

The following table provides a summary of the manual actions for OB-FZ-6B by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE OB-FZ-6B

ACTION #	Manual Action Required
15	Manually manipulate dampers (DM-56-15, DM-56-16 and DM-56-17) to restore ventilation to the 'A' 480V Switchgear Room due to hot short on its control cables.
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone OB-FZ-8A
Reactor Recirculation MG Set Room is part of the Office Building and is separated from the adjoining stairwell area (OB-FA-9), Turbine Building (TB-FA-11) and Reactor Building (RB-FA-1) by fire rated barriers. The ceiling is concrete with unrated openings to the Mechanical Equipment Room on 35' Elevation (OB-FZ-8B), AB Battery Room (OB-FZ-8C), and the Office Building (OB-FA-9), which has been evaluated as acceptable. This area/zone is analyzed together with OB-FZ-8B for safe shutdown purposes, due to the lack of rated fire barriers between the zones. Combustible loading consists of lubricating oil in MG Sets and cable insulation but the loading is tracked by combining it with OB-FZ-8B. The total fire loading for OB-FZ-8A & 8B is "low" as defined in the FHAR with the majority of the loading being in OB-FZ-8A. A closed head sprinkler system is installed throughout the majority of this fire zone (over MG Sets). An alarm is provided to the Control Room when water flows from a single sprinkler head. A smoke detector is provided in the exhaust duct of the ventilation system. SER dated June 25, 1990 (Reference 9) provided an exemption for not having automatic fire detection. Fire extinguishers are provided for manual fire fighting backup. Hose lines are available from outside hydrants and hose houses.

The following table provides a summary of the manual action for OB-FZ-8A by Action Number as identified in Attachment 2 of this letter.

TABLE OB-FZ-8A

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone OB-FZ-8B
Mechanical Equipment Room (35' Elevation) is part of the Office Building and is separated from the adjoining corridors (OB-FA-9) and Turbine Building (TB-FA-11) by fire rated barriers. The floor is concrete with unrated openings to the Reactor Recirculation MG Set Room (OB-FZ-8A), and the north wall is sealed for Halon containment but is unrated to the A/B Battery Room (OB-FZ-8C), both of which have been evaluated as acceptable. This area/zone is analyzed together with OB-FZ-8A for safe shutdown purposes, due to the lack of rated fire barriers between the zones. Combustible loading for this fire zone consists of minor amounts of cable insulation but the loading is tracked by combining it with OB-FZ-8A. The total fire loading for OB-FZ-8A & 8B is "low" as defined in the FHAR with the majority of the loading being in OB-FZ-8A. Manual fire fighting is available using hose lines and fire extinguishers from the Office Building corridor. There is no fire safe shutdown equipment located in this area, but there are safe shutdown cables in this area.

An enhancement is being made to install area-wide smoke detection in this area to provide for improved operator notification ability, thereby providing a quicker response time for any required actions.

The following table provides a summary of the manual action for OB-FZ-8B by Action Number as identified in Attachment 2 of this letter.

TABLE OB-FZ-8B

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone OB-FZ-8C
A/B Battery Room, Tunnel and Electrical Tray Room are part of the Office Building and are separated from the adjoining Office Building areas (OB-FA-9) and Turbine Building (TB-FA-11) by fire rated barriers except for the floor and south wall. The floor is concrete with unrated openings to the Reactor Recirculation MG Set Room (OB-FZ-8A), and south wall is sealed for Halon containment but is unrated to the Mechanical Equipment Room at 35' Elevation (OB-FZ-8B), both of which have been evaluated as acceptable. Major combustible loading is from cable insulation and plastic battery cases and fiberglass laminated polyester battery racks. There is also a minor amount of oil in the rotary inverter bearings. Fire loading is "low" as defined in the FHAR. A fixed, total flooding, Halon 1301 extinguishing system will discharge throughout the A/B Battery Room, Tunnel, and Electrical Tray Room. Smoke detectors are installed at the ceiling level and cross-zoned to sound a local alarm and an alarm in the Control Room upon actuation of one detector. Actuation of a second detector will sound a local alarm, discharge the halon system, trip supply and exhaust fans, and close dampers.

The following table provides a summary of the manual actions for OB-FZ-8C by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE OB-FZ-8C

ACTION #	Manual Action Required
4	Open breaker to close V-2-90 to prevent drain down of Condensate Storage Tank due to damage on instrument cables or loss of power supply on the hotwell level control circuits.
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone OB-FZ-10A
Monitor and Change Room Area and Operations Support Area are part of the Office Building (Service Area) and are located between the Reactor Building (RB-FA-1) and Turbine Building

(TB-FA-11). The walls and ceiling are rated. The floor is concrete with unrated openings to the Chemical Lab (OB-FZ-10B), which has been evaluated as acceptable. The Service Area equipment does not perform safety related functions although safety related cabling is routed through the building. Materials of construction are non-combustible, primarily reinforced concrete and concrete block. Major combustibles consist of electrical cable insulation located above the suspended ceiling. Other combustibles include health physics materials, Protective Clothing (PC) supplies, and other miscellaneous materials. The overall combustible loading for this fire area is "low" as defined in the FHAR. Smoke detectors are installed in a majority of the zone to provide early warning fire detection. A closed head automatic sprinkler system is installed above and below the ceiling in the Monitor and Change Room, in the Cable Tray Closet and above the ceiling in the Operations Support Area hallway to protect cable trays. In addition, a hose station located nearby outside the Control Room provides manual suppression capability.

An enhancement is being made to add sprinkler heads to the existing automatic sprinkler system in the Monitor and Change Room, stairway area and Operations Support Area to make it area-wide, thereby improving survivability of area cables and reducing the likelihood of the fire spreading. Also, additional smoke detection will be added to the area to make it area-wide.

The following table provides a summary of the manual actions for OB-FZ-10A by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE OB-FZ-10A

ACTION #	Manual Action Required
14	Monitor and install temporary ventilation for the "B" 480 V Switchgear Room to maintain in an operable condition.
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone OB-FZ-10B

Hot & Cold Chemical Lab, Instrument Lab, P.A.S.S., Count Room is part of the Office Building (Service Area) and is located between the Reactor Building (RB-FA-1) and Turbine Building (TB-FA-11). The floor and walls are rated. The ceiling is concrete with unrated openings to the Monitor and Change Room Area (OB-FZ-10A), which has been evaluated as acceptable. Fire loading consists of miscellaneous materials in the Chemistry Lab (flammable liquids, plastics, rubber, etc.) and cable insulation. The flammable liquids are maintained in flammable cabinets except during times of usage. The fire loading is "low" as defined in the FHAR. Product-of-combustion type smoke detectors are provided throughout OB-FZ-10B, except spaces above suspended ceilings. Detectors are not provided in the space above the ceiling in the Chemistry Lab; however, this space does not contain cable tray or other combustible material. Detectors are provided below the suspended ceiling to provide notification of a fire condition. Manual hose stations and portable fire extinguishers are provided and are considered to be adequate for the hazards and loading in this area. There is no fire safe shutdown equipment located in this area; however, there are fire safe shutdown cables (non-protected train) located in this area.

The following table provides a summary of the manual actions for OB-FZ-10B by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE OB-FZ-10B

ACTION #	Manual Action Required
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Area OG-FA-21
Augmented Off Gas (AOG) Building fire area is separated from other fire areas by at least 50 feet. The floors and roof are concrete, with the outside walls being unprotected metal siding. The building houses charcoal absorbers and hydrogen recombiners. Combustible loading consists of charcoal beds, lubricating oils (minor amounts of lubricants enclosed in valve gear boxes, pump bearings, etc.), cable and miscellaneous combustibles such as wood and paper. Fire loading is "moderate" as defined in the FHAR. Smoke detectors are installed throughout the building. The system will sound an alarm locally and in the Control Room. Hose stations are available from outside hydrants and a dry standpipe inside the building. Portable extinguishers are provided. Hydrogen detection is provided in areas containing process piping. No fire safe shutdown equipment or cables are located in this area.

The following table provides a summary of the manual action for OG-FA-21by Action Number as identified in Attachment 2 of this letter.

TABLE OG-FA-21

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Area OR-FA-19
The Old Radwaste Building is located on the east side of the Reactor Building. The Old Radwaste Building is separated from the Reactor Building by approximately 15 feet, and by 50 feet to any other fire area. The building floor, ceiling and walls are reinforced concrete. This area also includes a prefabricated steel structure on the west side of the building that houses sample tanks. The fire loading in OR-FA-19 consists of health physics supplies, lubrication oils (minor amounts of lubricants enclosed in valve gear boxes, pump bearings, etc.), ion exchange resins, paper products and wood products. The fire loading is "low" as defined in the FHAR. Fire protection features include a rate compensated/fixed temperature thermal detection system installed in portions of the building that will sound an alarm in the Augmented Off Gas Building and in the Control Room. There is no fire detection in the prefabricated steel enclosure. Fire detection is not considered necessary in this enclosure due to the very minimal combustible loading. Manual suppression is

available utilizing fire extinguishers as well as hose lines that are available from outside fire hydrants and hose houses. No fire safe shutdown equipment or cables are located in this area.

The following table provides a summary of the manual action for OR-FA-19 by Action Number as identified in Attachment 2 of this letter.

TABLE OR-FA-19

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone RB-FZ-1D
This fire zone is located in the Reactor Building elevation 51'-3". The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were either sealed similar to a 1-hour minimum fire barrier (six inches of fire-rated silicone foam) or were evaluated as acceptable since some of these barriers are not credited with separating redundant safe shutdown equipment. The major fixed combustible is cable insulation. The fire loading is "low" as defined in the FHAR. Fire protection features include automatic fire detection, which alarms locally and in the Control Room. Primary fire suppression is provided by fixed automatic water spray systems protecting the primary fire hazard in this zone (i.e., grouped electrical cable trays). The automatic water spray system is also installed at the equipment hatch opening and open stairway to both RB-FZ-1E (Reactor Building elevation 23'-6") and RB-FZ-1C (Reactor Building elevation 75'). The water spray systems are supplemented with hose stations and portable extinguishers. SER dated June 25, 1990 (Reference 9) provided an exemption for not having area-wide automatic fire suppression in this fire zone because it was concluded that the existing provisions would promptly detect and extinguish any fire.

The following table provides a summary of the manual actions for RB-FZ-1D by Action Number as identified in Attachment 2 of this letter.

TABLE RB-FZ-1D

ACTION #	Manual Action Required
11	Open breaker for V-20-21 at MCC 1A21 to prevent valve from repositioning after manually opening valve
12	Manually open V-20-21 due to control circuit damage to allow Core Spray to makeup to the Reactor Vessel
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone RB-FZ-1E
This fire zone is located in the Reactor Building elevation 23'-6". The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were either sealed similar to a 1-hour minimum fire barrier (six inches of fire-rated silicone foam) or were evaluated as acceptable. The major fixed combustible is cable

insulation. The fire loading is "low" as defined in the FHAR. Fire protection features include automatic fire detection, which alarms locally and in the Control Room. Primary fire suppression is provided by fixed automatic water spray systems protecting the primary fire hazard in this zone (i.e., grouped electrical cable trays). The automatic water spray system is also installed at the equipment hatch opening and open stairway to RB-FZ-1D (Reactor Building elevation 51'-3") as well as at the duct penetration at elevation 35'. The water spray systems are supplemented with hose stations and portable extinguishers. SER dated June 25, 1990 (Reference 9) provided an exemption for not having area-wide automatic fire suppression in this fire zone because it was concluded that the existing provisions would promptly detect and extinguish any fire.

The following table provides a summary of the manual action for RB-FZ-1E by Action Number as identified in Attachment 2 of this letter.

TABLE RB-FZ-1E

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zones RB-FZ-1F1, RB-FZ-1F2, RB-FZ-1F3, RB-FZ-1F4, and RB-FZ-1F5
These fire zones are located in the Reactor Building basement –19'-6" elevation (RB-FZ-1F1 (Southeast corner), RB-FZ-1F2 (Southwest corner), RB-FZ-1F3 (Northwest corner), RB-FZ-1F4 (Northeast corner), and RB-FZ-1F5 (Torus room - remaining area of Reactor Building basement.)). The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were either sealed similar to a 1-hour minimum fire barrier (six inches of fire-rated silicone foam) or were evaluated as acceptable. The major fixed combustible is limited to molded fiberglass reinforced polyester grating and minor amounts of lube oil in the various pumps. The fire loading is "low" as defined in the FHAR. Smoke detectors, which alarm locally and in the Control Room, provide fixed fire detection. For manual fire suppression, portable fire extinguishers are provided with hose stations for backup. SER dated June 25, 1990 (Reference 9) provided an exemption for not having area-wide automatic fire suppression in fire zone RB-FZ-1F due to the fact that there is a 1-hour fire wrap present. This was approved because of the low combustible loading and the fact that the fire detection would alert the fire brigade to the onset of a fire in the zone so that prompt manual suppression of any fire could be accomplished. A second exemption was approved by the same SER for RB-FZ-1F3 for not providing either additional separation from in-situ combustibles or protection for Core Spray system valve V-20-1 (re-entry into fire area required) and the exemption was approved due to the low fuel loading and automatic fire detection, as well as manual fire suppression capability and heat sink capability of the water-filled piping connected to the valve.

The following table provides a summary of the manual actions for RB-FZ-1F1, RB-FZ-1F2, RB-FZ-1F3, RB-FZ-1F4, and RB-FZ-1F5 by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE RB-FZ-1F1, RB-FZ-1F2, RB-FZ-1F3, RB-FZ-1F4, and RB-FZ-1F5

ACTION #	Manual Action Required
13B	Open breaker for Valve V-20-4 at MCC 1B21A to prevent valve from repositioning after manually opening valve for fire area RB-FZ-1F3 only.
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone RB-FZ-1G

The Shutdown Cooling room is located on the north side of the Reactor Building (Elevations 38' and 51'-3"). The ceiling is reinforced concrete with no openings. The floor and walls are reinforced concrete with non-rated openings to adjoining fire areas/zones. The non-rated openings were either sealed similar to a 1-hour minimum fire barrier (six inches of fire-rated silicone foam) or were evaluated as acceptable. Combustible loading consists of cable insulation, miscellaneous health physics material and pump motors. The fire loading is "low" as defined in the FHAR. Smoke detectors are installed and sound an alarm in the Control Room. Hose stations and portable extinguishers installed in RB-FZ-1D (Reactor Building elevation 51'-3") are available for use in this area.

The following table provides a summary of the manual action for RB-FZ-1G by Action Number as identified in Attachment 2 of this letter.

TABLE RB-FZ-1G

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone RB-FZ-1H

This fire zone is the Trunnion Room, elevation 23'-6", located in the Reactor Building. The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were evaluated as acceptable. Fire loading consists of minimal cable and MSIV damping oil within the MSIV actuators. The fire loading is "low" as defined in the FHAR. A hose station is provided in adjacent fire zone TB-FZ-11E (Condenser Bay) in the heater bay area. In addition, portable extinguishers are provided in access to the condenser bay area for use in this zone. The only fire safe shutdown equipment and cables located in the area are associated with the outboard MSIVs that are located outside the drywell. The inboard MSIVs and cables are located inside the drywell and are not located in this area.

The following table provides a summary of the manual action for RB-FZ-1H by Action Number as identified in Attachment 2 of this letter.

TABLE RB-FZ-1H

ACTION #	Manual Action Required
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Area TB-FA-3A
The 4160V Emergency Switchgear 1C Vault is located in the Turbine Building Mezzanine 23'-6" Elevation south end. The floor is reinforced concrete while the walls and ceiling are coated Metal lath with a fire resistant rating. All openings in these barriers are fire rated to adjoining fire areas/zones. Fire loading consists of minimal cable insulation, minimal amounts of plastics, and minimal amounts of hydrogen. The fire loading is "low" as defined in the FHAR. Fire Protection features include a manual, total flooding CO2 system. Smoke detectors are installed at the ceiling of the vault and sound an alarm locally and in the Control Room. Actuation of one fire detector closes all fire dampers in both TB-FA-3A and TB-FA-3B. In addition, an automatic pre-action sprinkler system is installed over the roof of this fire area in fire zone TB-FZ-11C (4160 Volt Switchgear 1A and 1B).

The following table provides a summary of the manual actions for TB-FA-3A by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE TB-FA-3A

ACTION #	Manual Action Required
5	Trip EDG-1 breaker (lock out) to ensure Main Core Spray Pumps are tripped and do not cause an overfill condition.
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Area TB-FA-3B
The 4160V Emergency Switchgear 1D Vault is located in the Turbine Building Mezzanine 23'-6" Elevation south end. The floor is reinforced concrete while the walls and ceiling are coated Metal lath with a fire resistant rating. All openings in these barriers are fire rated to adjoining fire areas/zones. Fire loading consists of cable insulation, minimal amounts of plastics, and minimal amounts of hydrogen. The fire loading is "low" as defined in the FHAR. Fire Protection features include a manual, total flooding CO2 system. Smoke detectors are installed at the ceiling of the vault and sound an alarm locally and in the Control Room. Actuation of one fire detector closes all fire dampers in both TB-FA-3A and TB-FA-3B. In addition, an automatic pre-action sprinkler system is installed over the roof of this fire area in fire zone TB-FZ-11C (4160 Volt Switchgear 1A and 1B).

The following table provides a summary of the manual actions for TB-FA-3B by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE TB-FA-3B

ACTION #	Manual Action Required
6	Trip EDG-2 breaker (lock out) to ensure Main Core Spray Pumps are tripped and do not cause an overfill condition.
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Area TB-FA-26

The 'C' 125 VDC Battery Room (Elevation 23'-6") is located in the south end of the Turbine Building and is separated from adjoining fire zones TB-FZ-11C (4160V Switchgear 1A and 1B), TB-FZ-11G (Turbine Mezzanine Truck Bay), and TB-FZ-1D (Turbine Building basement - south end) with fire rated barriers. Fire loading consists of battery cases and a minimum amount of cable. Fire loading is "low" as defined in the FHAR. Fire protection features include a smoke detection system that will alarm locally and in the Control Room. Hose lines are available from a hose station outside this area and from outside hydrants and hose houses. Fire extinguishers are also provided.

An enhancement is being made to install new sprinkler heads (area wide) in the 'C' 125 VDC Battery Room from the existing pre-action fire sprinkler system in the 4160V Switchgear 1A and 1B zone, thereby improving survivability of area components and cables, and reducing the likelihood of the fire spreading.

The following table provides a summary of the manual actions for TB-FA-26 by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted. Note that TB-FA-26 is wholly contained within TB-FZ-11C, and that cables traveling to TB-FA-26 must traverse TB-FZ-11C. Therefore TB-FZ-11C and TB-FA-26 are analyzed together for Fire Safe Shutdown analysis purposes, and the manual actions are duplicated in each area. A fire contained within TB-FA-26 is not expected to require most of the actions shown. These areas were not considered a single analysis area in the original FHAR submittal.

TABLE TB-FA-26

ACTION #	Manual Action Required
1	Trip Field Breakers for Recirculation Pumps MG Set so that the Fuel Zone Level Indicators can be used.
2	Provide Fire Water to Isolation Condenser shell by operating valves V-9-2099, V-11-49, V-11-63, and V-11-41 due to loss of power (contingency action).
3	Manually control 480V USS 1B2 Breakers for CRD Pump NC08B and 1B2M from Remote shutdown Panel due to control circuit damage.

ACTION #	Manual Action Required
7	Manually open V-11-36 to provide makeup to Isolation Condenser due to loss of power (contingency action).
8	Check Isolation Condenser Shell level locally due to loss of power (contingency action).
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone TB-FZ-11A

The Turbine Operating Floor 46'-6" elevation is located in the Turbine Building and has reinforced fire rated floors with unprotected openings adjacent to fire zones TB-FZ-11B (Lube Oil Bay), TB-FZ-11E (Condenser Bay), and TB-FZ-11G (Turbine Mezzanine Truck Bay). The walls are sheet metal on unprotected steel. The east wall adjoining OB-FZ-5 (Control Room) and TB-FZ-11B (Turbine Lube Oil Bay) is a fire resistive wall. The roof is a Class II metal deck on unprotected steel. The only significant combustible loading is the bearing lube oil and hydrogen for generator cooling. Fire loading is "moderate" as defined in the FHAR. The fire protection features include an automatic closed head sprinkler system provided over the bearing lift pump and turbine bearings. A fixed CO2 extinguishing system is provided for localized protection of the generator bearings and exciter. Hose stations are provided throughout the operating floor. Fire extinguishers are also provided throughout this area. No fire safe shutdown equipment or cables are located in this area.

The following table provides a summary of the manual action for TB-FZ-11A by Action Number as identified in Attachment 2 of this letter.

TABLE TB-FZ-11A

ACTION #	Manual Action Required
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone TB-FZ-11B

The Turbine Lube Oil Storage, Pumping & Purification Area is located on the north end of the Turbine Building, Elevations 0'-0", 27'-0, 36'-0, and 46'-6". The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were evaluated as acceptable. Turbine lube oil is the major fuel loading. Cable insulation also provides some combustible loading. The fire loading is "high" as defined in the FHAR. Fire protection features include a closed head automatic sprinkler system that is provided over cable trays. Water spray system (open-head deluge system) is installed over oil handling equipment and the oil storage tank. Closed head sprinkler system is provided for the bearing lift pump. Rate-of-rise/fixed temperature thermal detectors are installed over the largest hazard in the area, which is the lube oil storage tank; these detectors actuate the open head deluge (water spray) system. An alarm is provided to the Control Room when water flows from a single sprinkler head or from the deluge system. Hose stations are installed in the area at the basement level and in an adjacent corridor on the mezzanine level. Hose lines are also available from outside hydrants and hose houses. Fire extinguishers are provided throughout the area and AFFF Foam is staged in the Fire Brigade van for use, if necessary. Additional detection was not deemed necessary because

the area is protected by an automatic wet-pipe sprinkler system and the open-head deluge system is located above the largest hazard (Lube Oil Tank) and both alarm to the Control Room when a flow condition occurs.

The following table provides a summary of the manual actions for TB-FZ-11B by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE TB-FZ-11B

ACTION #	Manual Action Required
3	Manually control 480V USS 1B2 Breakers for CRD Pump NC08B and 1B2M from Remote Shutdown Panel due to control circuit damage
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone TB-FZ-11C

The 4160V Switchgear Room 1A and 1B, is located at the west end of the Turbine Building on Mezzanine Level Elevation 23'-6". The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were evaluated as acceptable. Fire loading consists of cable insulation and miscellaneous ordinary combustibles. The fire loading is "low" as defined in the FHAR. Fire protection features include smoke detection system installed at the ceiling over 4160V Switchgear 1A and 1B which actuates an alarm locally and in the Control Room. This system also actuates a pre-action sprinkler system in this fire zone located over the 4160V 1C & 1D Switchgear vaults (Fire areas TB-FA-3A and TB-FA-3B). Actuation of the pre-action sprinkler system alarms locally and in the Control Room. Hose lines are available from a hose station outside this area and from outside hydrants and hose houses. Fire extinguishers are also provided.

An enhancement is being made to install additional sprinkler heads on the existing pre-action fire sprinkler system so that the sprinkler system within Fire Zone TB-FZ-11C is area-wide (except for the small caged area to the east of the "C" 4160V Switchgear Room), thereby improving survivability of area components and cables (hazards protected) and reducing the likelihood of the fire spreading.

