



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

June 28, 2010

Mr. Michael J. Pacilio  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1: REQUEST FOR  
EXEMPTION FROM TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*  
PART 50, APPENDIX R REQUIREMENTS (TAC NO. ME0771)

Dear Mr. Pacilio:

The Commission has approved the enclosed exemption from specific requirements of Title 10 of the *Code of Federal Regulations*, Part 50, Appendix R, for Three Mile Island Nuclear Station, Unit 1. This action is in response to your application dated March 3, 2009, as supplemented on March 15, 2010 (Agencywide Documents Access and Management System Accession Numbers ML090630134 and ML100750093, respectively). This application requested exemption from Appendix R, Section III.G, "Fire Protection of Safe Shutdown Capability," for the use of an operator manual action in lieu of the requirements specified in Section III.G.2. The original application, dated March 3, 2009, requested approval for the use of ten manual operator actions. By letter dated March 15, 2010, nine of the ten operator manual actions were withdrawn from the request because your staff had determined that they were no longer needed. This exemption therefore reflects approval of the one remaining requested operator action.

A copy of the exemption is enclosed. The exemption has been forwarded to the Office of the Federal Register for publication.

Please contact me at (301) 415-2833 if you have any questions on this issue.

Sincerely,

A handwritten signature in cursive script that reads "Peter Bamford".

Peter Bamford, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure:  
Exemption

cc w/encl: Distribution via ListServ

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
EXELON GENERATION COMPANY, LLC  
THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1  
DOCKET NO. 50-289  
EXEMPTION

1.0 BACKGROUND

Exelon Generation Company, LLC (Exelon, the licensee) is the holder of Facility Operating License No. DPR-50 which authorizes operation of the Three Mile Island Nuclear Station, Unit 1 (TMI-1). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

The facility consists of a pressurized-water reactor (PWR) located in Dauphin County, Pennsylvania.

2.0 REQUEST/ACTION

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.48, requires that nuclear power plants that were licensed before January 1, 1979, must satisfy the requirements of 10 CFR Part 50, Appendix R, Section III.G, "Fire protection of safe shutdown capability." TMI-1 was licensed to operate prior to January 1, 1979. As such, the licensee's Fire Protection Program (FPP) must satisfy the established fire protection features of 10 CFR Part 50, Appendix R, Section III.G.

TMI-1 proposes to utilize an operator manual action (OMA) in lieu of meeting the circuit separation and/or protection requirements contained in 10 CFR Part 50, Appendix R, Section III.G.2 (III.G.2), which requires ensuring that one of the redundant trains of systems necessary to achieve and maintain hot shutdown is maintained free of fire damage. In this case, the OMA is proposed for a fire occurring in Fire Zone 6 of the plant's Auxiliary Building (AB-FZ-6). The prescribed action involves opening a breaker and manually opening valve MU-V-36 within 40 minutes to support maintaining a makeup pump minimum recirculation path. By letter dated December 30, 1986 (ADAMS Legacy Library Accession No. 8701090216), this OMA was previously approved by the NRC; however, the time requirement has been shortened, necessitating this exemption.

In summary, by letter dated March 3, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090630134), as supplemented by letter dated March 15, 2010 (ADAMS Accession No. ML100750093), Exelon requested an exemption for TMI-1 from certain technical requirements of III.G.2 for the use of an OMA in lieu of meeting the circuit separation and/or protection requirements contained in III.G.2 for AB-FZ-6.

### 3.0 DISCUSSION

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

In its March 15, 2010, letter, the licensee discussed financial implications associated with plant modifications that may be necessary to comply with the regulation. If such costs have been shown to be significantly in excess of those contemplated at the time the regulation was

adopted, or are significantly in excess of those incurred by others similarly situated, this may be considered a basis for considering an exemption request. However, financial implications were not considered in the regulatory review of their request since no substantiation was provided regarding such financial implications. Even though no financial substantiation was provided, the licensee did submit sufficient regulatory basis to support a technical review of their exemption request in that the application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule.

