

10 CFR 50.90
10 CFR 50.54(q)
10 CFR 50.4

TMI-17-010

February 13, 2017

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

Three Mile Island Nuclear Station, Unit 1
Renewed Facility Operating License No. DPR-50
NRC Docket No. 50-289

Three Mile Island Nuclear Station, Unit 2
Facility Possession-Only No. DPR-73
NRC Docket No. 50-320

Subject: Response to Request for Additional Information
License Amendment Request for Approval of Changes to the Three Mile Island
Nuclear Station Emergency Plan Related to Staffing

- References:
- 1) Letter from James Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission – *License Amendment Request for Approval of Changes to the Three Mile Island Nuclear Station Emergency Plan Related to Staffing*, dated July 15, 2016 (ML16201A146)
 - 2) U.S. Nuclear Regulatory Commission Electronic Mail Request to Francis Mascitelli, Exelon Generation Company, LLC – *Draft Request for Additional Information on TMI ERO Staffing Amendment*, dated December 1, 2016
 - 3) U.S. Nuclear Regulatory Commission Electronic Mail Request to Francis Mascitelli and Richard Gropp, Exelon Generation Company, LLC – *Request for Additional Information on TMI ERO Staffing Amendment*, dated December 21, 2016 (ML16356A480)

By letter dated July 15, 2016 (Reference 1), Exelon Generation Company, LLC (Exelon) submitted a license amendment request for Three Mile Island (TMI) to support changes to the Emergency Plan that involve on-shift emergency response staffing modifications as described in Table TMI 2-1, "*Minimum Staffing Requirements for TMI Station.*" The proposed changes would decrease the Radiation Protection technician staffing from three (3) to two (2) technicians, remove two (2) Maintenance technicians currently assigned to the "Repair and Corrective Action" function, and eliminate the on-shift Operations Support Center (OSC) Director position. An evaluation of the proposed changes pursuant to 10 CFR 50.54(q), determined that the proposed changes result in a reduction in effectiveness of the TMI Emergency Plan and, therefore, require prior NRC approval.

Subsequently, in an electronic mail request dated December 1, 2016 (Reference 2), the NRC issued a draft Request for Additional Information (RAI) indicating that it had reviewed the information submitted in the Reference 1 letter, and that additional clarifying information was needed to support its continued review. The draft RAI in Reference 2 was further discussed during a teleconference on December 13, 2016, between Exelon and NRC representatives. As a result of the discussions, it was determined that no modification to the draft RAI was needed and the NRC issued a formal RAI on December 21, 2016 (Reference 3), and requested a response by January 31, 2017. This date was extended until February 14, 2017, at the request of Exelon and was considered acceptable by the NRC.

As described in the Reference 1 letter, the proposed changes would decrease the Radiation Protection technician staffing from three (3) to two (2) technicians and remove two (2) Maintenance technicians currently assigned to the "Repair and Corrective Action" function. The proposed changes also discussed the elimination of the on-shift OSC Director position. However, after further evaluation, Exelon is no longer requesting the elimination of the on-shift OSC Director position, but is relaxing the requirement for who can fill the on-shift position (renamed Repair Team Lead), since maintaining this position would provide more consistency with NRC's draft NUREG-0654, Revision 2, *"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,"* guidance.

Attachment 1 to this letter provides Exelon's response to the NRC's RAI transmitted in the Reference 3 electronic mail message. The information included in Attachment 1 contains further clarification and additional justification in support of the proposed changes, which supersedes information previously submitted in Attachment 1 (i.e., Evaluation of Proposed Changes, Section 3 - Technical Evaluation and Section 4.3 - No Significant Hazards Consideration) of the Reference 1 letter. Attachment 2 provides revised mark-ups of the existing Emergency Plan pages depicting the proposed changes to the TMI Emergency Plan and Attachment 3 includes revised re-typed pages of the Emergency Plan. These revised Emergency Plan pages supersede those previously submitted in the Reference 1 letter. In addition, Attachment 4 (i.e., EP-AA-1009, Addendum 1, Three Mile Island On-shift Staffing Technical Basis) from the Reference 1 submittal is being withdrawn since it is no longer needed to support the requested changes.

Exelon has reviewed the information supporting a finding of No Significant Hazards Consideration (NSHC) and the Environmental Consideration provided to the NRC in the Reference 1 letter and the updated NSHC included in this submittal. The additional information and clarification provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. In addition, the information and clarification provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment as documented in the Reference 1 letter.

There are no regulatory commitments contained in this submittal.

If you have any questions concerning this submittal, please contact Richard Gropp at (610) 765-5557.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 13th day of February 2017.

Respectfully,



David P. Helker
Manager, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

- Attachments: 1) Response to Request for Additional Information - License Amendment
Request for Approval of Changes to the Three Mile Island Nuclear Station
Emergency Plan Related to Staffing
2) Revised Emergency Plan Mark-up Pages - Three Mile Island Nuclear Station
3) Revised Re-typed Emergency Plan Pages - Three Mile Island Nuclear Station

cc: w/ Attachments
Regional Administrator – NRC Region I
NRC Senior Resident Inspector – Three Mile Island
NRC Project Manager, NRR – Three Mile Island
R. R. Janati, Commonwealth of Pennsylvania

ATTACHMENT 1

**Response to the Request for Additional Information - License Amendment Request for
Approval of Changes to the Three Mile Island Nuclear Station
Emergency Plan Related to Staffing**

Attachment 1

Response to Request for Additional Information - License Amendment Request for Approval of Changes to the Three Mile Island Nuclear Station Emergency Plan Related to Staffing

By letter dated July 15, 2016 (Reference 1), Exelon Generation Company, LLC (Exelon) submitted a license amendment request for Three Mile Island (TMI) to support changes to the Emergency Plan that involve on-shift emergency response staffing modifications as described in Table TMI 2-1, "*Minimum Staffing Requirements for TMI Station.*" The proposed changes would decrease the Radiation Protection technician staffing from three (3) to two (2) technicians, remove two (2) Maintenance technicians currently assigned to the "Repair and Corrective Action" function, and eliminate the on-shift Operations Support Center (OSC) Director position. An evaluation of the proposed changes pursuant to 10 CFR 50.54(q) determined that the proposed changes result in a reduction in effectiveness of the TMI Emergency Plan and, therefore, require prior NRC approval.

Subsequently, in an electronic mail request dated December 1, 2016 (Reference 2), the NRC issued a draft Request for Additional Information (RAI) indicating that it had reviewed the information submitted in the Reference 1 letter, and that additional clarifying information was needed to support its continued review. The draft RAI in Reference 2 was further discussed during a teleconference on December 13, 2016, between Exelon and NRC representatives. As a result of the discussions, it was determined that no modification to the RAI was needed and the NRC issued a formal RAI on December 21, 2016 (Reference 3), and requested a response by January 31, 2017. The NRC's question cited in Reference 2 is listed below followed by Exelon's response.

NRC Question

TMI-RAI 1

Regulatory Issue Summary (RIS) 2016-10, "License Amendment Requests for Changes to Emergency Response Organization Staffing and Augmentation," dated August 5, 2016 (ADAMS Accession No. ML16124A002), states, in part;

In support of a proposed LAR [license amendment request], a licensee should supply sufficient information to allow the NRC to conclude independently that a proposed alternate staffing approach supports timely and effective performance of the "Major Functional Areas" and "Major Tasks" listed in Table B-1 of NUREG-0654.

The following paragraph from Section 3.0, "Technical Evaluation," has been repeated throughout Exelon's justification for all of the proposed changes:

The required tasks for each event were assessed to determine if sufficient personnel are available on-shift to perform all of the tasks required by the

applicable plant procedures and the Emergency Plan, without the need for any unacceptable collateral duties. This assessment concluded that the minimum on-shift staff of [insert the specific change being evaluated] is sufficient to perform all required tasks prior to augmentation. The TMI on-shift staffing assessment is included in Attachment 4 [EP-AA-1009, Addendum 1, Three Mile Island On-shift Staffing Technical Basis] of this submittal.

For each change, TMI has used the assessment reflected in Attachment 4 as the basis for our acceptance. However, the assessment provided in Attachment 4 is the current assessment used to meet §IV.A.9 to Appendix E of 10 CFR Part 50, and not an assessment of shift staffing with all the proposed changes in place. As a result, the evaluation performed by TMI to justify these changes was not provided and, therefore, the staff cannot independently conclude that the proposed changes will not cause an issue where emergency planning functions would not be the highest priority for a member of the on-shift staff to perform as assigned.

Please provide a revised assessment reflective of the proposed changes in support of the staff's continued technical review of the proposed staffing changes to independently conclude that the changes, as proposed, continue to meet the regulations and maintain reasonable assurance of adequate public health and safety.

RESPONSE

Upon review of the guidance contained in Regulatory Issue Summary (RIS) 2016-10, "License Amendment Requests for Changes to Emergency Response Organization Staffing and Augmentation," (Reference 4) it is understood that the On-Shift Staffing Assessment should not be used to provide the primary basis to support the Technical Evaluation of the proposed TMI License Amendment Request (LAR). The RIS states:

The NRC staff has recently received multiple LARs that seek to change ERO staffing commitments by extending the augmentation time for certain positions, or eliminating the staffing for positions entirely. In each case, the change has been justified primarily by referencing the on-shift staffing analysis developed in accordance with NEI 10-05, or a similar analysis using different accident scenarios. These LARs indicate a misunderstanding on how NEI 10-05 and the associated staffing analysis can be used effectively in the justification of proposed staffing changes.

...an evaluation performed using only the guidance of NEI 10-05 does not satisfy the requirement to identify and evaluate changes to ERO augmentation timing or ERO augmentation staffing that reduces the capability to perform an emergency planning function.

As described in the Reference 1 letter, the proposed changes would decrease the Radiation Protection technician staffing from three (3) to two (2) technicians and remove two (2) Maintenance technicians currently assigned to the "Repair and Corrective Action" function. The proposed changes also discussed the elimination of the on-shift OSC

Director position. However, after further evaluation and discussion with the NRC, Exelon is no longer requesting the elimination of the on-shift OSC Director position, but is relaxing the requirement for who can fill the on-shift position (renamed Repair Team Lead), since maintaining this position would provide more consistency with NRC's draft NUREG-0654, Revision 2, *"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,"* guidance (Reference 5).

In light of the guidance provided in RIS 2016-10, Exelon requests that the revised Technical Evaluation and No Significant Hazards Consideration contained in this RAI response supersede the information previously submitted in Attachment 1 (i.e., Evaluation of Proposed Changes, Section 3 - Technical Evaluation and Section 4.3 – No Significant Hazards Consideration) of the July 15, 2016, letter (Reference 1). The updated Technical Evaluation and No Significant Hazards Consideration information in support of this amendment request are discussed below.

In addition, Exelon is requesting that the information included in Attachment 4 of the Reference 1 submittal (i.e., EP-AA-1009, Addendum 1, Three Mile Island On-shift Staffing Technical Basis) be withdrawn as the basis for justifying the proposed changes. The technical justification for the proposed changes is now supported by the updated Technical Analysis and No Significant Hazards Consideration included in this RAI response.

