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J.E. Pollock
Site Vice President

March 6, 2009

Re: Indian Point Unit 3
Docket No. 50-286
NL-09-032

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

Subject: **Request for Exemption from 10 CFR 50, Appendix R, Paragraph III.G.2 for Use of Operator Manual Actions for Indian Point Unit No. 3**

- References:
1. NRC Regulatory Issue Summary (RIS) 2006-010, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions"
 2. NRC Inspection Procedure 71111.05T, "Fire Protection (Triennial)"

Dear Sir or Madam:

The purpose of this letter is to request exemptions from the requirements of 10 CFR 50, Appendix R in accordance with the guidance contained in NRC RIS 2006-010 (Reference 1), and in accordance with 10 CFR 50.12, "Specific exemptions." The Exemption Request is contained in Attachment 1.

Entergy Nuclear Operations, Inc, (Entergy) has reviewed the fire protection licensing bases for Indian Point Unit 3 (IP3) relative to 10 CFR 50, Appendix R, Paragraph III.G and the use of operator manual actions (OMAs) to mitigate certain potential spurious operations or maloperation of credited safe-shutdown components that could be caused by fire damage to components and/or cables.

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Reference 1 allows licensees to differentiate between those credited OMAs that have been previously reviewed by the Staff with approval, acknowledgement, or concurrence of these actions documented in one or more Safety Evaluation Reports, and those credited OMAs for which there is no record of prior Staff review and approval or concurrence of the OMAs. As exemptions are required in either case, Entergy has chosen to include all OMAs in one grouping as identified in Attachment 2.

The credited OMAs have been evaluated against the acceptance criteria of NRC Inspection Procedure 71111.05T (Reference 2) and confirmed to be feasible and reliable operator actions during the post-fire coping scenario. Further, these OMAs are consistent with the Staff's acceptance criteria for use as interim compensatory actions, and it is Entergy's position that these same credited OMAs are suitable and appropriate as permanent elements of the post-fire safe-shutdown strategy. The alternate shutdown strategy that is implemented for III.G.3 areas relies extensively on local OMAs for achieving and maintaining hot shutdown conditions, and utilizes further local OMAs, augmented by post-fire repairs for achieving and maintaining cold shutdown conditions. In contrast, the OMAs described for the listed III.G.2 fire areas are in each case representative of only a small subset of the OMAs credited for implementation of the more extensive alternate shutdown strategy.

The credited but unapproved OMAs described in Attachment 2 affect five fire areas in which compliance with one or more elements of Appendix R Paragraph III.G.2 is claimed. These OMAs, or more appropriately, sets of OMAs, in each case consist of a small number of manual actions that can be accomplished in a timely manner using the normal operations shift staff. These groupings of OMAs, in any of the affected fire areas, are bounded by the scenario presented to the operations shift staff in implementing the alternate shutdown methodology for those fire areas in which compliance with Appendix R Paragraph III.G.3 is necessary.

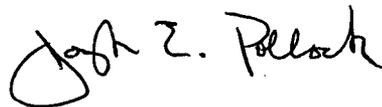
It is Entergy's belief that the requested exemption(s) should be granted, as:

- The identified OMAs are feasible and reliably implemented with the available operations shift staff, even considering the adverse conditions encountered during the post-fire environment and in consideration of possible multiple spurious actuations;
- Limited hazards and existing fire protection features provide assurance that the need to implement the OMAs is remote;
- No demonstrable fire/nuclear safety benefit would be gained by implementation of additional modifications in lieu of continued crediting of the defined OMAs, as credible and reliable means of achieving and maintaining safe-shutdown conditions.

- As required by 10 CFR 50.12(a)(1), 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.

There are no new commitments being made in this submittal. If you have any questions or require additional information, please contact Mr. Robert W. Walpole, IPEC Licensing Manager at (914) 734-6710.

Sincerely,



Joseph E. Pollock
Site Vice President
Indian Point Energy Center

Attachments:

1. Request for Exemption from 10 CFR 50, Appendix R, Paragraph III.G.2 For Use of Operator Manual Actions
2. Technical Basis in Support of Exemption Request

cc: Mr. John P. Boska, Senior Project Manager, NRC NRR DORL
Mr. Samuel J. Collins, Regional Administrator, NRC Region I
NRC Resident Inspector's Office, Indian Point Energy Center
Mr. Paul Eddy, New York State Department of Public Service
Mr. Robert Callender, Vice President NYSERDA

ATTACHMENT 1

**Request for Exemption from 10 CFR 50, Appendix R, Paragraph III.G.2
For Use of Operator Manual Actions**

**ENTERGY NUCLEAR OPERATIONS, INC.
Indian Point Nuclear Generating Unit No. 3
Docket No. 50-286**

**Request for Exemption from 10 CFR 50, Appendix R, Paragraph III.G.2
For Use of Operator Manual Actions**

1.0 EXEMPTION REQUEST

10 CFR 50, Appendix R, Paragraph III.G.2 requires the following:

Except as provided for in paragraph G.3 of this section, where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:

- a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier;
- b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or
- c. Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area;

Inside noninerted containments one of the fire protection means specified above or one of the following fire protection means shall be provided:

- d. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards;
- e. Installation of fire detectors and an automatic fire suppression system in the fire area; or
- f. Separation of cables and equipment and associated non-safety circuits of redundant trains by a noncombustible radiant energy shield.

10 CFR 50, Appendix R, Paragraph III.G.3 requires the following:

Alternative or dedicated shutdown capability and its associated circuits, independent of cables, systems or components in the area, room, zone under consideration should be provided:

- a. Where the protection of systems whose function is required for hot shutdown does not satisfy the requirement of paragraph G.2 of this section; or
- b. Where redundant trains of systems required for hot shutdown located in the same fire area may be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems.

In addition, fire detection and a fixed fire suppression system shall be installed in the area, room, or zone under consideration.

Consequently, unless alternative or dedicated shutdown capability is provided or an exemption from paragraph III.G.2 is granted, circuits which could cause maloperation or prevent operation of redundant trains for post-fire safe shutdown and are located in the same fire area must be protected in accordance with paragraph III.G.2.

As detailed in Attachment 2, Indian Point Unit 3 (IP3) credits a number of manual actions in lieu of one of the means specified in paragraph III.G.2 to ensure a train is free of fire damage when redundant trains are in the same fire area. Therefore, Entergy Nuclear Operations, Inc. (Entergy) hereby requests an exemption from the requirements of 10 CFR 50, Appendix R, Paragraph III.G.2 for IP3 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 located in the same fire area. The fire areas involved are Fire Areas AFW-6, PAB-2, ETN-4, TBL-5, and YARD-7.

2.0 BACKGROUND

As understood by many licensees (including Entergy) since the issuance of 10CFR50, Appendix R, the use of local operator manual actions (OMAs) to facilitate post-fire safe-shutdown was not explicitly prohibited by Paragraph III.G.2, and therefore in many cases, licensees' post-fire shutdown procedures include the use of such actions to mitigate situations in which cables or components could be damaged in a given fire scenario. However, the regulatory activities leading up to the proposed (now-withdrawn) "Manual Action Rule," and the issuance of RIS 2006-010 (Reference 7.1 of Attachment 2), have confirmed the NRC Staff's position that the crediting of OMAs was not explicitly or implicitly permitted by the regulation, and that any crediting of such manual actions for

compliance with III.G.2, without prior review and approval by the Staff in the form of an exemption, is unacceptable and noncompliant with Appendix R.

As evidenced by the development of the draft Manual Action Rule, the NRC Staff recognized this "misinterpretation" of III.G.2 was widespread among licensees, and that OMAs had been broadly integrated into the compliance basis and shutdown models for many fire areas in which compliance with III.G.2 was identified. It was further recognized and in many cases acknowledged during NRC audits/inspections that many of these OMAs had been demonstrated to be well proceduralized, feasible to implement in a sufficiently timely manner, and capable of ensuring with high confidence that the post-fire shutdown capability could be sustained through use of these specific manual actions. However, as the crediting of these OMAs without prior NRC review and approval technically constitutes noncompliance with Appendix R Paragraph III.G.2, the Staff has established guidance in RIS 2006-010 for interim acceptance of these OMAs (subject to specific conditions), pending permanent resolution of the noncompliance concerns.

The permanent resolution of "manual action" noncompliance may be achieved through the exemption process, shutdown methodology changes, plant modifications, or a combination of these approaches.

3.0 LICENSING BASIS

For the fire areas for which this exemption is requested (Fire Areas AFW-6, PAB-2, ETN-4, TBL-5, and YARD-7), the plant's fire protection licensing basis indicates that IP3 is committed to compliance with 10CFR50, Appendix R, Paragraph III.G.2. The explicit requirements of 10CFR50, Appendix R, Paragraph III.G.2 mandate that (using one of the options given by III.G.2) the redundant trains should be adequately separated and protected, such that in the event of a fire in that area, at least one train will remain free of fire damage, and therefore OMAs (for mitigation or recovery) should not be required. However, as contained in the IP3 Appendix R Safe-Shutdown Analysis (Reference 7.4 of Attachment 2), in the event of a fire in one of the fire areas that are the subject of this exemption request, certain local OMAs are credited to prevent or mitigate certain undesirable equipment operations that may occur due to fire damage to cables or components located in that fire area. In each case, the OMAs described are taken in another area (outside the area affected by the fire) or, in certain cases, are implemented in the affected fire area, after 60 minutes have elapsed, to conservatively ensure that reentry to the fire-affected area is feasible.

As documented by RIS 2006-010, while the stated hot shutdown OMAs may be reasonable, achievable, and an effective means of ensuring the post-fire safe-shutdown (hot shutdown) capability, the crediting of such actions without an approved exemption is not permitted within the options listed under Appendix R, Paragraph III.G.2. Therefore, as it appears that IP3 does not have documentation of prior NRC review and approval in the form of an existing

exemption for the OMAs contained herein, the requirements of Paragraph III.G.2 of Appendix R are not met for the affected fire areas. Therefore, in accordance with RIS 2006-010, the permanent resolution of the OMA noncompliance is to include an approved exemption from the requirements of 10 CFR 50, Appendix R, Paragraph III.G.2 in the licensing basis for the affected fire areas.

It should be noted that not all plant fire areas require an exemption. Fires occurring in some areas require no OMAs, and fires in certain other areas are mitigated in accordance with Appendix R, Paragraph III.G.3 (alternate shutdown), which incorporates the use of OMAs that do not require prior NRC review and approval. The focus of the exemption request is limited to those fire areas for which compliance with Appendix R, Paragraph III.G.2 is claimed and OMAs are credited, in part, for coping with the effects of a fire in that area, and are required to achieve and maintain hot shutdown.

