

December 11, 2008

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Subject: Response to Request for Additional Information
Request for Exemption from 10 CFR 50, Appendix R,
Section III.G, "Fire Protection of Safe Shutdown Capability"

- References:
1. Letter from P. B. Cowan, Exelon Generation Company, LLC, to U. S. Nuclear Regulatory Commission, "Request for Exemption from 10 CFR 50, Appendix R, Section III.G, 'Fire Protection of Safe Shutdown Capability'," dated October 5, 2007.
 2. Letter from J. D. Hughey, U. S. Nuclear Regulatory Commission, to C. G. Pardee, Exelon Generation Company, LLC, "Peach Bottom Atomic Power Station, Units 2 and 3 - Request for Additional Information Regarding Request for Exemption from 10 CFR 50, Appendix R, Section III.G, 'Fire Protection of Safe Shutdown Capability' (TAC Nos. MD7029 and MD7030)," dated November 21, 2008.

In Reference 1, Exelon Generation Company, LLC (Exelon) submitted a request for exemption from the provisions of 10 CFR 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability," for the use of operator manual actions for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, in lieu of the requirements specified in Section III.G.2. The NRC reviewed the exemption request and identified the need for additional information in order to complete their evaluation of the exemption request. A draft question was sent to Exelon to ensure the question was understandable, the regulatory basis for the question was clear and to determine if the information was previously docketed. On November 5, 2008, a public meeting was held between the NRC and Exelon to further discuss the additional information requested by the NRC. In Reference 2, the NRC formally issued the request for additional information. The attachment to this letter provides a restatement of the question along with Exelon's response.

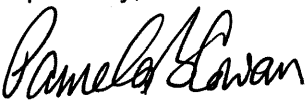
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Exelon has determined that the information provided in response to the request for additional information does not impact the conclusions of the original exemption request as stated in Reference 1.

This response to the request for additional information contains no regulatory commitments.

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

Respectfully,

g st 

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

Attachment: Response to Request for Additional Information

cc:	Regional Administrator - NRC Region I	w/attachment
	NRC Senior Resident Inspector - PBAPS	"
	NRC Project Manager, NRR - PBAPS	"
	S. T. Gray, State of Maryland	"
	R. R. Janati, Commonwealth of Pennsylvania	"

ATTACHMENT

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION 10 CFR 50, APPENDIX R, SECTION III.G.2 EXEMPTION REQUEST

In Reference 1, Exelon Generation Company, LLC (Exelon) submitted a request for exemption from the provisions of 10 CFR 50, Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability," for the use of operator manual actions for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, in lieu of the requirements specified in Section III.G.2. The NRC reviewed the exemption request and identified the need for additional information in order to complete their evaluation of the exemption request. A draft question was sent to Exelon to ensure the question was understandable, the regulatory basis for the question was clear and to determine if the information was previously docketed. On November 5, 2008, a public meeting was held between the NRC and Exelon to further discuss the additional information requested by the NRC. In Reference 2, the NRC formally issued the request for additional information (RAI). The question is restated below along with Exelon's response.

Attachment 2 of October 5, 2007, PBAPS exemption request lists the manual actions, in a table format, for which exemptions are being requested. To confirm that the safety basis established in the Safety Evaluation (SE) dated September 16, 1993, remains applicable to PBAPS, response to the following request for additional information (RAI) is requested:

Provide the technical justification for each operator manual action for which exemption is being requested. This technical justification would be based on the documentation that the NRC staff reviewed in support of the referenced SE regarding the manual actions. The documentation may have included the technical safety basis in the form of criteria and related technical information such as calculations, timelines, etc., for justifying the operator manual actions.

RESPONSE

This response includes a summary of information, based on the PBAPS Fire Protection Program (FPP) (Reference 3), safe shutdown calculations, drawings, fire guides, etc., that would have been available (except for subsequent revisions over time) when the manual actions credited for post-fire safe shutdown were previously approved by the NRC in 1993. This response provides a discussion of the initiating fire areas involved, the results of a feasibility review of the operator manual actions based on the criteria specified in NRC Inspection Procedure (IP) 71111.05 (Reference 4), and a discussion of how the manual actions meet the defense-in-depth criteria specified in Appendix R. While IP 71111.05 did not exist at the time the Safety Evaluation Report (SER) approving the manual actions was issued, it is assumed that NRC Regional Fire Inspectors used similar criteria when reviewing the operator manual actions at that time. The operator manual actions addressed in this response are limited to those operator manual actions contained in the original PBAPS exemption request (Reference 1) and the response to a previous RAI (Reference 5).