The additional information and clarification provided in this RAI response does not affect the bases previously included in the Reference 1 submittal and as updated that the proposed LAR does not involve a significant hazards consideration, and does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

3.0 TECHNICAL EVALUATION (Updated)

3.1 Elimination of One Radiation Protection Technician (RPT)

10 CFR 50.54(q) establishes that all holders of a nuclear power reactor operating license must follow and maintain in effect Emergency Plans which meet the planning standards in 10 CFR 50.47(b) and the requirements in 10 CFR 50, Appendix E, *"Emergency Planning and Preparedness for Production and Utilization Facilities."* In accordance with 10 CFR 50.47(b)(2), a licensee must provide *"...adequate staffing to provide initial facility accident response in key functional areas [that] is maintained at all times,"* and ensure that *"timely augmentation of response capabilities is available...."*

Current on-shift staffing at TMI includes three (3) RPTs. TMI is proposing that one (1) RPT be eliminated from the on-shift minimum staff.

NUREG-0654 - Applicable Guidance

NUREG-0654/FEMA-REP-1, "*Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*," Revision 1 (Reference 6), Table B-1 specifies the minimum staffing requirements for the ERO. Specifically, for Radiological Protection related support, the following guidance is provided:

Major Functional Area: "*Radiological Accident Assessment and Support of Operational Accident Assessment*"

- Major Task: "Offsite Dose Assessment" - one (1) person with Senior Health Physics (HP) Expertise augmented at 30 minutes.
- Major Task: "In-Plan Surveys" - one (1) RPT on-shift and one RPT augmented at 30 minutes.

Major Functional Area: "Protective Actions (In-Plant)"

- Major Task: Radiation Protection - two (2) RPTs, with the provision that these positions "*may be provided by shift personnel assigned other functions.*"

NUREG-0654 Draft Revision 2 - Applicable Guidance

The NRC is developing draft Revision 2 to NUREG-0654/FEMA-REP-1 (Reference 5), which provides updated staffing guidance in Table B-1. The updated guidance considers improvements and efficiencies gained through technology and training which have been incorporated throughout the industry. A draft version was issued in May 2015 for industry review and comment. The guidance states:

NPP [Nuclear Power Plant] applicants and licensees may voluntarily use the guidance in this document to demonstrate compliance with the underlying NRC regulations.

Specifically, for Radiation Protection (RP) related tasks, the required number of RPTs for a single unit site is two (2) qualified HP personnel (RPTs). The RP Function includes the following:

- Provide qualified HP coverage for responders accessing potentially unknown radiological environments during emergency conditions.
- Provide in-plant surveys, onsite surveys, and offsite surveys.
- Support offsite Field Monitoring Teams (FMTs).
- Control dosimetry and access control.

For Dose Assessments/Projections, the function is to perform dose assessments/projections and provide input to applicable Protection Action Recommendation (PAR) decision maker, until relieved. Additionally, for the Dose Assessments/Projections Function, the table states "*Other personnel may be assigned this function if no collateral duties are assigned to an individual that are beyond the capability of that individual to perform at any given time. A 10 CFR Part 50, Appendix E shift staffing evaluation must be performed to support assignment of multiple roles to individual responders on-shift.*" Exelon has performed a 10 CFR 50, Appendix E, shift staffing evaluation and concluded that the Dose Assessment function may be performed by one (1) of the two (2) on-shift RPTs.

The proposed staffing for RPTs at TMI is consistent with the draft NUREG-0654, Revision 2 guidance.

Historical TMI Emergency Plan, Revision 3, January 1981

In response to NUREG-0654, Revision 1 (Reference 6), Table B-1 guidance, TMI's Emergency Plan established three (3) RP personnel to support the On-Shift Emergency Organization with additional RPTs augmenting the ERO after 60 minutes. From the NRC approved TMI Emergency Plan:

To meet the Technical Specification (reference 4.10.1.3.1) requirement for having at least one member of the operating shift "qualified to implement radiation protection procedures", at least one, and normally three, Radiation Controls Technicians will be assigned to each shift. These technicians are qualified to determine doses received by workers during the performance of their duties and will be available during emergencies on a 24-hour per day basis to perform related functions.

NUREG-0746 – Applicable Guidance

In 1980, NUREG-0746, "*Emergency Preparedness Evaluation for TMI-1,*" (Reference 7) documented the completion of the NRC's review of TMI's Emergency Plan against the sixteen Emergency Planning Standards set forth in 10 CFR 50.47(b) and NUREG-0654/FEMA-REP-1, Revision 1, dated November 1980). As documented in NUREG-0746, the approved minimum shift for the onsite emergency organization is, "*...9 positions associated with operations, 5 with maintenance, and 4 with radiation/chemistry,*" for a total of 18 positions...." For TMI, the three (3) on-shift RPTs, along with the on-shift Chemistry technician, constitute the four (4) positions associated with radiation/chemistry.

Supplement 1 to NUREG-0746 (Reference 8) addressed unresolved issues from the NUREG-0654, Revision 1 in which the NRC concluded:

NUREG-0746 indicated that Revision 2 to the TMI-1 Emergency Plan generally satisfied the requirements and criteria of 10 CFR 50.47(b) and NUREG-0654 with the exception of some specifically identified items.

Since the issuance of NUREG-0746, the Licensee submitted Revision 3 to its Emergency Plan dated January 1981. That revised plan addressed some of the items identified by the NRC staff as being unresolved.

Based on our review of the TMI Emergency Plan against the requirements of 10CFR 50.47(b), 10 CFR Part 50, Appendix E, and the criteria of NUREG-0654, we conclude that the Three Mile Island Unit 1 Emergency Plan provides an adequate planning basis for an acceptable state of licensee's emergency preparedness.

Current Emergency Plan Annex EP-AA-1009

Under the current TMI Emergency Plan, EP-AA-1009, TMI still maintains three (3) RP positions and one (1) Chemistry Technician on-shift. The Emergency Plan description of the Functional Areas has been previously revised to more align with the NUREG-0654, Revision 1 (Reference 6), Table B-1 format and description.

3.1.1 NUREG-0654 Functional Area Technical Evaluation

The following discussion addresses each of the Major Tasks applicable to the on-shift RPTs as defined in the NUREG-0654, Table B-1, Functional Areas.

a. Major Functional Area: Radiological Accident Assessment and Support of Operational Accident Assessment

1. Major Task: Off-site Dose Assessment

One (1) on-shift RP position is credited under the Functional Area of Radiological Accident Assessment and Support of Operational Accident Assessment for the Major Tasks of Offsite Dose Assessment. Under Emergency Conditions, this position would be responsible for Dose Assessment and related activities. TMI is not proposing any changes to the on-shift staffing levels for this Major Task in Table TMI 2-1; however, the discussion below identifies that, based on improvements to the dose assessment process since the initial commitments, the on-shift dose assessor would have additional time to support other RPT related tasks.

10 CFR 50 Appendix E, Section IV.A.4, states in part that:

"The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization and the means for

notification of such individuals in the event of an emergency. Specifically, the following shall be included:

- 4. Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities."*

10 CFR 50.47(b)(9) states that, "Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use."

For TMI, the on-shift task of off-site dose assessment is performed by an RPT utilizing a computer program. Application of this program to determine projected dose involves input of data obtained from computer Plant Parameter Display System (PPDS) screens. Dose projections can be promptly performed to support completion as required by plant procedures. The Dose Assessment methods utilized today are improved and more efficient than those methods utilized in the 1980s when TMI's commitments to RP staffing were established. The rapid determination of dose assessment allows the assigned RPT for dose assessment time to support other RP tasks, including radiological assessment, decision-making, and radiological leadership during an emergency event.

Note that the Technical Support Center (TSC) and Emergency Operations Facility (EOF) minimum staff complements include individuals trained in the performance of off-site dose assessment utilizing the computerized dose assessment method. Both the TSC and EOF are activated within 60 minutes of a classification at an Alert or higher, thereby allowing timely transfer of this responsibility from the on-shift RPT.

2. Major Tasks: In-Plant Surveys

Two on-shift RP Technicians are credited under the Functional Area of Radiological Accident Assessment and Support of Operational Accident Assessment for the Major Tasks of In-Plant Surveys. TMI is proposing to reduce the number of RPTs for this task to one (1).

Under emergency conditions, the RPT responsibilities would include in-plant surveys as required. A review of the existing TMI procedures which support emergency conditions identified that RP in-plant surveys are dependent on the nature of the accident. There are no procedurally directed in-plant survey actions specifically identified in response to analyzed design basis events in the Emergency Operating Procedures (EOPs). In addition, there are no expected operator actions for these events that require RP coverage.

Note that RPT coverage is required to support firefighting activities in response to a fire requiring the evacuation of the Main Control Room (MCR) or an Engineered Safeguards Actuation System (ESAS) room fire. In both cases, the accident analysis does not result in an off-site release or in-plant radiological consequences which could not be addressed by the on-shift RPTs.

During emergency conditions, RP personnel may be required to establish boundaries for contaminated areas and elevated dose rate areas to control access. However, electronic access control is used to limit any access to the Radiologically Controlled Areas (RCAs) while specific area boundaries are being established.

TMI Updated Final Safety Analysis Report (UFSAR) Section 11.A, "*Postaccident Shielding Analysis*," documents a shielding evaluation that identified the necessary action to be taken for providing additional shielding in vital areas in which equipment may be unduly degraded by the large radiation fields in a post-accident environment and in which personnel may receive excessive exposures. Based upon the shielding analysis results and the modifications identified in the analysis, there are no areas that are expected to require operator access under post-accident conditions that would require RPT coverage. The shielding analysis is included in Attachment 5 of the July 15, 2016 submittal (Reference 1).

b. Major Functional Area: Protective Actions (In-Plant)

As a collateral duty, two (2) RPTs are designated under the Functional Area of In-Plant Protective Actions, as needed. The Emergency Plan notes that the function may be provided by personnel assigned other functions. Under emergency conditions, these RPTs responsibilities would include implementation of protective actions, as needed. Protective actions as stated in NUREG-0654 include Access Control, HP Coverage for repair, corrective actions, search and rescue, first aid and firefighting, personnel monitoring, and dosimetry.

TMI is not proposing any changes to the on-shift staffing levels for this Major Task in Table TMI 2-1; however, the discussion below identifies that based on improvements in technology and tools, the tasks supporting in-plant protective actions would be reduced, allowing additional time to support other RPT related tasks.

1. Major Tasks: Radiation Protection

Access Control

RPT support functions for Access Control to the RCA have become more efficient since on-shift staffing commitments for RPTs were established at TMI. Specifically, access to the RCA is controlled electronically. The electronic

access control system provides for the user to electronically sign Radiation Work Permits (RWPs) to self-authorize access to the RCA and self-issuance of an electronic dosimeter in addition to the assigned Dosimeter of Legal Record (DLR) that is always worn. Access to the RCA is controlled electronically without interface with an RPT.

RWPs are in place, and active for use with setpoints for dose and dose rate that reflect expected conditions. In an emergency, when expected conditions would likely change, electronic dosimeter setpoints can be adjusted via a network computer in the RCA access control program once the on-shift RPTs have determined actual dose rates. Onsite RP personnel determined that this routine evolution can be performed within approximately three minutes by the on-shift RPTs. If dose rates are unknown, continuous RPT assistance will be required. Additionally, RPTs can modify the setpoints on electronic dosimetry that is maintained in the fast-activation mode.