4.0 TECHNICAL BASIS

The technical basis to support this exemption request is contained in Attachment 2. It has been developed in accordance with the guidance of RIS 2006-010 (Reference 7.1 of Attachment 2), NRC Staff Memorandum dated July 19, 2006 (T. Dinh to S. Weerakkody) (Reference 7.2 of Attachment 2), and NRC Inspection Procedure (IP) 71111.05T (Reference 7.3 of Attachment 2). Additional guidance was obtained from SECY 08-0093 (Reference 7.5 of Attachment 2), in the screening of OMAs that require explicit NRC review and approval via the exemption process.

5.0 REGULATORY ANALYSIS

Pursuant to 10 CFR 50.12, the Commission may grant exemptions from the requirements of 10 CFR 50 that are (1) authorized by law; (2) will not present an undue risk to the public health and safety; (3) consistent with the common defense and security; and, (4) special circumstances, as listed in 10 CFR 50.12(a)(2) are present. This exemption request meets the criteria set forth in 10 CFR 50.12, as discussed herein.

5.1 The requested exemption is authorized by law

10 CFR 50.12(a) authorizes the NRC to grant exemptions from its regulations, and no law is known that precludes the NRC from granting the requested exemption. As discussed below, since the exemption request does not present an undue risk to public health and safety, will not endanger the common defense and security, and special circumstances exist, the NRC is authorized to issue the exemption.

5.2 The requested exemption does not present an undue risk to the public health and safety

The credited OMAs in Tables 2 through 9 of Attachment 2 have been evaluated against the acceptance criteria of IP 71111.05T and have been confirmed to be feasible and reliable actions during the post-fire coping scenario. These OMAs, or more appropriately, sets of OMAs, affect five fire areas and in each case consist of a small number of manual actions that can be accomplished in a timely manner using the normal operations shift staff, even considering the potentially adverse conditions encountered during the post-fire environment and in consideration of possible multiple spurious actuations. Use of the OMAs ensures that the effectiveness of the fire protection program is not degraded, and that the credited post-fire safe-shutdown capability is not challenged since at least one train of safe shutdown equipment will remain operable. Further, these OMAs are unlikely to be required to be implemented given the defense-in-depth features of the fire protection program, and the associated low likelihood of a significant fire in any of the fire areas of concern. Based on this and on the determination that safe shutdown even in the event of a fire can be achieved and maintained through the use of OMAs instead of meeting the requirements of Paragraph III.G.2 of Appendix R in all cases, the requested exemption does not present an undue risk to the public health and safety.

5.3 The requested exemption is consistent with the common defense and security

To ensure that the common defense and security are not endangered, the exemption request must demonstrate that the loss or diversion of Special Nuclear Material (SNM) is precluded. As a part of the Indian Point Energy Center (IPEC), IP3 has systems and processes in place that provide protection for the public from diversion of SNM that is licensed to be possessed on site. These systems and processes are those embodied in the "IPEC Physical Security Plan," the "IPEC Security Training and Qualification Plan," the "IPEC Safeguards Contingency Plan," and the "IPEC Security Implementing Procedures." The exemption request contained herein does not involve or affect the systems and processes contained in those documents/programs. Therefore, this exemption does not affect the common defense and security.

5.4. Special circumstances are present

10 CFR 50.12(a) requires that special circumstances be present in order for the Commission to consider granting an exemption. Per 10 CFR 50.12(a)(2)(ii), one special circumstance is that application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.

The underlying purpose of 10 CFR 50, Appendix R is to provide reasonable assurance that safe shutdown of the reactor can be achieved and maintained in the event of a postulated fire in any plant area. Circuits which could cause maloperation or prevent operation of redundant trains for post-fire safe shutdown and are located in the same fire area must be protected in accordance with Paragraph III.G.2 of Appendix R. If such protection is not provided, then Paragraph III.G.2 specifies that alternative or dedicated shutdown capability be provided or an exemption from Paragraph III.G.2 be granted. The NRC permits exemptions from III.G.2, as described in RIS 2006-10 via the use of OMAs as long as those actions are feasible and can be reliably implemented. The NRC has provided acceptance criteria set forth in NRC Inspection Procedure 71111.05T in order to evaluate if OMAs are feasible and reliably implemented.

The credited OMAs listed in Tables 2 through 9 of Attachment 2 have been evaluated against the acceptance criteria of IP 71111.05T and have been confirmed to be feasible and reliable operator actions during the post-fire coping scenario. Therefore, since an acceptable alternative to the regulation that has been provided by the NRC has been demonstrated to be acceptable for the OMAs listed in Tables 2 through 9 of Attachment 2, no demonstrable fire/nuclear safety benefit would be gained by the installation of additional modifications to comply with Paragraph III.G.2 of Appendix R in lieu of the crediting of the defined OMAs as credible and reliable means of achieving and maintaining safe-shutdown conditions. Therefore, the underlying purpose of the rule is satisfied and the application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule.

6.0 CONCLUSION

This request for exemption is warranted under the provisions of 10 CFR 50.12, in that it is authorized by law, does not present an undue risk to the public health and safety, and is consistent with the common defense and security. Further, it meets the requirement for a special circumstance in that it satisfies the underlying purpose of 10 CFR 50 Appendix R by providing reasonable assurance that safe shutdown of the reactor can be achieved and maintained in the event of a fire using operator manual actions in certain fire areas in lieu of the separation and protection requirements of Appendix R.

ATTACHMENT 2

Technical Basis in Support of Exemption Request

**ENERGY NUCLEAR OPERATIONS, INC.
Indian Point Nuclear Generating Unit No. 3
Docket No. 50-286**

Technical Basis in Support of Exemption Request

1. Background and Identification of Manual Actions

The explicit requirements of 10CFR50, Appendix R, Paragraph III.G.2 mandate that (using one of the options given by III.G.2) redundant trains of safe-shutdown equipment should be adequately separated and protected, such that in the event of a fire in that area, at least one train will remain free of fire damage, and therefore operator manual actions (for mitigation or recovery) should not be required. In response to a review of the IP3 post-fire shutdown methodology and Appendix R compliance bases to address NRC RIS 2006-010 (Reference 7.1), it was noted that in certain fire areas in which separation would typically be expected to meet the requirements of Appendix R, Paragraph III.G.2, the use of operator manual actions (OMAs) is credited in the IP3 Appendix R Safe-Shutdown Analysis (Reference 7.4) to mitigate certain undesirable equipment operations that may occur due to fire damage to cables or components located in those fire areas in order to restore or maintain the associated safe (hot) shutdown functions.

The fire areas where OMAs are credited are Fire Areas AFW-6, PAB-2, ETN-4, TBL-5, and YARD-7. Table 1 provides a summary of the Fire Hazards Analysis for each fire zone in those fire areas. Tables 2 through 9 list the specific OMAs that may be required to be performed in each of these III.G.2 fire areas. The OMAs have been reviewed in accordance with the guidance of RIS 2006-010, NRC Staff Memorandum dated July 19, 2006 (T. Dinh to S. Weerakkody) (Reference 7.2), and the acceptance criteria provided by Enclosure 2 of NRC Inspection Procedure 71111.05 (Reference 7.3) and have been determined to provide feasible and reliable mitigating actions to compensate for the potential fire-induced failure or spurious actuation of the identified safe-shutdown components.

It should be noted that not all IP3 fire areas are listed in Table 1. Fires occurring in some areas require no OMAs, and fires in certain other areas are mitigated in accordance with Appendix R, Paragraph III.G.3 (alternate shutdown). The focus of the issue addressed herein is limited to those fire areas in which compliance with Appendix R, Paragraph III.G.2 is claimed and manual actions are credited, in part, for mitigation or recovery of certain elements of the post-fire safe-shutdown capability in the event that a postulated fire in any one of the listed fire areas causes damage to redundant safe-shutdown equipment trains located in that fire area. In each case, the manual actions described are taken in another area (outside the area affected by the fire), or in certain cases are implemented in the affected fire area, after 60 minutes have elapsed, to conservatively ensure that reentry to the fire-affected area is feasible.

Consistent with the guidance given by References 7.1 and 7.2, the OMAs listed in Tables 2 through 9 have been implemented as interim compensatory measures, in lieu of fire watches, pending permanent resolution of the stated Appendix R

compliance concerns. The basis for acceptability of these actions, both as interim compensatory measures and as the long-term Appendix R, Paragraph III.G.2 compliance basis (pending NRC approval via the requested exemption) in this regard is discussed herein.

As shown in Table 1, each of the affected fire areas has one or more mitigating fire protection characteristics that provide a level of defense-in-depth protection, thus minimizing the necessity to use post-fire shutdown procedures for credible fire scenarios in these areas. When these defense-in-depth features are considered in concert with the station fire prevention measures of housekeeping controls, hot work constraints, and transient combustible controls, and the fire brigade manual suppression capabilities, the likelihood of the need for the identified OMAs is reduced further.

2. Binning of Manual Actions Per Guidance of SECY-08-0093

The credited OMAs have been screened to establish those that are credited for protection or recovery of the REQUIRED safe-shutdown train, versus those OMAs that are credited for protection or recovery of equipment that is "Important to Safe Shutdown," as outlined by SECY-08-0093 (Reference 7.5). Those OMAs that are identified as credited for protection of the REQUIRED SSD train, and that are not documented as acceptable OMAs in a previously granted exemption to Appendix R are the subject of this exemption request. Those OMAs that are identified as credited for protection or recovery of equipment "important to safe shutdown," i.e., that are NOT part of the REQUIRED SSD train, are considered acceptable actions, provided that they are demonstrated to be feasible and reliable, without requiring exemption from the requirements of Appendix R.

The IP3 Appendix R Safe-Shutdown Analysis was reviewed to identify all cases in which OMAs have been credited as an element of the safe-shutdown methodology in III.G.2 fire areas. These OMAs were then screened based on criteria given by SECY-08-0093 and NEI-00-01, Draft Rev. 2(c) (Reference 7.6) to isolate those OMAs that are credited for the protection or recovery of the required/credited safe-shutdown train in the affected fire areas. The screening criteria that were applied, and the resultant tabulation of the OMAs of concern, is captured in engineering report IP-RPT-08-00072 (Reference 7.7).