NRC IP 71111.05 was revised on March 6, 2003, to specifically address the feasibility of operator manual actions in support of the proposed manual action rule. At that time, PBAPS created a matrix table that considered the feasibility of each operator manual action using the attributes contained in the inspection procedure. The operator manual actions addressed in this exemption request are those that were previously approved in a non-exemption fire protection

SER, dated September 16, 1993 (Reference 6). Regulatory Issue Summary (RIS) 2006-10 (Reference 7) directs that operator manual actions that were approved in a non-exemption fire protection SER should be included in a request for "an exemption under 10 CFR Part 50.12, citing the special circumstances of Section 50.12(a)(2)(ii), citing the SER as the safety basis, and confirming that the safety basis established in the SER remains valid." The 1993 SER does not provide a detailed safety basis for the NRC approval of these operator manual actions. In order to confirm to the NRC that the operator manual actions are feasible, which would support the conclusion that the safety basis established in the 1993 SER remains valid, each of the operator manual actions addressed by this exemption request was reviewed against the feasibility criteria listed in the March 6, 2003, revision of IP 71111.05 and the defense-in-depth criteria provided in Appendix R. The intent is to provide confirmation that the operator manual actions remain safe and feasible to perform.

FIRE AREA DESCRIPTIONS

There are 11 initiating fire areas included in this exemption request. An initiating fire area is the area where a fire that requires the manual action to be performed originates. A brief description of each fire area is provided below. This information provides a summary of the type of fires that are postulated to occur in each area and the type of combustibles located in each area. Detection and suppression systems that are installed in the fire area are also discussed. The information provided was obtained from the PBAPS FPP, Chapter 5, and Appendix A, Table A-1. Note that many of these fire areas are made up of a number of separate rooms. The information provided is a summary of the rooms for the initiating fire areas, as appropriate. At the end of each fire area description, a list of the operator manual actions identified in the table in the Attachment of Reference 5 titled "Cross-Reference Between Peach Bottom Fire Protection Program, Revision 3, Table A-4 and Operator Manual Action Exemption Request..." is provided. For clarity, the component number listed in the first column of this table is used to identify the action.

Fire Area 2, Radwaste Building

This fire area is composed of a number of separate rooms located within the Radwaste Building. Significant rooms within this fire area include, but are not limited to: the Unit 2 and Unit 3 HPCI pump rooms, the RCIC pump rooms, the Reactor Building Closed Cooling water heat exchanger rooms (which contain the MG set lube oil pumps) and a number of tank rooms. Standby Gas Treatment (SBGT) charcoal filters are also in this fire area. Postulated fires within this area include: electrical cable fires (note that all exposed cables have fire retardant insulation), lube oil fires (significant lube oil hazards have either CO₂ or pre-action sprinkler systems), charcoal filter fires, trash in radwaste trash area, and paper in the Radwaste control room. The overall combustible loading for this fire area is LOW (an equivalent fire severity of less than 45 minutes). Combustibles in this fire area include: cable insulation, lube oil, silicone rubber, thermo-lag, charcoal and various Class A combustibles. There is smoke or heat detection in most rooms, although some of the radwaste pump and tank rooms (locked high radiation areas) do not have detection. Suppression systems include CO₂ in each HPCI pump room, pre-action sprinklers over the MG set lube oil pumps, wet pipe sprinklers in the radwaste trash area and water spray for the charcoal filters in the SBGT system. This fire area is physically divided into a number of separate rooms with heavy concrete walls and floors for radiological separation. This feature will prevent a single fire from rapidly propagating through this fire area.

Actions that may need to be performed as a result of a fire in Fire Area 2, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: 2AP35, 2BS456, 2DS456, 3BP35, MO3-10-034B, MO3-10-039B.

Fire Area 4, Unit 2 Recirculation Pump MG Set Room

The Unit 2 Recirculation Pump MG Set Room is located in the Radwaste Building, 135' elevation. This fire area is separated from adjacent areas by fire rated barriers. The postulated fires in this area include: electrical cable fires (note that all exposed cables have fire retardant insulation), and a lube oil fire. The overall combustible loading in this fire area is MODERATE (an equivalent fire severity of less than 105 minutes). Combustibles in this area include: cable insulation, lube oil and thermo-lag. This fire area has full area smoke detection that actuates a pre-action sprinkler system.

Actions that may need to be performed as a result of a fire in Fire Area 4, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: 2BS456, MO-2486, MO2-10-034A, MO2-10-039A.

Fire Area 6S, Unit 2 Reactor Building 135' elevation south side and the upper elevations of the Unit 2 Reactor Building (165', 195' and 234')

The postulated fires in the fire area include: electrical cable fire (note that all exposed cables have fire retardant insulation), boronated shield door fire, and Class A materials fire. The overall combustible loading for this fire area is LOW (an equivalent fire severity of less than 45 minutes). Combustibles in this fire area include: cable insulation, silicone rubber, lead blanket material and various Class A combustibles. Smoke detection is located on each elevation, except for the refueling floor (there are no cables associated with safe shutdown routed on that elevation). A water curtain type open head sprinkler system is installed on the west side of the 135' elevation of the reactor building, providing separation to Fire Area 6N located on the north side of the 135' elevation of the reactor building. This fire area is subdivided into various rooms and floors by heavy concrete barriers. It is unlikely that a fire will rapidly propagate through this fire area.