In accordance with applicable Exelon procedures for controlling access into high and locked high radiation areas, an individual entering a High Radiation Area (HRA) or a Locked High Radiation Area (LHRA), is required to receive a briefing in accordance with the applicable procedures, and must be equipped with one or more of the following:

- A radiation monitoring device which continually indicates the radiation dose rate in the area.
- A radiation monitoring device that continuously integrates the radiation dose rate in the area and alarms when a pre-set integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel made aware of them.
- An RP individual qualified in RP procedures with a radiation dose rate device, which is responsible for positive control over the activities in the area and shall perform periodic radiation surveillances at the frequencies specified in the RWP.

During emergency conditions when personnel must enter HRAs to perform immediate actions, they are not required to be informed of area dose rates prior to entry as long as they are provided a qualified RP individual to maintain positive control over the activities. This coverage is provided by the on-shift complement of RPTs. Operations personnel are not qualified to perform self-monitoring in these areas. Access entry points to HRAs are controlled by lock-and-key. Operations maintains HRA keys under the control of the Shift Manager for needed access under emergency conditions.

RP coverage for repair, corrective actions, search and rescue, first-aid, and firefighting

In accordance with applicable Exelon procedures, one (1) RPT is assigned to the MCR to support ongoing MCR Emergency Response Team (ERT) activities. The Shift Emergency Director establishes the priorities for all on-shift ERO members, and will direct RP resources as required to respond to plant conditions. This includes prioritizing support for repair, corrective actions, search and rescue, first-aid, and firefighting. Search and rescue and first-aid functions are assigned as collateral duties with support provided by personnel from Security, Operations, or RP based upon the specific conditions requiring such a response.

TMI UFSAR Section 11.A, "*Postaccident Shielding Analysis*," documents a shielding evaluation that identified the necessary action to be taken for providing additional shielding in vital areas in which equipment may be unduly degraded by the large radiation fields in a post-accident environment and in which personnel may receive excessive exposures. Based upon the shielding analysis results and the modifications identified in the analysis, there are no areas that are expected to require operator access under post-accident conditions that would require RPT coverage. The Shielding Analysis is included in Attachment 5 of the July 15, 2016, submittal (Reference 1).

TMI assigns one (1) RPT to perform RP activities to support the Fire Brigade. The RPT responds as a fire support person and is not a fire brigade member. Having a member of RP support the Fire Brigade assures that proper radiological controls are established in the fire area, as warranted.

Personnel monitoring

RPT support functions for personnel monitoring have become more efficient since on-shift staffing commitments for RPTs were established at TMI. Specifically, personnel are issued DLRs that are continuously worn for monitoring. No RPT support is needed for issuance of DLRs to on-shift emergency workers. Electronic dosimeters are self-issued through the electronic access control system. The electronic dosimeters are self-reading, alarming dosimeters that provide readout of accumulated dose and ambient dose rate. No RPT support is needed for issuance of electronic dosimeters since issuance and use of the electronic dosimeters are part of radiation worker training.

Automated whole body monitors provide contamination monitoring. All radiation workers are qualified to use the automated whole body monitors without RPT interface. In circumstances when the automated whole body monitors are not available, hand held friskers are used for personnel contamination monitoring. All radiation workers are qualified to use the hand held friskers without RPT interface.

Dosimetry

Personnel are issued DLRs that are continuously worn for monitoring. No RPT support is needed for issuance of DLRs to on-shift emergency workers. As described above, electronic dosimeters are self-issued through the electronic access control system. No RPT support is needed for issuance of electronic dosimeters.

If a DLR is lost or damaged under emergency conditions, additional DLRs are staged for emergency issuance. Emergency issuance does not require an American National Standards Institute (ANSI) qualified RPT to perform. The on-shift complement of RPTs is knowledgeable of the location of replacement DLRs and, if required in an emergency, will issue replacement DLRs to the remainder of the on-shift ERO members.

If an electronic dosimeter is lost or damaged, additional electronic dosimeters are maintained for immediate issuance. This task does not require an ANSI qualified RPT to perform. The on-shift complement of RPTs that are ERO members are trained and knowledgeable on the location of the electronic dosimeters that are maintained in the fast-activation mode and the procedure for activating them. These personnel are responsible for assisting all on-shift ERO members in performing this task during an emergency.

Conclusion

The number of RP staff on each shift is sufficient to perform tasks associated with the identified Major Functional Areas of NUREG-0654, Revision 1 (Reference 6), Table B-1 for RP related tasks.

3.1.2 Evaluation of TMI Emergency Plan Changes related to Radiation Protection Tasks

The following change is proposed to the TMI Emergency Plan Annex, EP-AA-1009, Table TMI 2-1 to recognize the reduction of one (1) on-shift RPT.

Functional Area:	Radiological Accident Assessment and Support of Operational Accident Assessment
Major Tasks:	In-Plant Surveys
Emergency Positions:	RP Technicians or Equivalent
Minimum Staffing Shift Size:	2 1

Planning Standard 10 CFR 50.47(b)(2) requires that on-shift facility licensee responsibilities for emergency response are unambiguously defined and that adequate staffing to provide initial facility accident response in key functional

areas is maintained at all times. Program Element NUREG-0654, Section II.B requires licensees to specify the emergency response organization and functions.

These changes reduce the on-shift minimum staffing for the In-plant Survey Major Task under the Radiological Accident Assessment and Support of Operational Accident Assessment functional area. Specifically, these changes reduce the number of RPTs assigned to the In-Plant Survey Major Task from two (2) to one (1).

Under emergency conditions, the RPT responsibilities would include in-plant surveys as required. A review of the existing TMI procedures which support emergency conditions identified that RP in-plant surveys are dependent on the nature of the accident. There are no procedurally directed in-plant survey actions identified in response to analyzed design basis events in the EOPs. In addition, there are no expected operator actions for these events that require RP coverage. One (1) RPT assigned to perform in-plant surveys is sufficient to support performance of AOPs and EOPs required in response to the accident condition until the on-shift staff are augmented at 60 minutes.

As part of this evaluation, the on-shift ERO staff performing emergency radiological assessment duties have been assessed through an on-shift staffing analysis based on the methodology of NEI 10-05, *"Assessment of On-Shift Emergency Response Organization Staffing and Capabilities,"* Revision 0 (Reference 9). The assessment concluded that two (2) RPTs on each shift is sufficient to accomplish all necessary actions to ensure a safe shutdown of the reactor for the analyzed events. Those actions assessed include performing radiological assessments; including performing in-plant radiation surveys, onsite radiation surveys, and performing radiological assessments in support of PAR decision-making for accident sequences that cannot be assessed on the basis of plant conditions alone.

3.2 Eliminate Requirements for Maintenance Discipline On-shift

3.2.1 Background / Supporting Information

10 CFR 50.54(q) establishes that all holders of a nuclear power reactor operating license must follow and maintain in effect Emergency Plans which meet the planning standards in 10 CFR 50.47(b) and the requirements in 10 CFR 50, Appendix E, *"Emergency Planning and Preparedness for Production and Utilization Facilities."* In accordance with 10 CFR 50.47(b)(2), a licensee must provide *"...adequate staffing to provide initial facility accident response in key functional areas [that] is maintained at all times,"* and ensure that *"timely augmentation of response capabilities is available...."*

TMI currently maintains five (5) Maintenance personnel and two (2) Equipment Operators (EOs) on shift to satisfy Emergency Plan Repair and Corrective Action

Major Functional Area. TMI personnel perform the following tasks under the current Emergency Plan:

Current Position	Current Duties
Mechanical Maintenance Technician	Dedicated to Repair and Corrective Actions
Electrical / I&C Technician	Dedicated to Repair and Corrective Actions
Maintenance Technician (Mechanical/Electrical/I&C)	Repair and Corrective Actions & Fire Brigade Member
Maintenance Technician (Mechanical/Electrical/I&C)	Repair and Corrective Actions & Fire Brigade Member
Equipment Operator	Repair and Corrective Actions & Operations
Equipment Operator	Repair and Corrective Actions & Operations
Shift Maintenance Supervisor	On Shift OSC Director & Fire Brigade Team Leader

Exelon is proposing to make the following changes to the Emergency Plan related to staffing of on-shift maintenance personnel:

- Revise the on-shift OSC Director position to remove the requirement that this position be from the Maintenance organization. Additionally, the on-shift OSC Director will be renamed as the Repair Team Lead. This revision is consistent with the draft guidance of NUREG-0654, Revision 2 (Reference 5).
- Delete each of the dedicated Mechanical and Electrical Maintenance Technicians. This will result in a reduction of two (2) people from the total on-shift staff. The Repair and Corrective Action tasks will continue to be performed by personnel who have other assigned functions.
- Delete the one (1) Mechanical Maintenance and one (1) Electrical Maintenance Technician (allowed to be assigned other functions) from Table TMI 2-1, Repair and Corrective Actions. This revision does not reduce the overall on-shift staffing total because the personnel are assigned other functions on shift.
- Delete the Emergency Plan discussion which references a minimum maintenance crew on shift. This revision does not reduce the overall on-shift staffing total and only removes the reference to an Operational policy.
- Annotate in Table TMI 2-1, Repair and Corrective Actions, the Maintenance Technicians which are required to augment the on-shift staff at 60 minutes and 90 minutes. Specifically, the Repair and Corrective Actions Task will be

augmented with one (1) Mechanical Maintenance Technician and one (1) Electrical Maintenance Technician at 60 minutes, as well as one (1) Maintenance I&C Technician at 90 minutes. A note is being added that Maintenance Technicians which may already be on-shift may be credited for this requirement.

The result of the proposed changes would be to delete the two (2) dedicated maintenance persons from the on-shift staffing total and to remove three (3) additional personnel (who are assigned other functions) from the Repair and Corrective Actions Major Task. The net result of the changes is to have two (2) persons on-shift (who may be assigned other functions) to support the Repair and Corrective Action function with three (3) additional Maintenance personnel augmenting within 60 minutes.

This revision is consistent with the requirements of the proposed draft guidance provided for NUREG-0654, Revision 2 (Reference 5).

NUREG-0654, Revision 1 - Applicable Guidance

NUREG-0654/FEMA-REP-1, "*Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*," Revision 1 (Reference 6), Table B-1 specifies the on-shift minimum staffing requirements for the ERO under the "*Repair and Corrective Actions*" Major Tasks column. The following are specifically noted:

- The Major Functional Area of "*Plant System Engineering, Repair and Corrective Actions*" is fulfilled on-shift by one (1) Mechanical Maintenance and one (1) Electrical Maintenance person. It is annotated in the guidance that these positions may be provided by Shift personnel assigned other functions.

NUREG-0654 Draft Revision 2 – Applicable Guidance

The NRC is developing draft Revision 2 to NUREG-0654/FEMA-REP-1 (Reference 5), which provides updated staffing guidance in Table B-1. A draft version was issued in May 2015 for industry review and comment and the final version is anticipated early 2017. The guidance states:

NPP applicants and licensees may voluntarily use the guidance in this document to demonstrate compliance with the underlying NRC regulations.