In accordance with 10 CFR 50.48(b), nuclear power plants licensed before January 1, 1979, are required to meet Section III.G, of 10 CFR Part 50, Appendix R. The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G is to ensure that the ability to achieve and maintain safe shutdown is preserved following a fire event. The regulation intends for licensees to accomplish this by extending the concept of defense-in-depth to:

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

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

- 1) Separation of cables and equipment by a fire barrier having a 3-hour rating;
- 2) Separation of cables and equipment by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards and with fire detectors and an automatic fire suppression system installed in the fire area; or

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

Exelon has requested an exemption from the requirements of III.G.2 for TMI-1 to the extent that one of the redundant trains of systems necessary to achieve and maintain hot shutdown is not maintained free of fire damage in accordance with one of the required means, for a fire occurring in Fire Zone AB-FZ-6 in the Auxiliary Building. In its March 15, 2010, response to the NRC's request for additional information, the licensee stated that the purpose of its request was to credit the use of an OMA, in conjunction with other forms of defense-in-depth, in lieu of the separation and protective measures required by III.G.2 for a fire in Fire Zone AB-FZ-6. Specifically, Fire Zone AB-FZ-6 is not protected throughout by an automatic fire suppression system and rated fire barriers or 20 feet of spatial separation are not provided between the redundant equipment. The OMA entails locally opening a feeder breaker (1P 480V Switchgear Unit 4C) located in Fire Zone CB-FA-2a and a valve (MU-V-36), which is located in Fire Zone AB-FZ-3, to establish a makeup pump recirculation flow path.

In summary, TMI-1 does not meet the requirements of III.G.2 for a fire in Fire Zone AB-FZ-6 and an OMA may be necessary to achieve and maintain hot shutdown capability. The licensee also indicated that the only credible scenario for a fire in Fire Zone AB-FZ-6 that may require the need to manually open valve MU-V-36 is as follows: the fire must initiate within the MU-V-36 breaker compartment of the 1A Engineered Safeguards Valve (ESV) motor control center (MCC), cause a fault on an energized circuit to make MU-V-36 close, cause power failure of the 1A ESV MCC, spread to and damage the instrument air tubing causing valves MU-V-18 and MU-V-20 to close, and cause failure of the 1B ESV MCC power circuit, which is contained within a 4-inch galvanized steel conduit.

See Section 3.3 below for additional details addressing the spatial separation between cables and instrument air tubing. In addition, the TMI-1 analysis assumes that fire damage may occur immediately upon first detection of the fire to all components in the fire area. The licensee stated that after confirmation of a fire, the fire abnormal operating procedure (AOP) for Fire Zone AB-FZ-6 would be entered.

The licensee has described in its initial request, and subsequent documents, elements of the fire protection program that provide justification that the concept of defense-in-depth that is in place in Fire Zone AB-FZ-6 is consistent with that intended by the regulation. To accomplish this, the licensee provides various forms of protection in order to maintain the concept of defense-in-depth. The licensee's approach is discussed below.

### 3.1 Fire Prevention

The licensee has stated that it has an administrative controls program in place to control ignition sources, hot work activities (activities such as welding or grinding), in situ and transient combustibles, and fire system impairments. The administrative controls program is described in the TMI-1 Updated Final Safety Analysis Report (UFSAR) and in the Fire Hazards Analysis Report (FHAR), which is incorporated by reference into the UFSAR. Transient combustibles are restricted in Fire Zone AB-FZ-6 and particularly in the 1A ESV MCC area.