The following table provides a summary of the manual actions for TB-FZ-11C by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE TB-FZ-11C

ACTION #	Manual Action Required
1	Trip Field Breakers for Recirculation Pumps MG Set so that the Fuel Zone Level Indicators can be used.
2	Provide Fire Water to Isolation Condenser shell by operating valves V-9-2099, V-11-49, V-11-63, and V-11-41 due to loss of power (contingency action).
3	Manually control 480V USS 1B2 Breakers for CRD Pump NC08B and 1B2M from Remote Shutdown Panel due to control circuit damage.
7	Manually open V-11-36 to provide makeup to Isolation Condenser due to loss of power (contingency action).
8	Check Isolation Condenser Shell level locally due to loss of power (contingency action).
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone TB-FZ-11D

This fire zone is located in the Turbine Building Basement Floor south end Elevation 3'-6". The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were evaluated as acceptable. Fire loading consists of cable insulation, transformer oil, lube oil (minor amounts of lubricants enclosed in valve gear boxes, pump bearings, etc.), and hydrogen seal oil; miscellaneous ordinary combustibles, such as wood and paper, exist in small quantities. The fire loading is "low" as defined in the FHAR. The Unit Substation 1A1 and 1B1 transformers are filled with Dow Corning 561 Silicon transformer oil. This material has characteristics that minimize the likelihood of a fire involving the insulating oil itself. A review of vendor information indicates that the flash and fire points are almost twice as high as other transformer oils, but more importantly, the heat release rate is almost 10 times lower, and any postulated fire originating at the transformer itself would tend to be limited in duration and would not involve sustained burning of the silicon oil. This judgment is supported by testing performed in 1977 by Industrial Risk Insurers of DC-561, which showed that the fluid tended to form a crust and self-extinguish (Reference 8). Based on the characteristics of the silicon fluid, any postulated fire event is expected to be very short in duration. The fire protection features include a closed-head automatic sprinkler system installed throughout the general area. A water spray system with closed head directional nozzles protects the hydrogen seal oil unit. Hose stations and fire extinguishers are also located in the area. SER dated June 25, 1990 (Reference 9) provided an exemption for not having automatic fire detection. The flow alarm for the sprinkler system alarms locally and in the Control Room. This was determined to be adequate based on the fact that the fire will not be of significant magnitude or duration, it will be promptly extinguished by one of the two automatic sprinkler systems installed in this fire zone, and the flow alarms will promptly alert the fire brigade who will respond to manually fight the fire.

The following table provides a summary of the manual actions for TB-FZ-11D by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE TB-FZ-11D

ACTION #	Manual Action Required
1	Trip Field Breakers for Recirculation Pumps MG Set so that the Fuel Zone Level Indicators can be used.
2	Provide Fire Water to Isolation Condenser shell by operating valves V-9-2099, V-11-49, V-11-63, and V-11-41 due to loss of power (contingency action).
3	Manually control 480V USS 1B2 Breakers for CRD Pump NC08B and 1B2M from Remote Shutdown Panel due to control circuit damage.
7	Manually open V-11-36 to provide makeup to Isolation Condenser due to loss of power (contingency action).
8	Check Isolation Condenser Shell level locally due to loss of power (contingency action).
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone TB-FZ-11E

The condenser bay is located in the Turbine Building Elevation 0'-0". The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were evaluated as acceptable. The fire loading consists of fiberglass-reinforced polyester grating installed on permanent scaffolding (flame spread of 15 as determined by ASTM E84) and cable insulation with a minor amount of lube oil in pumps. The low flame spread provides assurance that the grating will not contribute to a fire without a sustained external ignition source. The fire loading is "low" as defined in the FHAR. Fire protection features include closed head automatic sprinklers installed throughout the condenser bay and over cable trays in the condenser bay section. This system is not area-wide because the heater bay section does not have sprinkler heads except for the southwest corner where sprinkler heads were installed to protect an unsealed pipe and duct chase to another fire zone (TB-FZ-11H). There is very minimal combustible loading in the heater bay portion where the feedwater heaters are located and there are only a few cable trays that go to equipment/components that support the feedwater heaters (e.g., valves, etc.). Hose stations and fire extinguishers are also provided throughout this area. SER dated June 25, 1990 (Reference 9) provided an exemption for not having automatic fire detection. The flow alarm for the sprinkler system alarms locally and in the Control Room. This was determined to be adequate based on the fact that the fire will not be of significant magnitude or duration, it will be promptly extinguished by the automatic sprinkler system installed in this fire zone, and the flow alarms will promptly alert the fire brigade who will respond to manually fight the fire.

The following table provides a summary of the manual actions for TB-FZ-11E by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE TB-FZ-11E

ACTION #	Manual Action Required
3	Manually control 480V USS 1B2 Breakers for CRD Pump NC08B and 1B2M from Remote Shutdown Panel due to control circuit damage
4	Open breaker to close V-2-90 to prevent drain down of Condensate Storage Tank due to damage on instrument cables or loss of power supply on the hotwell level control circuits.
16	Manually manipulate valves V-9-11, V-9-9, and V-11-247 to align firewater to the CST to makeup (contingency action).
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone TB-FZ-11F
The Feedwater Pump Room is located in the Turbine Building Basement Elevation 3'6" on the east side. The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were evaluated as acceptable. The fire loading is "low" as defined in the FHAR. The fire loading consists of cable insulation, plastics and lube oil in the pumps. Fire protection features include manual suppression available from fire extinguishers and hose stations.

An enhancement is being made to install area-wide rate compensated/fixed temperature thermal detection in the Feedwater Pump Room to provide for improved operator notification ability, thereby providing a quicker response time for any required actions.

The following table provides a summary of the manual actions for TB-FZ-11F by Action Number as identified in Attachment 2 of this letter.

The manual actions listed in the table below would be performed due to potential cable and/or equipment damage unless otherwise noted.

TABLE TB-FZ-11F

ACTION #	Manual Action Required
4	Open breaker to close V-2-90 to prevent drain down of Condensate Storage Tank due to damage on instrument cables or loss of power supply on the hotwell level control circuits.
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone TB-FZ-11G
This area is located in the Turbine Building Mezzanine South Elevation 23'-6". The floor, walls and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were evaluated as acceptable. Fire loading consists of cable insulation, plastics, rubber, and wood. The fire loading is "low" as defined in the FHAR. Fire protection features include hose lines from a hose station outside this area and from outside hydrants and

hose houses. Portable fire extinguishers are also located in the area. A closed head sprinkler system protects the area under the turbine. This system alarms locally and in the Control Room.

An enhancement is being made to install area-wide rate compensated/fixed temperature thermal detection into Fire Zone TB-FZ-11G to provide for improved operator notification ability, thereby providing a quicker response time for any required actions.

The following table provides a summary of the manual action for TB-FZ-11G by Action Number as identified in Attachment 2 of this letter.

TABLE TB-FZ-11G

ACTION #	Manual Action Required
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Fire Zone TB-FZ-11H

The Demineralizer Tank and Steam Jet Air Ejector Area, Elevations 3'-6" and 23'-6" is located in the Turbine Building southeast end. The walls are not rated. The floor and ceiling are reinforced concrete with both rated and non-rated openings to adjoining fire areas/zones. The non-rated openings were evaluated as acceptable. Fire loading consists of cable insulation, plastics and miscellaneous ordinary combustibles. The fire loading is "low" as defined in the FHAR. The fire protection feature includes manual fire suppression provided by hose station and fire extinguishers. No fire safe shutdown equipment is located in this area but there are two "B" Train 125 VDC control power cables (non-protected train) that traverse through the stairway area of this zone at approximately Elevation 10'. There are also safe shutdown cables buried below the concrete floor and in one section, within a pull-pit covered by sand. SER dated June 25, 1990 (Reference 9) provided an exemption for not providing a 3-hour barrier for the "A" Train power cable that is located in the stairway area of this zone since it is located in a pull-pit that is covered with a minimum of six inches of sand.

The following table provides a summary of the manual actions for TB-FZ-11H by Action Number as identified in Attachment 2 of this letter.

TABLE TB-FZ-11H

ACTION #	Manual Action Required
18	Provide makeup control air to the accumulator for V-11-36 for the Isolation Condenser makeup line due to the loss of instrument air.

Yard Fire Area

The Yard Fire Area is analyzed to address three general areas: The Office Building Roof (OBROOF), Turbine Building Roof (TBROOF) and all remaining outside areas (OUTSIDE) within the protected area not analyzed under other existing fire areas/zones. No specific quantification of fire loading is considered necessary because these are open areas with nothing to contain a heat release in the event of a fire. There is constant observation of the site (yard area), both by humans

and electronic devices (cameras), so that if a fire would occur, it would be quickly detected and appropriate actions taken without significant delay. The fire protection feature for this area includes manual fire suppression provided by yard hydrants that are provided throughout the area

The following table provides a summary of the manual actions for the Yard Fire Area by Action Number as identified in Attachment 2 of this letter.

TABLE FOR YARD AREA

ACTION #	Manual Action Required
9	Manually open V-15-237, throttle V-15-30 and close V-15-52 to establish CRD flow to Reactor due to the loss of instrument air to the CRD Flow Control Valve.
17	Provide makeup control air to the accumulator for V-11-34 for the Isolation Condenser makeup line due to the loss of instrument air.

B. DETAILED EVALUATION OF OPERATOR MANUAL ACTIONS

The fire safe shutdown procedures at OCNGS were written to address all the potential loss of equipment that could occur in a fire area and assumed that the equipment losses would occur concurrently. The timelines developed to support the shutdown procedures are intended to demonstrate that all the manual actions can be performed concurrently as well, with a minimum of plant personnel available. The assumption that all the required post fire actions would have to be performed concurrently is conservative and not representative of conditions anticipated in real fire conditions.

The evaluation will address the manual actions in two separate approaches. The first approach will be to consider just the individual operator manual action in a specific fire area/zone. This part of the evaluation will consider both feasibility and reliability aspects and demonstrate that sufficient margin exists to perform the individual operator manual action. The second approach will consider all of the hot shutdown operator manual actions for a fire area/zone. The evaluation will demonstrate that sufficient time and staff is available to accomplish the operator manual actions.

Consideration of Individual Operator Manual Actions

Attachment 2 contains a table that lists the operator manual actions addressed by this exemption request. An individual assessment of each manual action is provided using times obtained from the safe shutdown calculations (more conservative than actual times obtained from equipment operator validations) following the end of the table. Each of the assessments concluded that the manual action could be performed with adequate margin.

Consideration of Combined Operator Manual Actions

The tables provided below cover each of the initiating fire areas that involve operator manual action(s) within this exemption request. A review of all of the operator manual actions necessary to achieve hot shutdown is included (not just those included in this exemption request). Actions necessary to achieve cold shutdown and repairs are not included, since those actions are not as time critical and additional plant personnel would become available several hours after the start of the event. The focus of this review is to demonstrate that adequate time and staff are available to perform all of the operator manual actions. The actions shown were performed in a sequential

order as directed by the Control Room to minimize repeated transitions to and from the Control Room. The tables are based on the assumption of worst-case conditions requiring all of the manual actions for a particular fire area/zone to be performed. The command and control process as directed by the fire support procedures (FSPs) consider environmental conditions and accessibility, tools and smoke issues, as necessary. Other than for prompt actions (those that require completion in 45 minutes or less), the diagnostic time is assumed to be 30 minutes, which is conservative as discussed below under Section III.C, Review of Operator Manual Actions against NUREG-1852. This information in the tables was obtained primarily from the timelines that are contained in each of the fire safe shutdown calculations, which are more conservative than actual times obtained from equipment operator validations. The timelines in the safe shutdown calculations give assignments to "Operator 3" and continue to give that operator additional assignments until there is an overlap; then "Operator 4" is given an assignment. This approach was taken to simply show that all actions could be performed within the allotted time with the available staff. In actual practice, the two operators are available and can be assigned as deemed appropriate by the Control Room. This approach adds a level of conservatism, since Operator 4 will be available to assist, as needed, which will shorten the action time.

In considering the combined actions for a fire area, the relative simplicity of the manual actions as previously described is considered. The ability to access each of the manual action locations and the environmental conditions for the majority of the actions is also a consideration in the ability to perform the tasks. There are two tasks (Actions 10 & 12 from Attachment 2) that may require the use of a self-contained breathing apparatus (SCBA) due to potential smoke issues; however, these tasks can be completed as expected due to the installed suppression systems in the area reducing the amount of smoke that would be present, configuration of the plant (large volumes with openings to the top elevation), and the time that the operator manual action needs to be performed (60 minutes or greater).

The tables that are listed below have eight columns; a short description of each column is as follows:

- Column 1 – Lists the Operator (OP) that has been designated to perform the action.
- Column 2 – Lists the operator manual action with a location description.
- Column 3 – Indicates whether the exemption was Phase I, Phase II, or approved in a previous exemption. Phase I operator manual actions are those that were previously found acceptable via an NRC fire protection safety evaluation report while the Phase II manual operator actions are those that are the subject of this exemption request. For Phase II actions, a cross-reference is also provided to the detailed action discussion provided in Attachment 2.
- Column 4 - Provides the walkdown time plus the time to obtain any required portable equipment, PPE, etc. Also, the first time that the operator is dispatched, a generic diagnostic time of either 10 minutes (prompt action) or 30 minutes (for the remaining actions) was applied and, since the Control Room staff will be in a state of continual diagnosis in parallel with the safe shutdown operators performing their actions, no additional diagnosis time was allotted for subsequent actions for the same operator. In addition, once the safe shutdown operator completes the first action, the total time for that action is utilized for the starting time of the subsequent action (actions are shown in series with each other).
- Column 5 - Lists the time to execute the prescribed action. Times are obtained from the safe shutdown calculations.

- Column 6 - Lists the total time to perform the action (walkdown time, portable equipment & PPE time, action time).
- Column 7 - Lists the time limit obtained from the safe shutdown calculations.
- Column 8 - Lists the time margin available for performing this action.

The review of each fire area/zone below found that all the operator manual actions necessary to achieve and maintain hot shutdown could be accomplished within the time allotted by the shutdown calculations.

Fire Area CW-FA-14 – Intake area is an outside area located remotely from the Power Block. The safe shutdown analysis credits using control rod drive (CRD) Hydraulic "B", Isolation Condenser "B" and firewater for makeup to Isolation Condenser for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (via Office Bldg), align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49, V-11-63.	Phase I	T = 10+5 = 15	8 (2m x 4 valves= 8m)	23	45	22
3	Same area, align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 23+1 = 24	10 (2m x 3 valves, 4m to monitor = 10m)	34	204	170
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 34+6 = 40	15	55	300	245

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator; however, this assistance is not deemed necessary based on the margin available to execute this operator manual action. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone RB-FZ-1D - This fire zone covers much of the 51' elevation of the Reactor Building except for the Drywell (RB-FA-2) and the Shutdown Cooling Rooms (RB-FZ-1G). The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "B" for hot shutdown. If an EMRV spuriously opens, Core Spray System II would be used for RPV injection. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to MCC 1A21 in "A" 480V SWGR RM, OB-FZ-6A (via Office Bldg.), trip bkr C02 to support OMA of V-20-21.	Phase II Action #11	T = 30+3 = 33	1	34	66	32
3	Proceed to RB-75' EL, RB-FZ-1C (from OB-FZ-6A) to manually operate V-20-21.	Phase II Action #12	T = 34+12 = 46 (5m for SCBA, 4m to RB 75', 3m for ladder)	10	56	66	10
3	Proceed to RB-FZ-1E (RB-23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 56+5 = 61	10 (2m x 3 valves, 4m monitor flow = 10m)	71	204	133

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Proceed to RB-FZ-1B (RB-23'-6" to 95'), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 71+6 = 77	15	92	300	208

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator; however, this assistance is not deemed necessary based on the margin available to execute this operator manual action. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone RB-FZ-1E and RB-FZ-1G - These fire zones cover much of the 23'-6" elevation of the Reactor Building. The safe shutdown analysis combines these two fire zones, which results in the zone having the same compliance strategy and manual actions. The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "B" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3, 4	CR to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor (FI-225-998 in RB-FZ-1D EL 51').	Phase I and SER Dated June 25, 1990	T = 90 (Valves are in fire affected area of concern. Per SER dated June 25, 1990, the action cannot occur before 60 minutes; therefore, a 90-minute delay for entry is assumed)	10 OP4 (2m x 3 valves=6m; 4m to monitor FI on RB-51' = 10m) OP3 at FI-225-998	100	204	104
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 100+6 = 106	15	121	300	179

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zones RB-FZ-1F1, RB-FZ-1F2, RB-FZ-1F4, RB-FZ-1F5, RB-FZ-1H - These fire zones cover southeast corner room of the (-) 19' elevation of the Reactor Building, southwest corner room of the (-) 19' elevation of the Reactor Building, northeast corner room of the (-) 19' elevation of the Reactor Building, much of the area around the Torus on the (-) 19" elevation of the Reactor Building and Main Steam Tunnel (Trunnion Room) on the 23'-6" elevation of the Reactor Building.

External (Non-Power Block) Buildings, AB-FA-13 (Auxiliary Boiler House), NR-FA-20 (New Radwaste Building); OG-FA-21 (Off Gas Building); OR-FA-19 (Old Radwaste Building) - These fire areas/zones are being discussed together because they all credit the same compliance strategies including operator manual actions. The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "B" for hot shutdown in the event of fire in these fire areas/zones. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E to align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 30+5 = 35	10 (2m x 3 valves, 4m to monitor = 10m)	45	204	159
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 45+6 = 51	15	66	300	234

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator if needed. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone RB-FZ-1F3 - This fire zone covers the northwest corner room of the -19' elevation of the Reactor Building. The safe shutdown analysis credits using Core Spray System II Train B with pump suction from the Condensate Storage Tank for Reactor Pressure Vessel (RPV) makeup and

Isolation Condenser "B" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to B 480V SWGR RM, OB-FZ-6B to trip MCC 1B21A bkr DO2 for V-20-4.	Phase II Action #13	T = 30+3 = 33	1	34	204	170
3	Proceed to RB-FZ-1F2 (RB -19' EL SW), manually operate V-20-2 and V-20-4.	Phase I	T = 34+25 = 59 (5m access + 20m Rad. Protection for brief and PC's = 25m) - valves are in locked high rad area.	10 (5m x 2 items = 10)	69	204	135
3	Proceed to RB-FZ-1F3 (RB -19' EL NW) to manually operate V-20-1.	Previously approved exemption (SER Dated June 25, 1990)	T = 90 (Valve is in fire affected area of concern. Per SER dated June 25, 1990, the action cannot occur before 60 minutes; therefore, a 90-minute delay for entry is assumed)	5	95	204	109
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 95+11 = 106	15	121	300	179

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator if needed. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Area OB-FA-9 – This fire area is a 3-story facility enveloped by the Reactor Building on the east side, the Turbine Building on the west side and the service area on the north side.

The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "B" for hot shutdown in the event of fire in these fire areas/zones. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to YARD, monitor CST level indicator, LI-424-993.	Phase I	T = 30+5 = 35	2	37	73	36
3	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 37+10 = 47	10 (2m x 3 valves, 4m to monitor = 10m)	57	204	147
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 57+6 = 63	15	78	300	222

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator if needed. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone OB-FZ-6A - This fire zone is in the Office Building in the "A" 480V Switchgear Room. The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "B" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to MT-FA-12 in Condensate Xfr. Bldg, to open a breaker at PDP-734-023 to close V-2-90. Then verify valve is closed.	Phase II Action #4	T = 10+5 = 15	3	18	39	21
3	In YARD (same area), monitor CST level indicator, LI-424-993.	Phase I	T = 18+4 = 22 (3m for frisk and 1m access)	2	24	73	49
3	Proceed to 4160V SWGR 1C, trip & lockout bkrs C0 & C5 to prevent Core Spray Injection.	Phase I	T = 24+6 = 30 (3m for access + 3m for PPE = 6m)	2 (1m per bkr x 2 bkrs = 2m)	32	120	88
3	Proceed to 4160V SWGR 1D, trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 32+1 = 33	2 (1m per bkr x 2 bkrs = 2m)	35	120	85
3	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 35+8 = 43	10 (2m x 3 valves, 4m to monitor = 10m)	53	204	151

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 53+6 = 59	15	74	300	226
3	Proceed to Cond Xfr Bldg, close V-9-11 and open V-9-9 & V-11-247 to makeup to CST from firewater (contingency action)	Phase II Action #16	T = 74+16= 90	12	102	210	108
4	CR to B 480V SWGR Room, trip Containment Spray Pump at USS-1B2 bkrs 042A & 043A, and remove fuses.	Phase II Action #10	T = 30+11 = 41 (5m for SCBA + 3m access + 3m for PPE/fuse puller= 11m)	4 (2m x 2 bkrs = 4m)	45	60	15
4	Same area, trip CS Booster Pump at USS-1B2 bkrs 046B & 046C and remove fuses.	Phase I	T = 45+ 0 = 45	4 (2m x 2 bkrs = 4m)	49	120	71
4	In B 480V SWGR Room, disconnect the bus-tie at USS-1B2 per 2400-APR-3730.01	SER dated June 25, 1990 provides exemption	Performed by Craft/Emergency Personnel (non-operators) within 180 minutes.				
4	In B 480V SWGR Room at RSP, transfer control of CRD Pump "B" and Breaker 1B2M	Phase I	T = 120	5	125	180	55

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to A/B Battery Room, align Static Charger to B Battery.	Phase I	T = 125+5 = 130	15	145	180	35

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone OB-FZ-6B - This fire zone is in the Office Building in the "B" 480V Switchgear Room. The safe shutdown analysis credits using CRD Hydraulic "A" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (EL 23'-6"), align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49 and V-11-63.	Phase I	T = 10+5 = 15	8 (2m x 4 valves= 8m)	23	45	22
3	At the same location, align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 23+1 = 24	10 (2m x 3 valves, 4m to monitor = 10m)	34	204	170

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Proceed to RB-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 34+6 = 40	15	55	300	245
4	CR to TB-FZ-11B stairway area, open dampers DM-56-15 & -16.	Phase II Action #15	T = 30+6 = 36 (3m to access and 3m for ladder = 6m)	20 (10m per damper x 2 = 20m)	56	90	34
4	Proceed to YARD, close DM-56-17	Phase II Action #15	T = 56+10 = 66	10	76	90	14

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zones OB-FZ-8A and OB-FZ-8B - These fire zones are in the Office Building in the MG-Set Room and Mechanical Equipment Room elevations 35'-0" and 23'-6", respectively. A fire in this area has the potential to impact the Containment Spray System II Train A, Core Spray System II Train A, Emergency Service Water System II Train A, Isolation Condenser System Train A, Control Room HVAC Train A, RBCCW Alternate Shutdown Alignment Train A and Shutdown Cooling System Alternate Shutdown Alignment Train A. The safe shutdown analysis credits using CRD Hydraulic "A" and Isolation Condenser "B" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	CR to RB-FZ-1E (EL 23'-6"), align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49, V-11-63.	Phase I	T = 10+5 = 15	8 (2m x 4 valves = 8m)	23	45	22
3	Same area, align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 23+1 = 24	10 (2m x 3 valves, 4m to monitor = 10m)	34	204	170
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 34+6 = 40	15	55	300	245
4	CR to 4160V SWGR 1D, trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 30+8 = 38 (5m access +3m for Electrical PPE = 8m)	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	40	120	80
4	Proceed to B 480V SWGR Room, trip CS Booster Pump at USS-1B2 bkrs 046B & 046C and remove fuses.	Phase I	T = 40+8 = 48	4 (2m x 2 bkrs = 4m)	52	120	68