3. Review of Credited Manual Actions as Acceptable Compensatory Measures Per IP 71111.05

The guidance of Enclosure 2 of Inspection Procedure 71111.05 is referenced in the July 19, 2006 NRC Staff memorandum (T. Dinh to S. Weerakkody). Enclosure 2 of IP 71111.05 describes the criteria that must be considered when determining whether an OMA, credited as an interim compensatory measure, is appropriate and feasible to credit in this capacity. The criteria, along with the IP3-specific responses, are discussed below.

i. Applicability

The identified OMAs are those which are credited in fire areas under which compliance to Appendix R, Paragraph III.G.2 is credited, and for which manual actions there is apparently no record of prior NRC review and approval, in an SER or approved exemption, of the use of these actions to establish equivalent compliance with III.G.2 requirements.

ii. Diagnostic Instrumentation

For fire scenarios occurring in III.G.2 fire areas, evacuation of the Central Control Room (CCR) and comprehensive implementation of alternative shutdown methods is not required or credited. As such, key diagnostic instrumentation can be expected to remain available in the CCR to alert operators to implement the contingency OMAs as credited in the IP3 Appendix R Safe-Shutdown Analysis. Key indicators that trigger the need for local operator intervention for the credited set of OMAs include not only the RCS and secondary system instrumentation, but also the failure of components to respond or reliably indicate status in the CCR. Based on field notes compiled from simulator exercises in which bounding fire area scenarios were modeled, it is judged that the available CCR instruments and indicators, combined with operator response in accordance with EOPs, AOPs, fire safe shutdown procedures, and other supporting procedures, provide reasonable assurance of timely diagnosis of conditions requiring the dispatch of operator(s) to perform the credited OMAs outside the CCR.

iii. Environmental Considerations

Radiation levels: None of the identified OMAs require an operator to enter high radiation fields.

Emergency lighting per Appendix R, Paragraph III.J: Emergency lighting is installed per Appendix R, Paragraph III.J, as necessary for access/egress to OMA locations, and for task performance at those locations.

Temperature and humidity: The credited OMAs are generally not conducted in the area directly affected by the fire, and given that they are performed in support of hot shutdown operation, they are performed relatively early in the coping period. As a result, in the event of the failure of normal HVAC systems early in the scenario, zone/room heatup that creates habitability concerns is not expected. However, for those specific cases in which it is necessary to reenter the fire area no less than one hour (except for the AFW Pump Room) after the postulated fire event, sufficient time is available to initiate smoke/heat venting through fixed ventilation systems and augmented by portable smoke ejectors, consistent with the

Pre-Fire Plans, to ensure operator habitability to implement the necessary OMAs.

Smoke and toxic gases: The identified OMAs are generally not conducted in the area directly affected by a postulated fire, and thus significant quantities of smoke and toxic gases impacting the areas where OMAs are performed are not typically expected. However, for those specific cases in which it is necessary to reenter the affected fire area, reentry is not credited in less than one hour after the start of the fire event, ensuring adequate time for extinguishment of the fire and initiation of smoke venting from the affected area. Pre-staged SCBAs, sufficient to equip the full operating crew, are available for deployment in response to post-fire environmental conditions.

iv. Staffing

Timed field walkthroughs of Abnormal Operating Procedure 3-AOP-SSD-1 (Reference 7.8) have been performed to validate that the number of operators available on the watch staff (7) can safely accomplish all required actions within the required time period to meet Appendix R safe-shutdown performance goals. The broad set of operator manual actions required in implementing 3-AOP-SSD-1 bounds the smaller set of manual actions credited for coping with III.G.2 fire area scenarios. The OMAs required for the III.G.2 fire areas are directed by Off-Normal Operating Procedure 3-ONOP-FP-1 (Reference 7.9).

v. Communications

Reliance is placed on radios for communication between plant operators during a post-fire shutdown event. Effective radio communications throughout all required plant areas is ensured by radio repeater stations. The primary radio repeater for IP3 is located inside the protected area. A backup radio repeater (the IP2 repeater station) is located outside the protected area, and is not subject to disruption caused by fire events within the protected area/power block. The repeaters are also equipped with uninterruptible power supplies to ensure continued operation in the event of the loss of normal power to the buildings in which they are located. Field verifications of radio system functionality have validated that communications between the designated control and monitoring locations are feasible and reliable.

vi. Special Tools

Any tools that are required in support of post-fire hot shutdown OMAs are pre-staged at the locations where they would be used. These consist of common tools such as wrenches, banding cutters, pliers. Where special tools/equipment are required, these are designated for post-fire cold

shutdown repairs, and the necessary tools and supplies are pre-staged in designated locations. The staging of necessary tools is confirmed via periodic surveillance.

vii. Training

The fire scenarios that may be encountered in III.G.2 fire areas may involve the use of EOPs and AOPs, as well as post-fire safe-shutdown procedure(s), in coping with the fire scenario. Initial and periodic requalification Operator training typically is provided on these procedures, consistent with standard licensed and non-licensed operator training programs, as well as emergent needs as identified by training evaluation action requests.

viii. Accessibility

Where ladders are required for access to components to perform OMAs, appropriate ladders are staged in accordance with plant procedures and the presence of these ladders is verified periodically in accordance with plant surveillance procedures.

ix. Procedures

Post-fire operator manual actions are clearly defined in procedures 3-ONOP-FP-1, 3-AOP-SSD-1, and supporting procedures. Where CCR controls and indication are not assured to be reliably operable, sufficiently detailed guidance is provided in these procedures to direct the operators to an alternate component or operating method that is assured to be available and viable for the specific fire scenario under consideration.

x. Verification and Validation

The post-fire OMAs have been validated through timed operator walkthroughs, using as the basis an enveloping scenario addressed by 3-AOP-SSD-1. When utilizing 3-AOP-SSD-1, the most challenging set of local manual operator actions (number of actions and time sensitivity of actions) is presented to the operations shift crew, and this set of actions is considered to adequately bound the limited set of manual actions that are credited in 3-ONOP-FP-1, and as listed for the fire areas shown in Tables 2 through 9. Note that 3-ONOP-FP-1 also relies principally on shutdown from the CCR. The timed walkthroughs of 3-AOP-SSD-1 have consistently demonstrated that the key safe-shutdown tasks (e.g., restoration of RCS makeup; restoration of auxiliary feedwater to steam generators; mitigation of key potential spurious actuation concerns) can be accomplished in a timely manner to meet the Appendix R safe-shutdown performance goals.

In addition to the validation of key OMAs credited in alternate safe-shutdown procedure 3-AOP-SSD-1, the plant simulator was utilized to perform evaluations of bounding III.G.2 fire scenarios, and based on the field notes compiled from these exercises, there is reasonable assurance that conditions requiring the implementation of the identified OMAs can be identified and mitigated in a sufficiently timely manner to ensure Appendix R performance goals are met.

4. Tabulation of Credited Hot Shutdown Operator Manual Actions

The attached Tables 2 through 9 list, on a fire area basis, the specific OMAs credited for recovery or protection of the credited equipment train for achieving and maintaining hot shutdown conditions in these Appendix R Paragraph III.G.2 fire areas. The manual action lists were extracted from the component, cable, and raceway database used for preparation of the IP3 Appendix R Safe-Shutdown Analysis. As shown by Tables 2 through 9, the total number of OMAs that may be required in response to any single III.G.2 fire scenario to restore or protect the credited/required equipment train is minimal.

The manual action sequences in all of the III.G.2 areas are considered to be bounded by the sequences represented by alternate shutdown (III.G.3) Fire Area CTL-3. The alternate shutdown scenario represented by Fire Area CTL-3 has been drilled through performance of procedure 3-AOP-SSD-1, and successful accomplishment of actions and required time targets has been demonstrated. It is further noted that in Fire Area CTL-3 (which encompasses the CCR, Cable Spreading Room, 480V Switchgear Room, and others), the high concentration of control, power, and instrumentation cables presents the greatest potential for multiple circuit damage and multiple spurious operation scenarios, and thus presents the greatest potential for the entire set of credited manual actions for this area to be performed. In the III.G.2 fire areas addressed by Tables 2 through 9, the cable densities and commonality of routing paths is a small fraction of those represented in Fire Area CTL-3.

5. Defense-In-Depth

The IP3 Fire Protection Program, consistent with NRC guidance as given by BTP APCS 9.5-1, 10 CFR 50, Appendix R, and supporting generic communications, is designed and implemented based on a foundation of defense-in-depth protection. The three tiers of defense in depth consist of:

- Fire Prevention – Preventing fires from starting, through control of fuel and ignition sources and conditions.
- Fire Detection and Suppression – Providing the capability to promptly detect any fires that may occur, and the capability to promptly and effectively control and extinguish any such fire.

- Protection of Safe Shutdown Capability – Providing protection for systems, structures, and components important to safety, such that any fire that is not promptly detected and extinguished will not prevent the safe shutdown of the plant.

The Fire Prevention layer of defense in depth is composed of administrative controls as well as inherent plant design features. Noncombustible materials have been used to the maximum extent practicable in original plant design and in any subsequent plant modifications, including not only structural components, but also (for example) the use of flame-resistant electrical cable insulation. Introduction of combustible materials into the power block is strictly controlled by administrative procedure EN-DC-161 (Reference 7.10) that requires fire protection engineering review and approval prior to the introduction of any significant quantity of transient combustibles into key plant areas. Routine housekeeping inspections ensure validation and enforcement of the controls on transient combustibles and fire hazards. Hot work in key areas of the plant is also controlled administratively, for processes including open-flame work, cutting, welding, and grinding. As a result of the above, the potential for exposure fires (in transient combustibles) and fires resulting from the introduction of significant ignition sources (hot work) is sharply limited.

The Fire Detection and Suppression layer of defense in depth is represented by fire detection and suppression systems that are installed in those plant areas that contain significant combustible hazards. Fire detection includes both smoke and heat detection systems that provide alarms to the CCR. Suppression systems include pre-action, deluge and wet pipe sprinkler systems, aqueous film-forming foam (AFFF) automatic suppression systems, total flooding and local application CO₂ suppression systems, and Halon 1301 total-flooding suppression systems. A summary of the fire detection and suppression features in all of the fire areas included in the subject exemption request is provided in Table 1.

Hose stations and fire extinguishers are located throughout the plant to facilitate firefighting activities by the fire brigade. As shown in Table 1, areas containing unique or significant hazards are provided with fire detection and/or automatic fire suppression systems. The installed fire detection and automatic suppression systems, in conjunction with fire brigade response and deployment of the available manual fire suppression features, provides assurance that a fire will be precluded from rapidly growing and involving other fire zones or areas.