Actions that may need to be performed as a result of a fire in Fire Area 6S, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: 2BS456, 2DS456, MO2-10-034B, MO2-10-039B, MO2-10-89D and MO2-10-25B.

Fire Area 13N, Unit 3 Reactor Building 135' elevation north side and the upper elevations of the Unit 3 Reactor Building (165', 195' and 234')

The postulated fires in the fire area include: electrical cable fire (note that all exposed cables have fire retardant insulation) and Class A materials fire. The overall combustible loading for this fire area is LOW (an equivalent fire severity of less than 45 minutes). Combustibles in this fire area include: cable insulation and various Class A combustibles. Smoke detection is located on each elevation, except for the refueling floor (there are no cables associated with safe shutdown routed on that elevation). A water curtain type open head sprinkler system is installed on the west side of the 135' elevation of the reactor building, providing separation to Fire Area 13S located on the south side of the 135' elevation of the reactor building. This fire

area is subdivided into various rooms and floors by heavy concrete barriers. It is unlikely that a fire will rapidly propagate through this fire area.

Actions that may need to be performed as a result of a fire in Fire Area 13N, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: 30S546, 3AS456, 3CS456, MO3-10-034A, MO3-10-039A, MO3-10-89A and MO3-10-25A.

Fire Area 13S, Unit 3 Reactor Building 135' elevation, south side

The postulated fires in the fire area include: electrical cable fire (note that all exposed cables have fire retardant insulation) and boronated shield door fire. The overall combustible loading for this fire area is LOW (an equivalent fire severity of less than 45 minutes). Combustibles in this fire area include: cable insulation and thermo-lag. Smoke detection is located in this area. A water curtain type open head sprinkler system is installed on the west side of the 135' elevation of the reactor building, providing separation to Fire Area 13N located on the north side of the 135' elevation of the reactor building.

Actions that may need to be performed as a result of a fire in Fire Area 13S, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: 3CS456 and MO3-10-25B.

Fire Area 26, MG Set Vent Supply Fan Room

This room is located on the 165' elevation of the Radwaste Building and is separated from adjacent fire areas by rated fire barriers. The postulated fire in this area is indeterminate due to the low amount of combustibles. The overall combustible loading rating for this fire area is LOW (an equivalent fire severity of less than 45 minutes). Combustibles in this fire area are limited to cable insulation. There is smoke detection located in this fire area, but there is no fire suppression system since there is no fire hazard.

Actions that may need to be performed as a result of a fire in Fire Area 26, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: 3CS456, MO3-10-034A and MO3-10-039A.

Fire Area 38, E32 Emergency Bus Room

This room is located on the 135' elevation of the turbine building in the control stack. The room is separated from other fire areas by rated fire barriers. The postulated fire in this area involves electrical cable insulation (note that all exposed cables have fire retardant insulation). The overall combustible loading for this fire area is LOW (an equivalent fire severity of less than 45 minutes). Combustibles in this fire area include: cable insulation and thermo-lag. This room has smoke detection that initiates a pre-action sprinkler system.

Actions that may need to be performed as a result of a fire in Fire Area 38, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: 2DS456 and MO-2486.

Fire Area 50, Unit 2 and Unit 3 Turbine Building

This fire area consists of the majority of the combined Unit 2 and Unit 3 turbine building. Significant rooms within this fire area include both the Unit 2 and Unit 3 moisture separator areas, Unit 2 and Unit 3 turbine decks and reactor feed pump rooms, the common hatch area and both Unit 2 and Unit 3 lube oil storage rooms. This large area is separated from adjacent fire areas (including separate fire areas located within the turbine building) by fire rated barriers. Postulated fires within this area include: electrical cable fires (note that all exposed cables have fire retardant insulation), lube oil fires (significant lube oil hazards are protected by sprinkler systems) and Class A material fires. The overall combustible loading for this fire area is LOW (an equivalent fire severity of less than 45 minutes); however, the turbine decks are considered MODERATE (equivalent fire severity of less than 105 minutes) and some individual rooms, such as the lube oil rooms, are considered HIGH (equivalent fire severity greater than 105 minutes). Combustibles in this fire area include: cable insulation, lube oil, thermo-lag, battery cases and various Class A combustibles. There is smoke and heat detection in certain individual rooms within the turbine building. Areas with significant fire hazards, such as lube oil, are provided with wet pipe sprinkler systems. Specifically, wet pipe sprinkler systems are provided in the moisture separator areas, the feed pump rooms, the lube oil rooms and in the common hatch area, as well as on the turbine bearings. The hydrogen seal oil skid on each unit is provided with an automatic deluge system. A pre-action sprinkler system is provided over the 13kV switchgear cabinets. Wet pipe sprinkler heads have been installed at the openings between the common area and the Unit 2 and Unit 3 portions of the turbine building at the open corridor.