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to CW-FA-14, crosstie USS-1A3 to USS-1B3 to restore ventilation to Control Room.	Phase I	T = 52+8 = 60	15	75	600	525

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone OB-FZ-8C - This fire zone is in the Office Building in the A/B Battery Room, Tunnel and Electrical Tray Room 35'-0" elevations. The safe shutdown analysis credits using CRD Hydraulic "A" and Isolation Condenser "B" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (EL 23'-6"), align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49, V-11-63.	Phase I	T = 10+5 = 15	8 (2m x 4 valves= 8m)	23	45	22
3	Proceed to A 480V SWGR Room, transfer incoming bkr, CRD pump and 480V HVAC to LSP-1A2.	Phase I	T = 23+2 = 25	5	30	60	30

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	At same location, trip CS Booster Pump at USS-1A2 bkrs 036B & 036C and remove fuses.	Phase I	T = 30+3 = 33 (0m access + 3m obtain PPE/fuse puller)	4 (2m/bkr x 2 bkrs = 4m)	37	120	83
3	Proceed to B 480V SWGR Room, trip CS Booster Pump at USS-1B2 bkrs 046B & 046C and remove fuses.	Phase I	T = 37+1 = 38	4 (2m x 2 bkrs = 4m)	42	120	78
3	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 42+2 = 44	10 (2m per valve x 3 valves, 4m to monitor = 10m)	54	204	150
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 54+6 = 60	15	75	300	225
4	CR to 4160V SWGR 1A (TB-FZ-11C), trip and lockout bkrs A3, A5 & A9 for Recirc Pumps.	Phase I	T = 10+8=18 (5m access + 3m for Electrical PPE = 8m)	3 (0.5m per action x 2 actions per bkr x 3 bkrs = 3m)	21	30	9
4	Proceed to 4160V SWGR 1C, trip and lockout bkrs C0 & C5 to prevent Core Spray Injection.	Phase I	T = 21+1 = 22	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	24	120	96

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to 4160V SWGR 1D, trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 24+1 = 25	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	27	120	93
4	Proceed to 4160V SWGR 1B, trip and lockout Reactor Feedwater Pumps B & C bkrs B2 & B10	Phase I	T = 27+1= 28	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	30	180	150
4	Proceed to MT-FA-12 in Condensate Xfr. Bldg, open breaker at PDP-734-023 to close V-2-90. Then verify valve is closed.	Phase II Action #4	T = 30+5 = 35	3	38	73	35
4	In YARD, monitor CST level indicator, LI-424-993.	Phase I	T = 38+4 = 42 (3m frisk+ 1m travel=4m)	2	44	73	29
4	Proceed to CW-FA-14, crosstie USS-1A3 to USS-1B3 to restore ventilation to Control Room.	Phase I	T = 44+1 = 45	15	60	600	540

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone OB-FZ-10A - This fire zone is in the Office Building on elevation 46'-6" in the Monitoring and Change Room Area and Operations Support Area. The safe shutdown analysis credits using CRD Hydraulic "A" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (EL 23'-6"), align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49 and V-11-63.	Phase I	T = 10+8 = 18	8 (2m x 4 valves= 8m)	26	45	19
3	At the same location, align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 26+1 = 27	10 (2m x 3 valves, 4m to monitor = 10m)	37	204	167
3	Proceed to RB-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 37+6 = 43	15	58	300	242
4	CR to B 480V SWGR Room to open door and provide temporary ventilation	Phase II Action #14	T = 30+8 = 38	17	55	120	65

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone OB-FZ-10B - This fire zone covers the Hot and Cold Chemical Lab, Instrument Lab, P.A.S.S. and Count Room 35' elevation of the Office Building. The safe shutdown analysis credits using CRD Hydraulic "A" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (EL 23'-6"), align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49 and V-11-63.	Phase I	T = 10+5 = 15	8 (2m x 4 valves= 8m)	23	45	22
3	At the same location, align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 23+1 = 24	10 (2m x 3 valves, 4m to monitor = 10m)	34	204	170
3	Proceed to RB-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 34+6 = 40	15	55	300	245

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator if needed. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Area TB-FA-3A - This fire area is the 4160V Emergency Switchgear 1C Vaults, which is located on the Turbine Building Mezzanine 23'-6" elevation. The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "B" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to 4160V SWGR 1D, trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 30+13 = 43 (5m for SCBA +5m access + 3m PPE = 13m)	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	45	120	75
3	Proceed to DG-FA-15, manually trip EDG output breaker DG-1 to "pull to Lock" and place EDG1 mode switch in stop	Phase II Action #5	T = 45+5 = 50	3	53	120	67
3	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 53+10 = 63	10 (2m x 3 valves, 4m to monitor = 10m)	73	204	131
3	Go to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T =73+6 = 79	15	94	300	206

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator if needed. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Area TB-FA-3B - This fire area is the 4160V Emergency Switchgear 1D Vaults, which is located on the Turbine Building Mezzanine 23'-6" elevation. The safe shutdown analysis credits using CRD Hydraulic "A" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (EL 23'-6"),align firewater to Iso Cond. V-9-2099, V-11-41, V-11-49, V-11-63.	Phase I	T = 10+5 = 15	8 (2m x 4 valves = 8m)	23	45	22
3	Proceed to DG-FA-17, trip EDG output breaker by taking to "Pull to Lock" and place EDG2 mode switch in stop	Phase II Action #6	T = 23+10 = 33	3	36	120	84
3	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 36+10= 46	10 (2m x 3 valves, 4m to monitor = 10m)	56	204	148
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 56+6 = 62	15	77	300	223

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator if needed. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone TB-FZ-11B - This fire zone covers Turbine Lube Oil Storage, Pumping and Purification East End Turbine Building 0'-0", 27'-0" and 36'-0" elevations of the Turbine Building. The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone.

The manual actions required by the safe shutdown analysis for a fire in this zone vary, depending upon the scenario. Two tables are listed below for operator manual actions for Fire Zone TB-FZ-11B. The first table are the actions that are required if offsite power is not lost while the second table are the actions required if offsite power is lost.

The scenarios can be summarized as follows:

- Offsite power available – actions required to prevent overfill by feedwater or core spray, actions to trip recirc pumps, actions to refill isolation condenser using Condensate Transfer.
- Offsite power not available – actions required to align diesel generator, actions to refill isolation condenser using Condensate Transfer system.

TB-FZ-11B - OFFSITE POWER AVAILABLE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to 4160V SWGR 1A & 1B (TB-FZ-11C), trip and lockout bkrs A3, A5, A9, B4, & B8 for Recirc Pumps.	Phase I	T = 10+ 8 = 18 (5m access + 3m for Electrical PPE = 8m)	5 (0.5m per action x 2 actions per bkr x 5 bkrs = 5m)	23	30	7
3	At same location 4160V SWGR 1A & 1B, trip and lockout Reactor Feedwater Pumps 1A, 2B & 2C (bkrs A8, B2, & B10)	Phase I	T = 23+0 = 23	3 (0.5m per action x 2 actions per bkr x 3 bkrs = 3m)	26	180	154
3	Proceed to 4160V SWGR 1C, trip and lockout bkrs C0 & C5 to prevent Core Spray Injection.	Phase I	T =26+1 = 27	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	29	120	91

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Proceed to 4160V SWGR 1D, trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 29+1 = 30	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	32	120	88
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 32+0 = 32	5	37	45	8
3	Proceed to "A" 480V SWGR Room to trip CS Booster Pump at USS-1A2 bkrs 036B & 036C and remove fuses.	Phase I	T = 37+13 = 50 (10m access + 3m for PPE/fuse puller=13m)	4 (2m x 2 bkrs = 4m)	54	120	66
3	Proceed to B 480V SWGR Room to RSP, operate transfer sw. & control CRD Pump B and bkr 1B2M to power USS-1B2	Phase II Action #3	T = 54+1 = 55	5	60	180	120
3	Proceed to RB EL 23'-6", and align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T =60+2 = 62	10 (2m x 3 valves, 4m to monitor = 10m)	72	204	132
3	Proceed to RB (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 72+6 = 78	15	93	300	207

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	CR to CW-FA-14, transfer control of incoming bkr 1B3M at LSP-1B3	Phase I	T = 10+ 5 = 15	5	20	45	25
4	Same location, confirm bkr 062C for MCC 1B32 is closed.	Phase I	T = 20+0 = 20	1 (1m x 1 bkr = 1m)	21	45	24
4	At MT-FA-12, transfer control of Condensate Transfer Pump at LSP-1B32.	Phase I	T = 21+1 = 22	5	27	45	18
4	In YARD, monitor CST level indicator, LI-424-993.	Phase I	T = 27+1 = 28	2	30	73	43

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

TB-FZ-11B - OFFSITE POWER NOT AVAILABLE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to 4160V SWGR 1D - trip and lockout bkrs D1, D2, D4, D6, D8, D9 to shed load & isolate the 1D bus	Phase I	T = 10+8 = 18 (5m access + 3m ppe= 8m)	6 (0.5m per action x 2 actions per bkr x 6 bkr = 6m)	24	45	21

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 24+0 = 24	5	29	45	16
3	Proceed to B 480V SWGR Room to RSP, operate transfer sw. & control CRD Pump B and bkr 1B2M to power USS-1B2	Phase II Action #3	T = 29+ 8 = 37	5	42	180	138
3	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T =42+2 = 44	10 (2m x 3 valves, 4m to monitor = 10m)	54	204	150
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 54+6 = 60	15	75	300	225
4	CR to DG-FA-17, transfer control of SWGR/EDG to LSP-DG2.	Phase I	T =10+4= 14	10	24	45	21
4	Proceed to CW-FA-14, transfer control of incoming bkr 1B3M at LSP-1B3	Phase I	T = 24+2 = 26	5	31	45	14
4	Same area, confirm bkr 062C for MCC 1B32 is closed.	Phase I	T = 31+0 = 31	1 (1m x 1 bkr = 1m)	32	45	13

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to MT-FA-12, transfer control of Condensate Transfer Pump at LSP-1B32.	Phase I	T = 32+1 = 33	5	38	45	7
4	In YARD, monitor CST level indicator, LI-424-993.	Phase I	T = 38+1 = 39	2	41	73	32

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone TB-FZ-11C and TB-FA-26 - This fire zone and area covers the Switchgear Room, west end of the Turbine Building on Mezzanine Level 23'-6" elevation and the "C" Battery Room. The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone.

The manual actions required by the safe shutdown analysis for a fire in this zone vary, depending upon the scenario. Four tables are listed below for operator manual actions for Fire Zone TB-FZ-11C and TB-FA-26. The first table are the actions that are required if offsite power is available, while the second table are the actions required if offsite power is lost. The last two tables are contingency tables if access is not immediately available to the 4160V Switchgear area (offsite power available and loss of offsite power).

The scenarios can be summarized as follows:

- Offsite power available – actions required to prevent overfill by feedwater or core spray, actions to trip recirc pumps, actions to refill isolation condenser using Condensate Transfer.
- Offsite power not available – actions required to align diesel generator, actions to refill isolation condenser using Condensate Transfer system.
- Offsite power available and 4160 area not immediately accessible – actions required to prevent overfill by feedwater or core spray, actions to trip recirc pumps, actions to refill isolation condenser using firewater.
- Offsite power not available and 4160 area not immediately accessible – actions required to align diesel generator, actions to refill isolation condenser using firewater.

Fire Zone TB-FZ-11C and TB-FA-26 - OFFSITE POWER AVAILABLE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	**In Control Room (CR)** 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to OB-FZ-8A at RY21 Panels, trip field bkrs for Recirculation Pumps A to E.	Phase II Action #1	T = 10+5 = 15 (2m access to area + 3m for Electrical PPE = 5m)	3 (0.5m x 5 bkrs = 2.5m, use 3m)	18	30	12
3	Proceed to 4160V SWGR 1D (TB-FA-3B), trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 18+13 = 31 (5m to access area + 5m for SCBA + 3m for PPE = 13m)	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	33	120	87
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 33+0 = 33	5	38	45	7
3	Proceed to SWGR 1C, trip and lockout bkrs C0 & C5 to prevent Core Spray Injection.	Phase I	T = 38+1 =39	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	41	120	79
3	Proceed to 4160V SWGR 1A & 1B trip and lockout Reactor Feedwater Pumps 1A, 1B & 1C bkrs A8, B2 & B10	Phase I	T = 41+1 = 42	3 (0.5m per action x 2 actions per bkr x 3bkr = 3m)	45	180	135

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	CR to CW-FA-14, at LSP-1B3 transfer control of incoming bkr 1B3M	Phase I	T = 10+ 5 = 15	5	20	45	25
4	Same area, confirm bkr 062C for MCC 1B32 is closed.	Phase I	T = 20+0 = 20	1 (1m x 1 bkr = 1m)	21	45	24
4	Proceed to A 480V SWGR to trip CS Booster Pump at USS-1A2 bkrs 036B & 036C and remove fuses.	Phase I	T = 21+11 = 32 (8m to access area + 3m for PPE = 11m)	4 (2m x 2 bkrs = 4m)	36	120	84
4	In B 480V room at RSP, operate transfer sw. & control CRD Pump P-15-1B and bkr 1B2M.	Phase II Action #3	T = 36+1 = 37	5	42	180	138
4	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 42+2 = 44	10 (2m x 3 valves, 4m to monitor = 10m)	54	204	150
4	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 54+6 = 60	15	75	300	225

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone TB-FZ-11C and TB-FA-26 - OFFSITE POWER NOT AVAILABLE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	**In Control Room (CR)** 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to 4160V SWGR 1D - trip and lockout bkrs D1, D2, D4, D6, D8, D9 to shed load & isolate the 1D bus	Phase I	T = 10+13 = 23 (5m access + 3m PPE + 5m SCBA = 13m)	6 (0.5m per action x 2 actions per bkr x 6 bkr = 6m)	29	45	16
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 29+0 = 29	5	34	45	11
4	CR to CW-FA-14, at LSP-1B3 transfer control of bkr 1B3M and SW Pump P-3-1B.	Phase I	T = 10+5 = 15	5	20	45	25
4	Same area, locally re-close MCC 1B32 feeder bkr 062C at USS 1B3.	Phase I	T = 20+0 = 20	1 (1m x 1 bkr = 1m)	21	45	24
4	Proceed to B 480V Room, at RSP operate transfer sw. & control CRD Pump P-15-1B and bkr 1B2M.	Phase II Action #3	T = 21+ 8 = 29	5	34	180	146

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 34+ 2 = 36	10 (2m x 3 valves, 4m to monitor = 10m)	46	204	158
4	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 46+6 = 52	15	67	300	233

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone TB-FZ-11C and TB-FA-26 CONTINGENCY – OFFSITE POWER AVAILABLE BUT ACCESS NOT IMMEDIATELY AVAILABLE TO 4160V AREA DUE TO SMOKE OR CO2

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	**In Control Room (CR)** 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to OB-FZ-8A at RY21 Panels, trip field bkrs for Recirculation Pumps A to E.	Phase II Action #1	T = 10+5 = 15 (2m access to area + 3m for Electrical PPE = 5m)	3 (0.5m x 5 bkrs = 2.5m, use 3m)	18	30	12

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Proceed to A 480V SWGR to trip CS Booster Pump at USS-1A2 bkrs 036B & 036C and remove fuses.	Phase I	T =18+8 =26 (5m access to area + 3m for PPE = 8m)	4 (2m x 2 bkrs = 4m)	30	120	90
3	Proceed to 4160V SWGR 1D (Turbine Build Mezz), trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 90 (Assume 90m for re-entry. PPE included in 90m)	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	92	120	28
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 92+0 = 92	5	97	180	83
3	Proceed to SWGR 1C, trip and lockout bkrs C0 & C5 to prevent Core Spray Injection.	Phase I	T = 97+1 =98	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	100	120	20
3	Proceed to 4160V SWGR 1A & 1B trip and lockout Reactor Feedwater Pumps 1A, 1B & 1C bkrs A8, B2 & B10	Phase I	T = 100+1 = 101	3 (0.5m per action x 2 actions per bkr x 3bkr = 3m)	104	180	76
3	Proceed to CW-FA-14, at LSP-1B3 transfer control of incoming bkr 1B3M	Phase I	T =104+ 5=109	5	114	180	66

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Same area, confirm bkr 062C for MCC 1B32 is closed at USS 1B3.	Phase I	T =114+0 =114	1 (1m x 1 bkr = 1m)	115	180	65
3	Proceed to OB-FZ-6B at RSP, operate transfer sw. & control CRD Pump P-15-1B and bkr 1B2M.	Phase II Action #3	T = 115+8=123	5	128	180	52
3	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 128+2 =130	10 (2m x 3 valves, 4m to monitor = 10m)	140	204	64
4	CR to RB-FZ-1E (EL 23'-6") to align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49, V-11-63.	Phase II Action #2	T = 10+ 5 = 15	8 (2m x 4 valves= 8m)	23	45	22

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to RB-FZ-1B (EL 95'-3"), Provide Fire Water to IC shell by manually operating valve V-11-36. Subsequently, monitor shell level locally and control level with V-11-36 as needed until CR electrical control is re-established.	Phase II Actions #7 and 8	T = 23+ 6 = 29	5 Subsequently, control level as needed	34	45	11
4	Same Area, connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 34+ 0 = 34	15	49	300 min after CR has taken back electrical control of V-11-36 from Operator	251

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

TB-FZ-11C and TB-FA-26 CONTINGENCY – LOSS OF OFFSITE POWER AND ACCESS NOT IMMEDIATELY AVAILABLE TO 4160V AREA DUE TO SMOKE OR CO2

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	**In Control Room (CR)** 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	CR to RB-FZ-1E (EL 23'-6") to align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49, V-11-63.	Phase II Action #2	T = 10+ 5 = 15	8 (2m x 4 valves= 8m)	23	45	22
3	Proceed to RB-FZ-1B (EL 95'-3"), Provide Fire Water to IC shell by manually operating valve V-11-36. Subsequently, monitor shell level locally and control level with V-11-36 as needed until CR electrical control is re-established.	Phase II Actions #7 and 8	T = 23+ 6 = 29	5 Subsequently, control level as needed	34	45	11
3	Same area, connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 34+ 0 = 34	15	49	300 min after CR has taken back electrical control of V-11-36 from Operator	251
4	CR to 4160V SWGR 1D - trip and lockout bkrs D1, D2, D4, D6, D8, D9 to shed load & isolate the 1D bus	Phase I	T = 90 (90m used for re-entry which included obtaining PPE)	6 (0.5m per action x 2 actions per bkr x 6 bkr = 6m)	96	180	84

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 96+0 = 96	5	101	180	79
4	Proceed to CW-FA-14, at LSP-1B3 transfer control of bkr 1B3M and SW Pump P-3-1B.	Phase I	T = 101+5 = 106	5	111	180	69
4	AT USS-1B3 (same area), locally re-close MCC 1B32 feeder bkr 062C.	Phase I	T = 111+0 = 111	1 (1m x 1 bkr = 1m)	112	180	68
4	Proceed to B 480V Room at RSP, operate transfer sw. & control CRD Pump P-15-1B and bkr 1B2M.	Phase II Action #3	T = 112+ 8 = 120	5	125	180	55
4	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 125+ 2 = 127	10 (2m x 3 valves, 4m to monitor = 10m)	137	204	67

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone TB-FZ-11D - This fire zone covers the Basement floor south end 0'-0" elevation of the Turbine Building. The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone.

The manual actions required by the safe shutdown analysis for a fire in this zone vary, depending upon the scenario. Four tables are listed below for operator manual actions for Fire Zone TB-FZ-11D. The first table are the actions that are required if offsite power is available, while the second table are the actions required if offsite power is lost. The last two tables are contingency tables if access is not immediately available to the 4160V Switchgear area (offsite power available and loss of offsite power).

The scenarios can be summarized as follows:

- Offsite power available – actions required to prevent overfill by feedwater or core spray, actions to trip recirc pumps, actions to refill isolation condenser using Condensate Transfer.
- Offsite power not available – actions required to align diesel generator, actions to refill isolation condenser using Condensate Transfer system.
- Offsite power available and 4160 area not immediately accessible – actions required to prevent overfill by feedwater or core spray, actions to trip recirc pumps, actions to refill isolation condenser using firewater.
- Offsite power not available and 4160 area not immediately accessible – actions required to align diesel generator, actions to refill isolation condenser using firewater.