The Protection of Safe-Shutdown Capability layer of defense in depth is represented by the fire barriers enclosing each fire area that provide assurance that a fire that is not promptly detected and/or not promptly controlled and suppressed, will ultimately be contained within the fire area of origination. As the IP3 Appendix R Safe-Shutdown Analysis places reliance on a postulated fire being confined to the fire area of origin, the passive (fire barrier) features ensure the continued integrity of the post-fire safe-shutdown analysis and the post-fire safe-shutdown procedures that have been developed based on that analysis.

Each fire area is separated from adjacent fire areas with a barrier commensurate with the hazards of the area. The fire barriers typically have a 3-hour fire resistance rating, including the barrier, doors, HVAC fire dampers, and penetration seals. However, other barrier types, including spatial separation, are used to divide fire areas. These fire area boundaries are described in the IP3 Fire Hazards Analysis (Reference 7.11). The IP3 Appendix R Safe-Shutdown Analysis documents the basis for achieving safe shutdown following a fire in any given fire area. The equipment lost and the equipment available has been reviewed and the actions necessary to ensure shutdown have been identified in the post-fire safe-shutdown procedures for each fire area. The OMAs addressed by the subject exemption request are part of the actions that may be necessary in support of the safe-shutdown methodology established by the IP3 Appendix R Safe-Shutdown Analysis.

6. Fire Hazards and Fire Protection Features in III.G.2 Fire Areas

An initiating fire area is the area in which one or more OMAs are credited to mitigate maloperation of equipment in the required/credited equipment train caused by potential fire-induced damage to components or cables located in that area. The five III.G.2 fire areas in which the OMAs discussed herein are credited are:

- **Fire Area AFW-6:**
Auxiliary Feedwater Pump Room
- **Fire Area ETN-4:**
Upper and Lower Electrical Tunnels including the common entryway at the Cable Spreading Room, the Upper and Lower Electrical Penetration Areas, including the connecting stairwell, and the Electrical Tunnel Fan Room
- **Fire Area PAB-2:**
Primary Auxiliary Building (PAB), Radioactive Machine Shop (RAMS) and Fan House Buildings
- **Fire Area TBL-5:**
Turbine Building and the Auxiliary Feedwater Pump Building with the exception of the Auxiliary Feedwater Pump Room
- **Fire Area YARD-7:**
The external yard areas, Intake Structure, Appendix R Diesel Generator Building, Backup Service Water Pump Pad, and miscellaneous buildings not associated with power generation

The details of combustible loading/fire severity and active fire protection features for all fire zones comprising the five fire areas of concern are listed in Table 1. Note that most of these fire areas are comprised of a number of fire zones consisting of

separate compartments, or fire zone delineations based on spatial separation. As described below, the character of the localization of the hazards and combustibles by fire zone, combined with the separation between fire zones by spatial and barrier separation, provide reasonable assurance that fires that occur within a given zone will be confined to the zone of origination.

As shown in Table 1, most fire zones comprising the above five fire areas are characterized by LOW combustible loading, corresponding to less than 100,000 BTU/ft², or an equivalent fire severity of 75 minutes or less. All fire zones characterized as having a HIGH combustible loading (greater than or equal to 200,000 BTU/ft², or an equivalent fire severity of at least 150 minutes) are typically equipped with automatic fire suppression systems, appropriate for the hazards of the area, thus sharply limiting the expected extent of any fire that may occur. The remaining fire zones are characterized by MODERATE combustible loading, with a combustible load of 100-200,000 BTU/ft², or an equivalent fire severity of 75 to 150 minutes. Of the fire zones classified as containing MODERATE or HIGH combustible loading, 13 fire zones are not provided with automatic fire suppression or detection systems, although manual fire suppression equipment is available, as shown in Table 1. Of these 13 fire zones, five are categorized as exhibiting HIGH combustible loading. No safe-shutdown related components or cables are located in these fire zones. Of the remaining 8 zones, which are characterized by MODERATE combustible loading, no safe-shutdown related components are located in these zones, although several safe-shutdown cables are located in Fire Zones 4A, 6A, 20A, and 30A of Fire Area PAB-2. These fire zones are discussed further as follows:

- **Fire Zone 4A** (PAB El. 34' Corridor), exhibits a MODERATE combustible loading principally as the result of the small floor area of the zone, and the conservative assumption of a substantial transient combustible load. In actuality, the transient combustible loading in the zone is limited by the controls of procedure EN-DC-161, and without appropriate compensatory measures, transient combustibles within the zone would not be permitted to accumulate to this level. The zone has few credible ignition sources. The potential fire-induced failure of the 10 safe-shutdown related cables routed through the zone is mitigated as described by the IP3 Appendix R Safe-Shutdown Analysis.
- **Fire Zone 6A** (PAB El. 34' Valve Room) also exhibits a MODERATE combustible loading principally as the result of the extremely small floor area of the zone, and the conservative assumption of a substantial transient combustible load. In point of fact, the transient combustible loading in the zone is limited by the controls of procedure EN-DC-161, and without appropriate compensatory measures, transient combustibles within the zone would not be permitted to accumulate to this level. The zone has few credible ignition sources. The potential fire-induced failure of the two safe-shutdown related cables routed through the zone is mitigated as described by the IP3 Appendix R Safe-Shutdown Analysis.

- **Fire Zone 20A** (PAB EI.55' Sample Room) also exhibits a MODERATE combustible loading principally as the result of the extremely small floor area of the zone, and the conservative assumption of a substantial transient combustibile load. In point of fact, the transient combustibile loading in the zone is limited by the controls of procedure EN-DC-161, and without appropriate compensatory measures, transient combustibles within the zone would not be permitted to accumulate to this level. The zone has few credible ignition sources. The potential fire-induced failure of the single safe-shutdown related cable routed through the zone is mitigated as described by the IP3 Appendix R Safe-Shutdown Analysis.
- **Fire Zone 30A** (PAB EI. 73' Valve Corridor) also exhibits a MODERATE combustibile loading principally as the result of the extremely small floor area of the zone, and the conservative assumption of a substantial transient combustibile load. In point of fact, the transient combustibile loading in the zone is limited by the controls of procedure EN-DC-161, and without appropriate compensatory measures, transient combustibles within the zone would not be permitted to accumulate to this level. The zone has few credible ignition sources. The potential fire-induced failure of the two safe-shutdown related cables routed through the zone is mitigated as described by the IP3 Appendix R Safe-Shutdown Analysis.

Fire Areas and Safe-Shutdown Analysis Areas

The above five listed Fire Areas (AFW-6, PAB-2, ETN-4, TBL-5, and YARD-7), in addition to two fire areas not addressed herein, form the foundation upon which the IP3 Appendix R Safe-Shutdown Analysis has been developed. Note that the two remaining fire areas, CTL-3 and CNT-1, are not discussed herein, as they are not the focus of previously unapproved III.G.2 OMAs. As discussed below and as illustrated by Tables 3 through 7, Fire Areas ETN-4 and PAB-2 are further subdivided into safe-shutdown "analysis" areas, as defined and analyzed in the IP3 Appendix R Safe-Shutdown Analysis. The subdivision of Fire Area ETN-4 into Analysis Areas (ETN-4{1} through ETN-4{4}) and Fire Area PAB-2 into Analysis Areas PAB-2{1} through PAB-2{5} is based upon spatial separation, active and passive fire protection features, safe-shutdown equipment locations, and specific exemptions granted for these areas. As such, for purposes of the IP3 Safe-Shutdown Analysis, these analysis areas are effectively considered to be separate fire areas. The details of the separation bases and applicable exemptions granted for these fire areas are described in References 7.4 and 7.11. Note that not all of the Fire Area ETN-4 and PAB-2 analysis areas are discussed below, as not all of the analysis areas involve unapproved III.G.2 OMAs.

Summary descriptions of each of the III.G.2 Fire/Analysis Areas are provided below. The combustibile loading, types of combustibles, postulated fires, available detection and suppression, and smoke/hot gas ejection methods are identified.

Fire Area AFW-6, AFW Pump Building Elevation 18'-6" (AFW Pump Room)

This fire area consists of a single room (the AFW Pump Room), and it is also designated Fire Zone 23. Alternate safe shutdown and safety-related equipment and cabling are located in the zone.

The overall combustible loading for this fire area is LOW. Combustibles in this fire area include: cable insulation, small quantities of lube oil, and small quantities of Class A combustibles. Based on the types and amounts of combustibles, the postulated fire is a slow developing cable fire or lubricating oil fire. The wet pipe sprinkler system is designed to control the fire, and its activation results in a CCR alarm which will result in subsequent response by the fire brigade to extinguish the fire, if required. Ionization detectors also result in a CCR alarm, providing early warning of a fire condition. Smoke and hot gases can be evacuated to the exterior via wall exhaust fans and portable smoke ejectors.

OMAs that may need to be performed as a result of a fire in Fire Area AFW-6 consist of four discrete action sets that are listed in Table 2.

Fire Area ETN-4, Electrical Tunnels

Within Fire Area ETN-4, the anticipated fire is a slow developing cable fire located in the cable trays. Thermal detectors in the cable trays provide early warning followed by activation of the preaction sprinkler system in the cable trays, which is expected to control the fire. Early warning detection is also provided by area-wide ionization detectors. Activation of both detection systems will result in CCR alarm and subsequent response by the fire brigade to extinguish any remaining fire. Smoke and hot gases can be evacuated to the exterior via the Electrical Penetration Tunnel Ventilation System and portable smoke ejectors.

The analysis areas of concern, ETN-4{1}, ETN-4{3}, and ETN-4{4}, are discussed below.

Fire/Analysis Area ETN-4{1} Entrance to the Electrical Tunnels, Fire Zones 7A and 60A

This analysis area includes those cable trays in the Electrical Tunnel, twenty feet in from where the floor of the Upper tunnel begins, for both the Upper and Lower tunnels and those raceways between cable tray stacks. The entrance to the tunnel is an area which contains both trains of safe shutdown equipment.

OMAs that may need to be performed as a result of a fire in Fire/Analysis Area ETN-4{1} consist of 14 discrete action sets that are listed in Table 3.

Fire/Analysis Area ETN-4{3} Upper Electrical Penetration Area and Electrical Tunnel Fan Room, Fire Zones 73 and 73A

The Upper Electrical Penetration Area is the normal access for cables which are routed to the Containment Building (VC). This area also contains instrument isolation cabinets and alternate power supplies for alternative shutdown.

OMAs that may need to be performed as a result of a fire in Fire/Analysis Area ETN-4{3} consist of four discrete action sets that are listed in Table 4.