Specifically, for the Repair Team Activities Function, the draft NUREG-0654, Revision 2, Table B-1, "*Emergency Response Organization (ERO) Staffing and Augmentation Plan*," states:

Repair Team Activities [On-Shift]

- *"Operations Staff - Limited maintenance capability needed on-shift⁵. This is typically limited to minor electrical and/or mechanical work to restore power and/or emergency core cooling system (ECCS) flow, as well as possibly filling and venting instrumentation lines."*

Note 5 – *"The ability to get ECCS equipment operational is the primary need while on-shift."*

Repair Team Activities (Augment within 60 Minutes)

Maintenance Personnel (OSC) (1 electrician, 1 mechanic)

- *(1) Electrician: Provide electrical support for Emergency Core Cooling System (ECCS) equipment, event mitigation, and equipment repair.*
- *(1) Mechanic: Provide mechanical support for ECCS equipment, event mitigation, and equipment repair.*

Repair Team Activities (Augment within 90 Minutes)

Maintenance

Personnel (OSC)

- *(1) I&C Technician: Provide assistance with logic manipulation, for providing I&C support for event mitigation and equipment repair, and for support of digital I&C if applicable. Additional I&C staff may be called out if needed.*
- *Electricians – As needed.*
- *Mechanics – As needed.*

Historical TMI Emergency Plan, Revision 3, January 1981

In response to NUREG-0654, Revision 1 (Reference 6), Table B-1 guidance, TMI's Emergency Plan (post-accident) established five (5) Maintenance personnel to support the on-shift ERO. From the NRC approved TMI Emergency Plan:

To provide for round-the-clock maintenance coverage, a maintenance crew is assigned to each shift. This crew typically consists of a Maintenance Foreman and several craft personnel providing capability in the mechanical, electrical, and instrumentation and controls disciplines.

NUREG-0746 – Applicable Guidance

NUREG-0746, "Emergency Preparedness Evaluation for TMI-1," December 1980 (Reference 7), documented the completion of the NRC's review of TMI's Emergency Plan against the sixteen Emergency Planning Standards set forth in 10 CFR 50.47(b) and NUREG-0654/FEMA REP-1, Revision 1, dated November 1980 (Reference 6). As documented in NUREG-0746, the approved minimum shift for the onsite emergency organization is **"...9 positions associated with operations, 5 with maintenance, and 4 with radiation/chemistry," for a total of 18 positions...."**

Supplement 1 to NUREG-0746, dated May 1981 (Reference 8) addressed unresolved issues from the NUREG-0746 in which the NRC concluded:

NUREG-0746 Indicated that Revision 2 to the TMI-1 Emergency Plan generally satisfied the requirements and criteria of 10 CFR 50.47(b) and NUREG-0654 with the exception of some specifically identified items.

Since the Issuance of NUREG-0746, the Licensee submitted Revision 3 to its Emergency Plan dated January 1981. That revised plan addressed some of the items identified by the NRC staff as being unresolved.

Based on our review of the TMI Emergency Plan against the requirements of 10CFR 50.47(b), 10 CFR Part 50, Appendix E, and the criteria of NUREG-0654, we conclude that the Three Mile Island Unit 1 Emergency Plan provides an adequate planning basis for an acceptable state of licensee's emergency preparedness.

Subsequent to the 1981 NRC evaluation, TMI has revised the on-shift staffing requirement under 10 CFR 50.54(q) such that the total on-shift minimum staff includes a total of 20 personnel. TMI continues to maintain five (5) Maintenance personnel on shift; however, two (2) additional on-shift positions were added. One (1) Licensed Operator was added to act as Fire Brigade Advisor in accordance with the TMI Fire Hazards Analysis Report (FHAR), and one (1) additional position was added to ensure that the Communicator function is staffed by an individual with no collateral duties.

Current Emergency Plan Annex – EP-AA-1009

Under the current TMI Emergency Plan, EP-AA-1009, TMI continues to maintain five (5) Maintenance personnel on shift. The Emergency Plan description of the Functional Areas has been revised to more closely align with the NUREG-0654, Revision 1 (Reference 6) Table B-1 format and description. EP-AA-1009, Table 2-1 provides the following with regard to the TMI on-shift Maintenance staff.

For the Plant System Engineering, Repair and Corrective Actions Function, and the Major Task of Repair and Corrective Actions, the Emergency Plan identifies the following on-shift positions:

- Mechanical Maintenance – one dedicated (1) on shift maintenance person and two (2) additional mechanical maintenance personnel on shift that can be assigned other functions (i.e., Fire Brigade). TMI typically utilizes an Equipment Operator qualified to perform minor mechanical maintenance work to fill one of the Mechanical Maintenance personnel that can be assigned other functions.
- Electrical Maintenance – one dedicated (1) on-shift maintenance technician and two (2) additional electrical maintenance personnel on shift that can be assigned other functions (i.e., Fire Brigade). TMI typically utilizes an EO qualified to perform minor electrical maintenance work to fill one of the Electrical Maintenance personnel that can be assigned other functions.
- OSC Director - one (1) on-shift provided by personnel assigned other functions. TMI's Emergency Plan, EP-AA-1009, Step 2.1.4 further describes the OSC Director stating *"An on-shift Maintenance Team Leader shall fill the Operations Support Center (OSC) Director position until relieved by the ERO OSC Director. This position reports to the Shift Emergency Director until control of the OSC is transferred to the TSC."*

Note that EOs at TMI are trained to perform minor Repair and Corrective Actions such as actions that can be performed promptly to restore a non-functional component to functional status (e.g., resetting a breaker), or to place a component in a desired configuration (e.g., installing electrical jumpers), and which does not require work planning or implementation of lockout/tagout controls to complete.

3.2.2 NUREG-0654 Functional Area Technical Evaluation

The following discussion addresses the Functional Area of "Plant System Engineering, Repair and Corrective Actions" and the Major Tasks assigned which define the Maintenance staffing requirements at TMI, as defined in the NUREG 0654, Table B-1.

a. Major Functional Area: Plant System Engineering, Repair and Corrective Actions

Major Task: Repair and Corrective Actions

Mechanical Maintenance	1** On Shift	-	1 within 60 Mins
Radwaste Operator	-	-	1 within 60 Mins
Electrical Maintenance	1** On Shift	1 within 30 Mins	1 within 60 Mins
Instrument & Control Technician	-	1 within 30 Mins	-

Mechanical Maintenance - TMI proposes to eliminate the dedicated Mechanical Maintenance technician assigned to perform the Repair and Corrective Actions Major Task, as well as one (1) of the Mechanical Maintenance personnel assigned who also may be assigned other functions. Additionally, TMI proposes to add one (1) Mechanical Maintenance Technician as a 60-minute augmented position in Table TMI 2-1. The change would result in one (1) Mechanical Maintenance person for the Emergency Position (who may be assigned other functions) on shift and one (1) Mechanical Maintenance Technician responding at 60 minutes, consistent with the NUREG 0654, Revision 1, Table B-1 guidance. Note that the on-shift Mechanical Maintenance position may be filled by a Maintenance Technician or an EO. TMI EOs have the necessary expertise and training to perform tasks associated with the Repair and Corrective Action Function.

NEI 10-05, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," (Reference 9) defines "Repair and Corrective Action" tasks on shift as *"An action that can be performed promptly to restore a non-functional component to functional status (e.g., resetting a breaker), or to place a component in a desired configuration (e.g., open a valve), and which does not require work planning or implementation of lockout/tagout controls to complete."*

Draft NUREG-0654, Revision 2 (Reference 5) defines the Table B-1 on-shift Repair activities as *"typically limited to minor electrical and/or mechanical work to restore power and/or emergency core cooling system ECCS flow, as well as possibly filling and venting instrumentation lines."*

The Mechanical Maintenance function provides for minor or limited scope damage repair and corrective actions, such as component repositioning, surveillance necessary for accident mitigation and/or hands off troubleshooting.

These are tasks which could be performed on-shift by a Maintenance Technician or an EO at TMI who may be assigned to the Mechanical Maintenance Emergency position. The TMI on-shift EOs have the necessary expertise and training to perform the actions associated with the Repair and Corrective Action functional area.

A review of procedures and tasks, including the activities directed by the normal plant operating procedures for a plant shutdown, as well as EOPs and Abnormal Operating Procedures (AOPs) was performed. The proposed staff for the Repair and Corrective Action Function was determined to be sufficient to perform all required actions without support from the on-shift Maintenance Technicians targeted by this change. The necessary timeframe for performing manual actions as well as the training required to perform the tasks was considered.

Additionally, an assessment was performed utilizing the guidance of NEI 10-05. The assessment did not identify any actions that would not be performed by a Maintenance Technician or EO assigned to these positions. The required tasks for each of the evaluated events were assessed to ensure sufficient personnel are

available on-shift to perform all of the identified tasks required by the applicable plant procedures and the Emergency Plan, and still support assigned collateral duties.

A change is also being made to the Table TMI 2-1, 60-minute response column for the Mechanical Maintenance Emergency Position. TMI Emergency Plan Table TMI 2-1 is revised to reflect one (1) additional Mechanical Maintenance Technician within 60 minutes of a declaration of an Alert or higher. The addition of the augmented maintenance staff offsets the removal of the on-shift maintenance staff discussed above; ensuring maintenance technicians are available at 60 minutes, consistent with the draft NUREG-0654, Revision 2 (Reference 5).

Based on this review, eliminating the Mechanical Maintenance Technician ERO responders has no effect on the performance and timeliness of associated tasks during the early stages of an event prior to staff augmentation and maintains the effectiveness of the ERO on-shift response. The proposed change continues to meet the intent of planning standards of 10 CFR 50.47(b) and the requirements of Appendix E to 10 CFR 50.

Electrical Maintenance/Instrument and Control – TMI proposes to eliminate the dedicated Electrical/I&C Maintenance technician assigned to perform the Repair and Corrective Actions Major Task, as well as one (1) of the Electrical/I&C Maintenance personnel assigned who also may be assigned other functions. Additionally, TMI proposes to add one (1) Electrical Maintenance Technician as a 60-minute augmented position and one (1) I&C Technician as a 90-minute augmented position in Table TMI 2-1. The change would result in one (1) Electrical/I&C Maintenance person for the Emergency Position (who may be assigned other functions) on shift and one (1) Electrical Maintenance Technician responding at 60 minutes, as well as one (1) I&C Technician responding at 90 minutes, consistent with the NUREG-0654, Revision 1 (Reference 6) Table B-1 guidance. Note the on-shift Electrical/I&C Maintenance position may be filled by a Maintenance Technician or an EO. TMI EOs have the necessary expertise and training to perform tasks associated with the Repair and Corrective Action function.