TB-FZ-11D - OFFSITE POWER AVAILABLE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to OB-FZ-8A at RY21 Panels, trip field bkrs for Recirculation Pumps A to E.	Phase II Action #1	T =10+ 5= 15 (2m access to area + 3m for PPE = 5m)	3 (0.5m x 5 bkrs = 2.5m, use 3m)	18	30	12
3	Proceed to 4160V SWGR 1D (Turbine Build Mezz), trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 18+13 = 31 (5m to access area + 5m for SCBA + 3m for PPE = 13m)	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	33	120	87
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 33+0 = 33	5	38	45	7

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Proceed to SWGR 1C, trip and lockout bkrs C0 & C5 to prevent Core Spray Injection.	Phase I	T = 38+1 = 39	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	41	120	79
3	Proceed to 4160V SWGR 1A & 1B, trip and lockout Reactor Feedwater Pumps 1A, 1B & 1C bkrs A8, B2 & b10	Phase I	T = 41+1 = 42	3 (0.5m per action x 2 actions per bkr x 3bkr = 3m)	45	180	135
4	CR to CW-FA-14, at LSP-1B3 transfer control of incoming bkr 1B3M	Phase I	T = 10+ 5 = 15	5	20	45	25
4	At USS-1B3 (same area), confirm bkr 062C for MCC 1B32 is closed.	Phase I	T = 20+0 = 20	1 (1m x 1 bkr = 1m)	21	45	24
4	Proceed to A 480V SWGR to trip CS Booster Pump at USS-1A2 bkrs 036B & 036C and remove fuses.	Phase I	T = 21+11 = 32 (8m access to area + 3m for PPE = 11m)	4 (2m x 2 bkrs = 4m)	36	120	84
4	Proceed to B 480V Room at RSP, operate transfer sw. & control CRD Pump P-15-1B and bkr 1B2M.	Phase II Action #3	T = 36+1 = 37	5	42	180	138

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to RB 23'-6", align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 42+2 = 44	10 (2m x 3 valves, 4m to monitor = 10m)	54	204	150
4	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 54+6 = 60	15	75	300	225

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

TB-FZ-11D - OFFSITE POWER NOT AVAILABLE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to 4160V SWGR 1D - trip and lockout bkrs D1, D2, D4, D6, D8, D9 to shed load & isolate the 1D bus	Phase I	T = 10+13 = 23 (5m access + 5m SCBA + 3m PPE = 13m)	6 (0.5m per action x 2 actions per bkr x 6 bkr = 6m)	29	45	16
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 29+0 = 29	5	34	45	11

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	CR to DG-FA-17, transfer control of SWGR/EDG-2 to LSP-DG2.	Phase I	T =10+4= 14	10	24	45	21
4	Proceed to CW-FA-14, at LSP-1B3 transfer control of bkr 1B3M and SW Pump P-3-1B.	Phase I	T =24+2 = 26	5	31	45	14
4	At USS-1B3 (same area), locally re-close MCC 1B32 feeder bkr 062C.	Phase I	T = 31+0 = 31	1 (1m x 1 bkr = 1m)	32	45	13
4	Proceed to B 480V Room at RSP, operate transfer sw. & control CRD Pump P-15-1B and bkr 1B2M.	Phase II Action #3	T = 32+ 8 = 40	5	45	180	135
4	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 45+ 2 = 47	10 (2m x 3 valves, 4m to monitor = 10m)	57	204	147
4	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 57+6 = 63	15	78	300	222

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

TB-FZ-11D CONTINGENCY – OFFSITE POWER AVAILABLE BUT ACCESS NOT IMMEDIATELY AVAILABLE TO 4160V AREA DUE TO SMOKE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	**In Control Room (CR)** 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to OB-FZ-8A at RY21 Panels, trip field bkrs for Recirculation Pumps A to E.	Phase II Action #1	T = 10+5 = 15 (2m access to area + 3m for Electrical PPE = 5m)	3 (0.5m x 5 bkrs = 2.5m, use 3m)	18	30	12
3	Proceed to A 480V SWGR to trip CS Booster Pump at USS-1A2 bkrs 036B & 036C and remove fuses.	Phase I	T =18+8 =26 (5m access to area + 3m for PPE = 8m)	4 (2m x 2 bkrs = 4m)	30	120	90
3	Proceed to 4160V SWGR 1D (Turbine Build Mezz), trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 90 (Assume 90m for re-entry. PPE included in 90m)	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	92	120	28
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 92+0 = 92	5	97	180	83
3	Proceed to SWGR 1C, trip and lockout bkrs C0 & C5 to prevent Core Spray Injection.	Phase I	T = 97+1 =98	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	100	120	20

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Proceed to 4160V SWGR 1A & 1B trip and lockout Reactor Feedwater Pumps 1A, 1B & 1C bkrs A8, B2 & B10	Phase I	T = 100+1 = 101	3 (0.5m per action x 2 actions per bkr x 3bkr = 3m)	104	180	76
3	Proceed to CW-FA-14 at LSP-1B3 transfer control of incoming bkr 1B3M	Phase I	T =104+ 5=109	5	114	180	66
3	Same area at USS 1B3, confirm bkr 062C for MCC 1B32 is closed.	Phase I	T =114+0 =114	1 (1m x 1 bkr = 1m)	115	180	65
3	Proceed to OB-FZ-6B at RSP, operate transfer sw. & control CRD Pump P-15-1B and bkr 1B2M.	Phase II Action #3	T = 115+8=123	5	128	180	52
3	Proceed to RB-FZ-1E (EL 23'-6") , align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 128+2 =130	10 (2m x 3 valves, 4m to monitor = 10m)	140	204	64

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	CR to RB-FZ-1E (EL 23'-6") to align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49, V-11-63.	Phase II Action #2	T = 10+ 5 = 15	8 (2m x 4 valves= 8m)	23	45	22
4	Proceed to RB-FZ-1B (EL 95'-3"), Provide Fire Water to IC shell by manually operating valve V-11-36. Subsequently, monitor shell level locally and control level with V-11-36 as needed until CR electrical control is re-established.	Phase II Actions #7 and 8	T = 23+ 6 = 29	5 Subsequently, control level as needed	34	45	11
4	Same area, connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 34+ 0 = 34	15	49	300 min after CR has taken back electrical control of V-11-36 from Operator	251

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

TB-FZ-11D CONTINGENCY – OFFSITE POWER NOT AVAILABLE AND ACCESS NOT IMMEDIATELY AVAILABLE TO 4160V AREA DUE TO SMOKE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	**In Control Room (CR)** 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (EL 23'-6") to align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49, V-11-63.	Phase II Action #2	T = 10+ 5 = 15	8 (2m x 4 valves= 8m)	23	45	22
3	Proceed to RB-FZ-1B (EL 95'-3"), Provide Fire Water to IC shell by manually operating valve V-11-36. Subsequently, monitor shell level locally and control level with V-11-36 as needed until CR electrical control is re-established.	Phase II Actions #7 and 8	T = 23+ 6 = 29	5 Subsequently, control level as needed	34	45	11
3	Same area, connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 34+ 0 = 34	15	49	300 min after CR has taken back electrical control of V-11-36 from Operator	251

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	CR to DG-FA-17, transfer control of SWGR/EDG-2 to LSP-DG2.	Phase I	T =30+4= 34	10	44	180	136
4	Proceed to 4160V SWGR 1D - trip and lockout bkrs D1, D2, D4, D6, D8, D9 to shed load & isolate the 1D bus	Phase I	T = 90 (90m used for re-entry which included obtaining PPE)	6 (0.5m per action x 2 actions per bkr x 6 bkr = 6m)	96	180	84
4	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 96+0 = 96	5	101	180	79
4	Proceed to CW-FA-14, at LSP-1B3, transfer control of bkr 1B3M and SW Pump P-3-1B.	Phase I	T = 101+5 = 106	5	111	180	69
4	At USS-1B3 (same area), locally re-close MCC 1B32 feeder bkr 062C.	Phase I	T = 111+0 = 111	1 (1m x 1 bkr = 1m)	112	180	68
4	Proceed to B 480V Room at RSP, operate transfer sw. & control CRD Pump P-15-1B and bkr 1B2M.	Phase II Action #3	T = 112+ 8 = 120	5	125	180	55

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 125+ 2 = 127	10 (2m x 3 valves, 4m to monitor = 10m)	137	204	67

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone TB-FZ-11E - This fire zone covers the Turbine Building Condenser Bay. The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone.

The manual actions required by the safe shutdown analysis for a fire in this zone vary, depending upon the scenario. Two tables are listed below for operator manual action for Fire Zone TB-FZ-11B. The first table are the actions that are required if offsite power is not lost, while the second table are the actions required if offsite power is lost.

The scenarios can be summarized as follows:

- Offsite power available – actions required to prevent overfill by feedwater or core spray, actions to trip recirc pumps, actions to refill isolation condenser using Condensate Transfer system.
- Offsite power not available – actions required to align diesel generator, actions to refill isolation condenser using Condensate Transfer system.

TB-FZ-11E – OFFSITE POWER AVAILABLE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	CR to 4160V SWGR 1A & 1B (TB-FZ-11C), trip and lockout bkrs A3, A5, A9, B4, & B8 for Recirc Pumps.	Phase I	T = 10+ 8 = 18 (5m access + 3m for Electrical PPE = 8m)	5 (0.5m per action x 2 actions per bkr x 5 bkrs = 5m)	23	30	7
3	At same location 4160V SWGR 1A & 1B, trip and lockout Reactor Feedwater Pumps 1A, 2B & 2C (bkrs A8, B2, & B10)	Phase I	T = 23+0 = 23	3 (0.5m per action x 2 actions per bkr x 3 bkrs = 3m)	26	180	154
3	Proceed to 4160V SWGR 1C, trip and lockout bkrs C0 & C5 to prevent Core Spray Injection.	Phase I	T =26+1 = 27	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	29	120	91
3	Proceed to 4160V SWGR 1D, trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 29+1 = 30	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	32	120	88
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 32+0 = 32	5	37	45	8
3	Proceed to "A" 480V SWGR Room to trip CS Booster Pump at USS-1A2 bkrs 036B & 036C and remove fuses.	Phase I	T = 37+13 = 50 (10m access + 3m for PPE/fuse puller=13m)	4 (2m x 2 bkrs = 4m)	54	120	66

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Proceed to B 480V SWGR Room to RSP, operate transfer sw. & control CRD Pump B and bkr 1B2M to power USS-1B2	Phase II Action #3	T = 54+1 = 55	5	60	180	120
3	Proceed to RB-FZ-1E (EL 23'-6"), and align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T =60+2 = 62	10 (2m x 3 valves, 4m to monitor = 10m)	72	204	132
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 72+6 = 78	15	93	300	207
4	CR to MT-FA-12 (Condensate Xfr Bldg), open breaker at PDP-734-023 to close V-2-90 to isolate CST drain down.	Phase II Action #4	T = 10+5= 15	3	18	30	12
4	Proceed to CW-FA-14, at LSP-1B3 transfer control of incoming bkr 1B3M	Phase I	T = 18+ 4 = 22 (3m frisk + 1m travel = 4m)	5	27	45	18
4	At USS-1B3 (same location), confirm bkr 062C for MCC 1B32 is closed.	Phase I	T = 27+0 = 27	1 (1m x 1 bkr = 1m)	28	45	17

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to MT-FA-12, transfer control of Condensate Transfer Pump at LSP-1B32.	Phase I	T = 28+1 = 29	5	34	45	11
4	In YARD, monitor CST level indicator, LI-424-993.	Phase I	T = 34+1 = 35	2	37	73	36
4	Proceed to MT-FA-12 (Cond Xfr Bldg), close V-9-11 and open V-9-9 & V-11-247 to makeup to CST from firewater (contingency action)	Phase II Action #16	T = 37+1=38	12	50	210	160

TB-FZ-11E – OFFSITE POWER NOT AVAILABLE

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to 4160V SWGR 1D - trip and lockout bkrs D1, D2, D4, D6, D8, D9 to shed load & isolate the 1D bus	Phase I	T = 10+8 = 18 (5m access + 3m PPE= 8m)	6 (0.5m per action x 2 actions per bkr x 6 bkr = 6m)	24	45	21
3	At LSP-1D (same area), transfer control of primary bkrs D5 & D7 for USS-1B2 & 1B3.	Phase I	T = 24+0 = 24	5	29	45	16

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	Proceed to B 480V SWGR Room to RSP, operate transfer sw. & control CRD Pump B and bkr 1B2M to power USS-1B2	Phase II Action #3	T = 29+ 8 = 37	5	42	180	138
3	Proceed to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T =42+2 = 44	10 (2m x 3 valves, 4m to monitor = 10m)	54	204	150
3	Proceed to RB-FZ-1B (EL 95'-3") , connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 54+6 = 60	15	75	300	225
4	CR to DG-FA-17, transfer control of SWGR/EDG-2 to LSP-DG2.	Phase I	T =10+4= 14	10	24	45	21
4	Proceed to CW-FA-14, at LSP-1B3 transfer control of incoming bkr 1B3M	Phase I	T = 24+2 = 26	5	31	45	14
4	At USS-1B3 (same location), confirm bkr 062C for MCC 1B32 is closed.	Phase I	T = 31+0 = 31	1 (1m x 1 bkr = 1m)	32	45	13

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
4	Proceed to MT-FA-12, transfer control of Condensate Transfer Pump at LSP-1B32.	Phase I	T = 32+1 = 33	5	38	45	7
4	In YARD, monitor CST level indicator, LI-424-993.	Phase I	T = 38+1 = 39	2	41	73	32
4	Proceed to MT-FA-12 (Condensate Xfr Bldg), open breaker at PDP-734-023 to close V-2-90 to isolate CST drain down.	Phase II Action #4	T = 41+1= 42	3	45	62 (30m from USS 1B3 bkr 062C being closed: 32 + 30 = 62m)	17
4	At same location, close V-9-11 and open V-9-9 & V-11-247 to makeup to CST from firewater (contingency action)	Phase II Action #16	T = 45+1=46	12	58	210	152

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone TB-FZ-11F - This fire zone covers the Reactor Feedwater Pump Rooms located on elevation 3'-6". The safe shutdown analysis credits using CRD Hydraulic "A" and Isolation Condenser "A" for hot shutdown in the event of fire in these fire zones. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (EL 23'-6"), align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49, V-11-63.	Phase I	T = 10+5 = 15	8 (2m x 4 valves= 8m)	23	45	22
3	Same location, align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 23+ 1 = 24	10 (2mx3 valves, 4m to monitor = 10m)	34	204	170
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 34+6 = 40	15	55	300	245
4	CR to MT-FA-12 (Condensate Xfr. Bldg.) To open breaker to close V-2-90 to isolate CST drain down.	Phase II Action #4	T = 30+5 = 35	3	38	73	35

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone TB-FZ-11G - This fire zone covers the Mezzanine Level Southwest Corner of the Turbine Building. A fire in this area has the potential to impact the Emergency Service Water System II Train A. The safe shutdown analysis credits using CRD Hydraulic "B" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 30+5 = 35	10 (2m x 3 valves, 4m to monitor = 10m)	45	204	159
3	Proceed to RB-FZ-1B, (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 45+6 = 51	15	66	300	234
3	Proceed to SWGR-1D, trip and lockout bkrs D4 & D9 to prevent Core Spray Injection.	Phase I	T = 90 (Post fire OMA for CS Pump trip – have to traverse through fire area -Assume 90m delay for entry. 90m includes obtaining PPE)	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	92	120	28
3	Proceed to SWGR 1C, trip bkr C0 & C5 to prevent Core Spray Injection.	Phase I	T = 92+1 = 93 (Post fire OMA for CS Pump trip.)	2 (0.5m per action x 2 actions per bkr x 2 bkrs = 2m)	95	120	25

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator during the first hour of the fire event; however, based on the limited number of operator manual actions and the time available to execute these actions, the assistances is not deemed necessary. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Zone TB-FZ-11H - This fire zone is the Demineralizer Area and Steam Air Ejector Area on elevations 3'-6" and 23'-6" of the Turbine Building. The safe shutdown analysis credits using CRD Hydraulic "A" and Isolation Condenser "A" for hot shutdown in the event of fire in this fire zone. The safe shutdown analysis credits the following actions being performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E (EL 23'-6") to align firewater valves to Isolation Condenser V-9-2099, V-11-41, V-11-49, V-11-63.	Phase I	T = 10+5 = 15	8 (2m x 4 valves= 8m)	23	45	22
3	Same area, align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 23+1 = 24	10 (2mx3 valves, 4m to monitor = 10m)	34	204	170
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 34+6 = 40	15	55	300	245

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator; however, based on the limited number of operator manual actions and the time available to execute these actions, the assistance is not deemed necessary. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

Fire Area DG-FA-15 - This fire area covers the No. 1 Emergency Diesel Generator Room.
Fire Zone TB-FZ-11A - This fire zone covers the Turbine Operating Floor 46'-6" elevation of the Turbine Building. These areas have been grouped together because they credit the same compliance strategies including operator manual actions. The safe shutdown analysis credits using CRD Hydraulic B and Isolation Condenser A to achieve hot shutdown in the event of fire in these fire areas/zones. The safe shutdown analysis credits the following operator manual actions:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A
3	CR to RB-FZ-1E(EL 23'-6"), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase I	T = 30+5 = 35	10 (2m x 3 valves, 4m to monitor = 10m)	45	204	159
3	Proceed to RB-FZ-1B (EL 95'-3"), connect air cylinder to V-11-36 accumulator to recharge.	Phase II Action #18	T = 45+6 = 51	15	66	300	234

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator; however, based on the limited number of operator manual actions and the time available to execute these actions, the assistance is not deemed necessary. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

YARD Area – This area was analyzed to address three general locations; the Office Building Roof, Turbine Building Roof, and all the remaining outside areas within the protected area not analyzed under existing fire areas / zones. The safe shutdown analysis credits using CRD Hydraulic A or B and Isolation Condenser B or EMRV/Core Spray depending upon where the fire is located to achieve hot shutdown in the event of fire in these yard locations. For conservatism, the operator manual actions for all the YARD areas are concurrently performed:

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
1, 2, 3, 4	In Control Room (CR) 2- CR OPs 2- Field OPs	N/A	N/A	N/A	N/A	N/A	N/A

OP 1-4	OMA Description & Location	Exemption Status / Action #	Walkdown Time (Min)	Time to Execute (Min)	Total Time (Min)	Allowable Time Limit (Min)	Margin Available (Min)
3	CR to RB-FZ-1E (via Office Bldg), align CRD valves V-15-30, V-15-52, V-15-237 and monitor flow locally (FI-225-2).	Phase II Action #9	T = 30+5 = 35	10 (2 x 3 valves, 4m to monitor = 10m)	45	204	159
3	Proceed to RB-FZ-1B EL 95'-3", connect air cylinder to V-11-34 accumulator to recharge.	Phase II Action #17	T = 45+6 = 51	15	66	300	234

There are two equipment operators available to perform operator manual actions and two operators stationed in the Control Room. The fourth operator could assist the third operator; however, based on the limited number of operator manual actions and the time available to execute these actions, the assistance is not deemed necessary. Each action has time margin available. The operator manual actions can be successfully executed in accordance with sequences and staffing credited in the safe shutdown analysis timelines.

C. REVIEW OF OPERATOR MANUAL ACTIONS AGAINST NUREG-1852

NUREG-1852 was used to provide guidance in reviewing the attributes of feasibility and reliability for each of the operator manual actions. NUREG-1852 noted that there would be some operator manual actions that may be considered "straightforward." The operator manual actions that can be considered straightforward will not require the same level of analysis as those that may be considered more complex. This point is made several times in the NUREG with statements such as: "However, not all of the criteria will usually require significant analysis or even be applicable, particularly for the simpler and more straightforward tasks." While the term "straightforward" was not specifically defined in the guidance documents, adequate information was provided to assist a licensee in determining which operator manual actions are straightforward and which operator manual actions are complex.

Many of the operator manual actions that are addressed by this exemption request may be considered straightforward. These operator manual actions are simple to perform, are actions that operators routinely perform as part of their normal work activities, and have sufficient time available to perform the activity. Most of the operator manual actions are performed in the switchgear rooms, general areas of the Reactor Building, or external buildings/yard area. These areas are areas in which operators routinely perform similar activities.

The feasibility and reliability of the OCNGS operator manual actions are addressed below considering the criteria in NUREG-1852.

1. Adequate Time Available to Perform the Action (Feasibility)

NUREG-1852 identifies the following four segments of time associated with an operator manual action (Note: Item Nos. 2 and 3 are combined in the information provided below):

1) The time to diagnose the need for the action and dispatch an operator(s) to perform the action,
2) Travel time to the location where the action is to be performed,
3) Time to perform the action, and
4) Time to verify the action has been successful and achieved the desired results.

Each of these time segments is addressed in the discussion below.

Diagnosis

At OCNGS, safe shutdown Fire Support Procedures (FSPs) have been developed for each fire area identified in the OCNGS Fire Hazards Analysis Report (FHAR). The FSPs for individual fire areas are used in conjunction with the Boiling Water Reactor (BWR) symptom-based Emergency Operating Procedures (EOPs) to provide a symptom-based approach to achieving safe shutdown following a fire. The symptom-based approach to shutdown is incorporated into the EOP procedures and involves the use of a flow chart of actions to chart the expected plant conditions and plant responses. The individual FSPs provide the operators with information as to the available equipment (including instrumentation) that can be relied upon following a fire. The fire area specific FSPs provide guidance to the operators as to what instrumentation and equipment could be affected by the fire. The FSPs will focus the operators on monitoring the conditions of the equipment identified in the FSPs as having the potential to be affected by a fire in that area. Because the operator remains within the symptom-based EOP procedure framework, the operator retains the ability to use any mitigating system that is unaffected by the fire.

Fires in the initiating fire areas of the manual actions addressed by this exemption request have no immediate impact on the Control Room environment. A fire in the Yard area may impact Control Room temperature after a number of hours into the event due to loss of ventilation, but there are no smoke or environmental challenges that will occur in the Control Room during the initial diagnostic phase of the event. As a result, Control Room habitability will not adversely impact the diagnosis time following a plant shutdown; therefore, the Control Room operators can focus attention on plant conditions and implementing the FSPs.

Each of the safe shutdown calculations that provide the technical basis for the FSPs contains a timeline for operator actions for the specific fire area. This timeline assumes that all potential fire damage identified for that fire area occurs instantaneously at the point of plant shutdown. The safe shutdown calculation timeline considers a generic 10 or 30-minute diagnosis time (depending upon whether the action is prompt or not) to assess the need for operator actions. Any prompt actions (i.e., those that must be done within 45 minutes or less) identified for a specific fire area are prescribed at the front of the applicable FSP. With the prompt action identified at the beginning of the FSP, the operators are trained to perform prompt actions first and prioritize them based upon existing plant conditions. Once the initial diagnosis period has elapsed, and the first operator actions are performed, there is no need to explicitly track additional diagnosis time, since the Control Room staff will be in a state of continual diagnosis in parallel with the safe shutdown operators performing their actions in the field. Additional information on diagnosis times is provided in the section that addresses demonstrations.

Procedural direction in ABN-29, "Plant Fires," requires that the FSPs be entered as soon as the existence of a fire is confirmed, and the FSPs are performed concurrently with any other procedure (such as the EOPs). Thus, the Control Room will be in a position to dispatch operators to perform contingency actions in the FSP earlier in the event than the 10 and 30-minute diagnostic times shown and may be able to anticipate the potential for the contingency actions before the postulated fire damage were to occur. There are several actions described within this exemption request that are to be completed within 45 minutes (prompt actions); ABN-29 contains an attachment listing the FSPs that contain prompt actions.

In the event of a fire, a plant page is provided dispatching the fire brigade, which is composed of plant operators and maintenance personnel. Therefore, in the event of a fire, the operators assigned safe shutdown responsibilities (which are separate from those operators assigned to the fire brigade) would be immediately aware of the fire. The fire brigade leader is instructed to provide key information on the fire (e.g., location of the fire, fire size, equipment involved, etc.) over the operations radio. The safe shutdown operators will be fully aware of the fire location and conditions and they will assemble in the Control Room or where instructed by the Control Room operators. They will be ready to initiate operator manual actions very close to the start of the event.

Travel and Action Time

The travel time and action time for each of the manual actions (performance of individual task only) addressed by this exemption request are provided in Attachment 2. These times are based on the fire safe shutdown calculations that were validated by walkdowns of a selected number of the actions. Since many of the actions are similar in nature, the selected number of actions were chosen to envelope the remaining actions. As noted above, the operator manual actions are within the skill of the craft and are similar to activities performed during normal work activities. The majority of the operator manual actions addressed by this exemption request occur in areas less than five minutes from the Control Room with the remaining actions being within approximately 10 minutes from the Control Room.

Confirmation Time

For all of the operator manual actions addressed by this exemption request, confirmation of the action's success is self-evident to the operator in the field, or directly in the Control Room. If an Appendix R fire occurred that caused the loss of offsite power or the loss of the RPV level makeup source, the operators would stabilize and maintain pressure using the Isolation Condensers until equipment was restored. In some cases, this would be apparent to the Control Room (e.g., restoration of power, etc.). Many of the actions involve the tripping of spuriously actuated equipment that cannot be tripped from the Control Room due to control circuit damage. In cases where confirmation is required from the operator in the field to the Control Room, additional time has been added to the estimated time to perform the operator manual action. The communication between the field operator and the Control Room could be achieved using radios or the operator could report directly back to the Control Room for the less time critical actions.

Based on the margin available as demonstrated in the combined operator manual action tables above in Section III.B, there is sufficient margin to meet the allotted time assumed in the safe shutdown calculations. This time margin has also been verified in the demonstrations that are discussed later in this section of the exemption request.