Fire/Analysis Area ETN-4{4} Lower Electrical Tunnel and Penetration Area, Fire Zones 7A, 74A

The Lower Electrical Tunnel analysis area contains safe shutdown cables for components located in the Primary Auxiliary Building and the Containment Building (VC). This area extends from the mouth of the tunnel up to and including the Electrical Penetration Area.

OMAs that may need to be performed as a result of a fire in Fire/Analysis Area ETN-4{4} consist of one discrete action set that is shown in Table 5.

Fire Area PAB-2, Primary Auxiliary Building

Within Fire Area PAB-2, the worst case fire is expected to occur in one of the fire zones for which Appendix R exemptions have been previously granted (Zones 1, 3, 4, 5, 6, 7 or 17A) or in adjacent zones (12A, 21A, 58A or 69A) based on the hazards present and the potential consequences. The postulated fire in Zone 1, 3, 4, 5, 6, or 7 is a rapidly developing oil-based fire associated with the respective safe shutdown pump located in each of these zones (CCW, RHR or Charging). In Fire Zone 17A, the postulated fire is a slow developing cable fire. Area-wide early warning detection of the fire is provided in each of these zones, including the under-floor area at the MCCs in Zone 17A, resulting in Control Room alarm. Adjacent zones 12A, 21A, 58A and 69A contain early-warning detection systems commensurate with the hazards present in those areas to assure that a fire originating in zones adjacent to safe shutdown equipment will not affect redundant safe shutdown equipment. Subsequent response by the fire brigade is expected to extinguish any fires. Smoke and hot gases can be evacuated to the exterior via the Primary Auxiliary Building Ventilation System and portable smoke ejectors.

The analysis areas of concern, PAB-2{3} and PAB-2{5}, are discussed below.

Fire/Analysis Area PAB-2{3} 55' Elevation Charging Pump Rooms, Fire Zones 5, 6 and 7

The three charging pumps are located on the 55' elevation of the Primary Auxiliary Building. Each charging pump is contained in a separate cubicle. Pumps 31 and 32 have indirect open doorways between the cubicles. Pump 33 is contained within its own cubicle. The safe shutdown analysis requires one charging pump to be free from

fire damage to accomplish the required safe shutdown performance objectives. All fire scenarios have been resolved by relying on either Pump 31 or 32.

The combustible loading for the fire zones comprising this analysis area is MODERATE. Combustibles in these fire zones include: cable insulation, small quantities of lube oil, and small quantities of Class A combustibles. Based on the types and amounts of combustibles, the postulated fire is a slow developing cable fire or lubricating oil fire. Early warning detection is provided by ionization detectors that alarm in the CCR to ensure subsequent response by the fire brigade to extinguish the fire. Smoke and hot gases can be evacuated to the exterior via PAB exhaust fans and portable smoke ejectors.

OMAs that may need to be performed as a result of a fire in Fire/Analysis Area PAB-2{3} consist of one discrete action set that is listed in Table 6.

Fire/Analysis Area PAB-2{5} The Remaining PAB Fan House and RAMS Areas not Covered by Other Analysis Areas

The remaining PAB areas consist of all other elevations and rooms that are not captured as part of Analysis Areas PAB-2{1} through PAB-2{4}. As shown in Table 1, the combustible loading in the balance of the PAB-2 fire zones includes zones with LOW, MODERATE, and HIGH combustible loading characteristics, with appropriate active fire protection features provided, except as discussed above. A postulated fire encompassing all fire zones forming the balance of the PAB is highly unlikely. A fire in the 55' elevation of the PAB is not likely to travel down to the 15' elevation or horizontally through the fan house door/wall to affect all components in both fire zones and all zones in between. However, the safe-shutdown analysis conservatively assumes that all safe-shutdown cables and components located in the fire zones comprising analysis area PAB-2{5} will fail simultaneously, as the result of fire damage.

OMAs that may need to be performed as a result of a fire in Fire/Analysis Area PAB-2{5} consist of four discrete actions, which are listed in Table 7.

TBL-5, Turbine Building and the Auxiliary Feedwater Pump Building with the exception of the Auxiliary Feedwater Pump Room

Fire Area TBL-5 consists of 33 discrete fire zones, with LOW combustible loading character in all but four fire zones. The remaining four fire zones, which exhibit HIGH combustible loading, are also provided with appropriate automatic fire detection and suppression systems, to ensure that any fire in these zones is rapidly detected and controlled.

Within Fire Area TBL-5, the worst-case fire based on existing hazards would involve one of the turbine oil hazards associated with Fire Zone 16 or 17. The anticipated fire is a rapidly developing lube oil fire. Trenches surrounding each of the fire zones prevent the accumulation and spread of lube oil beyond the zone boundaries.

Early warning detection is provided by area-wide thermal detectors that alarm in the CCR, followed by activation of an automatic foam spray suppression system which is designed to control the fire, and subsequent response by the fire brigade to extinguish the fire, if required. Smoke and hot gases can be evacuated to the exterior via the Turbine Building Ventilation System and area doors, and employing the use of portable smoke ejectors as necessary.

OMAs that may need to be performed as a result of a fire in Fire/Analysis Area TBL-5 consist of four discrete action sets that are listed in Table 8.

YARD-7, The external yard areas, Intake Structure, Appendix R Diesel Generator Building, Backup Service Water Pump Pad, and miscellaneous buildings not associated with power generation

Fire Area YARD-7 consists of 41 discrete fire zones, with LOW combustible loading character in all but six fire zones. These six fire zones exhibit HIGH combustible loading and are provided with appropriate automatic fire detection and suppression systems to ensure that any fire in these zones is rapidly detected and controlled, with the exception of Fire Zone 131A (Gas Turbine Substation and Switchgear Equipment). Fire Zone 131A is located remote from any safety-related SSCs, and contains only components associated with the alternate safe-shutdown capability.

Within Fire Area YARD-7, the most significant fire hazard is associated with either Main Transformer 31 (in Fire Zone 64A) or 32 (in Fire Zone 65A). The anticipated fire is a rapidly developing transformer oil fire. Early warning detection is provided by area-wide thermal detectors that alarm in the CCR, followed by actuation of an automatic deluge water spray system which is designed to control the fire, and subsequent response by the fire brigade to extinguish the fire, if required. Fire Zones 64A and 65A are naturally vented to the outside and require no special ventilation actions.

OMAs that may need to be performed as a result of a fire in Fire/Analysis Area YARD-7 consist of two discrete action sets that are listed in Table 9.

In summary, given the limited fire hazards in most fire zones comprising the III.G.2 fire areas, and the provision of appropriate active fire protection features in zones containing significant hazards, combined with the compartmental and/or spatial separation between fire zones within the III.G.2 fire areas, there is reasonable assurance that in the event of a fire in any of the affected fire areas, the likelihood of the need to invoke and implement the credited OMA would be minimal. The likelihood to implement most or all of the potential OMA designated for any given fire area is of even lower likelihood, given the multiple fire-induced failures that would be required to necessitate the use of these OMA measures.

7. References

- 7.1. NRC Regulatory Issue Summary (RIS) 2006-010, "Regulatory Expectations With Appendix R Paragraph III.G.2 Operator Manual Actions"
- 7.2. NRC Staff Memorandum dated July 19, 2006, T. Dinh to S. Weerakkody, "Summary of June 9, 2006 Category 3 Meeting on Technical Issues Clarifications on Post-Fire Operator Manual Actions"
- 7.3. NRC Inspection Procedure 71111.05, "Fire Protection (Triennial)," revised March 6, 2003
- 7.4. IP3 Appendix R Safe-Shutdown Analysis IP3-ANAL-FP-01503, Rev. 2
- 7.5. SECY-08-0093, "Resolution of Issues Related to Fire-Induced Circuit Failures"
- 7.6. NEI 00-01, Draft Revision 2(c), Guidance for Post-Fire Safe Shutdown Circuit Analysis; Appendix H: "Required for Hot Shutdown Versus Important to SSD Components"
- 7.7. Engineering Report IP-RPT-08-00072, Rev. 0; "Operator Manual Action Screening for Appendix R, Section III.G: IP2 and IP3"
- 7.8. 3-AOP-SSD-1, "Control Room Inaccessibility Safe-Shutdown Control," Rev. 5
- 7.9. 3-ONOP-FP-1, "Plant Fires," Rev. 24
- 7.10. Procedure EN-DC-161, Control of Combustibles, Rev. 2
- 7.11. IP3 Fire Hazards Analysis IP3-ANAL-FP-02143, Rev. 4

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
AFW-6	23	Low	19.0	Ionization	Area Wide	Automatic Wet Pipe Sprinklers	Area Wide	CO ₂ Dry Chemical	--	--
ETN-4	7A	Low	59.0	Thermal/Ionization	Cable Trays/ Area Wide	Automatic Preaction Water Spray	Cable Trays Only	CO ₂ Dry Chemical	--	--
ETN-4	60A	Low	68.0	Thermal/Ionization	Cable Trays/ Area Wide	Automatic Preaction Water Spray	Cable Trays Only	CO ₂ Dry Chemical	--	--
ETN-4	73	Low	11.0	None	N/A	None	N/A	CO ₂		
ETN-4	73A	Moderate	96.0	Thermal/Ionization	Cable Trays/ Area Wide	Automatic Preaction Water Spray	Cable Trays Only	CO ₂ Dry Chemical	--	--
ETN-4	74A	Low	28.0	Thermal/Ionization	Cable Trays/ Area Wide	Automatic Preaction Water Spray	Cable Trays Only	CO ₂ Dry Chemical	--	--
PAB-2	1	Low	8.0	Ionization	Area Wide	None	N/A	CO ₂	--	--
PAB-2	1A	Low	9.0	Ionization	Area Wide	None	N/A	None	CO ₂	1
PAB-2	2	Low	35.0	Ionization	Area Wide	None	N/A	Hose Station CO ₂	--	--
PAB-2	2A	Low	15.0	Ionization	Area Wide	None	N/A	Dry Chemical	--	--
PAB-2	3	Low	69.0	Ultraviolet	Area Wide	None	N/A	None	CO ₂ Hose Station	12A 14A
PAB-2	3A	Low	<1.0	None	N/A	None	N/A	None	CO ₂ Hose Station	2
PAB-2	4	Low	74.0	Ultraviolet	Area Wide	None	N/A	None	CO ₂ Hose Station	12A 14A