Actions that may need to be performed as a result of a fire in Fire Area 50, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: MO-2486 and MO-3486.

Fire Area 54, Diesel Generator Building Cardox Tank Room

This room is the 5th bay of the emergency diesel generator building. It is separated from the adjacent diesel bay by a fire rated barrier. The postulated fire is a lube oil fire from the minor quantity of oil located in the emergency service water booster pumps. The overall combustible loading for this fire area is LOW (an equivalent fire severity of less than 45 minutes). The combustible material located in this area is a small quantity of lube oil. There is smoke detection located in this fire area. There is no fire suppression system in this fire area due to the lack of a significant fire hazard.

Actions that may need to be performed as a result of a fire in Fire Area 54, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: MO-2486 and MO-3486.

Fire Area 57, Switchgear/Radwaste Corridor

This is a narrow corridor (approximately 6' wide) located between the 4kV bus rooms to the east and the radwaste building to the west. This corridor is separated from adjacent fire areas by rated fire barriers. The postulated fire in this fire area is an electrical cable fire (note that all exposed cables have fire retardant insulation). The overall combustible rating for this fire area is LOW (an equivalent fire severity of less than 45 minutes). Combustibles in this fire area

include: cable insulation and thermo-lag. There is a full area smoke detection system that actuates a pre-action sprinkler system that protects the entire corridor.

Actions that may need to be performed as a result of a fire in Fire Area 57, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: 2AP35, 2BS456, 2DS456, 3BP35, 3CS456, MO-2486, MO-3486, MO2-10-034A, MO2-10-039A, MO3-10-034B and MO3-10-039B.

Fire Area 58, Unit 3 Recirculation Pump MG Set Room

This fire area is located in the radwaste building, 135' elevation. This fire area is separated from adjacent areas by three-hour fire rated barriers. The postulated fires in this area include: electrical cable fires (note that all exposed cables have fire retardant insulation) and a lube oil fire. The overall combustible loading in this fire area is MODERATE (an equivalent fire severity of less than 105 minutes). Combustibles in this area include: cable insulation, lube oil and thermo-lag. This fire area has smoke detection that actuates a pre-action sprinkler system.

Actions that may need to be performed as a result of a fire in Fire Area 58, using the Table A-4 Cross-Reference section of the Reference 5 attachment, are as follows: 3CS456, MO-3486, MO3-10-034B, MO3-10-039B and MO3-10-89D.

REVIEW OF FEASIBILITY USING THE CRITERIA LISTED IN INSPECTION PROCEDURE 71111.05

RIS 2006-10 addresses operator manual actions in which a SER issued by the NRC approves the operator manual actions, but is outside of the 10 CFR 50.12 exemption process. The RIS directs licensees to "request an exemption under 10CFR Part 50.12, citing the special circumstances of section 50.12(a)(2)(ii), citing the SER as the safety basis, and confirming that the safety basis established in the SER remains valid." The 1993 SER that approved the operator manual actions did not list a specific safety basis. At the time the NRC issued the SER, the criteria necessary to establish that operator manual actions were feasible had not yet been created. Subsequently, the NRC created criteria against which the feasibility of operator manual actions should be reviewed and placed the criteria in IP 71111.05. In order to confirm to the NRC that the operator manual actions are feasible, which would support the conclusion that the safety basis established in the 1993 SER remains valid, each of the operator manual actions addressed by this exemption request was reviewed against the feasibility criteria listed in the March 6, 2003 revision of IP 71111.05. A general explanation of how the manual actions meet the criteria is provided below. Certain configurations are provided with a more detailed explanation.

Diagnostic Instrumentation: At PBAPS, the Transient Response Implementing Plan (TRIP) procedures and the T-300 Fire Guides provide the operators with specific instructions in the event of a fire in a specific fire area. The T-300 Fire Guides for each fire area provide a list of the key protected instruments available for a fire in that area. This lists includes instruments for both Unit 2 and Unit 3. If there are any "prompt" actions that are needed to restore an instrument for a fire in that area, i.e., those that need to be performed within 30 minutes, the applicable T-300 Fire Guide lists the "prompt" actions at the front of the document. The fire guides in use today are similar in structure and content to those that were available at the time of the 1993 approval. These fire guides have been reviewed during the triennial fire

protection inspections conducted at PBAPS. Therefore, the diagnostic instruments that are both available and unavailable (for the worse case Appendix R fire scenario) are listed at the beginning of each T-300 Fire Guide along with actions to restore needed instruments that may be disabled by the fire.

Environmental Considerations: These are conditions that operators performing the manual actions may encounter while traveling to the manual action location or where the manual action is to be performed. Adverse environmental conditions could prevent the operator from performing the required manual actions within the allotted time.