2. Adequate Time Available to Ensure Reliability

There are several sources of conservatism built into the time analysis for the manual actions. First, the fire safe shutdown calculation for each fire area identifies all the potential instruments and equipment that could fail as a result of the fire in that specific fire area. The FSPs have captured the worst-case loss considerations by assuming all fire damage occurs instantaneously and thus all operator manual actions will be required. However, in a real fire event, it is not credible that all the potential fire damage will occur instantaneously. The use of the EOPs in conjunction with the applicable FSPs will permit the use of any mitigating system available first, and if a desired system is not available, the FSP provides a contingency action to restore the system or provide another means to perform the function. The initiating fire zones with the least amount of time margin are the Turbine Building fire zones (TB-FZ-11B, 11C, 11D & 11E) and the A/B Battery Room fire zone (OB-FZ-8C). These fire zones have fire suppression on the significant combustible hazards in the area as described in the OCNGS FHAR. Furthermore, the Turbine Building fire zones are large areas, which supports the conclusion that it is not credible that all potential fire damage will occur instantaneously.

A second source of conservatism is the assumption of a 30-minute generic diagnostic time, except when there is a prompt action; for prompt actions, 10 minutes is utilized. The Control Room operators will know a fire condition exists from the onset of the event. They will also be aware of the location and size of the fire based on reports from the fire brigade. Procedural direction in ABN-29, "Plant Fires," requires that the FSPs be entered when the existence of a fire is confirmed. Thus, the Control Room will be in a position to closely monitor for the malfunctions discussed in the FSPs and dispatch operators to perform contingency actions in the FSPs earlier in the event than 30 minutes, and may be able to anticipate the potential for the contingency actions before the postulated fire damage were to occur. The conservatisms factored into this generic diagnostic approach to the operator manual actions used at OCNGS provides a level of additional margin.

A third source of conservatism is that the times documented in the safe shutdown calculations are more conservative than the equipment operator validation times. Two different crews were utilized for the validation times and the times for each crew were generally close to each other, and were less than the times specified in the safe shutdown calculations.

Finally, the assumption that all the required fire actions would have to be performed concurrently is not representative of conditions anticipated in real fire conditions. The Individual Plant Evaluation of External Events (IPEEE) for fire and a subsequent fire PRA performed for OCNGS found that, in most cases, the in-situ hazards within the fire area would not create a fire event of a magnitude sufficient to damage cables or equipment to require any operator manual actions. Also, CAROLFIRE (Reference 10) and NEI/EPRI fire testing (Reference 11) showed that spurious actuations do not occur immediately in a fire event. CAROLFIRE stated that there are many variables such as the relative location of various cables relative to the fire source, the routing configuration (e.g., open cable trays or air drops versus conduits), the thermal robustness of the cable insulation material, and the characteristics of the fire source. Cable trays in most locations in the Turbine and Reactor Buildings at OCNGS are approximately 10 feet off of the ground (except for the vertical cable trays), which will provide some additional time until the fire affects these cable trays. Also, the majority of the cable trays are protected by a suppression system in the affected fire areas.

Uncertainties in performance of operator manual actions in a real fire event such as unanticipated environmental conditions (e.g., inclement weather), human performance issues (e.g., emotional

response to the event, cognitive differences) and equipment issues (e.g., locked doors, stiff valve hand wheels) can occur. Forseeable impediments such as smoke, heat, and dose have been addressed, as discussed below in Section III.C.3. The additional time to perform the actions in the event that uncertainties are encountered are enveloped by the combination of the time available to perform most of the actions as described in the individual action summaries in Attachment 2 and in the conservatisms built into the Appendix R analysis as described above.

Based on the conservatisms discussed above, there is sufficient margin to meet the allotted time assumed in the safe shutdown calculations. This time margin has also been verified in the demonstrations that are discussed later in this section of the exemption request.

3. Environmental Factors

This section will evaluate the environmental conditions that the operators may encounter while traveling to the area where the manual action will be performed and within the area the manual action will take place. Specific environmental factors that could impact the ability of the operators to successfully perform the manual actions are considered in this section.

Radiological Exposure
None of the manual actions require operators to enter areas that have radiation levels so high that access would be prohibited. This includes both at power and post shutdown conditions. It is not postulated that operators would be subjected to radiation doses close to the 10 CFR 20 limits. Most of the actions are located in outdoor areas, electrical equipment rooms (e.g., Switchgear Room, Battery Room, etc.) or general areas of the plant (Reactor Building) where the anticipated dose rates are less than 5 millirem per hour. The only areas that could potentially increase in dose are the Reactor Building 75' and 95' elevations around the Isolation Condensers and associated equipment. Radiation monitoring has been performed with the Isolation Condensers in service. It was noted that changes in the radiation levels with the Isolation Condensers in service would not prevent the ability of the operators to perform the actions in that area.

Emergency Lighting
Each of the operator manual actions addressed by this exemption request is provided with emergency lighting that is in the area where the manual action is performed and in the access / egress route to the manual action location. Manual operation of safe shutdown equipment after eight hours does not require emergency lighting support in accordance with Appendix R, Section III.J. There are periodic tests that ensure that the lights are operating properly and that the lights are properly aimed.

Plant Environmental Conditions
The Switchgear Rooms ("A" and "B" 480V rooms), Diesel Generator Building, MG Set Room, Yard area, Condensate Transfer Building, Turbine Building stairway area and Reactor Building 23'-6", 75' and 95' elevations are the areas in which the operator manual actions addressed by this exemption request are performed. Each of these areas are entered by plant operators as part of their regular job activities, so these areas are familiar to plant operators that would be assigned to perform the operator manual actions. The familiarity with the rooms and areas will reduce anxiety that an operator may have performing operator manual actions under stressful conditions.

The Switchgear Room and MG Set Room temperatures are maintained within a certain range while the plant is operating. Room conditions will not undergo a significant change in the time following shutdown to when the actions must be performed. Temperature and humidity conditions in these

rooms will not challenge the operators performing the operator manual actions. The Diesel Generator Building and Condensate Transfer Building are exterior structures that are exposed to outside temperature and humidity conditions during the warmer months of the year, which would not prevent the operators from performing the manual actions in these areas. For the colder months, heat is provided in the areas where the manual actions are performed. This is also true for the Yard area for the warmer months of the year. For periods of inclement weather in the Yard area, capability of performing the manual action required in this area (Action #15 in the Attachment 2 Table) is addressed in Section III.C.2 above. The Turbine Building stairway area and Reactor Building 23'-6" elevation general area are not directly exposed to any high temperature equipment or steam lines (the main steam lines pass through the steam tunnel which is separated with a heavy concrete barrier). The temperature and humidity conditions in these areas will not significantly change following a plant trip. The Reactor Building 75' and 95' elevations may see a slight temperature increase during shutdown due to Isolation Condenser operation. However, the temperatures in these areas are not expected to present any challenge to the operator manual actions being performed. The manual actions that are being performed are short in duration and intermittent, and are considered moderately strenuous. Therefore, the operator will be able to complete the actions as described.

Fire Effects

This environmental condition considers if the operators will encounter fire effects enroute to the location where the action is to be performed or at the location where the action is to be performed. To determine the fire effects, the initiating fire area spatial and ventilation relationship with the action and access locations were considered. Fire effects related to this exemption request could be placed into specific categories as described below.

Separate Buildings. The initiating fire area and the action fire area are located in separate buildings. These are cases of physically separate buildings. A fire in one building would not affect the other building. There would be no impact to operators performing actions in the other building. Actions within this category need no further explanation.

Separate Fire Areas and Separate Ventilation Systems. The initiating fire area and the action fire area are separate fire areas with separate ventilation systems. The access route goes through fire areas separate from the initiating fire area. There would be no impact to operators performing actions in separate fire areas with separate ventilation systems. Actions within this category need no further explanation.

The fire effects on the manual actions stipulated in Attachment 2 are as follows:

1) Seven of the manual actions (Actions 1 through 3, 5, 6, 7, and 8 from the Attachment 2 Table) are either located in the Diesel Generator Building, Office Building or Reactor Building area and the initiating fires occur in the Turbine Building, which is a separate building from where the manual actions occur and access/egress will not be affected.

2) Two of the manual actions (Actions 9 and 18 from the Attachment 2 Table) are in the Reactor Building and the initiating fire occurs either in the Yard Area, Diesel Generator Building, Office Building or Turbine Building, which is a separate area from where the manual actions occur and access/egress will not be affected.

3) Two of the manual actions (Actions 4 and 16 from the Attachment 2 Table) occur in the Condensate Transfer Building (exterior building) and the initiating fires occur in the Turbine

Building or Office Building, which is a separate building from where the manual actions occur and access/egress will not be affected.

4) One of the manual actions (Action 17 from the Attachment 2 Table) is in a separate fire zone in the Reactor Building from the initiating fire zones that share the same ventilation system. However, the exhaust from these zones goes directly to the plant stack and does not recirculate in the affected fire zones. Note that there are other initiating fire locations for this action but they are all located in separate buildings and no further discussion is required to address this action. There are 300 minutes provided in the safe shutdown calculation between the start of the event and when this manual action has to occur. Therefore, the fire will be extinguished and the smoke vented from the area long before the action needs to be performed. In addition, the Reactor Building has a significant volume with high ceilings and open equipment hatches and stairwells. This will provide an advantage for the types of fires that are anticipated in this area. There will be significant dilution of smoke and self-venting to the refuel floor (Reactor Building 119' elevation), which has no manual actions and also contains an automatic wet pipe sprinkler system. Additionally, for the openings between the 23'-6" to 51' elevations and 51' to 75' elevations, a water curtain is available (automatic or manual operation), which provides reasonable assurance that any postulated fire will be extinguished, but will also help with cooling and general improvement of overall environmental conditions. The operators will not need an SCBA to perform this action and the action can be performed within the allotted time.

5) One of the manual actions (Action 13 from the Attachment 2 Table) is in a separate fire zone in the Reactor Building from the initiating fire zones that share the same ventilation system. However, the exhaust from these zones goes directly to the plant stack and does not recirculate in the affected fire zones. Also, the manual action occurs in the Reactor Building 23'-6" elevation while the initiating fire is in the Reactor Building corner room at –19' elevation. This corner room is actually located below the 480V Switchgear Room and access is from the Turbine Building. There are rated barriers between where the fire initiated and where the operator manual action is performed. Also, there are 204 minutes between the start of the event and when the manual action has to occur. Therefore, if smoke does get into this area, the fire will be extinguished and the smoke vented from the area long before the manual action needs to be performed. The operators will not need an SCBA to perform this manual action and the manual action can be performed within the allotted time.

6) One of the manual actions (Action 11 from the Attachment 2 Table) is in the Office Building and the initiating fire occurs in the Reactor Building, which is a separate area from where the manual action occurs and access/egress will not be affected.

7) One of the manual actions (Action 14 from the Attachment 2 Table) occurs in the "B" 480V Switchgear Room (Office Building fire zone OB-FZ-6B) and the initiating fire occurs in the Office Building (OB-FZ-10A), which is a separate fire zone from where the manual action occurs and access/egress will not be affected utilizing an alternate route to the manual action location. This manual action is in the adjacent Office Building fire zone (OB-FZ-6B) one elevation below where the fire is located; however, there are rated barriers separating the zones. As a result, there should be no issue with smoke or heat due to the rated barriers and the fact that any smoke or heat generated from the fire will rise away from this zone. Also, the ventilation systems are independent of each other; therefore, smoke cannot be transferred through the ventilation system.

8) One of the manual actions (Action 15 from the Attachment 2 Table) is in the Turbine Building stairway area (TB-FZ-11B) and yard area while the initiating fire occurs in the "B" 480V Switchgear Room (Office Building fire zone OB-FZ-6B), which is a separate zone with a separate ventilation system from where the manual actions occur. These two fire zones are adjacent to each other, but there are rated barriers between them (OB-FZ-6B corridor west wall and TB-FZ-11B stairwell east wall). The corridor of OB-FZ-6B is separated from the main part of the "B" 480V switchgear room by a non-rated sealed block wall and door that are similar in construction to a rated wall. The main part of the room is protected by halon so it is not expected that the fire will traverse into the corridor area due to the suppression system containing the fire to the main part of the room (refer to SER dated March 24, 1986 (Reference 7)), and due to the fact that there is very minimal combustible loading in this corridor. In addition, access/egress will not be affected. Thus, there is reasonable assurance that smoke will not impede the operator from performing the operator manual action.

9) One of the manual actions (Action 10 from the Attachment 2 Table) may require the use of an SCBA to access the "B" 480V Switchgear Room to trip a breaker and remove its close fuse. The barriers between the two fire zones are rated and they both have their own ventilation system but fire-fighting activities may allow smoke to enter this area. The SCBA is staged in the corridor in this area and operators are trained on the use of SCBA. It is not expected that a large amount of smoke will be in this area because the initiating area is protected by halon and the fire brigade is trained to allow a 20-minute soak time before entering. If the first discharge did not work, then a second discharge of halon will be initiated. Also, if power were lost to USS 1B2, as is postulated for this initiating fire zone, then this action would not be required. In addition, the five fire brigade members would be in the area to assist since they would be in standby while the halon was soaking. Furthermore, there is no upper limit on the time to perform this manual action since this action supports cold shutdown; however, 60 minutes has been allotted for analysis purposes to trip this breaker and remove the fuse. The actions can be performed after the fire has been extinguished and that area ventilated.

10) One of the manual actions (Action 12 from the Attachment 2 Table) may require the use of an SCBA to access the Reactor Building 75' elevation. The initiating fire is at Reactor Building 51' elevation and there is an open equipment hatch between the elevations. The action needs to be completed in 66 minutes. The Reactor Building has a significant volume with high ceilings and open equipment hatches and stairwells. This provides an advantage for the types of fires that are anticipated in this area, and there will be significant dilution of smoke and self-venting to the refuel floor (Reactor 119' elevation), which has no manual actions and also contains an automatic wet pipe sprinkler system. Additionally for the openings between the 51' to 75' elevations, a water curtain is available (automatic or manual operation), which will provide reasonable assurance that fire spread to this elevation will be prevented (refer to SER dated March 24, 1986 (Reference 7)), and will also help with cooling and general improvement of overall environmental conditions. The SCBA is staged enroute to this area and the operators are all trained on the use of SCBA.

The potential impact of smoke on the ability to perform the operator manual actions is addressed for each manual action as described above. For this exemption, none of the operator manual actions require re-entry into the initiating fire area to perform the operator manual actions. Based on the discussion above, heat from the fire should not impact the operator performing the operator manual

actions. In most cases, the initiating fire area and manual action location fire area are in separate buildings and/or have separate ventilation systems. The potential for smoke to impede the operator performing the operator manual actions is not expected due to the configuration of the plant (large volumes with openings to the top elevation), time that the manual action needs to be performed and/or due to the installed suppression systems. However, in areas where smoke may be present, SCBA is available to perform the operator manual action. The safe shutdown operators are trained and qualified in the use of SCBAs and are familiar with all the locations where SCBAs are staged.

Other than smoke, carbon dioxide (CO2) is the other toxic gas that could present a hazard within the power block. OCNGS only has CO2 fire suppression systems installed in the Turbine Building 4160V Switchgear Rooms, TB-FA-3A and 3B (manual actuation) and in the generator exciter, TB-FZ-11A (automatic actuation). For this exemption request, only one of the manual actions (Action #15 on Attachment 2) is in the Turbine Building stairway area and it is located in the northeast corner at 23'-6" elevation of the building while the CO2 systems are installed in the southwest corner of the Turbine Building at elevations 23'-6" and 46'-6". Due to the large separation and the fact that the Condenser Bay is located between these areas, CO2 will not have any affect on performing the operator manual actions that are addressed by this exemption request.

4. Equipment Functionality and Accessibility

The equipment to be operated as part of the operator manual actions will be free of fire damage and will be accessible to the operators performing the action. The safe shutdown analysis considers fire effects on the components and cables in the area under consideration. The analysis identified those components that will be free of fire effects and will be available. The safe shutdown analysis is available onsite for review; therefore, the information in the analysis is not repeated here. The components to be manipulated for operator manual actions will be available for a fire in the area under consideration.

As identified in the section above, regarding Environmental Factors, all operator manual actions addressed in this exemption request are performed in separate fire zones from the initiating fire area (no re-entry required). Conditions in the areas where the manual actions are to be performed will remain acceptable for the operator performing the actions. Access to the Switchgear Rooms is via vital area (card reader) doors. In the unlikely event that the card reader is not operating, these doors can be opened with keys if necessary. Keys to access these rooms are available in the Control Room. The access routes between the Control Room and each of the areas where operator manual actions are to be performed are well known to the operators since these areas are accessed as part of their regular job tasks. The operators also know alternate paths to these areas since their work involves frequent travel throughout the plant. The time available to travel to the area and perform the task as discussed in Attachment 2 demonstrates that there is adequate margin to compensate for unanticipated challenges.

The physical location of the components where operator manual actions are to be performed is readily accessible to the operator performing the action. All operator manual action locations are accessible from the floor or with a step ladder that has been staged for use by the operator. None of the operator manual actions are required to be performed in overhead areas, none require climbing across plant equipment, and all can be safely accessed by the operator.

5. Available Indications

The FSPs provide the operators with specific instructions in the event of a fire in a specific fire area. The FSPs for each fire area/zone provide a list of the key protected (credited) equipment available for a fire in that area. Therefore, the diagnostic instruments that are available are listed at the beginning of each FSP along with actions to restore needed instruments that may be disabled by the fire. For hot shutdown using the Isolation Condenser, this list includes RPV coolant level, RPV pressure, condensate storage tank water level and certain system process monitoring instruments. For hot shutdown using Electromatic Relief Valves (EMRVs) and Core Spray, this list includes RPV coolant level, RPV pressure, torus water level, torus water temperature and certain system process monitoring instruments. These indications are consistent with the guidance in Generic Letter 81-12, "Fire Protection Rule (45 FR 76602, November 19, 1980)," and Information Notice 84-09, "Lessons Learned from NRC Inspections of Fire Protection Safe Shutdown Systems (10 CFR 50, Appendix R)." If there are any "prompt" actions that are needed to restore an instrument for a fire in that area (i.e., those that need to be performed within 45 minutes), the applicable FSP lists the "prompt" actions at the beginning of the document.

6. Communications

OCNGS credits the use of portable radios during an Appendix R event. Two-way voice communications is available between the Control Room, Remote / Local Shutdown Panels and at manual action locations. The communication system is provided with three trains of repeaters located in different plant areas. The three repeaters are provided with (individual) battery backups sized to support the repeaters for at least three hours (main repeater battery good for up to eight hours), which is sufficient to ensure the completion of the time-critical operator actions. Line-of-sight radio communication ("talk-around") and face-to-face communication are also available. This system has been analyzed to demonstrate that one train is free of fire damage for all postulated fire scenarios. Most of the manual actions are simple in nature and do not require constant interface with the Control Room while performing the action; however, the radios are available if necessary. Upon completion of the action, the operator can report directly back to the Control Room, if necessary, or use the radio. Routine surveillances are performed to ensure that the radios function properly at various locations in the plant.

7. Portable Equipment

In order to perform the operator manual actions, tools and equipment may be required. The majority of the keys required for accessing or operating equipment for post-fire safe shutdown are provided on separate fire safe shutdown (FSSD) key rings that are provided to the FSSD Operators. Where other keys, tools or special equipment are required to perform an operator manual action, the FSP states what equipment is needed and where the tools, keys or equipment can be obtained. Equipment, tools and keys staged for the operator manual actions have been walked down as part of the validation effort to ensure equipment availability for a fire event. The operators responsible for performing the manual actions are familiar with the location of the tools and equipment storage areas.

8. Personal Protective Equipment

Operators performing the manual actions are provided with standard personal protective equipment (PPE) such as a hard hat, safety glasses, hearing protection, gloves, etc. The only actions requiring additional PPE are those isolating electrical breakers. Electrical PPE is available in a

cabinet located in the MG Set Room and in the 480V Switchgear Room corridor. In the event that smoke conditions would require SCBAs to be worn, the safe shutdown operators are qualified to wear SCBAs. SCBAs are stored in various locations, including the fire brigade equipment locker room (near the Control Room) and outside the 480V Switchgear Room in the corridor area. FSPs indicate the location of these storage areas if the action may require an SCBA.

9. Procedures and Training

The operator manual actions addressed by this exemption request are similar to activities performed by plant operators as part of normal work assignments. In addition, the operator manual actions addressed by this exemption request are similar to those performed for the Control Room evacuation shutdown procedure. Since these actions are similar to those performed as part of a typical work activity, these can be considered straightforward and training and demonstration demands are minimal. The physical actions addressed by this exemption request can be summarized as follows:

a) Opening (tripping) and closing breakers. Manipulation of electrical breakers is considered a skill required by plant equipment operators, which is performed during normal work functions. Breakers are manipulated at the direction of the Control Room during normal plant operation. Breakers are also manipulated as part of applying clearances for safe work boundaries.
b) Removing (pulling) individual fuses is considered a required skill performed by plant equipment operators during normal work functions. Fuses are pulled while applying clearances to establish safe work boundaries.
c) Operating isolation/control switches are considered required skills by plant equipment operators that are performed during normal work functions. This is such a basic activity and performed so frequently, that very minimal training is needed.
d) Opening mechanical valves is considered to be a required skill by plant equipment operators. Operation of these components is performed during normal work functions and is a common part of many work activities.
e) Staging portable ventilation equipment is considered a required skill performed by plant equipment operators during normal work functions. Portable equipment is staged in the required area and ample time is available to install this equipment.
f) Connecting an air cylinder to the drain port of an accumulator is a simple activity, which involves the use of a quick-connect plug-in connection device.
g) Monitoring a local gauge is considered a required skill performed by plant equipment operators during normal work functions.

Each of the manual actions consists of one or more of the actions described above.

The FSPs provide safe shutdown direction for fires in specific fire areas. These FSPs were written using a consistent format and were modeled after the EOP support procedures. Each FSP includes a section that lists the equipment that is credited to safely shut down and any manual actions that may be required for that credited equipment. The individual steps describe the purpose of the action, equipment needed, and a step-by-step process to perform the action, including room and panel or valve locations. Most actions have a significant time available to perform, and thus are performed on a symptomatic basis, with the Control Room determining the priority and sequencing of actions based on actual plant conditions. For one action, the time available is shorter; therefore, to ensure a high reliability, the FSPs direct an operator to be dispatched to the manual action location. This equipment operator is directed to "stand by" at the manual action location, so that the

action can be performed when directed by the Control Room. If there are any "prompt" actions that are needed to restore equipment for a fire in that area (i.e., those that need to be performed within 45 minutes), the applicable FSP lists the "prompt" actions at the beginning of the document.

In addition to the FSPs, there is ABN-29 that specifies the required actions in response to a fire. There are also response to alarm procedures (RAPs) to provide instructions on responding to plant alarms, including fire alarms. Each fire area has a pre-fire strategy plan that is used by the fire brigade to facilitate fire fighting in the area. If fire conditions warrant a unit shutdown, then the FSPs will be used in conjunction with the EOPs. The EOPs are a symptom-based approach that is used for all transients including fire that the operators repeatedly use in training.

Licensed and non-licensed operators are trained biennially on the FSPs. The operators have the ability to transition from ABN-29 to the required FSP for the specific fire area.