In addition to these measures, the licensee has stated that the power and control cables with voltages up to 480V AC and 480/120V in the fire zone are thermoset (Kerite with ethylene propylene rubber (EPR) insulation). Thermoset cables are resistant to self-ignited cable fires and are not considered to represent an ignition source. Other ignition sources in the area consist of control power transformers inside the 1A ESV MCC. The licensee also stated that the transformers are contained within the metal-clad MCC housing and contain no combustible or flammable liquids and that the control cables are located in open trays while the 480V power cables are in conduit or use armor jacketed cable. Therefore, due to limited ignition sources

and the cables installed in conduit and armored jacketed cables, flame propagation is not expected to present a hazard.

### 3.2 Detection, Control and Extinguishment

Fire Zone AB-FZ-6 is provided with a ceiling-mounted photoelectric smoke detection system, which is connected to the Auxiliary Building fire detection panel, located near the 1A ESV MCC. The licensee has indicated that if smoke is detected, a local horn and strobe light are actuated at the fire alarm panel as well as in the control room. There are two smoke detectors located within a few feet horizontally and approximately 13 feet vertically above the 1A ESV MCC. The smoke detection system is designed and installed in accordance with National Fire Protection Association (NFPA) 72D (1975), "Proprietary Protective Signaling Systems for Guard, Fire Alarm and Supervisory Service," and NFPA 72E (1978), "Automatic Fire Detectors."

A hose reel, with at least 100 feet of hose, is provided in adjacent Fire Zone AB-FZ-9. The hose reel is less than 100 feet from the 1A ESV MCC area or any other area in Fire Zone AB-FZ-6. The hose reels were designed and installed in accordance with NFPA 14 (1978), "Standpipe and Hose Systems," and have electrically-safe fog nozzles installed, which make them safe to use in the vicinity of electrical equipment. Portable dry chemical and carbon dioxide fire extinguishers are also permanently mounted in Fire Zone AB-FZ-6 and adjacent fire zones. These extinguishers have been installed in accordance with NFPA 10, "Standard for Portable Fire Extinguishers." The licensee stated that all fire protection equipment is maintained in accordance with the site FPP to ensure operability.

A water curtain is provided for fire protection of the zone boundary between Fire Zones AB-FZ-6 and AB-FZ-7. The pre-action water curtain system between Fire Zones AB-FZ-6 and AB-FZ-7 is actuated by the cross-zone smoke detection system but is not credited for fire suppression within Fire Zone AB-FZ-6. The water curtain is only provided for fire protection of

the zone boundary between Fire Zones AB-FZ-6 and AB-FZ-7 and all other openings are sealed with material having at least a 1-hour fire rating.

The remaining zone boundaries consist of reinforced concrete walls, floors and ceilings. The south boundary and portion of the ceiling are not adjacent to any other plant areas. The remainder of the ceiling adjacent to the chemical addition area and Emergency Safeguards Features (ESF) Ventilation Room is a 3-hour fire barrier. Most of the north boundary is adjacent to Fire Zone AB-FZ-7 with an open passage, discussed above, between the zones. The remainder of the north boundary is adjacent to the Reactor Building, which is a 3-hour rated fire barrier. The east boundary is adjacent to Fire Zones FH-FZ-1 and FH-FZ-2 and is made of reinforced concrete. A 3-hour rated fire barrier is provided on the floor where this zone is adjacent to Fire Zones AB-FZ-2a, AB-FZ-2b and AB-FZ-2c. An automatic pre-action system is located in Fire Zone AB-FZ-4 where the floor of Fire Zone AB-FZ-6 is adjacent to Fire Zone AB-FZ-4.

### 3.3 Preservation of Safe Shutdown Capability

The licensee has stated that the postulated fire event that may require the OMA to open MU-V-36 would include at least four independent failures to occur; two of which are sequence dependent (i.e., MU-V-36 hot short occurs prior to loss of MCC) as described below:

- While 1A ESV MCC is energized, the fire causes a hot short (within 1A ESV MCC), which establishes proper voltage in the closing circuit and causes MU-V-36 to travel closed (MU-V-36 control cable CQ232A).
- After MU-V-36 is closed, the fire causes loss of 1A ESV MCC (cable LP8 within MCC), which is located in the fire zone. This eliminates remote control of MU-V-16A and MU-V-16B and would isolate the 'A' train emergency makeup (High Pressure Injection [HPI]) flow path (valves normally closed).