NEI 10-05, *"Assessment of On-Shift Emergency Response Organization Staffing and Capabilities,"* (Reference 9) defines "Repair and Corrective Action" on-shift tasks as *"An action that can be performed promptly to restore a non-functional component to functional status (e.g., resetting a breaker), or to place a component in a desired configuration (e.g., open a valve), and which does not require work planning or implementation of lockout/tagout controls to complete."*

Draft NUREG-0654, Revision 2 (Reference 5) defines the Table B-1 Repair activities on shift as *"typically limited to minor electrical and/or mechanical work to restore power and/or emergency core cooling system ECCS flow, as well as possibly filling and venting instrumentation lines."*

The Electrical Maintenance/I&C function provides for minor or limited scope damage repair and corrective actions, such as identification and correction of controller and setpoint maladjustments, tripped breakers and overloads, surveillance necessary for accident mitigation and/or hands off troubleshooting.

These are tasks which could be performed on shift by a Maintenance Technician or an EO at TMI who may be assigned to the Electrical/I&C Maintenance Emergency position. The TMI on shift EOs have the necessary expertise and training to perform the actions associated with the repair and corrective action functional area.

A review of procedures and tasks, including the activities directed by the normal plant operating procedures for a plant shutdown, as well as EOPs and AOPs was performed. The proposed staff for the Repair and Corrective Action function was determined to be sufficient to perform all required actions without support from the on-shift Maintenance Technicians targeted by this change. The necessary timeframe for performing manual actions as well as the training required to perform the tasks was considered.

Additionally, an assessment was performed utilizing the guidance of NEI 10-05. The assessment did not identify any actions that would not be performed by a Maintenance Technician or an EO assigned to these positions. The required tasks for each of the evaluated events were assessed to ensure sufficient personnel are available on-shift to perform all of the identified tasks required by the applicable plant procedures and the Emergency Plan, and still support assigned collateral duties.

A change is also being made to the Table TMI 2-1, 60-minute response column for the Electrical/I&C Maintenance Emergency Position. TMI Emergency Plan Table TMI 2-1 is revised to reflect one (1) additional Electrical Maintenance Technician within 60 minutes and one (1) additional Maintenance I&C Technician within 90 minutes of a declaration of an Alert or higher. The addition of the augmented maintenance staff offsets the removal of the on-shift Maintenance staff discussed above; ensuring maintenance technicians are available at 60 minutes and 90 minutes, consistent with the draft NUREG-0654, Revision 2 (Reference 5).

Based on this review, eliminating the Electrical/I&C Maintenance Technician ERO responders on shift has no effect on the performance and timeliness of associated tasks during the early stages of an event prior to staff augmentation and maintains the effectiveness of the ERO on-shift response. The proposed change continues to meet the intent of planning standards of 10 CFR 50.47(b) and the requirements of 10 CFR 50, Appendix E.

OSC Director [on-shift] – The OSC Director function provides for coordination and oversight of minor or limited scope damage repair and corrective actions, similar to those discussed above prior to ERO augmentation. TMI provides

that the on-shift Maintenance Team Lead currently performs the function of the on-shift OSC Director.

TMI proposes to delete the requirement that the OSC Director be filled by a Maintenance Team Lead. The position is renamed as the Repair Team Lead and will continue to be maintained as a collateral duty for an available Maintenance or Operations person on shift, consistent with the draft NUREG-0654, Revision 2 (Reference 5) guidance. The revision does not result in a reduction in staffing numbers on shift.

NUREG-0654, Table B-1, Revision 1 (Reference 6) does not recognize the OSC Director as a required position; however, draft Revision 2 of NUREG-0654 indicates that a Repair Team Supervisor be available on shift as a collateral duty until relieved. Draft Revision 2 also requires *"A 10 CFR Part 50, Appendix E shift staffing evaluation be performed to support assignment of multiple roles to individual responder's on-shift."* Such an assessment was performed for TMI and did not identify any specific actions which would not be performed in the assignment of this task to either a shift Operator or an on-shift Maintenance Technician.

The proposal to remove the requirement for the OSC Director to be a Maintenance Team Lead does not impact the capability of the position. Operations personnel are capable of coordination and oversight of minor or limited scope damage repair and corrective actions. TMI may elect to re-name the OSC Director to Repair Team Supervisor consistent with the draft NUREG-0654, Revision 2 (Reference 5) guidance under 10 CFR 50.54(q) at a future date. Note that the on-shift OSC Director does not require specific ERO qualifications under TMI's Emergency Plan and may be performed by shift personnel assigned to other emergency response functions/tasks (i.e., collateral duties). Additionally, the proposed change does not represent a deviation from NUREG-0654, Revision 1 (Reference 6) Table B-1 guidance, which does not require an on-shift OSC Director/Repair Team Supervisor.

3.2.3 Evaluation of TMI Emergency Plan Changes related to Maintenance Technicians on shift.

Exelon is proposing to make the following changes to the TMI Emergency Plan related to staffing of on-shift Maintenance personnel:

- Table TMI 2-1 OSC Director - Revise the on-shift OSC Director position to remove the requirement that the position be filled by a Maintenance Team Lead. Additionally, the name Repair Team Lead is added to Table TMI 2-1 to reflect the on shift position.
- Table TMI 2-1 Repair and Corrective Actions.
 - Delete each of the dedicated Mechanical and Electrical Maintenance

Technicians. This will result in a reduction of two (2) people from the total on-shift staff.

- Delete one (1) Mechanical and one (1) Electrical/I&C Maintenance Technician assigned concurrent duties. This revision does not reduce the overall on-shift staffing total because the personnel are assigned other functions on shift.
- Add one (1) Mechanical Maintenance Technician as 60-minute augmentation responder and one (1) Electrical Maintenance and one (1) Maintenance I&C Technician as 90-minute augmentation responder.
- Delete the Emergency Plan requirement to maintain a minimum maintenance crew on shift at all times. This revision does not reduce the overall on-shift staffing total and only removes the requirement to have a defined complement of maintenance personnel on shift.

Each of the proposed changes are discussed below.

- a. Delete the requirement for the on-shift OSC Director to be a Maintenance Team Lead (EP-AA-1009, Step 2.1.4)

EP-AA-1009, Step 2.1 4 states:

2.1.4 ~~OSC Director~~Repair Team Lead

*An **designated person** on-shift ~~Maintenance Team Leader~~ shall fill the ~~Operations Support Center (OSC) Director~~ **Repair Team Lead** position until relieved by the ERO OSC Director. This position reports to the Shift Emergency Director until control of the OSC is transferred to the TSC.*

TMI is proposing to delete the reference to the on-shift Maintenance Team Lead such that qualified Operations or Maintenance personnel can fill this position. Additionally, the name of the position is revised to Repair Team Lead.

The OSC Director function provides for coordination and oversight of minor or limited scope damage repair and corrective actions, similar to those discussed above prior to ERO augmentation. TMI provides that the on-shift Maintenance Team Lead currently performs the function of the on-shift OSC Director.

TMI proposes to delete the requirement that the OSC Director be filled by a Maintenance Team Lead. The position will continue to be maintained as a collateral duty for an available Maintenance or Operations person on shift, consistent with the draft NUREG-0654, Revision 2 (Reference 5) guidance. The revision does not result in a reduction in staffing numbers on shift.

The TMI OSC is activated within 60 minutes of the classification of an Alert or higher. The OSC is not staffed prior to this point. There are no identified tasks directed to be performed by the OSC prior to facility activation and the position's responsibilities are limited to minor or limited scope damage repair. In accordance with Exelon procedural requirements, control of the EOs is maintained by the MCR until the OSC is activated.

NUREG-0654, Table B-1, Revision 1 (Reference 6) does not recognize the OSC Director as a required position; however, draft Revision 2 (Reference 5) indicates that a Repair Team Supervisor be available on shift as a collateral duty until relieved. Draft Revision 2 also requires *"A 10 CFR Part 50, Appendix E shift staffing evaluation be performed to support assignment of multiple roles to individual responder's on-shift."* Such an assessment was performed for TMI and did not identify any specific actions which would not be performed in the assignment of this task to either a shift Operator or Maintenance person.

OSC Director is not a position required on shift under the current NUREG-0654 Revision 1 guidance. The Repair Team Lead may be performed by shift personnel assigned to other emergency response functions/tasks (i.e., collateral duties). Therefore, the proposed change does not represent a deviation from NUREG-0654, Revision 1, Table B-1 guidance.

b. Revision to the Table TMI 2-1 Repair and Corrective Action Task

The following discussion addresses each of the proposed changes to TMI's Emergency Plan EP-AA-1009, Table TMI 2-1, Plant System Engineering, Repair and Corrective Actions

Emergency Position: Mechanical Maintenance - TMI proposes to eliminate the dedicated Mechanical Maintenance technician assigned to perform the Repair and Corrective Actions Major Task, as well as one (1) of the Mechanical Maintenance personnel assigned who also may be assigned other functions. Additionally, TMI proposes to add one (1) Mechanical Maintenance Technician as a 60-minute augmented position in Table TMI 2-1. The change would result in one (1) Mechanical Maintenance person for the Emergency Position (who may be assigned other functions), and one (1) Mechanical Maintenance Technician responding at 60 minutes consistent with the NUREG-0654, Revision 1, (Reference 6) Table B-1 guidance. Note that the on-shift Mechanical Maintenance position may be filled by a Maintenance Technician or an EO. TMI EOs have the necessary expertise and training to perform tasks associated with the Repair and Corrective Action Function.

The Mechanical Maintenance function provides for minor or limited scope damage repair and corrective actions, such as component repositioning, surveillance necessary for accident mitigation and/or hands off troubleshooting.

These are tasks which could be performed on shift by a Maintenance Technician or an EO at TMI who may be assigned to the Mechanical Maintenance Emergency

position. The TMI on-shift EOs have the necessary expertise and training to perform the actions associated with the Repair and Corrective Action functional area.

A review of procedures and tasks, including the activities directed by the normal plant operating procedures for a plant shutdown, as well as EOPs and AOPs was performed. The proposed staff for the Repair and Corrective Action function was determined to be sufficient to perform all required actions without support from the on-shift Maintenance Technicians targeted by this change. The necessary timeframe for performing manual actions as well as the training required to perform the tasks was considered.

A change is also being made to the Table TMI 2-1, 60-minute response column for the Mechanical Maintenance Emergency Position. TMI Emergency Plan Table TMI 2-1 is revised to reflect one (1) additional Mechanical Maintenance Technician within 60 minutes of a declaration of an Alert or higher. The addition of the augmented maintenance staff offsets the removal of the on-shift maintenance staff discussed above; ensuring maintenance technicians are available at 60 minutes, consistent with the draft NUREG 0654, Rev 2.

Based on this review, eliminating the Mechanical Maintenance Technician ERO responders has no effect on the performance of associated tasks during the early stages of an event prior to staff augmentation and maintains the effectiveness of the ERO on-shift response.

Emergency Position: Electrical Maintenance/Instrument and Control – TMI proposes to eliminate the dedicated Electrical/I&C Maintenance technician assigned to perform the Repair and Corrective Actions Major Task, as well as one (1) of the Electrical/I&C Maintenance personnel assigned who also may be assigned other functions. Additionally, TMI proposes to add one (1) Electrical Maintenance Technician as a 60-minute augmented position and one (1) I&C Technician as a 90-minute augmented position in Table TMI 2-1. The change would result in one (1) Electrical/I&C Maintenance person for the Emergency Position (who may be assigned other functions) on shift and one (1) Electrical Maintenance Technician responding at 60 minutes, as well as one (1) I&C Technician responding at 90 minutes, consistent with the NUREG-0654, Revision 1, (Reference 6) Table B-1 guidance. Note that the on-shift Electrical/I&C Maintenance position may be filled by a Maintenance Technician or an EO. TMI EOs have the necessary expertise and training to perform tasks associated with the Repair and Corrective Action function.