10. Staffing

There are five personnel (operators and maintenance personnel) assigned fire brigade duty and four operators assigned as safe shutdown operators for each shift. The four operators assigned as safe shutdown operators are not assigned fire brigade responsibilities and two of them will be responsible for performing the operator manual actions while the other two operators remain in the Control Room. Time estimates have been performed for all the actions contained in this exemption request, as well as other actions for which an exemption is not being requested at this time. These time estimates are maintained within the individual fire safe shutdown analysis calculations for each fire area/zone, and have been reviewed on several occasions by the NRC as part of triennial inspections. These time estimates show that the available operators can complete all of the manual actions.

A fire of the magnitude that would require plant shutdown will likely result in the declaration of an Emergency Action Level condition and activation of the Emergency Response Organization. Entry into the Emergency Plan would bring additional resources to the plant. Credit for the additional personnel that would respond to the plant as a result of the emergency declaration is not being taken for staffing purposes. However, from a practical standpoint additional personnel can be expected to help with shutdown activities following the emergency declaration.

11. Demonstrations

Demonstrations can provide a "test" to show that the operator manual actions can be performed within the times allotted by the fire safe shutdown calculations. Demonstrations can show reliability by achieving similar results when the operator manual actions are performed by different crews and at different times. OCNGS has developed two simulator scenarios for use in Licensed Operator Training that have been used to exercise the FSPs and demonstrate the capability of the Shift Operators to diagnose and perform the critical manual actions required. The two that were selected are considered to be two of the most challenging initiating fire areas; the Turbine Building Basement and the A/B Battery Room. The Turbine Basement Area (TB-FZ-11D) and A/B Battery Room (OB-FZ-8C) were both selected since they include manual actions that are prompt actions in other fire areas (common operator manual action for multiple fire areas/zones), and include a number of common operator manual actions to perform within the first 45 minutes.

For the purposes of the demonstrations, communication from the simulator to the "field" was actually made to the simulator controllers. The simulator controllers provided confirmation that a

manual action had been completed using the safe shutdown calculation times to complete the actions. Subsequently, two crews of plant safe shutdown operators simulated performing the tasks in the field. Actual diagnostic times from the two demonstrations were used as the start times for the operator walkdown and action times rather than the generic 30-minute diagnostic time discussed under Section III.B and Attachment 2. Also, actual equipment operator walkdown and action times were used rather than the safe shutdown calculation times. The Control Room (where the operators are assumed to assemble during a fire event) was utilized as the starting point for the event. The equipment operator break area was also considered as a starting point; however, the break area is in close proximity to the Control Room. As a result, there was very little difference between the two starting points. Subsequent actions were performed in a sequential order as directed by the Control Room to minimize repeated transitions to and from the Control Room. The time included obtaining copies of the procedures and, in some cases, actually opening the required cabinets (not just simulating opening of the cabinets), if possible.

Each scenario simulates a fire in a critical plant area that results in the need to perform most of the time-critical manual actions included in this exemption request. The times developed from these scenarios are combined with the actual walkdown times as indicated above to generate the total demonstrated times that are documented in this request.

The action points that are included in the demonstration discussions include:

- Point in scenario where the manual action will be required (e.g., Trip of Recirculation Pumps not required until after Reactor Scram).
- Diagnostic Time – This is the time that the Control Room Operator takes to realize that a required action cannot be performed from the Control Room and must be completed by an outside operator.
- Walkdown Performance Time – This is the time required to travel to the location of the manual action, which includes obtaining portable equipment, PPE, etc., and perform the manual action outside the Control Room as demonstrated by actual walkdowns
- Total Performance Time – The sum of Diagnostic Time & Walkdown Performance Time.
- Calculation Specified Time – This is the time documented in the fire safe shutdown calculation that provides the basis for the time limits for the manual actions.
- Time Margin - This is the actual time margin based on actual walkdown data.

A) SCENARIO 1 – FIRE IN THE A/B BATTERY ROOM (FIRE ZONE OB-FZ-8C)

This scenario demonstrates the Plant response to a fire in the A/B Battery Room. The fire progresses such that all important equipment in the room is impacted over a 10-minute period. The scenario results in a loss of the 'A' and 'B' DC buses and batteries, and a loss of the Rotary Inverter that supplies normal power to instrument panel CIP-3. This causes a closure of the MSIVs, Reactor Scram and Main Generator trip. It also leads to a loss of Division II of the Electrical Plant (4kV Buses 1B & 1D and all attached loads).

The manual actions demonstrated by this scenario include the following and were evaluated using multiple shifts of plant operators:

- Remote tripping of the Recirculation Pumps at 4160V Switchgear
- Transfer of control to LSP-1A2 for use of 'A' CRD Pump
- Lineup of CRD on Reactor Building 23'-6" elevation to inject via the Bypass Line

- Makeup to 'B' Isolation Condenser to maintain shell water level
- Trip of spuriously started Core Spray Pumps when not required
- Closure of V-2-90 to prevent drain down of the Condensate Storage Tank (CST)
- Recharge of the air accumulator for the Isolation Condenser Shell Makeup Valve

The results for each of the manual actions demonstrated by this scenario are discussed below.

1) Remote Tripping of the Recirculation Pumps

Point Required – Reactor Scram

Diagnostic Time – 6 minutes (avg); 10 minutes (longest)

Walkdown Performance Time – 6.6 minutes (longest)

Total Performance Time (Diagnostic + Walkdown) – 17 minutes (Maximum)

Calculation Specified Time – 30 minutes

Time Margin – 13 minutes

Demonstration Successful – **Yes**

Basis
Tripping of the Recirculation Pumps is required to restore accurate RPV level indication using the Fuel Zone Level Instruments in the event that RPV level decreases below 90" above the top of active fuel (TAF), or capability to use all other RPV level instruments is lost. Based on the expected availability of other RPV level instruments and the worst-case RPV level response during a fire event, use of the Fuel Zone Level Instruments may be required for accurate monitoring of RPV level during Plant cooldown. EOPs and FSPs provide adequate guidance when using the Fuel Zone Level Instruments before and after flow from the Recirculation Pumps has been stopped.

The worst-case timing considering the longest Diagnostic Time and the longest Walkdown Performance Time is less than the Calculation Specified Time with 13 minutes of margin. Therefore, the capability to perform this manual action has been successfully demonstrated.

2) Transfer of Control to LSP-1A2 for Use of 'A' CRD Pump

Point Required – Reactor Scram

Diagnostic Time – 10 minutes (avg); 14 minutes (longest)

Walkdown Performance Time – 4 minutes (longest)

Total Performance Time (Diagnostic + Walkdown) – 18 minutes (Maximum)

Calculation Specified Time – 60 minutes

Time Margin – 42 minutes

Demonstration Successful – **Yes**

Basis
CRD is required to restore high pressure injection to the RPV. Under worst-case assumptions, all Feedwater and all CRD are lost as injection sources to the RPV. No power is available to the 'B' and 'C' Feedwater Pumps or the 'B' CRD Pump due to loss of power to Division II of the Electric Plant. The 'A' Feedwater Pump is secured as part of the Operator Scram actions and cannot be restarted. Only the 'A' CRD Pump is available, but it must be controlled from LSP-1A2 due to loss of control cabling in the fire area.

The worst-case timing considering the longest Diagnostic Time and the longest Walkdown Performance Time is less than the Calculation Specified Time with 42 minutes of margin. Therefore, the capability to perform this manual action has been successfully demonstrated.

3) Lineup of CRD on Reactor Building 23'-6" Elevation to Inject via the Bypass Line

Point Required – Reactor Scram

Diagnostic Time – 30 minutes (avg); 40 minutes (longest)

Walkdown Performance Time – 5 minutes (longest) + 4 minutes for LSP-1A2 initiation = 9 minutes

Total Performance Time (Diagnostic + Walkdown) – 49 minutes (Maximum)

Calculation Specified Time – 204 minutes

Time Margin – 155 minutes

Demonstration Successful – **Yes**

Basis
Once the CRD Pump(s) are available for use as a high pressure injection source, a flow path to the RPV may need to be established in order to maximize the injection into the vessel. In the event that a loss of air or a loss of control power results in the closure of the CRD Flow Control Valves, a manual lineup of the system must be made on the 23'-6" elevation of the Reactor Building. This lineup will allow injection of up to 150 gpm to be accomplished.

The worst-case timing considering the longest Diagnostic Time and the longest Walkdown Performance Time is less than the Calculation Specified Time with 155 minutes of margin. In addition, although it is not credited in this analysis, the CRD Pump(s) will inject some water through the CRD mechanism seals via the charging line until the Reactor Scram is reset. Since the Scram cannot be reset until RPV water level has increased to at least 135" TAF, where injection into the vessel would no longer be required, the point in time where this manual action would have to be accomplished could be extended, adding additional margin. Therefore, the capability to perform this manual action has been successfully demonstrated.

4) Makeup to 'B' Isolation Condenser to Maintain Shell Water Level

Point Required – Isolation Condenser Initiation

Diagnostic Time – 14 minutes (avg); 20 minutes (longest)

Walkdown Performance Time – 7.5 minutes (longest)

Total Performance Time (Diagnostic + Walkdown) – 28 minutes (Maximum)

Calculation Specified Time – 45 minutes

Time Margin – 17 minutes

Demonstration Successful – **Yes**

Basis
Makeup to the Isolation Condenser Shell is required after 45 minutes of operation to maintain the capability to remove decay heat. This makeup can be from one of two sources; Condensate Transfer or Fire Water. For a fire in this zone (OB-FZ-8C), the availability of power to the Condensate Transfer Pumps is potentially lost; therefore, use of the Fire Water System is credited. Fire Water is lined up using a manual action on the 23'-6" elevation of the Reactor Building.

The 45 minutes of Isolation Condenser capability does not commence until the Isolation Condenser is put into service. Therefore, the Point Required for this action is when the Isolation Condenser is first used for pressure control. The worst-case timing considering the longest Diagnostic Time and the longest Walkdown Performance Time is less than the Calculation Specified Time with 17 minutes of margin. Therefore, the capability to perform this manual action has been successfully demonstrated.

5) Trip of Spuriously Started Core Spray Pumps When Not Required

Point Required – Reactor Scram

Diagnostic Time – 30 minutes (avg); 30 minutes (longest)

Walkdown Performance Time – 7.5 minutes (longest)

Total Performance Time (Diagnostic + Walkdown) – 38 minutes (Maximum)

Calculation Specified Time – 120 minutes

Time Margin – 82 minutes

Demonstration Successful – **Yes**

Basis
The tripping of the Core Spray Pumps is not required immediately. The pumps will run for a significant time through the minimum flow line. Injection into the RPV will not occur until pressure drops to less than 310 psig which will not occur for several hours, as controlled by Plant procedures. The Operators will not cooldown the Plant (depressurize) until there is a makeup source of water for the RPV. Then the cooldown rate will be limited to less than 100°F/hour. The EOPs and the FSPs give direction to secure any Core Spray Pumps not required for injection

before RPV pressure reaches 310 psig and the cooldown rate will be limited to a maximum of 10°F/hour if there is not a high pressure injection source available.

During the demonstration scenarios, pressure control was stabilized using the Isolation Condensers and the low pressure conditions requiring the tripping of Core Spray Pumps was not approached. Therefore, the prioritization for tripping these pumps was considered low and the direction to trip these pumps was not given until later in the scenario. This resulted in relatively long diagnostic times. The operators did note early in the scenarios that the pumps were running, but were in no danger of injection into the RPV. These controls, together with the Walkdown times demonstrated above, provide assurance that the Core Spray Pumps will be secured before they can result in an overfill event that would complicate Plant shutdown.

6) Closure of V-2-90

Point Required – Reactor Scram

Diagnostic Time – 25 minutes (avg); 27 minutes (longest)

Walkdown Performance Time – 4 minutes (longest)

Total Performance Time (Diagnostic + Walkdown) – 31 minutes (Maximum)

Calculation Specified Time – 73 minutes

Time Margin – 42 minutes

Demonstration Successful – **Yes**

Basis
Modifications performed in Refueling Outage 1R22 (Fall 2008) installed an air operator on V-2-90 that fails closed on loss of air or loss of power. The FSPs require the Control Room Operator to monitor CST water level and, on decreasing level, direct closure of V-2-90 unless it can be verified that there was a loss of air or power to the valve. Operators demonstrated this action during the simulator scenarios and would have directed the required manual action if required. The worst-case timing considering the longest Diagnostic Time and the longest Walkdown Performance Time is less than the Calculation Specified Time with 42 minutes of margin. Therefore, the capability to perform this manual action has been successfully demonstrated.

7) Recharge of the Air Accumulator for the Isolation Condenser Shell Makeup Valve

This manual action was not demonstrated during the simulator scenarios. The accumulator on each Isolation Condenser makeup valve is adequate to cycle the makeup valve at least six times, allowing the Isolation Condenser shell to be refilled six times. This provides at least five hours of decay heat removal before recharging of the accumulator is required. This is significantly after the last required manual action for this fire zone and after additional personnel will have arrived on site in response to the Emergency Plan activation. Therefore, demonstration of this action is satisfactory based upon the time allowed before it needs to be performed.

B) SCENARIO 2 – FIRE IN THE TURBINE BUILDING BASEMENT (FIRE ZONE TB-FZ-11D)

This scenario demonstrates the Plant response to a fire in the Turbine Building Basement. The fire progresses such that all important equipment in the zone is impacted over a 10-minute period. The scenario results in a loss of 480 VAC USS 1A1, USS 1B1 and 'C' 125 VDC DC Bus, and eventually a loss of all AC power to the In-Plant buses.

The manual actions demonstrated by this scenario were evaluated using multiple shifts of Plant Operators and include the following:

- Remote tripping of the Recirculation Pumps at MG Set Room
- Restoration of power to Plant buses from EDG-2 using partial initiation of the Alternate Shutdown System (Makeup to 'A' Isolation Condenser to maintain shell water level)
- Transfer of control to the Remote Shutdown Panel (RSP) for use of 'B' CRD Pump
- Lineup of CRD on Reactor Building 23'-6" elevation to inject via the Bypass Line
- Trip of spuriously started Core Spray Pumps when not required
- Recharge of the air accumulator for the Isolation Condenser Shell Makeup Valve

The results for each of the manual actions demonstrated by this scenario are discussed below.

1) Remote Tripping of the Recirculation Pumps

Point Required – Reactor Scram

Diagnostic Time – 6 minutes (avg); 10 minutes (longest)

Walkdown Performance Time – 4 minutes (longest)

Total Performance Time (Diagnostic + Walkdown) – 14 minutes (Maximum)

Calculation Specified Time – 30 minutes

Time Margin – 16 minutes

Demonstration Successful – **Yes**

Basis
Tripping of the Recirculation Pumps is required to restore accurate RPV level indication using the Fuel Zone Level Instruments in the event that RPV level decreases below 90" above the top of active fuel (TAF), or capability to use all other RPV level instruments is lost. Based on the expected availability of other RPV level instruments and the worst-case RPV level response during a fire event, use of the Fuel Zone Level Instruments may be required for accurate monitoring of RPV level during Plant cooldown. EOPs and FSPs provide adequate guidance when using the Fuel Zone Level Instruments before and after flow from the Recirculation Pumps has been stopped.

The worst-case timing considering the longest Diagnostic Time and the longest Walkdown Performance Time is less than the Calculation Specified Time with 16 minutes of margin. Therefore, the capability to perform this manual action has been successfully demonstrated.

2) Restoration of Power to Plant Buses from EDG-2 Using Partial Initiation of the Alternate Shutdown System

Point Required – Initiation of Isolation Condenser to Remove Decay Heat (makeup to 'A' Isolation Condenser)

Diagnostic Time – 6 minutes (avg); 10 minutes (longest)

Walkdown Performance Time – 16 minutes (longest)

Total Performance Time (Diagnostic + Walkdown) – 26 minutes (Maximum)

Calculation Specified Time – 45 minutes

Time Margin – 19 minutes

Demonstration Successful – **Yes**

Basis
The loss of power to the In-Plant bus requires that power be restored from the Emergency Diesel Generators. However, with a fire in this area, only EDG-2 is protected and capable of supplying power to its vital bus. Control for EDG-2 is credited from LSP-EDG2, and manual actions to strip 4kV bus 1D must be performed. Also, operation of the 4160V breakers for USS 1B2 and 1B3 are credited from LSP-1D. Operation of the 480V breakers are credited from the RSP and LSP-1B3 due to loss of control power cables. Once USS 1B3 is energized, motor control center (MCC) 1B32 can be reenergized to provide power to the Condensate Transfer Pumps. The Condensate Transfer Pumps can be operated from the Control Room to makeup to the Isolation Condensers. Each of these activities will be addressed separately below.

Providing power to the In-Plant buses is required initially to allow makeup to the Isolation Condenser shell within 45 minutes of initiation of the Isolation Condenser. Therefore, all diagnostic times are started from when the Isolation Condenser is first initiated. Power is also required to be supplied to the CRD System. This will be addressed in the following section.

1. Activation of LSP-EDG2 and Start of EDG-2

   Activation of this local shutdown panel (LSP) is only required in the event that power is lost to In-Plant buses during the fire. Under worst-case conditions, power is lost early in the event and needs to be recovered to provide power early for using the Condensate Transfer pumps to supply makeup to the 'A' Isolation Condenser. The time allowed is 45 minutes after the initiation of the Isolation Condenser. Closing of the Diesel Generator breaker will not occur until action 2 below is completed. The simulator demonstrations resulted in the following time line:

Average time to diagnose this action –	7 minutes after Isolation Condenser placed in service
Longest time to diagnose this action –	10 minutes after Isolation Condenser placed in service

Longest time to perform this action –	7.5 minutes + 2.5 minutes for completion of 2 below = 9.5 minutes
Total time to diagnose/perform this action –	20 minutes
Calculation Specified Time –	45 minutes
Time Margin –	25 minutes

Since the EDG cannot be placed on the 1D bus until the bus is stripped, the time margin of 19 minutes for Item 2 below is used since it is smaller.

2. Strip of 4kV Bus 1D

The stripping of loads from the 4kV 1D bus is performed by the same operator that is sent to the Switchgear Room to open the Recirculation Pump breakers. As with the initiation of the LSP-EDG2, this action is only required if power is lost to In-Plant buses. Under worst-case conditions, power is lost early in the event and needs to be recovered to provide power early for using the Condensate Transfer pumps to supply makeup to the 'A' Isolation Condenser. The time allowed is 45 minutes after the initiation of the Isolation Condenser. The simulator demonstrations resulted in the following time line:

Average time to diagnose this action –	7 minutes after Isolation Condenser placed in service
Longest time to diagnose this action –	10 minutes after Isolation Condenser placed in service
Longest time to perform this action –	9 minutes
Total time to diagnose/perform this action –	19 minutes
Calculation Specified Time –	45 minutes
Time Margin –	26 minutes

3. Activation of LSP-1D and Closure of Breakers 1B2P & 1B3P at Bus 1D

This action is performed by the same operator who is directed to the 4kV Switchgear Room to either open the Feedwater and Core Spray breakers (if power to In-Plant buses is available) or to strip the 1D Bus for use of EDG-2 (if power to In-Plant buses is not available). Including the times to perform the original directed actions together with activation of LSP-1D results in the following timeline:

Average time to diagnose this action –	7 minutes after Isolation Condenser placed in service
Longest time to diagnose this action –	10 minutes after Isolation Condenser placed in service
Longest time to perform this action –	2.5 minutes + 9 minutes from Action 2 above = 11.5 minutes

Total time to diagnose/perform this action –	22 minutes
Calculation Specified Time –	45 minutes
Time Margin –	23 minutes

4. Activation of LSP-1B3 and Closure of Breaker 1B3M

This action will be performed by the same operator who is directed to activate LSP-EDG2 in the event that power is lost to In-Plant buses. Including the times to perform the original actions of activating LSP-EDG2 results in the following timeline:

Average time to diagnose this action –	7 minutes after Isolation Condenser placed in service
Longest time to diagnose this action –	10 minutes after Isolation Condenser placed in service
Longest time to perform this action –	4.5 minutes + 10 minutes from Action 1 above = 14.5 minutes
Total time to diagnose/perform this action –	25 minutes
Calculation Specified Time –	45 minutes
Time Margin –	20 minutes

5. Reset and Closure of Supply Breaker to MCC-1B32

In order to power up the Condensate Transfer Pumps, MCC 1B32 must be reenergized. This breaker is on USS 1B3 and the operator who activated LSP-1B3 will perform this action. Because of the undervoltage trip in this circuit, this action cannot be performed until actions 3 and 4 above are complete, energizing USS 1B3. Including the times to perform the original actions of activating LSP-EDG2 and/or LSP-1B3 results in the following timeline:

Average time to diagnose this action –	7 minutes after Isolation Condenser placed in service
Longest time to diagnose this action –	10 minutes after Isolation Condenser placed in service
Longest time to perform this action –	1 minute + 15 minutes from Action 4 above = 16 minutes
Total time to diagnose/perform this action –	26 minutes
Calculation Specified Time –	45 minutes
Time Margin –	19 minutes

Conclusion:

As demonstrated by simulator scenarios and walkdowns, the manual actions for reenergizing the In-Plant buses to allow makeup to the Isolation Condenser System can be performed within the time limit included in this exemption request. The worst-case timing considering the longest

Diagnostic Time and the longest Walkdown Performance Time is less than the Calculation Specified Time with 19 minutes of margin. Therefore, the capability to perform this manual action has been successfully demonstrated.

3) Transfer of Control to the RSP for Use of 'B' CRD Pump

Point Required – Reactor Scram

Diagnostic Time – 17 minutes (avg); 30 minutes (longest)

Walkdown Performance Time – 6.5 minutes (longest) + 26 minutes to Reenergize MCC 1B32 = 32.5 minutes

Total Performance Time (Diagnostic + Walkdown) – 63 minutes (Maximum)

Calculation Specified Time – 180 minutes

Time Margin – 117 minutes

Demonstration Successful – **Yes**

Basis
CRD is required to restore high pressure injection to the RPV. Under worst-case assumptions, all Feedwater and all CRD are lost as injection sources to the RPV due to loss of power to In-Plant buses. The 'B' CRD Pump is available once power is restored from EDG-2, but it must be controlled from the RSP due to loss of control cabling in the fire area. The worst-case timing includes the fact that a higher priority is given to providing makeup to the Isolation Condenser System as discussed above. Therefore, the longest time evaluated above will be included in the action time for restoring the CRD System. Also included in these actions is reenergizing the USS 1B2 using the RSP.

The worst-case timing considering the longest Diagnostic Time and the longest Walkdown Performance Time is less than the Calculation Specified Time with 117 minutes of margin. Therefore, the capability to perform this manual action has been successfully demonstrated.

4) Lineup of CRD on Reactor Building 23'-6" Elevation to Inject via the Bypass Line

Point Required – Reactor Scram

Diagnostic Time – 27 minutes (Shortest); 35 minutes (longest)

Walkdown Performance Time – 5 minutes (longest) + 33 minutes to Activate the RSP to supply power to the pump = 38 minutes

Total Performance Time (Diagnostic + Walkdown) – 73 minutes (Maximum)

Calculation Specified Time – 204 minutes

Time Margin – 131 minutes

Demonstration Successful – **Yes**

Basis
Once the CRD Pump(s) are available for use as a high pressure injection source, a flow path to the RPV may need to be established in order to maximize the injection into the vessel. In the event that a loss of air or a loss of control power results in the closure of the CRD Flow Control Valves, a manual lineup of the system must be made on the 23'-6" elevation of the Reactor Building. This lineup will allow injection of up to 150 gpm to be accomplished.