- The fire causes a loss of integrity of the ¼ inch outside diameter copper tubing which causes a sufficient reduction in the Auxiliary Building instrument air supply pressure for MU-V-18 to close and eventually for MU-V-20 to close. Loss of control of MU-V-18 eliminates the use of the normal Reactor Coolant System (RCS) makeup flow path and depressurization of the MU-V-20 actuator would cause seal injection flow to the RCP to be isolated.
- Fire causes loss of power to 1B ESV MCC (cable LS7A). This eliminates remote control of MU-V-16C and MU-V-16D and would eliminate the 'B' train emergency makeup (HPI) flow path as an alternate means of RCS makeup (valves normally closed).

In order for a fire to cause MU-V-36 to close, the licensee has indicated that "...the fire must cause an intra-cable hot short between a normally energized conductor in multi-conductor cable CQ232A and the conductor that picks up the closing coil. This would short out the remote control switch and energize the closing coil for MU-V-36. The fire must maintain this hot short without grounding the circuit and blowing the control power fuses or otherwise causing a loss of control power, such as loss of the main 1A ESV MCC power cable LP8. The MU-V-36 circuits of concern are located within the MCC breaker compartment along with the control power fuses. It is unlikely that a fire could sufficiently damage cable CQ232A insulation and short the proper conductors to energize the closing coil for MU-V-36 prior to blowing the control power fuses. Because the fire must cause a hot short to close MU-V-36 prior to loss of control power, the most likely fire ignition location within Fire Zone AB-FZ-6 is in the MU-V-36 breaker compartment. Fires in other areas of 1A ESV MCC would be likely to trip the main bus breaker or otherwise damage the 1A ESV MCC power cable LP8 prior to affecting MU-V-36 circuits."

Next, the licensee has indicated that "[t]he primary combustible in Fire Zone AB-FZ-6 is 1A ESV MCC and associated cables...[t]he tubing closest to 1A ESV MCC is 1/4 inch outside

diameter tubing used for testing reactor building pressure switches. This tubing is at least six feet from the MCC with no intervening combustibles. The loss of integrity of these 1/4 inch outside diameter tubing lines may not be sufficient to exceed the capacity of the instrument air supply and reduce the instrument air supply pressure to MU-V-18 (normal RCS makeup isolation valve) below 60 psig [pounds per square inch gauge]. Both instrument air compressors are unaffected by a fire in Fire Zone AB-FZ-6 and would attempt to maintain the instrument air supply to MU-V-18. The loss of instrument air system integrity occurs in a section supplied through 3/8 inch regulators and 1/4 inch outside diameter tubing. The main instrument air system distribution headers are 2 inch lines. This specific failure may not be sufficient to reduce the air supply pressure to MU-V-18 enough to prevent adequate RCS makeup flow. The next closest copper tubing in Fire Zone AB-FZ-6 is against the containment wall. This tubing is further separated from 1A ESV MCC by at least 10 feet of distance with no intervening combustibles. Based on the existing separation with no intervening combustibles and outside diameter of the instrument air lines within Fire Zone AB-FZ-6, it is unlikely that a fire in 1A ESV MCC would cause a loss of Auxiliary Building instrument air pressure.”

The licensee further indicated that “[t]he power cable for 1B ESV MCC (LS7A) is routed through Fire Zone AB-FZ-6. The cable comes through the one hour-rated wall (similar to UL-tested configuration U-410) separating Fire Zones AB-FZ-6a and AB-FZ-6 in 4 inch galvanized steel conduit as it passes through the area near 1A ESV MCC. As it turns away from 1A ESV MCC (at least 6 feet of separation with no intervening combustibles), it exits the conduit and enters a tray (via a splice box). There is at least 12 feet of vertical separation with no intervening combustibles between the top of 1A ESV MCC and the 4 inch conduit that holds LS7A. Based on the existing separation and conduit protection, it is unlikely that the 1B ESV MCC power cable would be damaged, even if 1A ESV MCC were fully consumed in a fire.”