Radiation Levels None of the manual actions require operators to enter areas that have radiation levels so high that access would be prohibited. This includes both at power and post shutdown conditions. At no time would operators be subjected to radiation doses close to the 10 CFR Part 20 limits. PBAPS Radiation Engineering has reviewed actions in the areas listed on the table and determined that no operator would have to perform a task that would result in a dose exceeding 100 millirem, given the anticipated shutdown conditions. Most of the actions are located in electrical equipment rooms or general areas of the plant where the anticipated dose rates are less than 5 millirem per hour. The Unit 2 and Unit 3 torus areas, residual heat removal pump rooms and isolation valve compartments are normally locked high radiation areas. However, the manual actions in these areas (all involve manipulation of valves) will result in a dose of less than 100 millirem for the duration of the action.

Emergency Lighting The availability of emergency lighting at each action location and the access routes to the action location have been confirmed. There are periodic tests that ensure that lights are operating and that the lights are properly aimed. Emergency lights are provided on the pathways between the control room and action locations. Walkdowns have been performed to ensure that emergency lighting to illuminate pathways is available. In a few cases, re-entry into the area where the fire occurred is required. It is assumed that the emergency lighting in the area where the fire occurred will be unavailable following the fire. Portable hand lights are provided in the safe shutdown locker for use by the safe shutdown equipment operators. These portable hand lights are tested and batteries replaced on a periodic basis as part of the routine post-fire equipment inventory surveillance test. For the actions that require re-entry into the initiating fire area, the time limit to complete the action is at least 120 minutes (1 instance) and in most instances is 150 to 180 minutes. This provides ample time to obtain the portable hand light prior to accessing the room to perform the operator manual action.

Temperature and humidity conditions None of the actions are performed in main steam spaces. Temperature and humidity conditions will not be markedly different from normal plant operating conditions.

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

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

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

Separate Fire Areas with the following configurations:

- 1) The radwaste corridor (Fire Area 57) is a separate fire area from the 4kV bus rooms (which are each separate fire areas). The ventilation system for the 4kV bus rooms is routed through the radwaste corridor via ventilation ductwork. The ducts are provided with fire rated dampers. In addition, the radwaste corridor has a full area pre-action sprinkler system actuated by smoke detection. The radwaste corridor is a narrow, well-traveled hallway (about 6' wide) and storage of combustibles in the area is prohibited. The only combustible in the area is thermo-lag and cables in the overhead. It is unlikely that sufficient heat will be generated by a fire in the radwaste corridor to impact the bus room ventilation system. The bus rooms are kept at a positive pressure as compared to the radwaste corridor. Entry into the bus rooms will be made from the turbine building side, so there will be no access issues for the equipment operators. This applies to the following actions specified in the Table A-4 Cross Reference section of the Reference 5 attachment when Fire Area 57 is the initiating fire area: 2BS456, 2DS456 and 3CS456.
- 2) Bus Room E-32 (Fire Area 38) and E-42 (Fire Area 36) are separate fire areas but are adjacent rooms. They are separated by a rated fire barrier and both rooms have a pre-action sprinkler system. The rooms are accessed by separate routes and a fire in one room would not impact access to the other room by the equipment operator. This applies to the following action specified in the Table A-4 Cross Reference section of the Reference 5 attachment when Fire Area 38 is the initiating fire area: 2DS456.
- 3) Access to the valves on the torus catwalk is via the lower part of the reactor building which are separate fire areas from the general area of the reactor building on 135' elevation and above. The torus is also a separate fire area from the reactor building general area. This applies to the following actions specified in the Table A-4 Cross Reference table in Reference 5 when Fire Area 6S is the initiating fire area: MO2-10-034B and MO2-10-039B. This also applies to the following actions specified in the Table A-4 Cross Reference section of the Reference 5 attachment when Fire Area 13N is the initiating fire area: MO3-10-034A and MO3-10-039A.
- 4) Fire Areas 6N and 6S (Unit 2), and 13N and 13S (Unit 3), are established in part by the use of 20 feet of separation free of intervening combustibles on the east and west sides of the drywell at the 135' elevation. A fire in Fire Area 6S (13N) may

result in smoke propagation to Fire Area 6N (13S) on elevation 135'. However, the manual actions required to be performed in these areas do not need to be completed until 180 minutes after the initiation of the event. It is assumed that the fire will be extinguished in 60 minutes or less and that smoke will be removed following fire extinguishment. Access to the motor control center (MCC) and to the valve to be opened will not require travel through the fire-affected portion of the reactor building. Therefore, the emergency lighting for access paths and action locations for these actions will remain operable following the fire. This applies to the following action specified in the Table A-4 Cross Reference section of the Reference 5 attachment when Fire Area 6S is the initiating fire area: MO2-10-25B. This also applies to the following actions specified in the Table A-4 Cross Reference section of the Reference 5 attachment when Fire Area 13N is the initiating fire area: MO3-10-034A, MO3-10-039A and MO3-10-25A.