The Electrical Maintenance/Instrument and Control function provides for minor or limited scope damage repair and corrective actions, such as identification and correction of controller and setpoint maladjustments, tripped breakers and overloads, surveillance necessary for accident mitigation and/or hands off troubleshooting.

These are tasks which could be performed on shift by a Maintenance Technician or an EO at TMI who may be assigned to the Electrical/I&C Maintenance Emergency position. The TMI on-shift EOs have the necessary expertise and training to perform the actions associated with the repair and corrective action functional area.

A review of procedures and tasks, including the activities directed by the normal plant operating procedures for a plant shutdown, as well as EOPs and AOPs was performed. The proposed staff for the Repair and Corrective Action function was determined to be sufficient to perform all required actions without support from the on-shift Maintenance Technicians targeted by this change. The necessary timeframe for performing manual actions as well as the training required to perform the tasks was considered.

A change is also being made to the Table TMI 2-1, 60-minute response column for the Electrical/I&C Maintenance Emergency Position. TMI Emergency Plan Table TMI 2-1 is revised to reflect one (1) additional Electrical Maintenance Technician within 60 minutes and one (1) additional I&C Technician within 90 minutes of a declaration of an Alert or higher. The addition of the augmented maintenance staff offsets the removal of the on-shift maintenance staff discussed above; ensuring maintenance technicians are available at 60 minutes and 90 minutes, consistent with the draft NUREG-0654, Revision 2 (Reference 5).

Based on this review, eliminating the Electrical/I&C Maintenance Technician ERO responders on shift has no effect on the performance of associated tasks during the early stages of an event prior to staff augmentation and maintains the effectiveness of the ERO on-shift response.

Table Notes – The following EP-AA-1009, Table TMI 2-1 notes are be revised in support of this revision.

Note (k) ~~Must include one Senior Maintenance Technician on shift.~~

The existing Note (k) is deleted from Table TMI 2-1. The Note applies to all of the Repair and Corrective Action emergency positions. The evaluations above which support removal of on-shift Mechanical and Electrical Maintenance personnel also support removal of a requirement to have a Senior Maintenance Technician on shift. Considering the primary responsibility for the on-shift Repair and Corrective Action personnel is typically limited to minor electrical and/or mechanical work to restore power and/or emergency core cooling system ECCS flow, as well as possibly filling and venting instrumentation lines, the need for a Senior Maintenance Technician on shift at all times is not necessary. Also, due to the reduced number of Maintenance personnel assigned to the Repair and Corrective Action positions, the need for a Senior Maintenance Technician on shift is no longer present. There will continue to be a Repair Team Lead on shift who is responsible to help coordinate minor repair and corrective action activities. This revision is not deemed to have an effect on the performance of associated tasks

during the early stages of an event prior to staff augmentation and maintains the effectiveness of the ERO on-shift response.

~~Note (l): "This function shall be one dedicated maintenance technician with two additional technicians that can be filled by personnel assigned other functions (i.e., Fire Brigade) one of which may be a non-licensed operator."~~

Existing Note (l) is deleted from Table TMI 2-1. Following the changes discussed above regarding the Mechanical and Electrical/I&C Maintenance emergency positions, this note requiring a dedicated maintenance technician is no longer applicable. The justification for the revision of these emergency positions is applicable to the deletion of this note.

New Note (k): *"Within 60 Minutes, TMI is committed to having one (1) Mechanical Maintenance Technician and one (1) Electrical Maintenance Technician onsite and assigned to the OSC. Within 90 minutes, TMI is committed to have one (1) I&C Technician onsite and assigned to the OSC. Technicians who are already on shift may satisfy this requirement."*

A new Table TMI 2-1 note (k) is added to reflect the augmented staff requirements for the Mechanical, Electrical and I&C responders. The justification for adding these responders is discussed earlier. The note is required to clarify that Maintenance Technicians who are on shift at the time of the accident can be credited as an OSC Responder as long as they are assigned and available to perform OSC duties.

c. Revision to the EP-AA-1009, Step 5.3.2, Damage Control Equipment

Step 5.3.2 is revised to remove reference to the Operational Policy which requires that a minimum Maintenance crew be maintained on shift at all times:

The TMI plant site is extensively equipped to conduct preventive maintenance and repairs on mechanical, structural, electrical, and instrumentation and controls equipment found in the plant.
~~**Operational policy requires that a minimum maintenance crew be assigned to the onsite shift organization at all times. Each individual assigned to the maintenance crew is qualified and certified to perform the tasks associated with his craft in the working environment of a nuclear plant.**~~

The evaluation of the need to include Maintenance capability on-shift includes the following areas:

- Actions Required by EOPs and AOPs
- Duties Currently Assigned to On-shift Maintenance Personnel

Evaluations of these areas are provided below.

1. Actions Required by EOPs and AOPs

A review of procedures and tasks, including the activities directed by the normal plant operating procedures for a plant shutdown, as well as AOPs and EOPs was conducted. The minimum on-shift staff was determined to be sufficient to perform all required actions without support from Maintenance Technicians targeted by this change. The necessary timeframe for performing manual actions as well as the training required to perform the tasks was considered. Other Operator actions that may be required in the first 60 minutes of the event would be to align equipment for repair. This has also been evaluated under the Non-Licensed Operator (NLO) training program and no additional tasks are required. Based on this review, eliminating Maintenance "Technician Repair and Corrective Action" from the shift would have no effect on the performance of associated tasks during the early part of an event and maintains the effectiveness of the ERO on-shift response.

2. Duties Currently Assigned to On-shift Maintenance Personnel

The duties currently assigned to the on-shift Maintenance personnel include:

Current Position	Current Duties
Mechanical Maintenance Technician	Repair and Corrective Actions
Electrical / I&C Technician	Repair and Corrective Actions
Shift Maintenance Supervisor	Fire Brigade Team Leader
Maintenance Technician (Mechanical/Electrical/I&C)	Fire Brigade Member
Maintenance Technician (Mechanical/Electrical/I&C)	Fire Brigade Member

An evaluation of these duties concluded that Maintenance qualifications are not required to execute the associated tasks during the first 60 minutes post-event. The evaluations of these duties are as follows:

Repair and Corrective Actions – A "Repair and Corrective Action" task consists of an action that can be performed promptly to restore a nonfunctional component to functional status (e.g., resetting a breaker), or to place a component in a desired configuration (e.g., open a valve), and which does not require work planning or implementation of lockout/tagout controls to complete. Evaluations did not identify any actions that would not be performed by Operations personnel. Other Operator actions that may be required in the first 60 minutes of the event would be to align equipment for repair. The capability of Operations

personnel to perform these actions has been evaluated under the NLO training program.

Fire Brigade Team Leader - The TMI FHAR, as well as applicable Exelon procedures have been reviewed. The applicable requirements are limited to the position-specific Fire Brigade Team Leader training and periodic drill requirements. TMI has no requirement that the Fire Brigade Team Leader be a Shift Maintenance Supervisor or have maintenance-specific qualifications.

An assessment did not identify any concurrent tasks for the Fire Brigade Team Leader in the event of a fire. The position of Fire Brigade Team Leader does not require Maintenance qualifications and can be filled by any qualified individual who is not assigned to another ERO position.

Fire Brigade Member - The TMI FHAR, as well as applicable Exelon procedures have been reviewed. The applicable requirements for the position of Fire Brigade member are limited to the position-specific Fire Brigade training and periodic drill requirements. TMI has no requirement that the Fire Brigade members have maintenance-specific qualifications.

Based upon the requirements of the TMI FHAR, the position of Fire Brigade member does not require Maintenance qualifications and can be filled by any qualified individual who is not assigned to another ERO position.

3.3 Impact of Proposed Changes on State Emergency Plan

Exelon reviewed the proposed changes to the TMI Emergency Plan with representatives from the Pennsylvania Emergency Management Agency (PEMA) and the Pennsylvania Bureau of Radiation Protection (BRP).

Based upon a preliminary review of the proposed changes, there is no indication, at this point, that these changes would adversely impact the ability of the Commonwealth of Pennsylvania to implement its Emergency Plan. Exelon recognizes that any final decisions regarding the potential impact on the Commonwealth's Plan and its implementation will be based upon PEMA's and BRP's review of the formal license amendment request once submitted to the NRC. Attachment 6 of the July 15, 2016, submittal (Reference 1) provided additional information related to the Commonwealth's initial assessment of the proposed TMI on-shift ERO staffing changes.

Summary

Based upon the evaluation provided above, and the impact of each proposed change on the applicable NUREG-0654, Major Functions, as well as evaluation of the TMI Emergency Plan changes, Exelon concludes that the proposed changes will not impact the capability of the on-shift ERO to perform the required functions in a timely manner, consistent with the applicable regulatory requirements and Emergency Plan commitments.

4.3 **No Significant Hazards Consideration** (Updated)

In accordance with 10 CFR 50.90, "*Application for amendment of license, construction permit, or early site permit*," Exelon Generation Company, LLC (Exelon) requests amendments to the following licenses:

- DPR-50 and DPR-73 - Three Mile Island Nuclear Station, Units 1 and 2, respectively

Exelon also maintains the emergency planning responsibilities for TMI, Unit 2, which is owned by First Energy Corporation, through a service agreement.

The requested amendments to the licenses support changes to the TMI Emergency Plan based upon completion of a supporting evaluation of onsite Emergency Response Organization (ERO) staffing that determined that one (1) Radiation Protection Technician (RPT) and two (2) Maintenance technicians are no longer necessary to support the "Major Functions and Tasks" assigned to the minimum on-shift ERO, and Exelon proposes to remove these positions from the TMI Emergency Plan. In addition, this evaluation has concluded that personnel with Maintenance-specific qualifications are not required to perform these Functions and Tasks.

The proposed changes have been reviewed considering the applicable requirements of 10 CFR 50.47, 10 CFR 50 Appendix E, and other applicable NRC guidance criteria. Exelon has evaluated the proposed changes to the TMI Emergency Plan and determined that the changes do not involve a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three (3) standards, set forth in 10 CFR 50.92, "*Issuance of amendment*," is provided below.

1. *Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?*

Response: No.

The proposed changes to the TMI Emergency Plan do not increase the probability or consequences of an accident. The proposed changes do not impact the function of plant Structures, Systems, or Components (SSCs). The proposed changes do not affect accident initiators or accident precursors, nor do the changes alter design assumptions. The proposed changes do not alter or prevent the ability of the onsite ERO to perform their intended functions to mitigate the consequences of an accident or event. The proposed changes remove onsite ERO positions no longer credited or considered necessary in support of Emergency Plan implementation.

Therefore, the proposed changes to the Emergency Plan do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?*

Response: No.

The proposed changes have no impact on the design, function, or operation of any plant SSCs. The proposed changes do not affect plant equipment or accident analyses. The proposed changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed), a change in the method of plant operation, or new operator actions. The proposed changes do not introduce failure modes that could result in a new accident, and the proposed changes do not alter assumptions made in the safety analysis. The proposed changes remove onsite ERO positions no longer credited or considered necessary in support of Emergency Plan implementation.