The worst-case timing considering the longest Diagnostic Time and the longest Walkdown Performance Time is less than the Calculation Specified Time with 131 minutes of margin. In addition, although it is not credited in this analysis, the CRD Pump(s) will inject some water through the CRD mechanism seals via the charging line until the Reactor Scram is reset. Since the Scram cannot be reset until RPV water level has increased to at least 135" TAF, where injection into the vessel would no longer be required, the point in time where this manual action would be have to be accomplished could be extended, adding additional margin. Therefore, the capability to perform this manual action has been successfully demonstrated.

5) Trip of Spuriously Started Core Spray Pumps When Not Required

Point Required – Reactor Scram

Diagnostic Time – 31 minutes (avg); 32 minutes (longest)

Walkdown Performance Time – This action is performed by the operator already in the 4kV Switchgear Room. Only 1C bus breakers need to be tripped – 5 minutes (maximum) + 12 minutes to activate LSP-1D = 17 minutes

Total Performance Time (Diagnostic + Walkdown) – 49 minutes (Maximum)

Calculation Specified Time – 120 minutes

Time Margin – 71 minutes

Demonstration Successful – **Yes**

Basis
The tripping of the Core Spray Pumps is not required immediately. The pumps will run for a significant time through the minimum flow line. Injection into the RPV will not occur until pressure drops to less than 310 psig which will not occur for several hours, as controlled by Plant procedures. The Operators will not cooldown the Plant (depressurize) until there is a makeup source of water for the RPV. Then the cooldown rate will be limited to less than 100°F/hour. The EOPs and the FSPs give direction to secure any Core Spray Pumps not required for injection before RPV pressure reaches 310 psig and the cooldown rate will be limited to a maximum of 10°F/hour if there is not a high pressure injection source available.

During the demonstration scenarios, pressure control was stabilized using the Isolation Condensers and the low pressure conditions requiring the tripping of Core Spray Pumps was not approached. Therefore, the prioritization for tripping these pumps was considered low and the direction to trip these pumps was not given until later in the scenario. This resulted in relatively long diagnostic

times. The operators did note early in the scenarios that the pumps were running, but were in no danger of injection into the RPV. These controls, together with the walkthrough times demonstrated above, provide assurance that the Core Spray Pumps will be secured before they can result in an overfill event that would complicate Plant shutdown.

6) Recharge the Air Accumulator for the Isolation Condenser Shell Makeup Valve

This manual action was not demonstrated during the simulator scenarios. The accumulator on each Isolation Condenser makeup valve is adequate to cycle the makeup valve six times, allowing at least six refills of its Isolation Condenser. This provides at least five hours of decay heat removal before recharging of the accumulator is required. This is significantly after the last required manual action for this fire zone and after additional personnel will have arrived onsite in response to the Emergency Plan activation. Therefore demonstration of this action is satisfactory based upon the time allowed before it needs to be performed.

Conclusion
In these demonstrations, using the Control Room as the starting point for the first operator action, sequentially performing subsequent actions, and using the dispatch times from the simulator exercise, the prompt actions were completed within the time specified by the FSSD calculation.

Based on the use of two of the most challenging fire areas (Turbine Building and A/B Battery Room), the demonstrations were able to show that the conditions requiring operator manual actions were diagnosed, operators were dispatched and actions were completed within the time limits established by the safe shutdown calculations.

D. DEFENSE IN DEPTH

The principles of fire protection defense in depth are:

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

OCNGS has a Fire Protection administrative control program that addresses controls on ignition sources, hot work activities, combustibles, and fire system impairments. NRC Regional Inspectors, insurance inspectors and Nuclear Oversight auditors review these controls. The administrative control program is described in the OCNGS Updated Final Safety Analysis Report and the FHAR, which is incorporated by reference.

Fire detection and suppression systems are installed in those areas that contain significant combustible hazards. Fire detection includes both smoke and heat detection systems that provide alarms to the Control Room. Suppression systems include pre-action, deluge and wet pipe sprinkler systems as well as halon and carbon dioxide systems. Lube oil hazards, cable concentrations and storage areas are examples of areas provided with fire protection systems. Suppression systems have also been installed in areas with one-hour rated electrical raceway encapsulation. When fire protection systems become inoperable, compensatory measures are instituted. The plant has a fire brigade composed of plant operators and maintenance craft that are currently trained to meet the level of "interior/exterior structural firefighters." Hose stations and fire

extinguishers are located throughout the plant to facilitate firefighting activities by the fire brigade. These detection and suppression systems, as well as manual fire fighting equipment, are designed to detect fire at the appropriate stage to permit a response by plant personnel to the fire, including both operations and fire brigade. The suppression systems are designed to prevent a fire from rapidly growing and involving other areas. Manual suppression can be used to extinguish a fire or to prevent the fire from spreading to adjacent fire areas. Information regarding the fire protection defense-in-depth features in each of the initiating fire areas addressed by this exemption request was discussed previously.

OCNGS ensures safe shutdown in the event of a fire in several ways. First, the plant has been divided into fire areas/zones. Each fire area/zone is separated from adjacent fire areas with a barrier commensurate with the fire hazard. Typically, the fire barriers have a 3-hour fire resistance rating, including the barrier, the door(s), damper(s) and penetration seals. However, other barrier types are used to divide fire areas/zones. These fire area/zone boundaries are described in the OCNGS FHAR. In addition, analyses have been performed on how to achieve shutdown following a fire in any given fire area. The equipment lost and equipment available has been reviewed and actions necessary to ensure shutdown have been identified in the FSP for each fire area/zone. The manual actions addressed by this exemption request are part of the actions that may be necessary in a worst-case fire to achieve shutdown.

IV. ENVIRONMENTAL ASSESSMENT

The exemption request provides for NRC approval of operator manual actions associated with Appendix R post-fire safe shutdown. The review by Exelon confirms that the operator manual actions are feasible and reliable. Application of the rule in this circumstance is not necessary to achieve the underlying purpose of the rule.

The proposed exemption will not significantly increase the probability or consequences of accidents, no changes are being made in the types or quantities of any radiological effluents that may be released offsite, and there is no significant increase in occupational or public radiation exposure. Therefore, there are no significant radiological environmental impacts associated with the proposed exemption. In addition, the proposed exemption does not affect non-radiological plant effluents and has no other environmental impact. Therefore, there are no significant non-radiological impacts associated with the proposed exemption. As a result, in accordance with the requirements of 10 CFR 51.32, the proposed exemption will not have a significant effect on the quality of the human environment.

V. CONCLUSION

The requested exemption will not result in undue risk to the public health and safety because Exelon has determined that the subject manual actions are feasible and reliable, and that defense in depth is adequate to meet the objectives of Appendix R. The intent of 10 CFR 50, Appendix R, Section III.G.2, is to ensure that one train of systems necessary to achieve and maintain hot shutdown will remain available in the event of a fire, as needed. The manual actions discussed in this exemption request provide that assurance. If manual actions are not used to meet the underlying purpose of the rule, modifications to: 1) provide additional fire suppression systems, detection systems, or fire barriers, or 2) reroute cables or wrap cables, that involve issues such as accessibility, dose, structural interferences, design limitations, ampacity derating, etc., would be required to achieve compliance. Such modifications represent an unwarranted burden on Exelon since they are not necessary to meet the underlying purpose of the rule. Therefore, the special

circumstances for issuance of the exemption are satisfied in accordance with the requirements of 10 CFR 50.12(a)(2)(ii), since application of the rule is not necessary to achieve the underlying purpose of the rule. In addition, the requested exemption is authorized by law, and is consistent with the common defense and security.

VI. REFERENCES

1. 10 CFR 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979."

2. Regulatory Issue Summary (RIS) 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions," dated June 30, 2006.

3. NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," dated October, 2007.

4. SP-1302-06-013, Fire Protection Specification for Post-Fire Safe Shutdown Program Requirements at Oyster Creek.

5. Letter No. RA-09-017, dated March 3, 2009, from P. B. Cowan, Exelon Generation Company, LLC, to USNRC, "Request for Exemption from 10 CFR 50, Appendix R, Section III.G, 'Fire Protection of Safe Shutdown Capability' (Phase 1)."

6. Oyster Creek Nuclear Generating Station Fire Hazards Analysis Report, Revisions 14.

7. Letter (SER) dated March 24, 1986, from J. Zwolinski, USNRC, to P. Fiedler, Oyster Creek Nuclear Generating Station, "Exemptions from Requirements of Appendix R to 10 CFR Part 50, Section III.G.2 and the Post Fire Safe Shutdown Capability (TAC 56740, 56786)."

8. Industrial Risk Insurers, Document P.1.1.4, "Transformer and Capacitor Dielectric Fluids," August 30, 1977.

9. Letter (SER) dated June 25, 1990, from A. Dromerick, USNRC, to E. Fitzpatrick, Oyster Creek Nuclear Generating Station, "Exemption from Certain Technical Requirements Contained in Section III.G of Appendix R to 10 CFR Part 50 (TAC 62229)."

10. NUREG/CR-6931, CAROLFIRE Test Report

11. EPRI document 1003326, Characteristics of Fire-Induced Circuit Faults, Results of Cable Fire Testing.

ATTACHMENT 2

10 CFR 50.12 Exemption Request

Oyster Creek Nuclear Generating Station
Docket No. 50-219

Request for Exemption from 10 CFR 50, Appendix R,
Section III.G, "Fire Protection of Safe Shutdown Capability" (Phase 2)

List of Operator Manual Actions

ATTACHMENT 2
LIST OF OPERATOR MANUAL ACTIONS

Note: a more detailed discussion of the Actions is provided below following the table.

Action	Equipment	Action Required	Action Location	Initiating Fire Area
1	RY21 Panels	Trip Field Breakers for Recirculation Pumps A through E.	OB-FZ-8A	TB-FA-26, TB-FZ-11C, TB-FZ-11D
2	V-9-2099, V-11-49, V-11-63, V-11-41	Manually manipulate valves to align Fire Water for makeup to Isolation Condenser.	RB-FZ-1E	TB-FA-26, TB-FZ-11C, TB-FZ-11D
3	RSP	Operate transfer switch at RSP for USS-1B2 Main Breaker and "B" CRD Pump. Operate equipment as necessary.	OB-FZ-6B	TB-FA-26, TB-FZ-11B, TB-FZ-11C, TB-FZ-11D, TB-FZ-11E
4	V-2-90	Close V-2-90 by opening breaker at PDP-734-023 and verify closed to prevent drain down of CST to hotwell due to spurious signal on hotwell level loop.	MT-FA-12	OB-FZ-6A, OB-FZ-8C, TB-FZ-11E, TB-FZ-11F
5	4160V SWGR DG-1 (bkr DG-1)	Trip Breaker (Pull-To-Lock) for DG-1 and place EDG1 mode switch in stop to ensure Main Core Spray Pumps are tripped.	DG-FA-15	TB-FA-3A
6	4160V SWGR DG-2 (bkr DG-2)	Trip Breaker (Pull-To-Lock) for DG-2 and place EDG2 mode switch in stop to ensure Main Core Spray Pumps are tripped.	DG-FA-17	TB-FA-3B
7	V-11-36	Manually open V-11-36 to makeup to the Isolation Condenser	RB-FZ-1B	TB-FA-26, TB-FZ-11C, TB-FZ-11D,
8	LI-211-1214	Obtain "A" Isolation Condenser shell level using local mechanical gauge	RB-FZ-1B	TB-FA-26, TB-FZ-11C, TB-FZ-11D,
9	V-15-30, V-15-52, V-15-237, FI-225-2	Manually manipulate valves for CRD flow path and use local indicator.	RB-FZ-1E	YARD
10	USS-1B2 (Bkrs 042A & 043A)	Trip breakers and remove close fuses for Containment Spray Pumps to protect pumps due to spurious start signal.	OB-FZ-6B	OB-FZ-6A

Action	Equipment	Action Required	Action Location	Initiating Fire Area
11	MCC 1A21 (bkr C02)	Open breaker for V-20-21 to ensure V-20-21 remains open after manually repositioning.	OB-FZ-6A	RB-FZ-1D
12	V-20-21	Open Valve V-20-21 due to control circuit damage	RB-FZ-1C	RB-FZ-1D
13	MCC 1B21A (bkr D02)	Open breaker for V-20-4	RB-FZ-1E	RB-FZ-1F3
14	"B" 480V SWGR Room	1) Monitor "B" 480V Switchgear Room and open doors as necessary 2) Provide temporary ventilation for "B" 480V Switchgear Room	OB-FZ-6B	OB-FZ-10A
15	DM-56-15, DM-56-16	Manually manipulate dampers to restore ventilation to the "A" 480V Switchgear Room.	TB-FZ-11B	OB-FZ-6B
	DM-56-17		YARD	
16	V-9-11 V-9-9 V-11-247	Manually manipulate valves to align firewater to the CST to makeup (contingency action).	MT-FA-12	OB-FZ-6A, TB-FZ-11E
17	V-11-34	Connect H.P. air cylinder to drain port of accumulator to recharge	RB-FZ-1B	RB-FZ-1D, RB-FZ-1E, RB-FZ-1F1, RB-FZ-1F2, RB-FZ-1F3, RB-FZ-1F4, RB-FZ-1F5, RB-FZ-1G, RB-FZ-1H, TB-FA-3A, OB-FZ-6A, OB-FZ-8A, OB-FZ-8B, OB-FZ-8C, OB-FA-9, AB-FA-13, CW-FA-14, NR-FA-20, OG FA-21, OR-FA-19, YARD
18	V-11-36	Connect H.P. air cylinder to drain port of accumulator to recharge	RB-FZ-1B	DG-FA-15, OB-FZ-6B, OB-FZ-10A, OB-FZ-10B, TB-FA-3B, TB-FA-26, TB-FZ-11A, TB-FZ-11B, TB-FZ-11C, TB-FZ-11D, TB-FZ-11E, TB-FZ-11F, TB-FZ-11G, TB-FZ-11H

SUMMARY OF INDIVIDUAL MANUAL ACTIONS

Each of the notes below addresses an operator manual action for a specific fire area that is addressed by a specific Fire Support Procedure (FSP). This review only considers the performance of the individual task. This review does not address concurrent performance of other tasks included in the applicable FSP. Attachment 1 contains a review that considers concurrent performance of all of the operator manual actions for the applicable FSP. The following review will consider time required and time available to perform the task.

Some of the operator manual actions that are performed are repeated in numerous fire areas/zones because the fire safe shutdown (FSSD) analysis assumes that instrument air will be lost for the majority of the fire areas/zones, which requires the following operator manual actions to be performed:

- Control Rod Drive (CRD) flow control valve fails closed requiring three valves (V-15-30, 52 & 237) to be manually operated to utilize the bypass line around the normal flow control valve.
- The Isolation Condenser Makeup valves (V-11-34 & 36) have accumulators and, once depleted, the accumulator has to be re-charged utilizing air bottles that are staged in the vicinity. The accumulators are sized for six stroking cycles of the associated valve.

ACTION 1

This action is to trip all five Reactor Recirculation Pumps by opening field breakers on the RY-21 Panels located in the Office Building MG Set Room (OB-FZ-8C). The Reactor Recirculation pumps are tripped so that the fuel zone level indicators can be utilized during an Appendix R event. This action is considered a prompt action and the FSP dispatches one of the operators to the MG Set Room immediately to await the command to trip the pumps. The manipulation of these breakers is considered skill of the craft activities, since these tasks are consistent with normally assigned equipment operator duties. There are 30 minutes allotted to trip these breakers. The estimated travel time is two minutes plus three minutes for PPE. The performance time for these actions is three minutes. In addition, 10 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 18 minutes. Margin associated with this manual action is 12 minutes. From the Control Room the distance to the RY-21 panels is short and within the same building as the Control Room. There are no ALARA, environmental (heat), smoke and tools / special equipment associated with the performance of this manual action. Electrical personal protective equipment is required to perform this operator manual action; three minutes has been included in the travel time to obtain and don this equipment. For a fire in TB-FA-26, TB-FZ-11C and TB-FZ-11D, the operator has the ability to access and operate the required breakers, which are located outside the fire-affected area of concern (different buildings). Appendix R emergency lighting is provided in the area near the RY-21 Panels and access / egress route thereto. The ventilation for the Office Building provides a protected environment in which to perform these tasks since it is in a separate fire area and is free of fire damage. This manual action can be performed as directed by the procedures within the allotted time.

This action to trip the recirculation pumps was discussed in the original analysis but it did not indicate that the tripping of the pumps might have to occur at the MG Set Room if control from the Control Room was lost. Therefore, this action was included as part of this exemption request.

ACTION 2
This action is to align fire water system valves (V-9-2099, V-11-49, V-11-63, and V-11-41) to provide makeup water to the "A' Isolation Condenser. This is a contingency action if access to the 4160V Switchgear is delayed due to smoke and/or CO2, and the Condensate Transfer System is unavailable. Under these conditions, the safe shutdown analysis credits the fire water system to provide makeup water to the Isolation Condenser. This manual action is considered a prompt action for a fire in these fire zones. One of the two equipment operators has been assigned to perform this action upon confirmation that the 4160V switchgear area is not accessible. The manipulation of these valves is considered skill of the craft activities, since these tasks are consistent with normally assigned equipment operator duties. There are 45 minutes allotted to align these valves. The estimated travel time from the Control Room to the area of the valves in Reactor Building 23'-6" elevation is five minutes. The performance time for these actions is eight minutes. In addition, 10 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute these operator manual actions is 23 minutes. Margin associated with this manual action is 22 minutes. There are no ALARA, environmental (heat) and smoke issues associated with the performance of this manual action. The only personal protective clothing required for the operator to utilize is gloves. For a fire in these areas, the operator has the ability to access and operate the required valves located on Reactor Building 23'-6" elevation, Fire Zone RB-FZ-1E, which is outside the fire-affected area of concern. Appendix R emergency lighting is provided in the area near these valves and the access / egress route thereto. This manual action can be performed as directed by the procedures within the allotted time.

This contingency action was not part of the original analysis and was added due to potential issues (fire effects) with accessing the 4160V Switchgear areas to provide additional defense-in-depth measures. Therefore, this action was included as part of this exemption request.

ACTION 3
This action is to perform a partial initiation of the Remote Shutdown Panel (RSP) for USS-1B2 Main Breaker and "B" CRD Pump (common transfer switch) due to potential control circuit cable damage to one or both of the components. The RSP transfer switch will isolate the damaged cable. The individual control switches can then be operated as necessary. The manual operation of these switches is considered skill of the craft activity, since these tasks are consistent with normally assigned equipment operator duties. There are 180 minutes allotted to operate these control switches. The estimated travel time from the Control Room to the "B" 480V Switchgear Room is three minutes. The performance time for this action is five minutes. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 38 minutes. Margin associated with this manual action is 142 minutes. There are no ALARA, environmental (heat), smoke, special equipment and personal protective clothing requirements associated with the performance of this manual action. For a fire in these fire zones, the operator has the ability to access and operate the required switches, which are located outside the fire-affected area of concern (separate building). Appendix R emergency lighting is provided in the area near the RSP and access / egress route thereto. Although elevated temperatures in this area may occur until power is restored, the elevated temperatures should not affect the operator's capability of manipulating the control switches. This manual action can be performed as directed by the procedures within the allotted time.

This action was identified in the original analysis for one fire zone but it neglected to identify that five other fire zones may have to credit the same action due to potential control circuit damage. Therefore, this action was included as part of this exemption request.

ACTION 4

This action is to open a breaker to close the condensate valve V-2-90 and verify that this valve closes. The breaker and valve are located in the Condensate Transfer Building (in fire area MT-FA-12). This valve is required to be closed to prevent a drain down of the Condensate Storage Tank (CST) to the hotwell so that water inventory would be available to support the Isolation Condenser, CRD (for RPV makeup) and Shutdown Cooling (SDC) System operation. The drain down potentially occurs because upon the loss of instrument air and/or power to the normal hotwell level control valve (V-2-16), the valve will fail open. A recent modification changed a manual valve (V-2-90) in-series with the hotwell level control valve to an air-operated valve that will fail closed on the loss of air or power. For the majority of the fire zones, this modification will ensure that V-2-90 closes and prevents the drain down from the CST to the hotwell but for fire zones OB-FZ-6A, OB-FZ-8C, TB-FZ-11E and TB-FZ-11F, the CST/hotwell level control instrument loop wiring could be affected. It is conservatively postulated that the normal CST/hotwell level control valve will be driven open due to the fire. Then there would not be a loss of air or power that would close V-2-90.

The time limit for performing the manual action to isolate the drain down path (close V-2-90) to the CST has three different time limits; they are:

- 30 minutes (CST inventory needed for Isolation Condenser makeup, RPV losses and for raising RPV level to 185" TAF for SDC) (TB-FZ-11E),
- 39 minutes (CST inventory needed for Isolation Condenser makeup and RPV losses) (OB-FZ-6A), and
- 73 minutes (CST inventory needed for RPV losses and for raising RPV level to 185" TAF for SDC) (OB-FZ-8C and TB-FZ-11F).

The time limits vary because there are different safe shutdown paths that utilize different equipment as listed above in parenthesis. If the valve is successfully closed by the time limit, then there is adequate inventory in the CST to reach cold shutdown.

Valve V-2-90 can be closed manually by opening its 120 VAC breaker. The manipulation of this breaker is a considered skill of the craft activity, since the task is consistent with normally assigned equipment operator duties. For worst case, there are 30 minutes allotted to open this breaker. The estimated travel time from the Control Room to the Condensate Transfer Building is five minutes. Performance time for this action is three minutes, which includes the time for verifying that V-2-90 is closed. In addition, 10 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 18 minutes. Margin associated with this manual action is at least 12 minutes. There are no ALARA, environmental (heat) and smoke issues associated with the performance of this manual action. For a fire in OB-FZ-6A, OB-FZ-8C, TB-FZ-11E, TB-FZ-11F, the operator has the ability to access and open the breaker, which is located outside of these fire affected zones (exterior building) and will not have any fire effects. Appendix R emergency lighting is provided in the area near the associated breaker, V-2-90 and the access / egress route thereto. This manual action can be performed as directed by the procedures within the allotted time. Refer to Action 16 for contingency action to refill the CST if this action is not completed within the allotted time.

This action was not part of the original analysis and was added due to the assumed loss of instrument air. The original analysis did not identify that the normal level control valve could fail open and divert inventory from the CST. Therefore, this action was included as part of this exemption request.

ACTION 5

This action is to manually trip output breaker DG-1, by taking its control switch to "Pull-To-Lock" at the 4160V Switchgear DG-1 located in the No. 1 Emergency Diesel Room (in Fire Area DG-FA-15), and place the diesel mode switch to "Stop" if the diesel is running. The fire is postulated to be in Fire Area TB-FA-3A ("C" 4160V switchgear room) and emergency diesel No. 1 provides power to the "C" 4160V switchgear; therefore, this action is required to ensure that no power is available to power the main Core Spray Pumps. The manipulation of these switches is a considered skill of the craft activity, since the task is consistent with normally assigned equipment operator duties. There are 120 minutes allotted to operate these switches. The time to travel from the Control Room to the EDG-1 Room is four minutes. The performance time for these actions is three minutes. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 37 minutes. Margin associated with this manual action is at least 83 minutes. There are no ALARA, environmental (heat) and smoke issues associated with the performance of this manual action. For a fire in the "C" 4160V Switchgear Room (TB-FA-3A), the operator has the ability to access the diesel (separate building) and operate these switches, which are free of fire damage. Appendix R emergency lighting is provided in the area near Switchgear DG-1 and the access / egress route thereto. This manual action can be performed as directed by the procedures within the allotted time.