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Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
PAB-2	4A	Moderate	87.0	None	N/A	None	N/A	Hose Station Dry Chemical	--	--
PAB-2	5	Moderate	85.0	Ionization	Area Wide	None	N/A	None	Hose Stations CO ₂	17A A
PAB-2	5A	Low	6.0	None	N/A	None	N/A	None	None	--
PAB-2	6	Moderate	84.0	Ionization	Area Wide	None	N/A	None	Hose Stations CO ₂	17A
PAB-2	6A	Moderate	75.0	None	N/A	None	N/A	None	Hose Station Dry Chemical	4A
PAB-2	7	Moderate	77.0	Ionization	Area Wide	None	N/A	None	Hose Stations CO ₂	17A
PAB-2	8	Low	19.0	Ionization	Area Wide	None	N/A	CO ₂	--	--
PAB-2	8A	Low	16.0	None	N/A	None	N/A	None	Dry Chemical CO ₂ Hose Station	12A 14A
PAB-2	9	Low	10.0	None	N/A	None	N/A	None	Hose Station Dry Chemical	4A
PAB-2	9A	Low	60.0	Ionization	Area Wide	None	N/A	None	CO ₂ Hose Station	12A 14A
PAB-2	10A	Low	23.0	None	N/A	None	N/A	None	CO ₂ Hose Station	12A 14A
PAB-2	11A	High	166.0	None	N/A	None	N/A	None	CO ₂ Hose Station	12A 14A
PAB-2	12A	Low	42.0	Ionization	15'-0" Corr.	None	N/A	CO ₂	--	--
PAB-2	13A	Low	37.0	None	N/A	None	N/A	None	CO ₂ Hose Station	12A 14A

Table 1
IP3 Fire Hazards Analysis Summary
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Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
PAB-2	14A	Low	48.0	Ionization	Area Wide	Manual Water Spray Curtain	Separates PAB-2 (door) and Trans. Yard	Hose Station	--	--
PAB-2	15A	Moderate	95.0	None	N/A	None	N/A	None	CO ₂ Hose Station	12A 14A
PAB-2	16A	High	> 3 Hours	None	N/A	None	N/A	None	CO ₂ Hose Station	12A 14A
PAB-2	17A	Low	38.0	Ionization	Area Wide	None	N/A	Hose Stations CO ₂ Dry Chemical	--	--
				Ionization	Under Floor, MCC Area	--	--	--	--	--
				Ultraviolet	MCC Area	--	--	--	--	--
PAB-2	18A	Low	66.0	None	N/A	None	N/A	None	Hose Stations CO ₂ Dry Chemical	17A
PAB-2	19A	Low	26.0	None	N/A	None	N/A	None	Hose Stations CO ₂ Dry Chemical	17A
PAB-2	20A	Moderate	92.0	None	N/A	None	N/A	None	Hose Stations CO ₂ Dry Chemical	17A
PAB-2	21A	Moderate	125.0	Ionization & Ultraviolet	Area Wide	None	N/A	None	Hose Stations CO ₂ Dry Chemical	17A
PAB-2	22A	Low	29.0	None	N/A	None	N/A	CO ₂ Dry Chemical	--	--

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
PAB-2	23A	High	152.0	None	N/A	None	N/A	None	CO ₂ Dry Chemical CO ₂	22A 22A 24A
PAB-2	24A	Low	30.0	None	N/A	None	N/A	CO ₂	--	--
PAB-2	25A	Moderate	91.0	None	N/A	None	N/A	None	Hose Stations CO ₂	27A
PAB-2	26A	High	152.0	None	N/A	None	N/A	None	Hose Stations CO ₂	27A
PAB-2	27A	Low	15.0	None	N/A	None	N/A	Hose Stations CO ₂	--	--
PAB-2	28A	Moderate	115.0	None	N/A	None	N/A	None	Hose Stations CO ₂	27A
PAB-2	29A	Moderate	127.0	None	N/A	None	N/A	None	Hose Stations CO ₂	27A
PAB-2	30A	Moderate	108.0	None	N/A	None	N/A	None	Hose Stations CO ₂	27A
PAB-2	31A	Low	63.0	None	N/A	None	N/A	None	Hose Stations CO ₂	27A
PAB-2	32A	Low	64.0	None	N/A	None	N/A	None	Hose Stations CO ₂	27A
PAB-2	58A	Low	16.0	Ionization	PAB 41' Corridor	None	N/A	None	Dry Chemical Hose Stations CO ₂	2A 59A 59A
PAB-2	59A	Low	5.0	Ionization	Area Wide	None	N/A	Hose Stations CO ₂	--	--
PAB-2	61A	Low	< 1.0	None	N/A	None	N/A	None	None	--
PAB-2	62A	Low	15.0	None	N/A	None	N/A	Dry Chemical	None	--

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Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
PAB-2	63A	Low	38.0	None	N/A	None	N/A	None	Hose Stations CO ₂	17A
PAB-2	68A	Low	42.0	None	N/A	None	N/A	None	None	--
PAB-2	69A	Moderate	110.0	Ionization	Area Wide	None	N/A	None	CO ₂ Hose Station	12A 14A
PAB-2	79	Low	25.0	None	N/A	None	N/A	None	Dry Chemical	8A
PAB-2	79A	Low	58.0	None	N/A	None	N/A	None	CO ₂ Hose Station	59A
PAB-2	88A	Moderate	112.0	Ionization	72'-0" El. - Filter Area	Manual Deluge Water Spray	Containment Purge Exh. Charcoal Filter	Hose Stations CO ₂ Dry Chemical	--	--
				--	--	Manual Deluge Water Spray	PAB Exhaust Charcoal Filter	--	--	
				--	--	Manual Deluge Water Spray	Cont. Pressure Relief Charcoal Filter	--	--	
PAB-2	89A	Low	41.0	None	N/A	None	N/A	CO ₂	--	--
PAB-2	107	Low	14.0	Ionization/ Thermal	el. 44'-6" Area Wide Ion. / el. 54' & 73' Area Wide Thermal	None	N/A	Hose Stations CO ₂ Dry Chemical Pressurized Water	--	--
PAB-2	127	Low	50.0	Ionization	Area Wide	None	N/A	CO ₂ Pressurized Water	--	--
PAB-2	128	Low	22.0	Thermal	Area Wide	Automatic Pre-Action Sprinklers	Area Wide	CO ₂ Dry Chemical	--	--
PAB-2	622	Low	43.0	None	N/A	None	N/A	None	Dry Chemical	74A

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMA's Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
TBL-5	16	High	>3 hours	Thermal	Area Wide	Automatic Foam Spray	Lube Oil Storage Tank	None	Hose Stations – water & foam	42A
TBL-5	17	High	>3 hours	Thermal	Area Wide	Automatic Foam Spray	Lube Oil Reservoir, Htrs, Separator	None	Hose Stations – water & foam	42A
TBL-5	18	High	>3 hours	None	N/A	Automatic Wet Pipe Sprinklers	Area Wide	None	Hose Stations – water & foam	42A
TBL-5	19	Low	24.0	None	N/A	Automatic Wet Pipe Sprinklers	Area Wide	None	Hose Station CO ₂ Dry Chemical	37A, 38A 39A, 41A
TBL-5	20	High	>3 hours	Thermal	Area Wide	Automatic Foam Spray	Area Wide (Boiler Feed Pump Oil Console & Oil Accumulators)	Foam Hose Stations	--	--
TBL-5	21	Low	30.0	Thermal	Area Wide	Automatic Foam Spray	Area Wide (H2 Seal Oil Unit)	None	Hose Stations - water Hose Station - foam CO ₂ Dry Chemical	37A

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
TBL-5	37A	Low	53.0	Ionization/ Thermal	MCC 34, 6.9KV Switchgear /Battery & Charger Rm	Automatic Wet Pipe Sprinklers	Area Wide overhead (except Swgr Area), including Battery & Charger Rms	Hose Stations - Water Hose Station - Foam CO ₂ Dry Chemical	--	--
						Automatic Water Spray Exposure Protection	Separates TBL-5 & Trans. Yard			
TBL-5	38A	Low	15.0	Ionization	MCC 32	Automatic Wet Pipe Sprinklers	Area Wide overhead	Hose Station CO ₂ Dry Chemical	--	--

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
TBL-5	39A	Low	37.0	Ionization	MCC 33	Automatic Wet Pipe Sprinklers	Area Wide overhead	None	Hose Stations - Water Hose Station - Foam CO ₂ Wheeled Class D	40A
				Thermal	BFP Oil Console & BFP Drive Turb. HP Bgs.	Automatic Foam Spray	Boiler Feed Pump Oil Console	--	--	--
				--	--	Manual Water Spray	Turbine Building Boiler Feed Pumps			
				--	--	Automatic CO ₂	Local App., Drive Turb. HP Bgs, Boiler Feed Pumps	--	--	--
TBL-5	40A	Low	7.0	None	N/A	Automatic Wet Pipe Sprinklers	Area Wide overhead	Hose Stations - water & foam CO ₂ Wheeled Class D Dry Chemical	--	--
TBL-5	41A	Low	9.0	None	N/A	Automatic Wet Pipe Sprinklers	Area Wide overhead	Hose Station CO ₂ Dry Chemical	--	--
TBL-5	42A	Low	24.0	Ionization	MCC 35	Automatic Wet Pipe Sprinklers	Area Wide overhead	Hose Stations - water & foam	--	--

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
TBL-5	43A	Low	33.0	None	N/A	Automatic Wet Pipe Sprinklers	Area Wide overhead	Hose Stations CO ₂ Halon Pressurized Water	--	--
				--	--	Automatic Water Spray Exposure Protection	Separates TBL-5 and Trans. Yard			
TBL-5	44A	Low	13.0	None	N/A	None	N/A	None	Hose Stations CO ₂ Halon Pressurized Water	43A
TBL-5	45A	Low	3.0	None	N/A	None	N/A	None	--	--
TBL-5	46A	Low	9.0	None	N/A	Automatic Wet Pipe Sprinklers	Area Wide overhead	Hose Stations CO ₂ Dry Chemical	--	--
TBL-5	47A	Low	21.0	None	N/A	Automatic Wet Pipe Sprinklers	Area Wide overhead	Hose Station CO ₂ Dry Chemical	--	--
				Thermal	R4D4 Separator	Automatic Foam Spray	R4D4 Separator			
TBL-5	48A	Low	< 1.0	None	N/A	None	N/A	None	Hose Station CO ₂ Dry Chemical	47A