Therefore, the proposed changes to the Emergency Plan do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. *Does the proposed amendment involve a significant reduction in a margin of safety?*

Response: No.

Margin of safety is associated with confidence in the ability of the fission product barriers (i.e., fuel cladding, reactor coolant system pressure boundary, and containment structure) to limit the level of radiation dose to the public.

The proposed changes do not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analyses. There are no changes being made to safety analysis assumptions, safety limits, or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes. Margins of safety are unaffected by the proposed changes to the ERO minimum on-shift staffing.

The proposed changes are associated with the Emergency Plan staffing and do not impact operation of the plant or its response to transients or accidents. The proposed changes do not affect the Technical Specifications. The proposed changes do not involve a change in the method of plant operation, and no accident analyses will be affected by the proposed changes. Safety analysis acceptance criteria are not affected by these proposed changes. The proposed changes to the Emergency Plan will continue to provide the necessary onsite ERO response staff.

Therefore, the proposed changes to the Emergency Plan do not involve a significant reduction in a margin of safety.

4.4 Conclusions

In conclusion, based on the considerations discussed above: 1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, 2) such activities will be conducted in compliance with the Commission's regulations, and 3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

References

1. Letter from James Barstow (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission – *License Amendment Request for Approval of Changes to the Three Mile Island Nuclear Station Emergency Plan Related to Staffing*, dated July 15, 2016 (ML16201A146)
2. U.S. Nuclear Regulatory Commission Electronic Mail Request to Francis Mascitelli, Exelon Generation Company, LLC – *Draft Request for Additional Information on TMI ERO Staffing Amendment*, dated December 1, 2016
3. U.S. Nuclear Regulatory Commission Electronic Mail Request to Francis Mascitelli and Richard Gropp, Exelon Generation Company, LLC – *Request for Additional Information on TMI ERO Staffing Amendment*, dated December 21, 2016 (ML16356A480)
4. Regulatory Issue Summary (RIS) 2016-10, *"License Amendment Requests for Changes to Emergency Response Organization Staffing and Augmentation,"* dated August 8, 2016
5. Draft NUREG-0654/FEMA-REP-1, Revision 2, *"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,"* dated May 2015
6. NUREG-0654/FEMA-REP-1, Revision 1, *"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,"* dated November 1980
7. NUREG-0746, *"Emergency Preparedness Evaluation for TMI-1,"* dated December 10, 1980
8. NUREG-0746, Supplement 1, *"Emergency Preparedness Evaluation for TMI-1,"* dated May 29, 1981
9. NEI 10-05, *"Assessment of On-Shift Emergency Response Organization Staffing and Capabilities,"* Revision 0, dated June 2011

ATTACHMENT 2

Revised Emergency Plan Mark-up Pages - Three Mile Island Nuclear Station

(Response to the Request for Additional Information - License Amendment Request for
Approval of Changes to the Three Mile Island Nuclear Station
Emergency Plan Related to Staffing)

Emergency Plan Annex EP-AA-1009

Pages

TMI 2-2

TMI 2-5

TMI 2-6

TMI 2-7

TMI 5-8

2.1.4 ~~OSC Director~~**Repair Team Lead**

An ~~designated person on-shift Maintenance Team Leader~~ shall fill the **Operations Support Center (OSC) Director**~~Repair Team Lead~~ position until relieved by the ERO OSC Director. This position reports to the Shift Emergency Director until control of the OSC is transferred to the TSC.

2.1.5 The following functions will be performed by trained members of the normal shift complement:

1. **Firefighting**

Specific personnel on each shift (Site Fire Brigade) are trained in firefighting to ensure such capability will be available 24 hours per day. The Fire Brigade, under the direction of the Fire Brigade Team Leader or another individual designated by him, shall respond to all confirmed fire alarms or as directed by the Control Room and report to the location of the fire with assigned equipment. During the normal work week, additional qualified firefighting personnel will, as necessary, be obtained from the normal on-site organization. Assistance will be requested from local fire departments through the county dispatcher / appropriate local dispatch system.

2. **First Aid and Search and Rescue**

Medical emergencies and search and rescue operations will be the responsibility of the First Aid and Search and Rescue Teams. Specific personnel on each shift are trained in first aid techniques to ensure such assistance will be available 24 hours per day. Assistance will be requested from outside medical support personnel or organizations as deemed necessary.

TABLE TMI 2-1: Minimum Staffing Requirements for TMI Station

Functional Area	Major Tasks	Emergency Positions	Minimum Staffing			Full Augmentation
			Shift Size	^(a) 60 Minute Augmentation	Other On-Call	
1. Plant Operations/Safe Shutdown and Assessment of Operational Aspects	Control Room Staff	Shift Manager	1			
		Control Room Supervisor	1			
		Control Reactor Operator	2			
		Auxiliary Operator	2			
2. Emergency Direction and Control	Command and Control / Emergency Operations	Shift Emergency Director (CR)	1 ^(b)			
		Station Emergency Director (TSC)		1		
		Corporate Emergency Director (EOF)		1		
3. Notification & Communication	Emergency Communications	Plant Shift Personnel (CR)	1			
		TSC Director (TSC)		1		
		EOF Director (EOF)		1		
		State/Local Communicator		1 (EOF)		1 (TSC)
	Plant Status In-Plant Team Control Technical Activities Governmental	ENS Communicator		1 (TSC)		1 (EOF)
		HPN Communicator		1 (EOF)		1 (TSC)
		Operations Communicator (CR/TSC)				2
		Damage Control Comm. (CR/TSC/OSC)				3
		Technical Communicator (TSC)				1
		EOC Communicator (EOF)				1
		State EOC Liaison ^(d) (PEMA)				1
		Regulatory Liaison (EOF)				1
4. Radiological Accident Assessment and Support of Operational Accident Assessment	Offsite Dose Assessment	RP Personnel (CR)	1			
		Dose Assessment Coordinator (EOF)		1		1
		Dose Assessor (EOF)				1
	Offsite Surveys	Radiation Controls Coordinator (TSC)				
		Environmental Coordinator (EOF)		1		
		Field Team Communicator (EOF)				1
	Onsite Surveys In-plant Surveys Chemistry RP Supervisory	Field Team Personnel ^(h)		4		(c)
		Field Team Personnel ^(h)		2		(c)
		RP Technicians or equivalent	2 1			(c)
		Chemistry Personnel	1			(c)
		Radiation Protection Manager (TSC)		1		
		Radiation Protection Manager (EOF)		1		

TABLE TMI 2-1: Minimum Staffing Requirements for TMI Station (Cont'd)

Functional Area	Major Tasks	Emergency Positions	Minimum Staffing			Full Augmentation
			Shift Size	^(a) 60 Minute Augmentation	Other On-Call	
5. Plant System Engineering, Repair and Corrective Actions	Technical Support	STA / Incident Assessor ^(l) (CR)	1			
		Technical Manager (TSC)		1		
		Core/Thermal Hydraulics Engineer (TSC)		1		
		Mechanical Engineer (TSC)		1		
		Electrical Engineer (TSC)		1		
		SAMG Decision Maker (TSC)		1 ^(b)		
		SAMG Evaluator (TSC)		2 ^(b)		
		Operations Manager (TSC)		1		
	Repair and Corrective Actions ^(k)	Radiation Controls Engineer (TSC)				1
		Mechanical Maintenance ^(j) (OSC)	1/2 ^(b)	1 ^(k)	1 ^(k)	(c)
		Electrical Maintenance / I&C ^(j) (OSC)	1/2 ^(b)	1 ^(k)		(c)
		Maintenance Manager (TSC)		1		
		OSC Director/Repair Team Lead (OSC)	1 ^(b)	1		
		Assistant OSC Director (OSC)				1
	Accident Analysis	OPs Lead & Support Personnel (OSC)				(c)
		Technical Support Manager (EOF)				1
		Operations Advisor (EOF)				1
		Operations Assistant (EOF)				1
		Technical Advisor (EOF)				1
6. In-Plant Protective Actions	Radiation Protection	RP Technicians, or equivalent	2 ^(b)	4		(c)
7. Fire Fighting	--	Fire Brigade ^(e)	6			
8. First Aid and Rescue Operations	--	Plant Personnel	2 ^(b)			(c)
9. Site Access Control and Personnel Accountability	Security & Accountability	Security Team Personnel Security Coordinator ^(q) (TSC/ EOF)	(f)	(f)		2
10. Resource Allocation and Administration	Logistics / Administration	Logistics Manager (EOF)		1		1
		Logistics Coordinator (TSC)				1
		Administrative Coordinator (EOF)				(c)
		Clerical Staff (TSC/OSC/EOF)				1
		Events Recorder (EOF)				1
		Computer Specialist (EOF)				1

TABLE TMI 2-1: Minimum Staffing Requirements for TMI Station (Cont'd)

Functional Area	Major Tasks	Emergency Positions	Minimum Staffing			Full Augmentation	
			Shift Size	^(a) 60 Minute Augmentation	^(g) Other On-Call		
11. Public Information	Media Interface	Corporate Spokesperson (JIC)			1	1	
		Rad Protection Spokesperson (JIC)					
		Technical Spokesperson (JIC)					
	Information Development	Public Information Director (JIC)				1	1
		News Writer (JIC)					
		Media Monitoring and Rumor Control			Media Monitoring Staff (JIC)		
		Rumor Control Staff (JIC)					(c)
		Facility Operation and Control			JIC Director (JIC)		1
	JIC Coordinator (JIC)						
	Administrative Coordinator (JIC)						
	Events Recorder (JIC)						
	Clerical Support (JIC)						
	Access Control (JIC)						
TOTAL (Non-Collateral):			20-17	30 32	3 4	34+	

Legend:

- (a) Response time is based on optimum travel conditions.
- (b) May be provided by personnel assigned other functions. Personnel can fulfill multiple functions.
- (c) Personnel numbers depend on the type and extent of the emergency.
- (d) Staffing of the County EOC Liaison position is not required based on agreements with offsite agencies; however, every effort will be made to dispatch an Exelon Nuclear representative upon request from County EOC Director.
- (e) Fire Brigade per FSAR / TRM, as applicable. Includes one NSO for oversight in addition to the 5 Fire Brigade members per TMI Fire Plan.
- (f) Function performed by on-shift security personnel.
- (g) The following Emergency Public Information Organization personnel will be designated "minimum staffing" (on-call) positions, but are not subject to the 60-minute response time requirement: Corporate Spokesperson, Public Information Director and JIC Director.
- (h) Each Field Monitoring Team consists of a qualified Lead and Driver, trained in plume monitoring and air sample collection, as appropriate to designated task. Qualified on-shift personnel may also be mobilized, if required based on event, to support initial field monitoring requirements.
- (i) Refer to Section 2.1.3 for description of on-shift STA/Incident Assessor staffing requirements.
- (j) TSC Security Coordinator position will be staffed by TMI Security personnel. The EOF Security Coordinator position will be staffed by Corporate personnel.
- ~~(k) Must include one Senior Maintenance Technician on-shift.~~
- ~~(l) This function shall be one dedicated maintenance technician with two additional technicians that can be filled by personnel assigned other functions (i.e., Fire Brigade) one of which may be a non-licensed operator.~~
- (k) Within 60 Minutes, TMI is committed to having one (1) Mechanical Maintenance Technician and one (1) Electrical Maintenance Technician onsite and assigned to the OSC. Within 90 minutes, TMI is committed to have one (1) I&C Technician onsite and assigned to the OSC. Technicians who are already on shift may satisfy this requirement.**

5.3.1 First Aid and Medical Equipment

A first aid facility is designed to support a wide range of immediate care requirements ranging from simple first aid to procedures requiring a physician.