Additionally, the Auxiliary Building ventilation system is not credited for smoke removal. If the primary safe shutdown (SSD) operator becomes aware of smoke in the Auxiliary Building, the operator will don a self-contained breathing apparatus (SCBA) to perform actions when directed by the control room. Two SCBAs are staged near the primary operator station on Auxiliary Building 305' elevation. All operators assigned to fire brigade or SSD duties are qualified to use a SCBA. Validation exercises have been performed to demonstrate that operators can reliably don a SCBA in less than 3 minutes.

Given the lack of combustibles, separation of cables described above, and the sequence of events required, it is unlikely that the OMA to open MU-V-36 would be required. It is also likely that a fire would be detected and suppressed before the sequence of events and failures described above fully evolved. In the unlikely occurrence that the sequence does fully evolve, the OMA is available to provide assurance that safe shutdown can be achieved.

### 3.4 Feasibility and Reliability of the OMAs

This analysis postulates that the features described in Sections 3.1, 3.2 and 3.3, are not sufficient to assure safe shutdown capability. The licensee has proposed an OMA to be performed in addition to the above discussed fire protection features.

NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," provides criteria and associated technical bases for evaluating the feasibility and reliability of post-fire OMAs in nuclear power plants. The following provides the TMI-1 analysis of these criteria for justifying the OMA specified in this request for Fire Zone AB-FZ-6.

#### 3.4.1 Bases for Establishing Feasibility and Reliability

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

In their March 3, 2009, letter, and further supported by their March 15, 2010, letter, the licensee stated that environmental considerations such as radiological concerns, emergency lighting, temperature and humidity conditions and smoke and toxic gases were evaluated and found to not represent a negative impact on the operators' abilities to complete the OMA. The licensee stated that radiation levels expected during travel to or at the OMA location in the Auxiliary Building are minimal with dose rates that would be less than 10 millirem per hour. The licensee also confirmed that sufficient emergency lighting exists at the areas where actions are performed and along the travel routes to the areas. The licensee has stated that operators also have access to 8-hour battery-powered portable lights, as well. The licensee also has confirmed that temperature and humidity conditions will not challenge the operators performing the OMA. The licensee stated that radio and page communications are available for this OMA. Additionally, the licensee indicated that heat and smoke or gas generation from the fire will not impact the operator performing the OMA. This is further supported by the fact that the location of the postulated fire event is in a different fire zone than the locations for where actions are performed.

The licensee stated that the functionality of equipment and cables needed to perform the required OMA is documented in the OMA procedures, which reflect equipment availability and provide specific direction where functionality of equipment and cables may be compromised by fire. In addition, in-plant OMA walk downs were performed and demonstrated that the OMA equipment was accessible. The physical location of the components where the OMA is to be performed is identified in the fire AOPs and where components cannot be operated from the floor, installed ladders or portable ladders are provided. Other than keys, portable lighting, and portable ladders, the operators use no other additional support equipment. The fire AOPs identify when a key is required to perform the OMA. Keys required by operators are in the

possession of the operator and the specific key number required for the OMA is identified in the fire AOP.

With regard to available indications, the licensee has stated that available diagnostic instrumentation is listed in the fire AOP for each fire area; however, instrumentation or indications are generally not relied upon to perform the OMA. Explicit steps in the fire AOPs direct the operators on how to perform the OMA such that one train of available indications is always available for a fire in a given fire area or zone. The licensee stated that the OMA does not require any indication to support completion of the OMA; however, lack of indication may be used to initiate an action and that successful accomplishment of the OMA is directly observable by the operator performing the OMA. The successful completion of the action is then reported to the Control Room operators. Additionally, emergency makeup flow indication is available for a fire in Fire Zone AB-FZ-6.