This action was not part of the original analysis. The original analysis ensured that the normal 4160V supply to the fire-affected "C" 4160V Switchgear was isolated but it neglected to ensure the emergency diesel power source was also isolated. This action ensures that there is no power available to the "C" 4160V Switchgear to prevent the associated Core Spray Pumps from running. Therefore, this action was included as part of this exemption request.

ACTION 6

This action is to manually trip output breaker DG-2, by taking its control switch to "Pull-To-Lock" at the 4160V Switchgear DG-2 located in the No. 2 Emergency Diesel Room (in Fire Area DG-FA-17), and place mode switch to "Stop" if the diesel is running. The fire is postulated to be in Fire Area TB-FA-3B ("D" 4160V switchgear room) and emergency diesel No. 2 provides power to the "D" 4160V switchgear; therefore, this action is required to ensure that no power is available to power the main Core Spray Pumps (which effectively causes the pumps to trip). The manipulation of these switches is considered skill of the craft activity, since the task is consistent with normally assigned equipment operator duties. There are 120 minutes allotted to operate these switches. The time to travel from the Control Room to the EDG-2 Room is four minutes. The performance time for these actions is three minutes. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 37 minutes. Margin associated with this manual action is at least 83 minutes. There are no ALARA, environmental (heat) and smoke issues associated with the performance of this manual action. For a fire in the "D" 4160V Switchgear Room (TB-FA-3B), the operator has the ability to access the diesel (separate building) and operate these switches, which are free of fire damage. Appendix R emergency lighting is provided in the area near

Switchgear DG-2 and the access / egress route thereto. This manual action can be performed as directed by the procedures within the allotted time.

This action was not part of the original analysis. The original analysis ensured that the normal 4160V supply to the fire-affected "D" 4160V Switchgear was isolated but it neglected to ensure the emergency diesel power source was also isolated. This action ensures that there is no power available to the "D" 4160V Switchgear to prevent the associated Core Spray Pumps from running. Therefore, this action was included as part of this exemption request.

ACTIONS 7 & 8

Valve V-11-36 is an air-operated 2.5-inch valve that controls makeup to the shell side of the Isolation Condenser 'A'. This valve is provided with a hand operator that can also be used to take local override control of the valve. For fires in areas/zones TB-FA-26, TB-FZ-11C and TB-FZ-11D, AC power may not be immediately available to V-11-36 in time to support the initial replenishment of the Isolation Condenser 'A'. These actions have the equipment operator take local manual control of the Isolation Condenser 'A' shell inventory until such time as the Control Room control is restored, at which time control of the valve is transferred back to the Control Room. Once Isolation Condenser 'A' makeup is initially established, the 45-minute time limit is met. From then on, the operator will periodically monitor shell level locally and adjust V-11-36 as needed, until Control Room control is restored.

These actions are to align the 'A' Isolation Condenser Makeup Valve, V-11-36, and to monitor the Isolation Condenser local shell level indicator, LI-211-1214. The valve is being opened to provide makeup water to the 'A' Isolation Condenser and the local mechanical gauge is being utilized to monitor the level on the shell side of the Isolation Condenser. This is a contingency action if access to the 4160V Switchgear is delayed due to smoke and/or CO2, and the Condensate Transfer System is unavailable. Under these conditions, the safe shutdown analysis credits the fire water system to provide makeup water to the Isolation Condenser. The manual actions are considered a prompt action for a fire in this fire zone. One of the two equipment operators has been assigned to perform this action upon determination that access may not be available to the 4160V switchgear area as determined from radio communication with the Fire Brigade Leader. The manipulation of these valves is considered skill of the craft activities, since these tasks are consistent with normally assigned equipment operator duties. There are 45 minutes from the time that the Isolation Condenser is actuated to monitor the level to determine if makeup is required and then to align these valves to start the makeup to the Isolation Condenser. The performance of these actions are dependent on performing the actions in Action 2, and 23 minutes are required for those actions. The estimated travel time from Reactor Building 23'-6" elevation (where Action 2 is performed) to Reactor Building 95' elevation is six minutes, plus five minutes to manually operate V-11-36. Therefore, the total time (including time from Action 2) to execute these operator manual actions is 34 minutes. Margin associated with this manual action is 11 minutes. There are no issues with smoke since the action is in a separate area with its own ventilation system. Radiation monitoring has been performed with the Isolation Condenser initiated. It was noted that changes in the radiation levels with the Isolation Condenser in service would not prevent the ability of the operators to perform this action. The temperatures in this area are not expected to present any challenge to the manual actions being performed. The manual actions that are being performed are short in duration, intermittent, and considered moderately strenuous. Therefore, the operator will be able to complete the action as described. Appendix R emergency lighting is provided in the area near

these valves and the access / egress route thereto. This manual action can be performed as directed by the procedures within the allotted time.

This contingency action was not part of the original analysis and was added due to potential issues (fire effects) with accessing the 4160V Switchgear areas to provide additional defense-in-depth measures. Therefore, this action was included as part of this exemption request.

ACTION 9
This action is to align the CRD valves (V-15-30, V-15-52 and V-15-237) while monitoring the local flow indicator (FI-225-2) due to the potential loss of instrument air to the normal control valve. This manual action is performed to ensure makeup to the Reactor Pressure Vessel (RPV). The manual operation of these valves and monitoring of flow is considered a skill of the craft activity, since these tasks are consistent with normally assigned equipment operator duties. There are 204 minutes allotted to complete this manual action. The estimated travel time from the Control Room to Reactor Building 23'-6" elevation is five minutes. The performance time for this action is 10 minutes. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 45 minutes. Margin associated with this manual action is at least 159 minutes. There are no ALARA, environmental (heat), tools / special equipment and personal protective clothing requirements associated with the performance of this manual action. For a fire in the Yard area, the operator has the ability to access and operate the required valves and monitor flow from the instrument located outside the fire-affected area of concern. Appendix R emergency lighting is provided in the area near the valves and flow gauge and access / egress route thereto. This manual action can be performed as directed by the procedures within the allotted time.

This action was identified in the original analysis but it did not identify this particular fire area as requiring this action. This was due to the fact that Yard fire area was developed later to address the outside areas surrounding the power block to improve the existing analysis. Therefore, this action was included as part of this exemption request.

ACTION 10
This action is to trip two breakers at USS 1B2 and remove the close fuses for the Containment Spray Pumps due to a potential spurious start signal. The Containment Spray Pumps will be utilized for cold shutdown and this action ensures their availability for use later in the event. The manual tripping of the breaker and removing a fuse is considered skill of the craft activity, since these tasks are consistent with normally assigned equipment operator duties. There is no upper limit on the time to perform this action; however, 60 minutes has been allotted for analysis purposes to trip this breaker and remove the fuse. The estimated travel time from the Control Room to the "B" 480V Switchgear Room is 11 minutes, which includes time to don SCBA and PPE. The performance time for this action is four minutes. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 45 minutes. Margin associated with this manual action is at least 15 minutes. There are no ALARA requirements associated with the performance of this manual action. For a fire in these fire zones, the operator has the ability to access and trip the required breaker and remove its fuse, which is located outside the fire-affected area of concern. However, this action is in a fire zone adjacent to the area in which the fire occurs, and fire brigade activities may allow some smoke to enter this fire zone (OB-FZ-6B). It is not expected that a large amount of smoke will be in this area because the initiating area is protected by halon and the fire brigade is trained to allow a 20-minute soak time before entering. If the first

discharge did not work, then a second discharge of halon will be initiated. Therefore, an SCBA has been staged in the corridor outside this area in case there is smoke in the area. The time to don an SCBA is included in access time. A fuse puller is staged at the RSP for performing this task and the appropriate PPE is in the corridor area. Appendix R emergency lighting is provided in the area near USS 1B2 and access / egress route thereto. The ventilation for the 480V Switchgear Room is a separate system from the fire area and will be available unless the power has been lost to USS 1B2 (postulated failure from fire); however, if power is lost then this manual action is not required. In addition, the five fire brigade members would be in the area to assist since they would be in standby while the halon was soaking. This manual action can be performed as directed by the procedures within the allotted time.

This action was not part of the original analysis. The original analysis indicated that these pumps would be utilized for cold shutdown and that there were repairs necessary. This new action ensures that at least one of these pumps will be available for cold shutdown in the unlikely event that multiple spurious actuations occur, which could damage the pumps. Therefore, this action was included as part of this exemption request.

ACTION 11
This action is to open a breaker at MCC 1A21, which isolates power to valve V-20-21 to ensure that the valve remains open after the manual operation of the valve. V-20-21 is being manually opened (see action 12) in order that Core Spray can be utilized for makeup to the RPV. The manipulation of this breaker is considered a skill of the craft activity, since this task is consistent with normally assigned equipment operator duties. There are 66 minutes allotted to operate this breaker. For the fire in RB-FZ-1D, the estimated travel time from the Control Room to MCC 1A21 located in the "A" 480V Switchgear Room is three minutes. The performance time for this action is one minute. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 34 minutes. Margin associated with this manual action is at least 32 minutes. There are no ALARA, environmental (heat), smoke, tools / special equipment and personal protective clothing requirements associated with the performance of this manual action. For a fire in these fire zones, the operator has the ability to access and operate the required breaker (separate ventilation), which is located outside the fire-affected area of concern. Appendix R emergency lighting is provided in the area near this MCC and access / egress route thereto. The ventilation for the Switchgear Room provides a protected environment in which to perform these tasks since it is unaffected by the fire in these fire zones. This manual action can be performed as directed by the procedures within the allotted time.

This action was not part of the original analysis. However, Licensee Event Report (LER) 88-012-00 identified that this action was required and NRC Inspection Report (IR) 50-219/88-29 indicated that these actions were deemed acceptable by the inspector but no SER could be located for this action. Therefore, this action was included as part of this exemption request.

ACTION 12
This action is to open valve V-20-21 due to potential control circuit damage. V-20-21 is being manually opened in order that Core Spray can be utilized for makeup to the RPV. The manual operation of this valve is considered a skill of the craft activity, since this task is consistent with normally assigned equipment operator duties. There are 66 minutes allotted to operate this valve. Based on the sequence of manual actions, this action does not begin until Action 11 is

completed, which is described above. For the fire in RB-FZ-1D, there is a potential for smoke from Reactor Building 51' elevation to enter into the elevation above, Reactor Building 75' elevation, from the open equipment hatch located at the southeast portion of the Reactor Building. Prior to entering the Reactor Building the operator will don SCBA which is staged in the corridor outside the 480V Switchgear Room. The total travel time, which includes donning SCBA plus setting up a ladder that is staged in the area, is 12 minutes. The performance time for this action is 10 minutes. Therefore, the total time to execute this operator manual action is 56 minutes, including the 34 minutes for Action 11. Margin associated with this manual action is 10 minutes. There are no ALARA concerns associated with the performance of this manual action. The Reactor Building has a significant volume with its high ceilings and open equipment hatches and stairwells. This provides an advantage for the types of fires that are anticipated in this area because there will be significant dilution of the smoke and self-venting to the refuel floor (Reactor Building 119' elevation) which has no manual actions and also contains an automatic wet pipe sprinkler system. Additionally, for the openings between the Reactor Building 51' to 75' elevations, a water curtain is available (automatic or manual operation), which will provide reasonable assurance to extinguish any postulated fire, but will also help with cooling and general improvement of overall environmental conditions. The SCBA is staged enroute to this area. Appendix R emergency lighting is provided in the area near this valve and access / egress route thereto. This manual action can be performed as directed by the procedures within the allotted time.

This action was not part of the original analysis. However, Licensee Event Report (LER) 88-012-00 identified that this action was required and NRC Inspection Report (IR) 50-219/88-29 indicated that these actions were deemed acceptable by the inspector but no SER could be located for this action. Therefore, this action was included as part of this exemption request.

ACTION 13

This action is to open breaker D02 at MCC 1B21A, which isolates power to valve V-20-4 to ensure that the valve remains closed after the manual operation of the valve. V-20-4 is being manually closed in order that Core Spray can be aligned to the CST to provide makeup to the RPV. A fire in RB-FZ-1F3 potentially damages both CRD pumps, and therefore, the Core Spray pumps are utilized for makeup. The manipulation of this breaker is considered a skill of the craft activity, since these tasks are consistent with normally assigned equipment operator duties. There are 204 minutes allotted to operate this breaker. For the fire in RB-FZ-1F3, the estimated travel time from the Control Room to MCC 1B21A located in the "B" 480V Switchgear Room is three minutes. The performance time for this action is one minute. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 34 minutes. Margin associated with this manual action is 170 minutes. There are no ALARA, environmental (heat), smoke, tools / special equipment and personal protective clothing requirements associated with the performance of this manual action. For a fire in this fire zone, the operator has the ability to access and operate the required breaker, which is located outside the fire-affected area of concern. Appendix R emergency lighting is provided in the area near this MCC and access / egress route thereto. The ventilation for the Switchgear Room provides a protected environment in which to perform this task since it is unaffected by the fire in these fire zones. This manual action can be performed as directed by the procedures within the allotted time.

Note that the action to manually close V-20-4 was previously found acceptable via an NRC fire protection safety evaluation report, and was included in a request for exemption by letter dated

March 3, 2009 (Reference 5 in Attachment 1). However, the SER did not discuss the action of opening the breaker prior to manually closing V-20-4. Therefore, this action was included as part of this exemption request.

ACTION 14

This action is to monitor temperature in the 'B' 480V Switchgear Room, open doors and provide temporary ventilation, if needed. Also, the "A" train of power is the credited train for this fire zone; however, keeping USS 1B2 available keeps the B Battery available as well as other equipment that will be utilized for cold shutdown. This action is being performed because there is the potential that the normal ventilation system would not be available due to cable damage. The monitoring of temperature, opening a door and installing a temporary fan is considered skill of the craft activity, since these tasks are consistent with normally assigned equipment operator duties. There are 120 minutes allotted for opening the door and for providing temporary ventilation. The estimated travel time from the Control Room to "B" 480V Switchgear Room is eight minutes (alternate route). The performance time for opening the door and providing temporary ventilation is 17 minutes. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 55 minutes. Margin associated with this manual action is at 65 minutes. There are no ALARA or PPE requirements associated with the performance of this manual action. A portable fan and power cord has been staged in the area to use for this action. For a fire in this fire zone, the operator has the ability to access and perform the required actions, which is located outside the fire-affected area of concern. However, this action is in the adjacent Office Building fire zone one elevation below where the fire is located. There are rated barriers separating the zones and there should be no issue with smoke or heat due to the rated barriers and the fact that any smoke or heat generated from the fire will rise away from this zone. Appendix R emergency lighting is provided in this area and access / egress route thereto. The ventilation for the "B" 480V Switchgear Room is off so there will be elevated temperatures in this area but the task is not strenuous and the elevated temperatures should not affect the operator from opening the door and providing temporary ventilation. This manual action can be performed as directed by the procedures within the allotted time.

This action was not part of the original analysis. As indicated above, the "A" train of power is the credited train for this fire zone; however, keeping USS 1B2 ("B" train) available keeps the "B" Battery available as well as other equipment that will be utilized for cold shutdown, and this simplifies future actions that would be needed for cold shutdown. Therefore, this action was included as part of this exemption request.

ACTION 15

This action is to reposition three ventilation dampers (DM-56-15, DM-56-16, and DM-56-17) in the A 480V switchgear room ventilation system to restore ventilation. This action is located in the Yard area and in the stairwell area of TB-FZ-11B. This action is being performed because there is the potential that the normal ventilation system would not be available due to cable damage to the damper controls. The re-positioning of the dampers is a simple task of disconnecting the linkage by removing one nut and then using a wire with clips on both ends to hold the linkage arm in the desired position. The wrench and wires are staged at the dampers and the procedure gives detailed instructions on how to position the linkage arm. Additionally, there are pictures showing this configuration in the procedure. Therefore, this is considered skill of the craft activity, since these tasks are consistent with normally assigned equipment operator

duties. There are 90 minutes allotted to perform these actions. The estimated travel time from the Control Room to the stairway area outside of the "B" 480V Switchgear Room corridor where two of the dampers are located is three minutes plus three minutes for obtaining a ladder. Also, an additional 10 minutes is required to get to the third damper in the Yard area. The performance time for this action is 30 minutes. In addition, 30 minutes has been allotted for obtaining the procedure and getting briefed. Therefore, the total time to execute this operator manual action is 76 minutes. Margin associated with this manual action is 14 minutes. There are no ALARA, environmental (heat) or PPE requirements associated with the performance of this manual action. For a fire in this fire zone, the operator has the ability to access and perform the required actions, which is located outside the fire-affected area of concern. However, this action is in the adjacent Turbine Building fire zone, but there are rated barriers separating the zones and there should be no issue with smoke or heat due to the rated barriers. Appendix R emergency lighting is provided in this area and access / egress route thereto including the Yard area. This manual action can be performed as directed by the procedures within the allotted time. Note that an enhancement is being planned to install a new damper control switch in the Control Room so that manual operation of these ventilation dampers will not be required.

This action was not part of the original analysis. The damper controls were added to the RSP to ensure that these dampers would be available for alternate shutdown (Appendix R III.G.3) but the original analysis did not identify that these dampers could spuriously close for a fire in OB-FZ-6B where the RSP is located disabling the ventilation to OB-FZ-6A. USS 1A2 ("A" Train of power) is located in OB-FZ-6A and it is the protected (credited) train for a fire in OB-FZ-6B. Therefore, this action was included as part of this exemption request.

ACTION 16

For contingency, in case Action 4 cannot be completed in 30 or 39 minutes, makeup can be provided to the CST from firewater by operating two manual 10" valves (V-9-9 and V-11-247) and one manual 1" valve (V-9-11). These valves are located in the same fire area (MT-FA-12) as V-2-90 (Action 4); therefore, the access time, ALARA, environmental (heat), emergency lighting and smoke considerations are the same. Total time for access is five minutes and the time for manipulating the three valves is 12 minutes. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 47 minutes. Assuming V-2-90 is closed at 73 minutes, there would be 137 additional minutes (210 minutes total) to provide makeup to the CST. This manual action (contingency) can be performed as directed by the procedures within the allotted time, if needed. Note that this action is only being applied to OB-FZ-6A and TB-FZ-11E due to having prompt times for closing V-2-90. For the other two fire zones in which V-2-90 needs to be closed, there are 73 minutes to close this valve with adequate margin; therefore, the contingency action is not deemed necessary. For the remaining fire zones that credit the automatic closure of V-2-90, no contingency action is required because if the CST/hotwell level control valve fails open due to the loss of air or power, V-2-90 fails closed under the same conditions thereby preventing the drain down from occurring.

This contingency action was not part of the original analysis. It is expected that V-2-90 will be closed in the allotted time; however, this action was added to provide additional defense-in-depth measures. Therefore, this action was included as part of this exemption request.

ACTION 17
This action is to connect a high pressure air cylinder to the accumulator of Condensate Transfer System valve V-11-34. This air-operated valve is used to control makeup to the Isolation Condenser. The valve is provided with a control air accumulator that provides a minimum of six full cycles in five hours. As a result, this manual action is necessary to ensure long-term control of this valve and makeup to the Isolation Condensers. The manual operation to connect this air supply is considered a skill of the craft activity, since these tasks are consistent with normally assigned equipment operator duties. There are 300 minutes (five hours) allotted to complete this manual action. The estimated travel time from the Control Room to Reactor Building 95' elevation is 11 minutes. The performance time for this action is 15 minutes. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 56 minutes. Margin associated with this manual action is at least 244 minutes. There are no ALARA and personal protective clothing requirements associated with the performance of this manual action. Radiation monitoring has been performed with the Isolation Condenser initiated. It was noted that changes in the radiation levels with the Isolation Condenser in service would not prevent the ability of the operators to perform this action. The temperatures in this area are not expected to present any challenge to the manual actions being performed. The manual actions are short in duration, intermittent, and considered moderately strenuous. Therefore, the operator will be able to complete the action as described. This action is not needed for five hours; therefore, smoke or heat will not affect the performance of this manual action. The operator will not have to re-enter the zone where the fire was located to gain access to the accumulators since there are multiple ways to gain access to this area. Appendix R emergency lighting is provided in the area near the accumulator, valve, general Isolation Condenser area where the air cylinder and hose is staged, and access / egress route thereto. This manual action can be performed as directed by the procedures within the allotted time.

The air accumulators were part of the original analysis but the action to recharge these accumulators was never identified in any SER. If the plant shuts down immediately and no cold shutdown repairs are required, then there is adequate air in the accumulator to transition to the Shutdown Cooling System for cold shutdown. If cold shutdown repairs are required, then makeup to the accumulators is required. Therefore, this action was included as part of this exemption request.

ACTION 18
This action is to connect a high pressure air cylinder to the accumulator of Condensate Transfer System valve V-11-36. This air-operated valve is used to control makeup to the Isolation Condenser. The valve is provided with a control air accumulator that provides a minimum of 6 full cycles in 5 hours. As a result, this manual action is necessary to ensure long-term control of this valve and makeup to the Isolation Condensers. The manual operation to connect this air supply is considered a skill of the craft activity, since these tasks are consistent with normally assigned equipment operator duties. There are 300 minutes (5 hours) allotted to complete this manual action. For fire zones TB-FA-26, TB-FZ-11C and TB-FZ-11D, the potential exists for initial manual control of V-11-36 via the hand operator (Action 7). Use of the hand operator would not deplete the accumulator, and thus would further postpone the time until the accumulator required recharge. The estimated travel time from the Control Room to Reactor Building 95' elevation is 11 minutes. The performance time for this action is 15 minutes. In addition, 30 minutes has been allotted to obtain the procedure and get briefed. Therefore, the total time to execute this operator manual action is 56 minutes. Margin associated with this

manual action is at least 244 minutes. There are no ALARA, smoke and personal protective clothing requirements associated with the performance of this manual action. Radiation monitoring has been performed with the Isolation Condenser initiated. It was noted that changes in the radiation levels with the Isolation Condenser in service would not prevent the ability of the operators to perform this action. The temperatures in this area are not expected to present any challenge to the manual actions being performed. The manual actions are short in duration, intermittent, and considered moderately strenuous. Therefore, the operator will be able to complete the action as described. This action is not needed for five hours; therefore, smoke or heat will not affect the performance of this manual action. For a fire in these fire areas / zones, the operator has the ability to access and perform the task, which is located outside the fire-affected zones of concern. Appendix R emergency lighting is provided in the area near the accumulator, valve, general Isolation Condenser area where the air cylinder and hose is staged, and access / egress route thereto. This manual action can be performed as directed by the procedures within the allotted time.

The air accumulators were part of the original analysis but the action to recharge these accumulators was never identified in any SER. If the plant shuts down immediately and no cold shutdown repairs are required, then there is adequate air in the accumulator to transition to the Shutdown Cooling System for cold shutdown. If cold shutdown repairs are required, then makeup to the accumulators is required. Therefore, this action was included as part of this exemption request.