Small kits placed throughout the plant provide the most readily available first aid. These kits contain items typically needed to care for minor injuries. Typical contents can be referenced in Table TMI 5-1. The next level of first aid equipment is found at first aid stations. The medical staff can also provide Advanced Life Support and routine trauma care.

5.3.2 Damage Control Equipment

The TMI plant site is extensively equipped to conduct preventive maintenance and repairs on mechanical, structural, electrical, and instrumentation and controls equipment found in the plant. ~~Operational policy requires that a minimum maintenance crew be assigned to the onsite shift organization at all times. Each individual assigned to the maintenance crew is qualified and certified to perform the tasks associated with his craft in the working environment of a nuclear plant.~~

In addition to the equipment and materials required for normal maintenance, other items are available to handle extraordinary maintenance jobs that might arise in damage control. Selection of damage control equipment inventory is based upon (a) mitigating the consequences of flooding, (b) personnel rescue, (c) checking the uncontrolled flow of fluids from process systems, and (d) elimination of electrical hazards. Typical equipment available for damage control can be found in Table TMI 5-1.

5.3.3 Radiation Protection Equipment

The TMI plant site maintains an inventory of protective clothing, respiratory equipment, survey instruments and supplies to provide adequate contamination control for all personnel expected to be onsite who might be affected in the event of an emergency.

The supplies are maintained, updated, inventoried and calibrated, as appropriate, on a regular basis in accordance with applicable procedures. Storage locations of emergency supplies can be found in the site implementing documents. Typical equipment available can be found in Table TMI 5-1.

ATTACHMENT 3

Revised Re-typed Emergency Plan Pages - Three Mile Island Nuclear Station

(Response to the Request for Additional Information - License Amendment Request for
Approval of Changes to the Three Mile Island Nuclear Station
Emergency Plan Related to Staffing)

Emergency Plan Annex EP-AA-1009

Pages

TMI 2-2

TMI 2-5

TMI 2-6

TMI 2-7

TMI 5-8

2.1.4 Repair Team Lead

A designated person on-shift shall fill the **Repair Team Lead** position until relieved by the ERO OSC Director. This position reports to the Shift Emergency Director until control of the OSC is transferred to the TSC.

2.1.5 The following functions will be performed by trained members of the normal shift complement:

1. **Firefighting**

Specific personnel on each shift (Site Fire Brigade) are trained in firefighting to ensure such capability will be available 24 hours per day. The Fire Brigade, under the direction of the Fire Brigade Team Leader or another individual designated by him, shall respond to all confirmed fire alarms or as directed by the Control Room and report to the location of the fire with assigned equipment. During the normal work week, additional qualified firefighting personnel will, as necessary, be obtained from the normal on-site organization. Assistance will be requested from local fire departments through the county dispatcher / appropriate local dispatch system.

2. **First Aid and Search and Rescue**

Medical emergencies and search and rescue operations will be the responsibility of the First Aid and Search and Rescue Teams. Specific personnel on each shift are trained in first aid techniques to ensure such assistance will be available 24 hours per day. Assistance will be requested from outside medical support personnel or organizations as deemed necessary.

TABLE TMI 2-1: Minimum Staffing Requirements for TMI Station

Functional Area	Major Tasks	Emergency Positions	Minimum Staffing			Full Augmentation
			Shift Size	^(a) 60 Minute Augmentation	Other On-Call	
1. Plant Operations/Safe Shutdown and Assessment of Operational Aspects	Control Room Staff	Shift Manager Control Room Supervisor Control Reactor Operator Auxiliary Operator	1 1 2 2			
2. Emergency Direction and Control	Command and Control / Emergency Operations	Shift Emergency Director (CR) Station Emergency Director (TSC) Corporate Emergency Director (EOF)	1 ^(b)	1 1		
3. Notification & Communication	Emergency Communications Plant Status In-Plant Team Control Technical Activities Governmental	Plant Shift Personnel (CR) TSC Director (TSC) EOF Director (EOF) State/Local Communicator ENS Communicator HPN Communicator Operations Communicator (CR/TSC) Damage Control Comm. (CR/TSC/OSC) Technical Communicator (TSC) EOC Communicator (EOF) State EOC Liaison ^(d) (PEMA) Regulatory Liaison (EOF)	1	1 1 1 (EOF) 1 (TSC) 1 (EOF)		1 (TSC) 1 (EOF) 1 (TSC) 2 3 1 1 1 1
4. Radiological Accident Assessment and Support of Operational Accident Assessment	Offsite Dose Assessment Offsite Surveys Onsite Surveys In-plant Surveys Chemistry RP Supervisory	RP Personnel (CR) Dose Assessment Coordinator (EOF) Dose Assessor (EOF) Radiation Controls Coordinator (TSC) Environmental Coordinator (EOF) Field Team Communicator (EOF) Field Team Personnel ^(h) Field Team Personnel ^(h) RP Technicians or equivalent Chemistry Personnel Radiation Protection Manager (TSC) Radiation Protection Manager (EOF)	1 1 1	1 1 4 2 1 1 1		1 1 1 (c) (c) (c) (c)

TABLE TMI 2-1: Minimum Staffing Requirements for TMI Station (Cont'd)

Functional Area	Major Tasks	Emergency Positions	Minimum Staffing			Full Augmentation
			Shift Size	^(a) 60 Minute Augmentation	Other On-Call	
5. Plant System Engineering, Repair and Corrective Actions	Technical Support	STA / Incident Assessor ⁽ⁱ⁾ (CR)	1			
		Technical Manager (TSC)		1		
		Core/Thermal Hydraulics Engineer (TSC)		1		
		Mechanical Engineer (TSC)		1		
		Electrical Engineer (TSC)		1		
		SAMG Decision Maker (TSC)		1 ^(b)		
		SAMG Evaluator (TSC)		2 ^(b)		
		Operations Manager (TSC)		1		
	Repair and Corrective Actions	Radiation Controls Engineer (TSC)	1 ^(b)	1 ^(k)	1 ^(k)	1 (c)
		Mechanical Maintenance (OSC)		1 ^(k)		(c)
		Electrical Maintenance / I&C (OSC)	1 ^(b)	1		
		Maintenance Manager (TSC)	1 ^(b)	1		
		OSC Director (OSC)		1		
		Assistant OSC Director (OSC)				1 (c)
	Accident Analysis	OPs Lead & Support Personnel (OSC)				1 (c)
		Technical Support Manager (EOF)				1
		Operations Advisor (EOF)				1
		Operations Assistant (EOF)				1
		Technical Advisor (EOF)				1
6. In-Plant Protective Actions	Radiation Protection	RP Technicians, or equivalent	2 ^(b)	4		(c)
7. Fire Fighting	--	Fire Brigade ^(e)	6			
8. First Aid and Rescue Operations	--	Plant Personnel	2 ^(b)			(c)
9. Site Access Control and Personnel Accountability	Security & Accountability	Security Team Personnel Security Coordinator ^(q) (TSC/ EOF)	(f)	(f)		2
10. Resource Allocation and Administration	Logistics / Administration	Logistics Manager (EOF)		1		1
		Logistics Coordinator (TSC)				1
		Administrative Coordinator (EOF)				(c)
		Clerical Staff (TSC/OSC/EOF)				1
		Events Recorder (EOF)				1
		Computer Specialist (EOF)				1

TABLE TMI 2-1: Minimum Staffing Requirements for TMI Station (Cont'd)

Functional Area	Major Tasks	Emergency Positions	Minimum Staffing			Full Augmentation
			Shift Size	^(a) 60 Minute Augmentation	^(g) Other On-Call	
11. Public Information	Media Interface	Corporate Spokesperson (JIC)			1	1
		Rad Protection Spokesperson (JIC)				1
		Technical Spokesperson (JIC)				
	Information Development	Public Information Director (JIC)			1	
		News Writer (JIC)				1
		Media Monitoring and Rumor Control Staff (JIC)				(c)
	Facility Operation and Control	Rumor Control Staff (JIC)				(c)
		JIC Director (JIC)			1	
		JIC Coordinator (JIC)				1
		Administrative Coordinator (JIC)				1
		Events Recorder (JIC)				1
		Clerical Support (JIC)				(c)
		Access Control (JIC)				1
		TOTAL (Non-Collateral):	17	32	4	34+

Legend:

- (a) Response time is based on optimum travel conditions.
- (b) May be provided by personnel assigned other functions. Personnel can fulfill multiple functions.
- (c) Personnel numbers depend on the type and extent of the emergency.
- (d) Staffing of the County EOC Liaison position is not required based on agreements with offsite agencies; however, every effort will be made to dispatch an Exelon Nuclear representative upon request from County EOC Director.
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- (i) Refer to Section 2.1.3 for description of on-shift STA/Incident Assessor staffing requirements.
- (j) TSC Security Coordinator position will be staffed by TMI Security personnel. The EOF Security Coordinator position will be staffed by Corporate personnel.
- (k) Within 60 Minutes, TMI is committed to having one (1) Mechanical Maintenance Technician and one (1) Electrical Maintenance Technician onsite and assigned to the OSC. Within 90 minutes, TMI is committed to have one (1) I&C Technician onsite and assigned to the OSC. Technicians who are already on shift may satisfy this requirement.

5.3.1 First Aid and Medical Equipment

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Small kits placed throughout the plant provide the most readily available first aid. These kits contain items typically needed to care for minor injuries. Typical contents can be referenced in Table TMI 5-1. The next level of first aid equipment is found at first aid stations. The medical staff can also provide Advanced Life Support and routine trauma care.

5.3.2 Damage Control Equipment

The TMI plant site is extensively equipped to conduct preventive maintenance and repairs on mechanical, structural, electrical, and instrumentation and controls equipment found in the plant.

In addition to the equipment and materials required for normal maintenance, other items are available to handle extraordinary maintenance jobs that might arise in damage control. Selection of damage control equipment inventory is based upon (a) mitigating the consequences of flooding, (b) personnel rescue, (c) checking the uncontrolled flow of fluids from process systems, and (d) elimination of electrical hazards. Typical equipment available for damage control can be found in Table TMI 5-1.

5.3.3 Radiation Protection Equipment

The TMI plant site maintains an inventory of protective clothing, respiratory equipment, survey instruments and supplies to provide adequate contamination control for all personnel expected to be onsite who might be affected in the event of an emergency.

The supplies are maintained, updated, inventoried and calibrated, as appropriate, on a regular basis in accordance with applicable procedures. Storage locations of emergency supplies can be found in the site implementing documents. Typical equipment available can be found in Table TMI 5-1.