- 5) Fire Areas 13N and 13S are established in part by the use of 20' of separation free of intervening combustibles on the east and west sides of the drywell at elevation 135'. A fire in Fire Area 13S may result in smoke propagation to Fire Area 13N. Access to the MCC where the breaker and contactor are located (in Fire Area 13N) will require travel through the fire area where the fire occurred (13S). However, these manual actions do not need to be completed until 120 minutes after the initiation of the event. It is assumed that the fire will be extinguished in 60 minutes or less and that smoke will be removed following fire extinguishment. Emergency lighting in Fire Area 13S is assumed to be inoperable as a result of the fire. Therefore, portable hand lights are available in the fire safe shutdown equipment locker. The actual travel path through the affected fire area is less than 100 ft. and does not involve any stairs. This applies to the following action specified in the Table A-4 Cross Reference section of the Reference 5 attachment when Fire Area 13S is the initiating fire area: MO3-10-25B.

Same Fire Area – Post Fire Re-entry Required: The action to manually open MO-2486 and MO-3486 (physically open at the valve itself) is performed in the same fire area as the initiating fire area. There are 150 minutes between the start of the event and when the valve is to be opened. A fire in the Diesel Building Cardox room will be extinguished and the smoke vented from the area long before the action needs to be performed. The operators will not have any delay or need self contained breathing apparatus to perform this action. This applies to the following actions specified in the Table A-4 Cross Reference section of the Reference 5 attachment when Fire Area 54 is the initiating fire area: MO-2486 and MO-3486.

Staffing: There are five operators assigned fire brigade duty and three operators assigned as safe shutdown operators each shift. An equipment operator is assigned either Fire Brigade or Safe Shutdown duty as a collateral function to the operator's assigned watch station. The three operators assigned as safe shutdown operators are not assigned fire brigade responsibilities and will be responsible for performing the operator manual actions.

Communications: Operators have radios and/or phones to communicate with the control room; however, the operator manual actions can be assigned from the control room face-to-face. None of these manual actions require interface with the control room while performing the action. Each attachment to the T-300 Fire Guides that direct the actions of the Equipment

Operators includes all the steps necessary to complete that manual action. Upon completion of the action the operator can report directly back to the control room, if necessary, or use the phone or radio if available.

Special Tools: The T-300 Fire Guides identify if a key, tool or component is needed and where the key, tool or component is located. Where a specific tool, component or key is needed to perform the operator manual action it is staged for use in a specified location. There are periodic tests that check the inventory of these locations.

Training: The operator actions addressed by this exemption request fall into one of the following categories:

- Verifying breaker position. This is considered a skill of the craft activity. This is done frequently by operators while establishing clearance boundaries.
- Operating switches. This is considered a skill of the craft activity. The switches are clearly labeled.
- Opening/Closing breakers. This is considered a skill of the craft activity. Breaker manipulation is frequently performed by equipment operators as part of their normal routine.
- Opening valves. This is considered a skill of the craft activity. Manually operating valves is frequently performed by equipment operators as part of their normal routine.
- Installing test plugs. These are small multi-pronged plugs that fit into a labeled connection point on a panel in the cable spreading room. Installing test plugs is considered to be within the skill of the craft.
- Operating valves using the contactor in the MCC. This action is also required for actions associated with the Control Room fire evacuation shutdown procedure (Alternate Shutdown). The operators receive training on the use of the MCC contactor to manipulate valve position. The T-300 Fire Guide attachments that address this action contain a sketch of the contactor and specific instructions.

Accessibility: The equipment that needs to be operated is readily accessible and adequate time is allotted to permit access. In addition, tools needed for the manual action are available and accessible by the operators. The actions to verify breaker position, open/close breakers, operate switches and install test plugs can be done from the floor or with a small step ladder, which is called out in the procedure and is available in the safe shutdown equipment cage. All the valves that have to be operated can be reached from the floor, or from permanent platforms accessed by permanently mounted ladders.

Procedures: Each initiating fire area has a corresponding T-300 Fire Guide. Each T-300 Fire Guide includes a section that lists the contingency actions. Each contingency action is addressed in a separate attachment to that fire guide. Each attachment lists the purpose of the action, equipment needed, and a step-by-step process to perform the action, including room and panel or valve locations. Restoration steps are also included in each attachment.

Verification and Validation: The actions have been validated by plant walkdowns. Note that in cases where the same action is performed for fires in a number of different fire areas, the validation was only performed once.

A summary of action times and travel times within the time available to perform the function is provided below. The time available to perform the function is defined by the safe shutdown

calculations. Walkdowns were performed to obtain travel times. Significant actions, such as manipulating valves, were timed during actual field exercises.