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
TBL-5	49A	Low	7.0	Ionization/Thermal	Office/Exciter Enclosure, incl. Bgs 10 & 11	Automatic CO2	Total Flooding, Exciter Enclosure and Bearings 10 & 11	Hose Stations CO ₂ Dry Chemical Wheeled Dry Chem Halon Foam Pressurized Water	--	--
TBL-5	50A	Low	< 1.0	Thermal	Governor Housing & Oil Lines & TG Bearings 1-9	Automatic Preaction Spray	Governor Housing & Oil Lines & TG Bearings 1-9	Hose Stations CO ₂ Dry Chemical	--	--
				--	--	Manual CO2	Local App., TG Bgs 1,2,3 & MS Valves in Governor Enclosure	--	--	--
				--	--	Manual CO2	Local App., TG Bgs 4,5,6 & 7	--	--	--
				--	--	Manual CO2	Local App., TG Bearings 8 & 9	--	--	--
TBL-5	51A	Low	6.0	None	N/A	None	N/A	Hose Stations CO ₂	--	--
				Thermal	TB pipe bridge to AFW Pump Bldg	Automatic Water Spray Curtain	TB pipe bridge to AFW Pump Bldg	--	--	--
TBL-5	52A	Low	10.0	None	N/A	None	N/A	Dry Chemical	--	--

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
TBL-5	53A	Low	7.0	None	N/A	None	N/A	None	Dry Chemical Hose Station	52A 54A
TBL-5	54A	Low	14.0	None	N/A	None	N/A	Hose Station	--	--
TBL-5	57A	Low	37.0	Thermal	TB pipe bridge to AFW Pump Bldg	Automatic Water Spray	TB pipe bridge to AFW Pump Bldg	Dry Chemical	--	--
TBL-5	58	Low	67.0	None	N/A	None	N/A	None	Hose House & Hydrant	YARD-7
TBL-5	59	Low	65.0	Ionization	Area Wide	Automatic Wet Pipe Sprinklers	Area Wide	None	Hose Station CO ₂ Dry Chemical	38A
TBL-5	109	Low	32.0	Thermal	Area Wide	Automatic Wet Pipe Sprinklers	Area Wide	CO ₂ Dry Chemical	--	--
TBL-5	110	Low	12.0	Ionization	Area Wide	None	N/A	Hose Station CO ₂ Dry Chemical	--	--
TBL-5	111	Low	2.0	Thermal	Area Wide	Automatic Wet Pipe Sprinklers	Area Wide	Dry Chemical	--	--
TBL-5	112	Low	2.0	Ionization	Area Wide	None	N/A	Hose Station CO ₂	--	--
TBL-5	113	Low	< 1.0	Ionization	Area Wide	None	N/A	CO ₂ Dry Chemical	--	--
TBL-5	114	Low	2.0	Ionization	Area Wide	None	N/A	Hose Station CO ₂	--	--
YARD-7	22	Low	27.0	Photoelectric	Area Wide	None	N/A	Dry Chemical	--	--

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
YARD-7	55A	Low	2.0	Photoelectric	Area Wide	None	N/A	Hose Stations CO ₂	--	--
YARD-7	56A	Low	2.0	None	N/A	None	N/A	Adjacent Yard Hydrant	Hose House & Hydrant	YARD-7
YARD-7	64A	High	> 3 hours	Thermal	Area Wide	Automatic Deluge Water Spray	Main Transformer 31	Adjacent Yard Hydrant	Hose House & Hydrant	YARD-7
				XFMR detectors actuate water curtains	--	Automatic Water Spray Exposure Protection	Separates TBL-5 and Trans. Yard	--	--	--
				--	--	Automatic Water Spray Curtain	Separates XFMR 31 and Unit Aux. XFMR			
YARD-7	65A	High	> 3 hours	Thermal	Area Wide	Automatic Deluge Water Spray	Main Transformer 32	Adjacent Yard Hydrant	Hose House & Hydrant	YARD-7
				--	--	Manual Water Spray Curtain	Separates PAB-2 (door) and Trans. Yard	--	--	--

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
YARD-7	66A	High	> 3 hours	Thermal	Area Wide	Automatic Deluge Water Spray	Unit Auxiliary Transformer	Adjacent Yard Hydrant	Hose House & Hydrant	YARD-7
				XFMR detectors actuate water curtains	--	Automatic Water Spray Exposure Protection	Separates TBL-5 and Trans. Yard	--	--	--
				--	--	Automatic Water Spray Curtain	Separates XFMR 31 and Unit Aux. XFMR			
YARD-7	67A	High	> 3 hours	Thermal	Area Wide	Automatic Deluge Water Spray	Station Auxiliary Transformer	Adjacent Yard Hydrant	Hose House & Hydrant	YARD-7
				--	--	Manual Water Spray Curtain	Separates PAB-2 (door) and Trans. Yard	--	--	--
YARD-7	90A	Low	9.0	None	N/A	None	N/A	Hose Station CO ₂	--	--
YARD-7	91A	Low	9.0	None	N/A	None	N/A	Hose Station CO ₂	--	--
YARD-7	92A	Low	< 1.0	None	N/A	None	N/A	None	Dry Chemical	96A
YARD-7	93A	Low	< 1.0	None	N/A	None	N/A	None	Dry Chemical	96A
YARD-7	94A	Low	< 1.0	None	N/A	None	N/A	None	CO ₂	98A
YARD-7	95A	Low	< 1.0	None	N/A	None	N/A	None	CO ₂	98A
YARD-7	96A	Low	63.0	None	N/A	None	N/A	Dry Chemical		
YARD-7	97A	Low	6.0	None	N/A	None	N/A	None	CO ₂	98A

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
YARD-7	98A	Low	6.0	None	N/A	None	N/A	CO ₂	--	--
YARD-7	105A	Low	N/A	None	N/A	None	N/A	None	None	--
YARD-7	106A	Low	N/A	None	N/A	None	N/A	None	None	--
YARD-7	108	Low	9.0	None	N/A	None	N/A	None	Hydrant & Hose House	YARD-7
YARD-7	115	Low	12.0	Thermal/Photoelectric	Local coverage only	Automatic Wet Pipe Sprinklers	Area Wide	Hose Stations CO ₂ Pressurized Water Dry Chemical	--	--
YARD-7	116	Low	24.0	Photoelectric	Local coverage only	Automatic Wet Pipe Sprinklers	Area Wide	Hose Station CO ₂ Dry Chemical Pressurized Water	--	--
YARD-7	117	Low	47.0	Photoelectric	Local coverage only	Automatic Halon	Total Flooding, TSC Computer Room	Hose Stations CO ₂ Dry Chemical Pressurized Water Halon	--	--
				--	--	Manual Water Spray	TSC/OSC Charcoal Filter	--	--	--
YARD-7	118	Low	47.0	Photoelectric, Thermal and Ionization	Local coverage only inc. underfloor computer area	None	N/A	Hose Stations CO ₂ Pressurized Water Dry Chemical	--	--

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
YARD-7	119	Low	47.0	Thermal/ Photoelectric	Local coverage only	None	N/A	Hose Stations CO ₂ Dry Chemical Pressurized Water	--	--
YARD-7	120	Low	47.0	Photoelectric, Thermal/ Thermal	Local coverage only/ Documents Vault	Automatic Halon	Total Flooding, Documents Vault	Hose Stations Dry Chemical Pressurized Water Halon	--	--
YARD-7	121	Low	47.0	Thermal/ Photoelectric	Local coverage only	Manual Water Spray	Filter Units AS- FU-1,2,3	Hose Stations CO ₂ Dry Chemical Pressurized Water Halon	--	--
YARD-7	122	Low	47.0	Thermal, Photoelectric	Local coverage only	None	N/A	Hose Station CO ₂ Dry Chemical Pressurized Water Halon	--	--
YARD-7	123	Low	47.0	Ionization	Area Wide	None	N/A	Hose Station CO ₂ Dry Chemical Pressurized Water Halon	--	--
YARD-7	125	Low	7.0	Ionization	Area Wide	Automatic Wet Pipe Sprinklers	Area Wide	Hose Stations CO ₂ Dry Chemical Pressurized Water Halon	--	--

Table 1
IP3 Fire Hazards Analysis Summary
For Appendix R, Section III.G.2 Fire Areas in Which OMAs Are Credited

Fire Area	Fire Zone	Category	Equiv. Fire Severity (min)	Fire Detection		Fixed Fire Suppression		Manual Fire Suppression (see Note 1)	Adjacent Manual Suppression	
				Type	Coverage	Type	Coverage		Equipment (see Note 1)	Fire Zone
YARD-7	126	Low	3.0	Ionization	Area Wide	Automatic Wet Pipe Sprinklers	Area Wide	Hose Stations CO ₂ Pressurized Water Foam	--	--
YARD-7	129	Low	30.0	Ionization/ Thermal	Area Wide/ Men's & Women's Rooms	Automatic Wet Pipe Sprinklers	Area Wide	Hose Stations CO ₂ Dry Chemical Pressurized Water	--	--
YARD-7	130	Low	47.0	Ionization/ Thermal	Area Wide/ Men's Room & lunch room	Automatic Wet Pipe Sprinklers	Area Wide	Hose Stations CO ₂ Pressurized Water	--	--
YARD-7	131	High	177.0	Ionization & Thermal	Area Wide	Automatic Halon	Total Flooding	CO ₂ Dry Chemical	--	--
YARD-7	131A	High	> 3 hours	None	N/A	None	N/A	None	Hose House & Hydrant	YARD-7
YARD-7	132	Low	38.0	Ionization/ Infrared	Elec. Pump Room/ Diesel Pump Room	Automatic Wet Pipe Sprinklers	Area Wide, except Elec. Fire Pump Rm	CO ₂ Dry Chemical	--	--
YARD-7	133	Low	< 1.0	Ionization	Area Wide & in Ctrl Panels	None	N/A	CO ₂ Dry Chemical	--	--
YARD-7	136	Low	0.0	None	N/A	None	N/A	None	None	--
YARD-7	222	Low	N/A	None	N/A	None	N/A	None	Hose House & Hydrant	YARD-7
YARD-7	552	Low	N/A	None	N/A	None	N/A	None	None	--
YARD-7	553	Low	N/A	None	N/A	None	N/A	None	None	--
YARD-7	554	Low	N/A	None	N/A	None	N/A	None	Hose House & Hydrant	YARD-7

NOTE

1. In this column, CO₂, Dry Chemical, Wheeled Dry Chem[ical], Wheeled Class D, Pressurized Water, Foam, and Halon are types of Extinguishers – there is at least one in the zone when listed for a zone. Extinguishers in Area CNT-1 are stored outside Containment during normal operation. Hose stations are water unless otherwise noted.