With regard to communications, the licensee stated that TMI-1 has portable radio and installed phones available as part of the normal plant communications available between the Control Room and the operators and the radio and phone systems are robustly designed such that they should be available following most fire scenarios. If the various communication systems are not available, the method of communication will be face-to-face or using radios via line-of-sight (i.e., no repeaters). The licensee simulated face-to-face communication was simulated by having operators start the manual action from directly outside the Control Room. Task completion is normally reported by portable hand held radio or installed phones but may also be reported by face-to-face communication if plant communication systems are not available. The General Announcing System, Operations Radio System, Plant Telephone System, Sound Powered Phone System, and Face-to-Face Communications are all available to Control Room operators and operators performing OMAs.

The licensee stated that operators performing the OMA are provided with standard personal protective equipment (PPE), including hardhat, gloves, and protective glasses. In the unlikely event that smoke conditions would require SCBAs to be worn, the plant equipment operators are qualified to wear SCBAs and the SCBAs are staged at strategic locations in the plant with additional SCBAs in the fire brigade locker.

The licensee stated that fire AOPs have been developed for each fire area or zone and that the fire AOPs are staged in certain strategic locations that are easily accessible to the operators. The individual procedures are presented in a standardized procedure format that the operators are familiar with. The fire AOPs contain both preventive actions to prevent potential adverse fire effects, as well as reactive actions to direct timely action if a fire causes a particular adverse condition (i.e., valve spuriously opens or closes). The procedures for individual fire areas are used in conjunction with the symptom-based (reactive) Emergency Operating Procedures (EOPs) and other symptom-based AOPs to provide a combined preventive (fire AOPs) and reactive (EOPs and all AOPs, including fire) approach to achieve safe shutdown following a fire. The individual fire area shutdown procedures provide the operators with information as to the available equipment (including instrumentation) that can be relied upon following a fire. The fire AOP procedures provide specific guidance to the operators as to what equipment could be affected by the fire and are written in order of time criticality (i.e., the most time critical actions are in the front of the procedure) to ensure that the actions are taken within the analyzed time required in the safe shutdown analysis.

With regard to staffing and demonstrations, the licensee stated that three qualified operators are available to perform the manual action at all times and that demonstrations were performed in the TMI-1 plant simulator and in the plant by operator walk downs to show that the OMAs can be performed within the times as described in the safe shutdown analysis.

### 3.4.2 Feasibility

The licensee's analysis demonstrates that, for the expected scenario, the OMAs can be diagnosed and executed in 19 minutes while the time available to complete them is 40 minutes. The licensee stated that the 40-minute time limit itself is a conservative measure since recent testing on the MU-V-20 backup air supply demonstrated that MU-V-20 would only stay open for approximately 75 minutes. The licensee's analysis also demonstrates that various factors, as discussed above, have been considered to address uncertainties in estimating the time available. Therefore, the OMA included in this review is feasible because there is adequate time available for the operator to perform the required manual actions to achieve and maintain hot shutdown following a fire in Fire Zone AB-FZ-6.

### 3.4.3 Reliability

The stated completion time of 19 minutes provides reasonable assurance that the OMA can reliably be performed under a wide range of conceivable conditions by different plant crews because it, in conjunction with the 21-minute margin and other installed fire protection features, accounts for sources of uncertainty such as variations in fire and plant conditions, factors unable to be recreated in demonstrations and human-centered factors. Therefore, the OMA included in this review is reliable because there is adequate time available to account for uncertainties not only in estimates of the time available, but also in estimates of how long it takes to diagnose a fire and execute the OMAs (e.g., as based, at least in part, on a plant demonstration of the actions under nonfire conditions).