To consider the feasibility to perform the operator manual actions addressed by this exemption request in terms of times, the actions were considered in terms of the operator performing the task. The T-300 Fire Guides contain attachments that provide direction to perform specific operator manual actions to fulfill a certain post-fire shutdown need. Typically, a single safe shutdown equipment operator will be given an attachment to complete. If there are other T-300 attachments for that fire area, then the other safe shutdown operators may be assigned to perform the actions in those other attachments. There are some cases where more than one operator may be assigned to perform the tasks in the attachment. However, for the purposes of this review, only one operator will be considered to perform an attachment to create the most conservative case. The operator manual actions addressed by this exemption request are contained in a number of different attachments to the T-300 Fire Guides. The time to perform an action to meet the safe shutdown timeline is based on completion of the all the tasks within the attachment (and not discrete tasks within the attachment). However, the travel time and time to physically perform the individual tasks within the attachment were considered separately and then totaled to ensure that the combined travel and performance times for the discrete actions within the attachment can be performed within the time designated by the safe shutdown calculation.

The information below is divided into groups based on the time provided by the safe shutdown calculation to perform the entire attachment. This may combine several actions that are identified in the Table A-4 Cross Reference table in Reference 5. To provide a complete understanding of the individual manual actions involved, the actions, as listed in the Table A-4 Cross-Reference table, will be identified. Again, the total time to perform the action is the sum of the travel time for each task and the time necessary to perform the task assuming that all the tasks are done by a single operator.

There is one action that must be completed within 30 minutes. This action is identified in the Table A-4 Cross-Reference section of the Reference 5 attachment as 30S546. This action is identified as a "prompt" action in the applicable T-300 Fire Guide. This action involves travel from the control room to the cable spreading room to operate a key switch. The combined travel and action time is less than 5 minutes. The initiating fire area is the Unit 3 reactor building, which is a separate fire area and has a separate ventilation system. There is sufficient time margin to complete this task.

There are 14 attachments to the T-300 Fire Guides addressed by this exemption request that fall within the group of operator manual actions that need to be completed within 60 minutes. These actions are identified in the Table A-4 Cross-Reference section of the Reference 5 attachment as: 2BS456, 2DS456, 3AS456 and 3CS456. Each of these actions has two steps; the first is to verify a breaker is closed in a Bus Room and the second is to operate a hand switch in another Bus room. When the T-300 Fire Guides were developed, an initial step of verification of the breaker position (closed) of the alternate power source was added. Appendix R permits the assumption that equipment that is not fire affected will be in its expected position. Therefore, verification of this breaker position is not required for Appendix R compliance. However, Operations determined that they wanted to add a step to verify the position of the breaker as a precaution. This extra step (the first step of the action) was included since it is called out in the T-300 Fire Guide attachment and is performed in a different fire area than the

step associated with operating the switch. The Bus rooms are located below the control room and the Bus rooms are located together in a group. The combined travel time from the control room to the first bus room and then the second bus room is a total of four minutes. The time to verify the breaker position and operate the hand switch is a total of four minutes. The combined travel and action time for each attachment is eight minutes. There is sufficient time margin to complete these tasks.

There is one action that must be completed within 120 minutes. This action is identified in the Table A-4 Cross-Reference section of the Reference 5 attachment as MO3-10-25B. This action involves travel from the control room to the general area of the Unit 3 reactor building, 135' elevation. The travel time is four minutes. The action is to open a valve using the MCC contactor. This action takes 15 minutes to perform. The combined time is 19 minutes. There is sufficient time margin to complete this task.

There are 18 attachments to the T-300 Fire Guides that must be completed within 150 minutes. These actions are identified in the Table A-4 Cross-Reference section of the Reference 5 attachment as: 2AP35, 3BP35, MO-2486, MO-3486, MO2-10-034A, MO2-10-039A, MO3-10-034A, MO3-10-039A, MO3-10-034B, MO3-10-039B, MO2-10-034B, MO2-10-039B, MO2-10-89D and MO3-10-89D. The most limiting of these actions are those that involve establishing suppression pool cooling, which involves opening three breakers and cycling three valves (MO3-10-034B, MO3-10-039B and MO3-10-89D). If a single operator is assigned the action to open the three breakers and manually cycle all three valves, the maximum time would be 120 minutes (including travel and action times). The other attachments that address 150-minute time limit actions all require less time to perform the actions. Therefore, the most challenging case, the establishment of suppression pool cooling, is 120 minutes for a single operator. Additional operators can be used to reduce this time. This action has sufficient margin to ensure completion of the task.

There are five attachments to the T-300 fire guides that must be completed within 180 minutes. These actions are identified in the Table A-4 Cross-Reference section of the Reference 5 attachment as: MO-2486, MO-3486, MO3-10-034A, MO3-10-039A, MO3-10-89A, MO2-10-25B and MO3-10-25A. Several of these actions are the same as those listed for the 150-minute completion time. The difference is a result of different initiating fire areas. The most limiting of these actions is associated with establishing suppression pool cooling. The actions include opening three breakers and cycling three valves (MO3-10-034A, MO3-10-039A and MO3-10-89A) with a maximum time of 118 minutes if performed by a single operator. Additional operators can be used to reduce this time. The remaining attachments that address 180-minute time limit actions are all less than 118 minutes. This action has sufficient margin to ensure completion of the task.