**TABLE 2
FIRE AREA AFW-6
CREDITED III.G.2 OPERATOR MANUAL ACTIONS**

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Locally start 33 AFW Pump from breaker on Bus 6A	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	7 m	Action is performed in Fire Area CTL-3
Locally operate valves FCV-1123, FCV-406C, or FCV-406D	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	8 m	Either 33 or 32 AFW pump is used, depending on the damage scenario. Action is taken in Fire Area AFW-6 following fire extinguishment.
Locally operate PCV-1139, PCV-1310A, PCV-1310B, HCV-1118, FCV-405C or FCV-405D (if 32 AFW pump is used)	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	17 m	Either 33 or 32 AFW pump is used, depending on the damage scenario. Action is taken in Fire Area AFW-6 and AFW Pump Bldg, Fire Area TBL-5 following fire extinguishment.
Locally operate Steam Generator Atmospheric Dump Valve (SGADV) PCV-1134, PCV-1135, PCV-1136, or PCV-1137	4 hours	Control cooldown to RHR entry conditions. Reference calculation IP-CALC-06-00029.	9 m	Action taken in AFW Pump Building, Fire Area TBL-5

**TABLE 3
FIRE AREA ETN-4{1}
CREDITED III.G.2 OPERATOR MANUAL ACTIONS**

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Swap 32 CCW Pump to alternate power supply	> 1 hour	Start one CCW pump for charging pump cooling; reference Calculation IP-CALC-06-00029.	10 m	Action performed in Fire Area PAB-2 (transfer switch operation) and TBL-5 (MCC 312A breaker operation)
Operate 480V Bus 3A breaker locally to start 31 AFW Pump	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	7 m	Action performed in Fire Area CTL-3. Note that only one of 31 or 32 AFW Pump is required, thus only one of the two listed manual action sets is required.
Locally operate FCV-1121 in support of use of 31 AFW Pump, OR	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	8 m	Action performed in Fire Area AFW-6. Note that only one of 31 or 32 AFW Pump is required, thus only one of the two listed manual action sets is required.
Operate HCV-1118 manually to control 32 AFW Pump	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	17 m	Action performed in Fire Area AFW-6. Note that only one of 31 or 32 AFW Pump is required, thus only one of the two listed manual action sets is required.
Align Appendix R Diesel Generator (ARDG) to 480V Buses 2A and 5A	75 m	Maintain Pressurizer level within the indicating range of the WR channel; per Calculation IP-CALC-06-00029.	50 m	Action performed in Fire Area YARD-7, TBL-5, CTL-3. Conservatively assumes that per distribution system alignment per 3-SOP-EL-014, all breakers require local manual operation.

TABLE 3
FIRE AREA ETN-4{1}
CREDITED III.G.2 OPERATOR MANUAL ACTIONS

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Swap 31 OR 32 Charging Pump to alternate power supply	75 m	Maintain Pressurizer level within the indicating range of the WR channel; per Calculation IP-CALC-06-00029	8 m	Action performed in Fire Area PAB-2 (transfer switch operation) and TBL-5 (MCC 312A breaker operation).
Start ARDG and align power to 480V Buses 2A, 3A, 5A, and 312	70 m	Maintain Pressurizer level within the indicating range of the WR channel; per Calculation IP-CALC-06-00029.	50 m	Action performed in Fire Area YARD-7, TBL-5, and CTL-3. Conservatively assumes that per distribution system alignment per 3-SOP-EL-014, all breakers require local manual operation.
Locally operate FCV-405B, FCV-405D, FCV-406B to control AFW flow to SG	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766.	17 m	Actions performed in Fire Area AFW-6
Locally open valve 227 to establish a CVCS makeup flowpath to the RCS	75 m	Maintain Pressurizer level within the indicating range of the WR channel; per Calculation IP-CALC-06-00029.	9 m	Action performed in Fire Area PAB-2
Locally close valve LCV-112C; open valve 288 to align Charging Pump suction to the RWST	75 m	Maintain Pressurizer level within the indicating range of the WR channel; per Calculation IP-CALC-06-00029.	11 m	Actions performed in Fire Area PAB-2

**TABLE 3
FIRE AREA ETN-4{1}
CREDITED III.G.2 OPERATOR MANUAL ACTIONS**

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Locally control SGADVs PCV-1135, PCV-1136	4 hours	Support cooldown to RHR entry conditions (cold shutdown support action), per Calculation IP-CALC-06-00029	9 m	Action performed in AFW Pump Building, Fire Area TBL-5
Locally operate PCV-1139 to ensure steam supply to 32 AFW Pump	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	17 m	Action performed in Fire Area AFW-6
Locally operate PCV-1310A, PCV-1310B to ensure steam supply to 32 AFW Pump	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	17 m	Action performed in AFW Pump Building, Fire Area TBL-5
Locally manually perform Service Water (SW) Pump strainer backwash as required	> 1 hour	Ensure adequate SW Pump NPSH	15 m	Action, if required, performed in Fire Area YARD-7. Strainer backwash is limited to that associated with the selected operating SW Pump.

TABLE 4
FIRE AREA ETN-4{3}
CREDITED III.G.2 OPERATOR MANUAL ACTIONS

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Operate HCV-1118 manually to control 32 AFW Pump	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	17 m	Action performed in Fire Area AFW-6
Locally operate PCV-1139 to ensure steam supply to 32 AFW Pump	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	17 m	Action performed in Fire Area AFW-6
Locally operate PCV-1310A, PCV-1310B to ensure steam supply to 32 AFW Pump	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	17 m	Action performed in AFW Pump Building, Fire Area TBL-5
Locally operate FCV-405C, FCV-405D to control AFW flow to SG	30 m	Preclude SG boil-dry, per Calculation IP-CALC-04-00766	17 m	Actions performed in Fire Area AFW-6

TABLE 5
FIRE AREA ETN-4{4}
CREDITED III.G.2 OPERATOR MANUAL ACTIONS

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Locally operate SGADV PCV-1134, PCV-1135, PCV-1136, or PCV-1137 to support cooldown to RHR entry conditions	4 hours	Support cooldown to RHR entry conditions (cold shutdown support action), per Calculation IP-CALC-06-00029	9 m	Action performed in AFW Pump Building, Fire Area TBL-5.

TABLE 6
FIRE AREA PAB-2{3}
CREDITED III.G.2 OPERATOR MANUAL ACTIONS

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Locally close valve LCV-112C and open valve 288 to align Charging Pump suction path to Refueling Water Storage Tank (RWST)	75 m	Maintain Pressurizer level within the indicating range of the WR level channel. Reference Calculation IP-CALC-06-00029.	11 m	Actions are performed in PAB Analysis Areas PAB-2{3} and PAB-2{4}. Actions are not required until greater than 60 minutes following the start of the event, and the fire is expected to be extinguished and smoke adequately vented by that time.

**TABLE 7
FIRE AREA PAB-2{5}
CREDITED III.G.2 OPERATOR MANUAL ACTIONS**

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Locally close supply breaker for 32 CVCS Pump	75 m	Maintain Pressurizer level within the indicating range of the WR level channel. Reference Calculation IP-CALC-06-00029.	7 m	Action performed in Fire Area CTL-3
Locally control 32 CVCS pump speed via scoop tube positioner	75 m	Maintain Pressurizer level within the indicating range of the WR level channel. Reference Calculation IP-CALC-06-00029.	9 m	Actions are performed in PAB Analysis Areas PAB-2{3} and PAB-2{4} and are not required until greater than 60 minutes following the start of the event, and the fire is expected to be extinguished and smoke adequately vented by that time
Open valve 227 to establish charging flowpath to RCS around potentially failed closed HCV-142	75 m	Maintain Pressurizer level within the indicating range of the WR level channel. Reference Calculation IP-CALC-06-00029.	9 m	Actions are performed in PAB Analysis Area PAB-2{5} and are not required until greater than 60 minutes following the start of the event, and the fire is expected to be extinguished and smoke adequately vented by that time
Locally close valve LCV-112C and open valve 288 to establish flowpath from RWST to charging pump suction	75 m	Maintain Pressurizer level within the indicating range of the WR level channel. Reference Calculation IP-CALC-06-00029.	11 m	Actions are performed in PAB Analysis Area PAB-2{5} and are not required until greater than 60 minutes following the start of the event, and the fire is expected to be extinguished and smoke adequately vented by that time

**TABLE 8
FIRE AREA TBL-5
CREDITED III.G.2 OPERATOR MANUAL ACTIONS**

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Locally operate FCV-1121 AFW Pump recirculation valve during pump startup	30 m	Preclude SG boil-dry; reference Calculation IP-CALC-04-00766.	8 m	Actions performed in AFW Pump Room, Fire Area AFW-6
Locally operate FCV-406A and FCV-406B to control AFW flow to SGs	30 m	Preclude SG boil-dry; reference Calculation IP-CALC-04-00766.	8 m	Actions performed in AFW Pump Room, Fire Area AFW-6
Locally operate SGADV PCV-1134, PCV-1135, PCV-1136, or PCV-1137 to control secondary system cooldown	4 hours	Support secondary system cooling to transition to RHR entry conditions (cold shutdown transition action). Reference Calculation IP-CALC-06-00029.	9 m	Actions performed in AFW Pump Building, Fire Area TBL-5 and are not required until greater than 60 minutes following the start of the event, and the fire is expected to be extinguished and smoke adequately vented by that time
Locally/manually backwash SW Pump strainer as required if power to strainer associated with selected SW Pump is lost (Use one of STR PMP-31 through STR PMP-36)	>1 hour	Ensure selected SW Pump suction path is not impeded by excessive delta P of associated strainer	15 m	Action performed in SW Pump strainer pit, Fire Area YARD-7

**TABLE 9
FIRE AREA YARD-7
CREDITED III.G.2 OPERATOR MANUAL ACTIONS**

Required OMA	Required Time to Complete	Basis	Actual Time to Complete	OMA Location and Comments
Locally start ARDG to supply MCC 312A in support of the use of SWP-38	>1 hour	Provide SW for cooling of CCW, which is being used only for cooling of Charging Pumps during hot shutdown. Reference Calculation IP-CALC-06-00029.	25 m	Actions performed in Fire Area YARD-7 (ARDG) and in Fire Area TBL-5 (MCC-312A)
Locally/manually backwash SW Pump strainer as required if power to strainer associated with selected SW Pump is lost	>1 hour	Ensure selected SW Pump suction path is not impeded by excessive delta P of associated strainer	15 m	Action performed in SW Pump strainer pit, Fire Area YARD-7