## 3.5 Defense-In-Depth Summary

In summary, the defense-in-depth concept for a fire in Fire Zone AB-FZ-6 provides a level of safety that results in the unlikely occurrence of fires; rapid detection, control, and extinguishment of fires that do occur; and the protection of structures, systems, and components important to safety. As discussed above, in the unlikely event of a fire that

challenges safe shutdown capability, the licensee has provided preventative and protective measures in addition to a feasible and reliable OMA that together demonstrate the licensee's ability to preserve or maintain safe shutdown capability at TMI-1 in the event of a fire in Fire Zone AB-FZ-6.

### 3.6 Authorized by Law

This exemption would allow TMI-1 to utilize an OMA, in conjunction with the other installed fire protection features, to ensure that at least one means of achieving and maintaining hot shutdown remains available during and following a postulated fire event, as part of its fire protection program, in lieu of meeting the circuit separation and/or protection requirements specified in III.G.2 for a fire in Fire Zone AB-FZ-6. As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR Part 50. The NRC staff has determined that granting of the licensee's proposed Exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the exemption is authorized by law.

### 3.7 No Undue Risk to Public Health and Safety

The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G is to ensure that at least one means of achieving and maintaining hot shutdown remains available during and following a postulated fire event. Because the use of the specific OMA, in conjunction with the other installed fire protection features, only impacts the response to the specific Fire Zone AB-FZ-6 scenario described above, the probability of postulated accidents is not increased. Also, based on the above, the consequences of postulated accidents are not increased. Therefore, there is no undue risk to public health and safety.

### 3.8 Consistent with Common Defense and Security

The proposed exemption would allow TMI-1 to utilize a specific OMA, in conjunction with the other installed fire protection features, in response to a fire in Fire Zone AB-FZ-6 in lieu of meeting the requirements specified in III.G.2. This change, to the operation of the plant, has no



relation to security issues. Therefore, the common defense and security is not diminished by this exemption.

### 3.9 Special Circumstances

Special circumstances in accordance with 10 CFR 50.12(a)(2)(ii) are present whenever application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G is to ensure that at least one means of achieving and maintaining hot shutdown remains available during and following a postulated fire event. Therefore, since the underlying purpose of Appendix R, Section III.G is achieved, the special circumstances for granting an exemption from 10 CFR Part 50, Appendix R, Section III.G exist, as required by 10 CFR 50.12(a)(2)(ii).

### 4.0 CONCLUSION

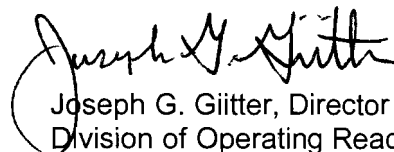
Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants Exelon an exemption from the requirements of Section III.G.2 of Appendix R of 10 CFR Part 50, to TMI-1 for the OMA discussed above.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (75 FR 36700).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 28<sup>th</sup> day of June 2010.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Joseph G. Giitter, Director  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

June 28, 2010

Mr. Michael J. Pacilio  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

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Peter Bamford, Project Manager  
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PUBLIC	RidsNrrLAABaxter Resource	RidsNrrDorlLpII-2 Resource
LPLI-2 R/F	RidsNrrDraAfpb Resource	RidsRgnlMailCenter Resource
LTrocine, EDO R-I	RidsAcraAcnw_MailCTR Resource	RidsNrrDpr Resource
RidsOgcRp Resource	RidsNrrPMThreeMileIsland Resource	RidsNrrDirRerb Resource

Accession Nos.: Letter: ML101310113, Exemption : ML101310121 \*by memo

OFFICE	LPLI-2/PM	LPLI-2/LA	AFPB/BC	OGC	LPLI-2/BC	DORL/D
NAME	PBamford	ABaxter	AKlein*	AJones, NLO	HChernoff	JGiitter
DATE	05/12/2010	05/24/2010	04/29/2010	06/07/2010	06/21/2010	06/28/2010

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