DEFENSE IN DEPTH

Defense in depth is defined in Appendix R as follows:

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

PBAPS has administrative controls to prevent fires from starting. These controls include:

- controls on hot work activities and ignition sources (involving cutting, welding, grinding, open flames or other heat producing activities);
- controls and limits on combustible materials used in the plant or brought into the plant;
- housekeeping inspection programs;
- use of fire retardant cables and plastics; and
- use of wood is limited and restricted to fire retardant wood (except for large cribbing).

Fire detection and suppression systems are installed in those areas that contain significant combustible hazards. Fire detection includes both smoke and heat detection systems that provide alarms to the main control room. Suppression systems include pre-action, deluge and wet pipe sprinkler systems as well as carbon dioxide systems. Lube oil hazards, cable concentrations and storage areas are examples of areas provided with fire protection systems. A summary of the fire protection features in the initiating fire area was provided previously within the description of each fire area. When fire protection systems become inoperable, compensatory measures are instituted. The plant has a fire brigade composed of plant operators that are currently trained to meet the level of "interior structural firefighters." Hose stations and fire extinguishers are located throughout the plant to facilitate firefighting activities by the fire brigade. These detection and suppression systems, as well as manual fire fighting equipment are designed to detect fire at the incipient stage to permit a response by plant personnel to the fire, including both operations and fire brigade. The suppression systems are designed to prevent a fire from rapidly growing and involving other areas. Manual suppression can be used to extinguish a fire or to prevent the fire from spreading to adjacent fire areas.

PBAPS ensures safe shutdown in the event of a fire in several ways. First, the plant has been divided into fire areas. Each fire area is separated from adjacent fire areas with a barrier commensurate with the fire hazard. Typically, the fire barriers have a 3-hour fire resistance rating, including the barrier, the door(s), damper(s) and penetration seals. However, other barrier types, including spatial separation, are used to divide fire areas. These fire area boundaries are described in the PBAPS FPP document. In addition, analyses have been performed on how to achieve shutdown following a fire in any given fire area. The equipment lost and equipment available has been reviewed and actions necessary to ensure shutdown have been identified in the T-300 Fire Guides for each fire area. The manual actions addressed by this exemption request are part of the actions that may be necessary in a worse-case fire to achieve shutdown.

CONCLUSION

The operator manual actions addressed in this exemption request have been reviewed against the existing criteria the NRC has developed to determine the feasibility of these actions to be performed following a fire. This review determined that all of these manual actions could be performed and completed within the time lines established by the fire safe shutdown analyses. This provides the confirmation that the considerations used by the NRC to approve these operator manual actions in the 1993 SER remain valid. Defense-in-depth for the fire areas involved in this exemption include administrative controls on ignition sources and combustibles, fire protection systems in areas that present significant hazards, manual fire fighting capability, separation between fire areas to limit fire spread and safe shutdown procedures, based on a

detailed analysis providing a path to shutdown for each fire area. Therefore, the requested exemption will not result in undue risk to the public health and safety.

REFERENCES

1. Letter from P. B. Cowan, Exelon Generation Company, LLC, to U.S. Nuclear Regulatory Commission, "Request for Exemption from 10 CFR 50, Appendix R, Section III.G, 'Fire Protection of Safe Shutdown Capability'," dated October 5, 2007.
2. Letter from J. D. Hughey, U.S. Nuclear Regulatory Commission, to C. G. Pardee, Exelon Generation Company, LLC, "Peach Bottom Atomic Power Station, Units 2 and 3 - Request for Additional Information Regarding Request for Exemption from 10 CFR 50, Appendix R, Section III.G, 'Fire Protection of Safe Shutdown Capability' (TAC Nos. MD7029 and MD7030)," dated November 21, 2008.
3. Peach Bottom Atomic Power Station, Units 2 and 3, Fire Protection Program, Revision 16.
4. NRC Inspection Procedure 71111.05, "Fire Protection," March 6, 2003.
5. Letter from P. B. Cowan, Exelon Generation Company, LLC, to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information, Request for Exemption from 10 CFR 50, Appendix R, Section III.G, 'Fire Protection of Safe Shutdown Capability'," dated May 1, 2008.
6. Letter from J. W. Shea, U.S. Nuclear Regulatory Commission, to G. A. Hunger Jr., PECO Nuclear, "Peach Bottom Atomic Power Station, Units 2 and 3, Fire Protection Program," dated September 16, 1993.
7. Regulatory Issue Summary 2006-10, "Regulatory Expectations with Appendix R Paragraph III.G.2 Operator Manual Actions," June 30, 2006.